COMPUTER OPERATOR AND PROGRAMMING ASSISTANT

NSQF LEVEL - 3

Volume I of II

TRADE PRACTICAL

SECTOR: IT & ITES

(As per revised syllabus July 2022 - 1200 hrs)

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Directorate General of Training

DIRECTORATE GENERAL OF TRAINING
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
GOVERNMENT OF INDIA

NATIONAL INSTRUCTIONAL MEDIA INSTITUTE, CHENNAI

Post Box No. 3142, CTI Campus, Guindy, Chennai - 600 032

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Duration : **1 Year**

Trade : **COPA - Volume I of II Trade Practical - NSQF Level - 3 (Revised 2022)**

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FOREWORD

The Government of India has set an ambitious target of imparting skills to 30 crores people, one out of every four Indians, to help them secure jobs as part of the National Skills Development Policy. Industrial Training Institutes (ITIs) play a vital role in this process especially in terms of providing skilled manpower. Keeping this in mind, and for providing the current industry relevant skill training to Trainees, ITI syllabus has been recently updated with the help of Mentor Councils comprising various stakeholder's viz. Industries, Entrepreneurs, Academicians and representatives from ITIs.

The National Instructional Media Institute (NIMI), Chennai has now come up with instructional material to suit the revised curriculum for **COPA Volume I of II Trade Practical NSQF Level - 3 (Revised 2022) in IT & ITES Sector.** The NSQF Level - 3 (Revised 2022) Trade Practical will help the trainees to get an international equivalency standard where their skill proficiency and competency will be duly recognized across the globe and this will also increase the scope of recognition of prior learning. NSQF Level - 3 (Revised 2022) trainees will also get the opportunities to promote life long learning and skill development. I have no doubt that NSQF Level - 3 (Revised 2022) the trainers and trainees of ITIs, and all stakeholders will derive maximum benefits from these IMPs and that NIMI's effort will go a long way in improving the quality of Vocational training in the country.

The Executive Director & Staff of NIMI and members of Media Development Committee deserve appreciation for their contribution in bringing out this publication.

Jai Hind

Ms. TRISHALJIT SETHI
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PREFACE

The National Instructional Media Institute (NIMI) was established in 1986 at Chennai by then Directorate General of Employment and Training (D.G.E & T), Ministry of Labour and Employment, (now under Ministry of Skill Development and Entrepreneurship) Government of India, with technical assistance from the Govt. of the Federal Republic of Germany. The prime objective of this institute is to develop and provide instructional materials for various trades as per the prescribed syllabi (NSQF LEVEL - 3) under the Craftsman and Apprenticeship Training Schemes.

The instructional materials are created keeping in mind, the main objective of Vocational Training under NCVT/NAC in India, which is to help an individual to master skills to do a job. The instructional materials are generated in the form of Instructional Media Packages (IMPs). An IMP consists of Theory book, Practical book, Test and Assignment book, Instructor Guide, Audio Visual Aid (Wall charts and Transparencies) and other support materials.

The trade practical book consists of series of exercises to be completed by the trainees in the workshop. These exercises are designed to ensure that all the skills in the prescribed syllabus are covered. The trade theory book provides related theoretical knowledge required to enable the trainee to do a job. The test and assignments will enable the instructor to give assignments for the evaluation of the performance of a trainee. The wall charts and transparencies are unique, as they not only help the instructor to effectively present a topic but also help him to assess the trainee's understanding. The instructor guide enables the instructor to plan his schedule of instruction, plan the raw material requirements, day to day lessons and demonstrations.

In order to perform the skills in a productive manner instructional videos are embedded in QR code of the exercise in this instructional material so as to integrate the skill learning with the procedural practical steps given in the exercise. The instructional videos will improve the quality of standard on practical training and will motivate the trainees to focus and perform the skill seamlessly.

IMPs also deals with the complex skills required to be developed for effective team work. Necessary care has also been taken to include important skill areas of allied trades as prescribed in the syllabus.

The availability of a complete Instructional Media Package in an institute helps both the trainer and management to impart effective training.

The IMPs are the outcome of collective efforts of the staff members of NIMI and the members of the Media Development Committees specially drawn from Public and Private sector industries, various training institutes under the Directorate General of Training (DGT), Government and Private ITIs.

NIMI would like to take this opportunity to convey sincere thanks to the Directors of Employment & Training of various State Governments, Training Departments of Industries both in the Public and Private sectors, Officers of DGT and DGT field institutes, proof readers, individual media developers and coordinators, but for whose active support NIMI would not have been able to bring out this materials.

Chennai - 600 032 **EXECUTIVE DIRECTOR**

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ACKNOWLEDGEMENT

National Instructional Media Institute (NIMI) sincerely acknowledges with thanks for the co-operation and contribution extended by the following Media Developers and their sponsoring organisations to bring out this Instructional Material **(Trade Practical)** for the trade of **COPA Volume I of II** (NSQF LEVEL - 3) (Revised 2022) under **IT & ITES** Sector for ITIs.

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NIMI records its appreciation for the Data Entry, CAD, DTP operators for their excellent and devoted services in the process of development of this Instructional Material.

NIMI also acknowledges with thanks the invaluable efforts rendered by all other NIMI staff who have contributed towards the development of this Instructional Material.

NIMI is also grateful to everyone who has directly or indirectly helped in developing this Instructional Material.

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INTRODUCTION

TRADE PRACTICAL

The trade practical manual is intented to be used in workshop . It consists of a series of practical exercises to be completed by the trainees during the course of the **COPA Vol I of II** Trade supplemented and supported by instructions/ informations to assist in performing the exercises. These exercises are designed to ensure that all the skills in compliance with NSQF LEVEL - 3 (Revised 2022)

Module 1 - Safe Working Practices
Module 2 - Assemble a Desktop PC
Module 3 - Using Windows Operating System
Module 4 - Computer Basics & Software Installation
Module 5 - DOS Command Line Interface
Module 6 - Install Ubuntu Linux operating system and execute basic Linux commands
Module 7 - Using Word Processing Software
Module 8 - Format documents
Modfule 9 - Manage Tables and Lists
Module 10 - Create and Manage References
Module 11 - Manage Graphic Elements
Module 12 - Manage Document Collaboration
Module 13 - Manage Mailings
Module 14 - Spread Sheet Application, Manage Worksheets and Workbooks
Module 15 - Manage Data Cells and Ranges
Module 16 - Manage Tables and Table Data
Module 17 - Perform Operations using Formulas and Functions
Module 18 - Manage Charts
Module 19 - Manage Pivot Tables
Module 20 - Power Point Presentations
Module 21 - Format Presentations
Module 22 - Manage Tables and Bulleted Text
Module 23 - Manage Graphic Elements
Module 24 - Manage Audio & Video Elements
Module 25 - Manage Transitions and Animations
Module 26 - Manage Collaboration
Module 27 - Demonstrate on
Module 28 - Demonstrate on
Module 29 - Demonstrate on

The skill training in the shop floor is planned through a series of practical exercises centred around some practical project. However, there are few instances where the individual exercise does not form a part of project.

While developing the practical manual a sincere effort was made to prepare each exercise which will be easy to understand and carry out even by below average trainee. However the development team accept that there is a scope for further improvement. NIMI, looks forward to the suggestions from the experienced training faculty for improving the manual.

TRADE THEORY

The manual of trade theory consists of theoretical information for the course of the **COPA** Trade. The contents are sequenced according to the practical exercise contained in the manual on Trade practical. Attempt has been made to relate the theortical aspects with the skill covered in each exercise to the extent possible. This co-relation is maintained to help the trainees to develop the perceptional capabilities for performing the skills.

The Trade theory has to be taught and learnt along with the corresponding exercise contained in the manual on trade practical. The indicating about the corresponding practical exercise are given in every sheet of this manual.

It will be preferable to teach/learn the trade theory connected to each exercise atleast one class before performing the related skills in the shop floor. The trade theory is to be treated as an integrated part of each exercise.

The material is not the purpose of self learning and should be considered as supplementary to class room instruction.

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CONTENTS

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
	Module 1 : Safe Working Practices		
1.1.01	Locate the electrical connections with computer system setup	1	1
1.1.02	Identifying Safety symbols and Hazard identification		2
1.1.03	Practice safe methods of fire fighting in case of electrical fire		3
1.1.04	Use of fire extinguishers		4
	Module 2 : Assemble a Desktop PC		
1.2.05	Identify computer peripherals and internal components of a desktop computer	1	6
1.2.06	Assemble components of desktop computer		9
	Module 3 : Using Windows Operating System		
1.3.07	Practice on Windows interface and navigation Windows	1	12
1.3.08	Practice on managing files and folders using removable drives		15
1.3.09	Customize the desktop		17
1.3.10	Settings and manage user accounts		19
1.3.11	View System properties and control panel details		21
1.3.12	Work with keyboard shortcut commands		24
1.3.13	Print and scan documents using different commands		26
	Module 4 : Computer Basics & Software Installation		
1.4.14	View the BIOS settings and their modifications	1	28
1.4.15	Install Windows operating system		31
1.4.16	Format hard disk and create partition		36
1.4.17	Identify and rectify common hardware and software issues during OS installation		37
1.4.18	Install necessary application software for Windows		38
1.4.19	Configure bluetooth / Wi-Fi settings		44
1.4.20	Install printer, scanner, Web camera & DVD drives		48
1.4.21	Burn data, video and audio files on CD/DVD using application software		52
	Module 5 : DOS Command Line Interface		
1.5.22	Basic DOS Commands	1	53
1.5.23	Managing files and folders using dos commands		56
	Module 6 : Install Ubuntu Linux operating system and execute basic Linux commands		
1.6.24	Basic DOS Commands	1	60
1.6.25	Install necessary application software in Linux		64
1.6.26	Use basic Linux commands for directory listing File, Folder management, Password etc.,		66
1.6.27	Use the Linux graphical user interface for file and folder management, exploring the system etc		73
1.6.28	Customize desktop settings and manage user accounts in Linux		76
1.6.29	View system properties and manage system setting in Linux		79
	Module 7 : Using Word Processing Software		
1.7.30	Navigate within documents	2	80
1.7.31	Format documents		85
1.7.32	Save and share documents		94

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Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.7.33	Inspect documents for issues	2	97
	Module 8 : Format documents		
1.8.34	Insert text and paragraphs	2	102
1.8.35	Format text and paragraphs		104
1.8.36	Create and configure document sections		109
	Module 9 : Manage Tables and Lists		
1.9.37	Create tables	2	112
1.9.38	Modify tables		114
1.9.39	Create and modify lists		118
	Module 10 : Create and Manage References		
1.10.40	Create and manage reference elements	2	124
1.10.41	Create and manage reference tables		128
	Module 11 : Manage Graphic Elements		
1.11.42	Insert illustrations and text boxes	2	132
1.11.43	Format illustrations and text boxes		146
1.11.44	Add text to graphic elements		150
1.11.45	Modify graphic elements		151
	Module 12 : Manage Document Collaboration		
1.12.46	Add and manage comments	2	159
1.12.47	Manage change tracking		161
	Module 13 : Manage Mailings	2	
1.13.48	Perform mail merge		165
	Module 14 : Spread Sheet Application, Manage Worksheets and Workbooks		
1.14.49	Open files in MS Excel	3	172
1.14.50	Import data		176
1.14.51	Navigate within workbooks		177
1.14.52	Format worksheets and workbooks		183
1.14.53	Customize options and views		186
1.14.54	Configure content for collaboration		195
	Module 15: Manage Data Cells and Ranges		
1.15.55	Manipulate data	3	204
1.15.56	Format cells and ranges		208
1.15.57	Define and reference named ranges		212
	Module 16: Manage Tables and Table Data		
1.16.58	Create and format tables	3	216
1.16.59	Managing tables and its data		218
1.16.60	Filter and sort table data		220
	Module 17: Perform Operations using Formulas and Functions		
1.17.61	Insert references	3	223
1.17.62	Calculate and transform data		229
1.17.63	Format and modify text		231

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Exercise No.	Title of the Exercise	Learning Outcome	Page No.
	Module 18: Manage Charts		
1.18.64	Create Charts	3	233
1.18.65	Modify charts		237
1.18.66	Format charts		240
	Module 19: Manage Pivot Tables	3	
1.19.67	Create Pivot Tables		242
	Module 20: Power Point Presentations		
1.20.68	Open files in MS PowerPoint		253
1.20.69	Format PowerPoint Presentations		257
1.20.70	Modify slide masters, handout masters, and note masters	4	259
1.20.71	Change presentation options and views		261
1.20.72	Save and share PowerPoint Presentations		265
1.20.73	Configure and present slide shows		267
1.20.74	Prepare presentations for collaboration		269
	Module 21: Format Presentations		
1.21.75	Insert text and paragraphs	4	270
1.21.76	Format text and paragraphs		273
1.21.77	Create and configure sections		278
	Module 22: Manage Tables and Bulleted Text		
1.22.78	Create tables		280
1.22.79	Modify tables	4	283
1.22.80	Create and modify bulleted text		288
1.22.80A	Create and manage reference elements (hyperlinks)		289
	Module 23: Manage Graphic Elements		
1.23.81	Insert illustrations and text boxes	4	292
1.23.82	Format illustrations and text boxes		295
1.23.83	Add and modify text in graphic elements		303
	Module 24: Manage Audio & Video Elements		
1.24.84	Add Audio elements	4	308
1.24.85	Add Video elements		310
	Module 25: Manage Transitions and Animations		
1.25.86	Add slide transitions	4	313
1.25.87	Add slide Animations		318
	Module 26: Manage Collaboration	4	
1.26.88	Add and manage comments		336
	Module 27: Demonstrate on		
1.27.89	Installation of MySQL		338
1.27.90	Troubleshooting basic installation issues		343
1.27.91	Creation and use of database	5	347
1.27.92	Designing of tables		348
1.27.93	Applying data integrity rules		349
1.27.94	Using the DDL, DCL and DML statements		351
1.27.95	Enforcing constraints, primary key and foreign key		354
1.27.96	Adding indices to Tables		356

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Exercise No.	Title of the Exercise	Learning Outcome	Page No.
	Module 28: Demonstrate on		
1.28.97	Simple select queries	5	357
1.28.98	Insert and delete queries Update queries		358
	Module 29: Demonstrate on		
1.29.99	Using the Number, Date and Character functions. Joins and Functions	5	360
1.29.100	Joins, Group by, Having, Sub query		362

LEARNING / ASSESSABLE OUTCOME

On completion of this book you shall be able to

S.No.	Learning Outcome	Ref. Ex.No.
1	**Install and setup operating system and related software in a computer following safety precautions. (Mapped NOS: SSC/N3022)**	**1.1.01 - 1.6.29**
2	**Create, format, and edit document using word processing application software. (Mapped NOS: SSC/N3022)**	**1.7.30 - 1.13.48**
3	**Create, format, edit and develop a workbook by using spreadsheet application software. (Mapped NOS: SSC/N3022)**	**1.14.49 - 1.19.67**
4	**Create and customize slides for presentation. (Mapped NOS: SSC/N3022)**	**1.20.68 - 1.26.88**
5	**Create and manage database file by using MySQL. (NOS: SSC/N9401)**	**1.27.89 - 1.29.100**

SYLLABUS

Duration	Reference Learning Outcome	Professional Skills (Trade Practical) with Indicative hours	Professional Knowledge (Trade Theory)
Professional Skill- 94 Hrs; Professional Knowledge - 32 Hrs	Install and setup operating system and related software in a computer following safety precautions. (Mapped NOS: SSC/N3022)	**Safe working practices (10 Hrs)** 1. Visit COPA Lab. of the institutes and locate the electrical connections with computer system setup. (3 Hrs) 2. Identifying safety symbols and hazard identification. (3 Hrs) 3. Practice safe methods of fire fighting in case of electrical fire. (2 Hrs) 4. Use of fire extinguishers. (2Hrs) **Assemble a Desktop PC (8 hrs)** 5. Identify computer peripherals and internal components of a desktop computer. (4 Hrs) 6. Assemble components of desktop computer. (4 Hrs) **Using Windows Operating Systems (20 hrs)** 7. Practice on Windows interface and navigating windows. (3 Hrs)	**Introduction to Computers (3 Hrs)** • Safe working practices • Scope of the COPA trade. • Safety rules and safety signs. • Types and working of fire extinguishers. Introduction t o Computer components **Introduction to computer system (4 Hrs)** • Concepts of Hardware and Software. • Function of mother board components and various processors. • Various Input/ Output devices in use and their features Introduction Windows Operating System (9 Hrs)

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		8. Practice on managing files and folders using removable drives. (4 Hrs) 9. Customize the desktop (2 hrs) 10. Settings and manage user accounts. (1 Hr) 11. View system properties and control panel details. (3 Hrs) 12. Work with keyboard shortcut commands. (4 Hrs) 13. Print and scan document using different commands. (3 Hrs) **Computer basics and Software Installation (20 Hrs)** 14. View the BIOS settings and their modifications. (3 Hrs) 15. Install Windows operating system. (4 Hrs) 16. Format hard disk and create partition. (3 Hrs) 17. Identify and rectify common hardware and software issues during OS installation. (3 Hrs) 18. Install necessary application software for Windows i.e. Office Package, PDF Reader, Media Player etc. (2 Hrs) 19. Configure Bluetooth and Wi-Fi settings. (1 Hr) 20. Install Drivers for printer, scanner, webcam and DVD etc. (2 Hrs) 21. Burn data, video and audio files on CD/DVD using application software. (2 Hrs) **DOS Command Line Interface (9Hrs)** 22. Use basic DOS commands for directory listing. (5 Hrs) 23. Manage files and folders using DOS commands. (4 Hrs) **Install Ubuntu Linux operating system and execute basic Linux commands (27 Hrs)** 24. Installation of Ubuntu Linux operating system (6 Hrs) 25. Install necessary application software for Linux i.e. Office Package, PDF Reader, Media Player etc. (4 Hrs) 26. Use Basic Linux commands for directory listing, file and folder management, password etc. (6 Hrs) 27. Use the Linux graphical user interface for file and folder management, exploring the system etc. (6 Hrs) 28. Customize desktop settings and manage user accounts in Linux. (3 Hrs)	• Introduction to operating System • Main features of Windows OS • Concept of various shortcut commands. **Introduction to the booting process (6 Hrs)** • Introduction to various types of memories and their features. • Basic Hardware and software issues and their solutions. • Usage of Application software and Antivirus. **Introduction to DOS Command Line Interface & Linux Operating Systems (10 Hrs)** • Introduction to basic DOS Internal and External Commands. • Introduction to Open Source Software • Introduction to Linux Operating System features, structure, files and processes • Basic Linux commands.

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		29. View system properties and manage system setting in Linux. (2 Hrs)	
Professional Skill - 47 Hrs.; Professional Knowledge - 14 Hrs	Create, format, and edit document using word processing application software. (Mapped NOS: SSC/N3022)	**Using Word Processing Software (47 hrs)** **Manage documents (11 Hrs.)** 30. Navigate within documents (2 Hrs) • Search for text • Link to locations within documents • Move to specific locations and objects in documents • Show and hide formatting symbols and hidden text **31. Format documents (4.6 Hrs)** • Set up document pages • Apply style sets • Insert and modify headers and footers • Configure page background elements **32. Save and share documents (2 Hrs)** • Save documents in alternative file formats • Modify basic document properties • Modify print settings • Share documents electronically **33. Inspect documents for issues (2.4 Hrs)** • Locate and remove hidden properties and personal information • Locate and correct accessibility issues • Locate and correct compatibility issues **Format documents (8 Hrs.)** 34. Insert text and paragraphs (2 Hrs) • Find and replace text • Insert symbols and special characters **35. Format text and paragraphs (3 Hrs)** • Apply text effects • Apply formatting by using Format Painter • Set line and paragraph spacing and indentation • Apply built-in styles to text • Clear formatting **36. Create and configure document sections (3 Hrs)** • Format text in multiple columns • Insert page, section, and column breaks • Change page setup options for a section **Manage tables and lists (9.5 Hrs)** **37. Create tables (3 Hrs)** • Convert text to tables • Convert tables to text	**Using Word Processing Software (14 Hrs)** • Introduction to the various applications in MS office. • Introduction to Word features, Office button, toolbars. • Creating, saving and formatting and printing documents using Word. • Working with objects, macro, mail merge, templates and other tools in Word.

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		• Create tables by specifying rows and columns **38. Modify tables (3 Hrs)** • Sort table data • Configure cell margins and spacing • Merge and split cells • Resize tables, rows, and columns • Split tables • Configure a repeating row header **39. Create and modify lists (3.5 Hrs)** • Format paragraphs as numbered and bulleted lists • Change bullet characters and number formats • Define custom bullet characters and number formats • Increase and decrease list levels • Restart and continue list numbering • Set starting number values Create and manage references (3 Hrs.) **40. Create and manage reference elements (1.4 Hrs)** • Insert foot notes andend notes • Modify footnote and endnote properties • Create and modify bibliography citation sources • Insert citations for bibliographies **41. Create and manage reference tables (1.6 Hrs)** • Insert tables of contents • Customize tables of contents • Insert bibliographies **Manage graphic elements (8.5 Hrs.)** **42. Insert illustrations and text boxes (3 Hrs)** • Insert shapes • Insert pictures • Insert 3D models • Insert Smart Art graphics • Insert screenshots and screen clippings • Insert text boxes **43. Format illustrations and text boxes (3 Hrs)** • Apply artistic effects • Apply picture effects and picture styles • Remove picture backgrounds • Format graphic elements • Format SmartArt graphics • Format 3D models **44. Add text to graphic elements (1 Hr)** • Add and modify text in text boxes • Add and modify text in shapes • Add and modify SmartArt graphic content	

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		45. Modify graphic elements (1.5 Hrs) • Position objects • Wrap text around objects • Add alternative text to objects for accessibility **Manage document collaboration (3.5 Hrs.)** **46. Add and manage comments (1 Hrs)** • Add comments • Review and reply to comments • Resolve comments • Delete comments **47. Manage change tracking (2.5 Hrs)** • Track changes • Review tracked changes • Accept and reject tracked changes • Lock and unlock change tracking **Manage Mailings (3.5 Hrs)** **48. Perform mail merge (3.5 Hrs)** • Create envelopes • Create labels • Create a new mailing list • Perform mail merge using an existing list	
Professional Skill - 72 Hrs.; Professional Knowledge - 18 Hrs	Create, format, edit and develop a workbook by using spreadsheet application software. (Mapped NOS: SSC/N3022)	**Spread Sheet Application (72 Hrs)** **Manage Worksheets and Workbooks (12 Hrs.)** **49. Open files in MS Excel (1.5 Hrs)** • Open MS Excel • Create a new Excel file • Create a new Excel file from a template • Open an existing Excel file 50. Import data (1.5 Hrs) • Import data from txt files • Import data from csv files **51. Navigate within workbooks (2 Hrs)** • Search data • Navigate to named cells, ranges or workbook elements • Insert and remove hyperlinks **52. Format worksheets and workbooks (2 Hrs)** • Modify page setup • Adjust row height and column width • Customize headers and footers **53. Customize options and views (3 Hrs)** • Display and modify content in different views • Freeze rows and columns • Change window views • Modify basic workbook properties • Display formulas	**Spread Sheet Application (18 Hrs)** • Introduction to Excel features and Data Types. • Cell referencing and linking Sheets. • Introduction to various functions in all categories of Excel. • Concepts of sorting, filtering and validating data. • Analyzing data using charts, data tables, pivot tables, goal seek and scenarios

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		54. Configure contentf o r collaboration (2 Hrs) • Set a print area • Save workbooks in alternative file formats • Configure print settings Manage data cells and ranges (12 Hrs.) **55. Manipulate data (3 Hrs)** • Paste data by using special paste options • Fill cells by using Auto Fill • Insert and delete multiple columns or rows • Insert and delete cells **56. Format cells and ranges (5 Hrs)** • Merge and Unmerge cells • Modify cell alignment, orientation and indentation • Format cells using Format Painter • Wrap text within cells • Apply number formats • Apply cell formats from the Format cells dialog box • Apply cell styles • Clear cell formatting **57. Define and reference named ranges (4 Hrs)** • Define a named range • Name a table • Summarize data visually Insert spark lines • Apply built in conditional formatting • Remove conditional formatting **Manage tables and table data (12 Hrs.)** **58. Create and format tables (4 hrs)** • Create excel tables from cell ranges • Apply table styles • Convert tables to cell ranges 59. Manage tables and table data (5 Hrs) • Add or remove table rows and columns • Configure table style options • Insert and configure total rows **60. Filter and sort table data (3 Hrs)** • Filter records • Sort data by multiple columns Perform operations using formulas and functions (12 Hrs.) **61. Insert references (3 Hrs)** • Insert relative, absolute and mixed references • Reference named ranges and named tables in formulas **62. Calculate and transform data (5 Hrs)** • Perform calculations using AVERAGE(), MIN(), MAX() and SUM() • Count cells by using COUNT(), COUNTIF() and COUNTBLANK() • Perform conditional operations by	

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		using the IF() function 63. Format and modify text(4 Hrs) • Format text using RIGHT(),LEFT() and MID() functions • Format text using UPPER(), LOWER() and LEN() functions • Format text using CONCAT() and TEXTJOIN() functions **Manage Charts (12 Hrs.)** 64. Create Charts (3 Hrs) • Create charts • Create chart sheets **65. Modify charts (4 Hrs)** • Add data series to charts • Switch between rows and columns in source data • Add and modify chart elements • Add trend lines to chart **66. Format charts (5 Hrs)** • Apply chart layouts • Apply chart styles • Add alternative text to charts for accessibility **Manage Pivot Tables (12 Hrs.)** **67. Create Pivot Tables(12 Hrs)** • Create Pivot tables from cell ranges • Manipulate fields (columns) to get desired analysis • Use Filters for pivot tables • Represent data as Count, Sum, Average & % of row / column • Group data in Columns & rows for aggregate reports	
Professional Skill - 53 Hrs; Professional Knowledge - 13 Hrs	Create and customize slides for presentation. (Mapped NOS: SSC/N3022)	**Power point Presentations (9.5 Hrs.)** **68. Open files in MS PowerPoint (1 Hr)** • Open MS PowerPoint • Create a new PowerPoint file • Create a new PowerPoint file from a template • Open an existing PowerPoint file **69. Format PowerPoint Presentations (1.5 Hrs)** • Add slides • Add titles and text • Select slide layouts • Add PowerPoint templates • Duplicate slides **70. Modify slide masters, handout masters, and note masters (2 Hrs)** • Change the slide master theme or background • Modify slide master content • Modify slide layouts **71. Change presentation options and views (1.5 Hrs)** • Change slide size • Display presentations in different views	**Power point Presentations (13 Hrs.)** • Image editing, Presentations • Introduction to Open Office. • Introduction to the properties and editing of images. • Introduction to different formats of images and their uses. • Introduction to Power Point and its advantages. • Creating Slide Shows. Fine tuning the presentation and good presentation technique

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		72. Save and share PowerPoint Presentations (1.5 Hrs) • Save presentations in alternative file formats • Configure different Print settings • Share presentations electronically **73. Configure and present slide shows (1 Hr)** • Hide unwanted slides while presenting • Configure slide show options • Present slide shows by using Presenter View **74. Prepare presentations for collaboration (1 Hrs)** • Protect presentations by using passwords • Export presentations to other formats **Format presentations (6.5 Hrs.)** **75. Insert text and paragraphs (2 Hrs)** • Find and replace text • Insert symbols and special characters **76. Format text and paragraphs (2 Hrs)** • Apply text effects • Apply formatting by using Format Painter • Set line and paragraph spacing and indentation • Apply built-in styles to text **77. Create and configure sections (2.5 Hrs)** • Format text in multiple columns • Text and image presentation styles • Clear formatting **Manage tables and bulleted text (8 Hrs)** 78. Create tables (3 Hrs) • Insert tables in PowerPoint • Apply built-in table styles • Create tables by specifying rows and columns **79. Modify tables (3 Hrs)** • Insert and delete table rows and columns • Configure cell margins and spacing • Merge and split cells • Resize tables, rows, and columns **80. Create and modify bulleted text (2 Hrs)** • Format paragraphs as numbered and bulleted lists • Change bullet characters and number formats • Increase and decrease list indents	

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		• Set starting number values • Restart and continue list numbering on different slides **Create and manage reference elements (hyperlinks) (1.25 Hrs)** • Create hyperlinks within presentations • Create hyperlinks in presentations for files and other sources **Manage graphic elements (11.5 Hrs)** **81. Insert illustrations and text boxes (3.5 Hrs)** • Insert shapes • Insert pictures • Insert SmartArt graphics • Insert screenshots and screen clippings **82. Format illustrations and text boxes (4 Hrs)** • Apply artistic effects • Apply picture effects and picture styles • Remove picture backgrounds • Crop images • Format graphic elements • Format SmartArt graphics **83. Add and modify text in graphic elements (4 Hrs)** • Add and modify text in text boxes • Add and modify text in shapes • Add and modify SmartArt graphic text • Create, insert and modify charts **Manage Audio & Video elements (6.5 Hrs)** **84. Add Audio elements (2 Hrs)** • Import audio files in presentations • Configure audio playback options **85. Add Video elements (4.5 Hrs)** • Import video files in presentations • Resize video to fit slide • Configure video playback options **Manage transitions and animations (9 Hrs)** **86. Add slide transitions (5 Hrs)** • Add same slide transition for all slides • Set transition effect duration • Configure transition start and finish options • Customise select slide transitions **87. Add animations (4 Hrs)** • Animate text and graphic elements • Order shapes, images, and text boxes • Group shapes, images, and text boxes	

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		• Configure animation effects • Configure animation paths • Reorder animations on a slide **Manage collaboration (0.75 Hrs)** 88. Add and manage comments (0.75 Hrs) • Add comments • Review and reply t o comments	
Professional Skill - 53 Hrs.; Professional Knowledge - 13 Hrs	Create and manage database file by using MySQL. (NOS: SSC/N9401)	**Demonstrate on (15 Hrs.)** 89. Installation of MySQL. (1 Hr) 90. Troubleshooting basic installation issues. (1 Hr) 91. Creation and use of database. (3 Hr) 92. Designing of tables. (3 Hr) 93. Applying data integrity rules. (2 Hr) 94. Using the DDL, DCL and DML statements. (2 Hrs) 95. Enforcing constraints, primary key and foreign key. (2 Hrs) 96. Adding indices to Tables. (1 Hr) **Demonstrate on (15 Hrs)** 97. Simple select queries. (5 Hrs) 98. Insert and delete queries Update queries. (10 Hrs) **Demonstrate on (23 Hrs)** 99. Using the Number, Date and Character functions. Joins and Functions (11.5 Hrs) 100. Joins, Group by, Having, Sub query. (11.5 Hrs)	**Database Concepts (4 Hrs.)** • Concept of DBMS, RDBMS. • Data Models, Concept of DBA, Database Users. • Database Schema. • Designing Database using Normalization Rules. • Various data types Data integrity, DDL DML and DCL statements. • Enforcing Primary key and foreign key. • Adding Indices. **Queries (4 Hrs)** • Concepts of Transactions • ACID Property of Transaction Constraints. **Joins and Functions (5 Hrs)** • Joining of tables • Sub Queries " Functions used in query like sum, average, max, min, count etc.
Professional Skill - 68 Hrs; Professional Knowledge - 16 Hrs	Install, setup/ configure, troubleshoot, and secure computer network including Internet. (Mapped NOS: SSC/N3022)	**Computer Network (68 Hrs.) Set-up & configure a Computer Network (48 Hrs.)** 101. View Network connections. (2 Hrs) 102. Connect a computer to a network and share Devices i.e. Printers, files, folders and drives. (4 Hrs) 103. Work with various Network devices, connectors and cables. Create straight and cross cable and punch a UTP cable in the patch socket and test the connectivity. (4 Hrs) 104. Practice IP Addressing and Subnet masking for IPV4/ IPV6 and pinging to test networks. (4 Hrs) 105. Configure Hub and Switch. (4 Hrs) 106. Set up and configure wired and wireless LAN in a Computer Lab within at least three computers. (6 Hrs) 107. Use patch panel & I/O Box for wired LAN and installing & configuring Internet connection in a single PC and in a LAN. (6 Hrs) 108. Set up a proxy server/ DHCP Server with firewall. (8 Hrs) 109. Set up video conferencing using open-source software. (4 Hrs)	**Communicating in a Connected World (12 Hrs.)** • Local Networks, • Communicating on a Local Network, Principles of Communications, • How do Ethernet Networks Work?, • How are Networks Built?, • Routing Across Networks • Explain how end- user devices and local networks interact with the global Internet. • Communicating in a Connected World Explain the concept of network communication. • Local Networks Explain the roles of devices in a network. • What Does a Home Network Look Like? • How Does Wi-Fi Work? • Introduction to LAN Devices, Internetworking Devices, **Internet Concepts (4 Hrs)** • Introduction to www, Concept of Internet, Web Browsers, internet servers and search engines. • Concepts of Domain naming Systems and E mail communication. • Introduction to video chatting tools and Social Networking concepts.

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		110. Use various tools (by open source /free) for network troubleshooting, maintenance and security for both Wired and Wireless (6 Hrs) 111. Set up Internet access & communication (10 Hrs) • Set-up internet connectivity • Set-up digital communication 112. Use the Internet (10 Hrs) • Browse the Internet • Use e-mail • Use Social Media • Use the phone for online activities	
Professional Skill - 67 Hrs; Professional Knowledge - 17 Hrs	Develop web pages using HTML and CSS. (Mapped NOS: SSC/N0503, SSC/N0501)	**Create simple static web pages using HTML tags (67 Hrs.)** 113. Practice HTML (46 Hrs) • Practice with basic HTML elements (e.g. head, title, body), tag and attributes. • Design simple web page with text, paragraph and line break using HTML tags • Format text, change background colour and insert pictures in web page • Design simple web page with tables and lists. • Use marquees, hyperlinks and mail to link in designing web pages • Create frames, add style and design layout. • Display a web page within a web page using iframes. • Insert text, check and combo box in web page. • Design web page using password field, submit button • Reset button and radio button etc. • Design a web page adding flash file, audio and video files. • Design web page with forms and form controls using HTML tags 114. Create simple static web pages using CSS (21 Hrs) • CSS syntax, Adding colors, fonts, backgrounds, images borders, text alignment, text transformation, Lists etc. • 3 types of CSS • Adding a Navigation Bars(vertical/ horizontal bars) • CSS drop downs & Forms • CSS counters and website layout, Multiple backgrounds & Putting the stylesheet in a separate file • CSS Animations & CSS Buttons	**Web Design Concepts (17 Hrs)** • Concepts of Static and Dynamic Web pages. • Introduction to HTML and various tags in HTML. • Concepts of different controls used in Web Pages. • Concepts of CSS and applying CSS to HTML. • Introduction to open source CMS viz, Joomla, Word press etc. and Web authoring tools viz. Kompozer, WordPress, Front Page etc.
Professional Skill - 173 Hrs;	Develop web pages using JavaScript. (Mapped NOS:	**JavaScript (173 Hrs)** **Embed JavaScript in HTML Pages (127 Hrs)**	**Introduction to JavaScript (35 Hrs)** • Introduction to Programming and Scripting Languages.

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Professional Knowledge - 35 Hrs	SSC/N0503, SSC/ N0501)	115. Practicing the JavaScript in creating dynamic HTML pages. (53 Hrs) 116. Embed JavaScript in HTML to Display Information in Web pages. (31 Hrs) 117. Use error handling techniques in JavaScript. (11 Hrs) 118. Use objects and classes in JavaScript. (31 Hrs) 119. Describe Animation and Multimedia using JavaScript. (1 Hr) Create a dynamic website using an open-source tool (40 Hrs) 120. Develop dynamic HTML pages using JavaScript. Deploy a simple web project (6 Hrs) 121. Deploy web project using IIS.	• Introduction to JavaScript and its application for the web. • Introduction to Web Servers and their features. • JavaScript Basics - Data types, Variables, Constants and Conversion between data types. • Arithmetic, Comparison, Logical Operators in JavaScript. Operator precedence. • Program Control Statements and loops in JavaScript. • Arrays in JavaScript - concepts, types and usage. • The String data type in JavaScript. Introduction to String, Math and Date. • Introduction to Functions in JavaScript. • Built in JavaScript functions overview. • Concepts of Pop Up boxes in JavaScript. • Introduction to the Document Object Model. • Concepts of using Animation and multimedia files in Java Script.
Professional Skill - 73 Hrs Professional Knowledge - 17 Hrs	Create workbooks with advanced formulas, macros, charts, pivot tables and demonstrate ability to use Power tools. (NOS: SSC/ N9402)	**Data Visualization or analysis using Excel - (73 Hrs)** **Create advanced formulas and macros (24 Hrs)** 122. Create and modify simple macros (6 Hrs) 123. Perform form controls and create simple data entry form with macros. (6 Hrs) 124. Look up data by using functions. (6 Hrs) 125. Use advanced date functions.(6 Hrs) **Manage advanced charts and tables (21 hrs)** 126. Create and modify advanced charts. (10 Hrs) 127. Create and modify PivotTables. (11 Hrs) **Use Power Query and Power BI (24 Hrs)** 128. Create a Power Query, Power Query Function. Invoking the Power Query function and combining queries. Organize the workbook queries (12 Hrs) 129. Use Power BI for simple data visualizations. (12 Hrs) **Make a dashboard in Excel (4 Hrs)**	**Advanced Excel Concepts - Theory- (17 Hrs)** • MS excel revision (row, columns, basic formatting, insert menu, Print setup, etc.) and Look up introduction and functions • Types of references and cell naming • Excel Linkage Custom Format and Excel Protection • Tips and tricks • Pivot table and Pivot chart • Conditional formatting • Advanced Graphs • Power Queries

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Professional Skill - 25hrs; Professional Knowledge - 10 Hrs.	Browse, select, and transact using E-commerce websites(NOS: SSC/N9403)	**Browse e-Commerce sites to identify products & services (6.5 Hrs)** 130. Demonstrate e-Commerce sites. (1.5 Hrs) 131. List features of e-commerce sites. (2 Hrs) 132. Use e-commerce sites to source an item. (3 Hrs) Shop online (4.5 Hrs) 133. Undertake transactions on an e-commerce site. (4.5 Hrs) **Manage e-commerce operations (14 Hrs)** 134. Add products to an ecommerce website. (4 Hrs) 135. Practice order processing. (3 Hrs) 136. Practice payment processing. (4.5 Hrs) 137. Identify common security issues. (3.5 Hrs)	**e-Commerce (10 Hrs)** • Introduction to E Commerce and advantages. • Building business on the net. • Payment and Order Processing, Authorization, Chargeback and otherpayment methods. • Security issues and payment gateways.
Professional Skill - 20 Hrs Professional Knowledge - 10 Hrs.	Secure information from Internet by using cyber security concept. (NOS: SSC/N9404)	**138. Protect information, computers and networks from viruses, spyware and other malicious code (19 Hrs)** • Explain Cyber security (2 Hrs) • Secure computers & the network (5.5 Hrs) • Reduce cyber security threats (2 Hrs) • Secure a Wi-Fi Network (4 Hrs) • Use Anti-Virus software (3 Hrs) • Perform back-ups of files, data & information (2.5 Hrs) **139. Explain compliance with IT Act (1 Hr)** • Identify steps for information privacy. (0.5 Hrs) • Identify common cybercrimes and penalties applicable. (0.5 Hrs)	**Cyber Security (10 Hrs)** • Overview of Information Security, SSL, HTTPS, Security threats, information Security vulnerability and Risk management. • Introduction to Directory Services, Access Control, Security, Privacy protection, Audit and Security. • Introduction to IT Act and penalties for cybercrimes.
Professional Skill -25 Hrs; Professional Knowledge 15 Hrs.	Explain Cloud concepts &services and Describe Application Development Life Cycle. (NOS: SSC/N9405)	**Cloud Computing (15 Hrs) Working with Cloud Services (12 Hrs)** 140. Practice with IaaS using free cloud services. (4 Hrs) 141. Practice with PaaS using free cloud services. (4 Hrs) 142. Practice with SaaS using free cloud services. (4 Hrs) **Web hosting in Cloud (3 Hrs)** 143. Host a website in a free cloud. (3 Hrs) **Develop an application and perform the Application Development Life Cycle (10 Hrs)** 144. Identify Phases of the Application Development Life Cycle. (5 Hrs) 145. Describe Roles in each of the phases of Application Development Life Cycle. (5 Hrs)	**Introduction to Cloud Computing (12 Hrs)** • Benefits of cloud services, different categories. • Resources available in cloud. **Explain the Application Development Life Cycle (3 Hrs)** • Identify Phases of the Application Development Life Cycle. • Describe Roles in each of phases of the Application Development Life Cycle.

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To be selected either "Programming in Python" or "Programming in Java" as Elective Module for COPA.			
COPA - Elective Module - I Programming in Python			
Professional Skill - 70 Hrs; Professional Knowledge - 30 Hrs.	Write programs using Python language. (NOS: SSC/N9406)	**Programming language (Python) Use Python from command line (7 Hrs)** 1. Install, set up the environment & run Python. (3 Hrs) 2. Use Command Line and IDE to create and execute a python program. (4 Hrs) **Perform Operations using Data Types and Operators (15 Hrs)** 3. Write and test a python program to demonstrate print statement, comments, different types of variables. (5 Hrs) 4. Write and test a python program to perform data and data type operations, string operations, date, input and output, output formatting and operators. (5 Hrs) 5. Determine the sequence of execution based on operator precedence. (5 Hrs) **Control Flow with Decisions and Loops (20hrs)** 6. Construct and analyze code segments that use branching statements. (10 Hrs) 7. Construct and analyze code segments that perform iteration. (10 Hrs) **Document and Structure Code (18 Hrs)** 8. Document code segments using comments and documentation strings. (3 Hrs) 9. Construct and analyze code segments that include List comprehensions, tuple, set and Dictionary comprehensions. (16 Hrs) **Perform Operations Using Modules and Tools (10 Hrs)** 10. Perform basic operations using built-in modules. (5 Hrs) 11. Solve complex computing problems by using built-in modules. (5 Hrs)	Programming language (Python) (30 Hrs) • Introduction to Python History • Features, Setting up path Basic Syntax, Comments, Variable • Different Data Types • Casting, string, Boolean • Python Operators • Conditional Statements • Looping • Control Statements, String Manipulation, Lists, Tuple, sets • Dictionaries • Arrays • Iterators, modules, dates, math, • Modules, Input and Output.
COPA - Elective Module - II Programming in JAVA			
Professional Skill - 70 Hrs; Professional Knowledge - 30 Hrs.	Writing programs using JAVA. (SSC/ N9407)	**Object Oriented Programming and JAVA Language (15 Hrs)** 1. Installing JAVA. 2. Setting the Class path. 3. Writing and Executing a simple JAVA Program to display "Hello". **Demonstrate writing JAVA programs:** 4. Use of various data types in JAVA. 5. Use of various operators in JAVA. 6. Create and use of Local, Instance and Class variables.	**Explain the following:** • Object Oriented Programming with Core Java • Java Programming features • JVM, Byte codes and Class path • Java Program Development • Compilation and Execution of JAVA programs • Basic JAVA language elements - keywords, comments, data types and variables.

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		7. Read text from the keyboard using scanner class read text from the keyboard using console class.	• JAVA Arithmetic, Assignment, Relational, Logical, Increment / Decrement operators and expressions. • JAVA String Operators • JAVA Input and Output streams, System in, System out. • Input using Scanner class and Console class methods. (10Hrs.)
		JAVA Program Flow Control (20 Hrs) **Demonstrate writing JAVA programs:** 8. Use of the if and if … else statements. 9. Use of the Switch statement. 10. Use of the Do … While and while - do loops. 11. Use of the For Loop. 12. Use of the Break and Continue Keywords. 13. Use of the JAVA Numbers Class methods. 14. Use of the JAVA Character Class methods. 15. Use of the JAVA String Class methods. 16. Create and use of arrays.	**Explain the following:** • Decision making and flow control using if…then, if then else, nested if, switch case and the conditional ternary operators in JAVA. • Loop control flow using while - do, do - while loops, for loop, using the break, continue statements. • Terminating the JAVA program. JAVA Number, Character and String Classes. Arrays in JAVA. (6Hrs.)
		JAVA Classes, Overloading and Inheritance (20 Hrs) **Demonstrate writing JAVA programs:** 17. Create and use of simple classes, objects and methods in JAVA. 18. Pass data and Objects to Methods. 19. Return data and Objects from Methods. 20. use of constructors in JAVA. 21. Create and use of Overloaded methods in JAVA. 22. Override methods in JAVA. 23. Create and use of Super class, Sub class in JAVA.	**Explain the following:** • JAVA Objects, Classes and Methods. • Passing data and objects as parameters to methods. • Method Overloading. • Constructors and Overloaded constructors. • Inheritance in JAVA. • Method Overriding in JAVA. (8Hrs.)
		Abstract Classes and Interfaces in JAVA (15 Hrs) Demonstrate writing JAVA programs: 24. Create and use virtual methods. 25. Create abstract classes and methods. 26. Create interfaces in JAVA. 27. Override methods in JAVA. 28. Create and implement an interface. 29. Extend interfaces in JAVA. 30. Create and use a package in JAVA. Troubleshooting Java issues Download and Install Java, Check and Verify Java Configurations, Test Java, Remove Old Versions of Java, Find Java version, Always redirected to the java.com download page	**Explain the following:** • Concept of Virtual methods. • Concept of Abstract classes and methods • Features of Abstract Classes • JAVA Interfaces and their advantages • Method Overriding in JAVA • Polymorphism in JAVA • Creating, implementing and extending interfaces • Creating and using Packages in JAVA. (6Hrs.)

Industrial Visit/Project work / Broad Area:

a) Create and host a web site of at least 6 web pages using JavaScript & CSS containing interactive objects, functions etc.

b) Create a project with Excel on Payroll Systems.

c) Create a database with MySQL on Library management system.

d) Create project in Python/Java programming language.

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Locate the electrical connections with computer system setup

Objectives: At the end of this exercise you shall be able to
- **identify the power location and connections.**

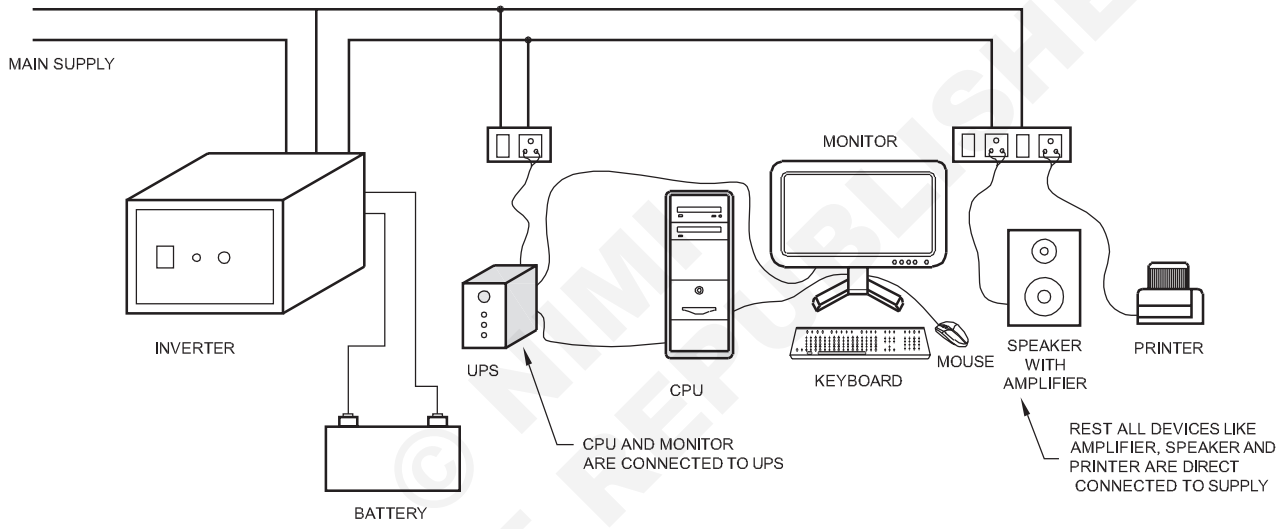
PROCEDURE

TASK 1: **Identify the proper power location**

1 Identify the proper power location and draw the layout of Electrical connections to the computer system.

Note: Write connection type and connector. like: Power Pin Plug.

Fig 1



UPS CONNECTION WITH INVERTER AND COMPUTER

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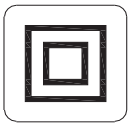
Identifying Safety symbols and Hazard identification

Objectives: At the end of this exercise you shall be able to
- **identify the four basic categories of safety signs.**

PROCEDURE

TASK 1: **Identify the four basic categories of safety sign**

Sign	Type	Meaning

Sign	Type	Meaning
		

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Practice safe methods of fire fighting in case of electrical fire

Objectives: At the end of this exercise you shall be able to
- **demonstrate the ability of fire-fighting during electrical fire**
- **as a member of the fire-fighting team**
- **as a leader of the group.**

Requirements

Equipment/Machines

- Fire extinguishers- CO_2 - 1 No.

PROCEDURE

General procedure to be adopted during electrical fire

1 Raise an alarm. Follow the methods giving below to raise an alarm signal when the fire breaks out.
   – Raise your voice and shout Fire! Fire! to draw attention.
   – run towards fire alarm/bell to activate
   – switch off the mains (if possible)

2 when you hear the alarm signal:
   – stop working
   – turn off all machinery and power
   – switch off fans/air circulators/exhaust fans. (it's good to switch off the sub-main)

3 If you are not involved in the firefighting:
   – leave the place using the emergency exit.
   – evacuate the premises
   – assemble at a safe place along with others
   – check, if anyone has called the fire services
   – close the doors and windows, but do not lock or bolt

As a member of the fire-fighting team

4 If you are involved in firefighting:

– take instructions to extinguish fire in an organized way.

If taking instructions:

– follow the instructions, and obey. Be safe and do not get trapped.

– do not use your own ideas.

As a leader of the group

If you are giving instructions:
   – locate and use co2 fire extinguisher
   – seek for sufficient assistance and inform the fire brigade
   – locate locally available suitable means to put out the fire
   – judge the magnitude of the fire, ensure that emergency exit paths are clear with no obstructions and then attempt to evacuate the place. (Remove explosive materials, substances that would easily catch fire.
   – Put off the fire with assistance identifying people with assigned responsibility for each activity.

5 Report the measures taken to put out the fire, to the authorities concerned.

Detailed reports on the fire accidents, even if they are small accidents, shall help in identification of the causes of the fire. The identified causes shall help in taking preventive measures to avoid similar occurrences in the future.

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Use of fire extinguishers

Objectives: At the end of this exercise you shall be able to
- **select fire extinguishers according to the type of the fire**
- **operate the fire extinguisher**
- **extinguish the fire.**

Requirements

Equipment/Machines

- Fire extinguishers- CO_2 - 1 No.
- Scissors 100mm - 1 No.
- Cell phone - 1 No.

PROCEDURE

1 Alert people in the surrounding area by shouting fire, fire, fire when you see fire.

2 Inform fire service or arrange to inform them immediately.

3 Open the emergency exit and ask the people inside the area to go away.

4 Switch “OFF” all electrical power supply.

Do not allow people to go near the fire.

5 Analyze to identify the type of fire. Refer Table1.

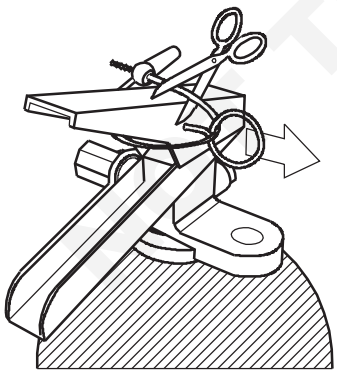
6 Assume that is it type D fire (Electrical fire).

7 Select CO_2 (carbon dioxide) fire extinguisher.

8 Locate and take the CO_2 fire extinguisher. Check for its expiry date.

9 Break the seal. (Fig 1)

Fig 1



BREACKING OF SEAL

CO20N1104H1

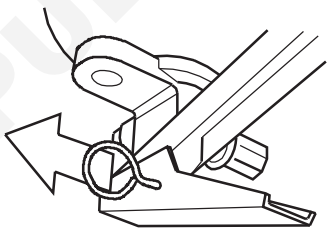
10 Pull the safety pin from the handle. (Fig 2) (the Pin is located at the top of the fire extinguisher.)

11 Aim the extinguisher nozzle or hose at the base of the fire. (This will remove the source of the fuel fire.) (Fig 3)

Keep yourself low.

12 Slowly squeeze the handle lever to discharge the agent. (Fig 3)

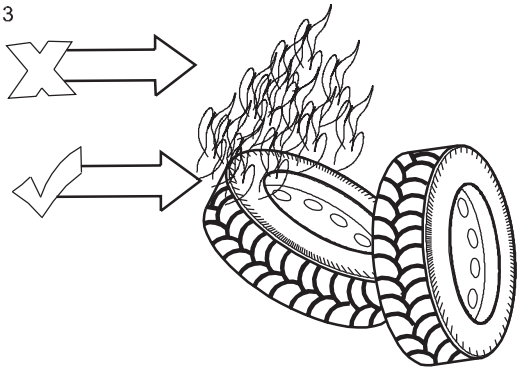
Fig 2



PULLING THE SAFETY PIN

CO20N1104H2

Fig 3



AIMING THE NOZZLE AT THE BASE OF THE FIRE

CO20N1104H3

13 Sweep from side to side approximately 15 cm over the fuel fire until the fire is put off. (Fig 4)

Fire extinguishers are manufactured for to use distance from 75 feet (22.9 m) or less.

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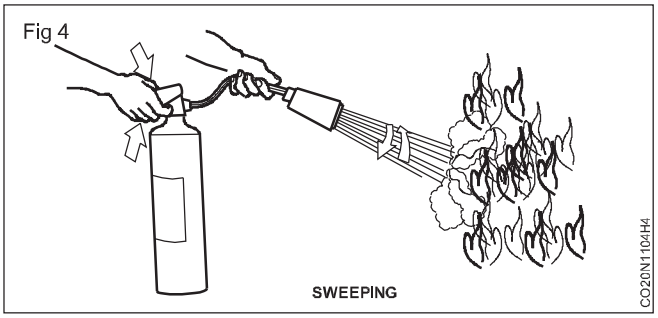
Fig 4



Caution

- While putting off fire, the fire may flare up.
- Do not panic so long as it is being put off promptly
- If the fire does not respond well even after you have used the fire extinguisher, move away from the fire point.
- Do not attempt to put out a fire when it emits toxic smoke. Leave it to the professionals.
- Remember that your life is more important than the property. So do not take risks.

In order to remember the simple operation of fire extinguisher, remember P.A.S.S.

This will help to use the fire extinguisher.

P for pull

A for aim

S for squeeze

S for sweep

— — — — — —

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Identify computer peripherals and internal components of a desktop computer

Objectives: At the end of this exercise you shall be able to
- **identify various input/output device connected to the computer**
- **identify front and back panel of desktop computer**
- **identify the internal parts of a desktop computer.**

Requirements

Tools/Equipment/Machines

- A Working PC with Internet Connection - 1 No./batch.

Among the three identical PC's, one PC will be used for demonstration by the instructor where as the other two will be used by two groups of trainees.

PROCEDURE

TASK 1: **To identify various input/output devices of connected to the computer**

Instructor will show the different input/output devices (available in your lab) connected to the computer and the trainees will make a record of it in Table 1. (Fig 1)

Fig 1

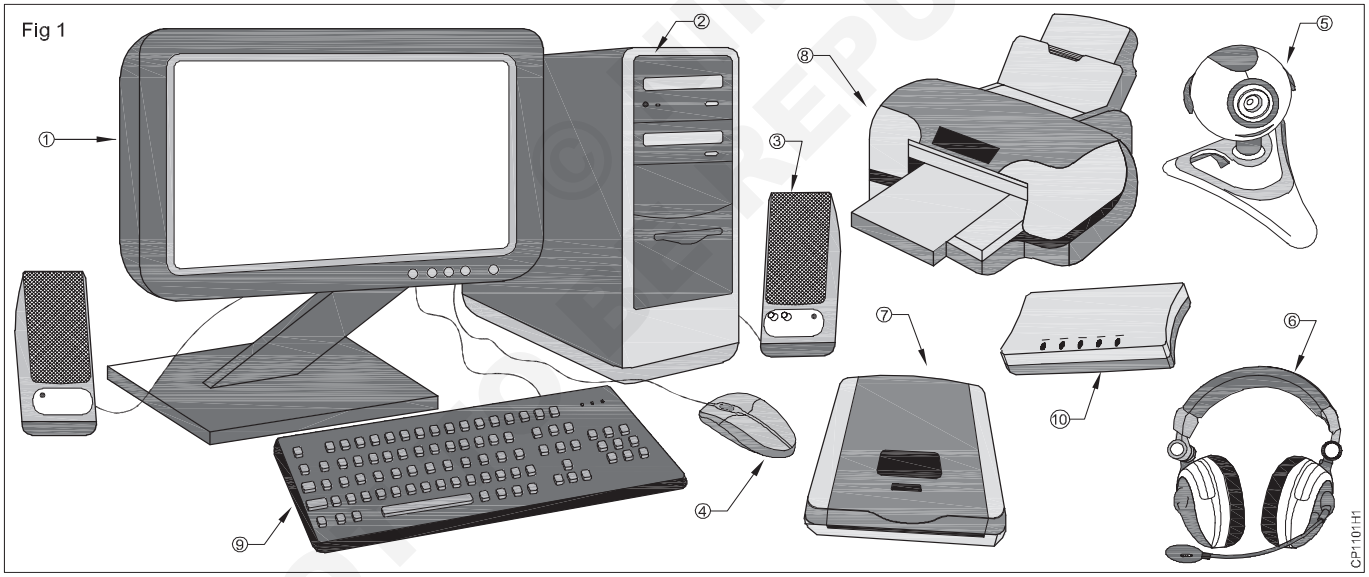

Table 1

Sl.No.	Name of the devices	Type
1		
2		
3		
4		
5		

Sl.No.	Name of the devices	Type
6		
7		
8		
9		
10		

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TASK 2 : **Identify front and back panel of desktop computer**

The instructor will demonstrate the uses of the following indicators, switches controls in Fig 2 and ports external to the processor found on the system unit shown in and the trainees will make a record of it in Table 2 and Table 3. (Fig 3)

Fig 2

Table 2

Sl. No.	Name the parts on the CPU Front Panel
1	
2	
3	
4	
5	
6	
7	

Fig 3

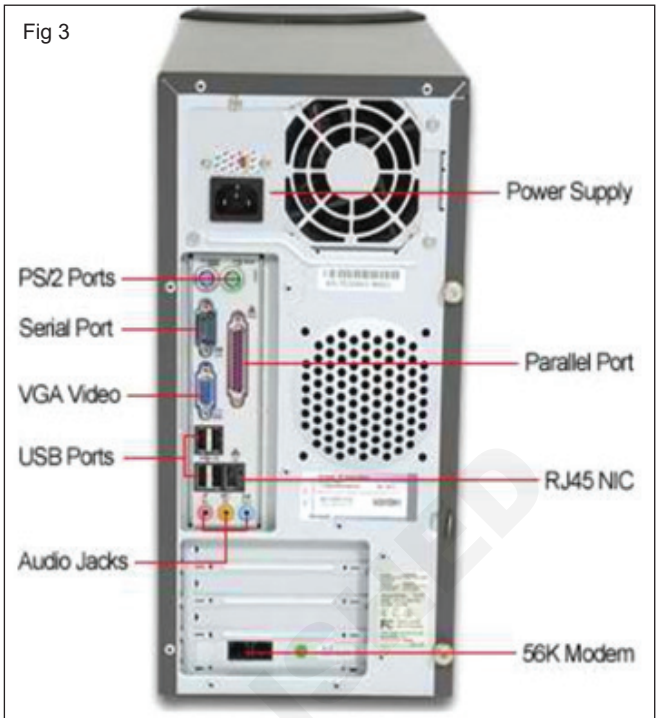

Table 2

Sl. No.	Name the parts on the CPU back Panel
1	
2	
3	
4	
5	
6	
7	
8	
9	

TASK 3 : **Identify the internal parts of a desktop computer**t

The instructor will open the system unit (available in your lab) and show the parts of system unit and motherboard components as shown in Fig 4 & Fig 5 and the trainees will make a record of the parts in Table 4 & 5.

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Fig 4

Table 4

Sl.No.	Name the internal parts of desktop CPU
1	
2	
3	
4	
5	
6	
7	
8	

Fig 5

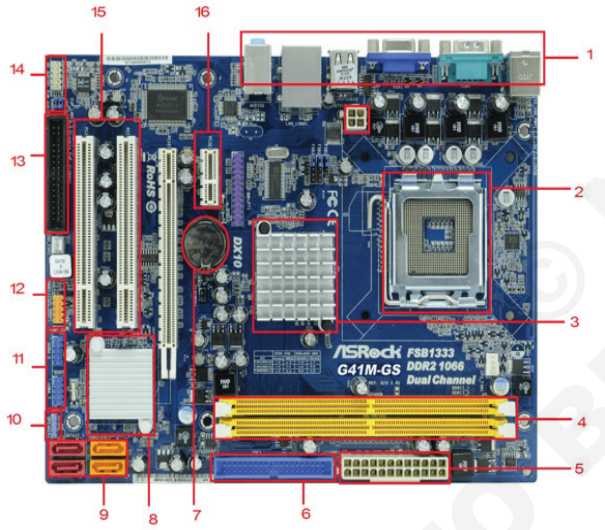

Table 5

Sl.No.	Name the parts of Mother board
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

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Assemble components of desktop computer

Objectives: At the end of this exercise you shall be able to
- **identify the assemble components of desktop computer.**

Requirements

Tools/Equipment/Machines

- Intel Motherboard supported with (I3/I5/I7/I9 Processor and DDR4/DDR5 / Latest Model – 1 No
- I3/I5/I7/I9 Process with heat Zink Fan – 1 No
- Thermal Paste – 1 No
- RAM (DDR4/DDR5) – 1 No
- Hard Disk SATA 3.5” – 1 No
- DVD Optical Drive SATA – 1 No
- Cabinet – 1 No
- SMPS ATX – 1 No

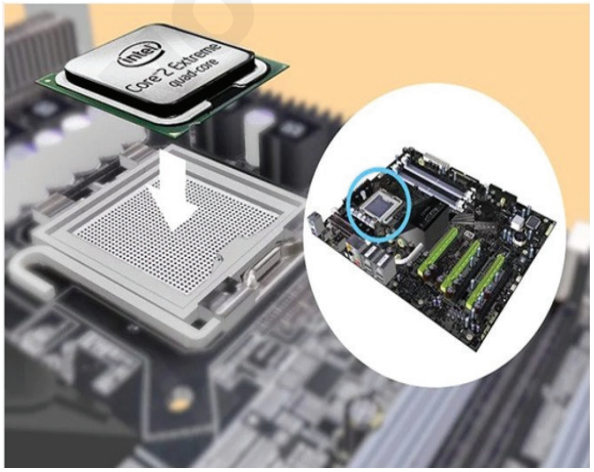
PROCEDURE

1 Prepare the Mainboard (motherboard). If you want to assemble you should use Intel i3,i5,i7,i9 processor supported Motherboard. (Fig 1)

Fig 1

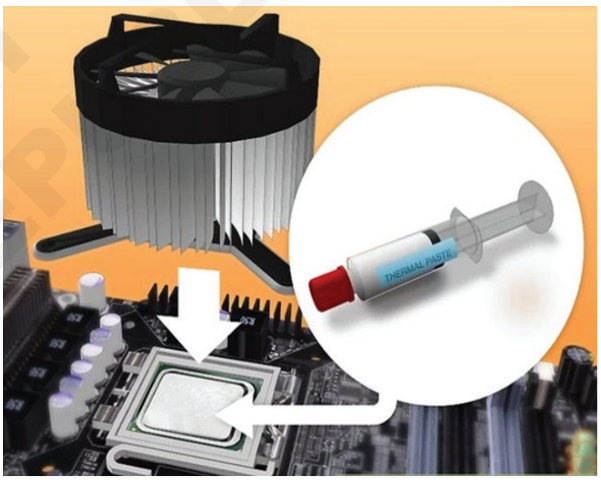
2 Mount the CPU in the socket of the Motherboard. Be careful not to install the CPU in wrong direction, it could short-circuit and damage your motherboard. (Fig 2)

Fig 2



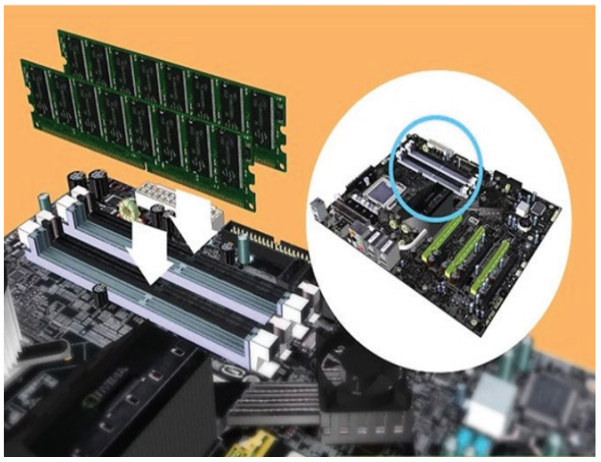
3 Connect the CPU cooler to the Mainboard if required use Thermal Paste. (Fig 3)

Fig 3



4 Attach the RAM (memory) modules in the corresponding slots. Make sure the pins on the RAM cards line up with the pins on the motherboard connector. (Fig 4)

Fig 4



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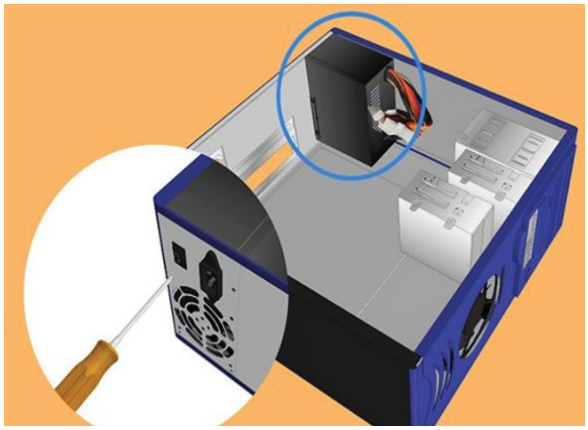
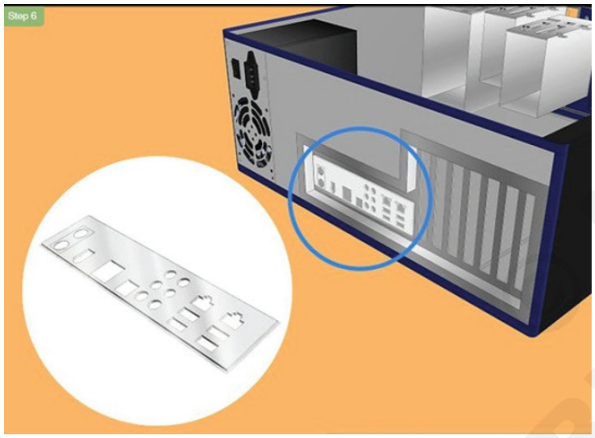
5 Open the Cabinet case and mount the power supply which is ATX type. Make sure to connect all the connections to the drives and the motherboard. (Fig 5)

Fig 5



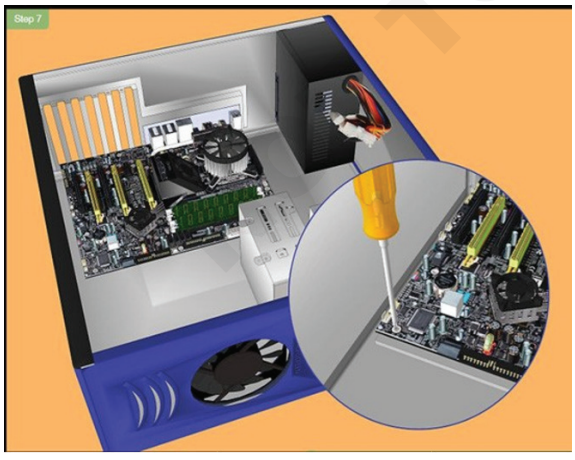
6 Attach the Motherboard back plate to the case and check the Motherboard mounting positions. (Fig 6)

Fig 6



7 Suitably position the Motherboard in the cabinet. (Fig 7)

Fig 7

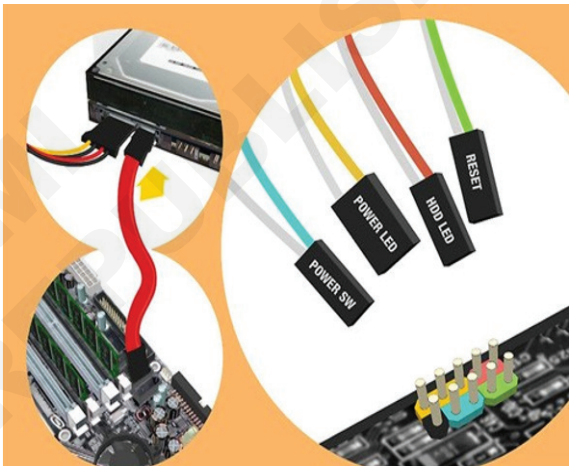


8 Mount the Hard disk and connect it to the power supply and the motherboard. There should be separate connections for the power supply, In SATA Hard disk case, should remove the jumper. (Fig 8)

Fig 8

9 Connect the SATA connectors to the drives and the USB connectors and the Cabinet Front Panel Power switches to the motherboard. The case and motherboard's instructions should tell where to connect the cables. (Fig 9)

Fig 9



10 Connect the 24 pin ATX connector and the 4-pin power supply control connector to the motherboard. (Fig 10)

Fig 10

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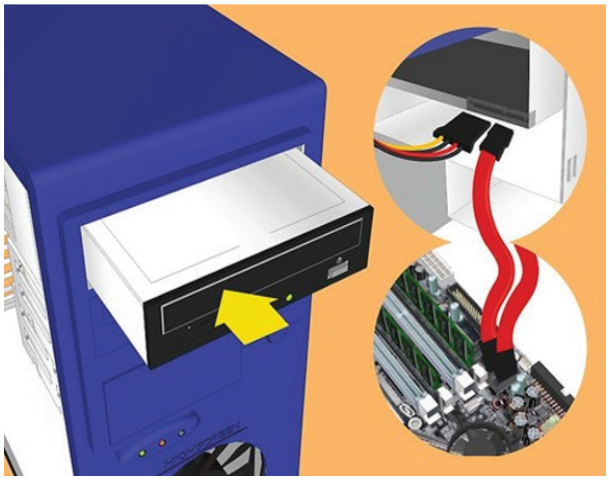
11 Mount the DVD-ROM drive. After connecting the SATA cable to the device, hook it up to the power supply. (Fig 11)

Fig 11



12 Finally, select a compatible operating system, and install using DVD or USB then follow the instructions to install. (Fig 12)

Fig 12

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Practice on Windows interface and navigation Windows

Objectives: At the end of this exercise you shall be able to
- **identify the files folders and drives in windows 10 desktop**
- **identify the utilities of Windows10 setting**
- **advanced search using Cortana**
- **application setting and pin up to desktop.**

Requirements

Tools/Equipment/Machines

- PC with Windows 10 OS - 1 No.

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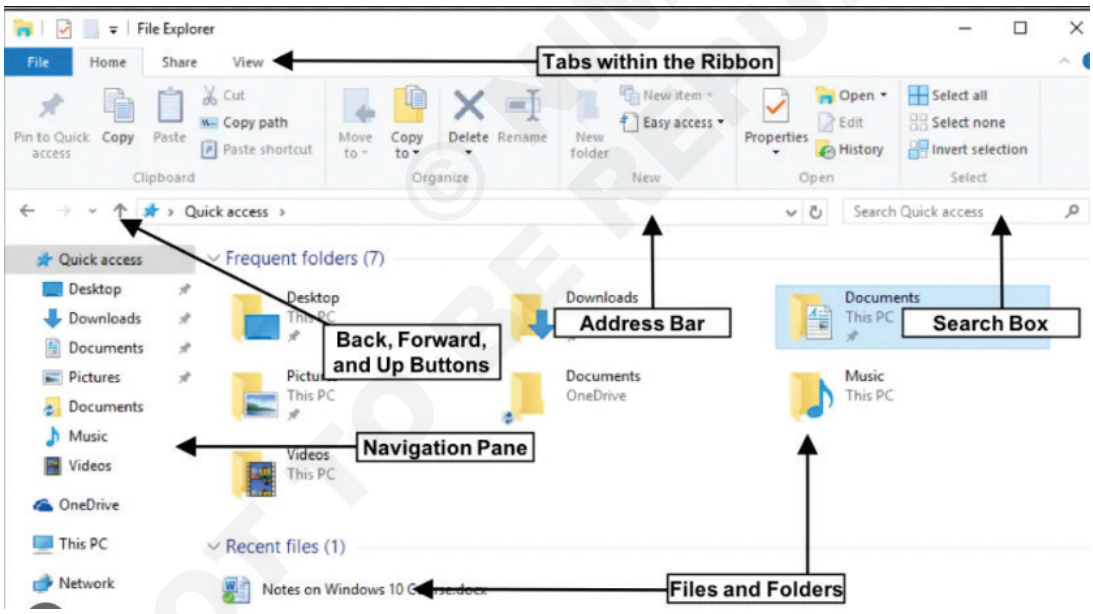
PROCEDURE

TASK 1: **Identify the files folders and drives in windows 10 desktop**

1 Open File Explorer from taskbar or Start Menu. Another way is by using the shortcut key Windows Logo +E to open File Explorer (Fig 1)

Fig 1



2 Select This PC

3 Record the displayed drives and other icons in your notebook and get it checked by your instructor.

4 Select any Drive required and then click the desired file or folder in the drive.

5 Record the address path of the file chosen.

The address will be displayed in the address bar. Here the location of the selected file is :This PC > Local Disk(D:) > Books

6 Close the Window

— — — — — —

TASK 2: **Identify the utilities of Windows10 setting**

1 Click Start →Setting or Click Windows logo + X to display a menu of Windows tools and utilities

2 Select Settings. (Fig 2)

3 Select your prepared tool to modify or customize

4 Click OK to apply the changes and close the Window. (Fig 3)

Fig 2

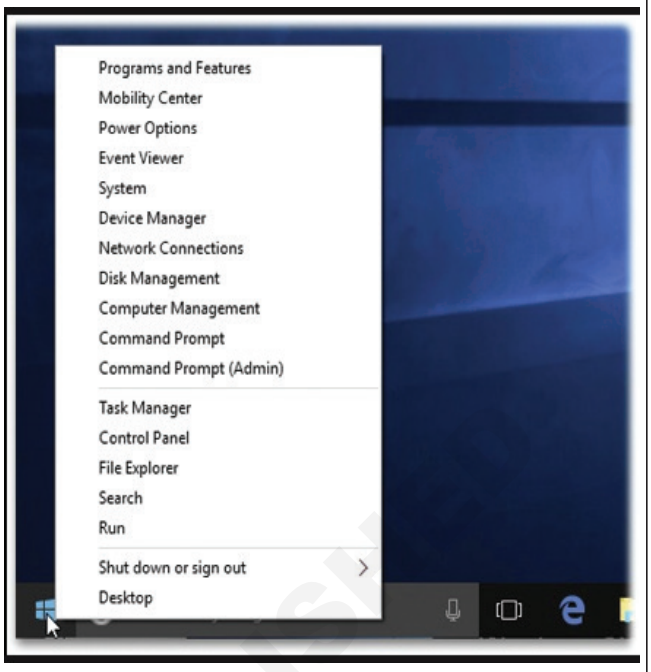
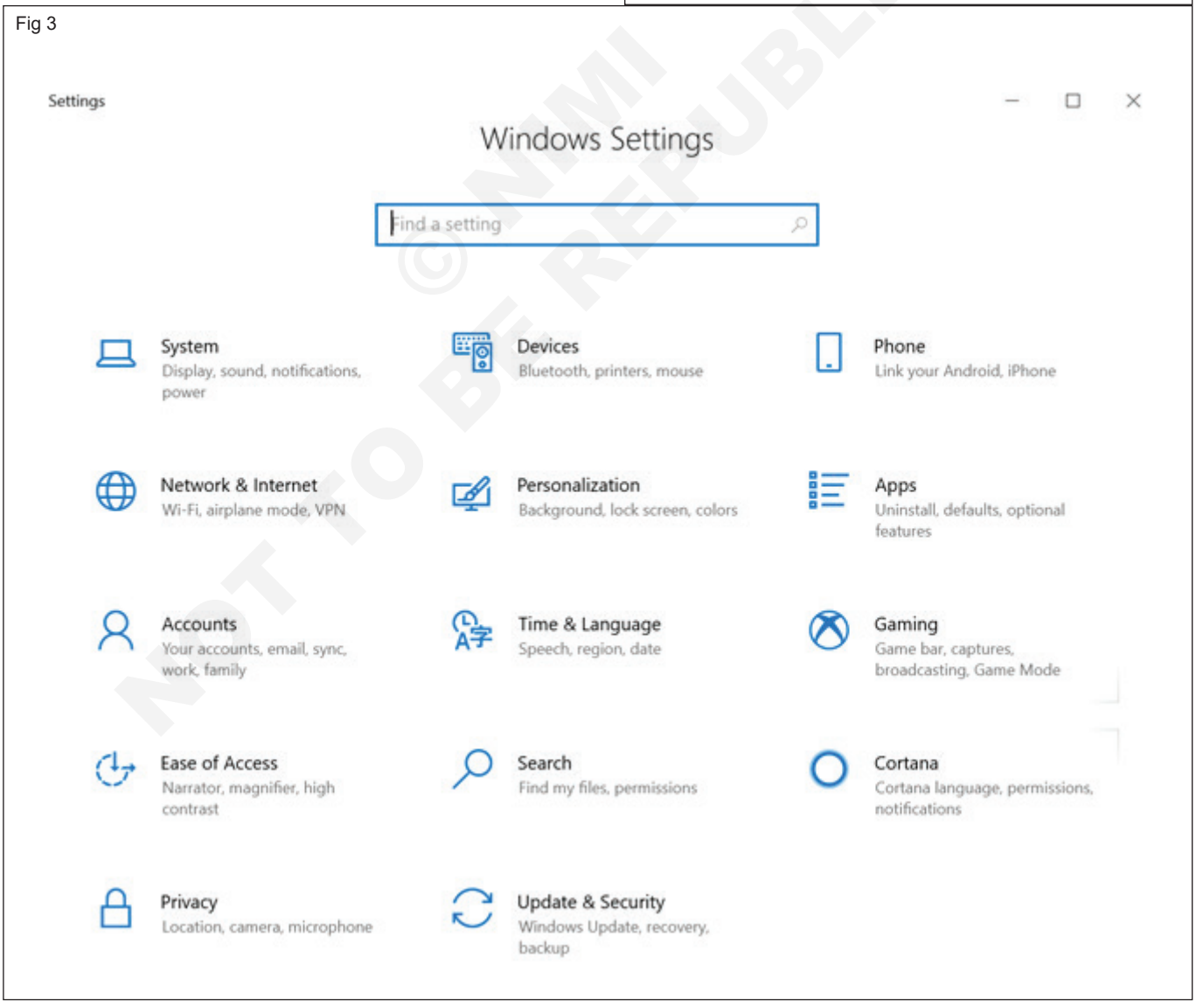


Fig 3



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TASK 3: **Application setting and pin up to Taskbar and Start menu**

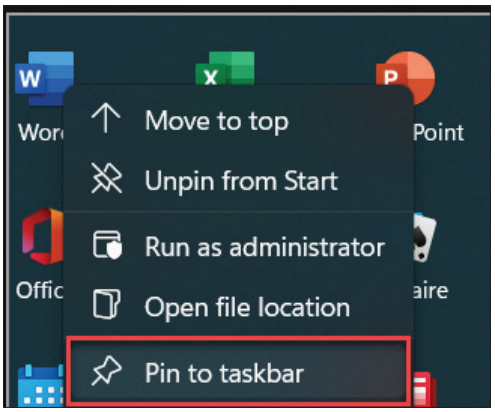
You can pin a program to the taskbar either from the Start menu or from the desktop.

1 To pin up using Start menu, Click Start and then locate the app you want to pin.

2 Right-click the app.

3 Click Pin to taskbar. (Fig 4)

Fig 4



4 To pin up using desktop, locate the app on the desktop.

5 Right-click the app

6 Click Pin to taskbar

7 To pin an app in Start menu, locate the app in desktop you want to pin

- Right-click the app
- Click Pin to Start (Fig 5)

To unpin an app, Click Unpin from start / desktop/taskbar.

To see the application setting of an t app in the start menu, first locate the app Right click on the app and click on App Settings.

If you want to change any setting (default, uninstall, terminate, reset etc.), make the desired changes. (Fig 6).

Fig 5

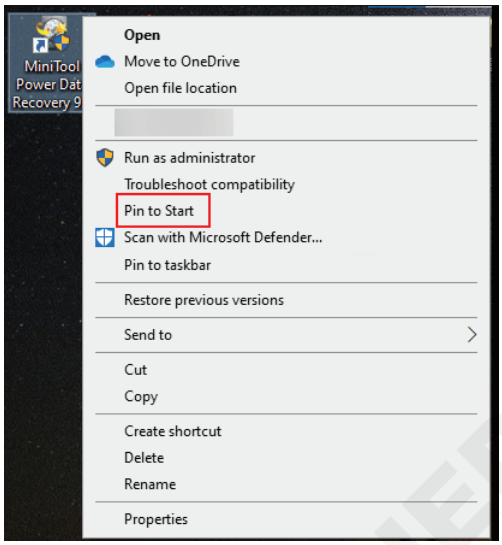
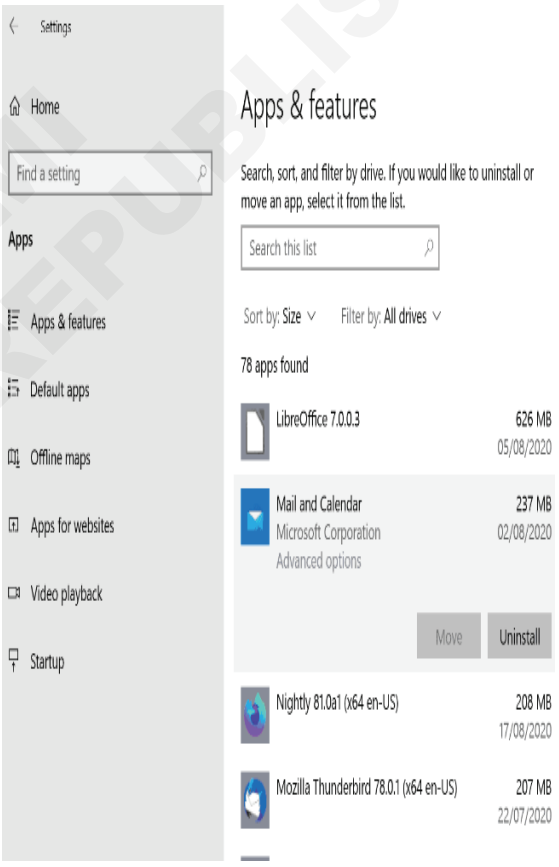


Fig 6



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Practice on managing files and folders using removable drives

Objectives: At the end of this exercise you shall be able to
- **insert and remove the pen drive in proper way**
- **check the bad sectors and viruses in pen drive using antivirus software**
- **copy the files and folders from and to the pen drive.**

Requirements

Tools/Equipment/Machines

• PC with Windows 10 OS	- 1 No.	• Pen Drive (Any Size)	- 1 No.

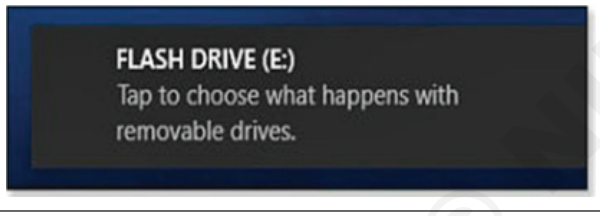
PROCEDURE

TASK 1: **Insert and remove the Pen drive in proper way**

1 Insert the pen drive in the USB port.

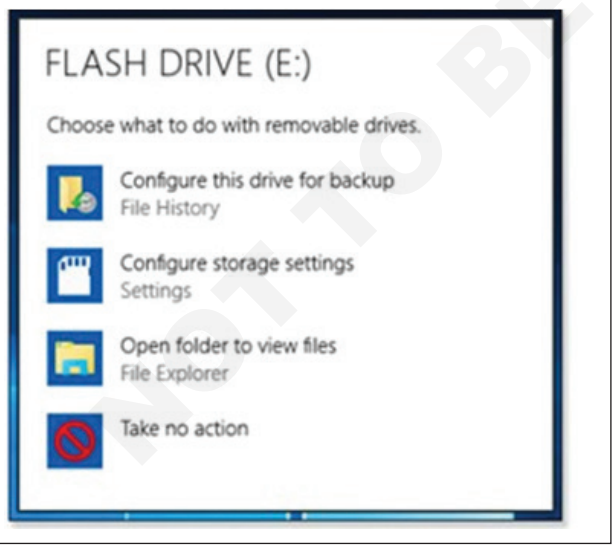
2 Click on the notification that appears on the lower right corner of the screen. (Fig 1)

Fig 1



3 Click on Open folder to view files (Fig 2).

Fig 2



4 Choose the file or folder to view from the pen drive

5 Close the file or folder

6 Click on Show hidden icons (Fig 3)

Fig 3

7 Click on Safely Remove Hardware and Eject Media icon

8 Click on the Eject Button

9 Remove the pen drive when Safe To Remove Hardware message is displayed on the screen (Fig 4)

Fig 4

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TASK 2: **Copy the files and folders from and to the pen drive**

1 Insert the pen drive in the USB port

2 Click on the notification that appears on the lower right corner of the screen.

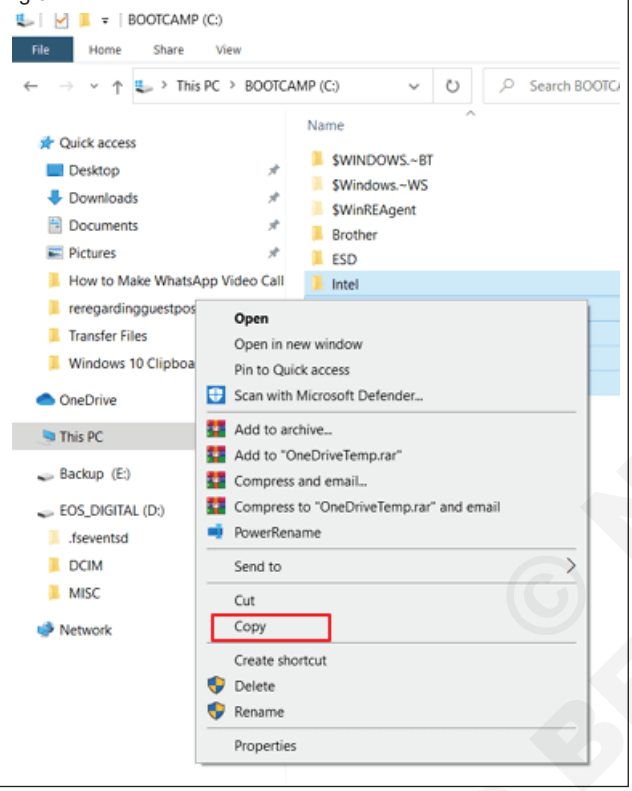
3 Click on Open folder to view files.

4 Right click on the file or folder available from the pen drive.

5 Select Copy from the drop down menu. (Fig 5) or use Shortcut key **Ctrl+C** to copy.

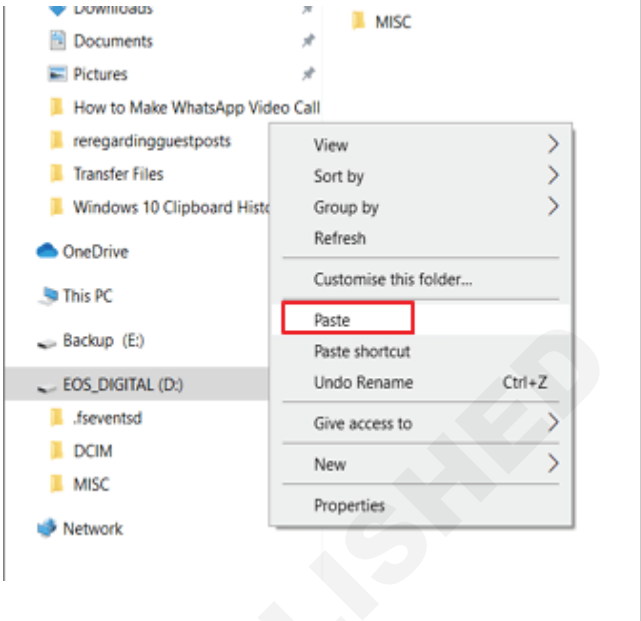
6 Open the drive or folder on the computer to paste the file or folder from the pen drive

Fig 5



7 Right click and select Paste option in the drop down menu. (Fig 6) or use Shortcut key **Ctrl+V** to Paste

Fig 6



8 To copy files or folders from computer to pen drive, select the file or folder then copy and paste into pen drive. (Or)

9 Right click and select **Send to** from the drop down menu and the select the drive of the pen drive.

Copy option from the drop down menu can also be used to copy the file to the pendrive by right clicking the file. Then open the pen drive and right click. Select Paste option from the menu.

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Customize the desktop

Objectives: At the end of this exercise you shall be able to
- **open desktop settings**
- **modify desktop settings.**

Requirements

Tools/Equipment/Machines

- PC with Windows 10 OS - 1 No.

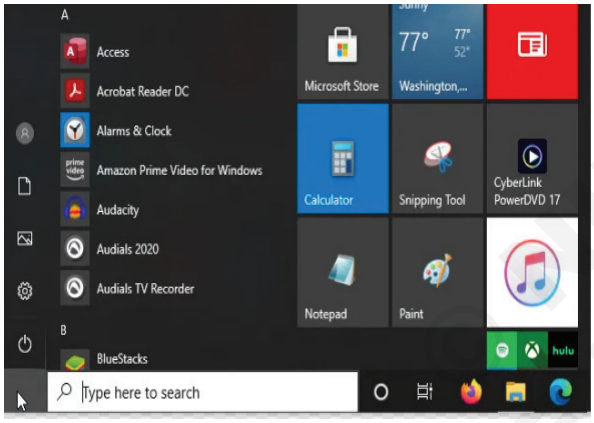
PROCEDURE

TASK 1: **Open desktop settings**

1 Click on Start menu.

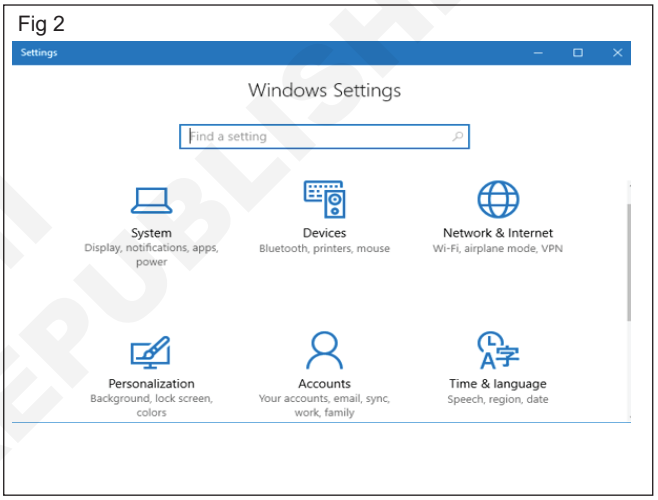
2 Select Settings tab. (Fig 1)

Fig 1



3 This will open Settings Window (Fig 2)

Fig 2



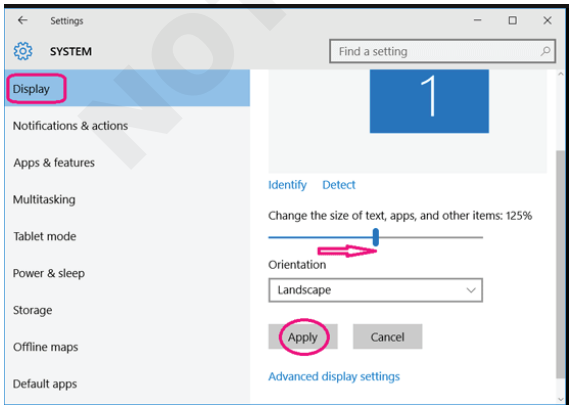
TASK 2: **Modify the desktop settings**

1 Open the Settings Window.

2 Click on System in the Settings Window

3 Click Display to change the display settings (Fig 3)

Fig 3



4 Change the brightness of the display by dragging the bar of Change brightness from left or right.

5 Record the brightness percentage at the left most and right most end of the Change brightness bar.

6 Change the orientation and note the how the display changes.

Note: To go back to the initial orientation, press Revert.

7 To change the background, click on the Personalization icon of settings window.

8 Click on the Background tab in the Personalization window.

9 Select the Type of Background you want to keep. If it is Picture, choose from picture given or You can browse your desired picture. (Fig 4)

10 Select Fill in Choose a fit. (Fig 5)

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Fig 4

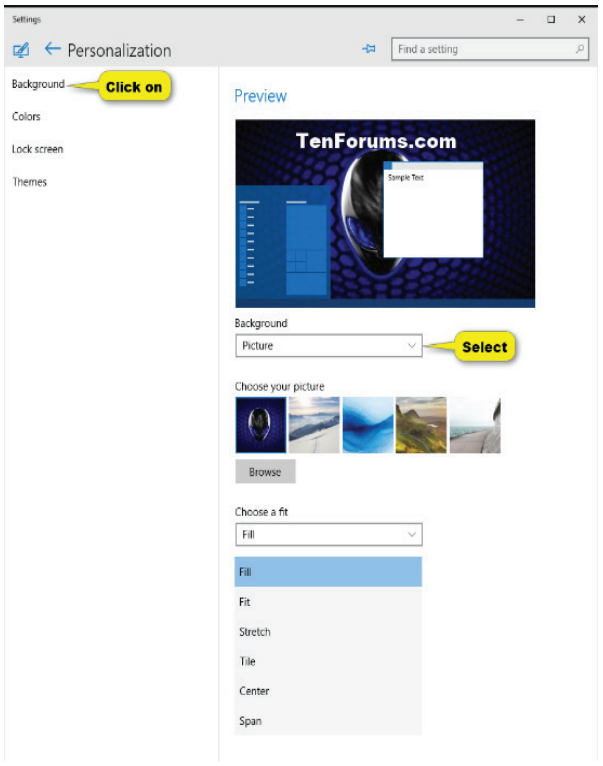
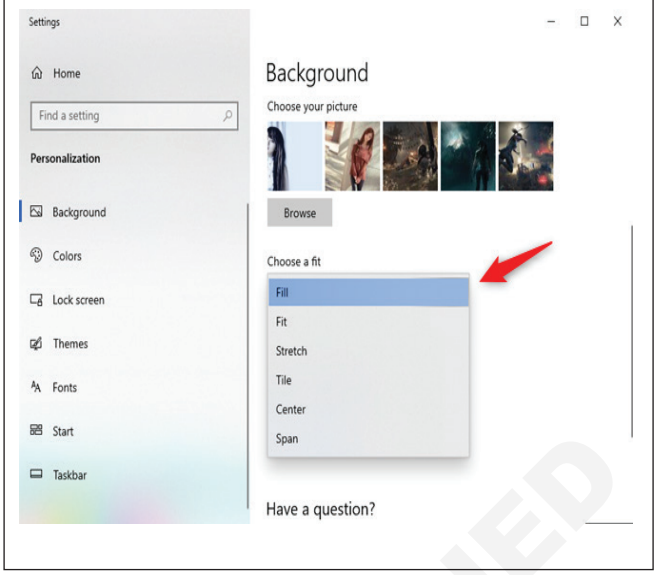


Fig 5



11 Repeat step 7 to modify color, lock screen, themes, fonts, start and task bar.

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Settings and manage user accounts

Objectives: At the end of this exercise you shall be able to
- **create new user**
- **grant and modify the user rights**
- **remove user account.**

Requirements

Tools/Equipment/Machines

- PC with Windows 10 OS - 1 No.

PROCEDURE

TASK 1: **Create new user**

Create a local user account

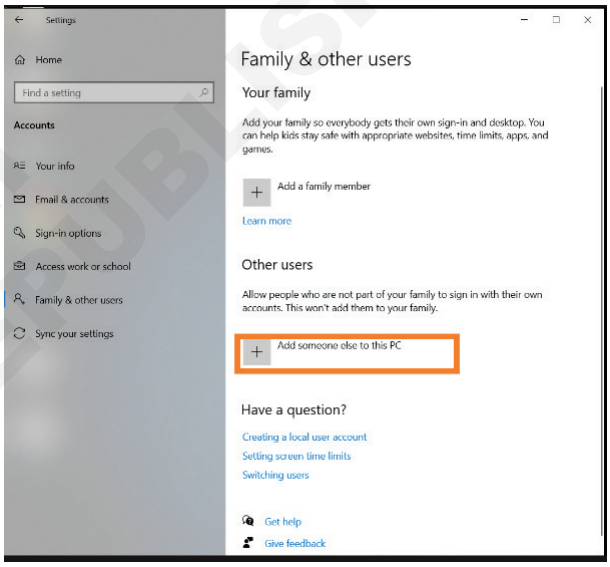
1 Select **Start > Settings > Accounts** and then select **Family & other users.** (In some versions of Windows you'll see Other users.)

2 Select Add someone else to this PC.

3 Select I don't have this person's sign-in information, and on the next page, select Add a user without a Microsoft account.

4 Enter a user name, password, or password hint—or choose security questions—and then select Next.

Fig 1



TASK 2: **Change a local user account to an administrator account**

1 Select Start > Settings > Accounts .

2 Under Family & other users, select the account owner name (you should see "Local Account" below the name), then select Change account type.

Note: If you choose an account that shows an email address or doesn't say "Local account", then you're giving administrator permissions to a Microsoft account, not a local account.

3 Under Account type, select Administrator, and then select OK.

4 Sign in with the new administrator account. (Figs 2 & 3)

Fig 2

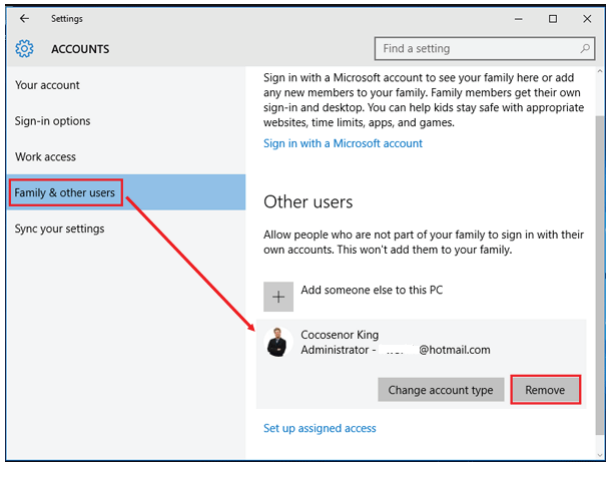


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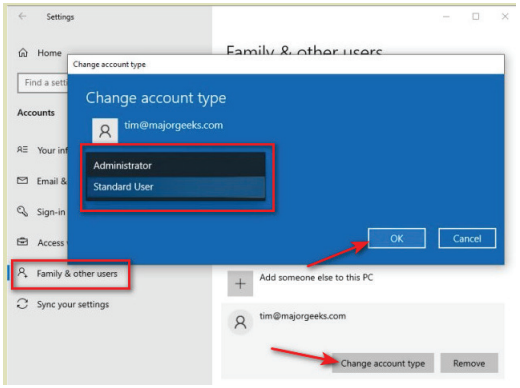
Fig 3



TASK 3: **Remove user account**

1 Open the Settings Window

2 Click on Accounts in the Settings Window.

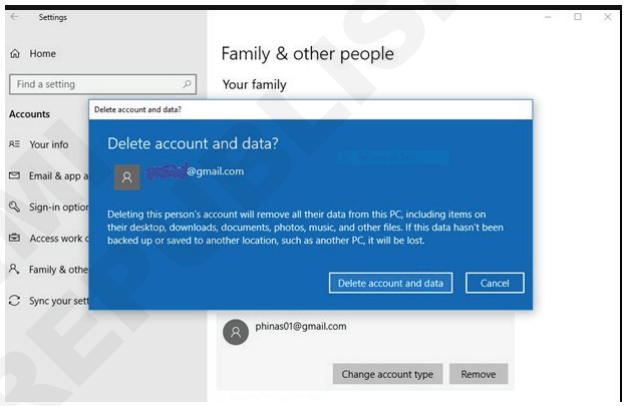
3 Select Family & other people.

4 Click on the user account whose user rights have to be granted or modified.

5 If you want to delete the account of the user, Click the user account and select Remove.

6 Click on the Delete account and data tab to remove the selected user account from the system. (Fig 4)

Fig 4



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View System properties and control panel details

Objectives: At the end of this exercise you shall be able to
- **identify the desktop components in device manager**
- **change clock, date, regional language in control panel**
- **repair, modify and uninstall the applications in control panel.**

Requirements

Tools/Equipment/Machines

- PC with Windows 10 OS - 1 No.

PROCEDURE

TASK 1: **Identify the desktop components in device manager**

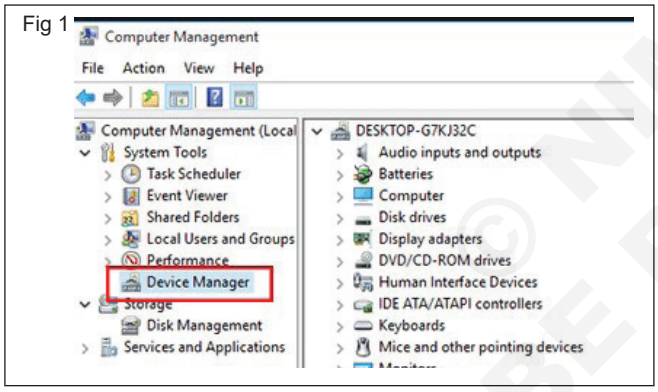
1 Click on File manager in the taskbar.

2 Select and Right click This PC

3 Right Click on Properties.

4 Click on Device Manager in Fig 1.

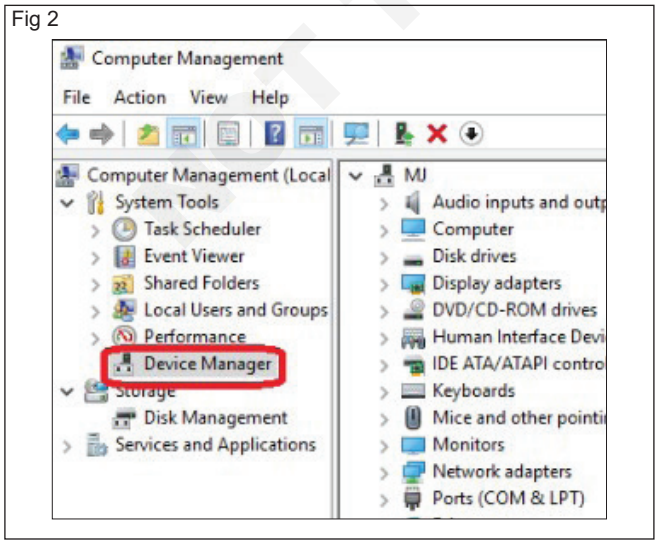
Fig 1



5 Double click on the Universal Serial Bus controllers in the menu.

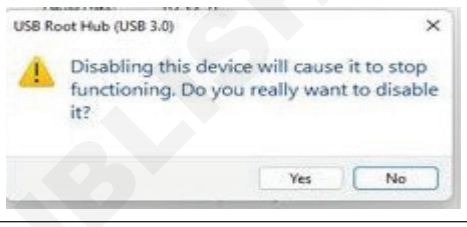
6 Right click on USB Root Hub and select Disable device (Fig 2)

Fig 2



7 Click Yes in the USB Root Hub. (Fig 3)

Fig 3



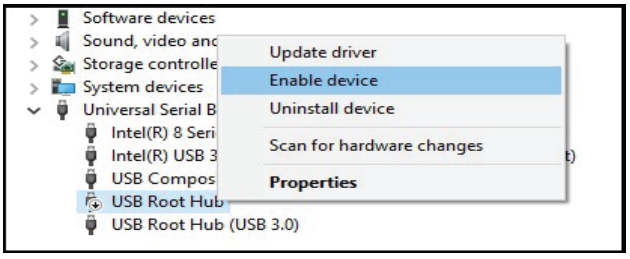
8 Insert a Pen drive/ USB in the USB slot

9 Check This PC folder to see if any removable device/ USB is shown.

10 Go to Device Manager and double click on the Univer- sal Serial Bus controllers.

11 Right click on USB Root Hub and select Enable device (Fig 4)

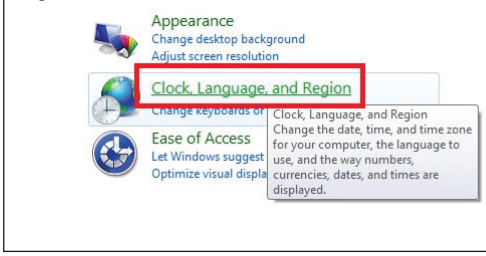
Fig 4



12 Insert a Pen drive/ USB in the USB slot

13 Check This PC folder to see if any removable device/ USB is shown. (Fig 5)

Fig 5



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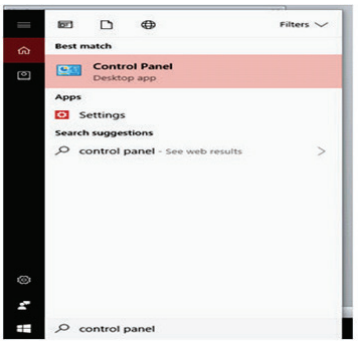
TASK 2: **Change clock, date, regional language in control panel**

1 Type Control Panel in the Search box

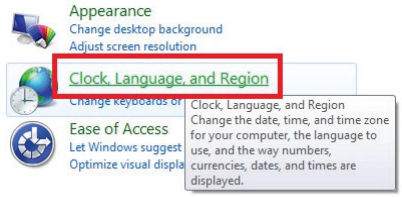
2 Select Control Panel app from the menu. (Fig 6)

Fig 6



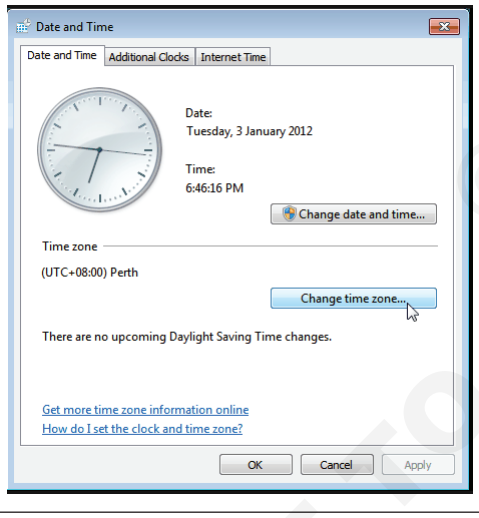
3 Select Date and Time from the Control panel. (Fig 7)

Fig 7



4 Click on Change date and time. (Fig 8)

Fig 8



5 Change the date and time. Press OK.

6 Close window

7 **To change language**, select Region from the Control panel.

8 Click on Language preferences as shown in Fig 9

9 Click on + Add a Language (Fig 10)

10 Type the name of the language you need the system to work/change. (Fig 11)

11 Click Install.

12 Close the Window.

Fig 9

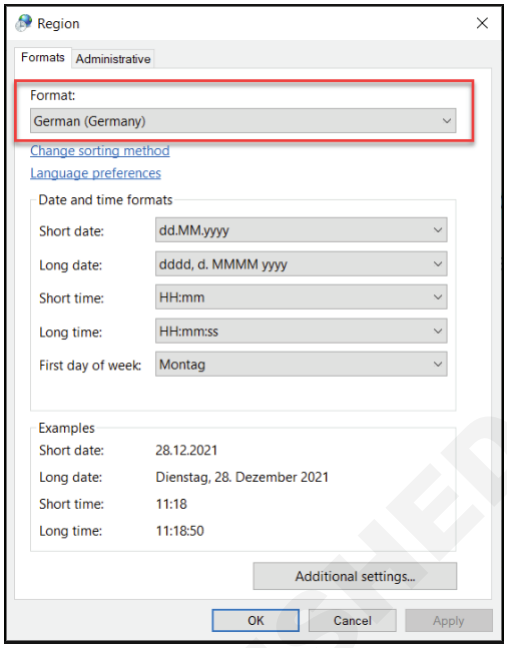


Fig 10

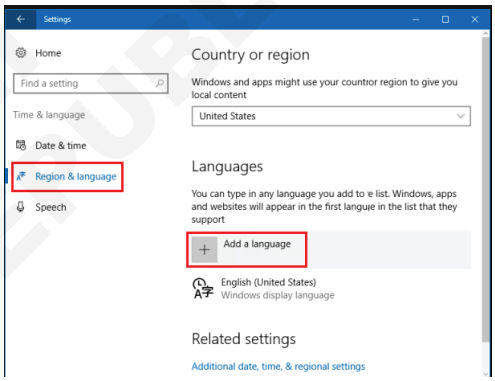
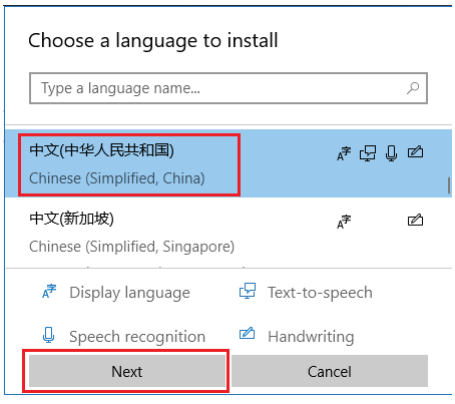


Fig 11



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TASK 3: **Repair, modify and uninstall the applications in control panel**

1 Select **Programs and Features** from the Control panel

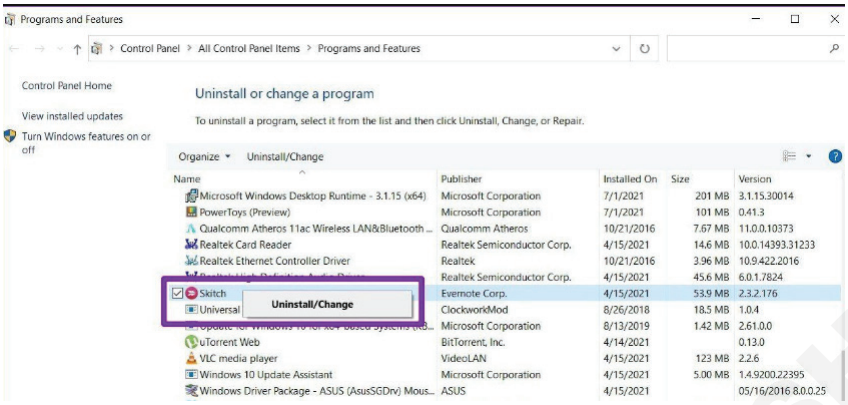
2 Select the program from the drop down menu.

3 Click on Uninstall / Change / Repair (Fig 12)

4 Click Yes to Uninstall / Change / Repair the application

5 Close the window.

Fig 12



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Work with keyboard shortcut commands

Objectives: At the end of this exercise you shall be able to
- **read and Observe the Windows Shortcut Keys in the table**
- **practice all the shortcut keys of windows 10 and write the description in below the table.**

Requirements
Tools/Equipment/Machines
• PC with Windows 10 OS - 1 No.

PROCEDURE

TASK 1: **Read and Observe the following Windows Shortcut Keys in the table**

Press This	To Do This
Windows Logo	Toggle the Start menu
Windows Logo+A	Open the Notifications pane
Windows Logo+B	Activate the notification area's Show Hidden Icons arrow (press Enter to display the hidden icons)
Windows Logo+C	Open Cortana for voice commands
Windows Logo+D	Minimize all open windows to display the desktop
Windows Logo+E	Run File Explorer
Windows Logo+F	Display the Start menu and activate the Search box
Windows Logo+H	Display the Share pane
Windows Logo+I	Run the Settings app
Windows Logo+K	Display the Devices pane
Windows Logo+L	Lock your computer
Windows Logo+M	Minimize all windows
Windows Logo+O	Turn the tablet orientation lock on and off
Windows Logo+P	Display the Project pane to configure a second display
Windows Logo+Q	Open Cortana for voice commands
Windows Logo+R	Open the Run dialog box
Windows Logo+S	Open Cortana for keyboard commands
Windows Logo+T	Activate the taskbar icons (use the arrow keys to navigate the icons)
Windows Logo+U	Open the Ease of Access Center
Windows Logo+W	Activate the Search box
Windows Logo+X	Display a menu of Windows tools and utilities
Windows Logo+=	Open Magnifier and zoom in
Windows Logo+-	Zoom out (if already zoomed in using Magnifier)
Windows Logo+	Temporarily display the desktop

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Windows Logo+Enter	Open Narrator
Windows Logo+Left	Snap the current app to the left side of the screen
Windows Logo+Right	Snap the current app to the right side of the screen
Windows Logo+Up	Restore a minimized app; maximize a restored app
Windows Logo+Down	Restore a maximized app; minimize a restored app
Windows Logo+PgUp	Move the current app to the left monitor
Windows Logo+PgDn	Move the current app to the right monitor
Windows Logo+PrtSc	Capture the current screen and save it to the Pictures folder
Windows Logo+Ctrl+D	Create a virtual desktop
Windows Logo+Ctrl+Right	Switch to the next virtual desktop
Windows Logo+Ctrl+Left	Switch to the previous virtual desktop
Windows Logo+Ctrl+F4	Close the current virtual desktop
Windows Logo+Tab	Open Task View, which displays thumbnails for each running app as well as the available virtual desktops

— — — — — —

TASK 2: **Practice all the shortcut keys of windows 10 and write the description in below the table**

Sl.No	Shortcut Key	Description

Get it check by your instructor

— — — — — —

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Print and scan documents using different commands

Objectives: At the end of this exercise you shall be able to
- **scan and save the image**
- **print image or document.**

Requirements

Tools/Equipment/Machines

- PC with Windows 10 OS - 1 No.

PROCEDURE

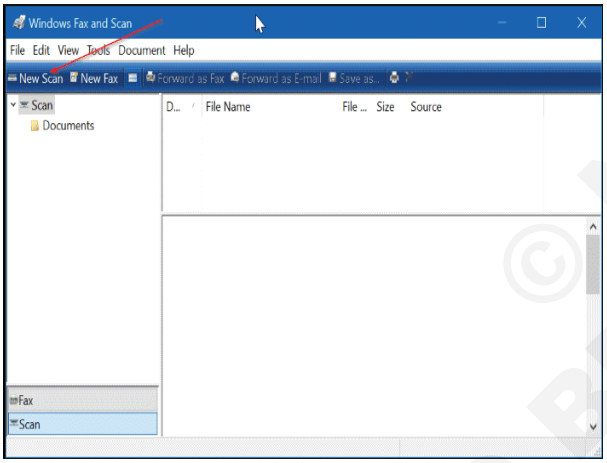
TASK 1: **Scan and save the image**

Save scanned files as PDF using Windows Fax & Scan

1 Open Windows “Printers and Scanners”.

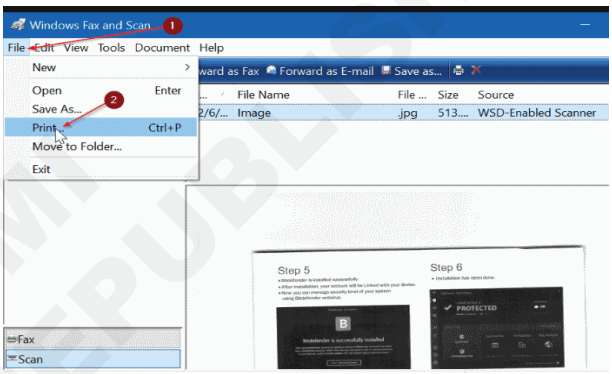
2 Click New Scan button in the toolbar. (Fig 1)

Fig 1



3 View or select a different scanner by clicking Change button in the Scanner section. (Fig 2)

Fig 2



4 In the Profile section, select the type of the file that you are going to scan as either Photo or Documents.

5 Change other default settings, if you want.

6 Click the Scan button to begin scanning the hard copy in the scanner.

TASK 2: Print image or document.

1 Once the scanning is completed, click the File menu and then click Print option. Yes, we are going to save the file as PDF. (Fig 3)

2 Select Microsoft Print to PDF from the printer drop-down box, and then click Print button. (Fig 4)

3 At the Save Print Output As dialog, enter a name for your scanned file.

4 select a location to save the file. (Fig 5)

5 Click Save button to save it as PDF file.

6 Or choose the installed printer and then click Print.

7 Get it check with your instructor

Fig 3

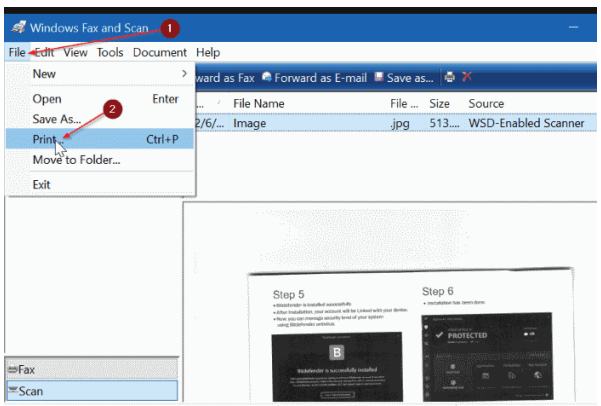


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Fig 4

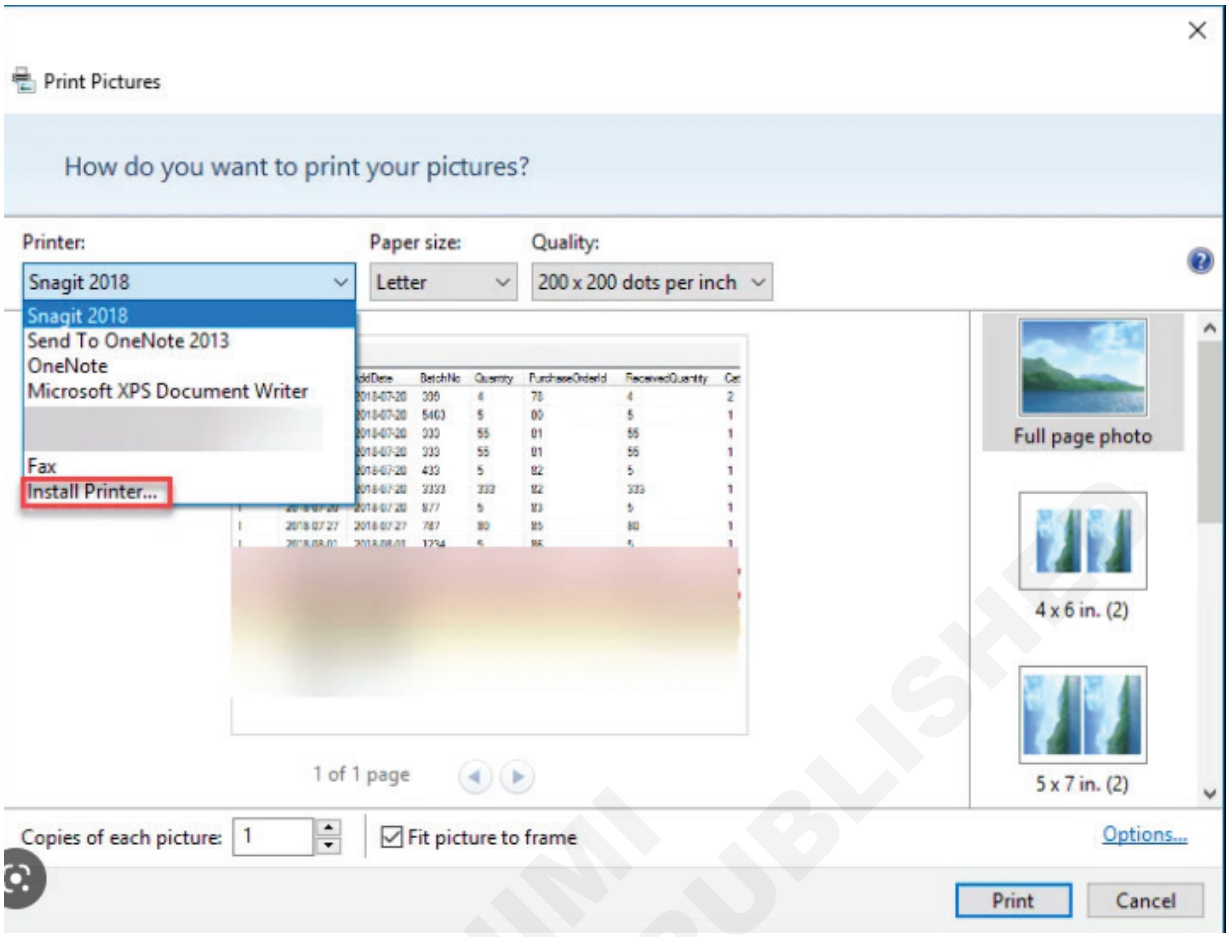
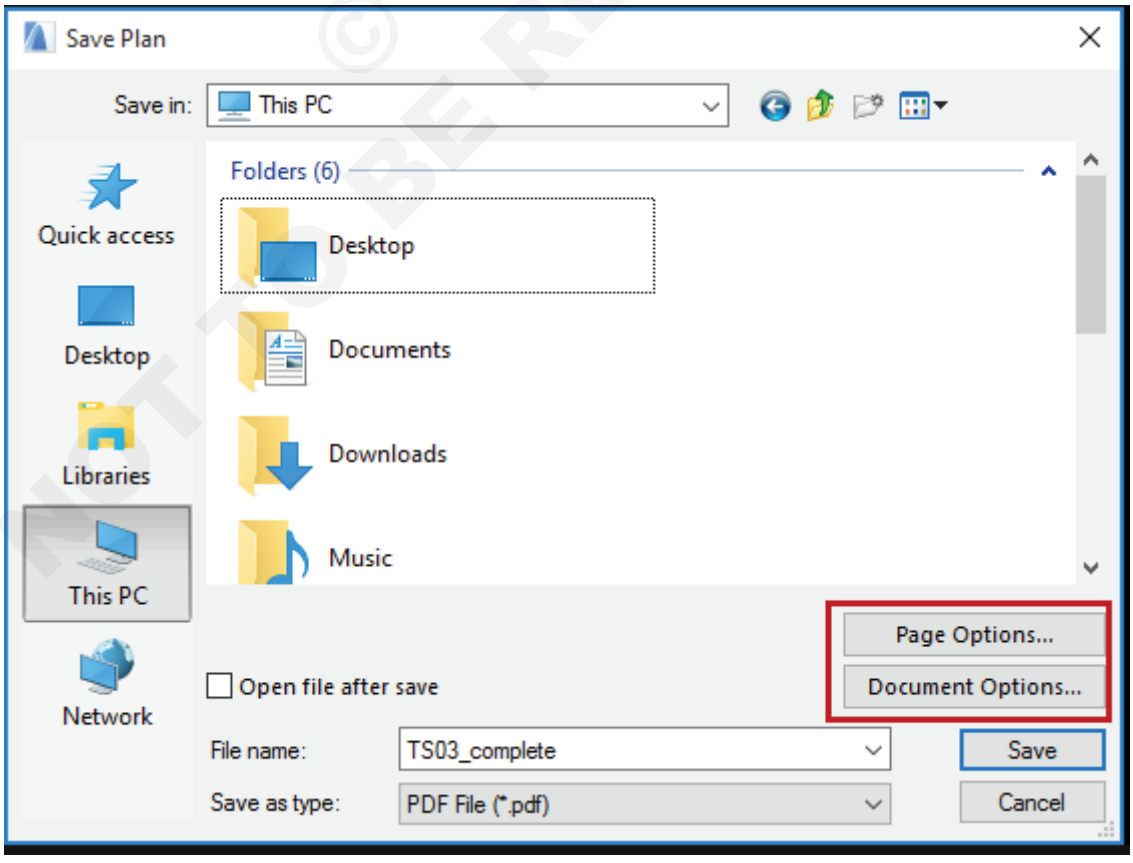


Fig 5



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View the BIOS settings and their modifications

Objectives: At the end of this exercise you shall be able to

- **enter into CMOS setup**
- **enter into standard CMOS setup and change the parameters**
- **enter into BIOS features setup and change the parameters**
- **set System password**
- **explain to change system boot order**
- **default setting load.**

Requirements

Tools/Equipment/Machines

- A working PC - 1 No.

PROCEDURE

TASK 1: **Enter into CMOS setup**

1 Power on PC.

2 Press <DEL> key immediately a few times to enter into CMOS setup utility menu.

Prompt message is displayed as follows.

"Press <DEL> to enter setup or <ESC> to By-pass the "CMOS SETUP UTILITY" menu displayed on the memory.

In some computer, F2 or F10 or F12 can be used to enter BIOS

Based on manufacturer of computer it can be vary. So refer manual..

3 RECORD all the configuration menu options displayed on the screen in the record sheet.

Enter the password, if required.

4 Get the work checked by your instructor.

5 Move the highlight up and down (main menu) using arrow keys to select the desired utility.

Highlight is used to indicate the selection option in the menu. Do not press "ENTER" key.

6 Get the work checked by your instructor.

Fig 1

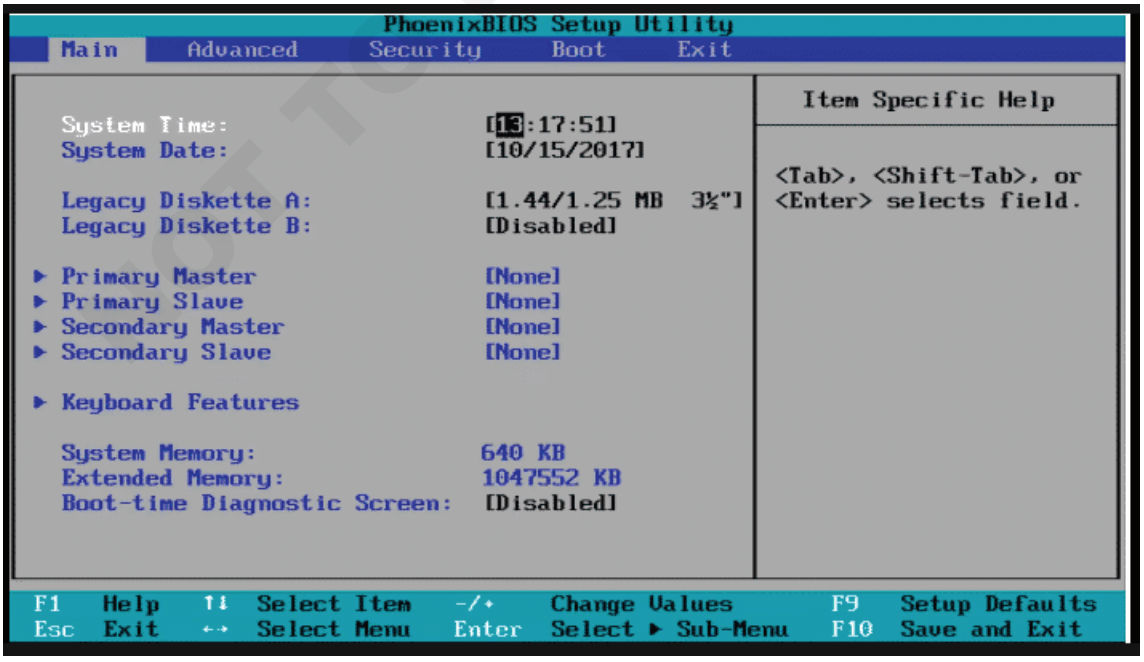

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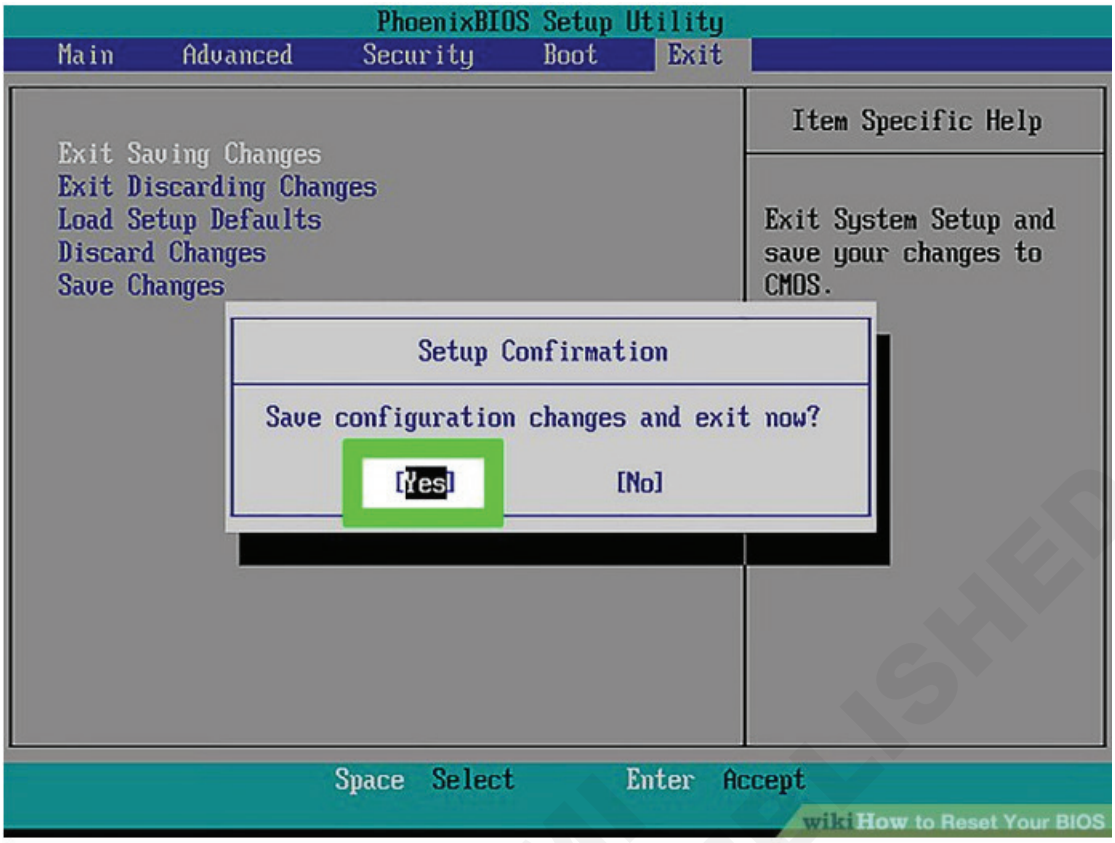
Fig 2



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TASK 2: **Enter into standard CMOS setup and change the Date & time**

1 Move the highlight to standard CMOS setup and press <enter> key and record the parameters, referring to the screen in Table 1.

Parameters displayed on screen can be changed using "Pageup and pagedown".

2 Select "Date" parameter and set the current date, month and year by using pageup/pagedown.

3 Select "Time" parameter and set the current date, month and year by using pageup/pagedown.

4 Set "Time" parameter and set the time.

5 Press F10 to save a exit CMOS setup.

6 Get the work checked by your instructor.

— — — — — —

TASK 3: **Set System passwords**

1 Enter into CMOS setup utility following the steps in Task 1.

2 Move the highlight to BIOS feature setup and press <enter> key.

3 Move the highlight to security option and modify it to "System" using <pageup>/<pagedown> key.

4 Press "Esc" to CMOS setup utility.

5 Move the highlight user password and press <enter> key.

6 Observe the menu displayed and enter the password (password should be 8 character length).

7 Observe the menu displayed and reenter the same password to confirm.

8 Press <Esc> to CMOS setup utility.

9 Press function key F10 or select save and exit, press enter followed by option 'Y'

This process leads to Restart the system and enter password for further booting process.

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TASK 4: **How to Change System Boot Order**

Step 1: Enter your Computer's BIOS set up utility

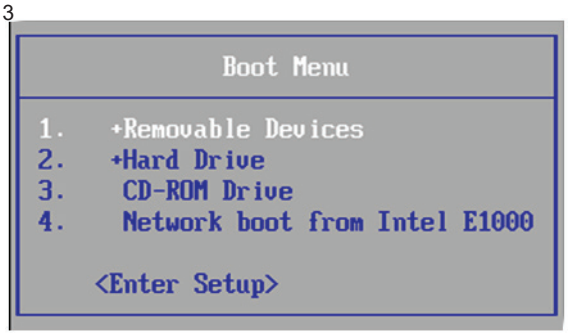
Step 2: Navigate to the boot order menu in BIOS

- Under a menu option called Boot, Boot Options, Boot Sequence, or even under an Advanced Options tab

Step 3: Change the Boot Order

- Once you've located the page for boot order options in BIOS, you'll see a list of options that your computer can load up from.
- Again, these options will vary slightly between computers but will typically include: Hard Drive, Optical (CD or DVD) Drive, Removable Devices (e.g. USB or Floppy), and Network.
- Change the list order so that USB Device or Removable Devices is listed first. (Fig 3)

Fig 3



Step 4: Save your Changes

- Make sure you save your changes before exiting BIOS for the changes to take effect
- Navigate to the Save and Exit or Exit menu and choose an option that says, "Save Changes" or F10 to "Exit with Changes Saved"

TASK 5: **How to reset the BIOS from the BIOS interface**

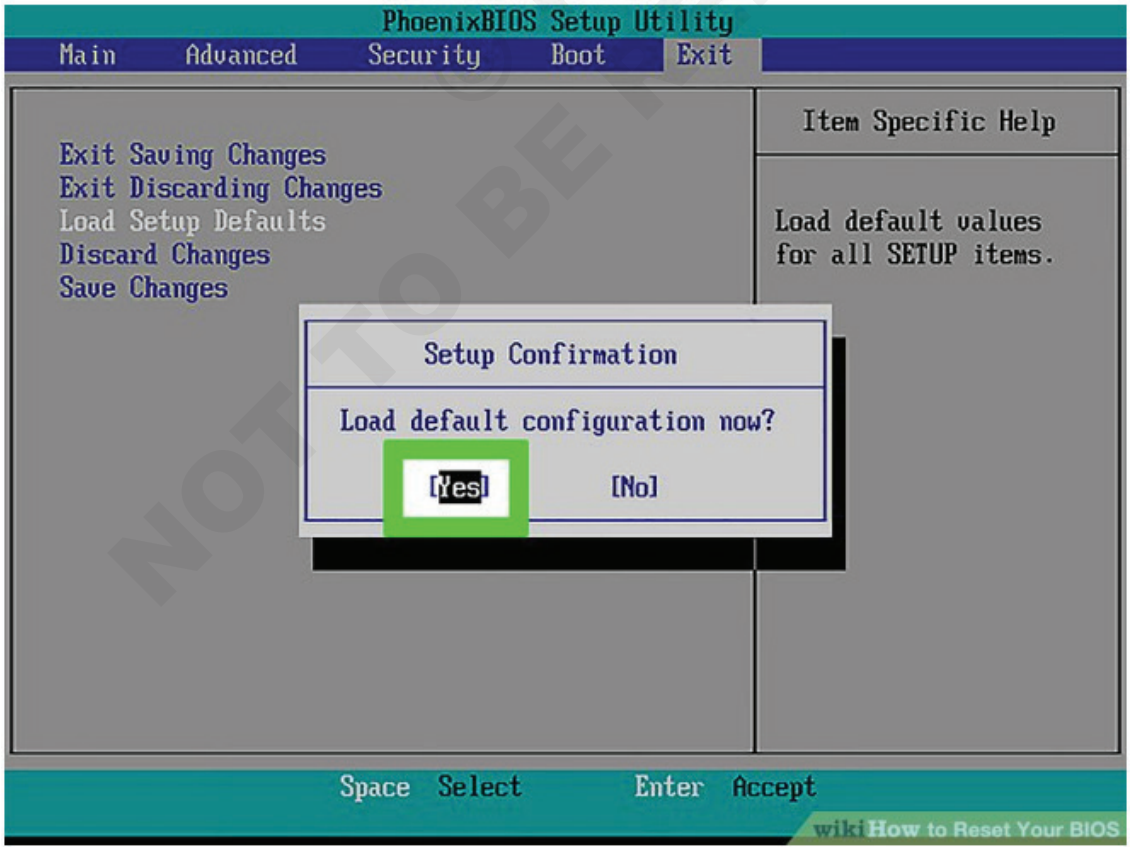
Step 1: Enter your Computer's BIOS set up utility

Step 2: Navigate to the Exit menu in BIOS and Find the "Setup Defaults" option

Step 3: Select the "Load Setup Defaults" option and press Enter.

Step 4: Press F10 or Save Key to save all changes and exit the BIOS setup screen. (Fig 4)

Fig 4



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Install Windows operating system

Objectives: At the end of this exercise you shall be able to
- **install windows 10 operating system.**

Requirements

Tools/Equipment/Machines

- A working PC with windows 10 OS - 1 No.

PROCEDURE

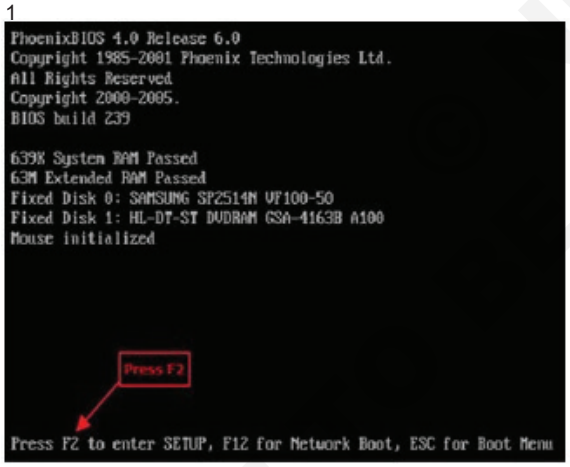
1 Prepare your bootable DVD or USB disk with Windows 10 ISO Image.

2 Keep your DVD or USB as First Boot Device in Boot Order Option of BIOS Setup.

3 Press F1 / F2 / F10 / Delete or Del / Esc to enter BIOS Setup into your computer when its powered ON and Display POST Code messages along with Manufacture logo.

Note: BIOS setup Entry option may very based on Computers manufactured, refer Manual.

Fig 1



4 After enter into BIOS Setup Utility Choose Boot Option ' Boot Device Priority Setting

5 Select Removable Device for USB or CD Rom Drive for Optical Drives

6 Ensure Boot Mode option into UEFI / Legacy, Windows10 Recommended UEFI.

Note:

- **Legacy Boot is the boot process used by BIOS firmware, Its uses Valid Master Boot Record (MBR).**
- **UEFI boot is the boot process used by UEFI firmware, Its uses valid GUID Partition Table (GPT)**

Fig 2

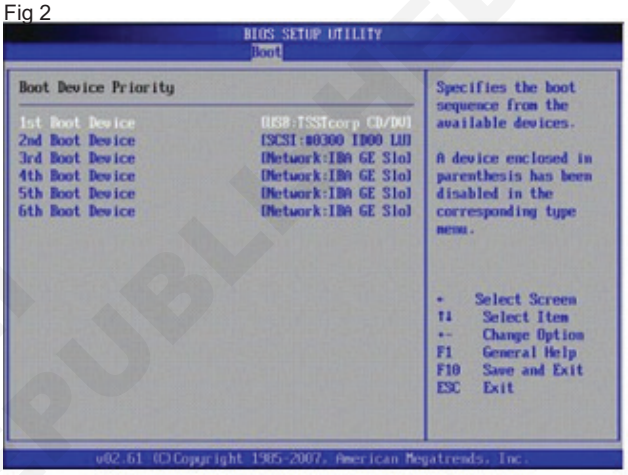


Fig 3

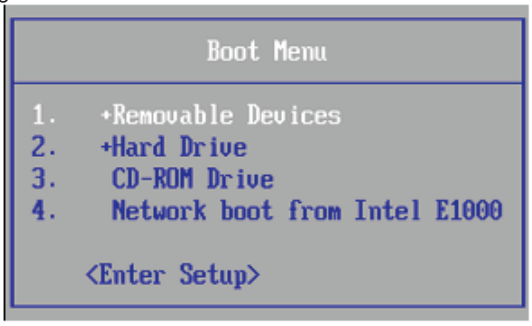
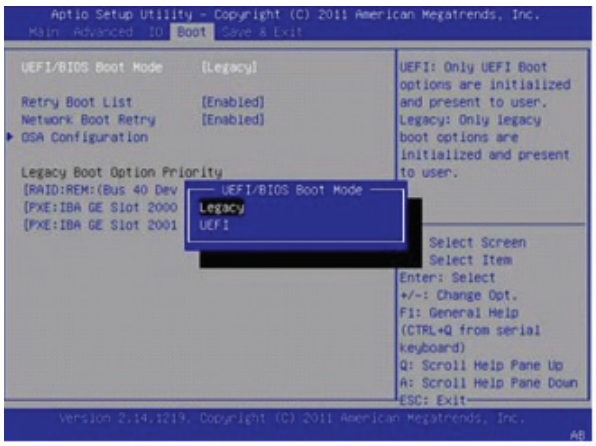


Fig 4



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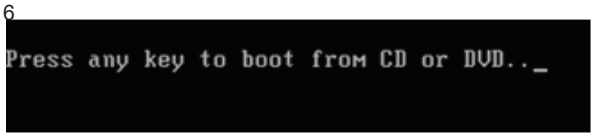
7 F10 to Save BIOS setup configuration and Exit.

Fig 5

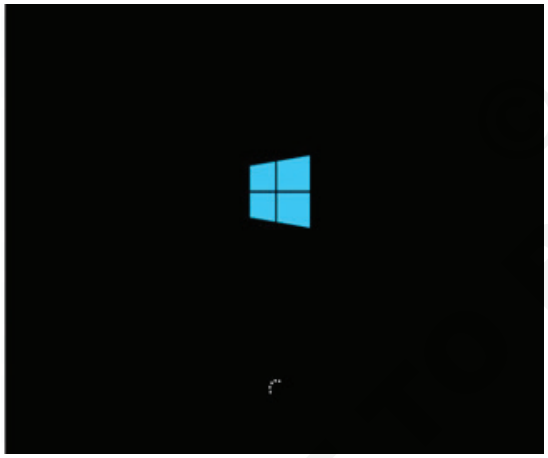
8 Insert the Image DVD into optical Drive and reboot the PC then Press any key to boot the Installation from DVD.

Fig 6



9 Or Insert the USB Flash Drive into USB Port and reboot the PC then bootable Installation starts immediately.

Fig 7



10 Choose to Install now

11 Choose the language of the interface, the time and currency format, and the keyboard layout.

12. Enter the Windows 10 product key. You can skip this step if you want to activate Windows later on. Make sure you enter the correct code.

Fig 8

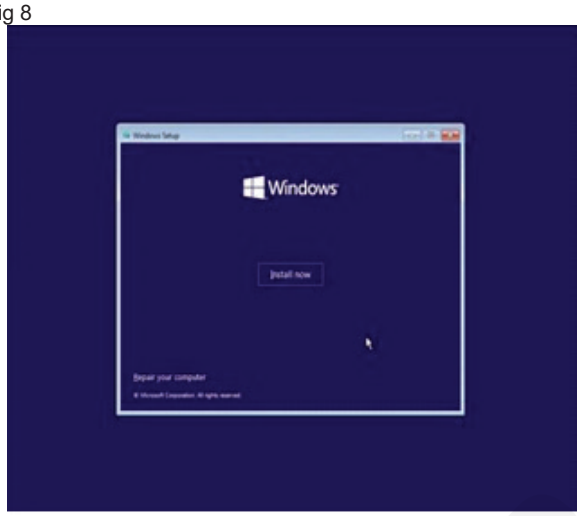


Fig 9

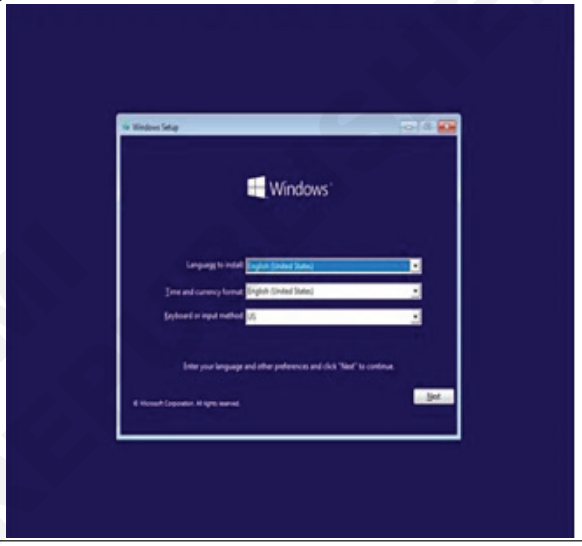
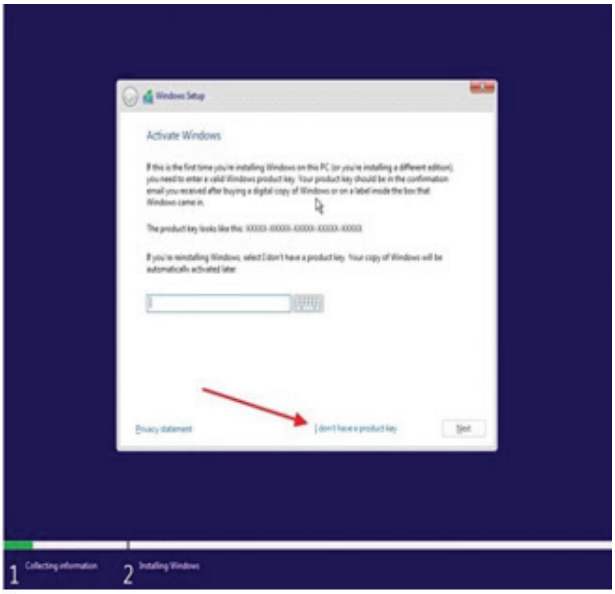


Fig 10



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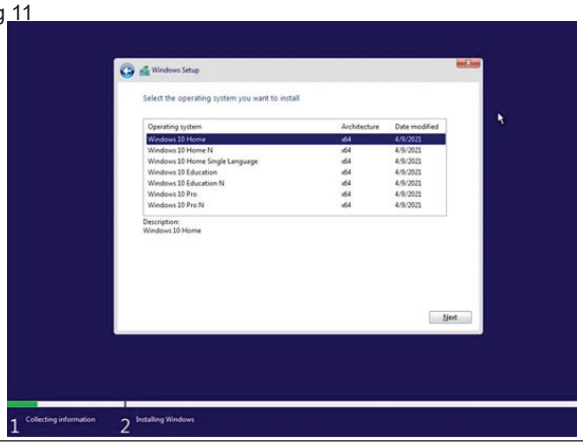
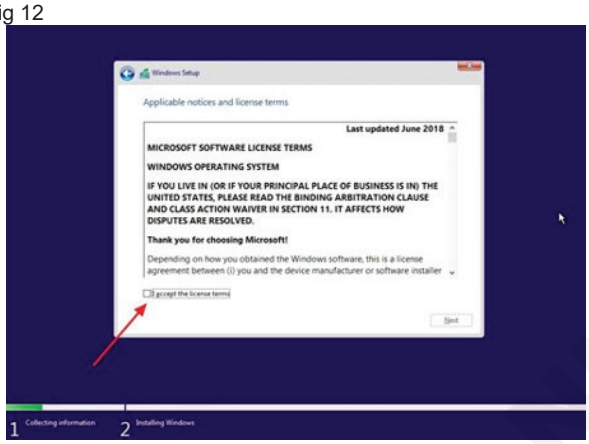
13 Select the Windows edition you want to install

Fig 11



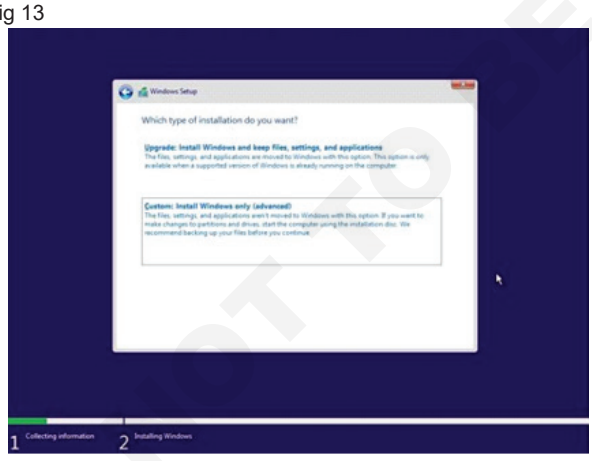
14 Agree to licensing terms (EULA).

Fig 12



15 Select the installation type: Upgrade an existing installation of Windows (version 7, 8, or 10) or Since it's a new computer choose Custom.

Fig 13



16 Choose the disk where Windows files will be copied. At this step, you can partition the existing disk, If you no need partition then choose unformatted disk just select it and hit Next.

17 The setup will now start to copy files from the install disk to their final destination.

18 Installation will do auto reboot the PC and load the Windows

19 Select the geographical region: India, and keyboard layout : English(India)

Fig 14

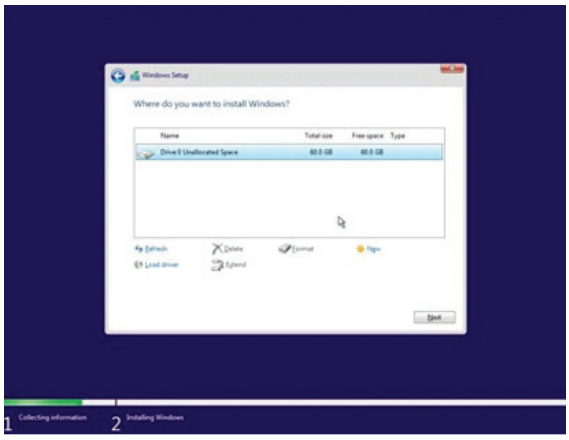


Fig 15

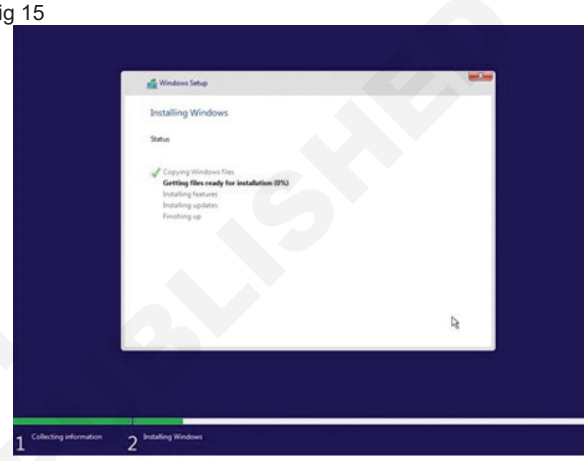


Fig 16

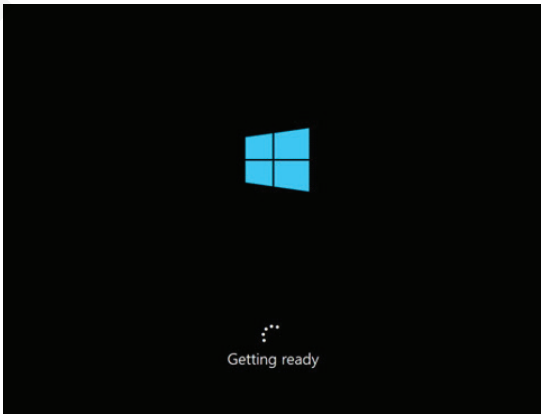


Fig 17

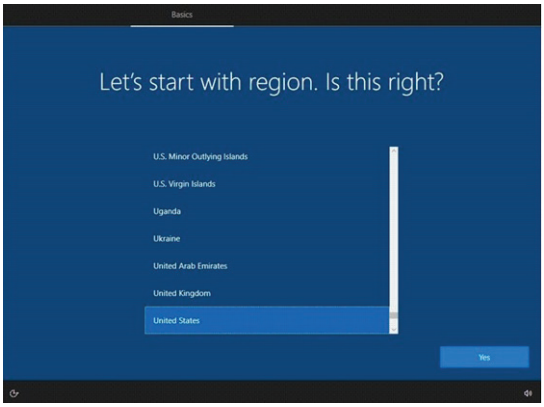


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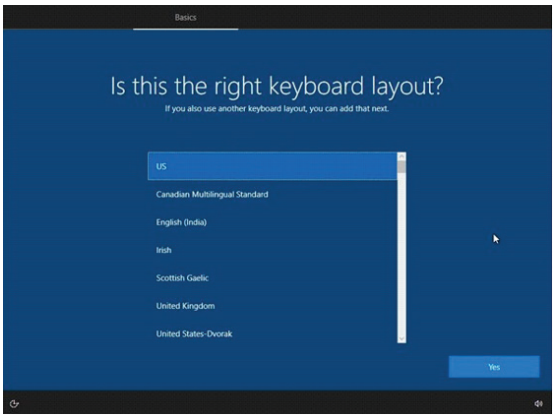
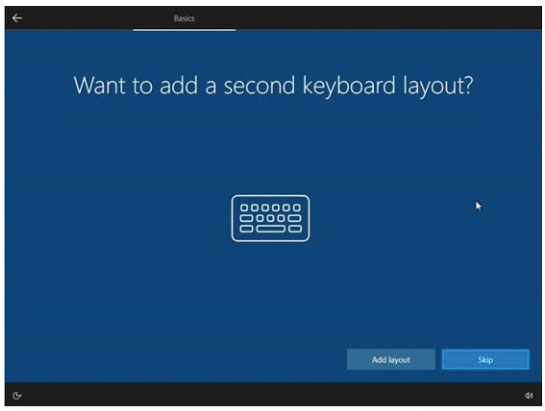
Fig 18



Skip Add Second Keyboard Option

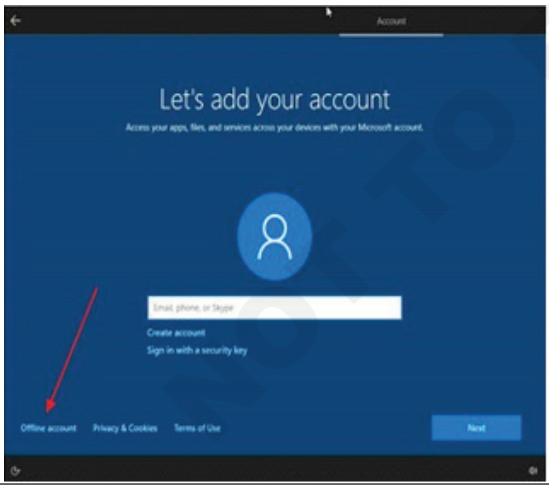
Fig 19



20 Now we'll create the first user account which will also act as the administrator for this computer.

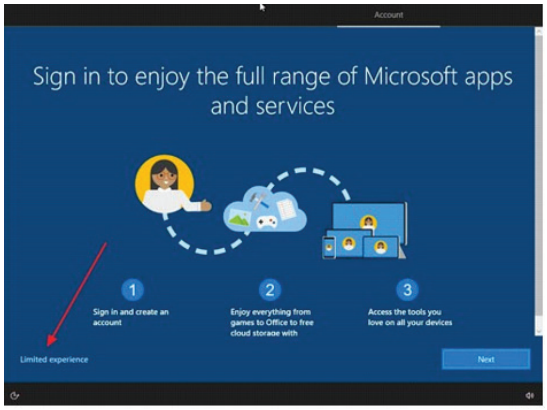
Choose: Offline Account then Click Next

Fig 20



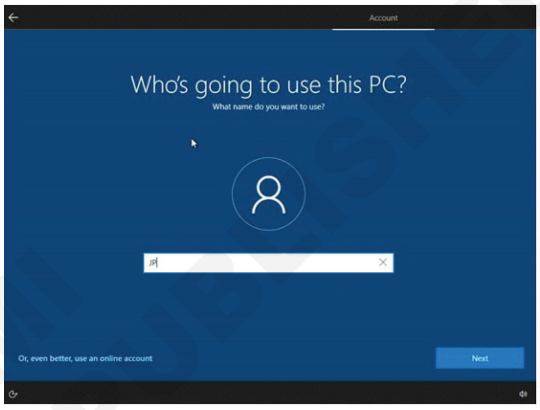
Microsoft App and Service : Limited Experience then Click Next

Fig 21



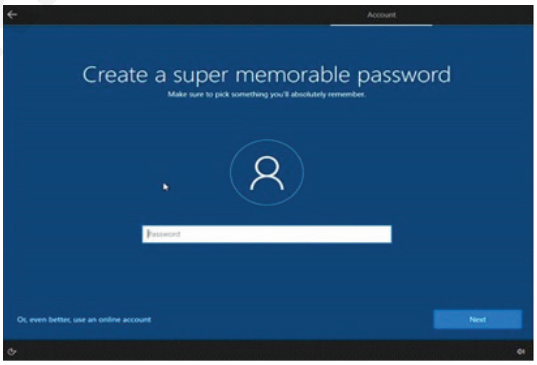
Type: UserName then Click Next

Fig 22



Confirm Password then Click Next

Fig 23



21 Create Security Question and Answer for newly created account, but it seems you have to select 3 security questions that will help you recover your account in case you forget the password.

22 Privacy settings Click Accept and Cortana Setting Click Not Now or Accept

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Fig 24

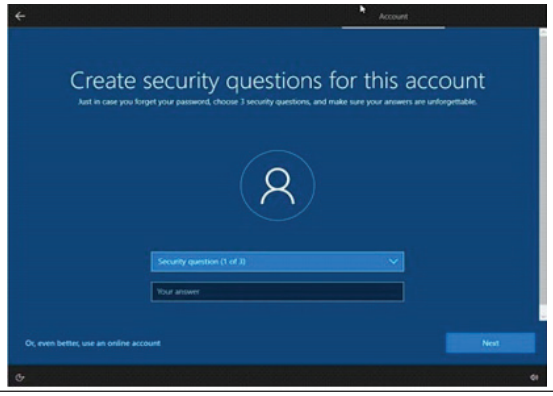


Fig 25

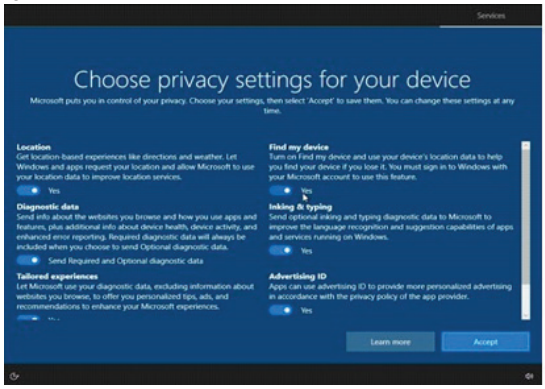
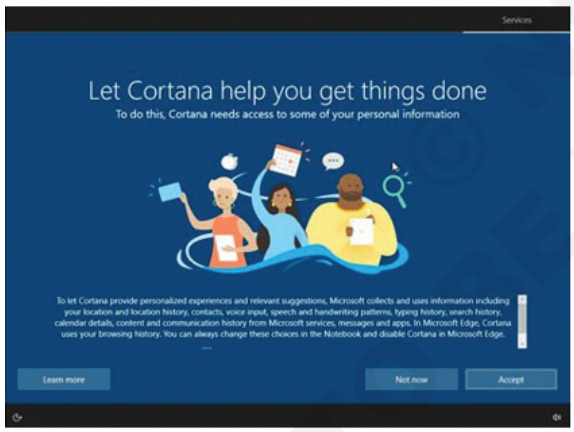


Fig 26



23 After a few moments and a couple of different screens you'll be greeted with the familiar Windows10 desktop for the first time

Fig 27

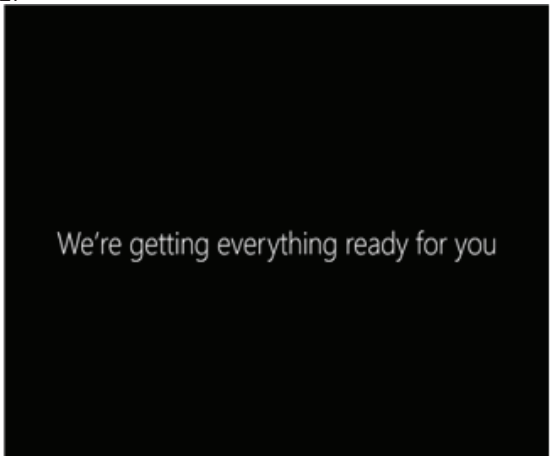


Fig 28

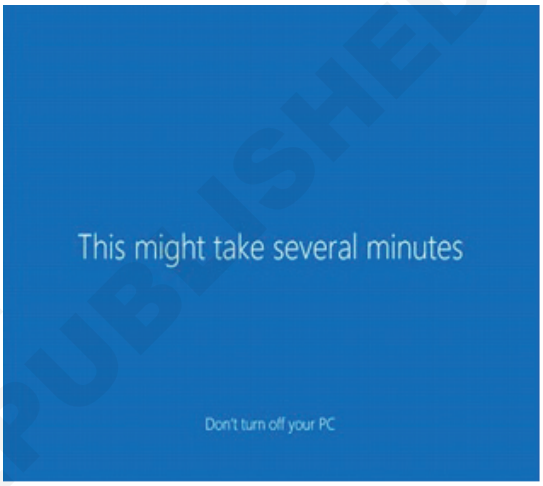
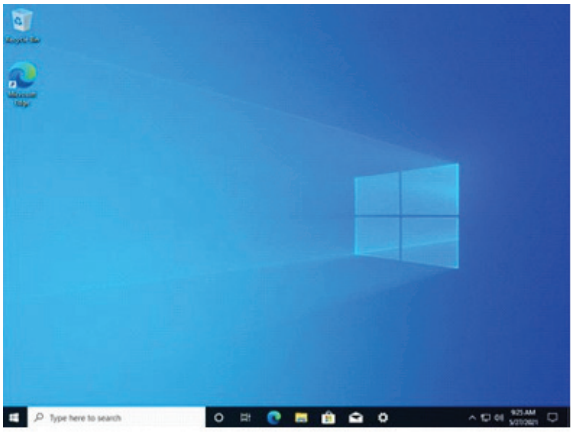


Fig 29



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Format hard disk and create partition

Objectives: At the end of this exercise you shall be able to
- **format Hard Drive in Windows 10 with Disk Management.**

Requirements

Tools/Equipment/Machines

- A working PC with windows 10 OS - 1 No.

PROCEDURE

TASK 1: **Format HD Drive in Windows 10 with Disk Management**

Disk Management in Windows 10 is a built-in tool which enables to format, create, delete, extend, shrink partition without rebooting system. If you want to use this tool to format Windows 10 hard drive, you should open Disk Management by one of the following ways at first.

1 Click start menu and then type Disk Management to search

(or)

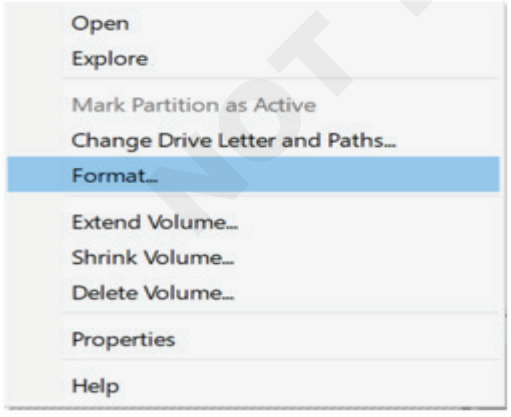
2 Click start menu and type cmd to open command line and then input compmgmt.msc and then click Enter

(or)

3 Press “Windows + R” to open the command line and then enter “diskmgmt.msc” to launch Disk Management

4 After open Disk Management, right click the Windows 10 hard drive partition you need to format (partition D) and then choose Format as shown in Fig 1.

Fig 1



As a reminder, here’s what you should see:

- Volume label: [label of your choosing]
- File system: NTFS
- Allocation unit size: Default
- Perform a quick format: Checked
- Enable file and folder compression: unchecked

5 In the pop-up window, and set file system and cluster size and then click OK as shown in Fig 2&3

6 Right click the un allocated space and create the new drive by clicking new simple value with required spaze and align drive letter . Then format the drive.

Fig 2

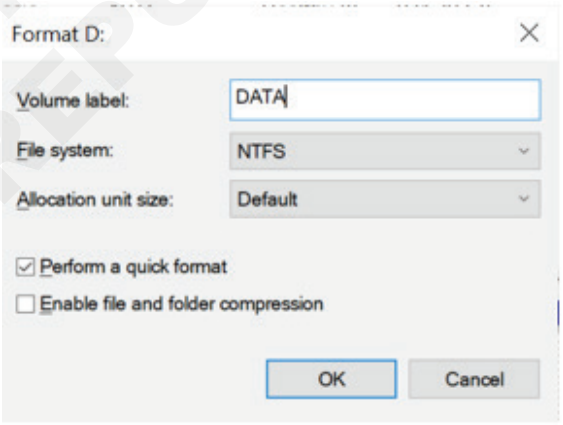
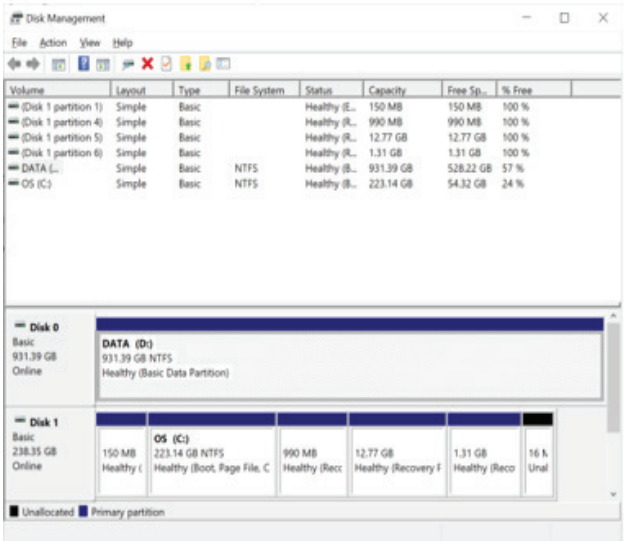


Fig 3



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Identify and rectify common hardware and software issues during OS installation

Objectives: At the end of this exercise you shall be able to
- **write chart of issues found while installation of OS.**

Requirements
Tools/Equipment/Machines
• A working PC with windows 10 OS - 1 No.

PROCEDURE

TASK 1: **Write chart of issues found while installation of OS**

Sl.No.	Problem Found	Name the problem
	SW | HW	
	SW | HW	
	SW | HW	
	SW | HW	
	SW | HW	
	SW | HW	
	SW | HW	

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Install necessary application software for Windows

Objectives: At the end of this exercise you shall be able to
- **install MS-Office 0365**
- **install Nero software in windows operating system**
- **install VLC Media player**
- **install Adobe PDF Reader**
- **download and Install Avira Free Antivirus software in windows operating system.**

Requirements

Tools/Equipment/Machines

- PC with Windows 10 OS - 1 No.
- MS – Office 2019 or 0365 - 1 No.
- Nero Software for Windows - 1 No.
- VLC Media Player Software - 1 No.
- Adobe PDF Reader Software - 1 No.
- Avira Free Antivirus Software - 1 No.

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PROCEDURE

TASK 1: **Subscribing to Microsoft 0365 and installing**

1 **Go to https://www.microsoft.com/.Then,** select Microsoft 365 in the top menu bar. This is the official product page for Microsoft 365.

a In late 2022, Microsoft Office became part of Microsoft 365. Subscribing to Microsoft 365 gives you access to the apps that were part of Microsoft Office (e.g. Word, Excel, and PowerPoint).

b There is also the option for a one-time purchase of Office Home & Student 2021, which includes 2021 versions of Word, Excel, and PowerPoint.

2 **Click Buy now.** This is located in the top menu bar.

3 **Select a plan.** Click Buy Now to start the purchasing process for a subscription plan. There are a few options:

- Pay yearly or monthly.
- Select the Family plan if you have multiple users, or the Personal plan if it's just for you.

4 Sign in to your Microsoft Account. Then, follow the instructions to complete your purchase.

Installing on Windows

1 Go to https://www.office.com/.Click Sign in if you aren't already signed in.

2 Click Install Office. This is a button on the Office home page.

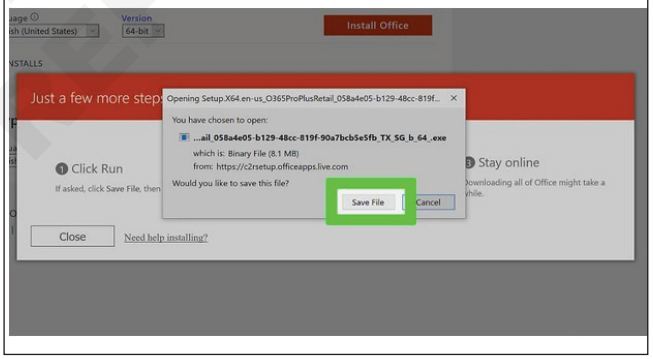
3 Click Install. It's a button in the Microsoft 365 subscription section. This might also be labeled Install Office >. The download for the Office setup file will start.

- For work and student accounts, click Office 365 apps or Microsoft 365 apps instead.

4 Click Save File. Your Office setup file will begin downloading.

- You may have the options to select Run or Setup depending on your browser.

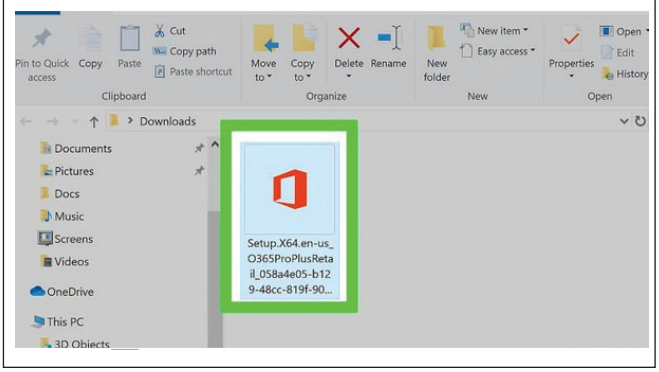
Fig 1



5 Double-click the Office setup file. You'll find it in your computer's default download location.

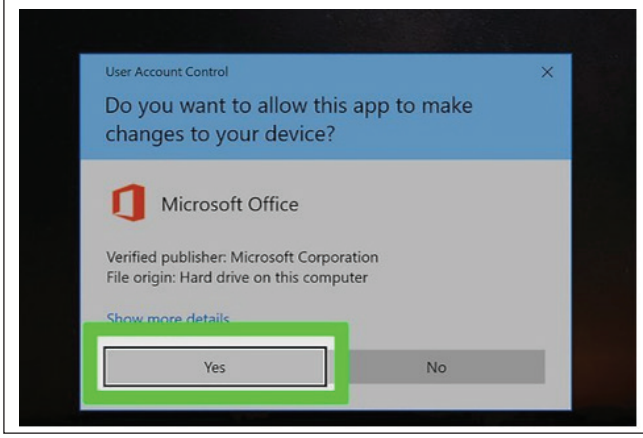
- Skip this step if the installation has already started.

Fig 2



6 Click Yes when prompted. You may see a prompt asking “Do you want to allow this app to make changes to your device?” Selecting Yes will run the setup file and begin installing Office on your computer.

Fig 3



7 Wait for Microsoft Office to finish installing. This process may take several minutes.

8 Click Close when prompted. Your Microsoft Office programs have now been installed on your computer. You can begin using these programs right away.

Fig 4

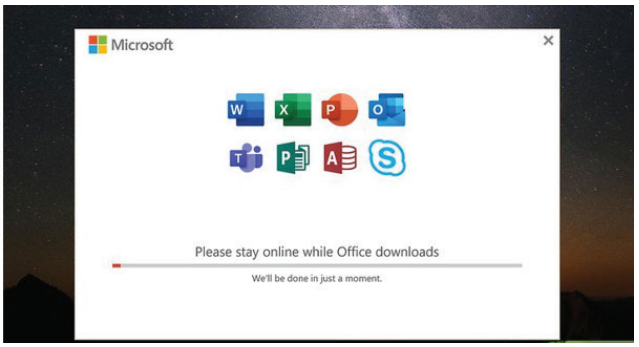
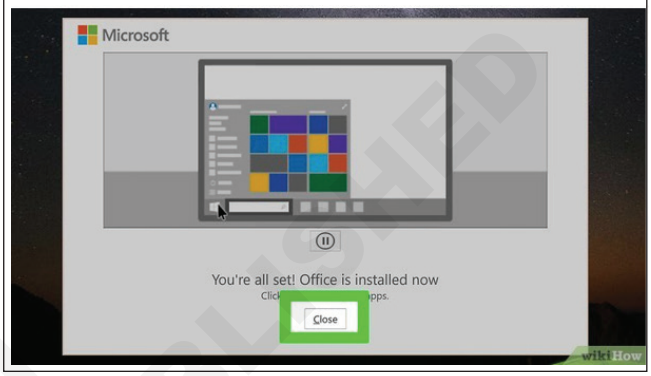


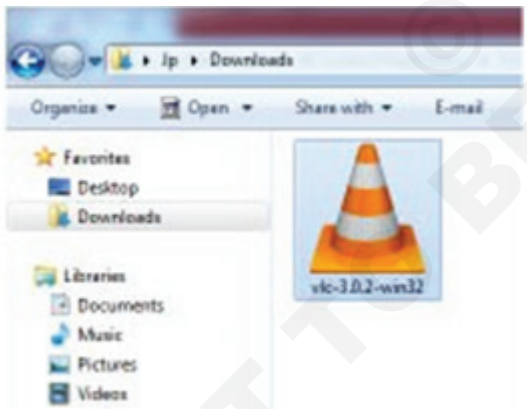
Fig 5



TASK 2: **Installing VLC media player**

1 Double click on the Vlc-3.0.2-win32 exe file as on Fig 6.

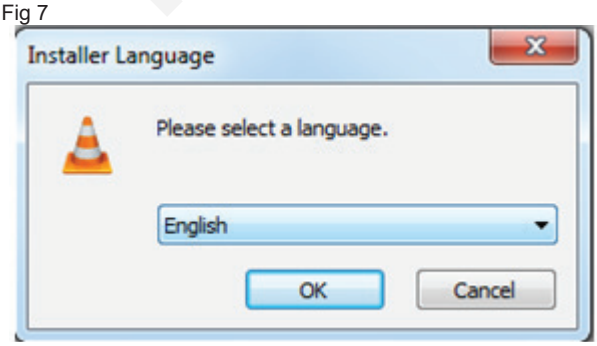
Fig 6



2 Click Run button in the window

3 Select the language and click ok button as shown in Fig 7.

Fig 7

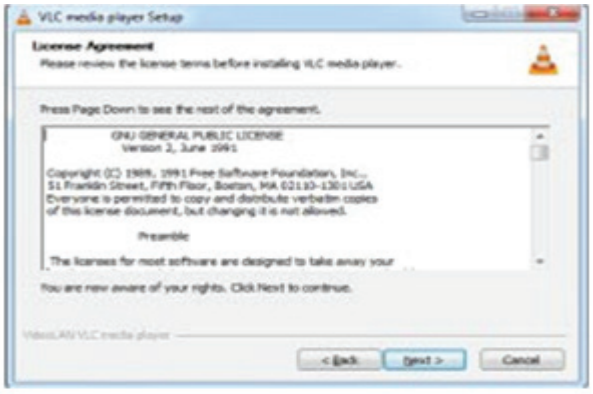


4 Click Next Button as shown in Fig 8.

Fig 8

5 Click the Next Button On the License Agreement window as on Fig 9.

Fig 9



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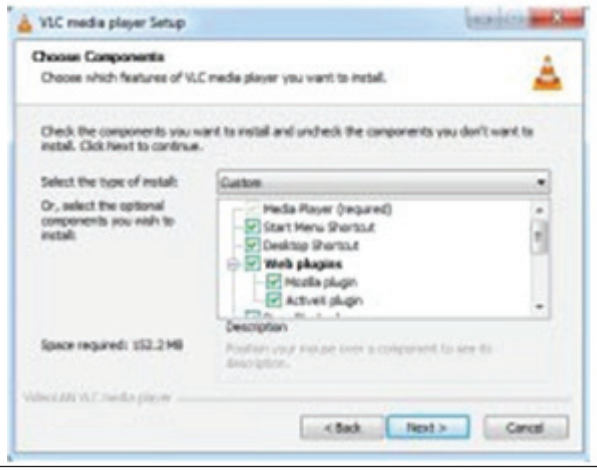
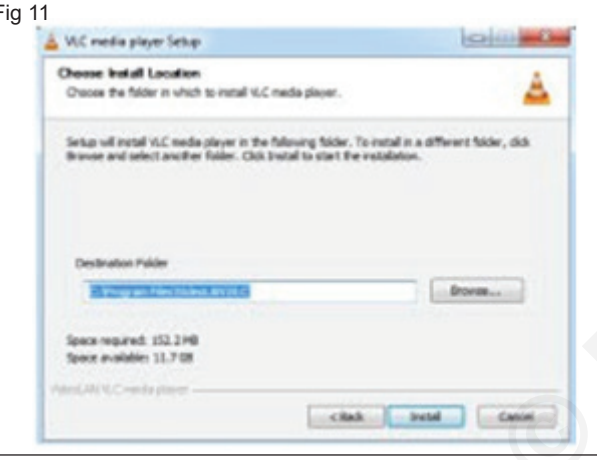
6 Select components of Media player and click Next Button as shown in Fig 10.

Fig 10

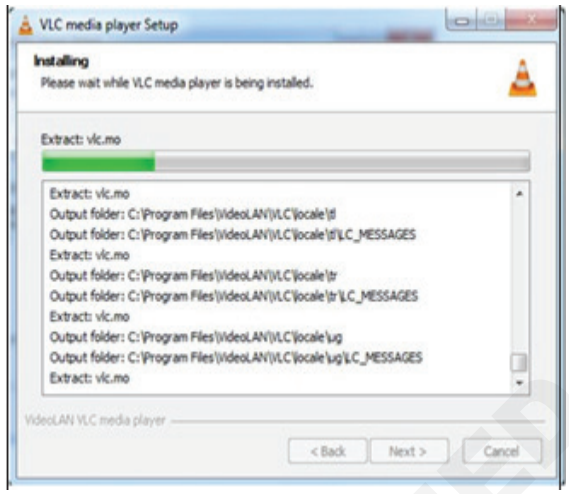


7 Click Install Button as on Fig 11.

Fig 11

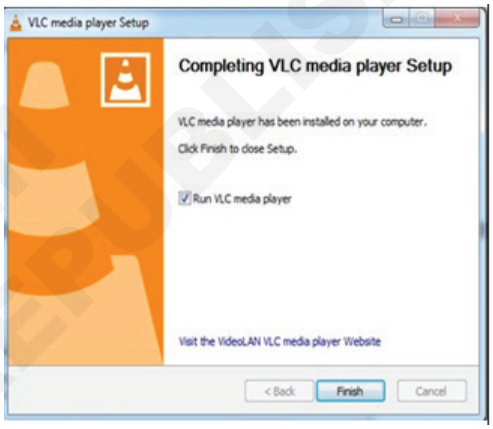


The installation process window will display as on Fig 12.



8 Click Finish Button as on Fig 13.

Fig 13

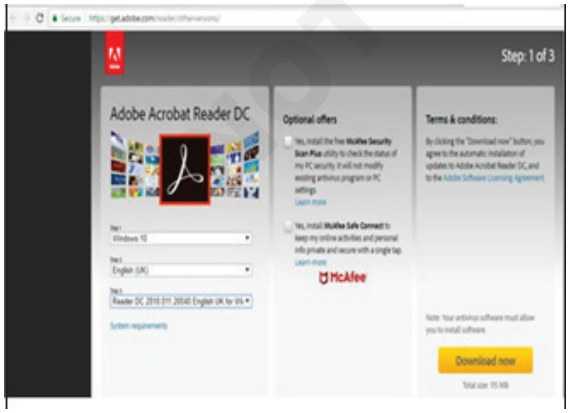


TASK 3: **Download and install the adobe Acrobat Reader DC from the Internet**

1 Open the browser

2 Select the corresponding website https:// get.adobe. com/reader/other versions/ as shown in Fig 14.

Fig 14



3 **Select** "windows version, Language and Reader version"

4 Click download button as shown in Fig 15.

Fig 15

The down loading process will start and the EXE file will show bottom of the Browser

5 Click the up arrow and again click show in folder menu as shown in Fig 16.

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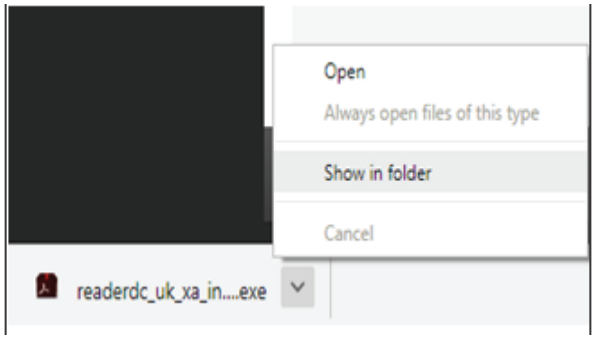
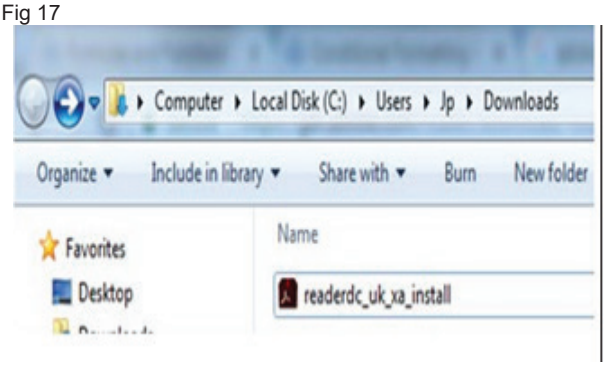
Fig 16



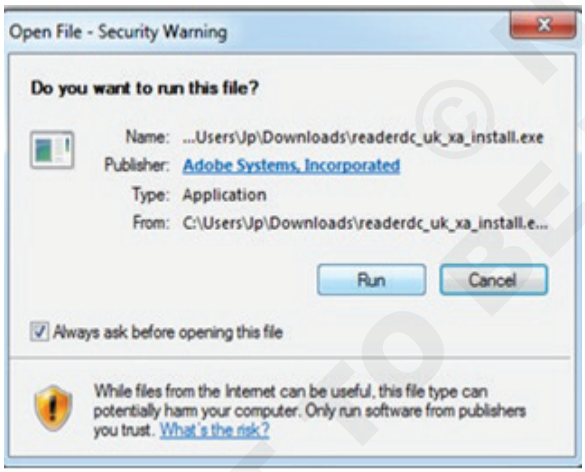
6 Double click the file as shown in Fig 17.

Fig 17



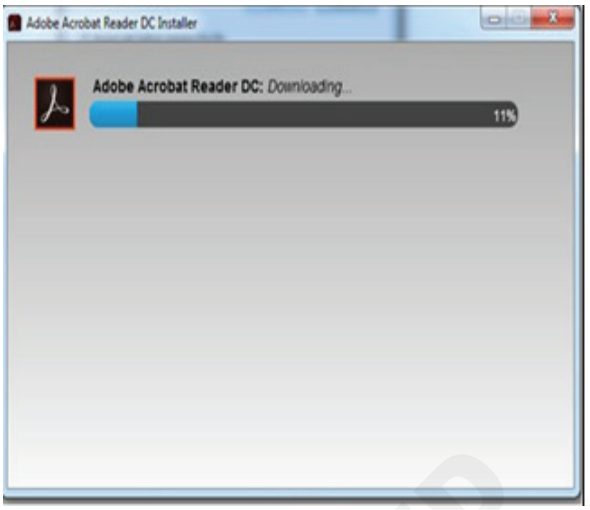
7 Click Run button as shown in Fig 18.

Fig 18



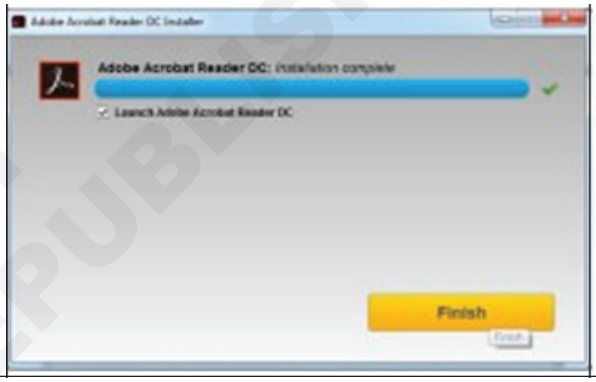
The down loading process window is shown in Fig 19.

Fig 19



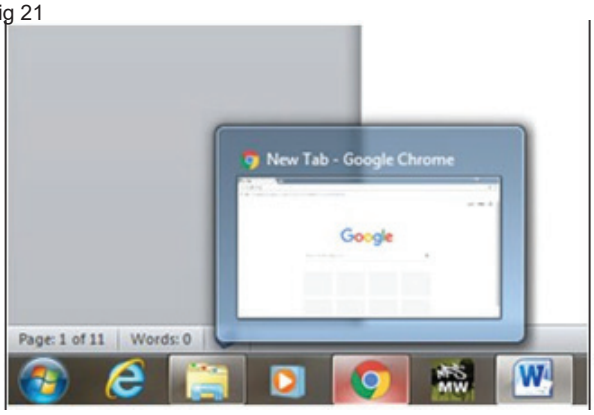
8 After complete the installation click Finish Button as shown in Fig 20.

Fig 20



9 The welcome window is shown in Fig 21.

Fig 21



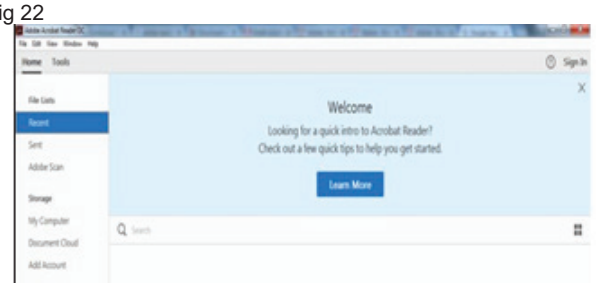
TASK 4: **Installing Avira Free Antivirus software in windows operating system**

1 Click “Google Chrome” icon in windows task Bar as shown in Fig 22.

2 Type the text “download avira antivirus for windows 10” in text box and click “Search” Button as shown in Fig 23.

Display the list of related links in the chrome web page.

Fig 22



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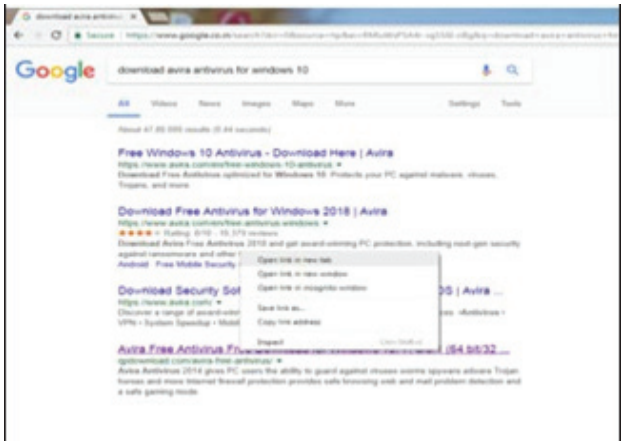
3 Right click on the related link and click “Open link in new tab” as shown in Fig 23.

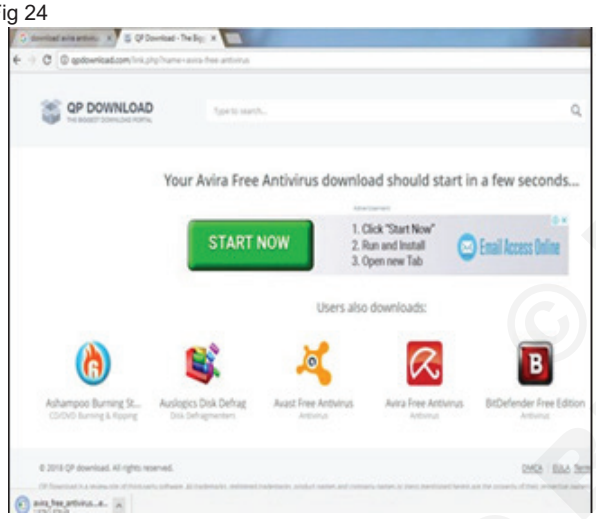
The corresponding software exe file will download bottom of the web page

Fig 23



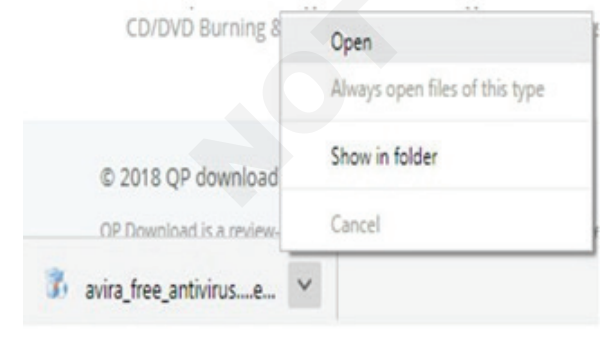
4 Click “START NOW” button in the web site as shown in Fig 24.

Fig 24



5 After download the file “click the ^ button” and click “open” menu as shown in Fig 25.

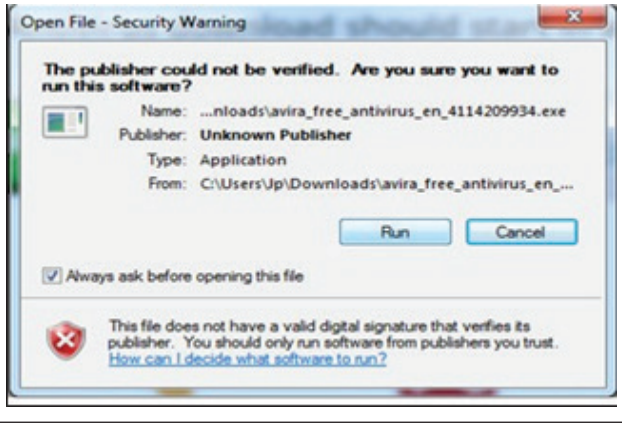
Fig 25



6 Click “Run” button in the below window as Shown in Fig 26.

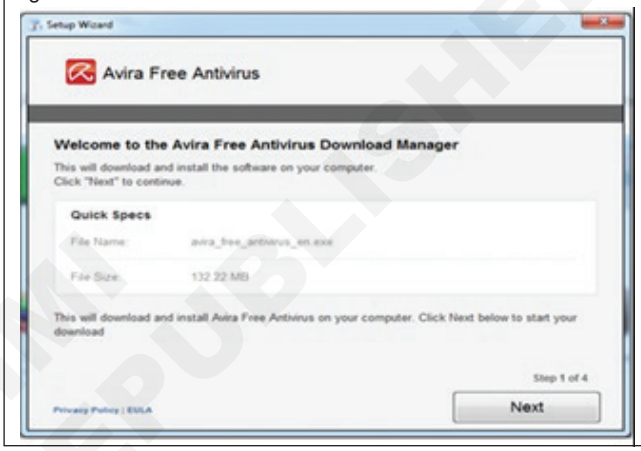
The bellowed screen shows “This will down load and install the software on your computer”

Fig 26



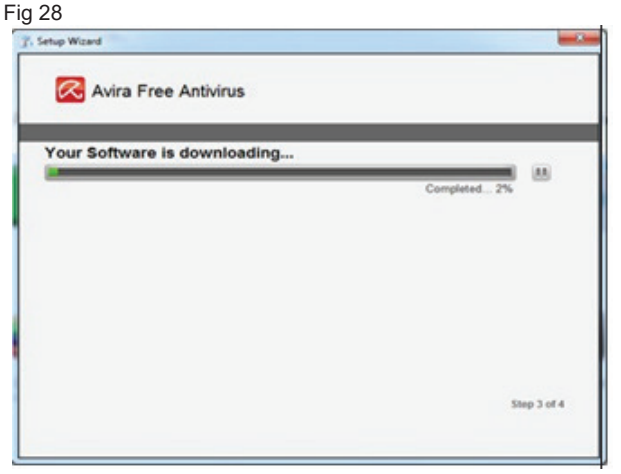
7 Click “Next” to continue the downloading process as on Fig 27.

Fig 27



The downloading progress bar will display the downloading status as shown in Fig 28.

Fig 28



8 Click “Finish” button after complete the 100% downloading progress as on Fig 29.

9 After complete the downloading process the window will appear as on Fig 30.

10 Click “install now” button in the bottom of the window.

The “preparing installation” process begins as on Fig 31.

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Fig 29

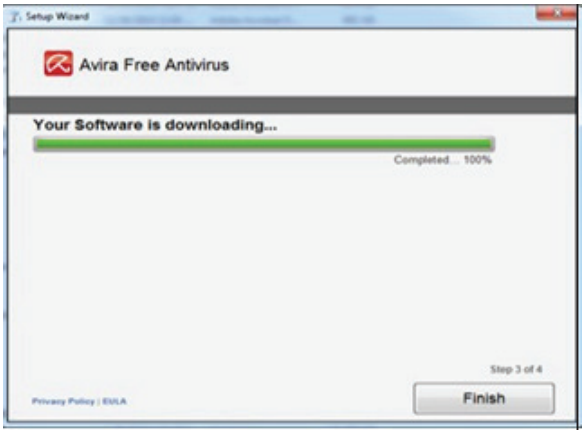
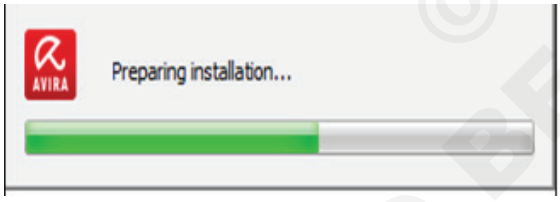


Fig 30

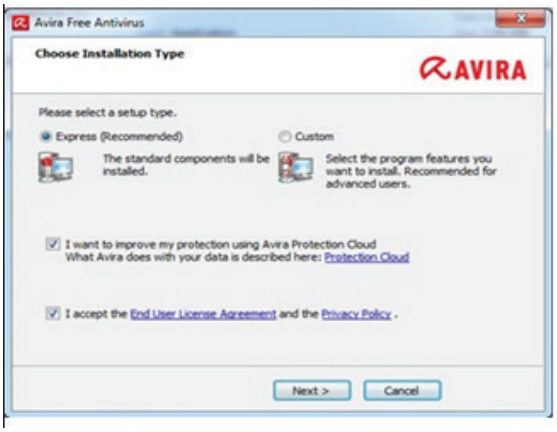
Fig 31



After complete the "preparing installation" process the " Choose Installation Type" window will appear

11 Select the "Express(Recommended)" setup type option and select the license agreement and privacy policy option in the bottom of the window as shown in Fig 32.

Fig 32



12 Click "Next" button

The Avira Antivirus application installation completed as shown in Fig 33 and 34.

Fig 33

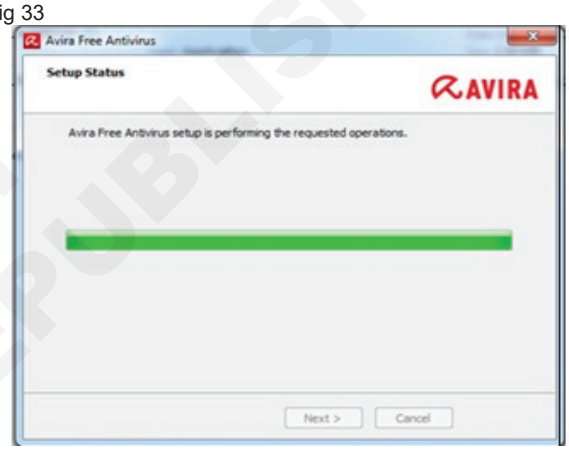
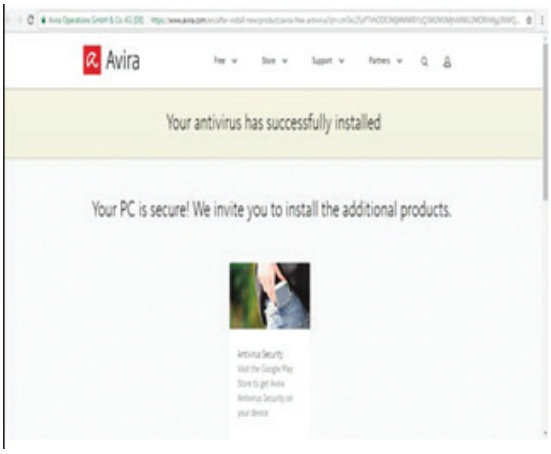


Fig 34



13 Get it checked with your instructor.

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Configure bluetooth / Wi-Fi settings

Objectives: At the end of this exercise you shall be able to
- **connecting Bluetooth devices to Windows 10**
- **create a WIFI connection for a PC.**

Requirements

Tools/Equipment/Machines

- A working PC with Inbuilt Bluetooth and WiFi enabled - 1 No.
- Windows 10 OS - 1 No.
- Bluethooth Dongle (if its not inbuilt with PC) - 1 No.
- WiFi Dongle (if its not inbuilt with PC) - 1 No.
- Bluetooth Enabled Devices (Keyboard / Mouse / Speaker / Headset) - 1 No.

PROCEDURE

TASK 1: **Connecting Bluetooth devices to Windows 10**

Connecting Bluetooth devices to Windows 10

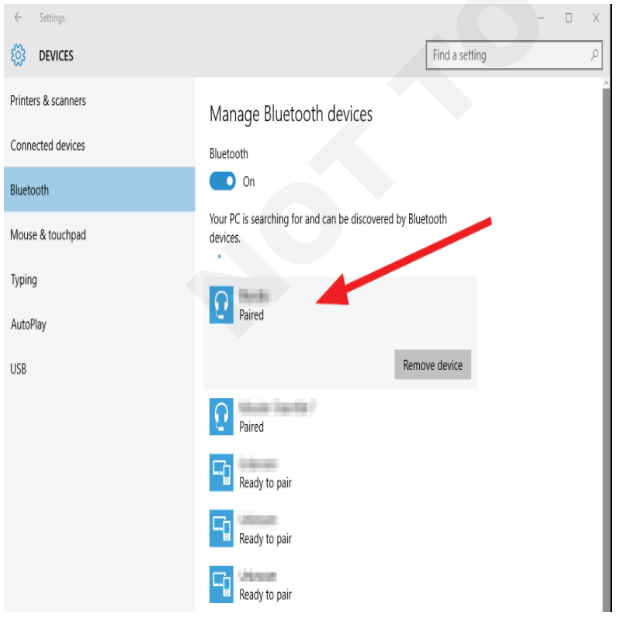
1 Use Windows key + I keyboard shortcut, open the Settings app.

2 Navigate to Devices and go to Bluetooth.

3 Make sure the Bluetooth switch is in the On position. (You'll know it is working because you'll notice the message reads "Your PC is searching for and can be discovered by Bluetooth devices.")

4 Select the device you want to connect and click Pair. Once you click Pair, you're all done. Windows 10 will take care of the rest. You'll notice the "Connected" label under the device name. (Fig 1)

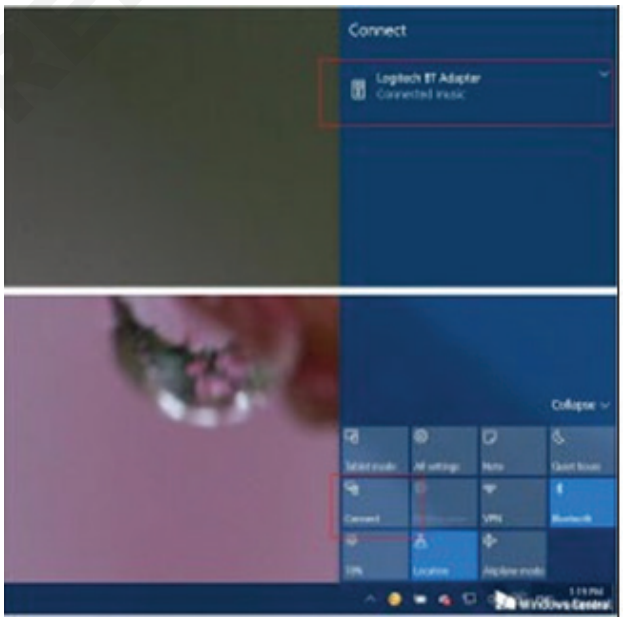
Fig 1



5 From the Quick actions area, click the Connect button.

6 Then all the enabled devices will appear in the list, click on the device, and it should pair automatically. (Fig 2)

Fig 2



Quick troubleshooting tips

If you don't see the Bluetooth section on Devices, chances are that there are issues with Bluetooth driver. Go to Device Manager to verify the driver is present and installed correctly. Still not working you may want to download and reinstall the latest Bluetooth driver from your computer's manufacturer support website. (Fig 3)

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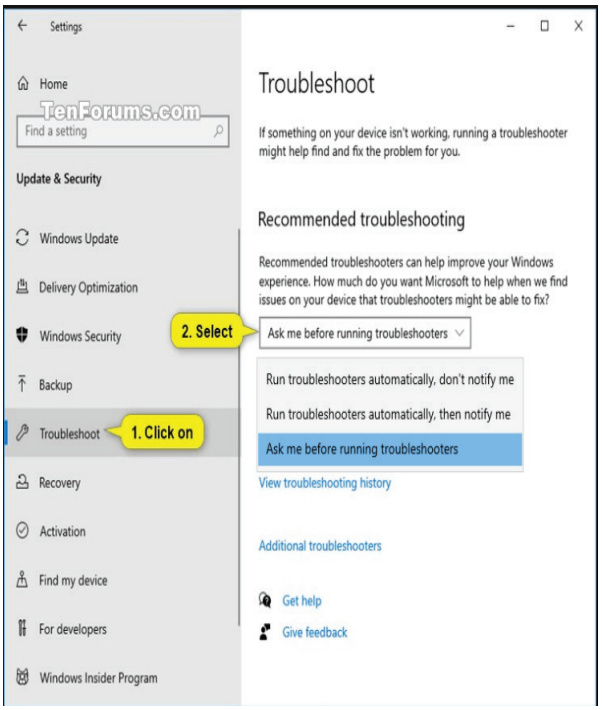
Fig 3



If the problem is with the speakers, headphones, mouse, or keyboard, make sure to turn the peripheral off, wait a few seconds, and turn it back on to try again.

Removing a Bluetooth peripheral from Windows 10

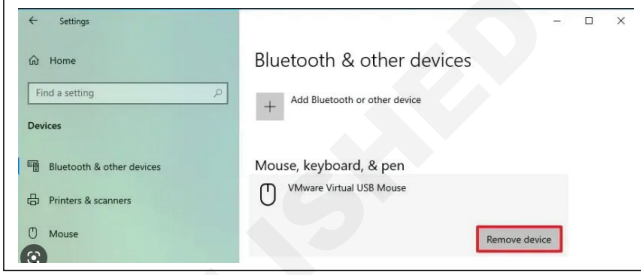
Disconnecting a wireless peripheral is as easy as connecting. Just follow the steps below:

1 Use the Windows + I keyboard shortcut to open the Settings app.

2 Navigate through Devices and go to Bluetooth.

3 Click on the peripheral you want to disconnect, and click the Remove button and then click Yes to confirm. (Fig 4)

Fig 4



TASK 2: **Create a WIFI connection for a PC**

How to connect to a Wi-Fi network

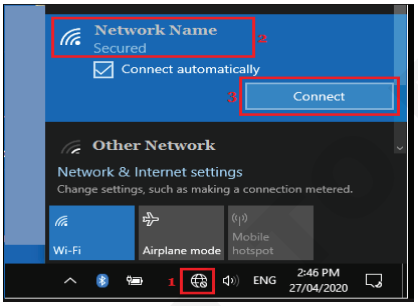
1 Click the wireless icon in the notification area.

2 Select the network you want to connect.

3 Check the Connect automatically option.

4 Click the Connect button. (Fig 5)

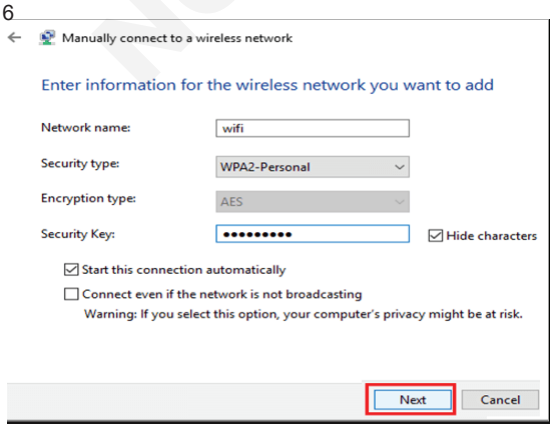
Fig 5



5 Enter the network security key.

6 Click the Next button. (Fig 6)

Fig 6



How to disconnect from a Wi-Fi network

Removing your device from a wireless network is also a straightforward process that can be done in a few different ways.

Disconnecting using the flyout menu

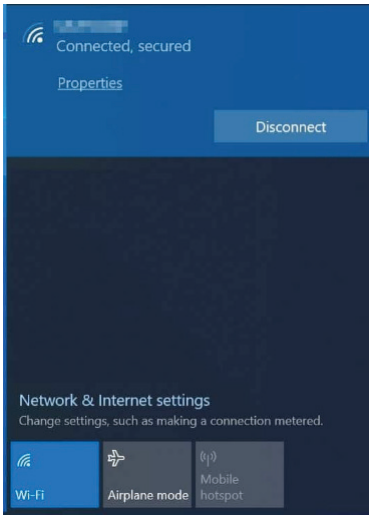
The easiest way to disconnect is using the network flyout menu.

1 Click the wireless icon in the notification area.

2 Select the network you're currently connected.

3 Click the Disconnect button on the network connection. (Fig 7)

Fig 7



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Disconnecting using the Settings app

Alternatively, you can enable or disable Wi-Fi using the Settings app.

1 Open **Settings.**

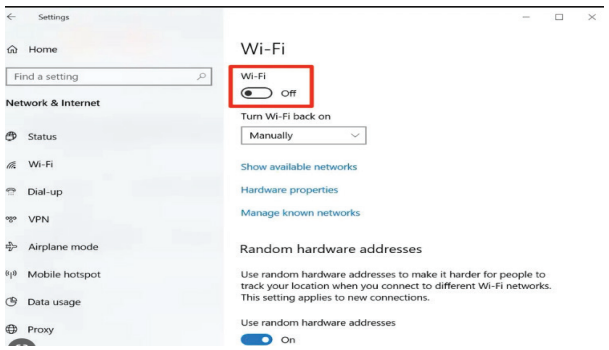
2 Click on **Network & Security.**

3 Click on **Wi-Fi.**

4 Turn off the toggle switch for the adapter you want to disconnect.

5 Use the drop-down menu to select an option to turn on the wireless adapter on schedule. (Fig 8)

Fig 8



How to view a Wi-Fi connection properties

1 Open Settings.

2 Click on Network & Security.

3 Click on Wi-Fi.

4 Under the wireless network, click the Hardware properties link. (Fig 9 & 10)

Fig 9

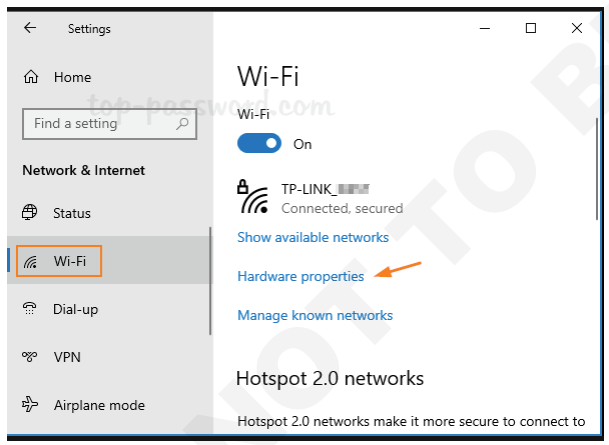
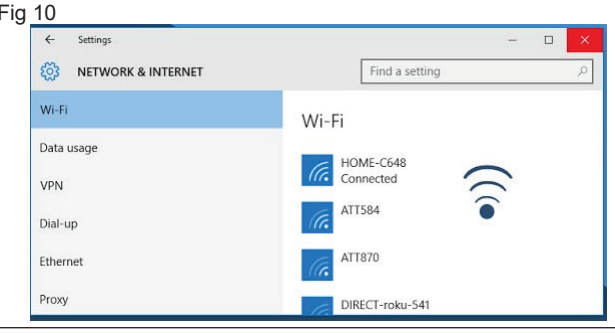


Fig 10



How to Manage Wi-Fi connections

Using the Settings app is also possible to add or remove a Wi-Fi network manually in those cases when you may need to connect to a network that doesn't broadcast its SSID (Service Set Identifier), or when you need to set up a wireless connection beforehand to save time.

Adding a Wi-Fi network

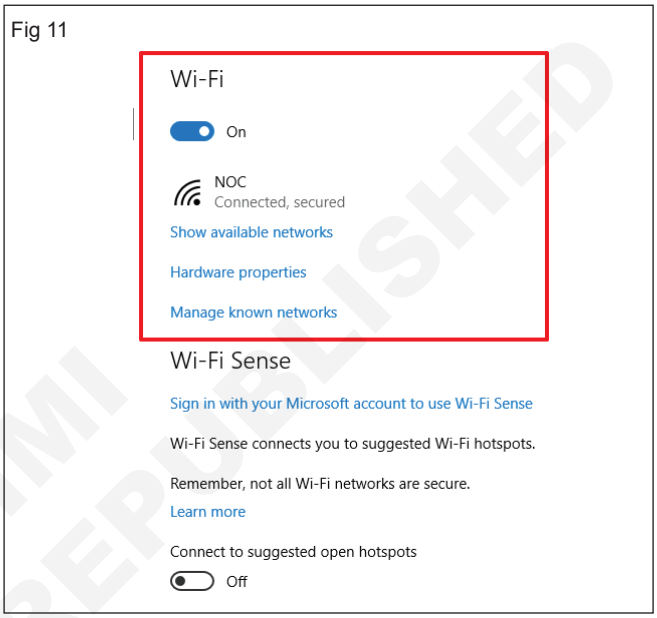
1 Open Settings.

2 Click on Network & Security.

3 Click on Wi-Fi.

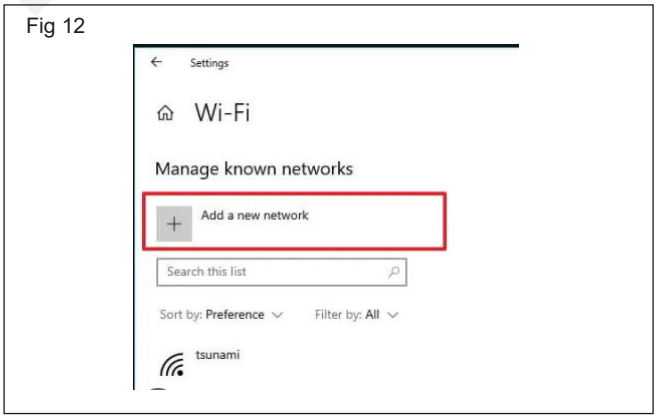
4 Click the Manage known networks link. (Fig 11)

Fig 11



5 Click the Add a new network button. (Fig 12)

Fig 12



6 Enter the network name.

7 Using the drop-down menu, select the network security type.

8 Check the Connect automatically option.

9 Check the Connect even if the network is not broadcasting option.

10 Click Save. (Fig 13)

Once you've completed the steps, whenever your device is within range of the network, it'll connect automatically without any further steps.

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Fig 13

Fig 14

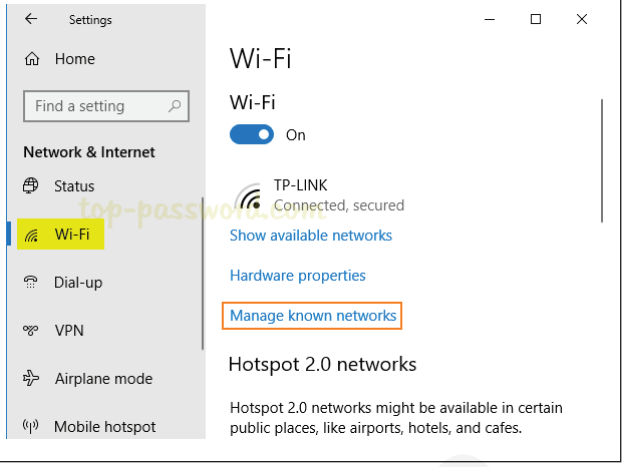
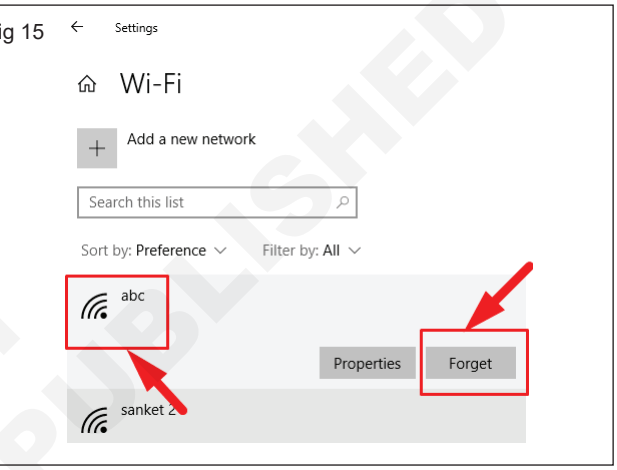


Fig 15



Removing a Wi-Fi network

If you must remove (forget) a Wi-Fi network, the Settings app makes it a very straightforward process.

1 Open Settings.

2 Click on Network & Security.

3 Click on Wi-Fi.

4 Click the Manage known networks link. (Fig 14)

5 Select the Wi-Fi connection you want to remove.

6 Click the Forget button (there is no confirmation dialog using this button, so make sure that you really want Windows 10 to forget this connection before clicking the button). (Fig 15)

After completing the steps, your device will no longer try to connect with the network you've removed.

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Install printer, scanner, Web camera & DVD drives

Objectives: At the end of this exercise you shall be able to
- **add local printer in windows 10 operating system**
- **install a wireless printer, web camera and external DVD drive**
- **add a Scanner to Windows 10 PC.**

Requirements

Tools/Equipment/Machines

- PC with windows 10 OS - 1 No.
- Printer, scanner, web camera & DVD drive software - 1 No.

PROCEDURE

TASK 1: **Add local printer in windows 10 operating system**

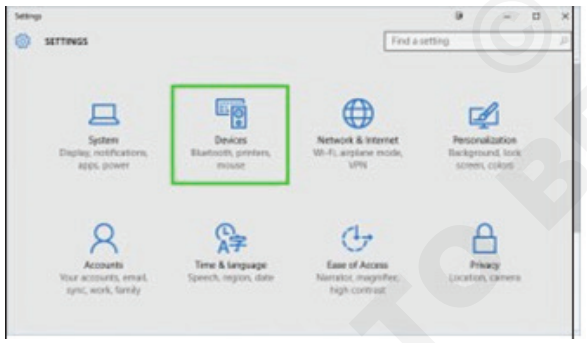
The most common way to connect a printer to the PC is by USB cable, which makes it a local printer. And also install a wireless printer or add a printer connected to another computer on your network which makes it a Network Printer

1 Connect the printer to your computer using the USB cable and turn it on.

2 Open the Settings app from the Start menu.

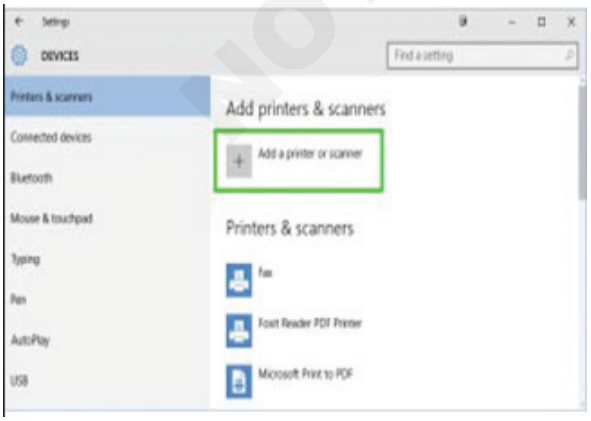
3 Click Devices as shown in Fig 1.

Fig 1



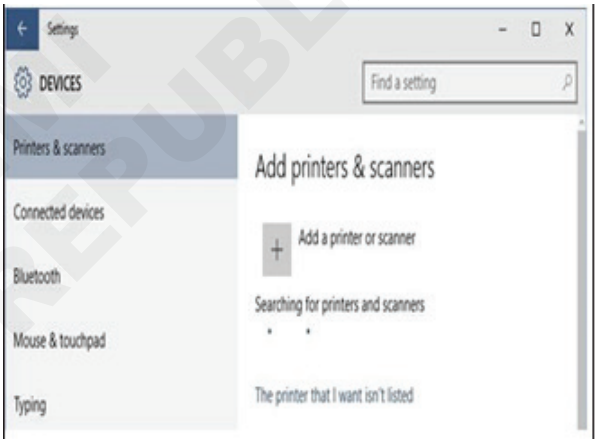
4 Click Add a printer or scanner as on Fig 2.

Fig 2



5 If Windows cannot detect the connected printer, click the printer that I want isn't listed link as shown in Fig 3

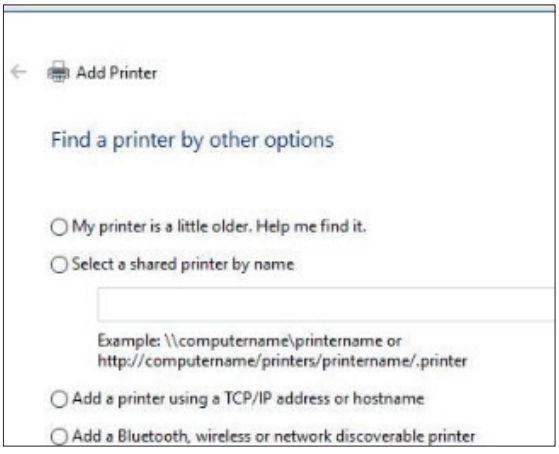
Fig 3



6 On the Find a printer with other options window, click to select the Add a local printer or network printer with manual settings radio button.

7 Click Next to continue as on Fig 4.

Fig 4



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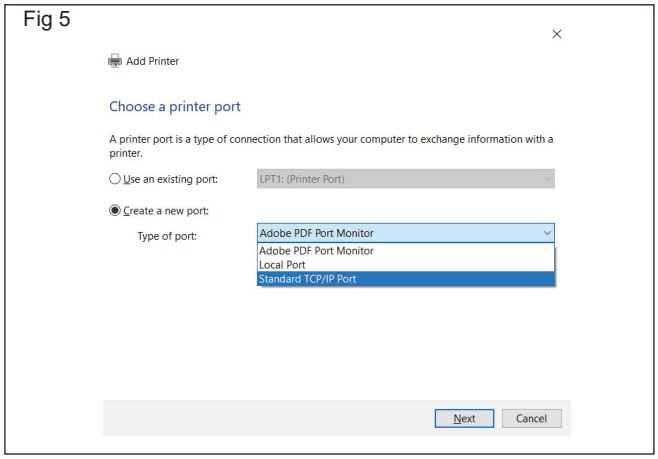
8 On the Choose a printer port window, leave the default options selected and click Next.

If you are an advanced user, you can also choose a different option from the Use an existing port drop-down list, or you can define your own port by selecting the Create a new port radio button and specifying your custom port in the enabled field as on Fig 5.

Fig 5



9 click Next.

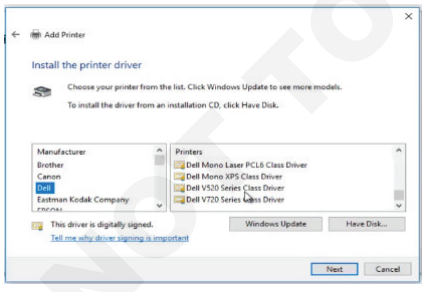
10 On the Install the printer driver window, from the displayed list of printer manufacturers in the left section, click to select the one to which the connected printer belongs.

11 From the right section, locate and click to select the specific model of the printer that is connected to the PC.

Note: At this point, you can also click the Have Disk button and browse and locate the driver for the connected printer if you have downloaded it manually from its official website or driver DVD linked by manufacturer.

12 Click Next to proceed to the next step as on Fig 6.

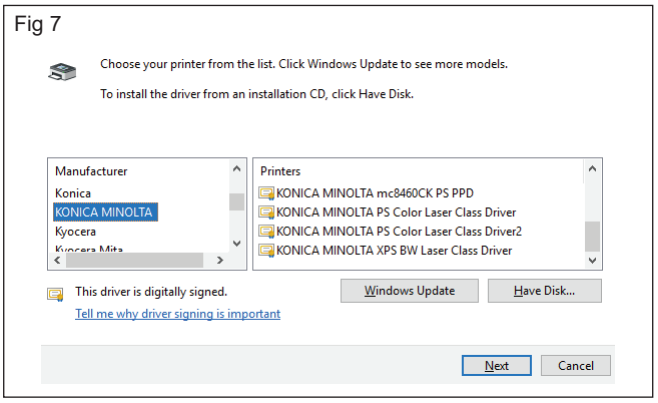
Fig 6



13 Type a printer name window, in the Printer name field, type an informative name for the printer as shown in Fig 7.

14 click Next.

Fig 7



15 If you share the printer , select “Share this printer so that others on the network can find and use it” radio button.

Note: If you do not want to share the printer with the network users, you can select the Do not share this printer radio button.

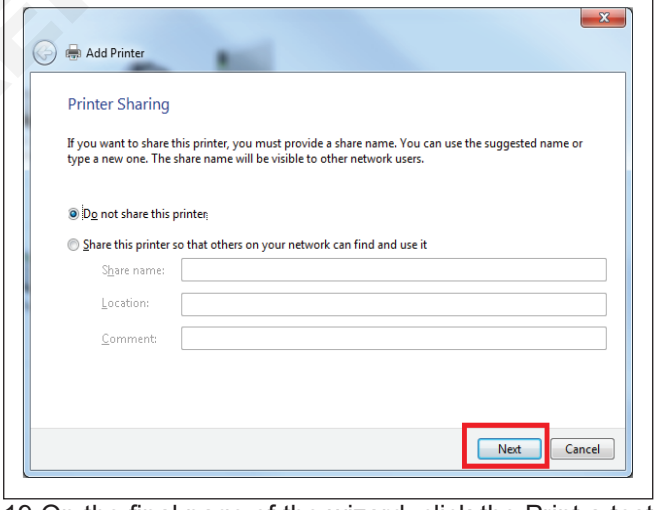
16 In the Share name field, type a short share name for the printer.

Note: The name you specify here will be displayed to the remote users when they search for this printer over the network.

17 Populate the Location and Comment fields with your preferred information.

18 Click Next to continue as on Fig 8.

Fig 8



19 On the final page of the wizard, click the Print a test page button to check the connectivity and proper functioning of the printer.

20 Click Finish to complete the process.

— — — — — —

TASK 2: **Installing a wireless printer**

1 Open Settings.

2 Click on Devices.

3 Click on Printers & scanners.

4 Click on the Add a printer or scanner button as on Fig 9.

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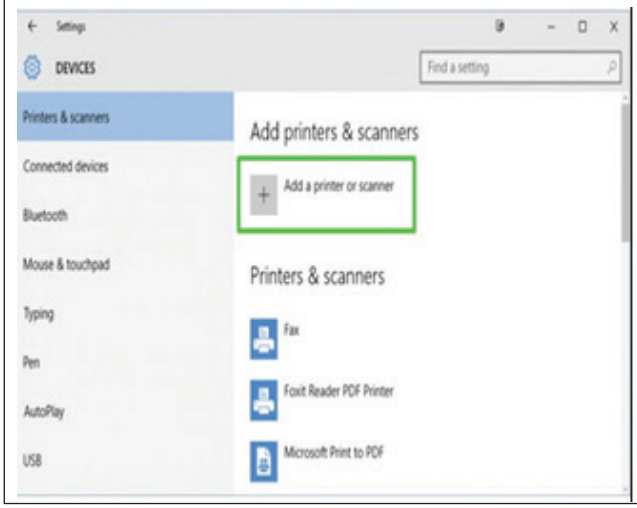
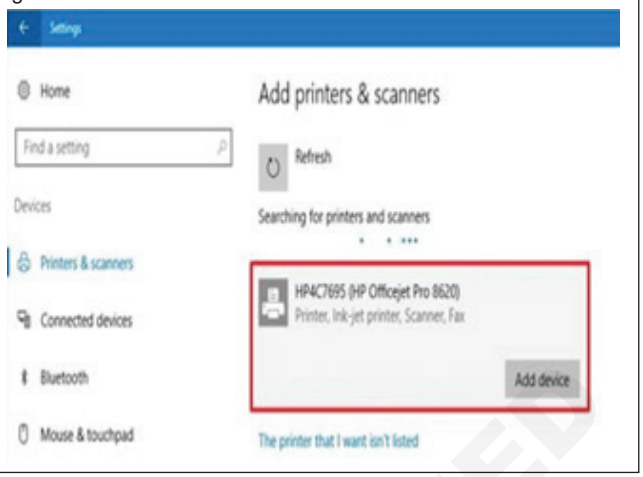
Fig 9



5 Select the printer from the list and click Add device to install the wireless printer to Windows 10 as shown in Fig 10.

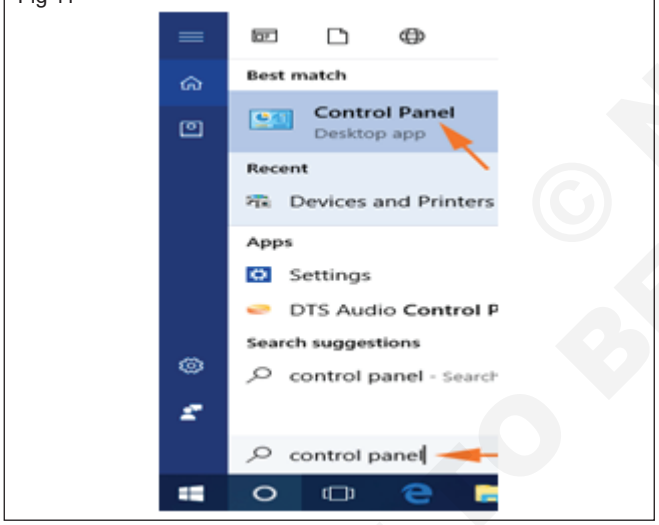
Fig 10



TASK 3: **Adding a Scanner to Windows 10 PC**

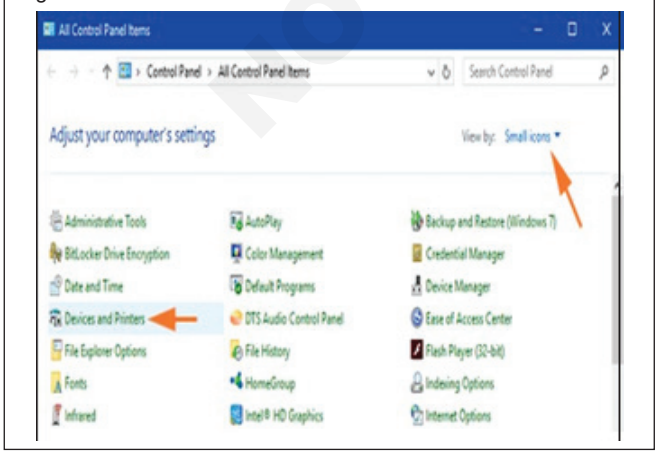
1 Go to the search box on the taskbar and type control panel. Cortana will also display the Control Panel and its icon as the Best Match, click on it as shown in Fig 11.

Fig 11



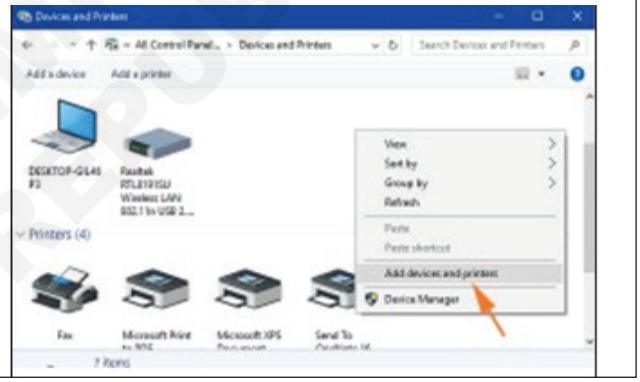
2 Locate and select Devices and Printers as on Fig 12.

Fig 12



3 Inside Devices and Printers, find a blank space and perform a right-click there. Few options will appear, click Add devices and printers as on Fig 13.

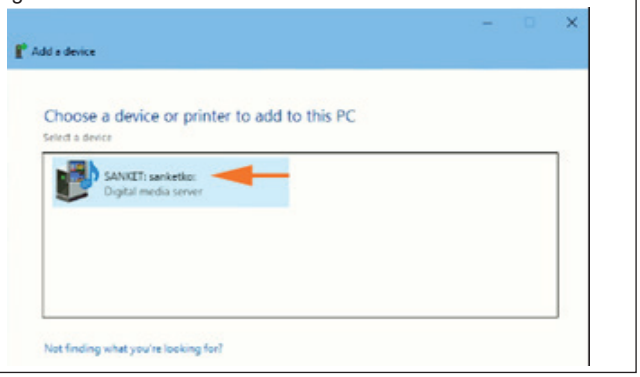
Fig 13



4 A small box with a title Add a device will be visible on the screen and it will start finding the device.

5 After the scan gets over, the scanner name will be displayed on the box. So, select the scanner name and click Next as shown in Fig 14.

Fig 14



6 Finally, successfully added the scanner to Windows 10 PC.

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TASK 4: **Installing Web camera**

1 Connect your Web camera to your computer.

2 Wait for your computer to detect the Web camera. Because you have windows Vista or latest installed on your computer, your computer will automatically detect that a new hardware was connected to your USB port. A message will appear in the bottom right corner of your screen that reads, “your devices are ready to use” or

3 Install the Software to operate the camera, your camera came with software to install on your computer. Simply insert the disk that came with your web camera and follow the instruction.

— — — — — —

TASK 5: **Installing External DVD writer**

1 Connect your DVD writer to your computer.

2 Wait for your computer to detect the DVD writer. Because you have windows Vista or latest installed on your computer, your computer will automatically detect that a new hardware was connected to your USB port. A message will appear in the bottom right corner of your screen that reads, “your devices are ready to use”.

3 New external DVD writer are working plug and play options..

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Burn data, video and audio files on CD/DVD using application software

Objectives: At the end of this exercise you shall be able to
- **burn a data into CD or DVD.**

Requirements

Tools/Equipment/Machines

- PC with windows 10 OS - 1 No.
- Nero software - 1 No.

PROCEDURE

TASK 1: **Burn a Data into CD or DVD**

1 Put the CD in the CD/DVD writer

2 Go to Start > All programs > Nero, then NeroStart Smart

3 Scroll over the icons on the top right of the program window, to find the Data icon. (Fig 1) or audio video or others

Fig 1

4 Choose Make Data CD. This will launch Nero Express as shown in Fig 2.

5 Click Add and browse the hard drive and select the files like included on the CD. When finished adding files click Finished.

6 Click Next and name the disk.

7 Check Verify data after burning if you want to make sure your burn happened correctly (this will take a little more time).

8 Click Burn and insert a blank CD as on Fig 3

Fig 2

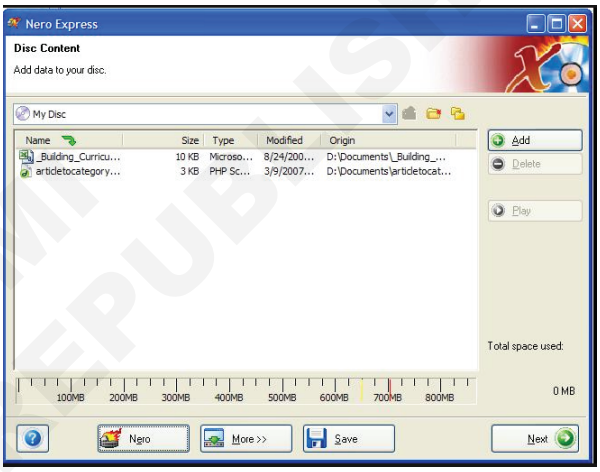
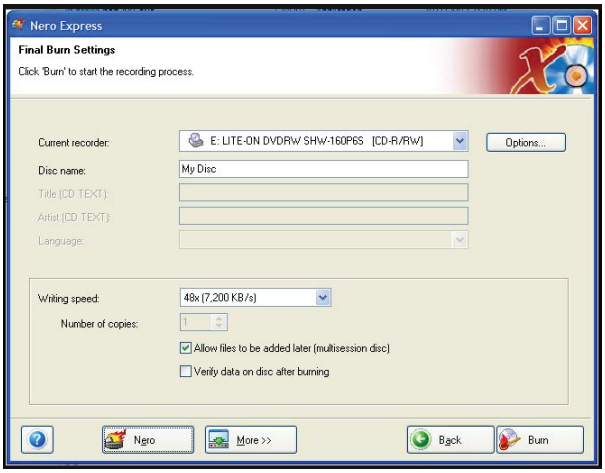


Fig 3



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Basic DOS Commands

Objectives: At the end of this exercise you shall be able to
- **enter to dos command prompt**
- **use basic dos commands**
- **list directory contents using DIR command**
- **view directory structure.**

Requirements

Tools/Equipment/Machines

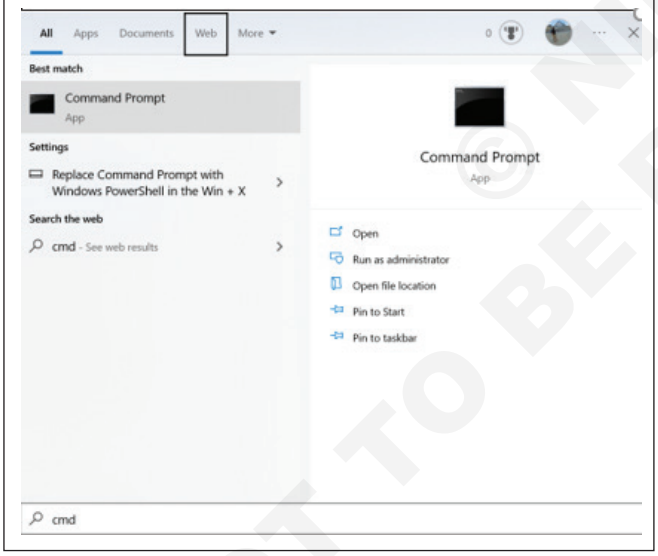
- PC with windows 10 OS - 1 No.
- DOS command prompt software - 1 No.

PROCEDURE

TASK 1: **Enter in to DOS command prompt**

1 In Windows 10, one of the fastest ways to launch Command Prompt is to use search. Inside the search field from your taskbar, enter command or cmd (Fig 1) Then, click or tap on the Command Prompt result.

Fig 1



Or Start RUN using WIN+R → Type CMD then Click Enter.

2 Command prompt window is displayed on the screen. (Fig 2)

Fig 1a

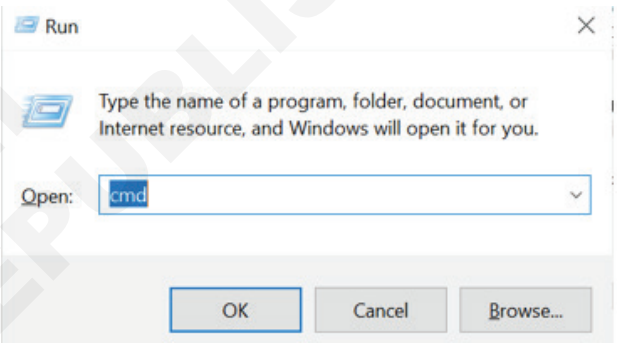
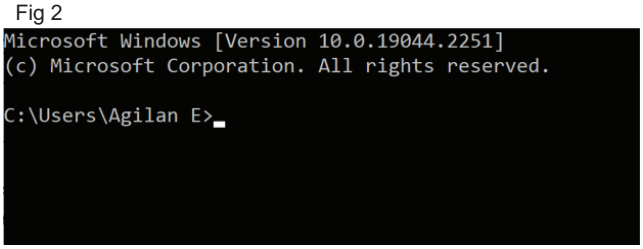


Fig 2



NOTE: Command Prompt is not case sensitive, meaning that commands can be typed with capital letters, lowercase or any combination of them. The commands date or DATE will all work in the same way.

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TASK 2: **Use basic DOS commands**

Note: Each and every DOS command should be typed at DOS Prompt only and Enter key should be pressed at the end of each DOS command to execute it.

a Change the working drive from C to D

1 Type D: at DOS prompt as shown below.

C:\Users\nimi> D:

Note: is the symbol for pressing Enter key on the keyboard. When we enter wrong DOS command, it displays Bad command or filename or some other error messages (discussed in Related Theory 1.5.01). We have to correct the Wrong DOS command to get the result.

Now the prompt is changed from C:\Users\nimi> to D:\> and the currently working drive is changed from C to D.

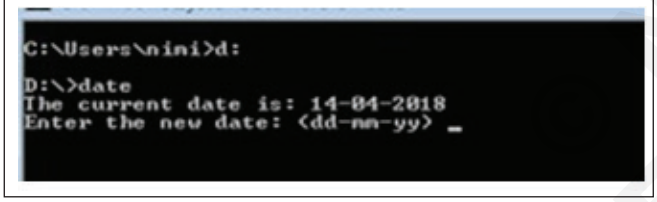
b View/change System date

DATE command is used to view/change system date.

D:\>DATE

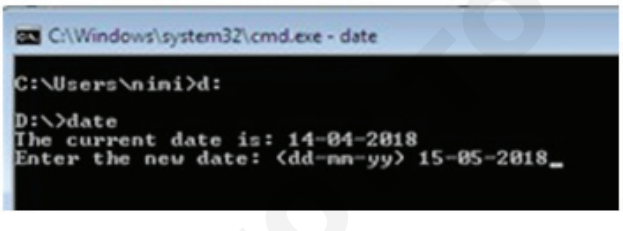
2 It displays the current date as shown below (Fig 3)

Fig 3



3 If the current date is not displayed, type the Current date as shown in the box given below. (Fig 4)

Fig 4



4 Press enter key to update. Record the displayed the date.And new updated dtae.

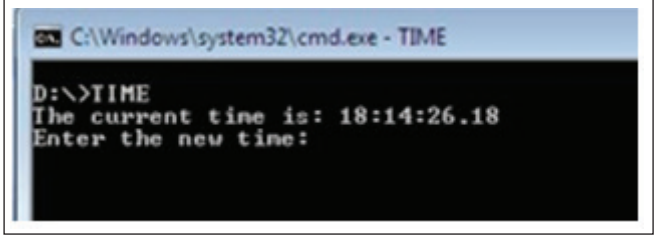
c View/change System time

TIME command is used to view/change system time.

D:\>TIME

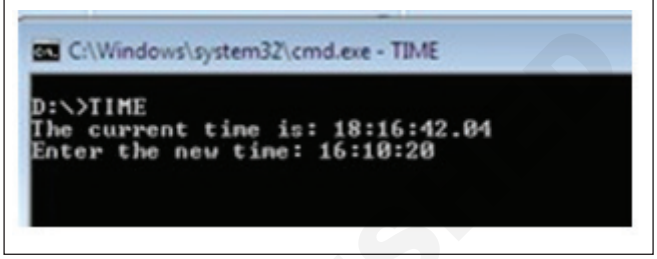
1 It displays the current time as shown below (Fig 5)

Fig 5



2 If the current time is not correct, type the Current time as shown in the box given below. (Fig 6)

Fig 6



3 Press Enter key to update. Record the displayed time and new updated time.

d Clears screen

CLS command is used to clear the screen.

D:\>CLS

The displayed contents are cleared and the DOS prompt appears at the top left corner of the screen.

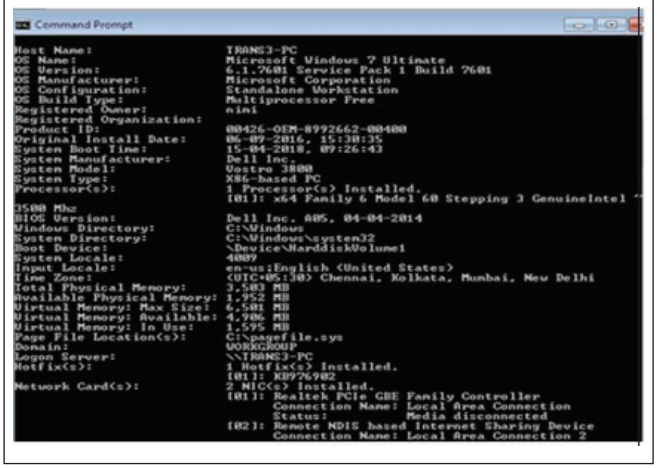
i Display complete system information for Microsoft Windows computers.

1 Type the following command

D:\> SYSTEMINFO

2 It displays the complete system information as shown below. (Fig 7)

Fig 7



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3 Record the output

j Exit DOS session

EXIT command is used to exit the DOS session.

1 Type the following command

D:\> EXIT

It exits the DOS session and return to Windows OS

TASK 3: **List directory contents using DIR command.**

DIR command displays a list of files and directories in a directory.

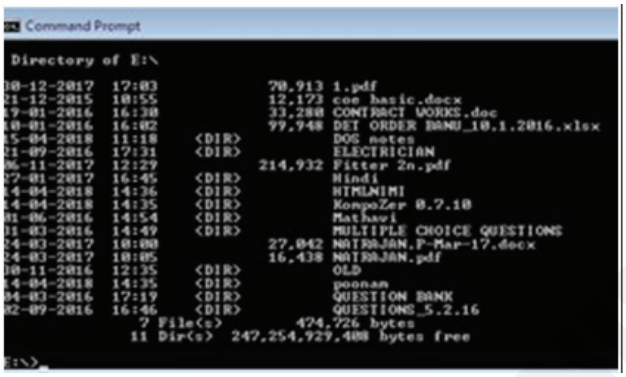
1 Change over to E drive by typing E: at DOS prompt.

2 Type the following command.

E:\> DIR

3 It displays a list of files and directories of E drive as shown below. (Fig 8)

Fig 8

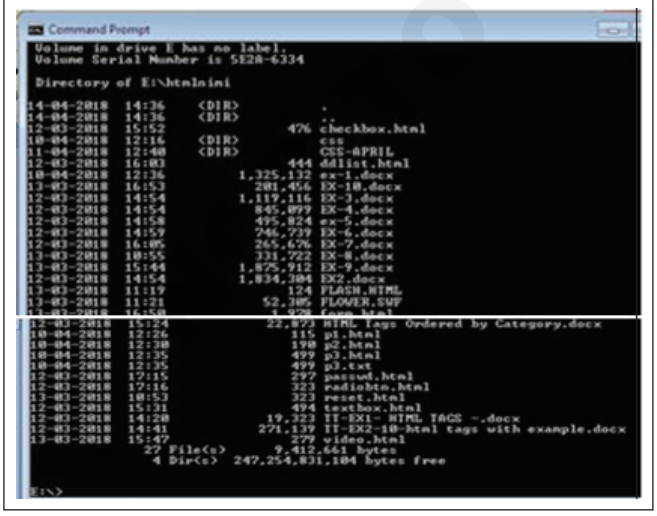


4 Type the following command

E:\> DIR htmlnimi

5 Displays a list of files and directories of HTMLNIMI directory of E drive as shown below. Record the output. (Fig 9)

Fig 9



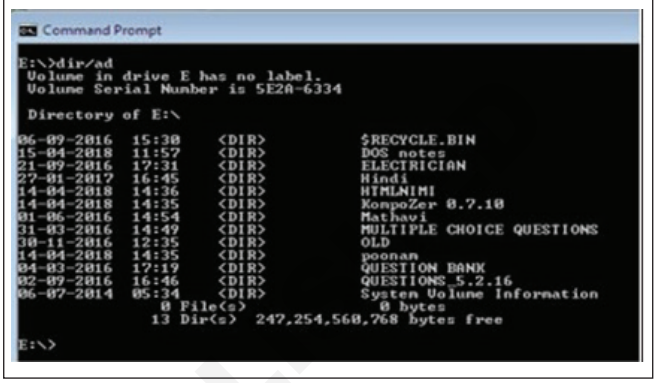
6 Type the following command

E:\> DIR/AD

Note : /AD is a switch or option used with DIR command to display only the directories of specified drive or directory.

7 It displays only the directories of E drive as shown below. Record the output. (Fig 10)

Fig 10

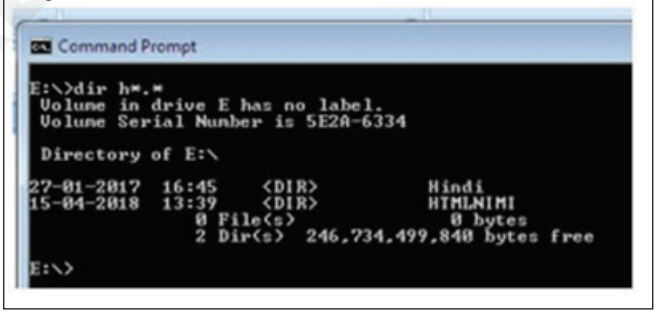


8 Type the following command.

E:\> DIR H*.*

9 It lists all files and folders begin with letter H and have any extension as shown below. (Fig 11)

Fig 11



10 Type the following command.

E:\> DIR ?????

11 It lists all files and folders which are 5 characters long without any extension as shown below.

Note:Wildcards are typically either an asterisk (*), which represents one or more characters or question mark(?), which represents a single character.

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Managing files and folders using dos commands

Objectives: At the end of this exercise you shall be able to
- **manage files using DOS commands**
- **manage directories using DOS commands.**

Requirements

Tools/Equipment/Machines

- PC with windows 10 OS - 1 No.
- DOS command prompt software - 1 No.

PROCEDURE

TASK 1: **Manage files using DOS commands**

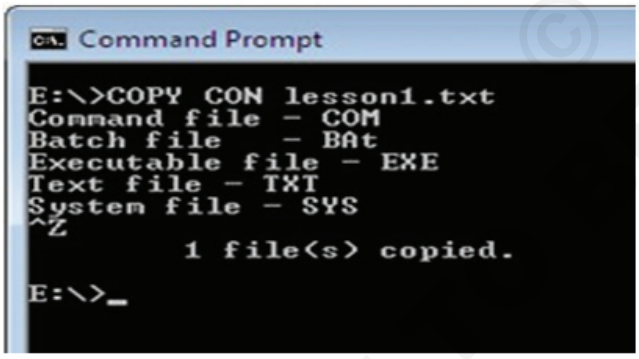
Practice the following DOS commands in Command Prompt, record the output and get it checked by the instructor:

Note :File name should not be greater than 11 characters out of which 8 characters are for the name and 3 characters are for the extension.

1 **COPYCON** lesson1.txt

- It creates the text file lesson1.txt as shown in Fig 1

Fig 1

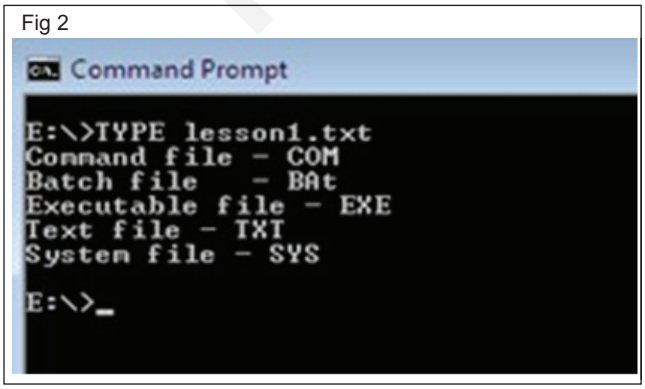


- **^Z (Ctrl Z) or F6** is used to save the text file.

2 **TYPE** lesson1.txt

- It displays the content of the text file lesson1.txt as shown in Fig 2.

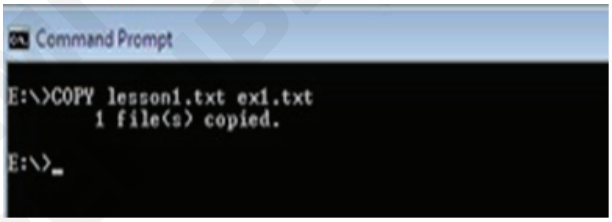
Fig 2



3 **COPY** lesson1.txt ex1.txt

- It copies **lesson1.txt** to ex1.txt as shown in Fig 3.
- Use DIR command to check that the file ex1.txt is in the list.

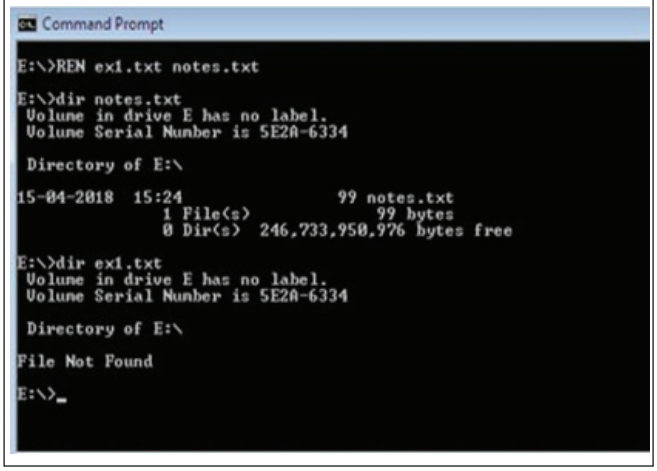
Fig 3



4 **REN ex1.txt** notes.txt

- It renames the file ex1.txt as notes.txt as shown in Fig.4
- Use DIR command to check that the file ex1.txt is renamed as notes.txt (Fig 4)

Fig 4



5 **DEL** notes.txt

- It deletes the file notes.txt as shown in Fig 5
- Use DIR command to check that the file notes.txt is available in the list.

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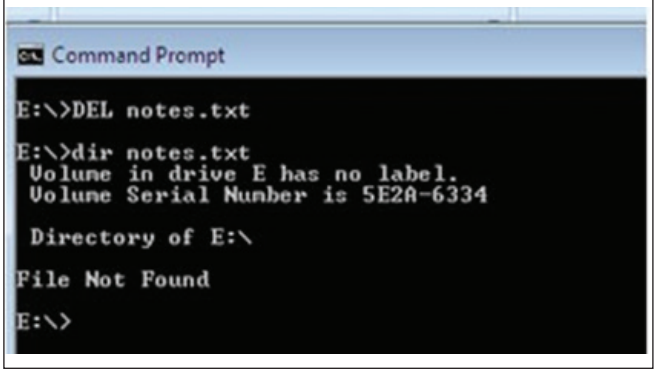
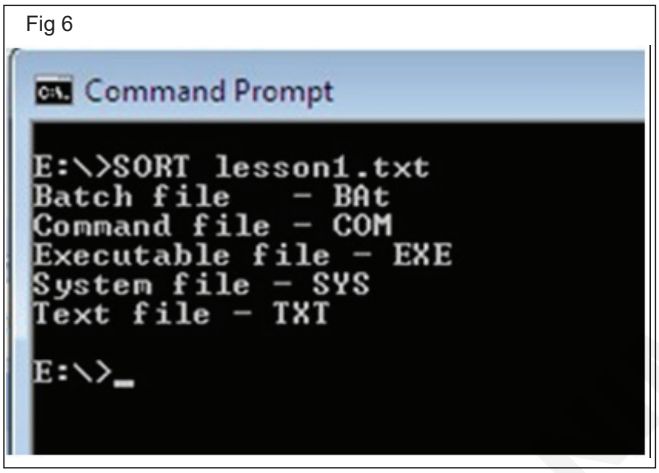
Fig 5



6 SORT lesson1.txt

- It sorts the content of the file lesson1.txt as shown in Fig 6.

Fig 6

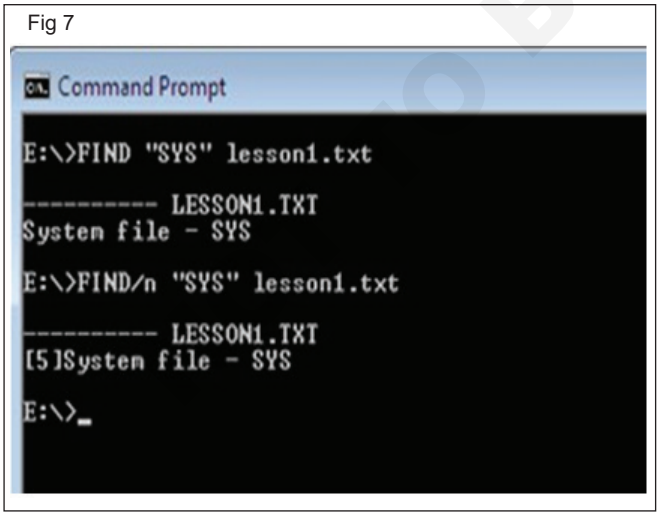


7 **FIND "SYS"** lesson1.txt

- It searches for a text string **"SYS"** in the text file lesson1.txt and displays a line having the text string **"SYS"**as shown in Fig 7

  FIND/n **"SYS"** lesson1.txt

Fig 7

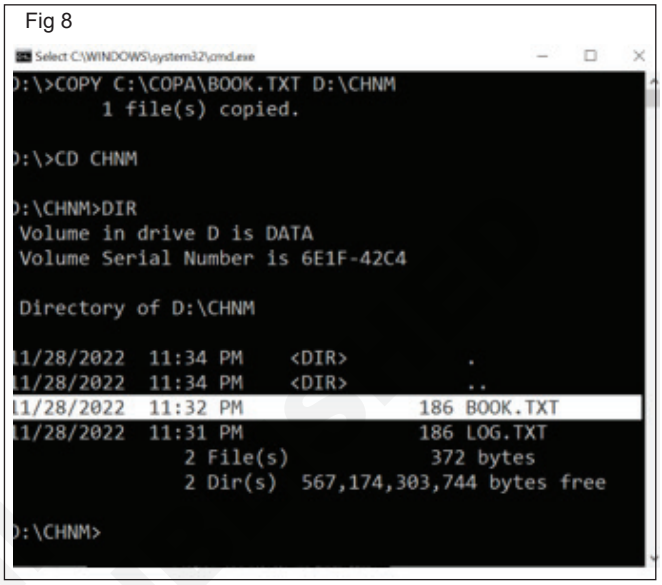


8 Copy and Move files from one directory to another directory.

COPY command used to Copies one or more files from location to another location. Here we have copied Book.txt file from C:\COPA to D:\CHNM. so Book.txt file is available while listing the files in CHNM folder on Drive. (Fig 8)

COPY C: |COPA|BOOK.TXTD:}CHNM

Fig 8

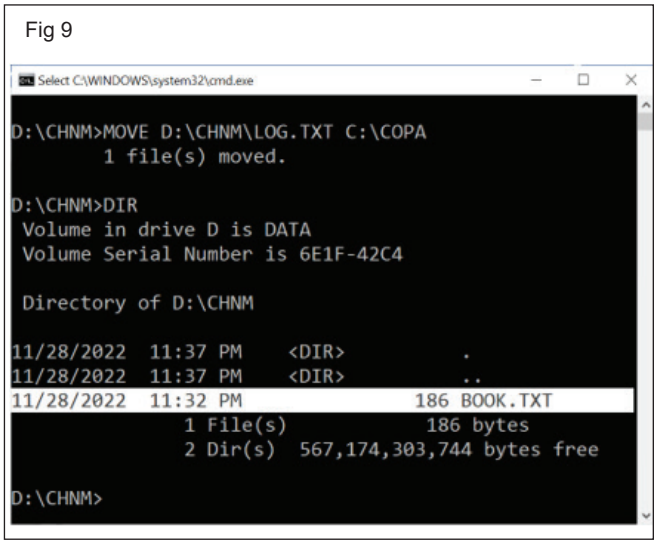


MOVE command used to Moves one or more files from one directory to another directory.

MOVE D: |CHNM|LOG.TXT C:|COPA

Here we have moved LOG.txt file from D:\CHNM to C:\COPA. so LOG.txt file is not available while listing the files in CHNM folder on Drive. (Fig 9)

Fig 9



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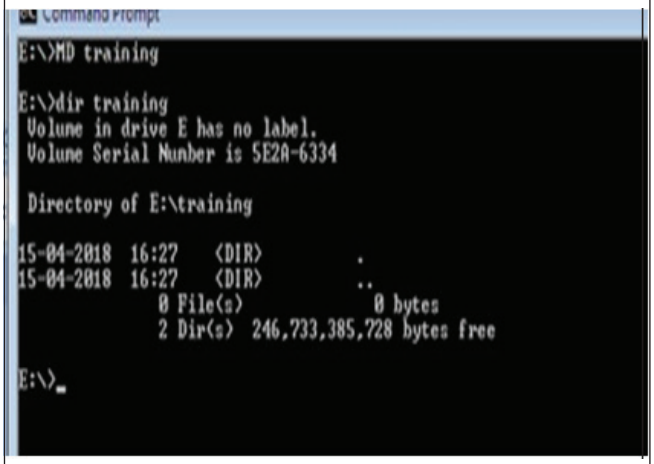
TASK 2: **Manage directories (folders) using DOS commands**

Practice the following DOS commands in Command Prompt, record the output and get it checked by the instructor:

1 MD training

- It creates the new directory “training” as shown in Fig 10
- Use DIR command to check the directory “training” is in the list. (Fig 10)

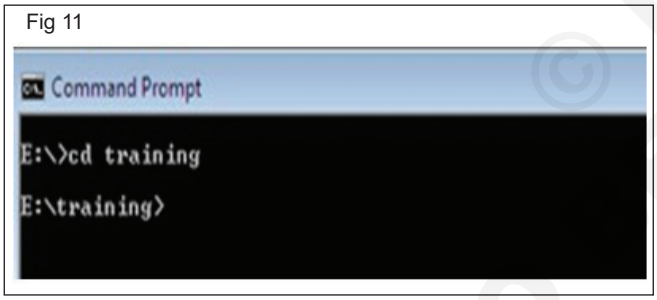
Fig 10



2 CD training

- It changes the current directory to training and it can be seen in the DOS prompt as shown in Fig 11

Fig 11



- **MD Theory**

  It creates a new subdirectory Theory in the main directory training

- **MD Practical**

  It creates a new subdirectory Practical in the main directory training

- Use DIR command to check that the new subdirectories Theory and Practical are listed in the main directory training as shown in Fig 12

- **CD Practical**

- It changes the current working directory to Practical as shown in Fig 13

Fig 12

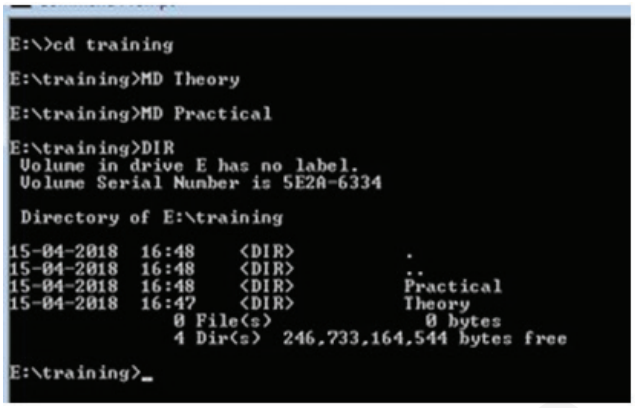
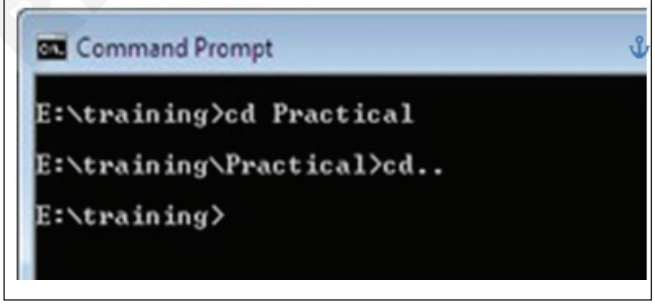


Fig 13

- **CD.**
- It exits current working subdirectory Practical and goes to the main directory training as shown in Fig 14.

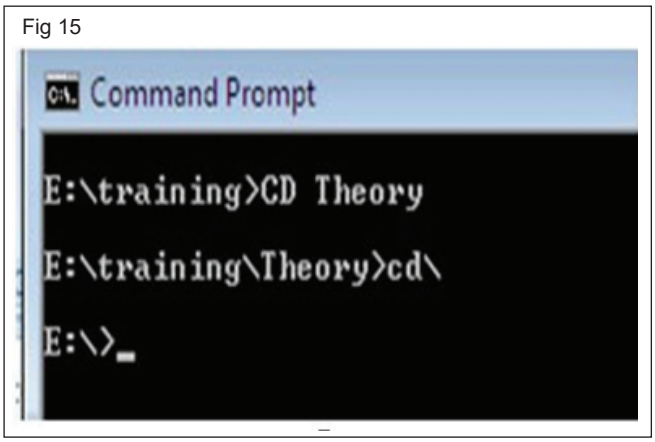
Fig 14



- **CD Theory**

  It changes the current working directory to Theory as shown in Fig 15

Fig 15



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- **CD**

  It exits all directories Theory and training and goes to the root directory E:\ as shown in Fig 15

4 RD training

- RD command removes the empty directory only. So first thing is to remove all files and directories inside the directory training.
- **CD training**

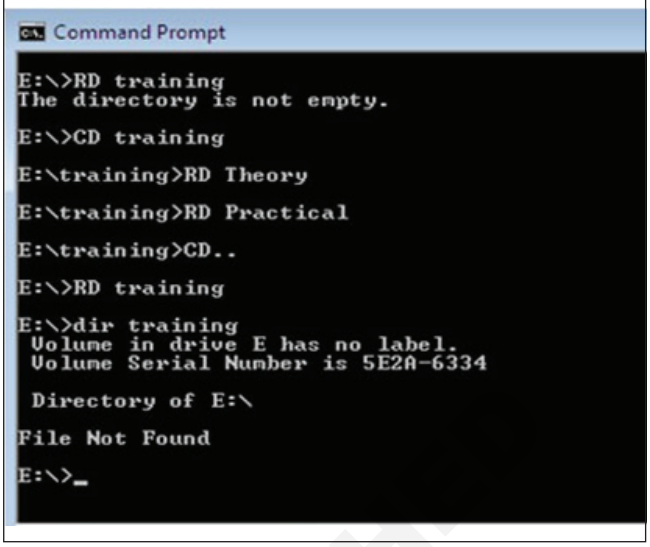
  It changes the current working directory into training (Fig 16)
- **RD Theory**

  It removes the empty subdirectory Theory (Fig 16)
- **RD Practical**

  It removes the empty subdirectory Practical(Fig 16)
- **CD.**

  It exits the current working directory training and goes to E:\> (Fig 16)
- Use DIR command to check the availability of the directory training (Fig 16)

Fig 16



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TASK 3: **Create the given Directory Structure (Fig 17)**

E:\>MAINDIR1

<Subdir1>

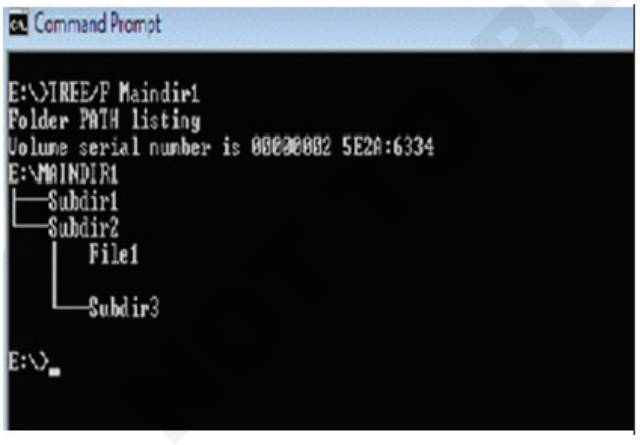
<Subdir2>

File1

|<Subdir3>

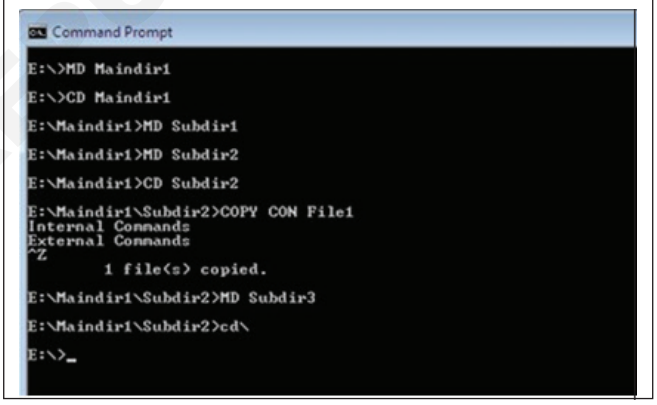
- Use TREE command to view the directory structure of the directory MAINDIR1(Fig 17)

Fig 17



Command sequence to create the given directory structure and it is shown in Fig 18.

Fig 18



MD MAINDIR1	-	Creates MAINDIR1
CD MAINDIR1	-	Enters into directory MAINDIR1
MD Subdir1	-	Creates Subdir1
MD Subdir2	-	Creates Subdir2
CD Subdir2	-	Enters into Subdir2
COPY CON File1	-	Creates the file File1
^Z	-	Saves the file File1
MD Subdir3	-	Creates Subdir3
CD\	-	Exits all subdirectory and goes to root directory E:

— — — — — —

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COPA - Install Ubuntu Linux operating system and execute basic Linux commands

Installation of ubuntu linux operating system

Objectives: At the end of this exercise you shall be able to
- **install ubuntu Linux operating system.**

Requirements

Tools/Equipment/Machines

- A Working PC - 1 No.
- Ubuntu 22.04.1 / Latest Linux OS - 1 No.

PROCEDURE

TASK 1: **Installing ubuntu Linux operating system**

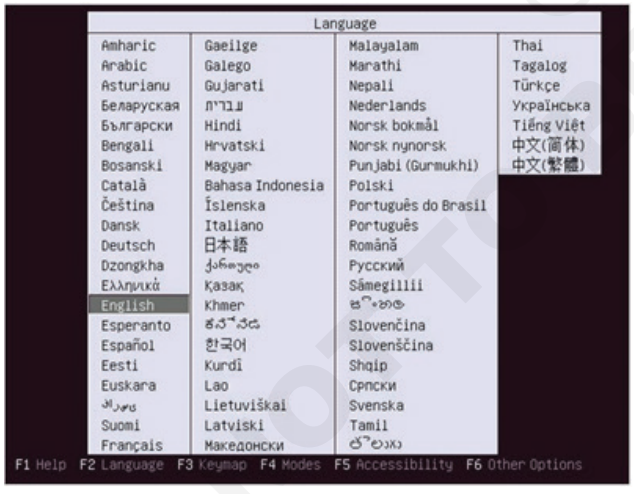
1 Download Ubuntu 22.04.1 ubuntu-22.04.1-desktop-amd64.iso from https://ubuntu.com/ burn into DVD and Insert the DVD on the DVD ROM drive, change the boot sequence accordingly, so that DVD ROM can boot first.

OR

Load Ubuntu ISO into USB flash, change the boot sequence according to the USB mass storage to boot first.

2 Select the Language and press Enter as on Fig 1.

Fig 1



3 Select install ubuntu as on Fig 2.

This is starting screen as on Fig 3, it will be disappeared in a minute.

Fig 2

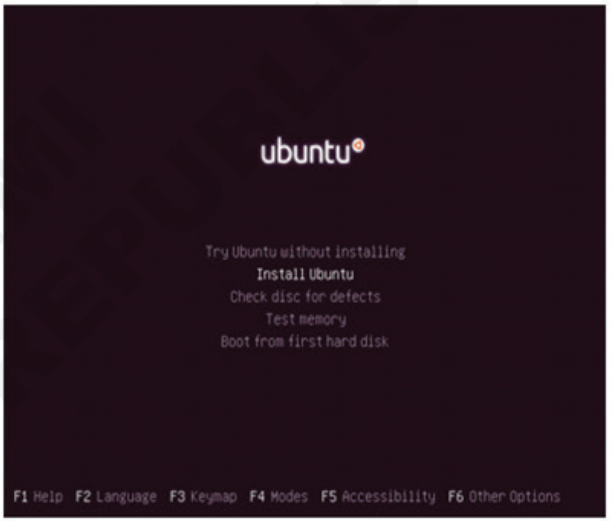


Fig 3

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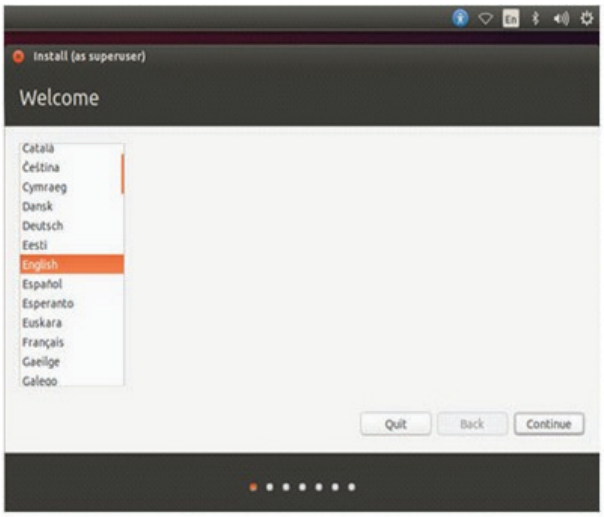
After few seconds the following screen will appear as on Fig 4.

4 Select language and click continue as on Fig 4.

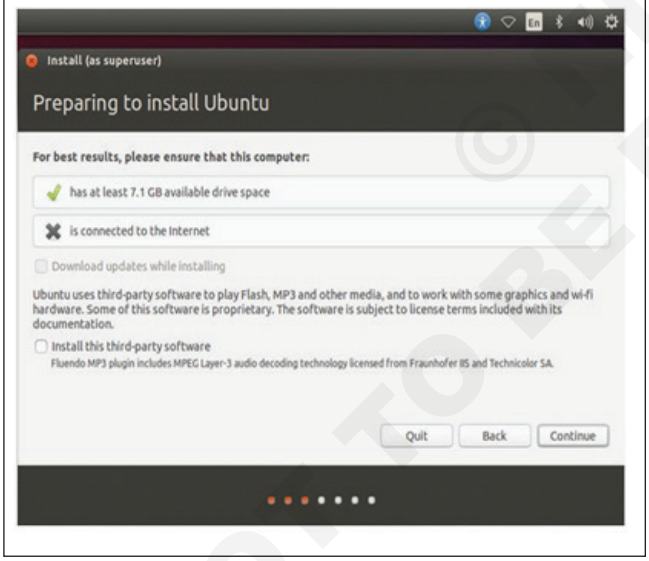
Fig 4



5 Click forward on preparing to install Ubuntu screen.

6 Erase disk and install Ubuntu (i.e. it will format the entire drive and install the OS). If you don't have any idea about the partitioning scheme simply click continue as on Fig 5.

Fig 5



7 Once clicked on continue, you would be asked to confirm the auto partitioning. Click on continue to proceed as on Fig 6.

Once clicked, you would get the following page where installer lists available hard disk. In this case i have one harddisk size of 20GB, to create a partition; click on New Partition Table to create empty partition since this is a new harddisk. Pop up will ask you to confirm, click on continue as on Fig 7.

Fig 6

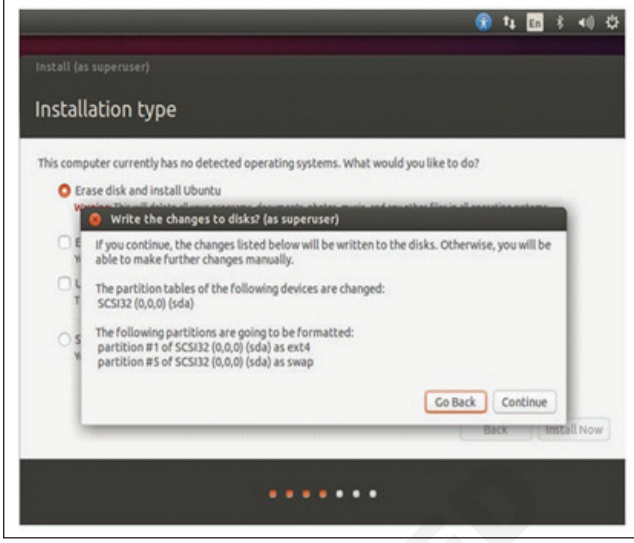
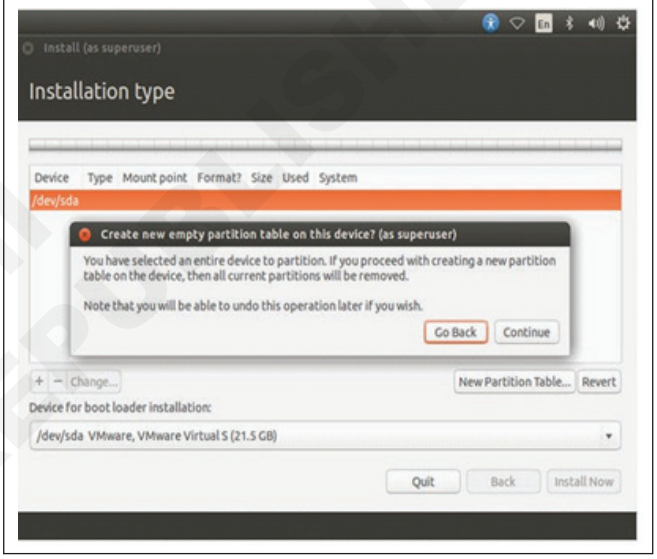


Fig 7



Partition scheme will be like below:

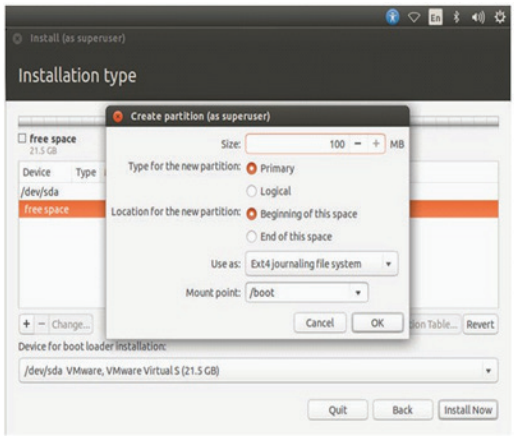
/boot - 100MB

swap - 2048MB (2 x RAM size)

/ - Remaining (19GB)

8 Select free space and click on + sign at the bottom to create partitions. Following shows for /boot partition as on Fig 8.

Fig 8



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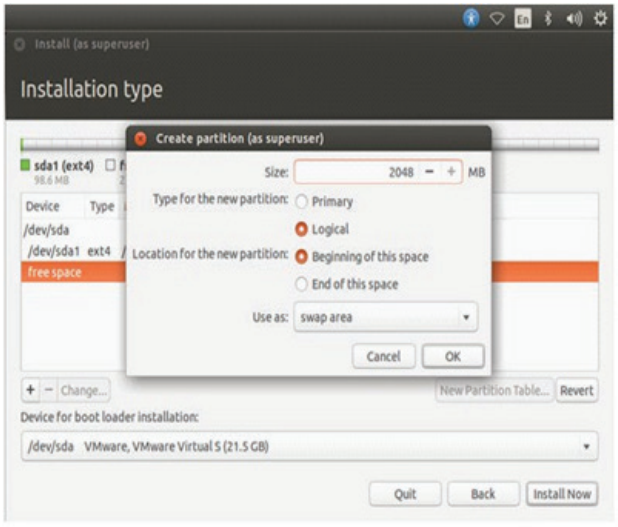
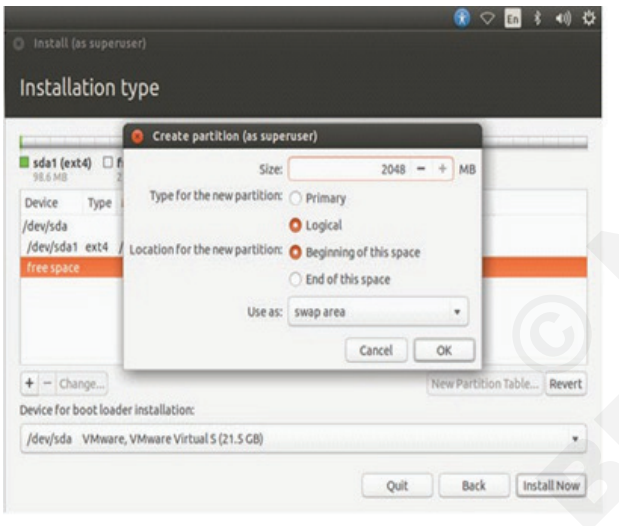
9 Following for swap partition, make sure you selected use as swap area and click ok as on Fig 9.

Fig 9



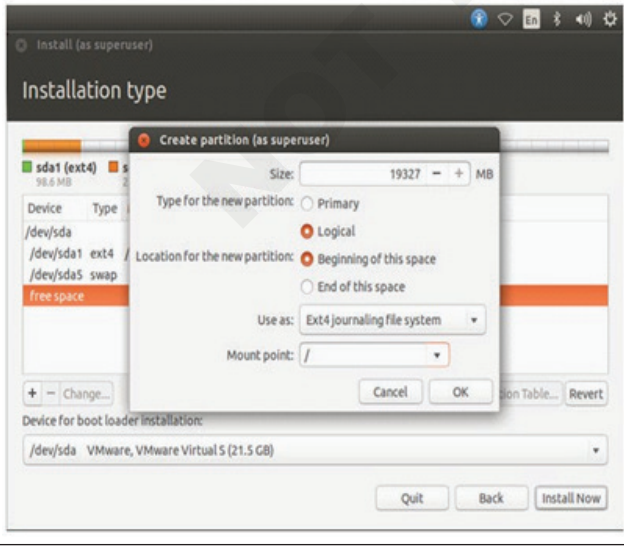
10 Follow for / (root) partition as on Fig 10.

Fig 10



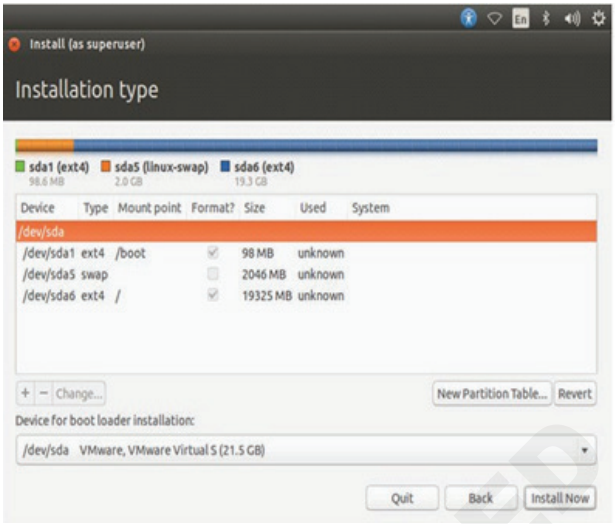
11 Review the partitions and click on install now as on Fig 11.

Fig 11



12 Confirm the partition scheme as on Fig 12.

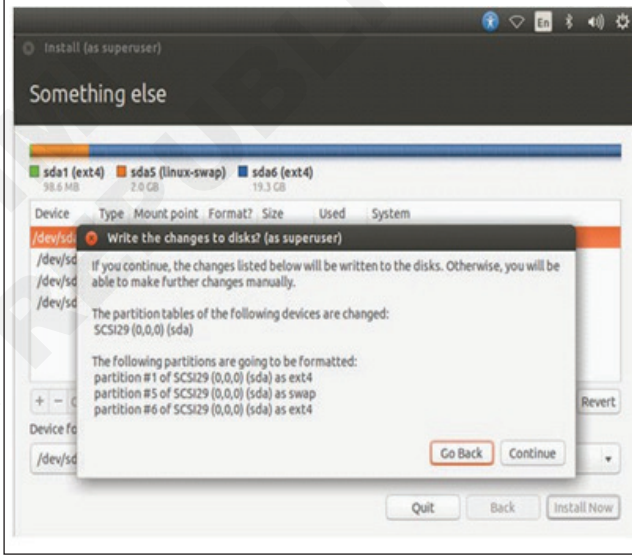
Fig 12



13 Select the location.

14 Select the keyboard layout as on Fig 13.

Fig 13



In case you are not sure, use the 'Detect Keyboard Layout' option and you can also test your selection by typing in the test text box.

In the final screen you will be prompted to enter information about the first user that is going to be created on the system. Enter your information in this screen as on Fig 14.

Here is one thing you should remember - if select 'Log in automatically', it will never ask you your password for authentication while try to log in to the Ubuntu System. Its best if you give a very secure password for the installation. Ubuntu will inform whether the password is secure or not.

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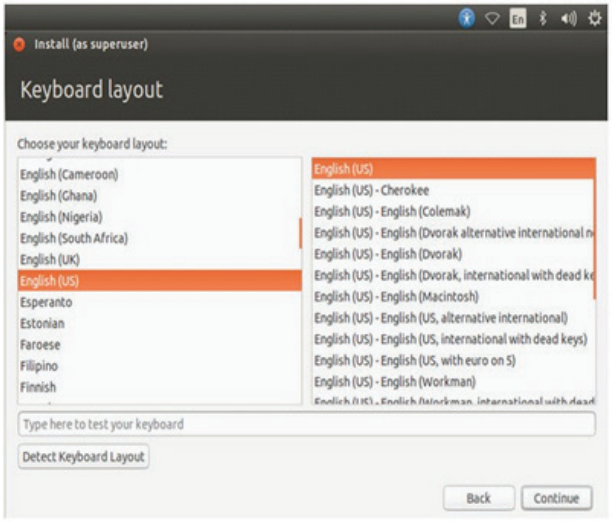
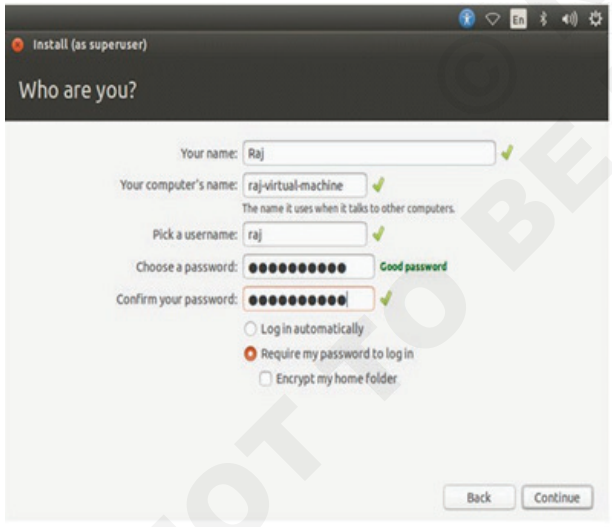
If you select 'Encrypt my home folder' it will make all the files and folders in your home folder more secure from unauthorized viewing if you have multiple users using your computer. When you log in to your computer your files are seamlessly decrypted for just your session. If you are not sure, leave this box unchecked.

Fig 14



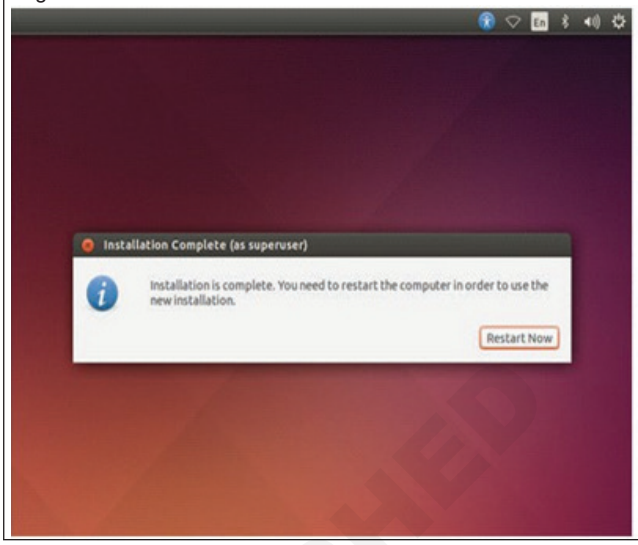
15 Once the installation is over, click on the restart now as on Fig 15.

Fig 15



16 Once the Machine restarted, login window login window will as on Fig 16. Type the password on the below of the user name and Press Enter.

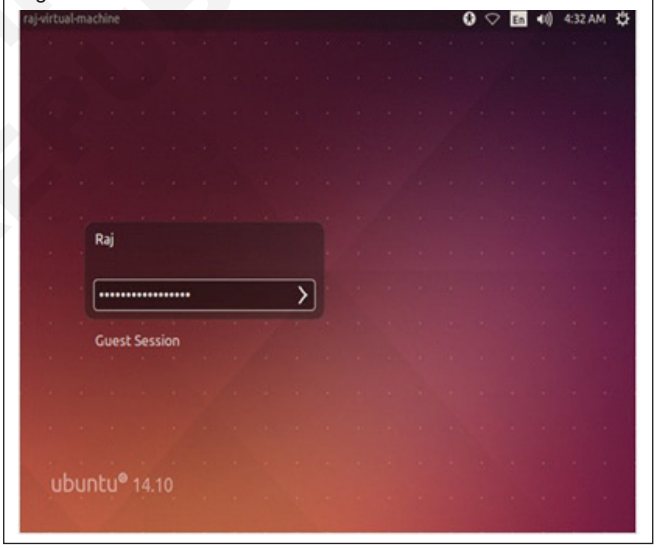
Fig 16



The Desktop of the Ubuntu 14.10 will be like below as on Fig 17.

17 Get it checked with your instructor.

Fig 17



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COPA - Install Ubuntu Linux operating system and execute basic Linux commands

Install necessary application software in Linux

Objectives: At the end of this exercise you shall be able to
- **install Adobe reader in linux OS**
- **install VLC media player in linux OS**
- **install libreoffice in linux OS.**

Requirements

Tools/Equipment/Machines

- A Working PC - 1 No.
- Ubuntu 22.04.1 / Latest Linux OS - 1 No.
- Adobe Reader Linux Supported - 1 No.
- VLS Media Player Linux Supported - 1No
- Libreoffice Linux Supported - 1No

PROCEDURE

TASK 1: **Install Adobe reader in linux OS**

1 Open up terminal by pressing Ctrl+Alt+T on keyboard.

2 Execute the command sudo add-apt-repository “deb http://archive.canonical.com/ precise partner”

3 Type the user password when it asks.

Note: That there’s no visual feed back when you typing a password.

4 Update package lists by running the command sudo apt-get update

5 Install acroread package by running the command sudo apt-get install acroread

6 Remove the Canonical Partners repository by running the command sudo add-apt-repository -r “deb http:// archive.canonical.com/ precise partner”

7 Execute the command sudo apt-get update

8 Execute the command sudo gedit /etc/gnome/ defaults.list to Set Adobe Reader as default PDF reader

9 Find out and change the line application/ pdf=evince. desktop into application/ pdf=acroread.desktop

And add below line into the end

application/fdf=acroread.desktop

application/xdp=acroread.desktop

application/xfdf=acroread.desktop

application/pdx=acroread.desktop

10 Save the file and restart nautilus by the command nautilus -q in terminal to apply changes.

— — — — — —

TASK 2: **Install VLC media player in linux OS**

1 Open up terminal by pressing Ctrl+Alt+T on keyboard.

2 Run the command sudo apt-get update to refresh the software repository catalogue

3 Run the command sudo apt-get install vlc to install VLC Media Player

4 When prompted with the ‘Do you want to continue’ press ‘Y’ on keyboard.

5 Install acroread package by running the command sudo apt-get install acroread

6 Remove the Canonical Partners repository by running the command

sudoadd-apt-repository -r “deb http:// archive.canonical.com/ precise partner”

7 Execute the command sudo apt-get update.

— — — — — —

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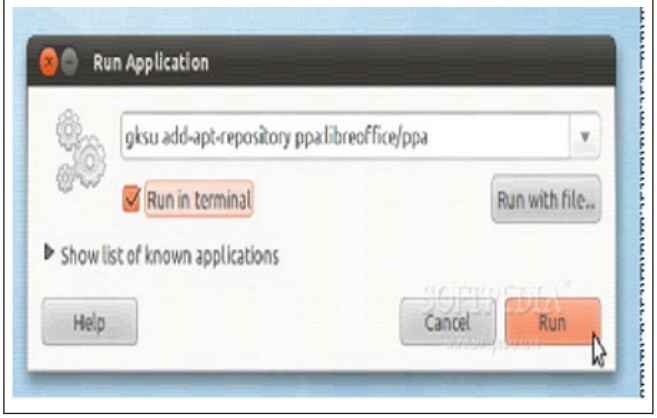
TASK 3 : **Install libreoffice in linux OS**

1 Open up Run Application dialog by pressing Alt+F2 on keyboard.

2 Execute gksu add-apt-repository ppa:libreoffice/ppa in Run Application dialog (Fig 1)

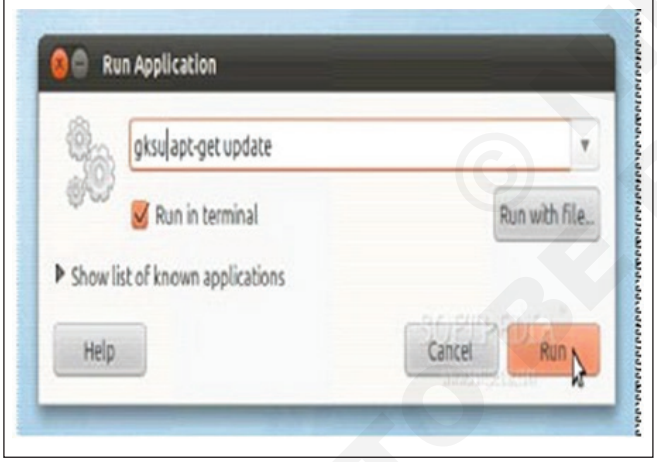
Fig 1



3 Enter the password when asked and hit the OK button

4 Hit the ALT+F2 key combination again and run the command gksu apt-get update in the “Run Application” dialog. (Fig 2)

Fig 2

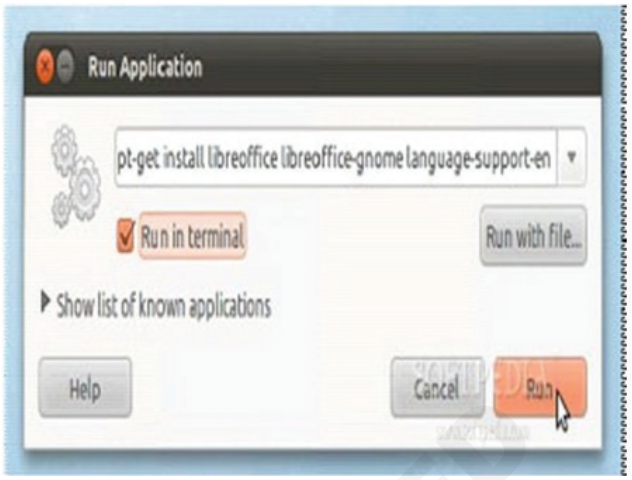


5 Enter the password when asked and hit the OK button

6 Hit the ALT+F2 key combination again and run the command sudo apt-get install libreoffice libreoffice-gnome language-support-en in the “Run Application” dialog. (Fig 3)

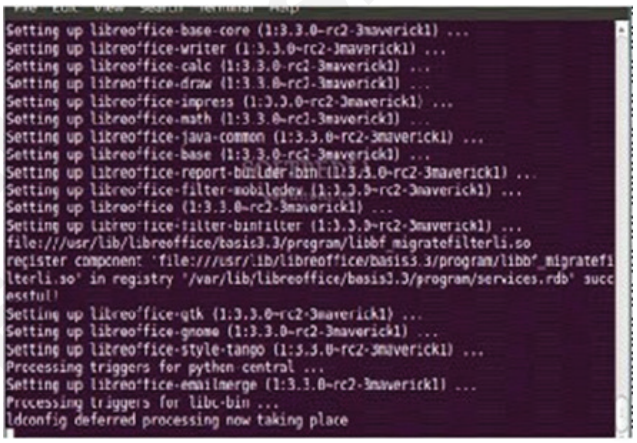
7 Enter the password when terminal window will appear and asked.

Fig 3



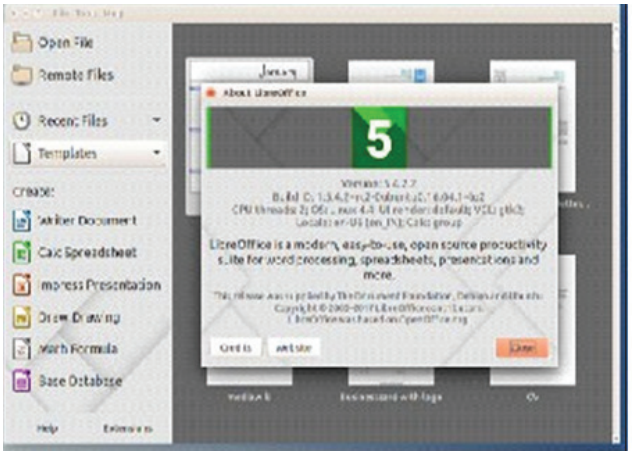
8 Type Y and hit Enter, When will be asked if you want to install the LibreOffice packages. (Fig 4)

Fig 4



9 Libre Office is now completely installed and ready to use. (Fig 5)

Fig 5



COPA - Install Ubuntu Linux operating system and execute basic Linux commands

Use basic Linux commands for directory listing File, Folder management, Password etc.,

Objectives: At the end of this exercise you shall be able to

- **list directories with the ls command**
- **list and combine files with the cat command**
- **move to directories with cd command**
- **find files with the find, where and locate command**
- **manage files and directories using various commands**
- **handle user level commands and changing the permissions.**

Requirements

Tools/Equipment/Machines

- A Working PC - 1 No.
- Ubuntu 22.04.1 / Latest Linux OS - 1 No.

PROCEDURE

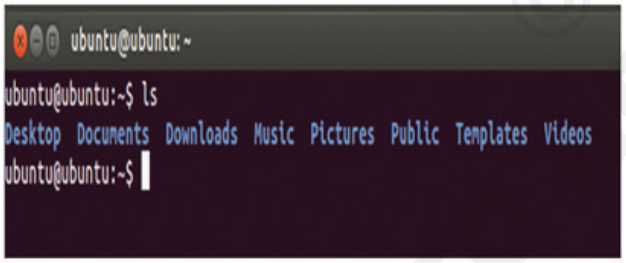
TASK 1: **Listing directories with the ls command**

1 Open the console window.

2 Type ls and press enter.

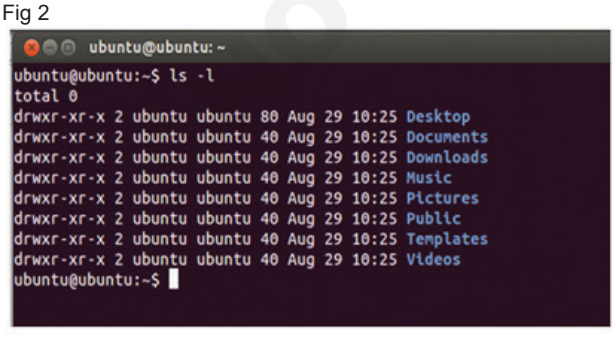
3 Observe the output on the screen. The output will be as shown in Fig 1.

Fig 1



4 To list the files as well as directories those are kept in the particular working directory type ls -l. The output will display as on Fig 2.

Fig 2

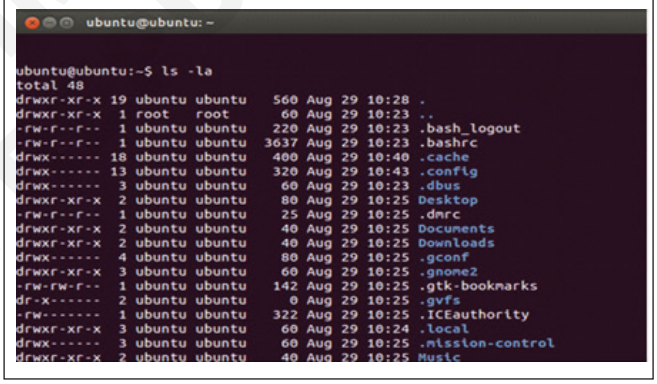


5 Type the following command in console window.

$ ls -la

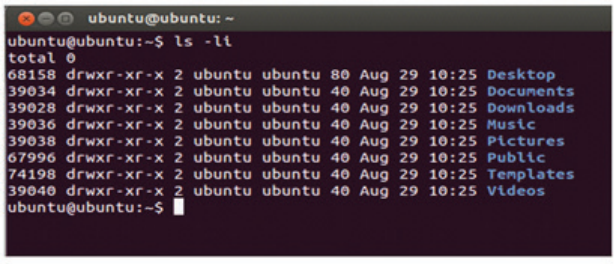
The output window will display as on Fig 3.

Fig 3



6 Type the command ls -li in console window and observe the output. The output window will display as on Fig 4.

Fig 4



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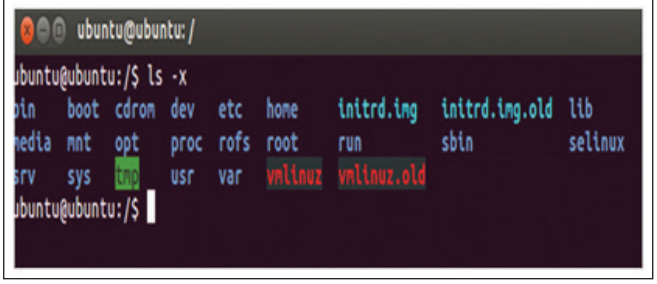
7 In console window type ls -m. The output window will display as on Fig 5.

Fig 5

8 Type the command ls -x in the console window. The output window will appear as on Fig 6.

Fig 6



Try the following commands in console window, write the description and observe the output screen in record sheet with the help of Instructor.

Commands	Description
ls /usr ls -R / ls -Rd /*/*/* dir Vdir	

— — — — — —

TASK 2 : **Listing and combining files with the cat command and redirection**

1 Type the following command in console window and type the text under the command for creating new text file as shown in Fig 7.

$ cat > samplefile1.txt

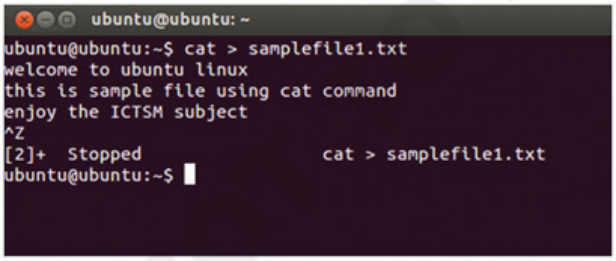
welcome to ubuntu linux

this is sample file using cat command

enjoy the ICTSM subject

The output window will appear as on Fig 7.

Fig 7



2 Type the cat command followed by filename for displaying content of the file.

$ cat samplefile1.txt

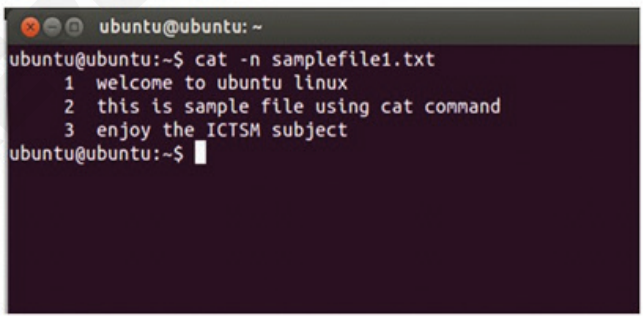
welcome to ubuntu linux

this is sample file using cat command

enjoy the ICTSM subject

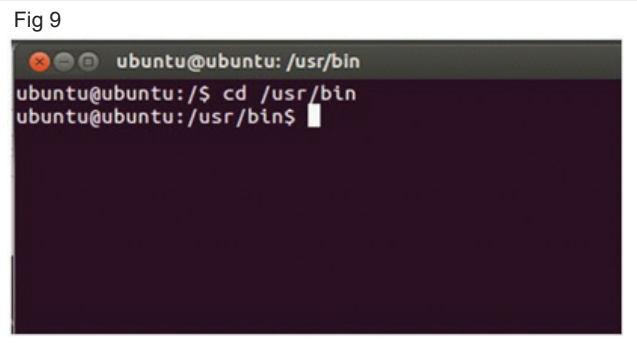
The output window will appear as on Fig 8.

Fig 8



3 In console window type the cat -n command followed by file name for display line numbers in the file content. The output window will appear as on Fig 9.

Fig 9



$ cat -n samplefile1.txt

Try the following commands in console window, write the description and observe the output screen in record sheet with the help of Instructor.

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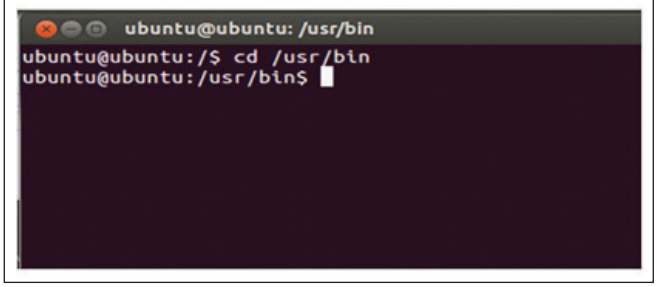
Commands	Description
cat -n samplefile1 samplefile2 (or) cat -n samplef* $cat sample* > samplefile3.txt $cat samplefile1.txt>>samplefile2.txt $ wc samplefile1.txt	

TASK 3 : **Moving to directories with cd command**

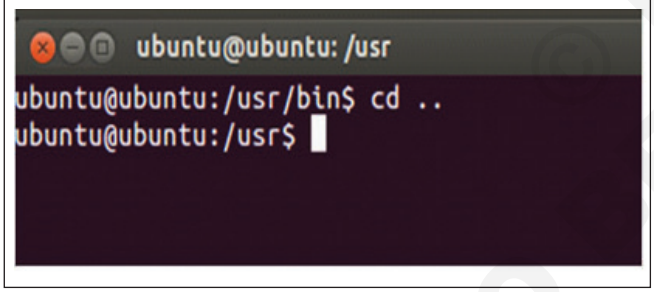
1 Type the command cd /usr/bin in command window for moving the cursor /usr/bin directory. The output win- dow will appear as on Fig 10.

Fig 10



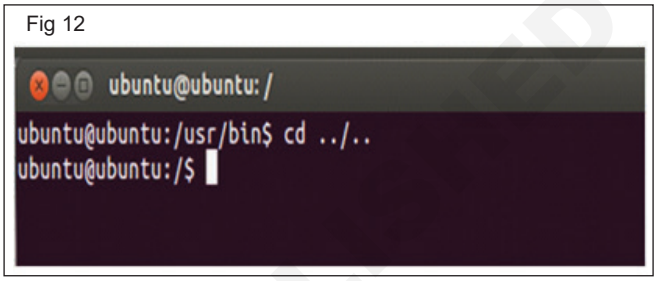
2 In console window type cd .. command for move up one stage to the previous directory. Observe the output screen. The output window will appear as on Fig 11.

Fig 11



3 Type the command cd ../.. in console window to move root directory. The output window will display as on Fig 12.

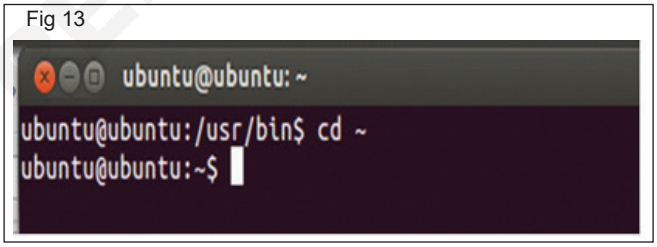
Fig 12



4 Type the command cd ~ (or) cd in console. For go back the blinking cursor to home directory. The output window will appear as on Fig 13.

5 Type the command pwd in console window for print working directory. And observe the output window. And verify it with your instructor.

Fig 13

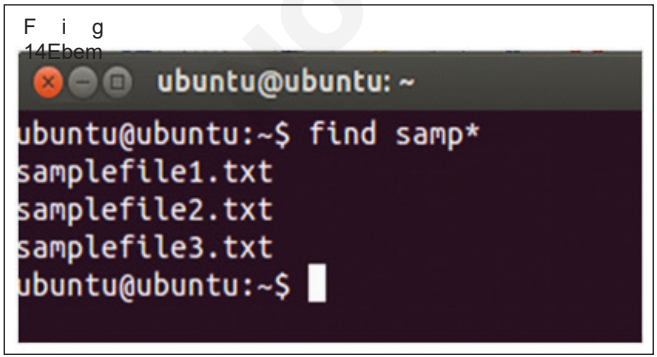


TASK 4 : **Find files with the find, where and locate command**

`Grep command

1 Create a file using cat command as show below

Fig 14Ebem



$ cat example.txt

UNIX operating system

UNIX and Linux operating system

Linux operation system

2 Type the grep command for searching particular word as shown in below.

$ grep UNIX example.txt

The output will display as below.

UNIX operating system

UNIX and Linux operating system

3 Type another grep command with option -v to exclude matching word as shown in below grep command for example.

$ grep UNIX example.txt

The output will display as below.

UNIX operating system

4 Try the grep command with some attributes and check the output with the help of instructor.

5 Type the following example in the console and record the output with the help of your instructor.

$ cat testfile.txt

a

b

c

d

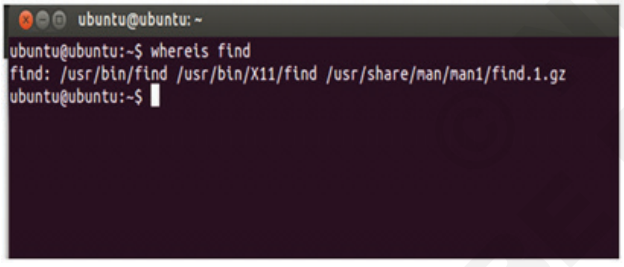
$ grep -v -e “a” -e “b” -e “c” testfile.txt

6 Write the output with description in the below box.

Commands	Description
grep -c UNIX example.txt	
grep -v -c testfile.txt	
grep -l “hai” testfile*	

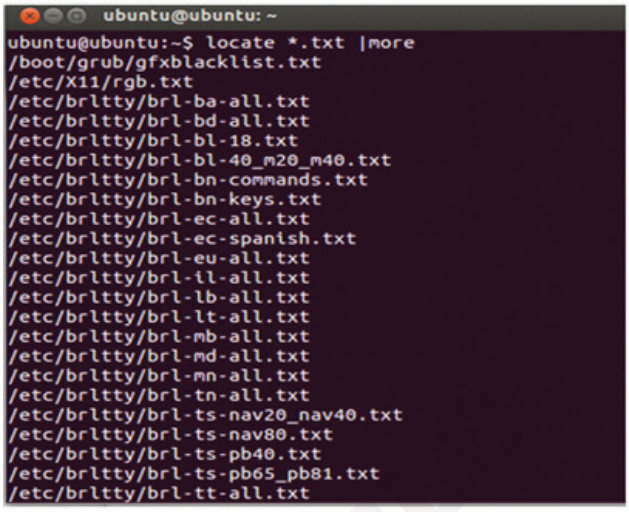
7 Type whereis command followed by and another command. It will shows that the command where it is located. The output window will appear as on Fig 15

Fig 15



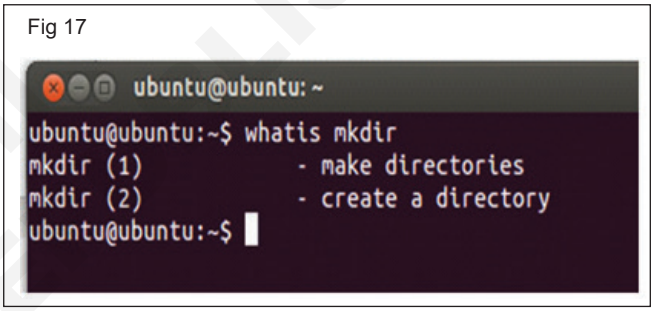
8 Type the command locate in console window. The output window will appear as on Fig 16.

Fig 16



9 To get the summery of particular command, type whatis in the console window the output window will display as on Fig 17.

Fig 17



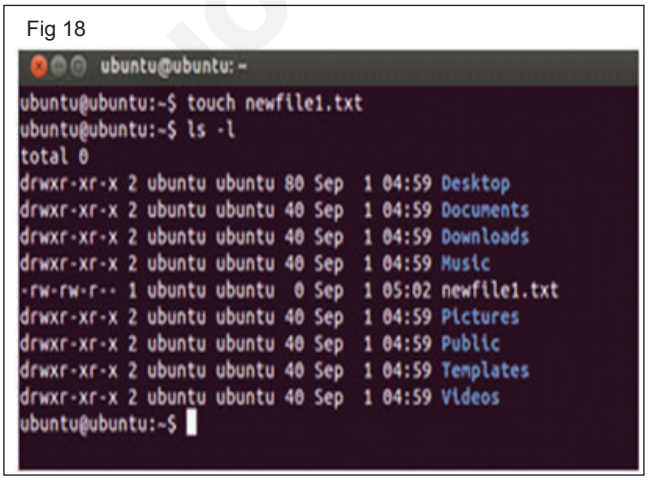
TASK 5 : **Manage files and directories using various commands**

1 Open the console window.

2 Type the touch command in console.

3 Observe the output. The output window as on Fig 18.

Fig 18



4 Type the rm command in console window for using remove a file for example.

$ rm testfile1.txt

5 Try the rm command in console window with additional attributes and record the outputs with screenshots.

6 Type the command mkdir followed by directory name in console window for make a new directory for example:-

$ mkdir computer

7 Try the mkdir command followed by different attributes with directory name.

Command	Description
mkdir memos letters email mkdir -p /home/joe/customer/babu	

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8 In console window type rmdir followed by directory name for used to remove a empty directory for example.

$ rmdir dirname

Command	Description
rmdir -p dir1/dir2/dir3 rmdir dir1/dir2/dir3 dir1/dir2 dir1 rm -rf dirname	

9 Type the command mv in console window for moving one file or directory from one place to another place, it is also used for renaming a directory or file for Example.

$ mv oldfilename newfilename (to change the file name)

10 Try the mv command with some attributes

Command	Description
mv foo /tmp mv foo /tmp/joe mv /tmp/foo . mv /tmp/foo ~ mv /tmp/foo ~/dir1 mv foo1 foo2 foo3 dir1 mv foo[123] dir1 mv foo* dir1 mv dir1 dir2	

11 In console window type the command cp for copy the file to the destination directory for example.

$ cp /home/fruits/mango.txt /root/abcd

12 Try the cp command with some attributes and check with instructor

Command	Description
cp chapter1 /tmp cp chapter1… cp file1 file2 file3 /tmp cp -r foo /tmp cp /tmp/foo ~/dir1 cp foo1 foo2 foo3 dir1 cp foo[123] dir1 cp foo* dir1 cp -r dir1 dir2	

— — — — — —

TASK 6 : **Handle user level commands and changing the permissions**

User add -to create a new user

1 Type the command useradd in console window and record the output for example.

$ useradd username

2 In console window type the userdel followed by user name to remove a user from linux for example

$userdel tarun

3 Type the command groupadd in console window to add a new group for Example

$ groupadd fruits

4 In console window type the gruopdel command to de- lete a group for Example

$ groupdel fruits

5 Type the command chown in the console window to change the ownership of a file or directory for example

$ ls -l

drwxrw-rw- 2 root root 4096 Mar 11 12:03 abcd (permission) (owner) (group own) (size) (name)

6 And typethe following in console window

$ chown tarun /abcd

$ ls -l

drwxrw-rw- 2 tarun root 4096 Mar 11 12:03 abcd

7 In console window type chgrp to change the group ownership of a file or directory for example

$ ls -l

drwxrw-rw- 2 tarun root 4096 Mar 11 12:03 abcd

$ chgrp tarun /abcd

$ ls -l

drwxrw-rw- 2 tarun root 4096 Mar 11 12:03 abcd

Try the following commands in the console window, write the output and verify it with the help of instructor

— — — — — —

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TASK 7 : **Handling additional commands**

1 Clear -it will clear the screen (shortcut ctl+l) for example.

$ clear

2 Exit -to end a current session as well current terminal logging for example.

$ exit

3 Man -to view the manual page of commands for example.

$ man mkdir

4 --help -to view the help documents of a command example.

$ ls --help

5 Who -This command is used to display user name and their ip addresses who have logged in on your server example.

$who

6 whoami -this command shows the current logged in terminal user name for example

$whoami

8 su -username to switch from one user to another users home directory for example.

$su mango

9 type the date in console window for displaying current system date for example.

$ date

Wed Aug 18 16:24:44 EDT 2015

10 Type the Cal command in console window to display the calendar of the current month for example.

$ cal

August 2007

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

11 In console window type the ncal command for changing the output format for example

$ ncal

August 2007

Mo	6	13	20	27	
Tu	7	14	21	28	
We	1	8	15	22	29
Th	2	9	16	23	30
Fr	3	10	17	24	31
Sa	4	11	18	25	
Su	5	12	19	26	

12 Try the cal command with various attributes and observe the output screen with the help of instructor

Command Description

cal 1 2007

cal -3 cal -J cal -e cal -m cal -j cal -p cal -w cal -y

13 Type the paswd command in console window to change the password for the current user for example

$ passwd dhinesh

Enter new UNIX password:

Retype new UNIX password:

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passwd: password updated successfully

$ chage --list dhinesh

Last password change : Apr 23, 2009
Password expires : never

Password inactive : never

Account expires : never Minimum number of days

between password change : 0

Maximum number of days

between password change : 99999

Number of days of warning before password expires 7

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COPA - Install Ubuntu Linux operating system and execute basic Linux commands

Use the Linux graphical user interface for file and folder management, exploring the system etc

Objectives: At the end of this exercise you shall be able to
- **accessing computer explorer in ubuntu**
- **adding emblems to files and folders**
- **changing file and folder permissions**
- **renaming and deleting files and folders.**

Requirements

Tools/Equipment/Machines

- A Working PC - 1 No.
- Ubuntu 22.04.1 / Latest Linux OS - 1 No.

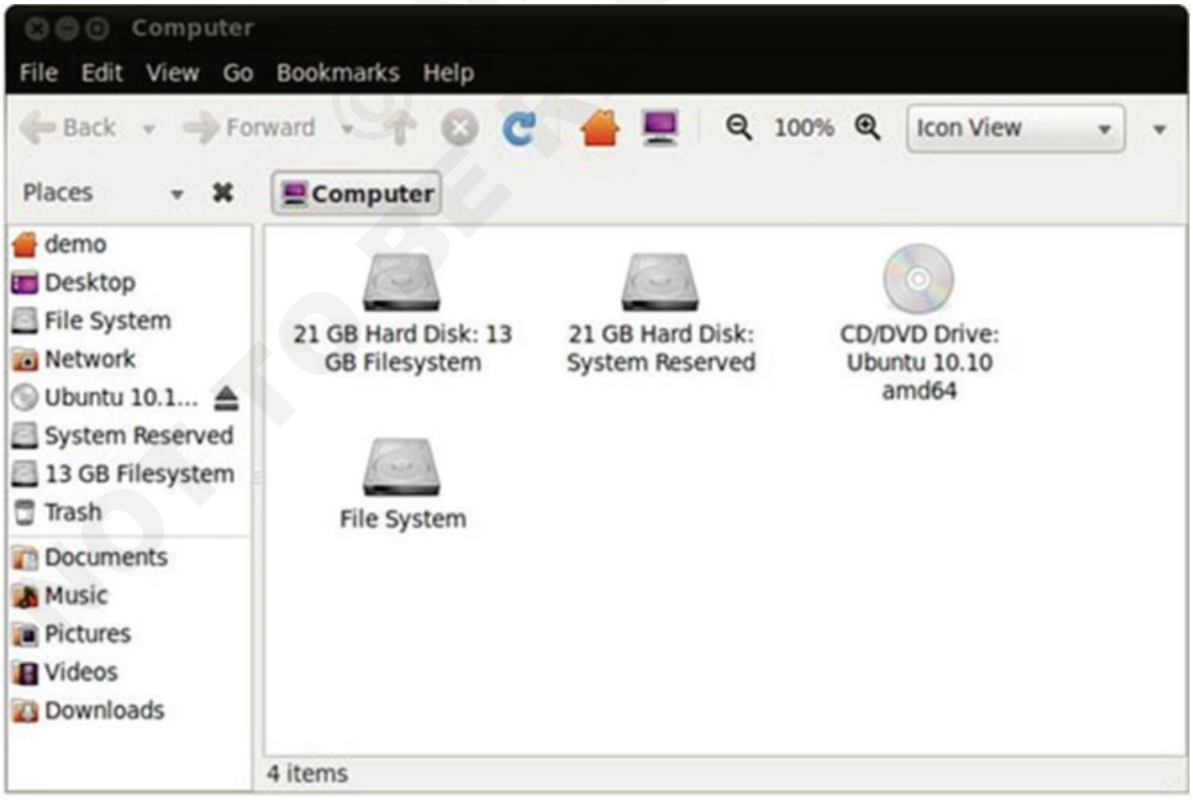
PROCEDURE

TASK 1: **Access computer explorer in ubuntu**

1 Selecting places -> computer will invoke Nautilus with a list of devices and locations available for browsing. (Fig 1)

2 In the above fig the primary devices on the system are listed. Double clicking on any of these icons will open a new window containing the files and folders located on that device.

Fig 1



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3 The properties of any icon (such as file system type and disk usage) can be displayed by clicking with the right mouse button over an icon and selecting Properties from the resulting dialog as in Fig 2. The following figure shows the properties dialog for a hard disk drive based file system:

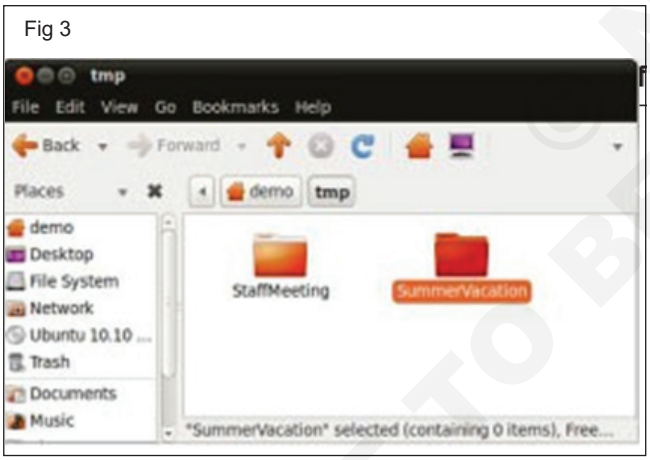
Fig 2

TASK 2 : **Adding emblems to files and folders**

Recent versions of nautilus provide a useful feature that allows descriptive emblems to be placed next to file or folder icons. For example, you might want to a photos emblem next to a folder in which you store digital pictures, or a presentation emblem next to a file containing a presentation. The addition of emblems is achieved using the nautilus properties panel. As an example, we will add emblems next to the following summerVacation and staff meeting folders.

1 Select the “summer vacation” folder and right click with the mouse. (Fig 3).

Fig 3



2 From the popup menu, select properties and in the properties dialog click on the emblems tab. (Fig 4)

3 Scroll down the list of emblems until you find the photos emblem and select the checkbox to add the emblem.

4 Note that you can add more than one emblem to each file or folder. Repeat these steps to add a documents emblem to the StaffMeeting folder and close the properties dialog. The end result should appear as follows. (Fig 5)

Fig 4

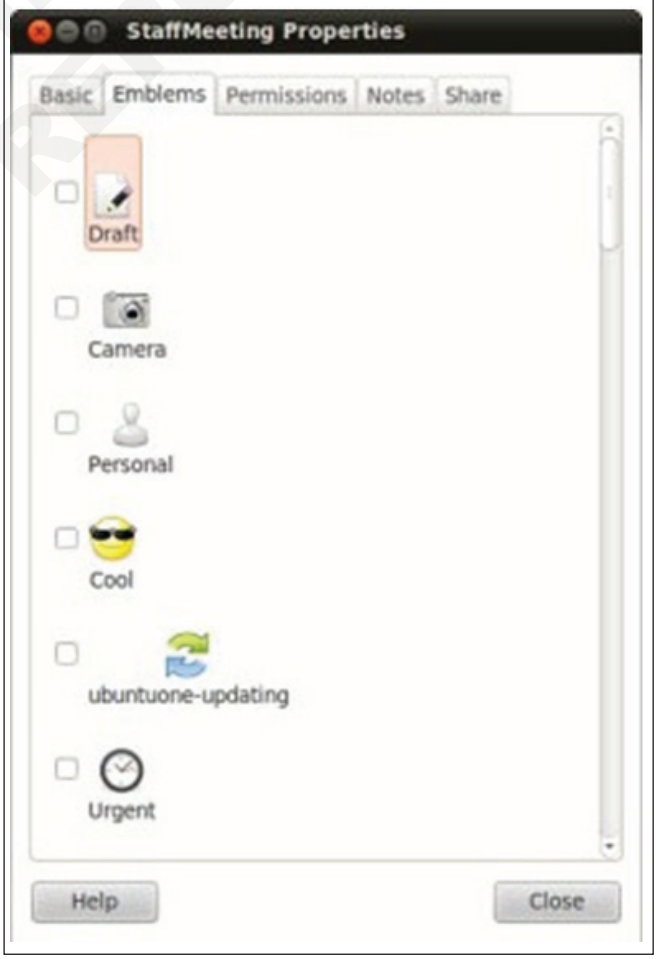


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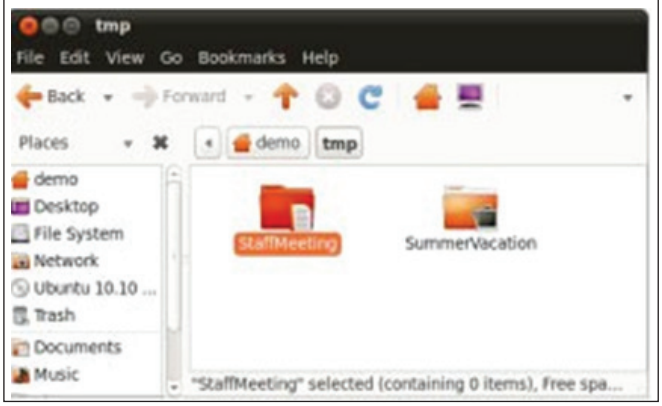
Fig 5

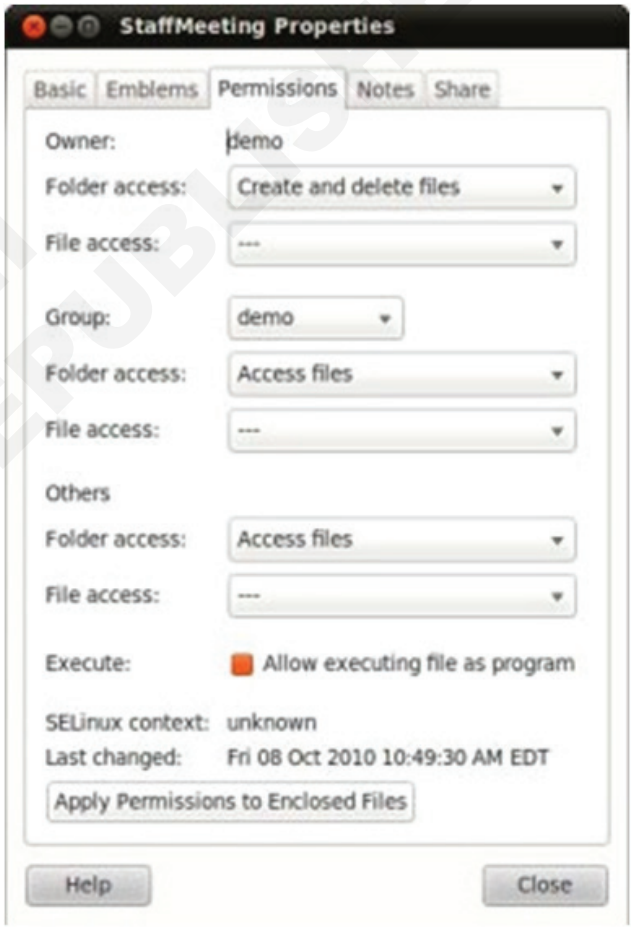


TASK 3 : **Changing file and folder permissions**

1 Click with the right mouse button over the file or folder to be changed and select Properties from the popup menu.

2 In the resulting properties dialog select the Permissions tab to display the current settings for the file or folder. (Fig 6)

Fig 6



TASK 4 : **Renaming and deleting files and folders**

1 Files and folders can be renamed by right clicking on the icon and selecting Rename from the popup menu. Files can be moved to the Trash in a number of ways.

2 One option is to simply select the icon and press the Delete key on the keyboard. Another is to click on the icon and drag and drop into the trash can in bottom right corner of the desktop.

3 Yet another option is to right click on the icon and select move to trash.

Now that we have looked at some of the features of Nautilus we will now look at configuring the Ubuntu File Manager.

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COPA - Install Ubuntu Linux operating system and execute basic Linux commands

Customize desktop settings and manage user accounts in Linux

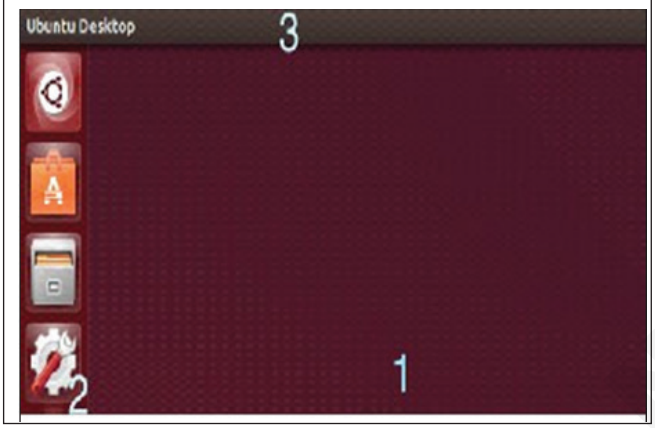
Objectives: At the end of this exercise you shall be able to
- **set desktop options in Linux**
- **manage user accounts to Linux.**

PROCEDURE

TASK 1: **Set desktop options in Linux**

1 Select Unity launcher (2) option in Ubuntu desktop as in Fig 1.

Fig 1



2 Click on Usser menu at the top right comer, to access Appearance a Settings in Ubuntu, on the top Menu bar and select System Settings in Fig 2.

Fig 2

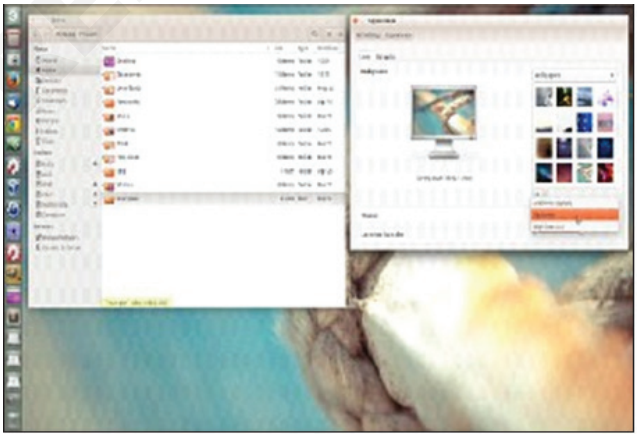
3 Select the Appearance icon.

4 Click on any wallpaper thumbnail icon to set the wallpaper of desktop in Fig 3.

5 Select a theme from themes, to set a working theme as in Fig 4.

Fig 3

Fig 4



6 Set the icon level of display to get resized of the icons. (Fig 5)

7 Select behavior tab to set launcher settings to show/ hide icons. (Fig 6)

8 Reveal again using On button if required. (Fig 7)

Note : Never set the reveal sensitivity at the lowest level because it will make it hard to get the launcher back.

9 To tet back options use tools as in (Fig 8)

10 Click on tick marks as in above figure to show the menus for a window.

11 Click Restore Behavior Settings at the bottom, to get the default settings of the Linux interface.

Fig 5

Fig 6

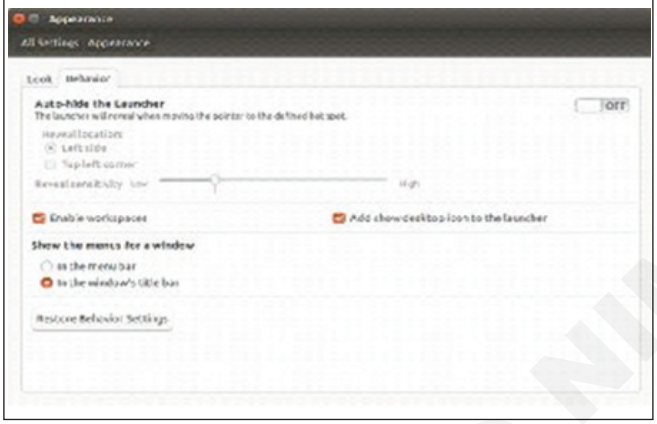


Fig 7

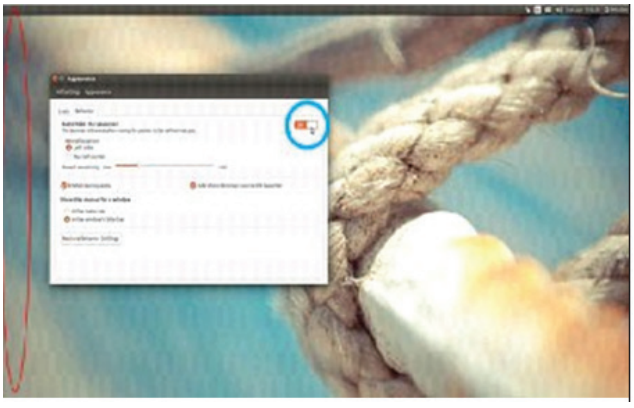
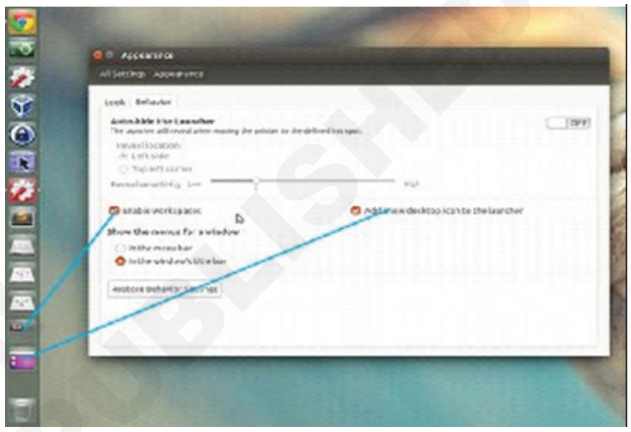


Fig 8



TASK 2 : **Manage user accounts to Linux**

Add a new user account

You can add multiple user accounts to your computer. Give one account to each person in your household or company. Every user has their own home folder, documents, and settings.

You need administrator privileges to add user accounts.

1 Open the Activities overview and start typing Users.

2 Click on Users to open the panel.

3 Press Unlock in the top right corner and type in your password when prompted.

4 Press the + button, below the list of accounts on the left, to add a new user account.

5 If you want the new user to have administrative access to the computer, select Administrator for the account type.

Administrators can do things like add and delete users, install software and drivers, and change the date and time.

6 Enter the new user's full name. The username will be filled in automatically based on the full name. If you do not like the proposed username, you can change it.

7 You can choose to set a password for the new user, or let them set it themselves on their first login.

If you choose to set the password now, you can press the icon to automatically generate a random password.

8 Click Add.

Delete a user account

You can add multiple user accounts to your computer. If somebody is no longer using your computer, you can delete that user's account.

You need administrator privileges to delete user accounts.

1 Open the Activities overview and start typing Users.

2 Click Users to open the panel.

3 Press Unlock in the top right corner and type in your password when prompted.

4 Select the user that you want to delete and press the - button, below the list of accounts on the left, to delete that user account.

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5 Each user has their own home folder for their files and settings. You can choose to keep or delete the user's home folder. Click Delete Files if you are sure they will not be used anymore and you need to free up disk space. These files are permanently deleted. They cannot be recovered. You may want to back up the files to an external storage device before deleting them.

Change your login screen photo

When you log in or switch users, you will see a list of users with their login photos. You can change your photo to a stock image or an image of your own. You can even take a new login photo with your webcam.

You need administrator privileges to edit user accounts other than your own.

1 Open the Activities overview and start typing Users.

2 Click Users to open the panel.

3 If you want to edit a user other than yourself, press Unlock in the top right corner and type in your password when prompted.

4 Click the picture next to your name. A drop-down gallery will be shown with some stock login photos. If you like one of them, click it to use it for yourself.

- If you would rather use a picture you already have on your computer, click Browse for more pictures….
- If you have a webcam, you can take a new login photo right now by clicking Take a photo…. Take your picture, then move and resize the square outline to crop out the parts you do not want. If you do not like the picture you took, click Take Another Picture to try again, or Cancel to give up.

Log in automatically

You can change your settings so that you are automatically logged in to your account when you start up your computer:

1 Open the Activities overview and start typing Users.

2 Click Users to open the panel.

3 Select the user account that you want to log in to automatically at startup.

4 Press Unlock and enter your password.

5 Toggle the Automatic Login switch to ON.

Change your password

It is a good idea to change your password from time to time, especially if you think someone else knows your password.

You need administrator privileges to edit user accounts other than your own.

1 Open the Activities overview and start typing Users.

2 Click Users to open the panel.

3 Click the label ····· next to Password. If you are changing the password for a different user, you will first need to Unlock the panel.

4 Enter your current password, then a new password. Enter your new password again in the Verify New Password field.

You can press the icon to automatically generate a random password.

5 Click Change.

Change who has administrative privileges

Administrative privileges are a way of deciding who can make changes to important parts of the system. You can change which users have administrative privileges and which ones do not. They are a good way of keeping your system secure and preventing potentially damaging unauthorized changes.

You need administrator privileges to change account types.

1 Open the Activities overview and start typing Users.

2 Click Users to open the panel.

3 Press Unlock in the top right corner and type in your password when prompted.

4 Select the user whose privileges you want to change.

5 Click the label Standard next to Account Type and select Administrator.

6 The user's privileges will be changed when they next log in.

— — — — — —

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COPA - Install Ubuntu Linux operating system and execute basic Linux commands

View system properties and manage system setting in Linux

Objectives: At the end of this exercise you shall be able to
- **open system properties.**

Requirements

Tools/Equipment/Machines

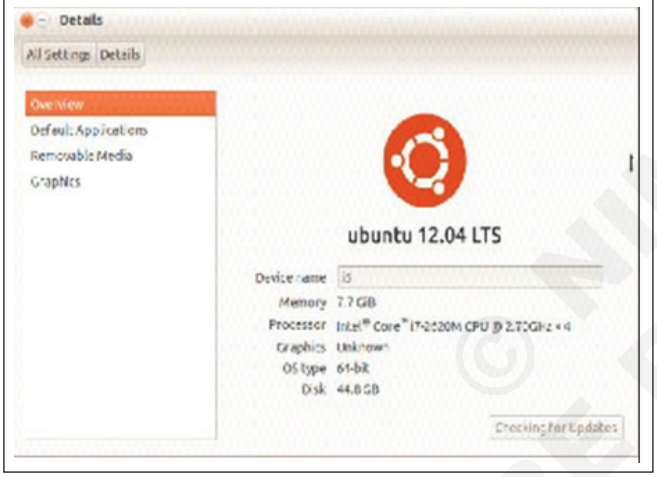
- A Working PC - 1 No.
- Ubuntu 22.04.1 / Latest Linux OS - 1 No.

PROCEDURE

TASK 1: **Open System Properties**

1 Go to Settings, and under System, click on Details for basic information: (Fig 1)

Fig 1



2 Search for “system” in Software Center, and install System Profiler and Benchmark. (Fig 2)

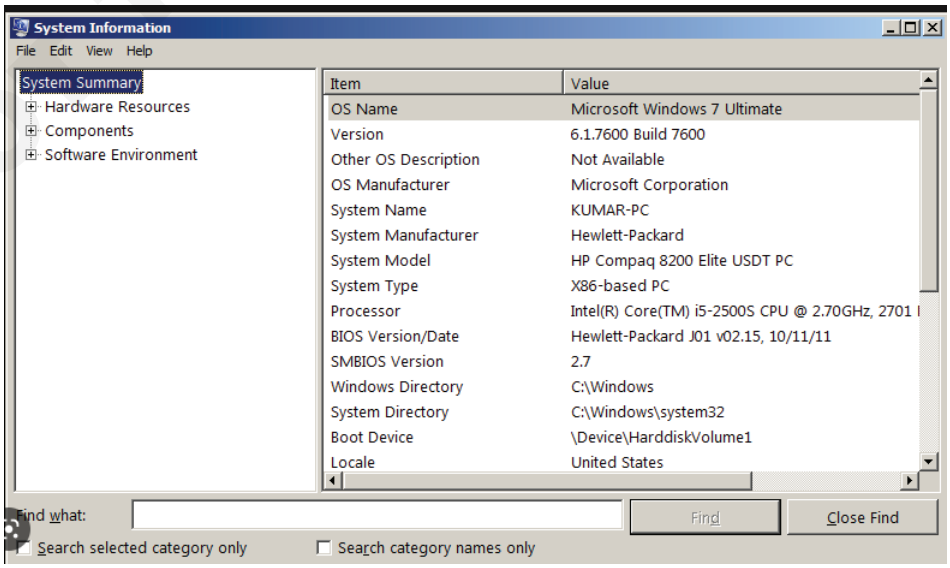
3 Run it from the Launcher (type “system” if it isn’t there already) and will display a detailed list of

Fig 2

hardware that can be expanded further by category. (Fig 3)

Note: Following are examples for CPU and Memory information in Ubuntu Linux.

Fig 3



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Navigate within documents

Objectives: At the end of this exercise you shall be able to
- **open MS Word and create a new document**
- **save a document.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS – 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Open MS Word and create a new document**

1 Click the 'start' button

2 Open Word.

3 Select Blank document.

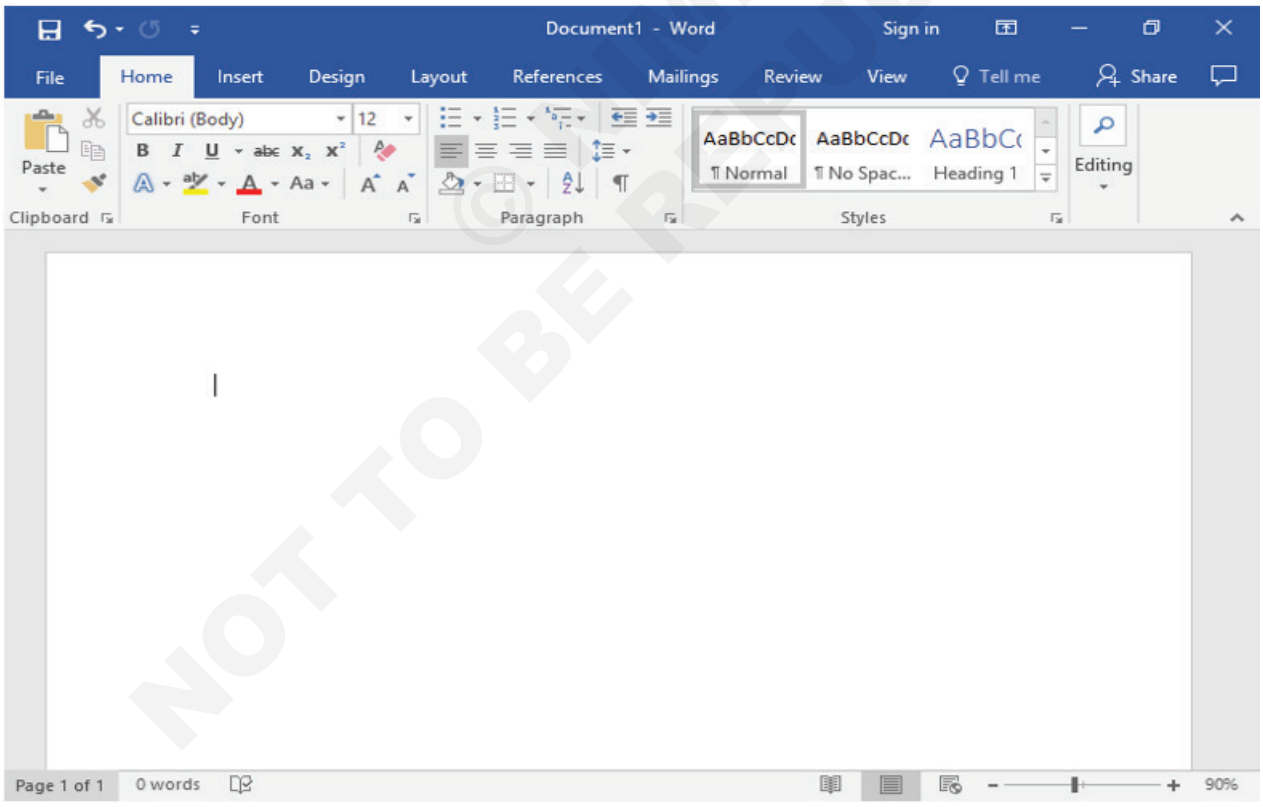
Or, if Word is already open, select File > New > Blank document.

Or, to create a document using a template

- Open Word. Or, if Word is already open, select File > New
- Double-click a template to open it.

4 After Blank Page opened then start to type as you wish to create the document. (Fig 1)

Fig 1



TASK 2: **Save a document**

1 Click the File → Save or Click → save button on Quick Access.

2 Click 'save' as shown in Fig

3 Choose Browse to locate the Location where do you wants to save the documents (Desktop/Documents/ Downloads/Local Drivers.)

4 Type sample1 as the new file name, in the filename box. Save as type word Document(*.docx) as in Fig 2.

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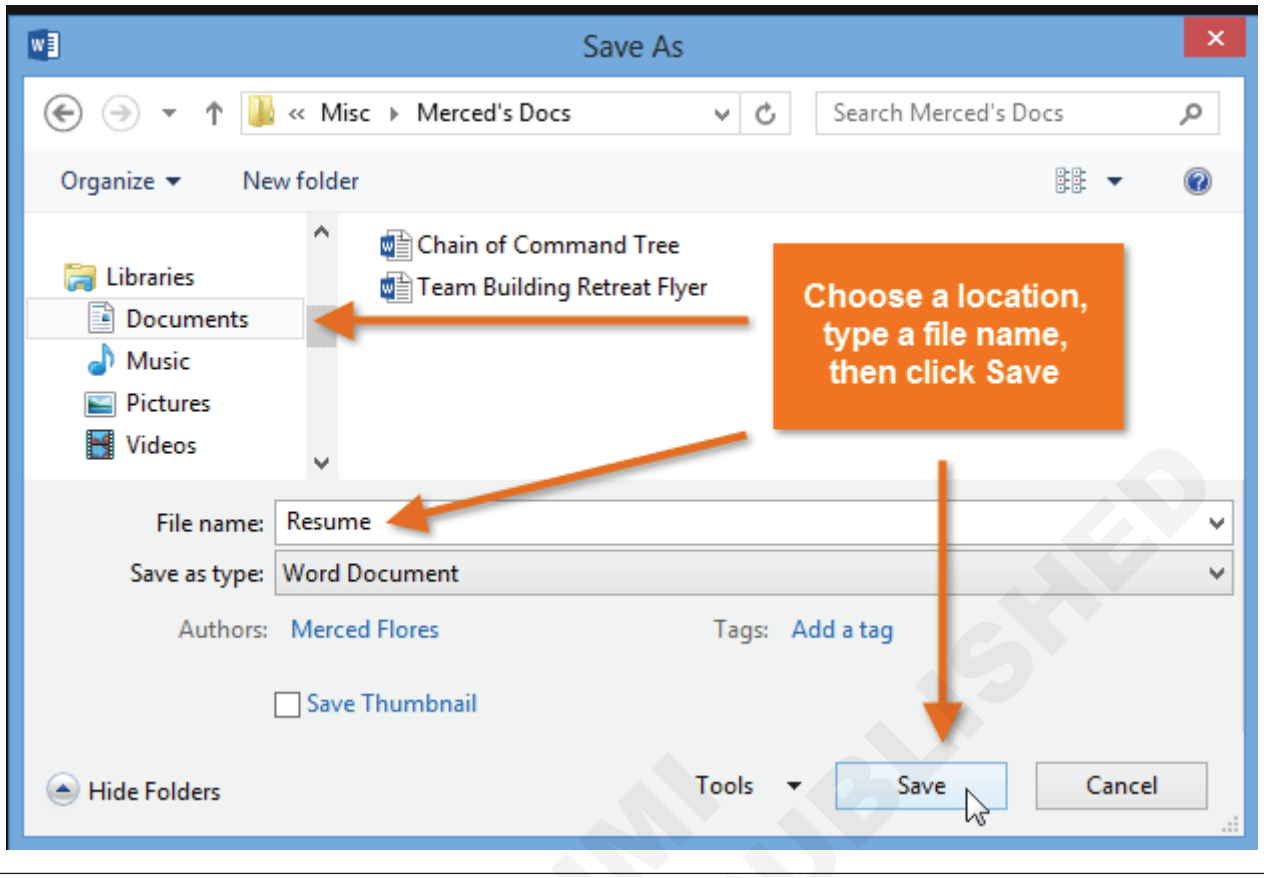
Fig 2



TASK 3: **Search for text**

1 To open the Find pane from the Edit View, press **Ctrl+F**, or click **Home > Find. (Fig 3)**

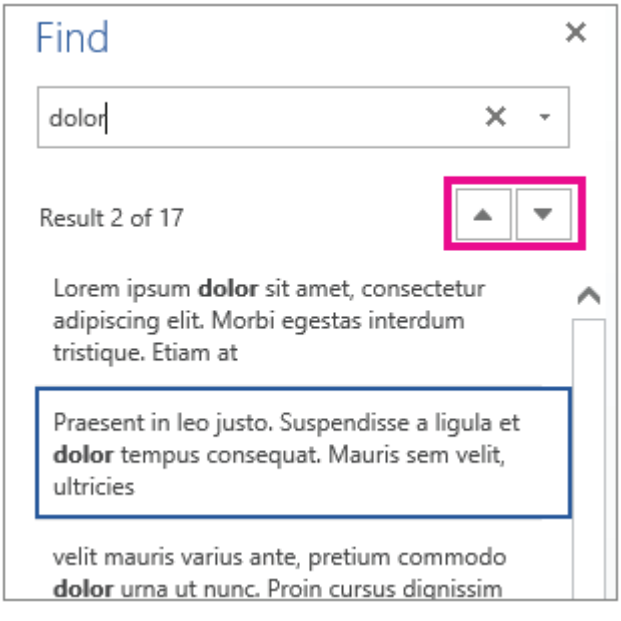
Fig 3

2 Find text by typing it in the Search the document for… box. Word Web App starts searching as soon as you start typing. To further narrow the search results, click the magnifying glass and select one or both of the search options.

3 When you type in your document or make a change, Word Web App pauses the search and clears the Find pane. To see the results again, click the Next Search Result or Previous Search Result arrow. (Fig 4)

4 When you're done searching, click the X at the end of the Search box.

Fig 4



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TASK 4: **Link to locations within documents**

After you've marked the destination, you're ready to add the link.

1 Select the text or object you want to use as a hyperlink.

2 Right-click and then click Hyperlink

3 Under Link to, click Place in This Document.

4 In the list, select the heading or bookmark that you want to link to.

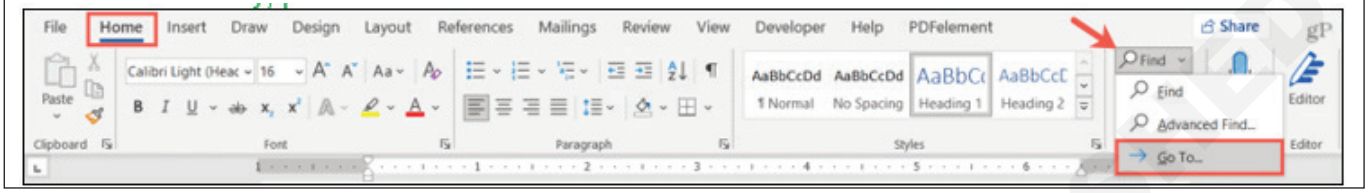
TASK 5: **Move to specific locations and objects in documents**

Open the Go To Tool in Microsoft Word

1 You can open the Go To tool using the menu or a keyboard shortcut in Word on Windows.

- On Windows, go to the Home tab, click the drop-down arrow next to Find, and select Go To. Alternatively, press Ctrl + G (Fig 5)

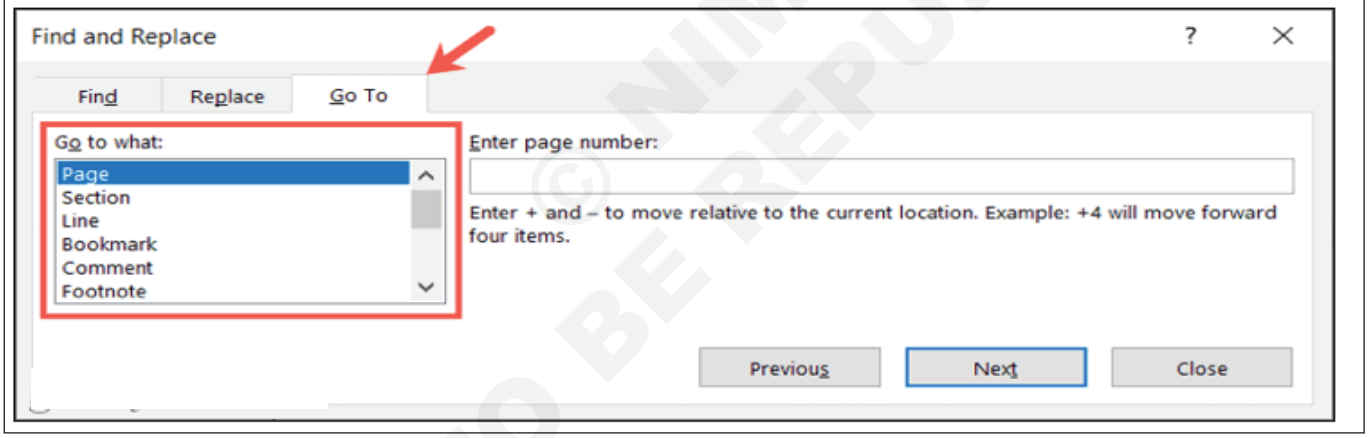
Fig 5



2 Go to the Next or Previous Item in Word

- Once you open the Go To tool, you should be on the Go To tab. If not, select it at the top.
- On the left, choose where you'd like to go from the list. You can pick a page, section, line, bookmark, comment, and more. (Fig 6)

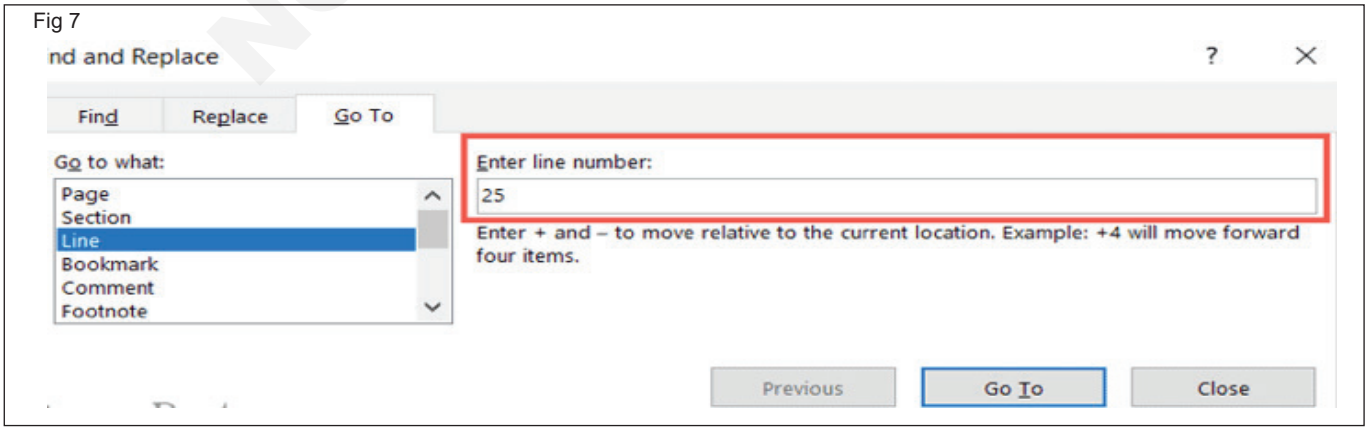
Fig 6



3 Go to an Item Number or Name

- If you want to go to a particular spot in your document, then you can use the box on the right to enter a number or choose a name for the item. Here are a couple of examples.
- To jump to a particular page, section, line, footnote or endnote, table, graphic, equation, or heading, enter the number in the box. For instance, you may want to jump to line 25 in your document. So you would select Line from the list, enter "25" in the box, and click Go To. (Fig 7)

Fig 7



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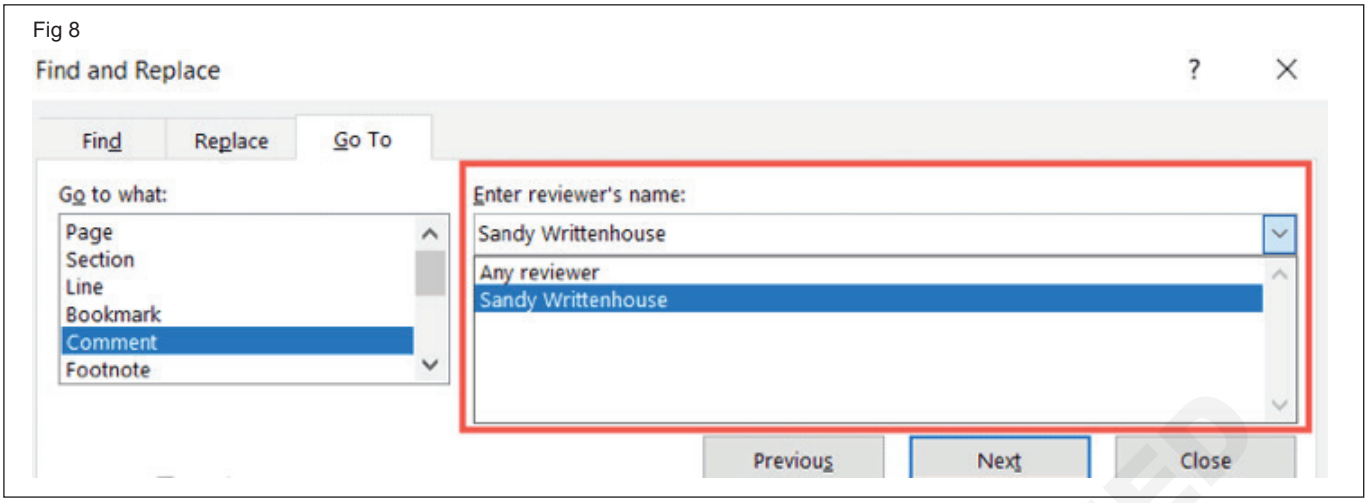
4 Select a name from the drop-down box for a specific **bookmark, comment, field, or object.**

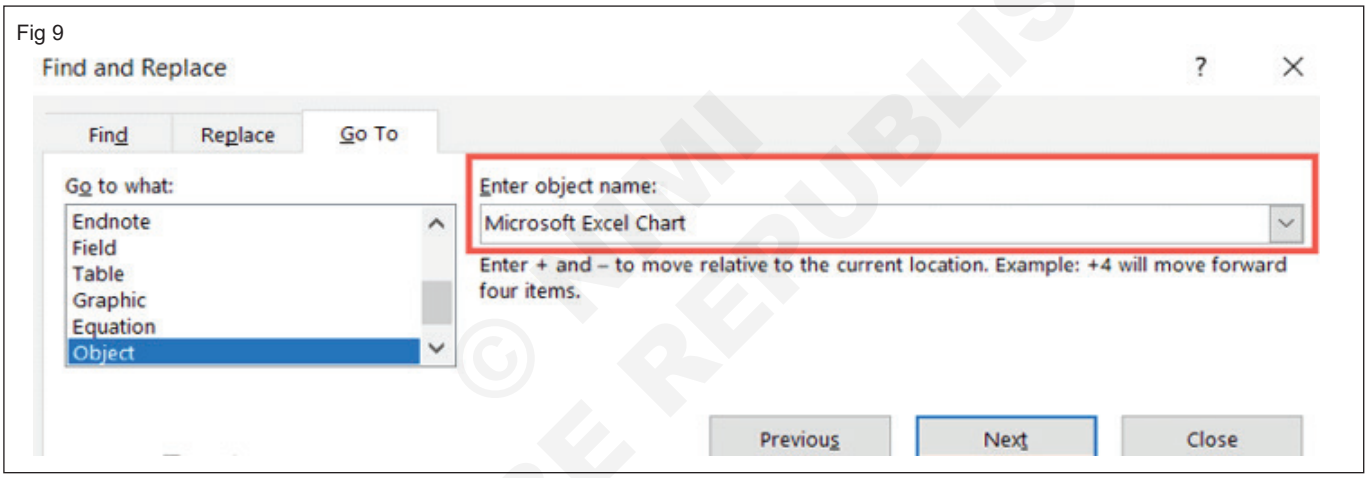
- For example, if you want to go to a comment you added, choose Comment, select your name in the drop-down box, and click Next. (Fig 8)

Fig 8



5 If you want to go to an Excel chart you inserted, select Object, choose Microsoft Excel Chart in the drop-down box and click Next. (Fig 9)

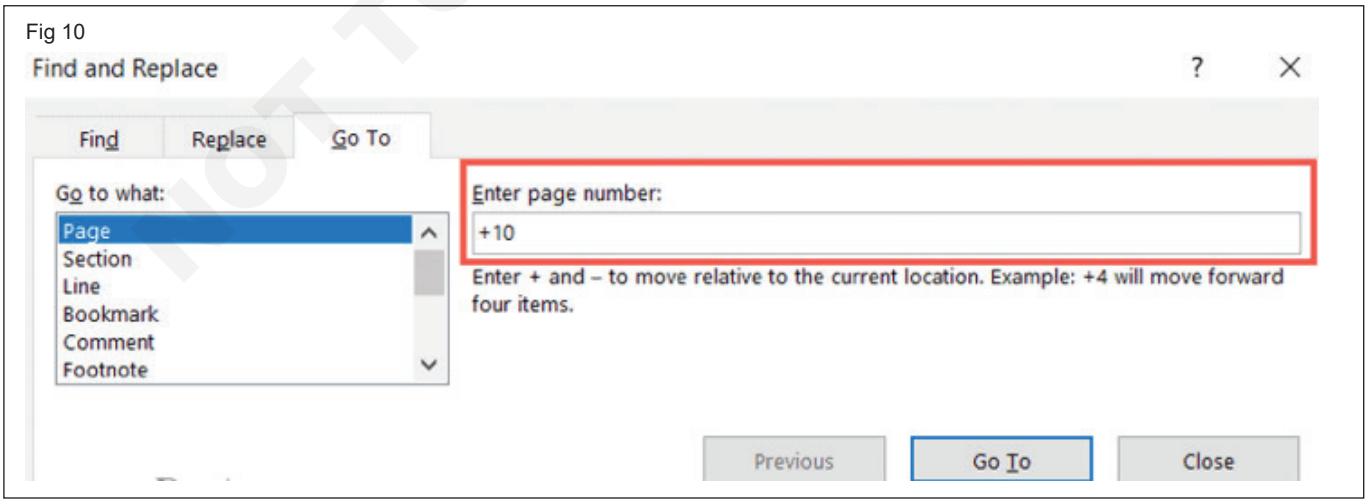
Fig 9



6 Move Relative to Your Current Spot

- Another handy way to use the Go To tool is to jump ahead or behind your current location in the document. Here are a couple of examples.
- Maybe you want to jump ten pages forward from the current page. Select Page, enter "+10" in the box, and then click Go To. You will then move ahead by ten pages. (Fig 10)

Fig 10



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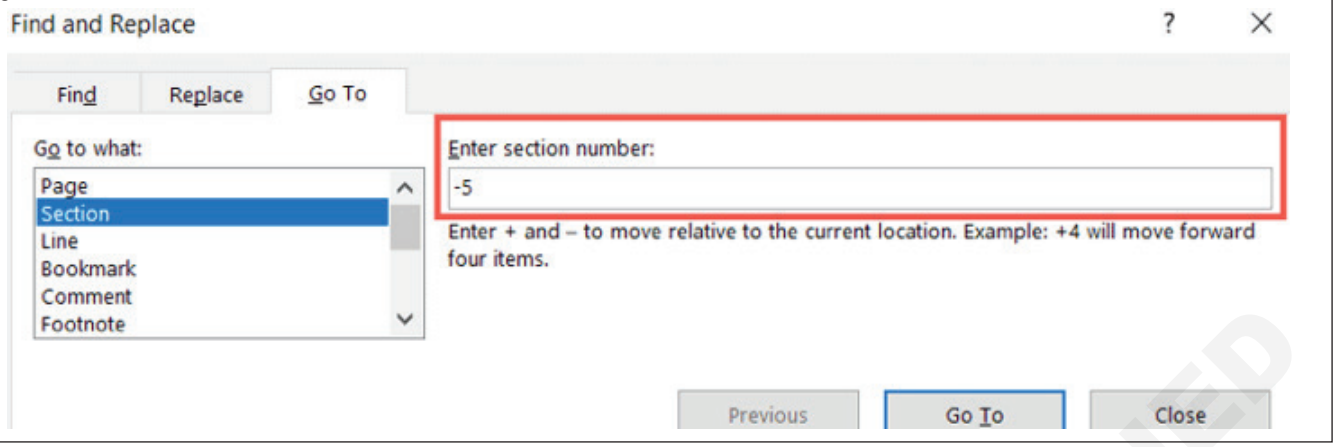
8 You can also go back from your current spot. Say you want to move back five sections—select section, enter “-5” in the box, and then click Go To to do this. (Fig 11)

9 Remember to use a plus sign (+) to go forward and a minus sign (-) to go backward. These symbols only work for those items that allow for a number to be entered in the box, as described earlier.

Fig 11

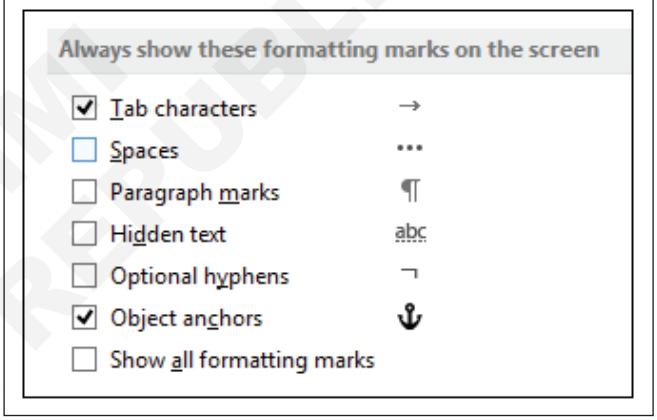


TASK 6: **Show and hide formatting symbols and hidden text**

1 Go to File > Options > Display.

2 Under Always show these formatting marks on the screen, select the check box for each formatting mark that you always want to display regardless if the Show/ Hide button is turned on or off. Clear any check boxes for ones you don’t want always displayed. (Fig 12)

Fig 12



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Format documents

Objectives: At the end of this exercise you shall be able to
- **open MS Word and create a new document**
- **save a document.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS – 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

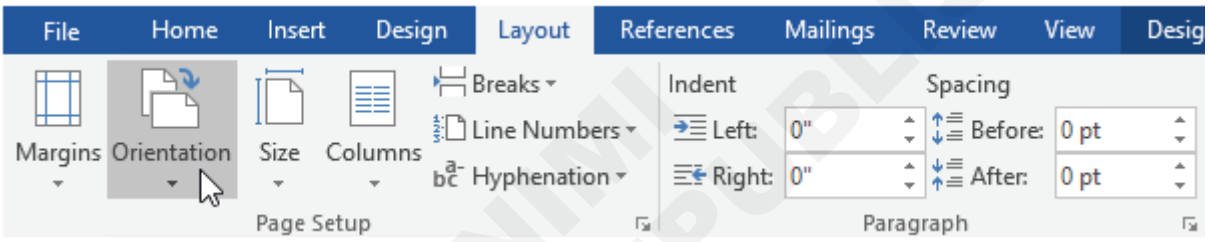
TASK 1: **Set up document pages**

To change page orientation

1 Select the **Layout tab**.

2 Click the **Orientation** command in the Page Setup group. (Fig 1)

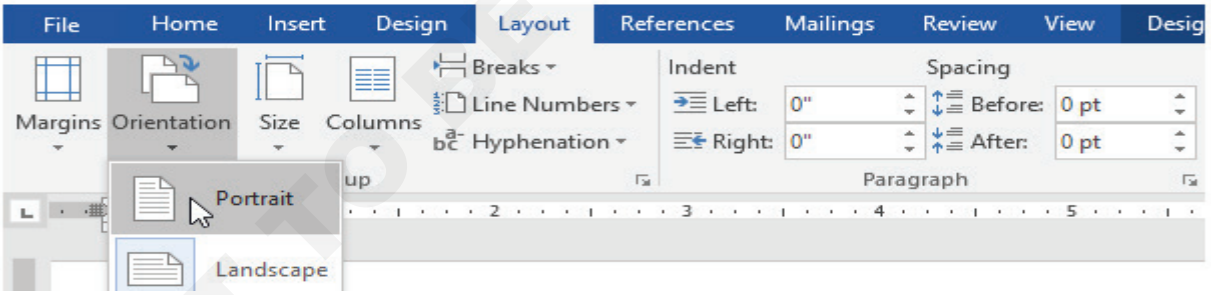
Fig 1



3 A drop-down menu will appear. Click either **Portrait or Landscape** to change the page orientation. (Fig 2)

4 The page orientation of the document will be changed.

Fig 2

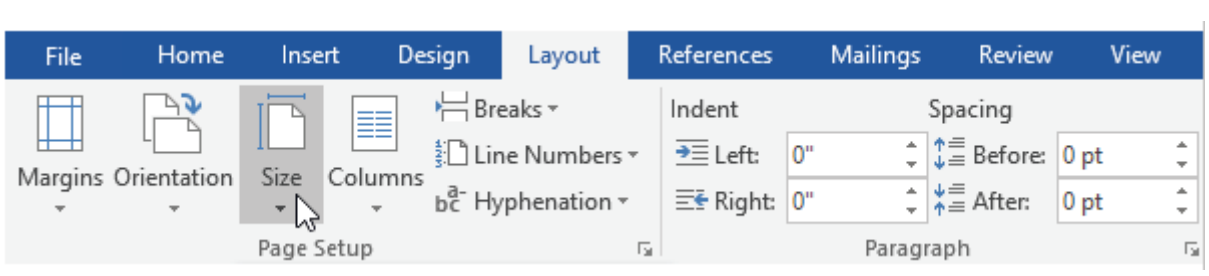


Page size : By default, the page size of a new document is 8.5 inches by 11 inches. Depending on your project, you may need to adjust your document's page size. It's important to note that before modifying the default page size, you should check to see which page sizes your printer can accommodate.

To change the page size: Word has a variety of predefined **page sizes** to choose from.

1 Select the **Layout tab**, then click the **Size** command. (Fig 3)

Fig 3



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2 A drop-down menu will appear. The current page size is highlighted. Click the desired **predefined page** size. (Fig 4)

3 The page size of the document will be changed.

To use a custom page size : Word also allows you to customize the page size in the **Page Setup** dialog box.

1 From the **Layout tab**, click Size. Select **More Paper Sizes** from the drop-down menu. (Fig 5)

Fig 4

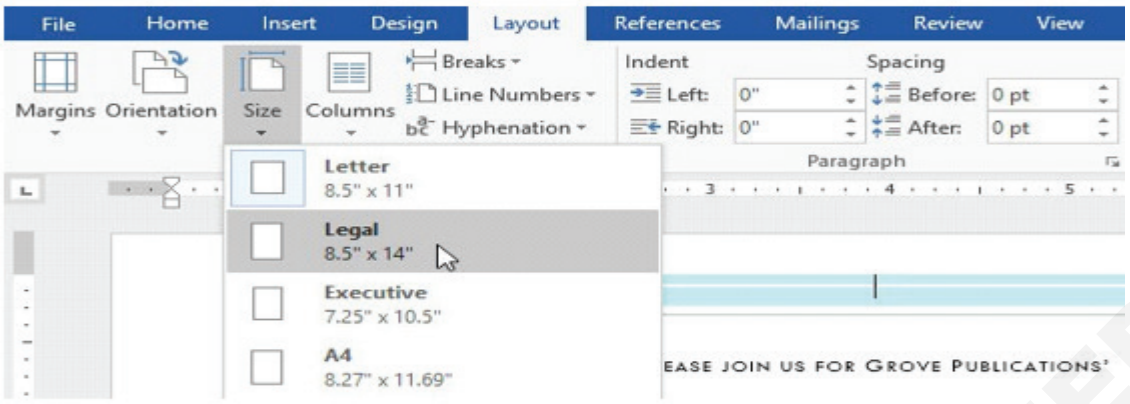


Fig 5

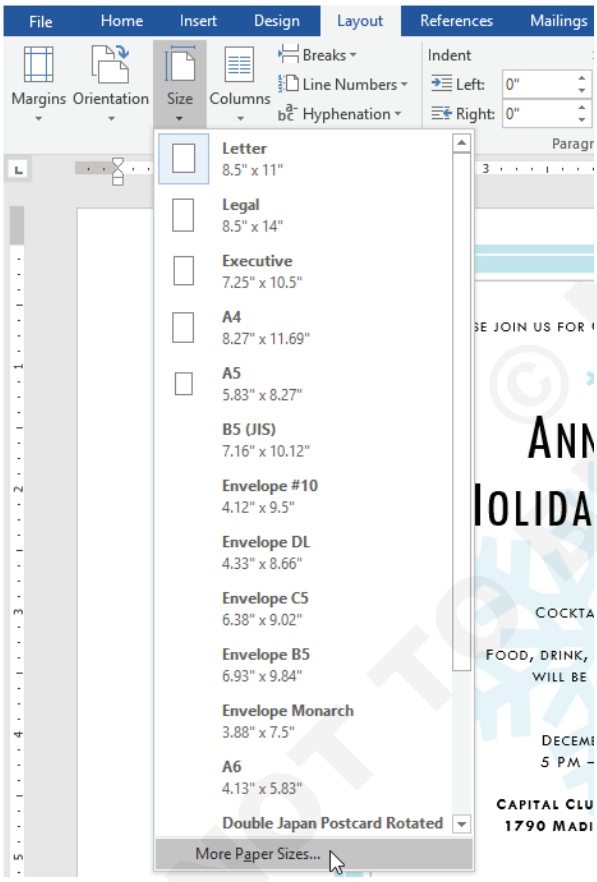
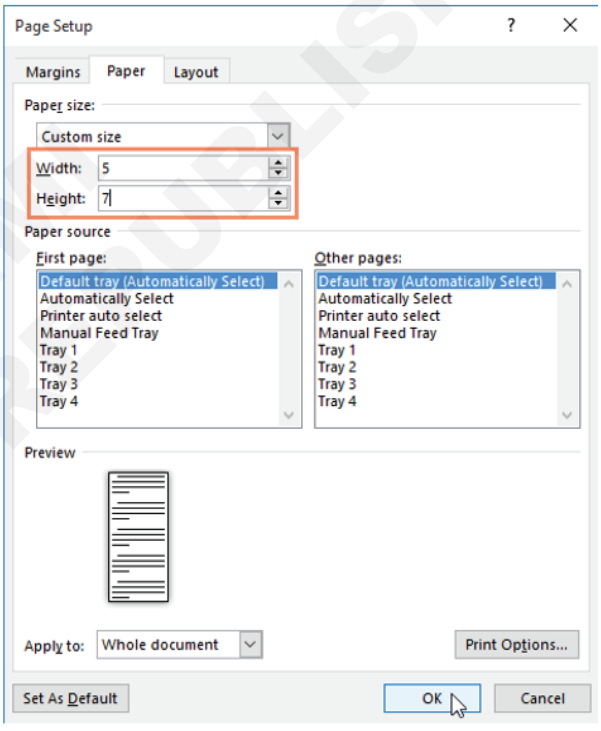


Fig 6



2 The Page Setup dialog box will appear.

3 Adjust the values for Width and Height, then click OK (Fig 6).

4 The page size of the document will be changed.

Page margins : A margin is the space between the text and the edge of your document. By default, a new document's margins are set to Normal, which means it has a one-inch space between the text and each edge. Depending on your needs, Word allows you to change your document's margin size.

To format page margins : Word has a variety of predefined margin sizes to choose from.

1 Select the Layout tab, then click the Margins command. (Fig 7)

2 A drop-down menu will appear. Click the predefined margin size you want. (Fig 8)

3 The margins of the document will be changed.

To use custom margins : Word also allows you to customize the size of your margins in the Page Setup dialog box.

1 From the Layout tab, click Margins. Select Custom Margins from the drop-down menu. (Fig 9)

2 The Page Setup dialog box will appear.

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Fig 7

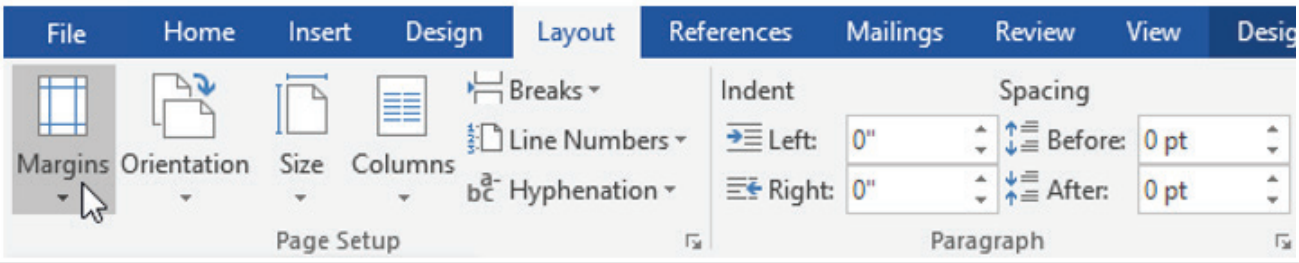


Fig 8

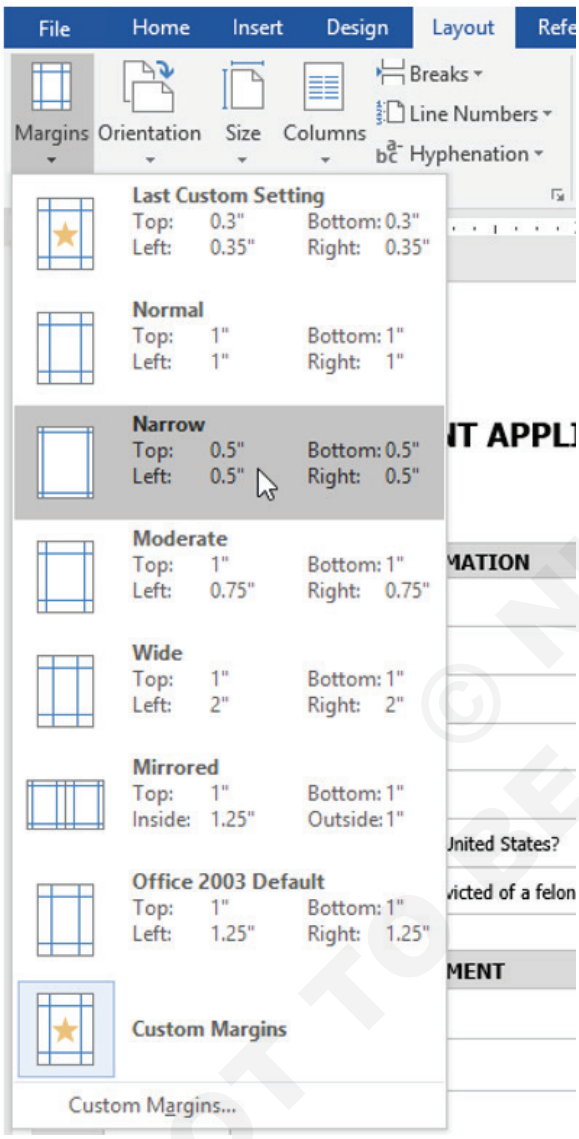
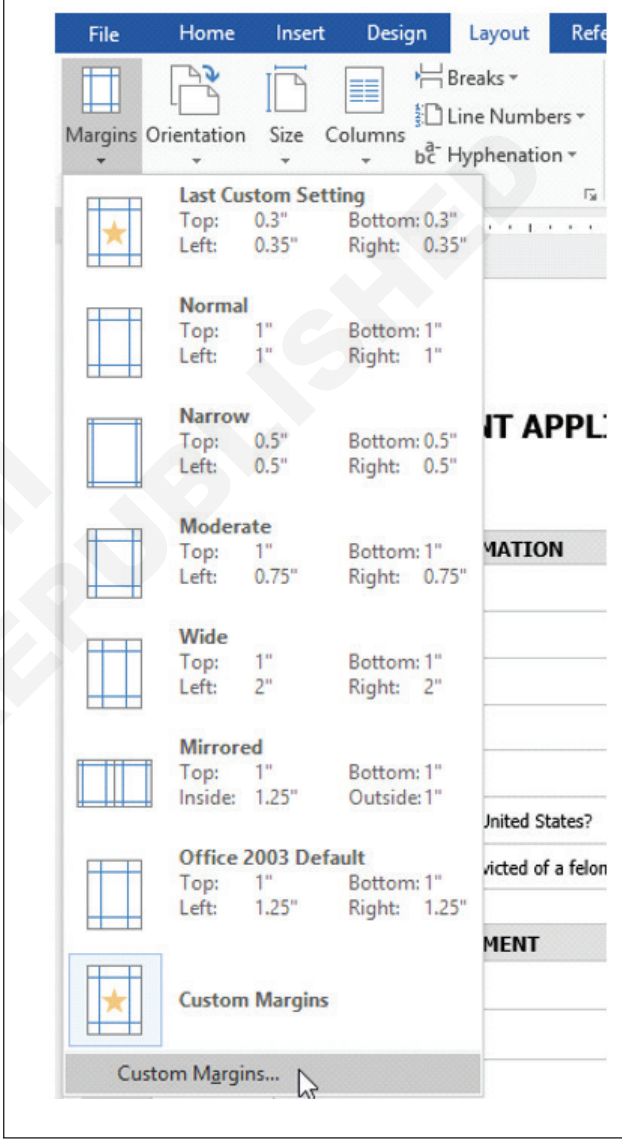


Fig 9



3 Adjust the values for each margin, then click OK.

4 The margins of the document will be changed. (Fig 10)

You can also open the Page Setup dialog box by navigating to the Layout tab and clicking the small arrow in the bottom-right corner of the Page Setup group. (Fig 11)

You can use Word's convenient Set as Default feature to save all of the formatting changes you've made and automatically apply them to new documents.

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Fig 10

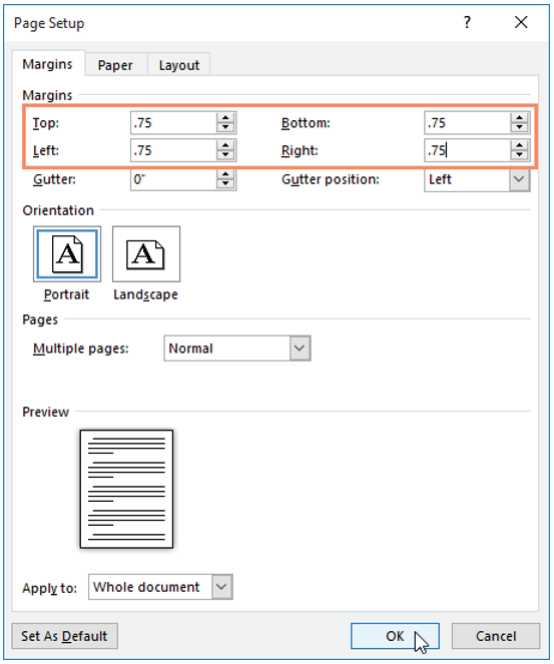
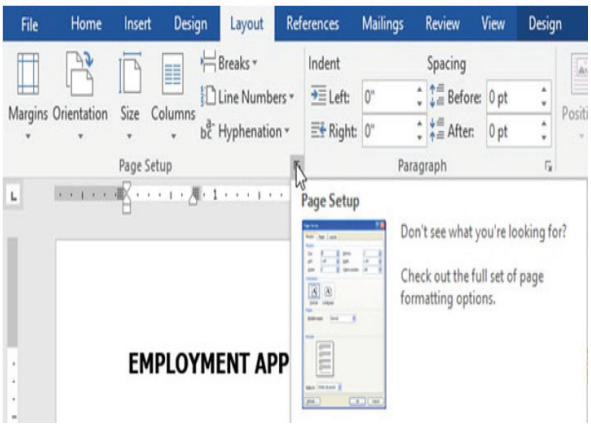


Fig 11



TASK 2: **Insert and modify headers and Footers**

Use the Built-In Headers and Footers in Word : If you want a quickly add a header or footer to a Word document, you can use one of the preset options. These let you pick a layout for your header or footer. For example, you may wish to use a header or footer with three columns, apply a style that uses color, or format it to include specific details.

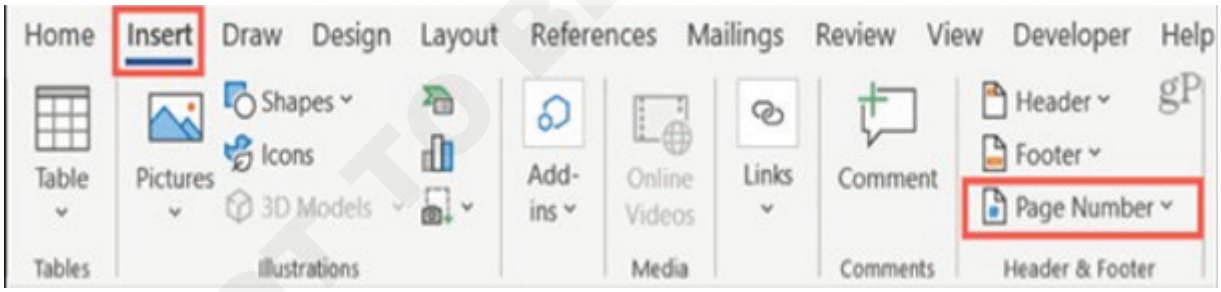
To add a preset header or footer in Word

1 Go to the Header & Footer section of the Insert tab on the ribbon bar.

2 Click Header or Footer, then review the options in the drop-down box.

- If you want a page number, click that drop-down arrow and pick a location. (Fig 12)

Fig 12



3 Select the header or footer style you want, and it will appear in your document. (Fig 13)

- If the option you select is waiting for additional details, go to the designated area in the header or footer to add them. For example, you may need to add a custom document title. (Fig 14)

Customize the Header or Footer : You can type whatever you like in the header or footer section once it is open for editing. While this is convenient, you can also insert other details automatically using the Header & Footer tab on the ribbon bar.

On the left side of the ribbon, you have the same built-in header, footer, and page number options as above. This allows you to apply a preset style or add page numbers afterward. (Fig 15)

To the right, you'll see the Insert section of the ribbon. This lets you pop in the details you want to use, such as the date and time, document title, and more. (Fig 16)

1 **Date & Time:** To include the date and time, click the Date & Time button. Choose the format you want to use in the window that appears and click OK. (Fig 17)

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Fig 13

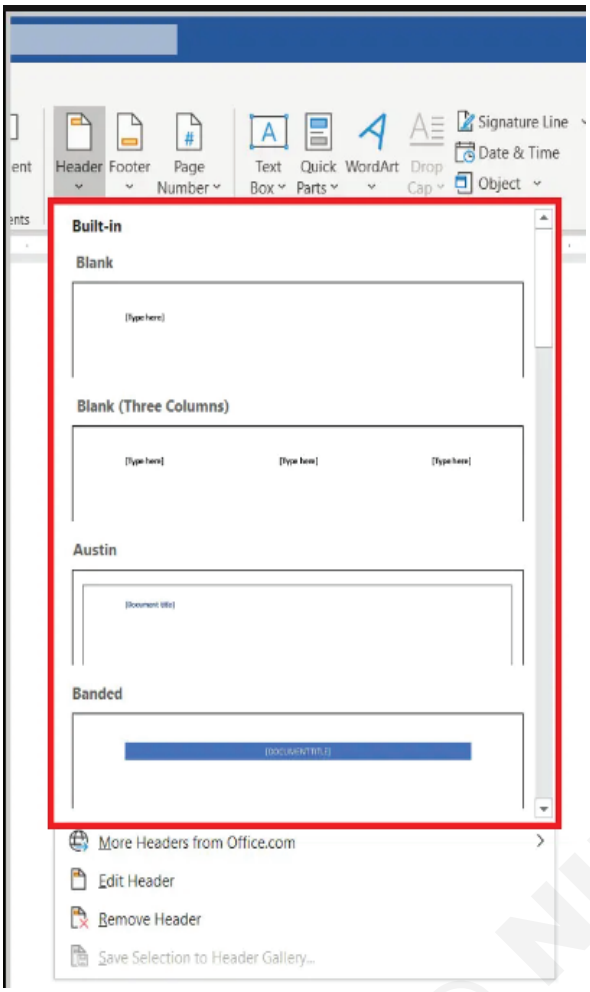


Fig 14

Fig 15

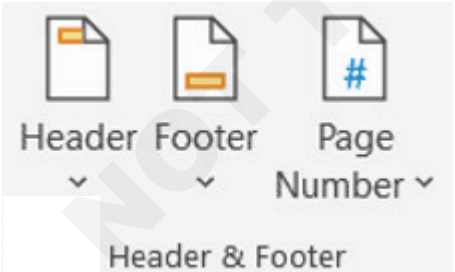


Fig 16

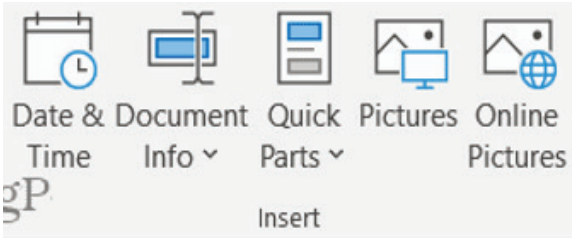
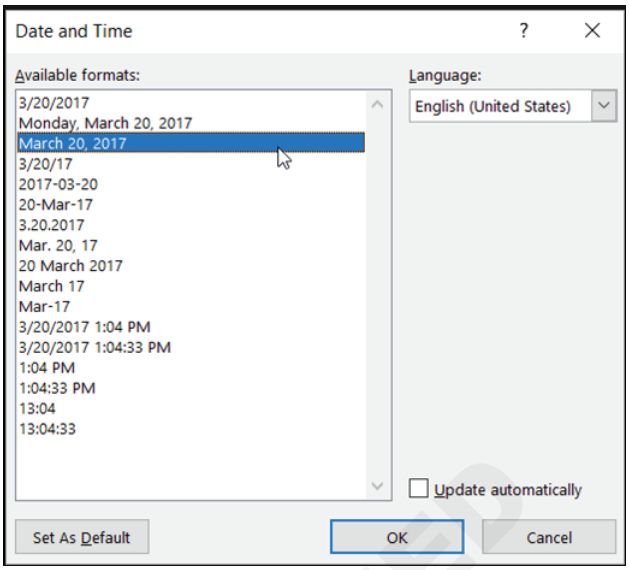
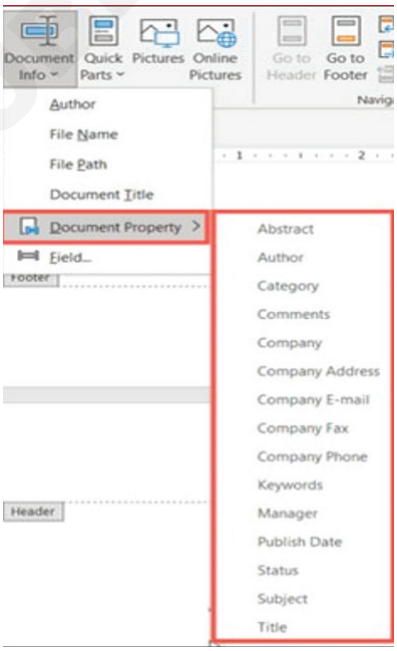


Fig 17



2 **Document Info:** In this drop-down box, you'll see options like Author, File Name, and Document Title. You can also pick a different Document Property in the same pop-out menu for things like Category, Company, and Manager. (Fig 18)

Fig 18



3 In addition, you choose from a slew of Field options. This includes things like a hyperlink, citation, section, or symbol. Select Field, review the available options, then choose the option you want. Click OK to insert it. (Fig 19)

4 Quick Parts: If you have AutoText set up, such as a signature, use the Quick Parts drop-down options. You can also select Document Properties or a Field option from the same drop-down menu. (Fig 20)

5 Pictures and Online Pictures: If you want to include an image, such as a company logo, use the Pictures and Online Pictures buttons to choose and insert the image. (Fig 21)

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Fig 19

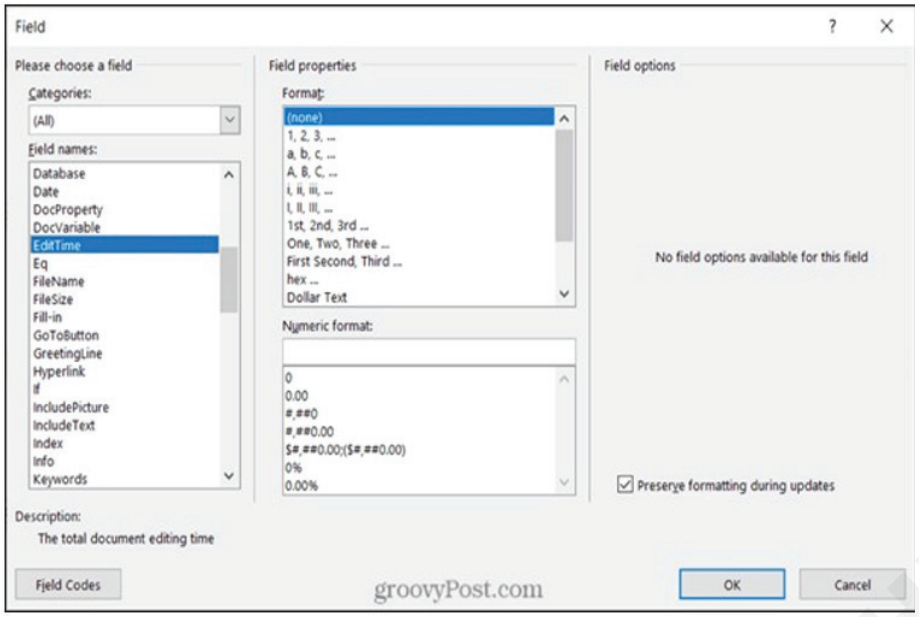

Fig 20

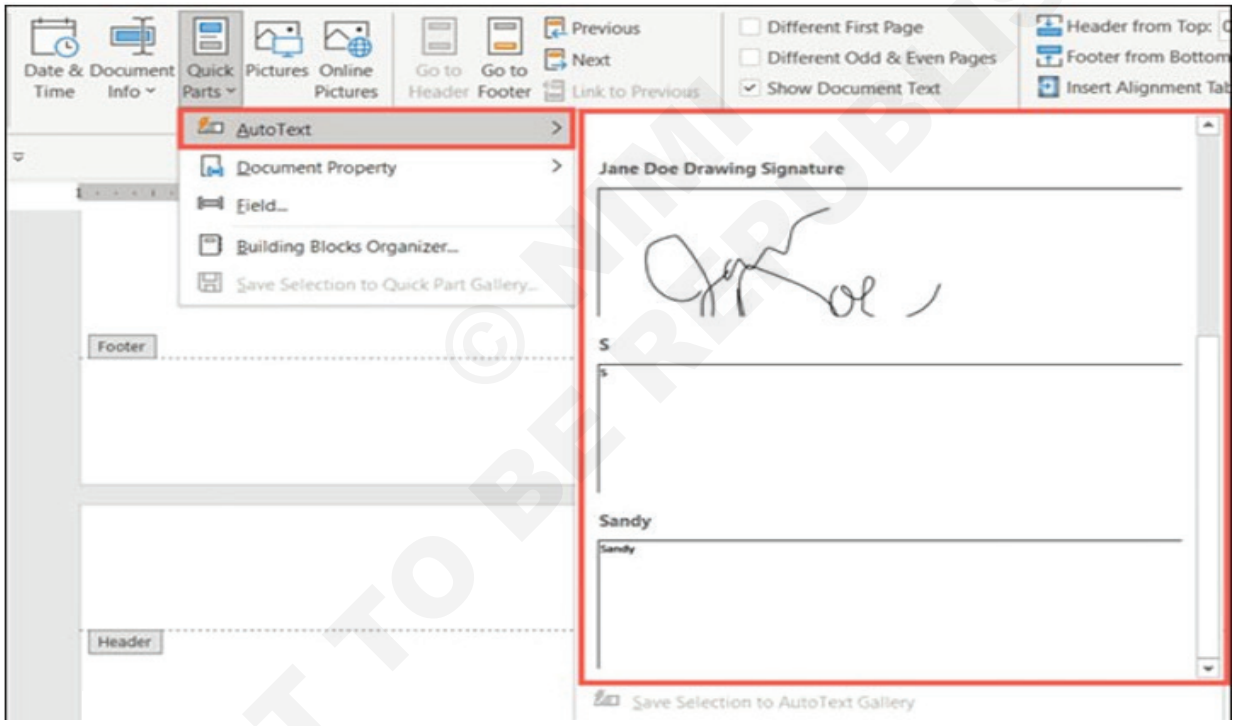

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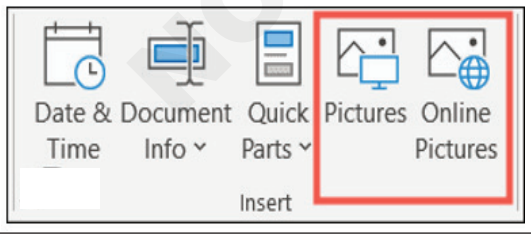
Fig 21



The remaining options on the Header & Footer tab allow you to jump between the header and footer sections easily, use different headers and footers on odd and even pages, and adjust the spacing between the section and the margin. (Fig 22)

Fig 22

6 You can use the Font formatting options on the Home tab to apply bold or italic formatting or choose a font style and color just like your document text. (Fig 23)

7 To finish editing the header or footer, click Close Header and Footer on the right side of the ribbon. Alternatively, double-click a spot outside of those areas in your document. (Fig 24)

Fig 23

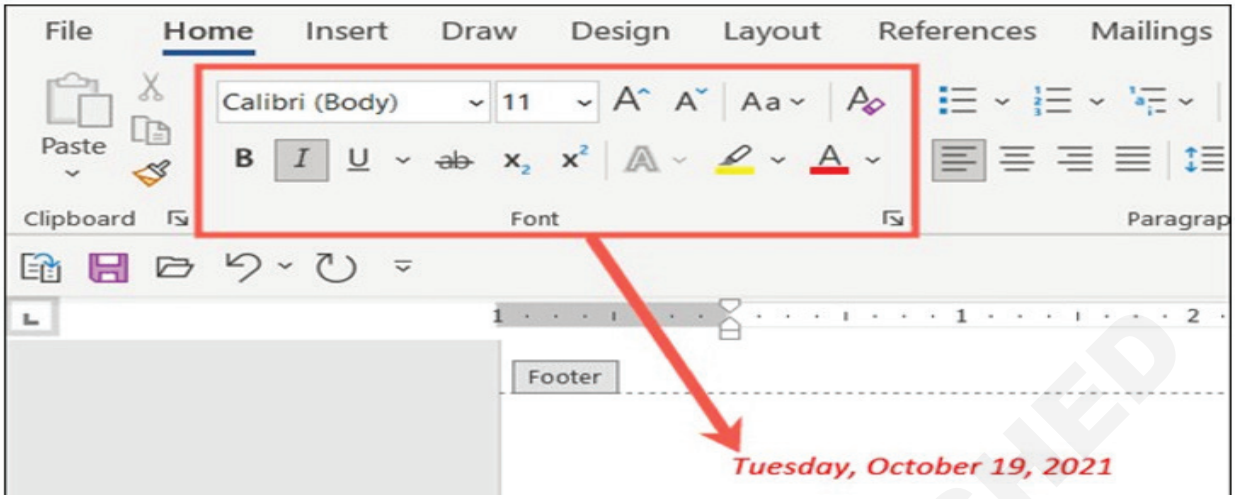
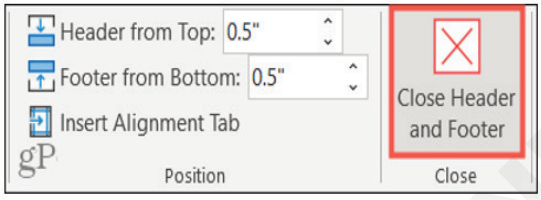


Fig 24

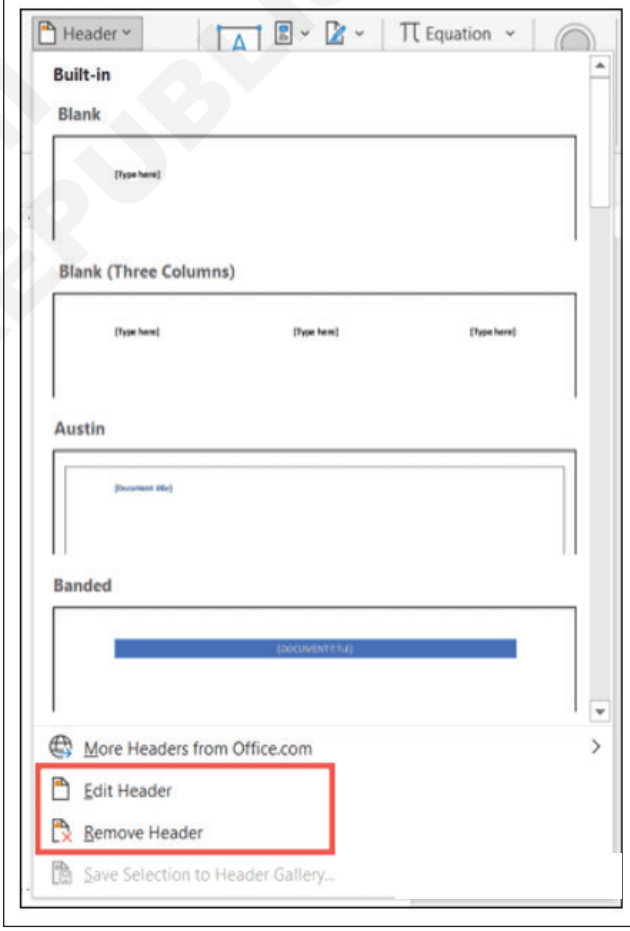


Edit or Remove a Header or Footer : You can change or remove a header or footer in Word at any time after you insert it.

a To do this, go to the Insert tab, click either Header or Footer, and choose Edit Header or Edit Footer from the drop-down list. This will open the section ready for you to make your changes.

b To remove them, choose Remove Header or Remove Footer in the drop-down list. (Fig 25)

Fig 25



TASK 4: **Configure page background elements**

Add or change the background color

1 Go to Design > Page Color.

2 Choose the color you want under Theme Colors or Standard Colors.

- If you don't see the color you want, select More Colors, and then choose a color from the Colors box.
- To add a gradient, texture, pattern, or picture, select Fill Effects, and then go to Gradient, Texture, Pattern, or Picture and select an option.

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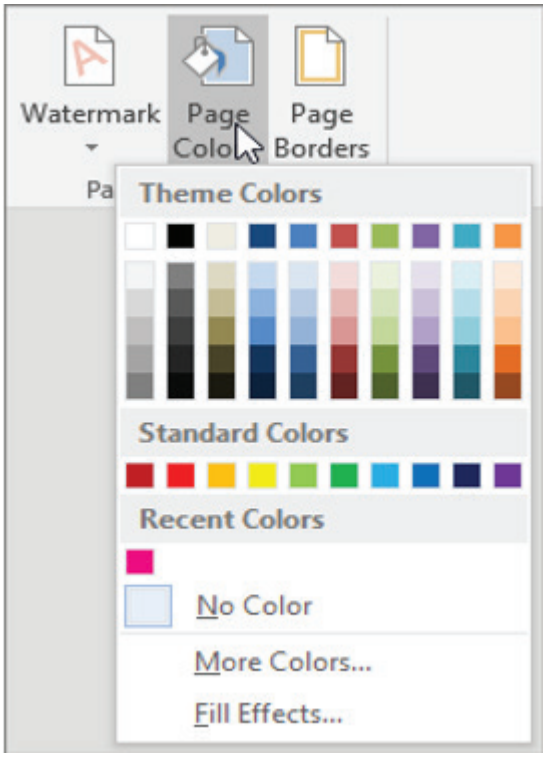
Patterns and textures are repeated (or "tiled") to fill the entire page. If you save your document as a webpage, the textures are saved as JPEG files, and the patterns and gradients are saved as PNG files. (Fig 26)

Fig 26



Remove the background color

1 Go to Design > Page Color.

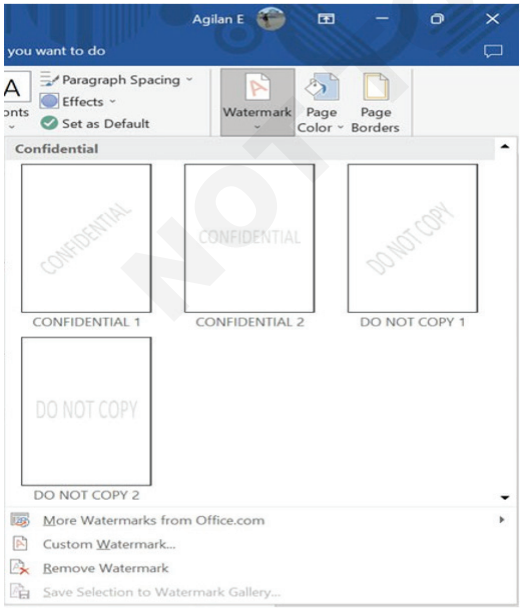
2 Select No Color

Add or change the background Watermark

1 Go to Design > Watermark.

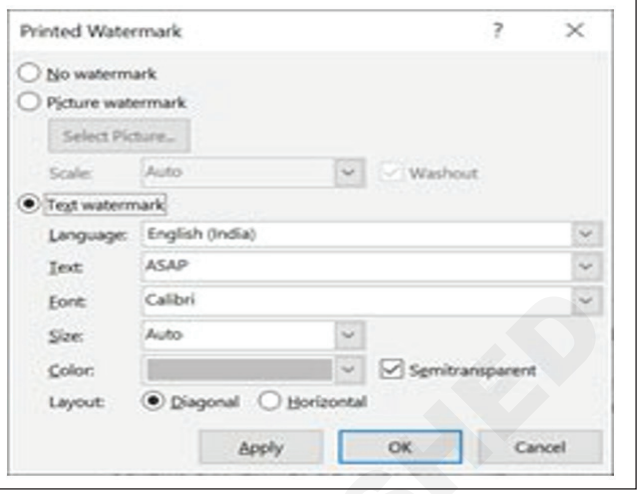
2 Choose the watermark you want under Confidential or Disclaimer or Urgent (Fig 27)

Fig 27



- If you don't see the watermark you want, select More Watermarks from Office.com or choose Custom Watermark - Picture Watermark or Text Watermark (format the text as you need). (Fig 28)

Fig 28



Remove the background Watermark

3 Go to Design > Watermark.

4 Select Remove Watermark.

Add or change the background Page Borders

1 Go to Design > Page Boarders.

2 Choose the Page Boarder you want under Page Boarder Tab. (Fig 29)

3 Applying Setting as None or Box or Shadow or 3-D or Custom.

4 Applying Style of border Line and Color and Width size and Art. (Fig 30)

Fig 30

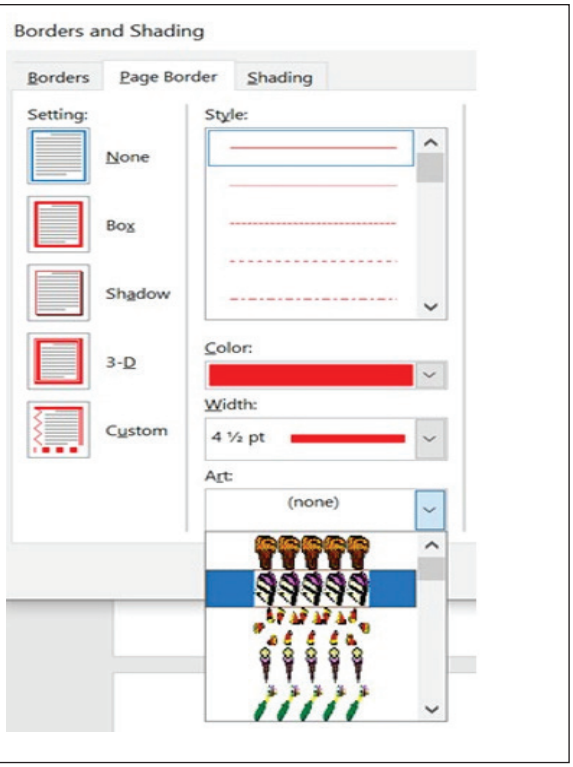


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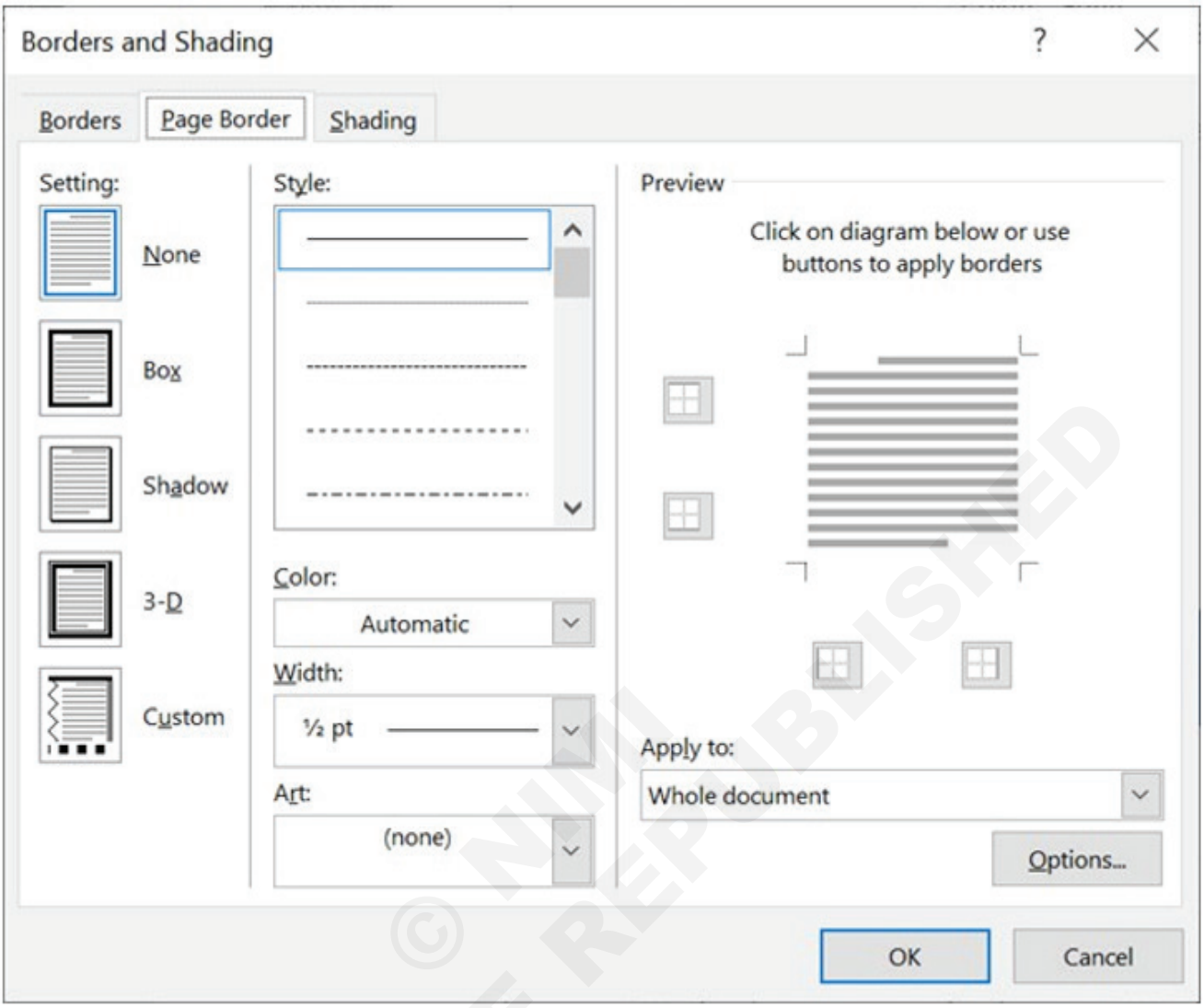
Fig 29



5 After applying all these we can preview the Page Border and also this setting can be applied to any of the following pages.

- Whole documents
- This Section
- This Section - First Page only (Fig 31)
- This Section - All except first page

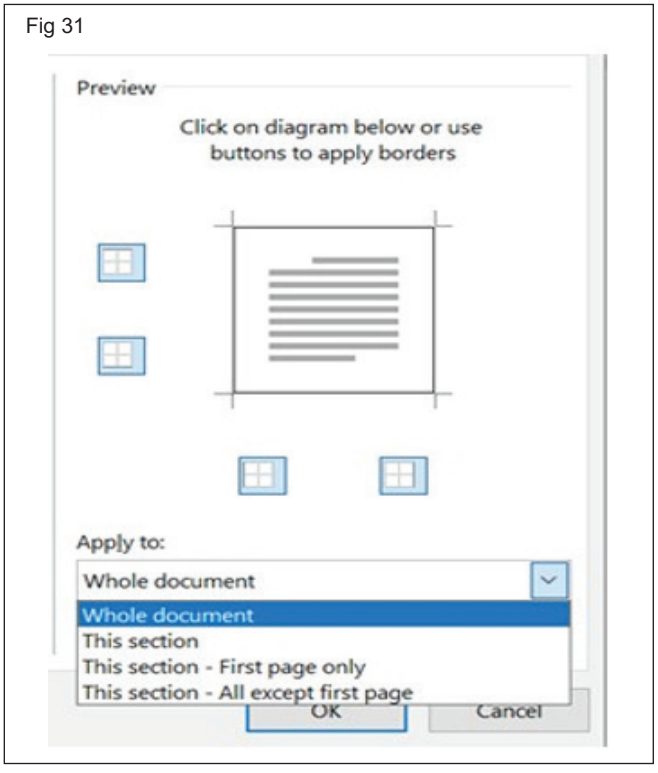
6 Then Click OK to Finish

Remove the background Page Borders

1 Go to Design > Page Borders.

2 Select None in setting and Click OK.

Fig 31



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Save and share documents

Objectives: At the end of this exercise you shall be able to
- **save documents in alternative file formats.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS – 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Save documents in alternative file formats**

To change page orientation

1 Select File > Save As.

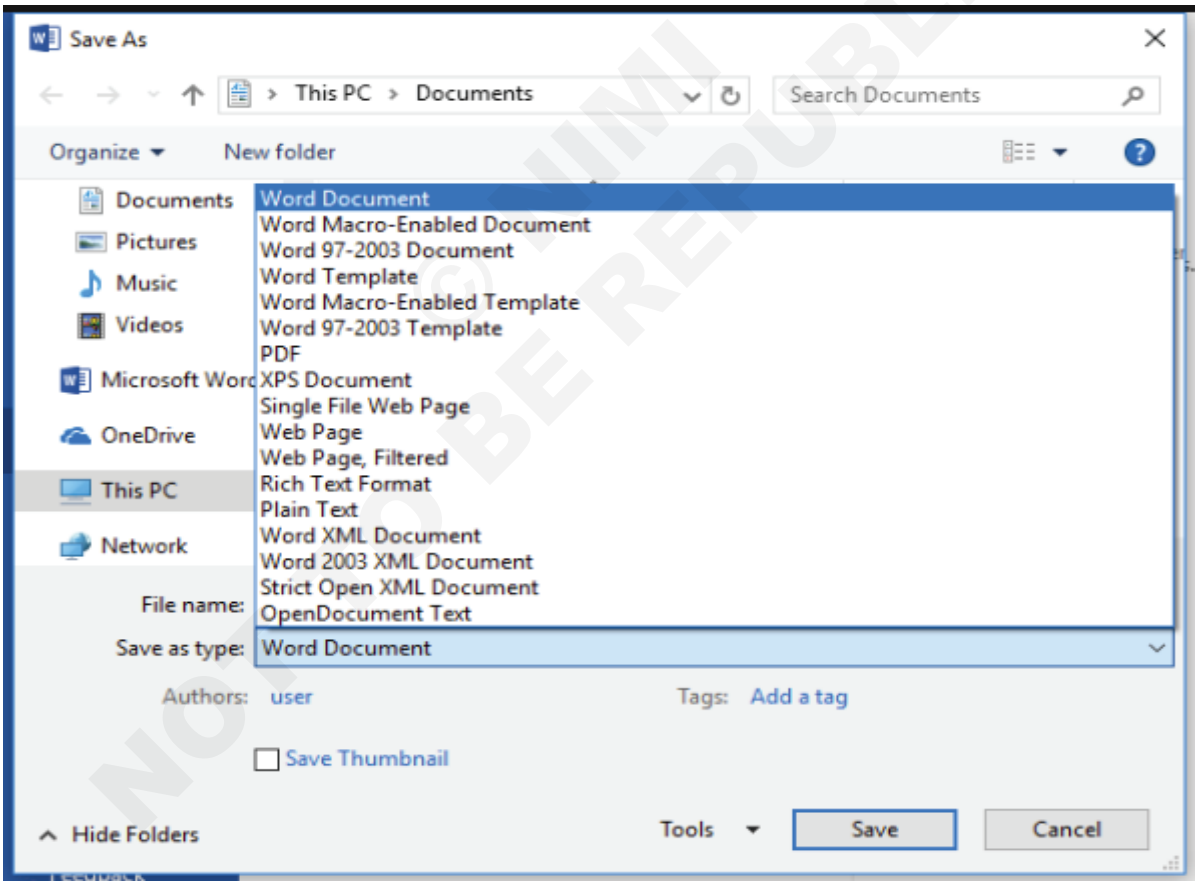
2 Select a place to save the file, or select Browse and go to the location where you want to save the file.

3 Enter a name for the document.

4 Select Save as type and choose the file format you want to use.

5 Select Save. (Fig 1)

Fig 1



TASK 2: **Modify basic document properties**

1 Click the File tab.

2 Click Info then View the Details of Properties. (Fig 2)

3 Click Properties at the top of the page, and then select Advanced Properties.

4 Here you can edit Summary Details about the Documents.

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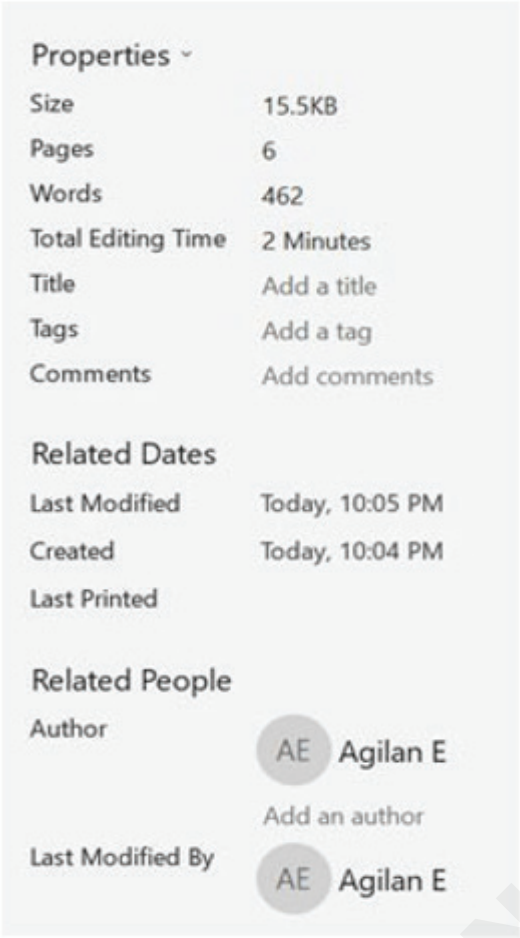
Fig 2



5 Click the Custom tab. (Fig 3)

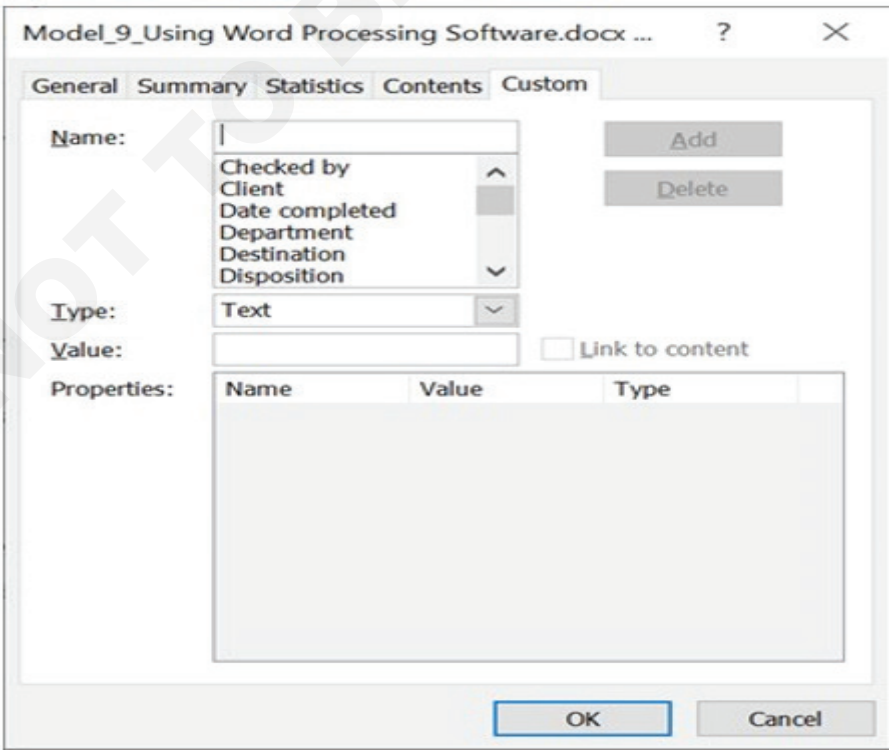
- In the Name box, type a name for the custom property, or select a name from the list.

Fig 3

- In the Type list, select the data type for the property that you want to add.
- In the Value box, type a value for the property. The value that you type must match the selection in the Type list. For example, if you select Number in the Type list, you must type a number in the Value box. Values that don't match the property type are stored as text.

6 Click OK (Fig 4)

Fig 4



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TASK 3: **Modify print settings**

1 Select File > Print.

2 To preview each page, select the forward and backward arrows at the bottom of the page. (Fig 5)

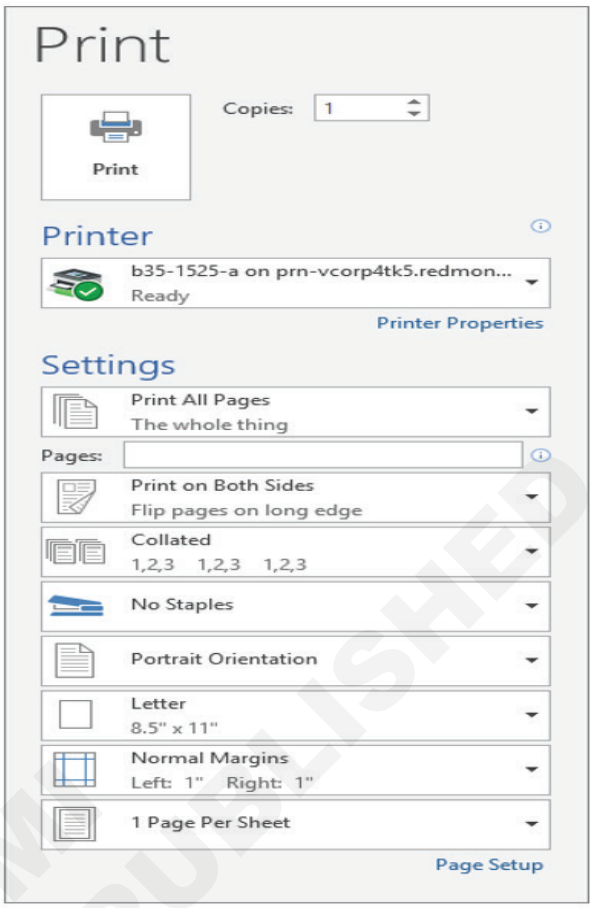
Fig 5

If the text is too small to read, use the zoom slider at the bottom of the page to enlarge it. (Fig 6)

Fig 6

3 Choose the number of copies, and any other options you want, and select the Print button. (Fig 7)

Fig 7



TASK 4: **Share documents electronically**

1 Click File > Share.

2 You Can share the document by Share with people or Email or Present Online or Post Blog. (Fig 8)

3 If you want to choose the option of Share with People then Save your document in OneDrive Cloud, if it's not already there.

4 The Share window displays if your document is not currently saved in OneDrive. Select the OneDrive option, then name your document and select OK.

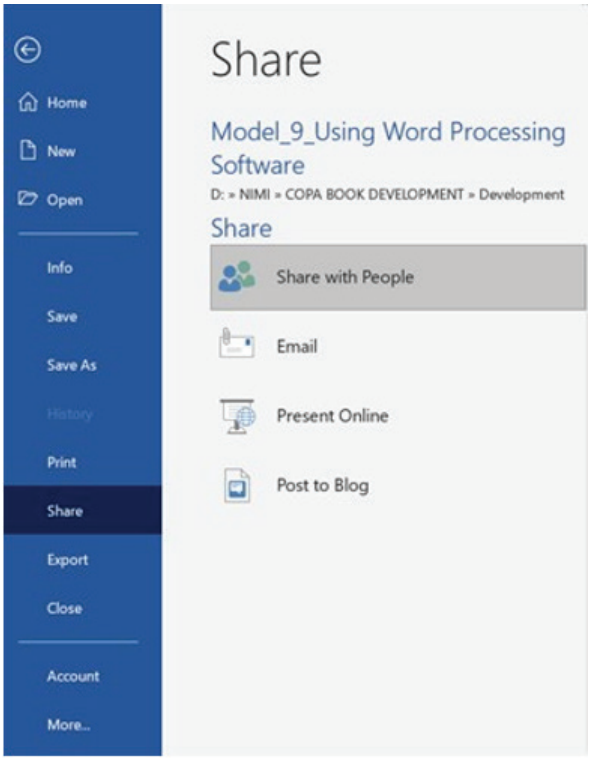
Note: Before Sharing, please ensure that Sender and receiver must have Microsoft Outlook Email Account or Microsoft O365 subscribed organization email account.

5 Enter email addresses of the people you want to share with and make choices for permission you want to allow.

6 Type a message if you want, and select Send.

The people you're sharing with will get mail from you, with a link to your document.

Fig 8



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Inspect documents for issues

Objectives: At the end of this exercise you shall be able to
- **locate and remove hidden properties and personal information.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS – 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Locate and remove hidden properties and personal information**

You can use the Document Inspector to find and remove hidden data and personal information in Word documents. It is a good idea to use the Document Inspector before you share an electronic copy of your Word document, such as in an e-mail attachment.

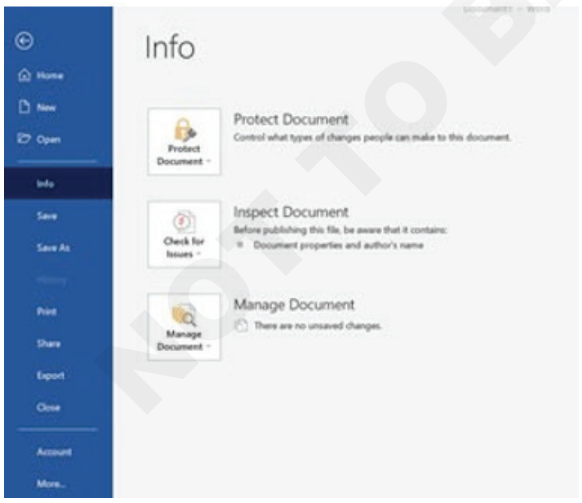
1 Open the Word document that you want to inspect for hidden data and personal information.

2 Click the File tab, click Save As, and then type a name in the File name box to save a copy of your original document.

3 In the copy of your original document, click the File tab, and then click Info.

4 Click Check for Issues, and then click Inspect Document. (Fig 1)

Fig 1



5 In the Document Inspector dialog box, select the check boxes to choose the types of hidden content that you want to be inspected. (Fig 2)

6 Click Inspect. (Fig 3)

Fig 2

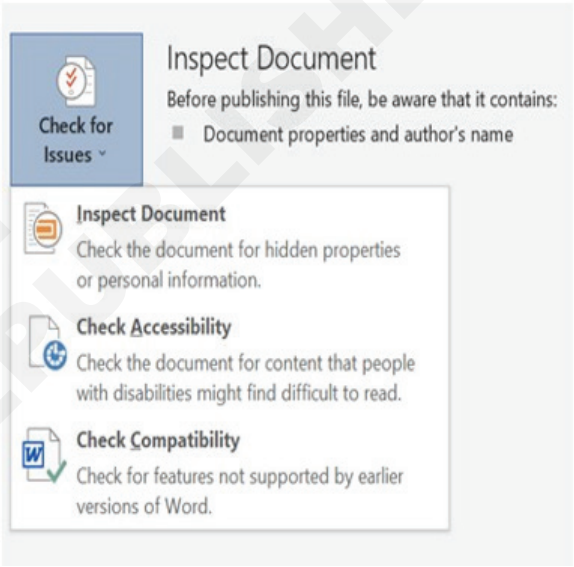
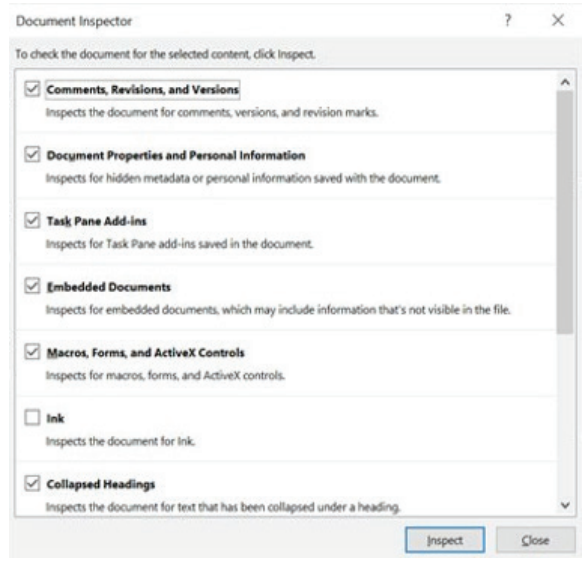


Fig 3



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7 Review the results of the inspection in the Document Inspector dialog box. (Fig 4)

8 Click Remove All next to the inspection results for the types of hidden content that you want to remove from your document. (Fig 5)

Fig 4

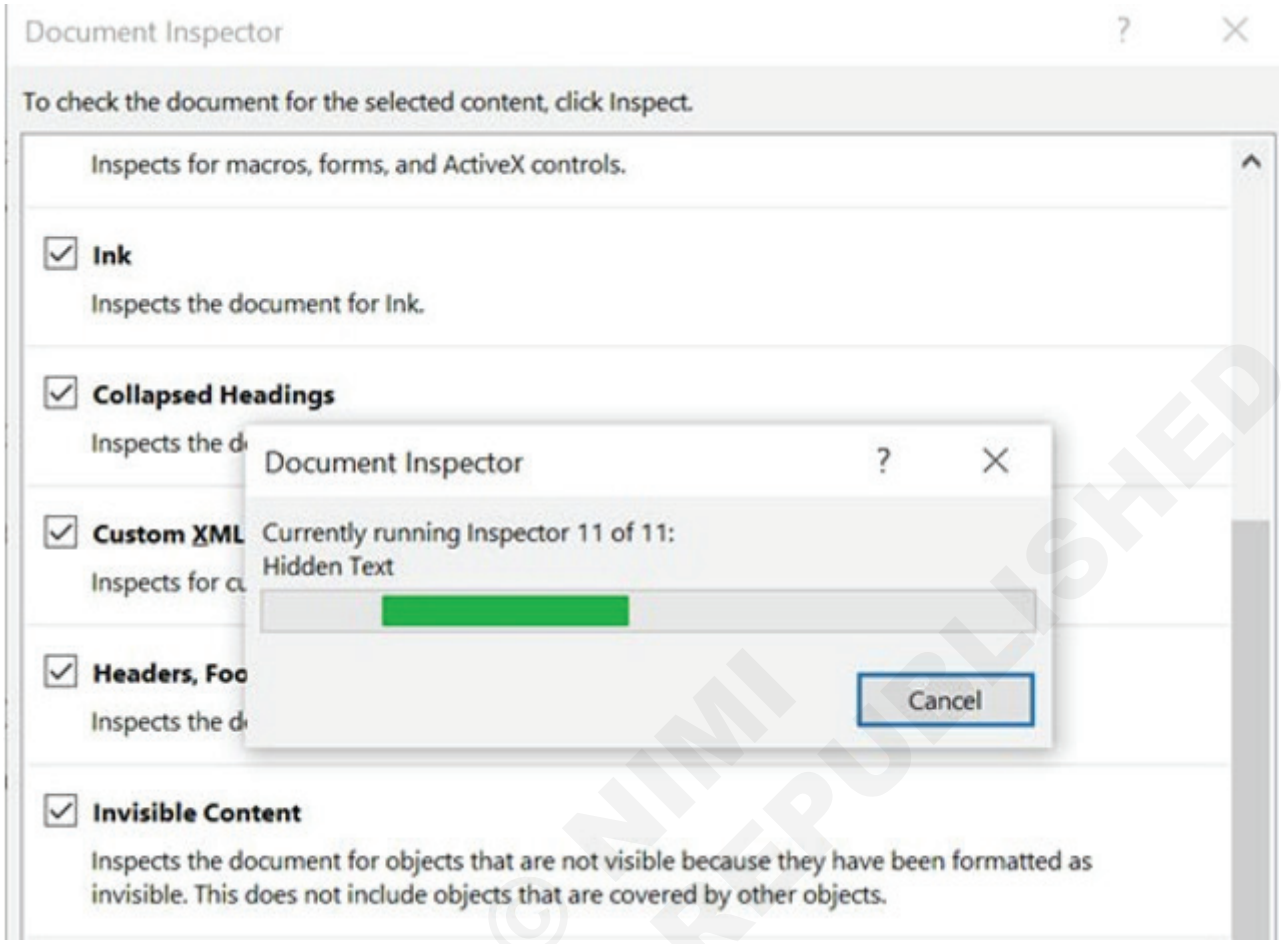
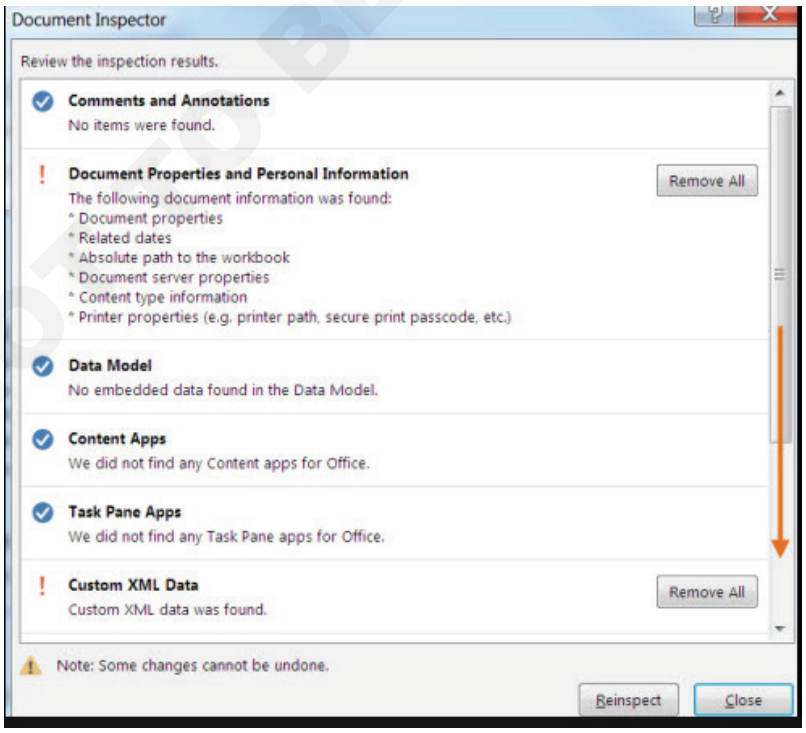


Fig 5



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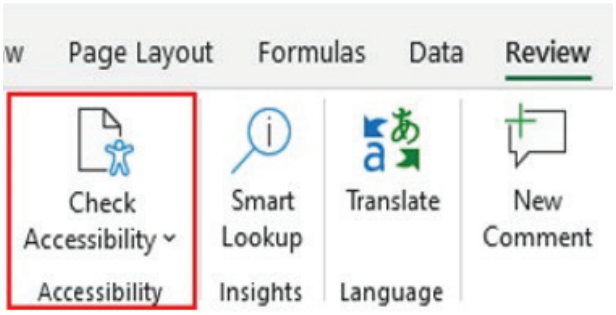
TASK 2: **Locate and correct accessibility issues Use the Accessibility Checker**

1 On the ribbon of the Microsoft Office app, select the Review tab. If you're using Outlook, you'll only see the Review tab when writing or replying to messages.

2 Select the upper part of the Check Accessibility split button. The Accessibility pane opens to the right of the screen. The Accessibility ribbon activates at the top of the screen.

Tip: To see more options, select the lower part of the Check Accessibility button. (Fig 6)

Fig 6



3 In the Accessibility pane, review and address the findings as instructed in Apply recommended actions.

Apply recommended actions : In the Accessibility pane, you'll see a list of errors, warnings, and tips with how-to-fix recommendations for each. To quickly fix the issues, apply one of the recommended actions. For more information on how the findings are categorized, go to Rules for the Accessibility Checker.

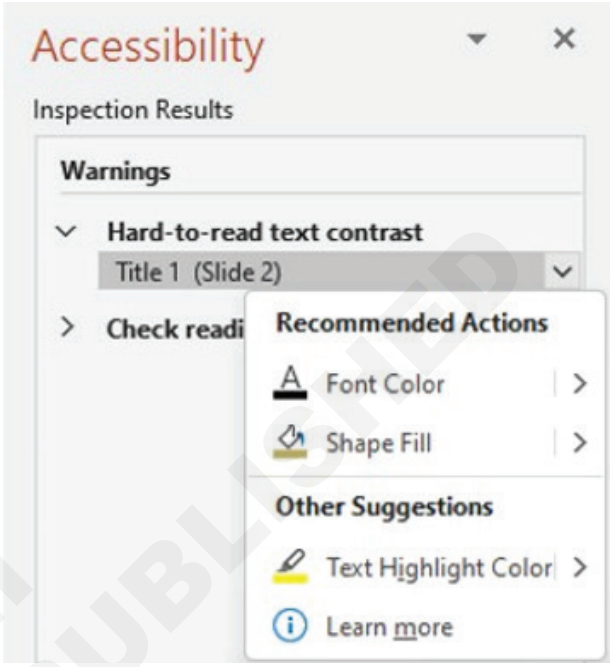
1 In the Accessibility pane, select an issue under Warnings or Errors. The list expands and shows the items and objects affected by the issue.

Tip: To view the exact location of the affected item or object, select the item or object.

2 To address the issue, select the down arrow button next to it. The Recommended Actions list opens. (Fig 7)

3 To apply a one-click fix, select an action from the Recommended Actions list. To view more options, select the right arrow button next to an action (if available).

Fig 7



4 Go through and resolve each issue under Warnings and Errors.

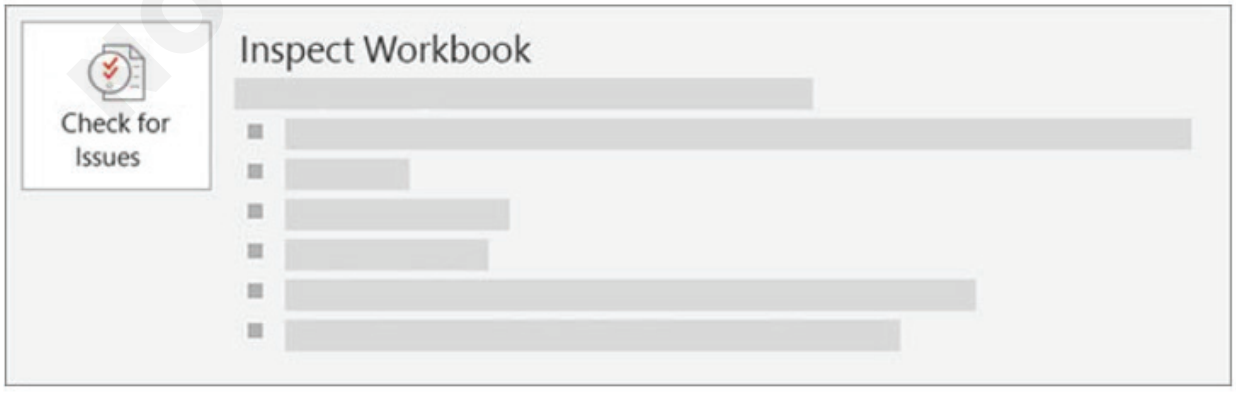
Don't see the Accessibility Checker? : If you don't see the Check Accessibility button on the Review tab, you might have an older version of the app. Follow these steps to open the Accessibility Checker in an older app version:

1 Select File > Info.

2 Select the Check for Issues button. (Fig 8)

Tip: To the right of the Check Accessibility button, under the Inspect heading, is a list of any potential issues.

Fig 8



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3 In the Check for Issues drop-down menu, select Check Accessibility. (Fig 9)

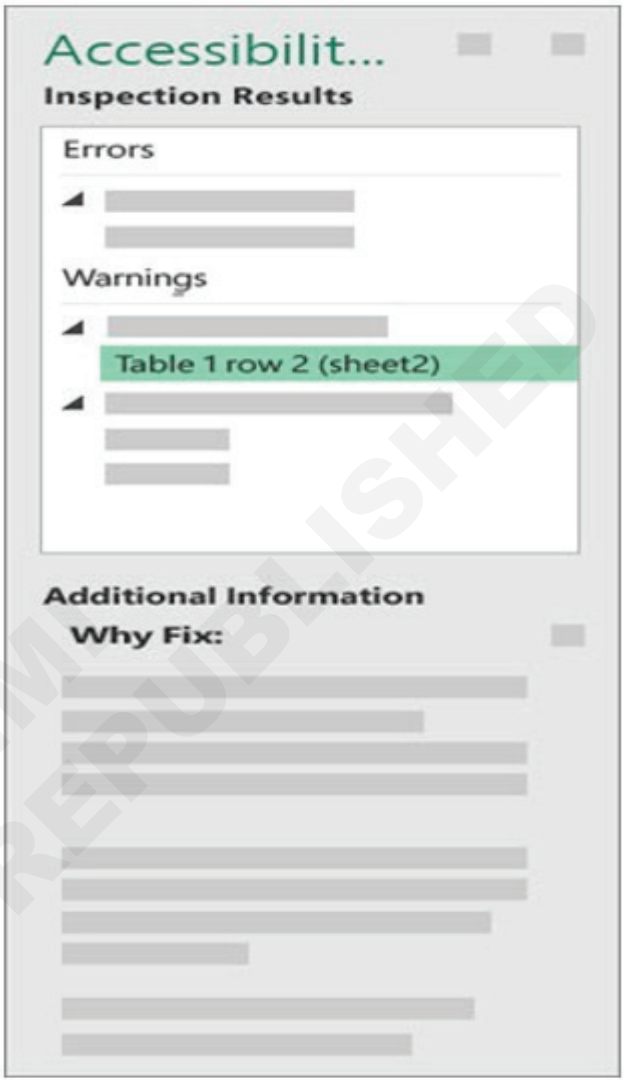
Fig 9

4 The Accessibility Checker task pane appears next to your content and shows the inspection results. (Fig 10)

Fig 10

5 To see information on why and how to fix an issue, under Inspection Results, select an issue. Results appear under Additional Information, and you're directed to the inaccessible content in your file. (Fig 11)

Fig 11



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TASK 3: **Locate and correct compatibility issues**

Check file compatibility with earlier versions

You can check compatibility between versions of your Microsoft Office files to see if features in a file are supported by older versions of Office by using Compatibility Checker.

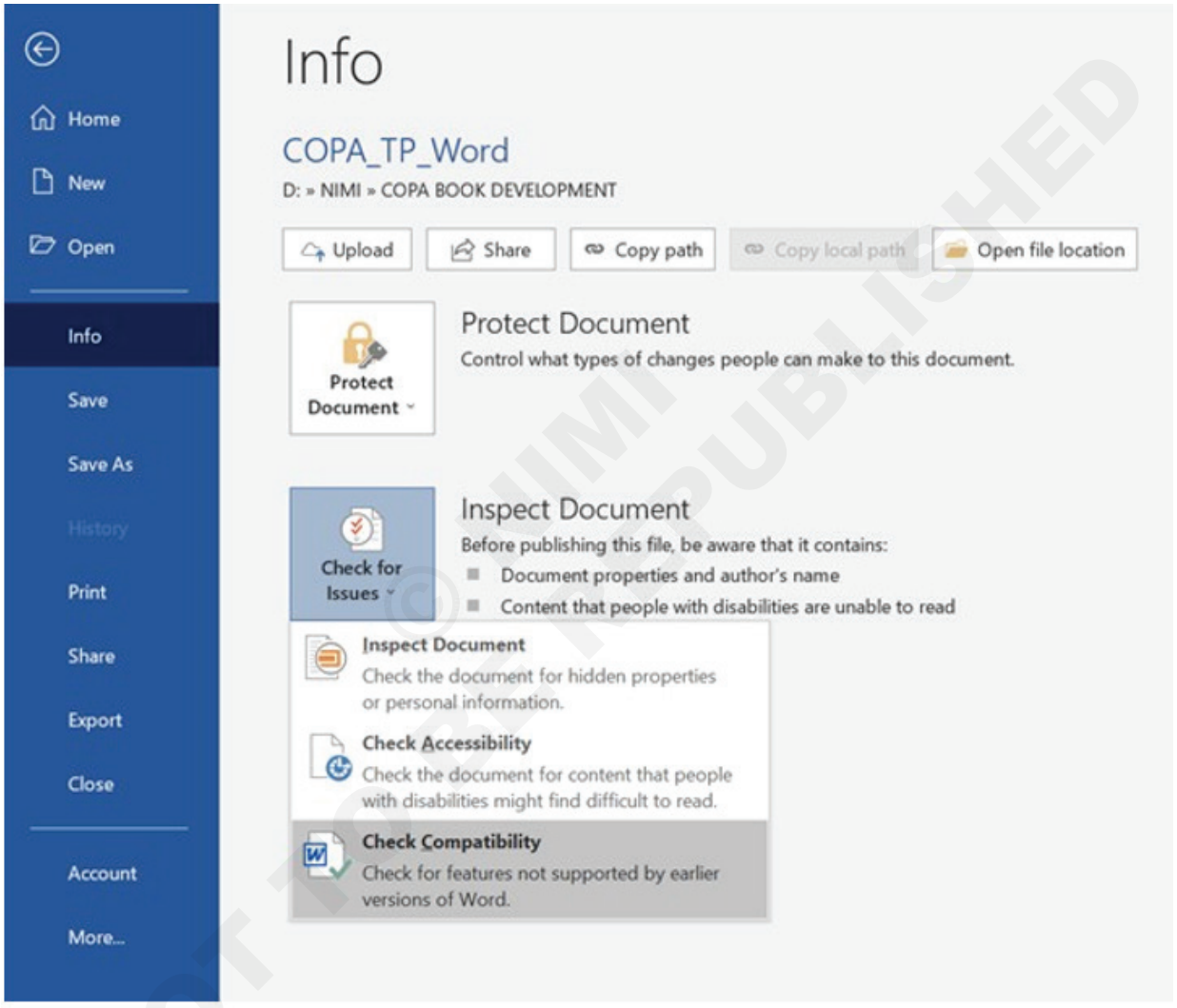
To check compatibility with an older version of Office

1 Click the File tab, and then click Info.

2 Click Check for Issues, and then click Check Compatibility.

3 Any issues between the versions are listed under Summary in the Compatibility Checker window. (Fig 12)

Fig 12



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Insert text and paragraphs

Objectives: At the end of this exercise you shall be able to
- **find and replace text**
- **insert symbols and special characters.**

Requirements			
Tools/Equipment/Machines			
• A Working PC with Windows 10 OS	- 1 No.	• MS Office 2019 / Latest	- 1 No.

PROCEDURE

TASK 1: **Find and replace text**

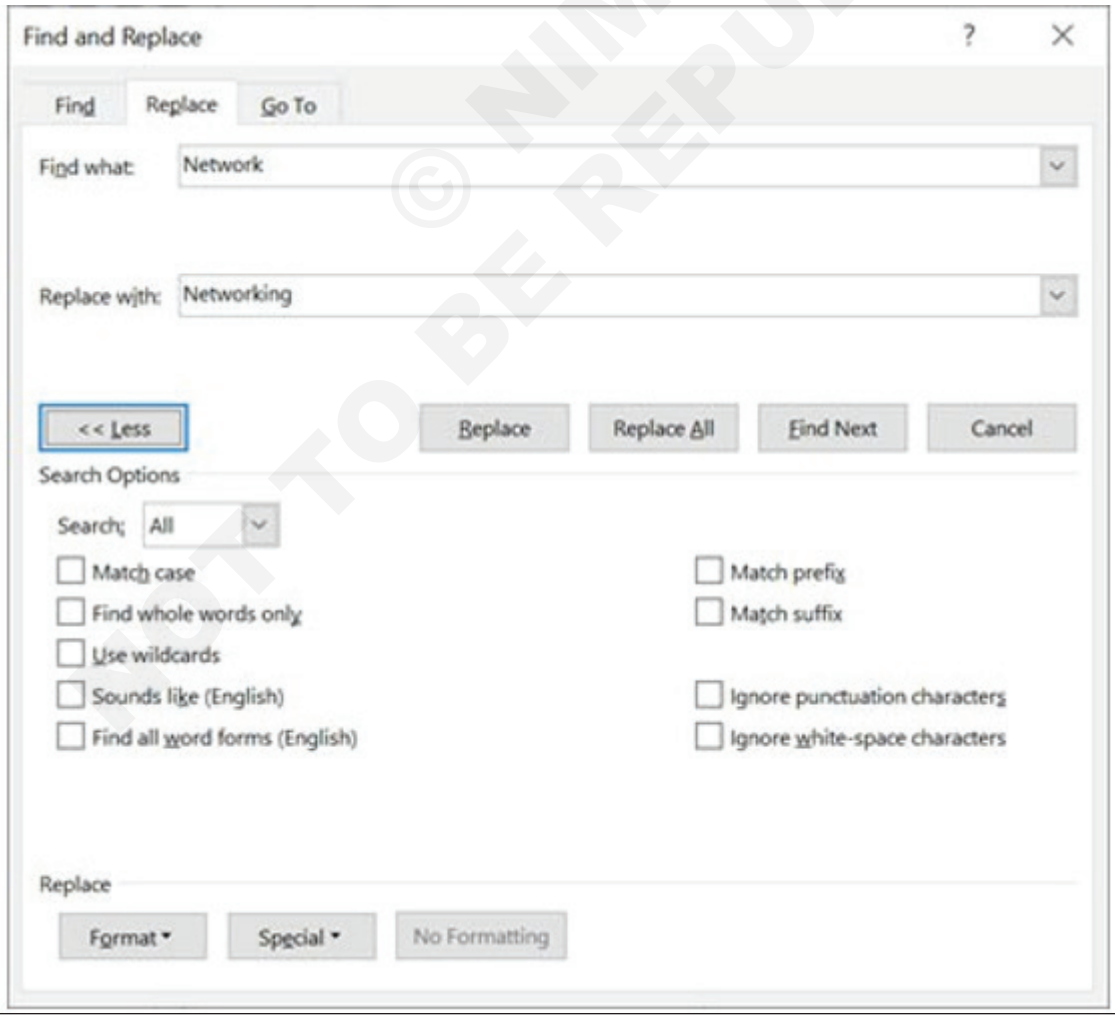
1 Go to Home > Replace or Ctrl + H

2 Enter the word or phrase you want to replace in Find what.

3 Enter your new text in Replace with.

4 Choose Replace All to change all occurrences of the word or phrase. Or, select Find Next until you find the one you want to update, and then choose Replace.

5 To specify only upper or lowercase in your search, select More > Match case. There are several other ways to search in this menu.



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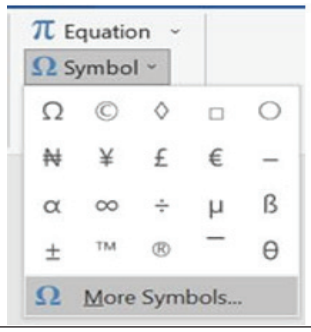
TASK 2: **Insert symbols and special characters**

1 Go to Insert > Symbol.

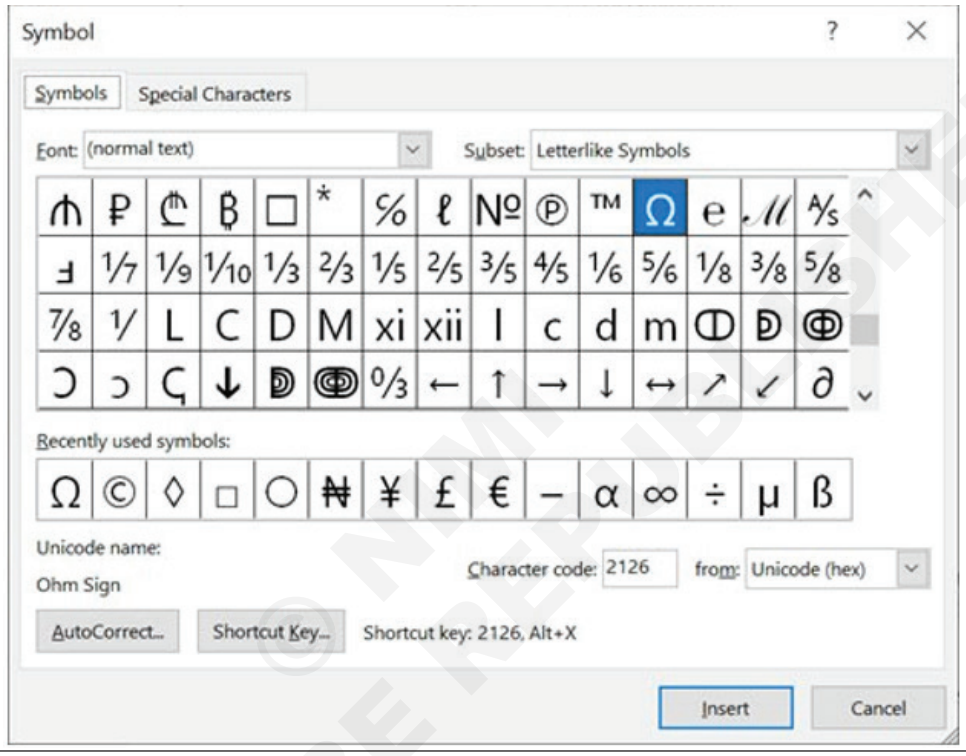


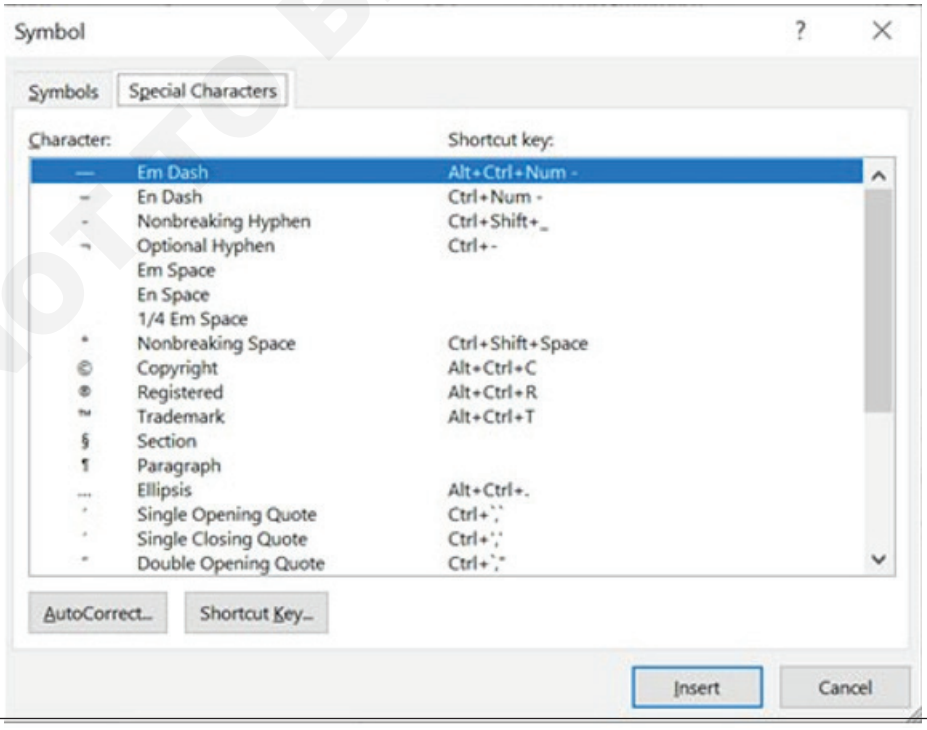
2 Pick a symbol, or choose More Symbols.

3 Choose the Symbol or Special Character tab and Scroll up or down to find what you want to insert.

4 When you find the symbol or special character you want, double-click it. The symbol will be inserted in your file.

5 Select Close.





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Format text and paragraphs

Objectives: At the end of this exercise you shall be able to
- **apply text effects**
- **apply formatting by using Format Painter**
- **set line and paragraph spacing and indentation.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

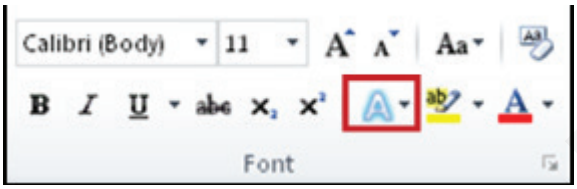
TASK 1: **Apply text effects**

Add an effects text effects

1 Select the text that you want to add an effect to.

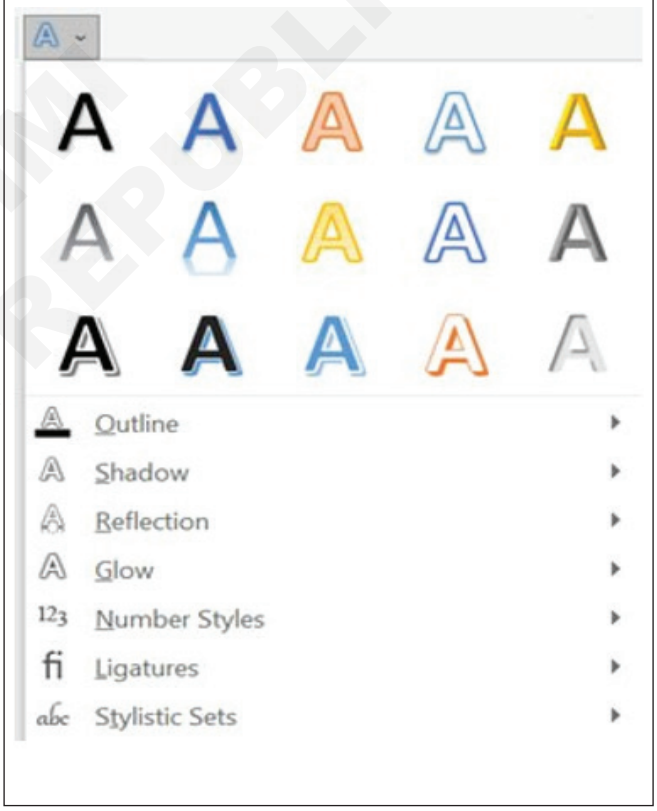
2 On the Home tab, in the Font group, click Text Effect. (Fig 1)

Fig 1



3 Click the effect that you want. For more choices, point to Outline, Shadow, Reflection, or Glow, and then click the effect that you want to add.(Fig 2)

Fig 2

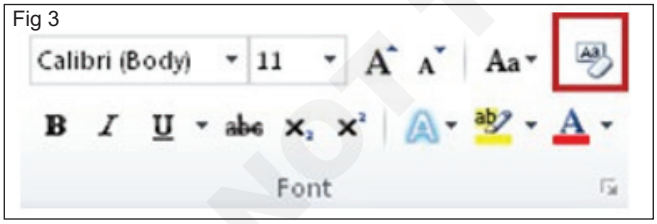


Remove an effect from text

1 Select the text that you want to remove an effect from.

2 On the Home tab, in the Font group, click Clear Formatting. (Fig 3)

Fig 3



TASK 2: **Apply formatting by using Format Painter**

1 Select the text or graphic that has the formatting that you want to copy.

Note: If you want to copy text formatting, select a portion of a paragraph. If you want to copy text and paragraph formatting, select an entire paragraph, including the paragraph mark.

2 To choose Format Painter:

On the Home tab, select Format Painter in the Clipboard group. (Fig 4)

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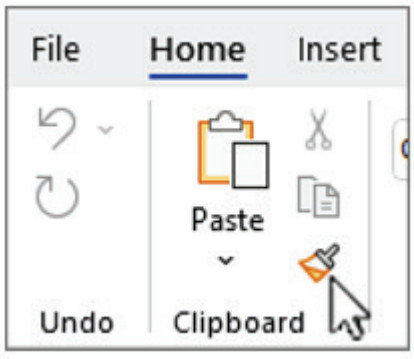
Fig 4



3 The cursor changes to a paintbrush icon.

4 Use the brush to paint over a selection of text or graphics to apply the formatting. This only works once. To change the format of multiple selections in your document, you must first double-click Format Painter.

5 To stop formatting, press ESC

TASK 3: **Set line and paragraph spacing and indentation**

Change paragraph indents and spacing

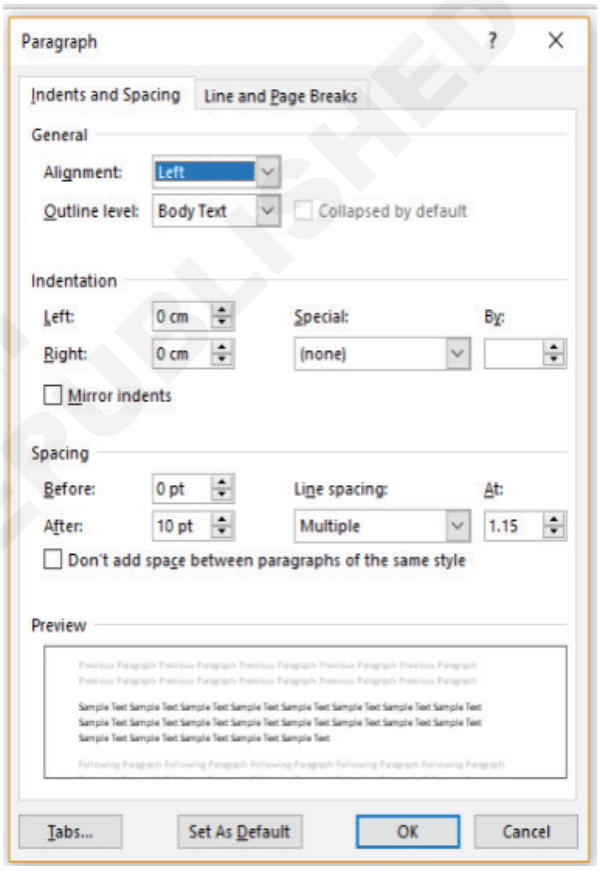
1 Select one or more paragraphs that you want to adjust. (Fig 5)

Fig 5

2 Go to Home and then select the Paragraph dialog box launcher. (Fig 6)

3 Choose the Indents and Spacing tab.

Fig 6



General

Alignment

Choose Left to align text to the left with a ragged right edge (or use the keyboard shortcut, **Ctrl+L**).

Choose Center to center text with a ragged left and right edge **(Ctrl+E)**.

Choose Right to align text to the right with a ragged left edge **(Ctrl+R)**.

Choose Justify to align text both left and right, adding space between words **(Ctrl+J)**.

Outline level — The level at which the paragraph appears in Outline view.

Choose Collapsed by default if you want the document to open with headings collapsed by default.

Indentation

Left Indents the paragraph on the left by the amount you choose.

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Right	Indents the paragraph on the right by the amount you choose.
Special	Choose First line > By to indent the first line of a paragraph.
	Choose Hanging > By to create a hanging indent.
Mirror indents	When you choose this, Left and Right become Inside and Outside. This is for book style printing.

Spacing

Before	Adjusts the amount of space before a paragraph.
After	Adjusts the amount of space after a paragraph.
Line spacing	Choose Single to single-space text.
	Choose 1.5 lines to space text one-and-one-half times that of single spacing.
	Choose Double to double-space text.
	Choose At least > At to set the minimum amount of spacing needed to fit the largest font or graphic on the line.
	Choose Exactly > At to set fixed line spacing, expressed in points.
	Choose Multiple > At to set line spacing as a multiple expressed in numbers greater than 1.
Don't add	Choose Don't add space between paragraphs when you don't want extra space between paragraphs.

If you want to save the settings you chose as your default, select Set as Default.

4 Choose the Line and Page Breaks tab

Keep lines of a paragraph together on a page or in a column

1 Select the paragraphs that contain lines you want to keep together.

2 On the Home tab in Word, select the Paragraph Dialog Box launcher .

3 Select the Line and Page Breaks tab.

4 Under Pagination, select Keep lines together.

5 Select OK.

Keep paragraphs together on a page or in a column

1 Select Home tab ' Paragraph Dialog Box launcher

2 Select the Line and Page Breaks tab.

3 Under Pagination, select Keep with next.

4 Select OK.

Always force a page break before a paragraph

1 Select Home tab ' Paragraph Dialog Box launcher

2 Select the Line and Page Breaks tab.

3 Under Pagination, select Page break before.

4 Select OK.

Control widow and orphan lines

1 Select Home tab→Paragraph Dialog Box launch

2 Select the Line and Page Breaks tab.

3 Under Pagination, select Widow/Orphan control.

4 Select OK.

Note: This option is turned on by default.

Suppress line numbers from a paragraph or paragraphs

1 Select Home tab→Paragraph Dialog Box launcher.

2 Select the Line and Page Breaks tab.

3 Under Formatting, select Suppress line numbers.

4 Select OK.

Remove hyphens from a paragraph or paragraphs

1 Select Home tab ' Paragraph Dialog Box launcher

2 Select the Line and Page Breaks tab.

3 Under Formatting, select Don't hyphenate.

4 Select OK.

Text box Options

You can use the text box options to more tightly wrap the text that surrounds the text box. To use these options, the text box border must be transparent (no line and no fill), and the Wrap Text must be set at Tight or Through.

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1 Select Home tab→Paragraph Dialog Box launcher.

2 Select the Line and Page Breaks tab.

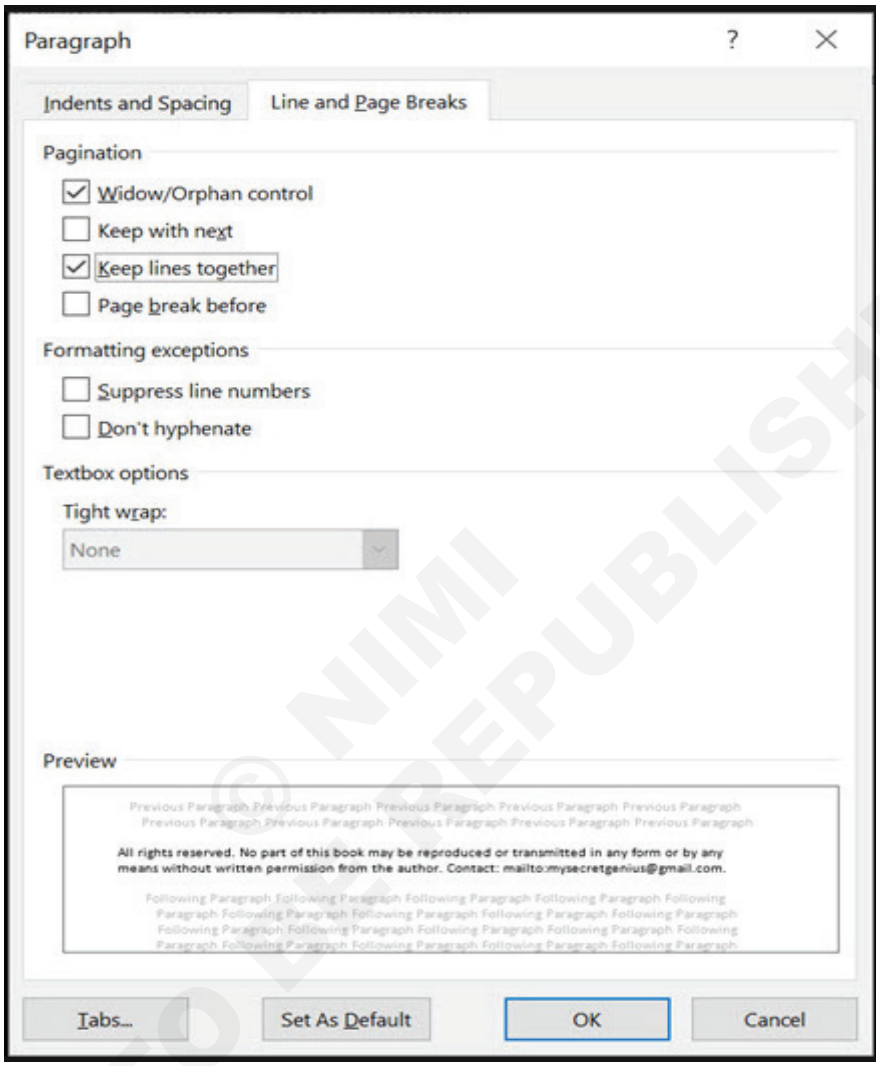
3 Under Textbox options, in the Tight wrap list, select one of the following:

- All
- First and Last Lines
- First Line Only
- Last Line Only

Note: To undo changes, select None.

4 Select OK.

5 Choose your settings, and then select OK



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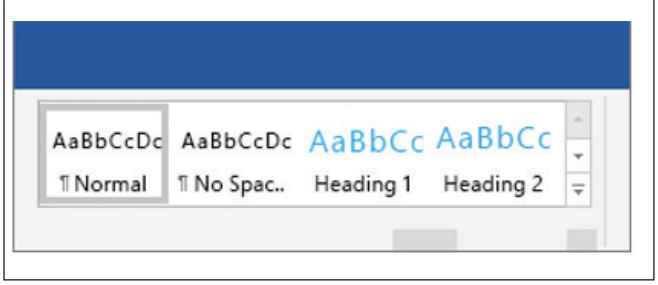
TASK 4: **Apply built-in styles to text**

1 Select the text you want to format.

2 On the Home tab, point to a style to preview it.



If you don't see a style you want, click the More button to expand the gallery.

3 Select a style.

Using Headings allows you to move parts of the document around by using View > Navigation Pane and then moving the listed headings up or down in the doc. Headings also can be used in creation of a table of contents.

TASK 5: **Clear formatting**

Undo formatting

Select Undo to undo the last formatting change.

Clear All Formatting

1 Select the text with the formatting you want to clear.

2 Select Home > Clear All Formatting or press Ctrl + Spacebar

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Create and configure document sections

Objectives: At the end of this exercise you shall be able to
- **format text in multiple columns**
- **insert page, section, and column breaks.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

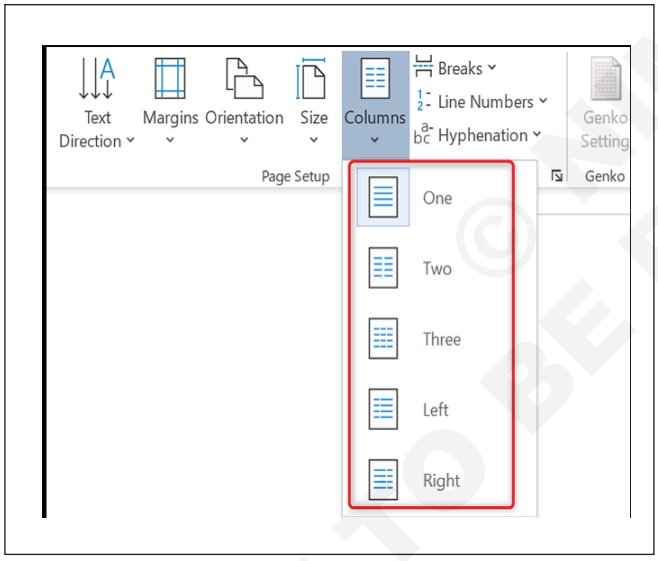
PROCEDURE

TASK 1: **Format text in multiple columns**

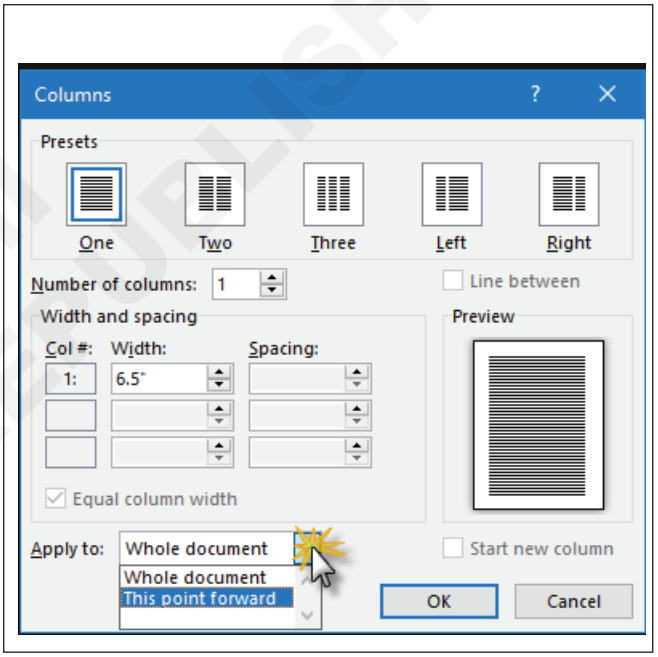
You can format your document in a newspaper-style column layout by adding columns. On the Layout tab, click Columns, then click the layout you want.

1 To apply columns to only part of your document, with your cursor, select the text that you want to format.

2 On the Layout tab, click Columns, then click More Columns.



3 Click Selected text from the Apply to box then Click OK.



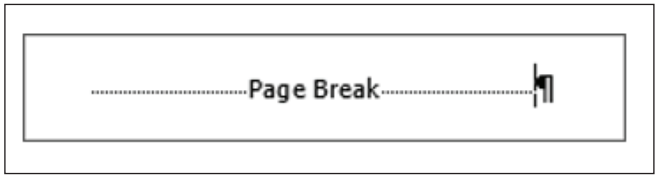
TASK 2: **Insert page, section, and column breaks**

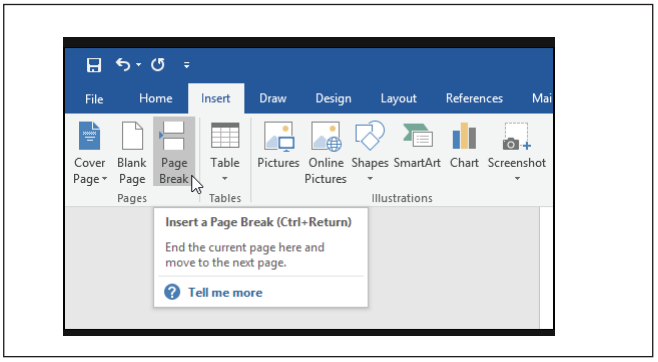
Insert Page Breaks

1 Put your cursor where you want one page to end and the next to begin.

2 Go to Insert > Page Break ¶.

Tip: If Word puts a new page in your document unexpectedly, it might be because of a page break. To view page breaks so that you can select and delete them, go to Home > Show/Hide





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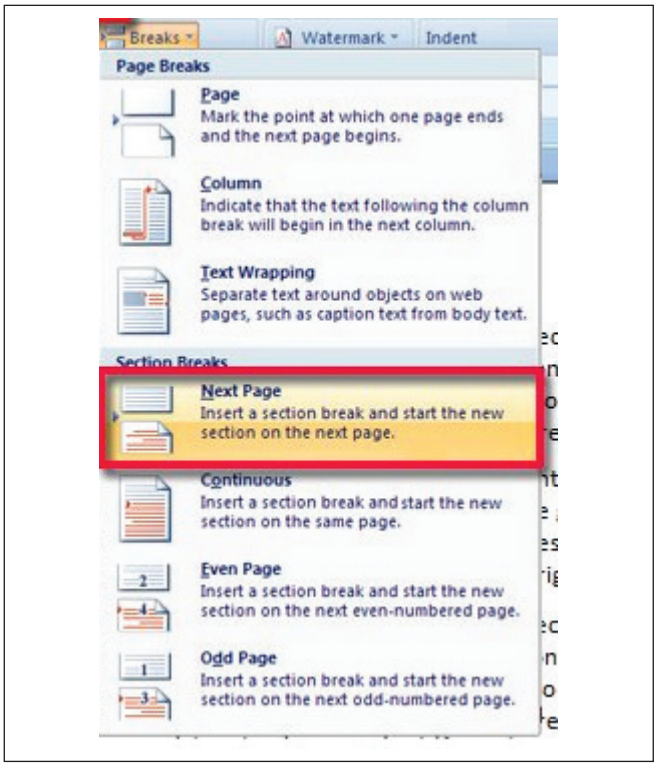
Insert Section Breaks

1 Select where you want a new section to begin.

2 Go to Layout > Breaks.



Choose the type of section break you want:

- **Next Page** Section break starts the new section on the following page.

- **Continuous** Section break starts the new section on the same page. This type of section break is often used to change the number of columns without starting a new page.

- **Even Page** Section break starts a new section on the next even-numbered page.

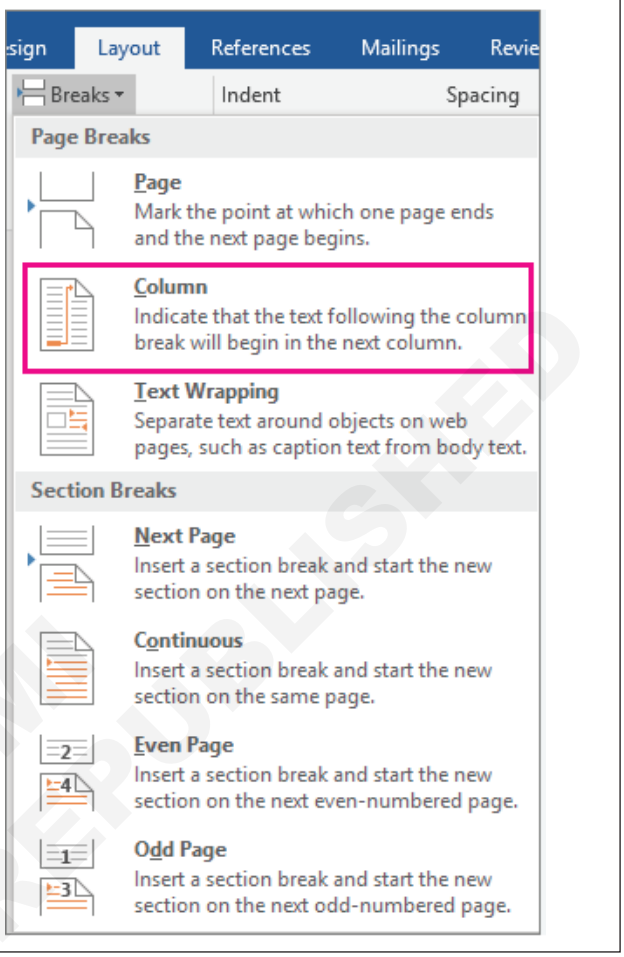
- **Odd Page** Section break starts a new section on the next odd-numbered page.

Insert column breaks

If you format a document with columns (as in some newsletter layouts), the text will automatically flow from one column to the other. You can insert your own column breaks for more control over the document format.

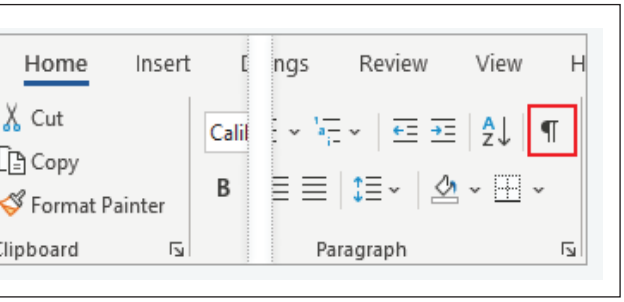
1 Place your cursor where you want the column to break.

2 Click Layout > Breaks.

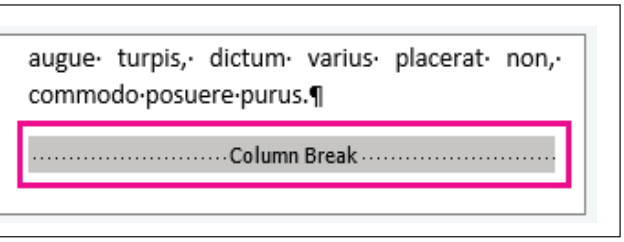


3 A menu with options will appear. Click Column.

4 A column break is inserted. Click Home > Show/Hide to see it.



Tip: The keyboard shortcut Ctrl+Shift+Enter also inserts a column break where you've placed your cursor.



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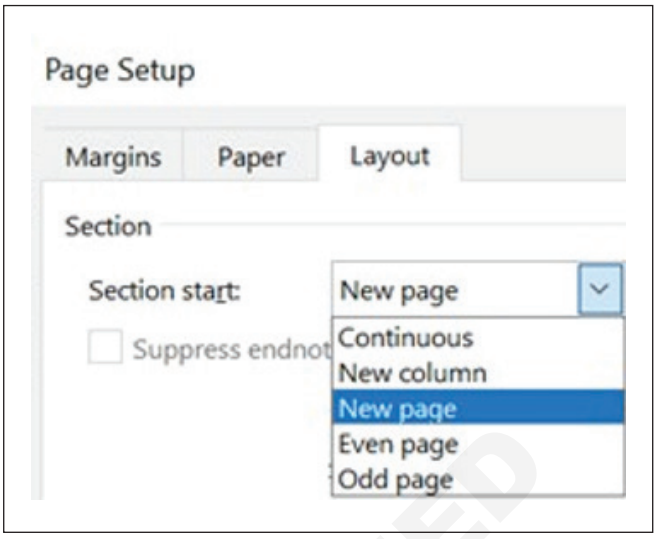
TASK 3: **Change page setup options for a section**

1 On the Layout tab in Word, select the Page Setup launcher .

2 Choose Layout option ‘ Section ‘ Section Start

3 Choose Page setup as you want.

4 Then click OK to complete.



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Create tables

Objectives: At the end of this exercise you shall be able to
- **convert text to tables**
- **convert tables to text**
- **create tables by specifying rows and columns.**

Requirements

Tools/Equipment/Machines

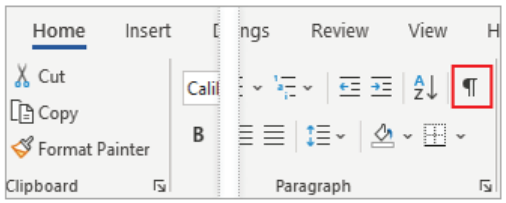
- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Convert text to tables**

To convert text to a table or a table to text, start by clicking the Show/Hide paragraph mark on the Home tab so you can see how text is separated in your document. (Fig 1)

Fig 1



Convert text to a table

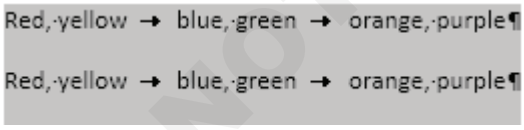
1 Insert separator characters-such as commas or tabs- to indicate where to divide the text into table columns.

Note: If you have commas in your text, use tabs for your separator characters.

2 Use paragraph marks to indicate where you want to begin a new table row.

In this example, the tabs and paragraph marks will produce a table with 3 columns and 2 rows: (Fig 2)

Fig 2



3 Select the text that you want to convert, and then click Insert > Table > Convert Text to Table. (Fig 3)

4 In the Convert Text to Table box, choose the options you want. (Fig 4)

Under Table size, make sure the numbers match the numbers of columns and rows you want.

Under AutoFit behavior, choose how you want your table to look. Word automatically chooses a width for the table columns. If you want a different column width, choose one of these options:

Fig 3

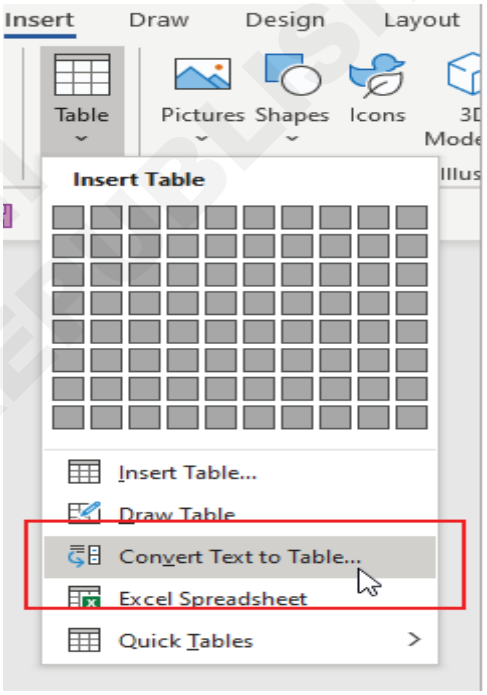
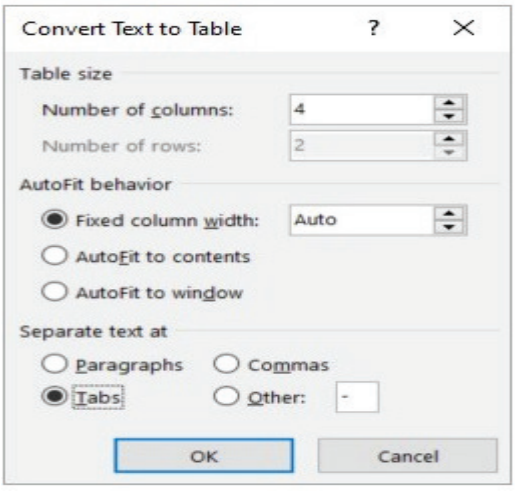


Fig 4



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To do this	Choose this option
Specify a width for all the columns	In the Fixed column width box, type or select a value.
Resize the columns to fit the width of the text in each column	AutoFit to contents
Resize the table automatically in case the width of the available space changes (for example, web layout or landscape orientation)	AutoFit to window

Under Separate text at, choose the separator character you used in the text.

5 Click OK. The text converted to a table should look something like this: (Fig 5)

Fig 5

Red, yellow	blue, green	orange, purple
Red, yellow	blue, green	orange, purple

TASK 2: **Convert tables to text Convert a table to text**

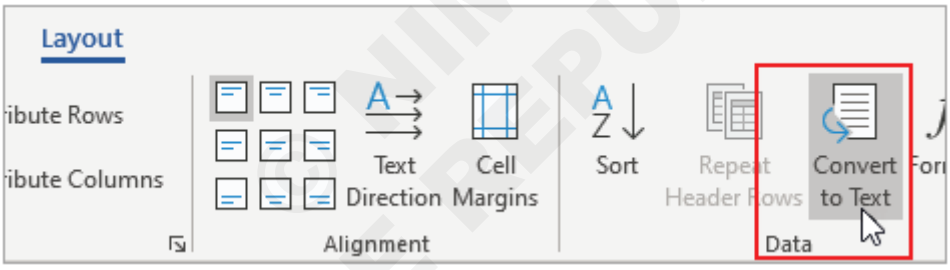
1 Select the rows or table you want to convert to text.

2 On the Layout tab, in the Data section, click Convert to Text.

3 In the Convert to Text box, under Separate text with, click the separator character you want to use in place of the column boundaries. Rows will be separated by paragraph marks.

4 Click OK. (Fig 6)

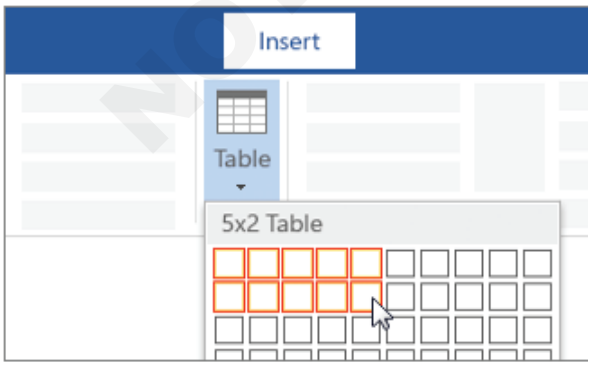
Fig 6



TASK 3: **Create tables by specifying rows and columns**

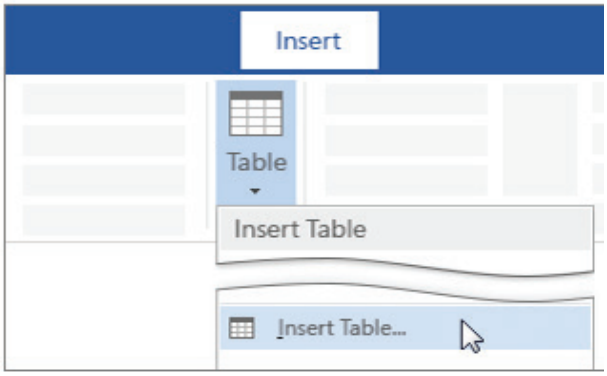
1 For a basic table, click Insert > Table and move the cursor over the grid until you highlight the number of columns and rows you want. (Fig 7)

Fig 7



2 For a larger table, or to customize a table, select Insert > Table > Insert Table. (Fig 8)

Fig 8



Tips

- If you already have text separated by tabs, you can quickly convert it to a table. Select Insert > Table, and then select Convert Text to Table.
- To draw your own table, select Insert > Table > Draw Table.

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Modify tables

Objectives: At the end of this exercise you shall be able to
- **sort table data**
- **configure cell margins and spacing**
- **merge and split cells**
- **resize tables, rows, and columns**
- **split tables**
- **configure a repeating row header.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Sort table data**

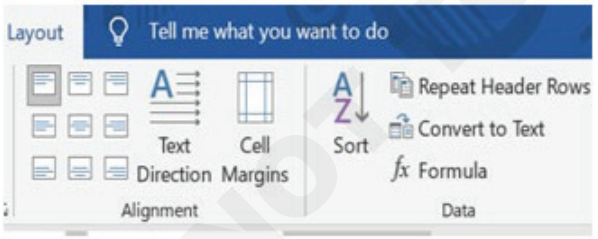
Sort a table in Word

1 Select any Column where do you want to sort in the table.

Name	Trade
RamKumar	CHNM
Amar	Electrician
Sekar	Welder
Vikram	RACT
Karthick	MTTW

2 Select Table Tools Layout > Data Group > Sort. (Fig 1).

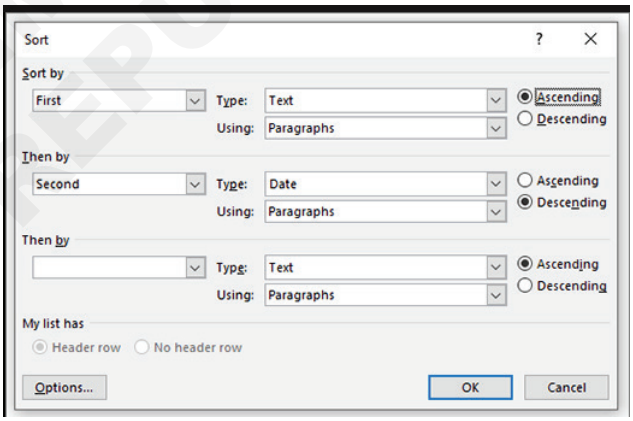
Fig 1



3 Choose your sort criteria:

- Select the column you want to Sort by.
- To sort on a second column, select Then by and select another column.
- Select Ascending or Descending.
- To keep the header row at the top of the table, select Header row. (Fig 2)

Fig 2



4 Select OK.

Name	Trade
Amar	Electrician
Karthick	MTTW
RamKumar	CHNM
Sekar	Welder
Vikram	RACT

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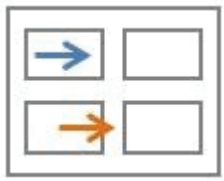
TASK 2: **Configure cell margins and spacing**

Add or change the space inside the table

To add space inside your table, you can adjust cell margins or cell spacing. (Fig 3)

Fig 3



Cell margins are inside the table cell, like the blue arrow on the top of the graphic. Cell spacing is between the cells, like the orange arrow on the bottom.

1 Click the table.

2 On the Layout tab, in the Alignment group, click Cell Margins, and then in the Table Options dialog box

3 Do one of the following:

- Under Default cell margins, enter the measurement you want to adjust the Top, Bottom, Left, or Right margins.
- Under Default cell spacing, select the Allow spacing between cells check box, and then enter the measurement you want.

Note: The settings that you choose are available only in the active table. Any new tables that you create will use the original default setting.

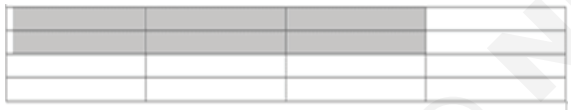
TASK 3: **Merge and split cells**

Merge and split cells

You can combine two or more table cells located in the same row or column into a single cell.

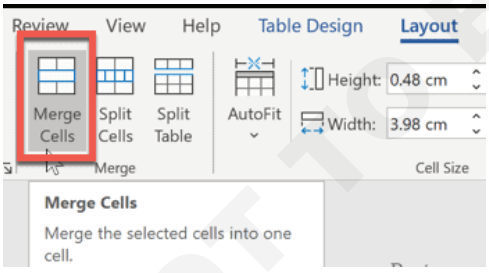
1 Select the cells that you want to merge. (Fig 4)

Fig 4



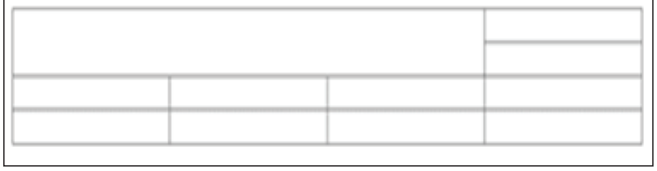
2 Under Table Tools, on the Layout tab, in the Merge group, click Merge Cells. (Fig 5)

Fig 5



3 The cells you selected will now be merged together. (Fig 6)

Fig 6



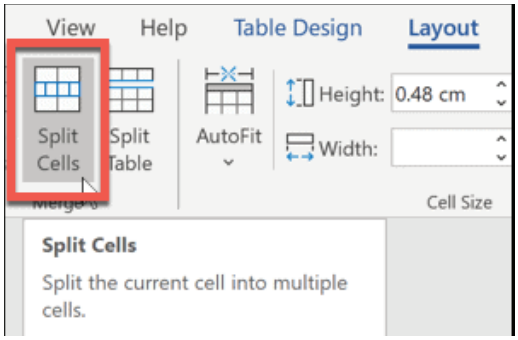
Split cells

1 Click in a cell, or select multiple cells that you want to split. (Fig 7)

Fig 7

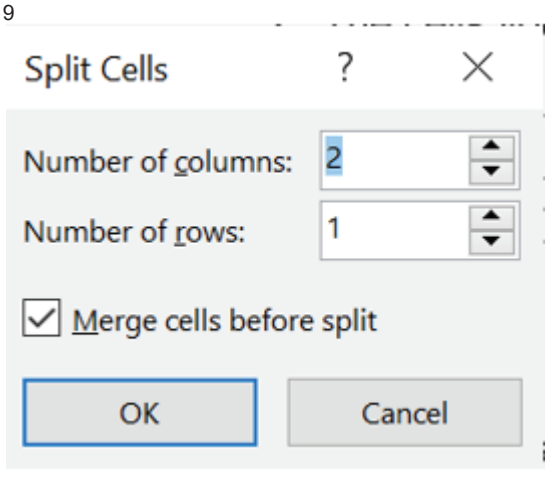
2 Under Table Tools, on the Layout tab, in the Merge group, click Split Cells. (Fig 8)

Fig 8



3 Enter the number of columns or rows that you want to split the selected cells into. (Fig 9)

Fig 9



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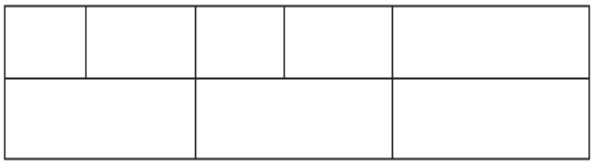
4 Click OK to confirm your choice. (Fig 10)

5 Your cells will now be split using the values you selected in the Split Cells dialog box.

Fig 10



TASK 4: **Resize tables, rows, and columns**

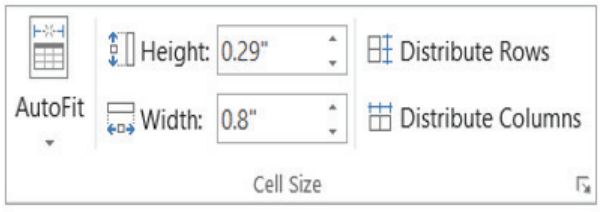
Resize a column or table automatically with AutoFit

Automatically adjust your table or columns to fit the size of your content by using the AutoFit button.

1 Select your table.

2 On the Layout tab, in the Cell Size group, click AutoFit. (Fig 11)

Fig 11



3 Do one of the following.

- To adjust column width automatically, click AutoFit Contents.
- To adjust table width automatically, click AutoFit Window.

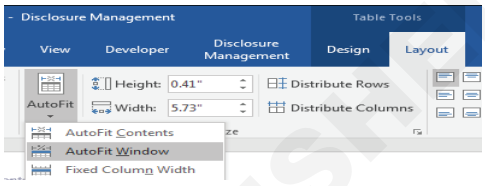
Note: Row height automatically adjusts to the size of the content until you manually change it.

Turn off AutoFit

If you don't want AutoFit to automatically adjust your table or column width, you can turn it off.

1 Select your table. (Fig 12)

Fig 12



2 On the Layout tab, in the Cell Size group, click AutoFit.

3 Click Fixed Column Width.

Resize an entire table manually

1 Rest the cursor on the table until the table resize handle appears at the lower-right corner of the table.

2 Rest the cursor on the table resize handle until it becomes a double-headed arrow.

3 Drag the table boundary until the table is the size you want.

TASK 5: **Split tables**

Once you have a table in Word, you might decide to split that table into two or more tables. This way, you can create smaller tables, or add text in between two tables.

1 Put your cursor on the row that you want as the first row of your second table. In the example table, it's on the third row. (Fig 13)

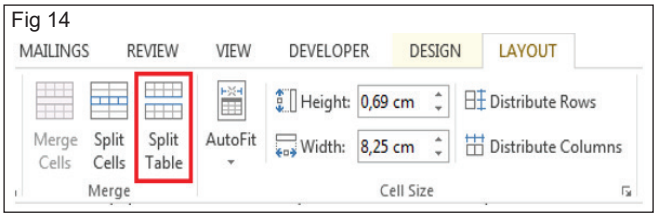
Fig 13

1	A
2	B
3	C
4	D

When you click inside the table, two new Table tools tabs appear on the ribbon: DESIGN and LAYOUT. These tools are visible only when you are in the table, for example, when you add content to the cells.

2 On the LAYOUT tab, in the Merge group, click Split Table. (Fig 14)

Fig 14



The table splits into two tables.

You can split the table further, as long as there are multiple rows. (Fig 15)

Fig 15

1	A
2	B

3	C
4	D

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TASK 6: **Configure a repeating row header**

When you work with a very long table, it will run across multiple pages. You can set up the table so that the table header row or rows appear on each page automatically.

You can choose from two ways to set up your table so that its header row or rows repeat.

You can do the following:

1 Select the header row or rows that you want to repeat on each page. The selection must include the first row of the table.

2 Under Table Tools, on the Layout tab, in the Data group, click Repeat Header Rows. (Fig 16)

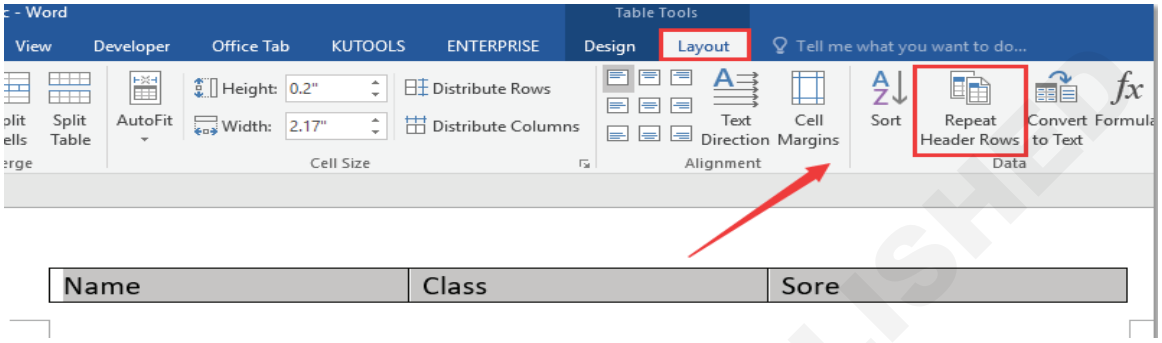
Or, you can use this approach:

1 In the table, right-click in the row that you want to repeat, and then click Table Properties.

2 In the Table Properties dialog box, on the Row tab, select the Repeat as header row at the top of each page check box.

3 Select OK.

Fig 16



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Create and modify lists

Objectives: At the end of this exercise you shall be able to
- **format paragraphs as numbered and bulleted lists**
- **change bullet characters and number formats**
- **define custom bullet characters and number formats**
- **increase and decrease list Levels**
- **restart and continue list numbering**
- **set starting number values.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Format paragraphs as numbered and bulleted lists**

Create a list

To start a numbered list, type 1, a period (.), a space, and some text. Word will automatically start a numbered list for you.

Type* and a space before your text, and Word will make a bulleted list.

To complete your list, press Enter until the bullets or numbering switch off.

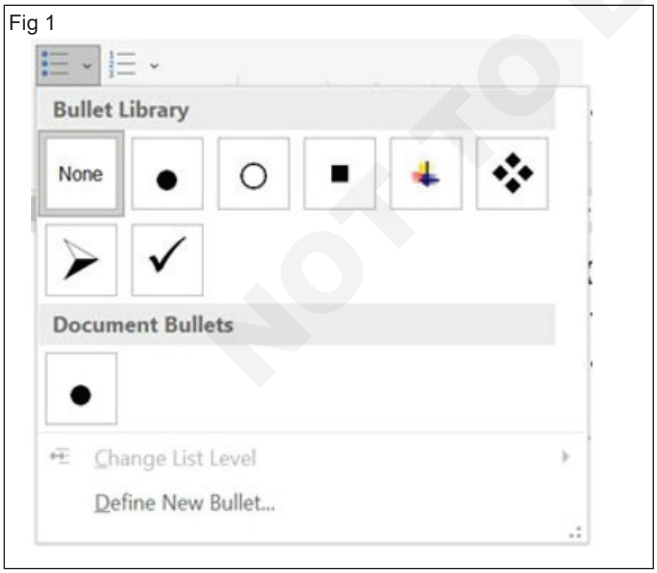
Create a list from existing text

1 Select the text you want to change into a list.

2 Go to Home> Bullets or Home> Numbering.

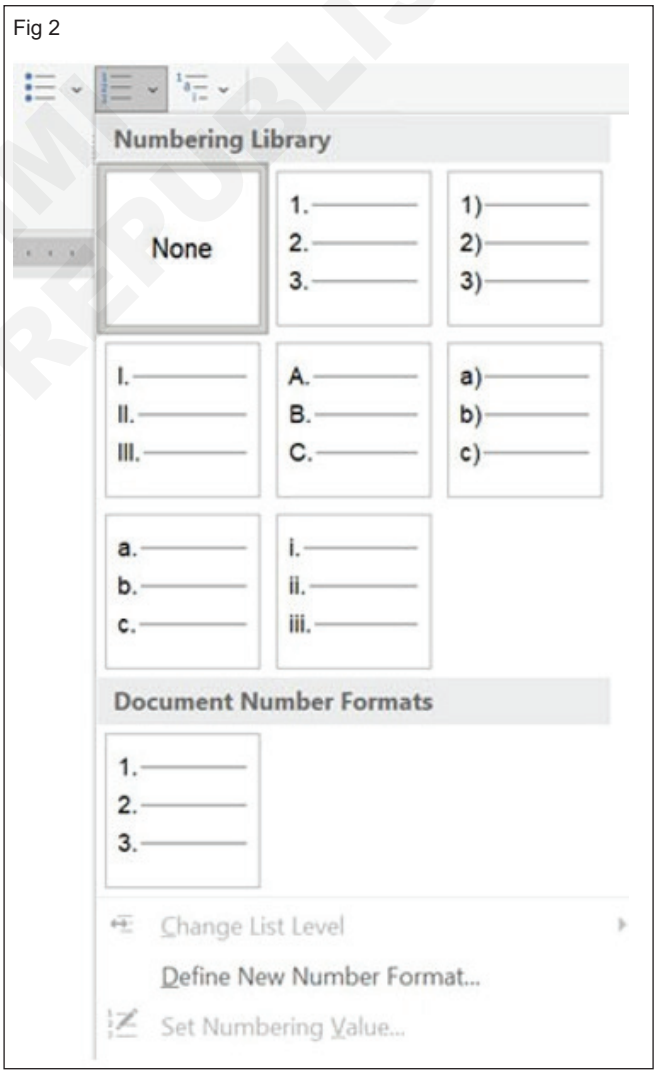
Bullet Library (Fig 1)

Fig 1



Numbering Library (Fig 2)

Fig 2



Note: Find different bullet styles and numbering formats by clicking the down arrow next to Bullets or Numbering.

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TASK 2: **Change bullet characters and number formats**

1 Select the text or bulleted list you want to change. (Fig 3)

Fig 3

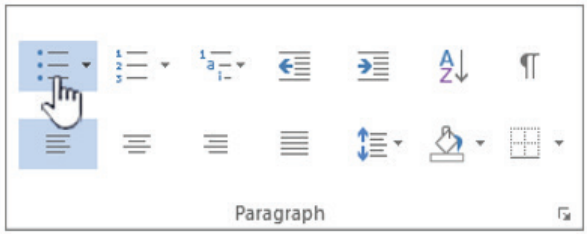
2 Click a bullet or number in the list that you want to change.

By clicking a bullet or number in an automatically recognized bulleted or numbered list, you select the entire list.

3 On the Home tab, in the Paragraph group, click Bullets or Numbering.

To change the list back, click either Bullets or Numbering (Fig 4)

Fig 4



TASK 3: **Define custom bullet characters and number formats**

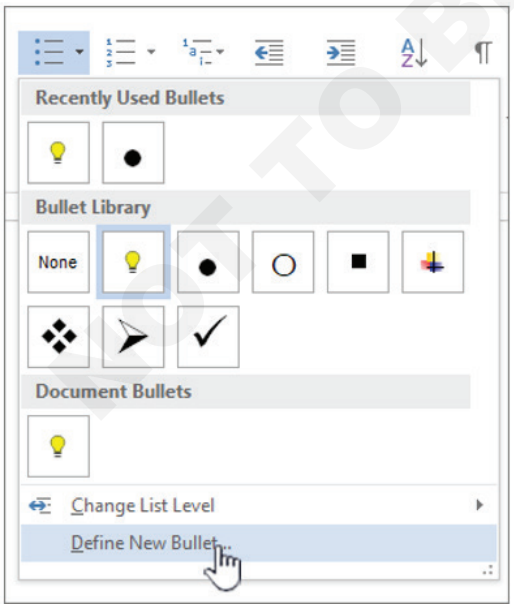
Change the bullet to a symbol / Picture / Font

1 Select the text or bulleted list you want to change. (Fig 5)

Fig 5

2 On the Home tab, in the Paragraph group, click the arrow next to Bulleted List (Fig 6).

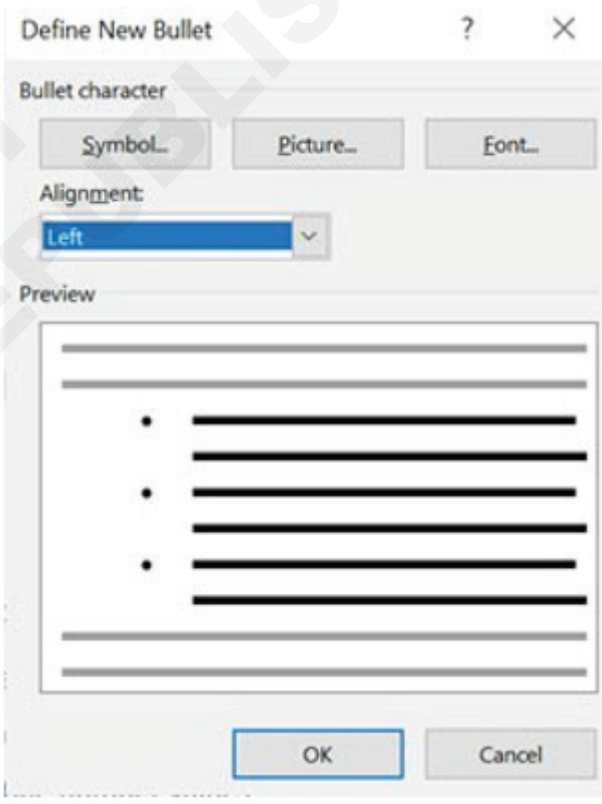
Fig 6



3 Then click Define New Bullet (Fig 7)

- Click Symbol and then click the symbol you want to use.

Fig 7



- Click OK.

Change the bullet to a Picture

- Click Picture and then browse for your picture from a file or Bing Image Search. (Fig 8)
- Click Insert.
- Review what the picture bullets will look like and click OK to add it or change the picture by repeating steps 3-5.

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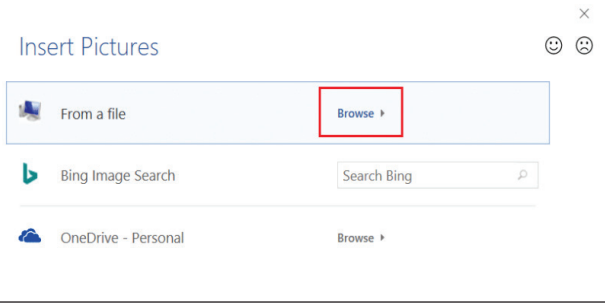
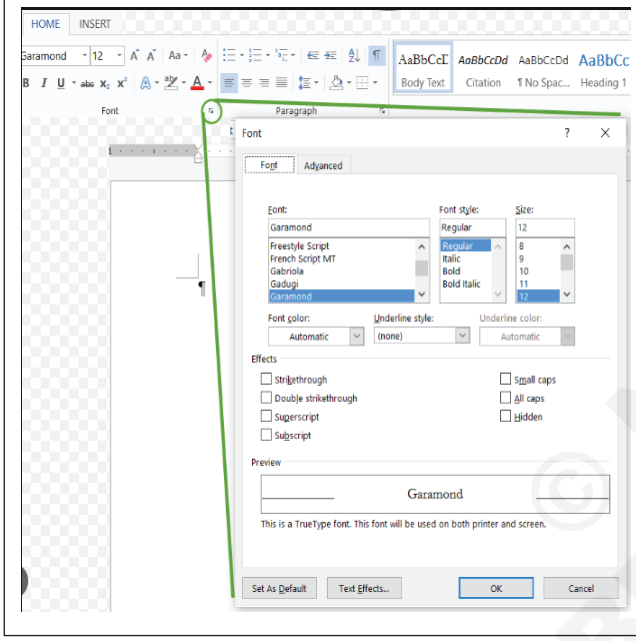
Fig 8



Change the bullet to a Font

- Click Font and then change the font properties to be used for the bullet. You can choose settings on the Font tab or Advanced tab: (Fig 9)

Fig 9



Tab	Description
Font tab	Change the bullet font, style, size, color, underline style, underline color, and effects
Advanced tab	Change the bullet font character spacing and OpenType features.

Change the bullet alignment

1 Under alignment, choose Left, Centered, or Right. (Fig 10)

2 Click OK.

Define a new number format

1 Select the text or numbered list you want to change. (Fig 11)

Fig 10

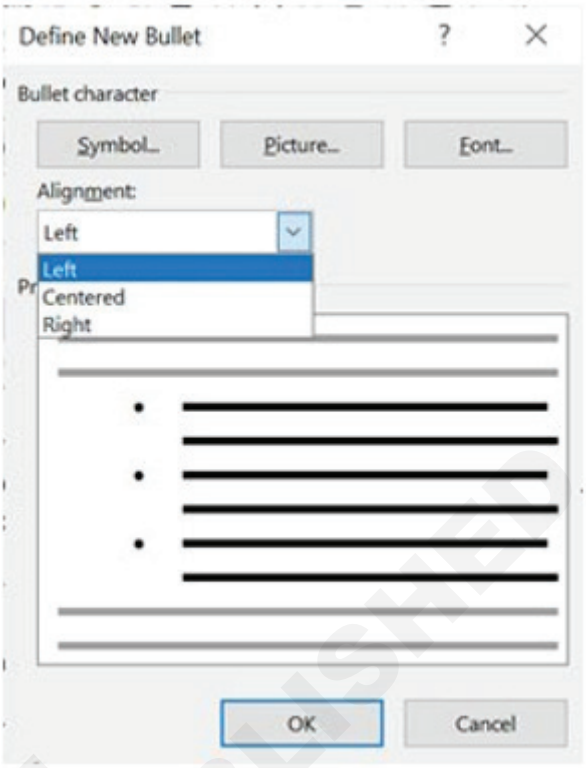
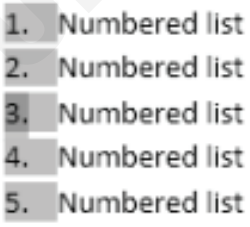


Fig 11



2 On the Home tab, in the Paragraph group, click the arrow next to Numbered List, and then click Define New Number Format.

3 To change the style, click the down arrow next to Number style and choose numbers, letters, or another chronological format.

4 To change the font size, style, and color, click Font and choose a setting on the Font tab or Advanced tab:. (Fig 12 & 13)

Tab	Description
Font tab	Change the bullet font, style, size, color, underline style, underline color, and effects.
Advanced tab	Change the bullet font character spacing and OpenType features.

5 To append the numbering with a dash, parentheses, or another value, enter it in the Number format field.

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Fig 12

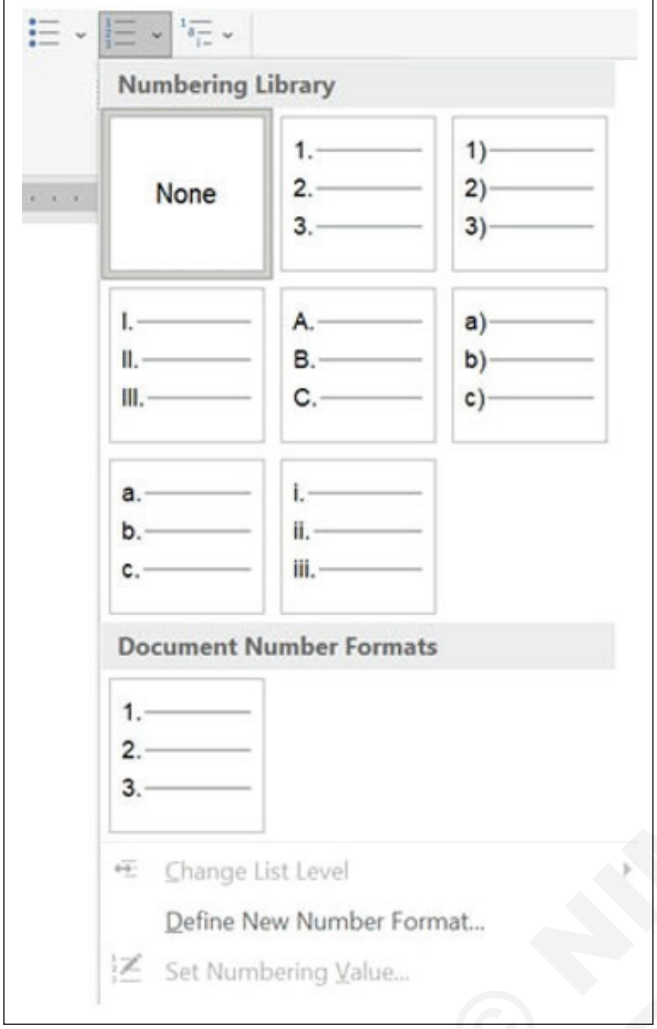
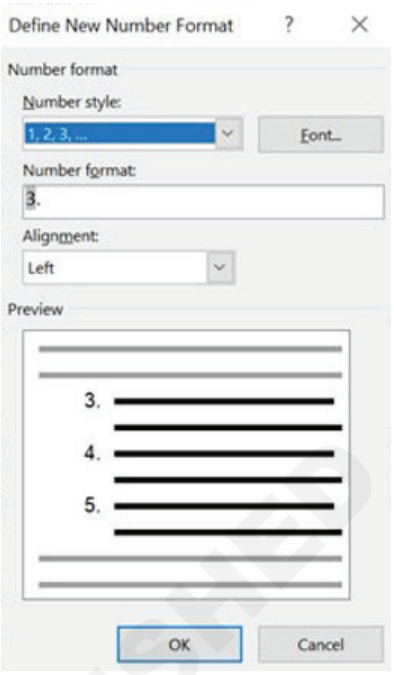


Fig 13



6 To change the number alignment, choose Left, Centered, or Right under Alignment.

7 Click OK.

TASK 4: **Increase and decrease list Levels**

You can easily change the level of a list item.

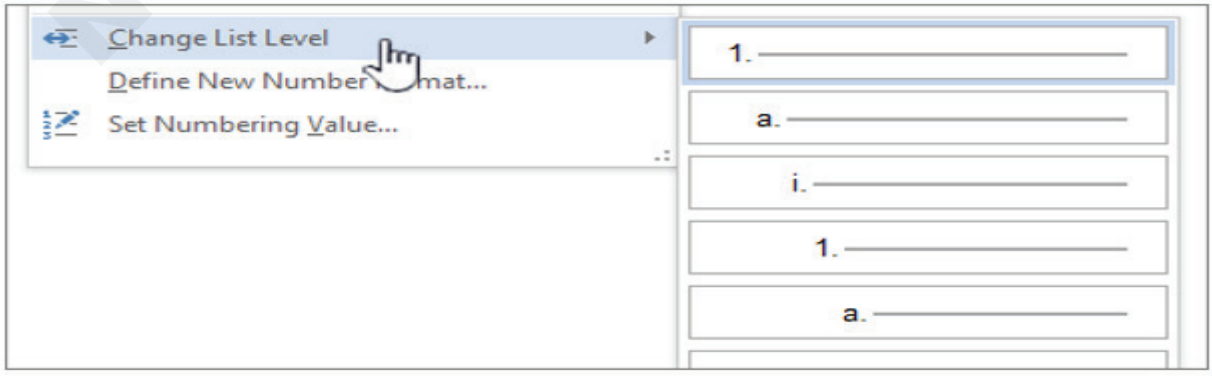
1 Click the bullet or number that has moved out of position.

2 On the Home tab, under Paragraph, click the arrow next to Bullets or Numbering. (Fig 14)

3 Point to Change List Level, and then click the level that you want. (Fig 15)

Fig 14

Fig 15



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TASK 5: **Restart and continue list numbering**

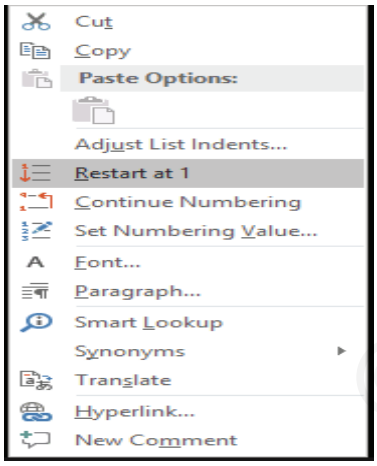
Restart numbering at 1

1 Click the item that you want to be the first item in the new list. (Fig 16)

Fig 16

2 Ctrl+click or right-click the item, and then click Restart numbering. (Fig 17)

Fig 17



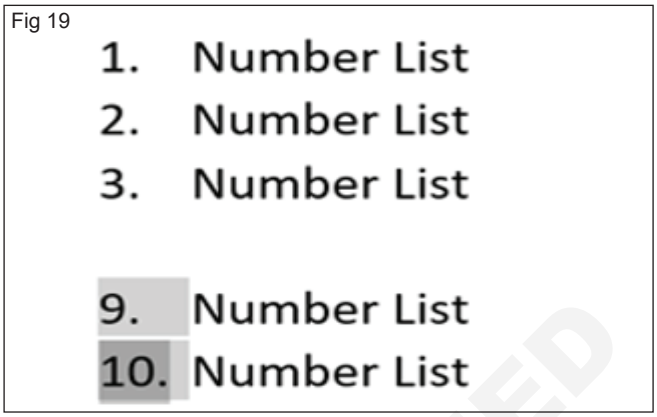
3 Then Bulleting Number list start by 1 (Fig 18)

Fig 18

Continue Numbering

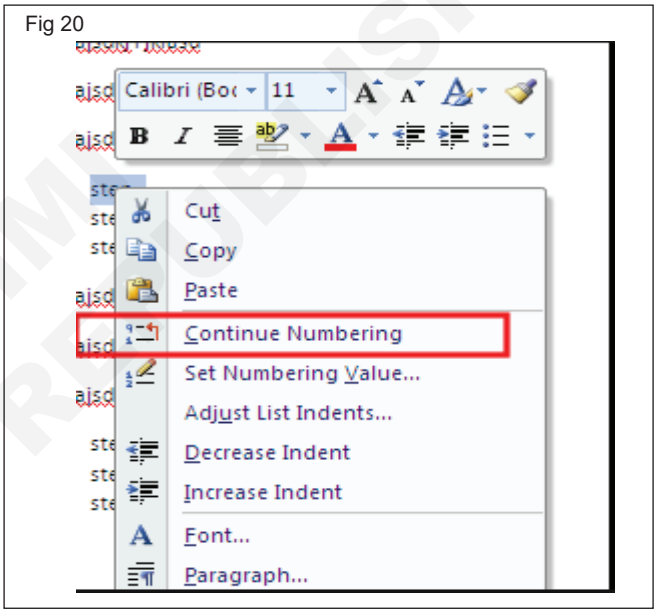
1 Click the item that you want to be the first item in the new list. (Fig 19)

Fig 19



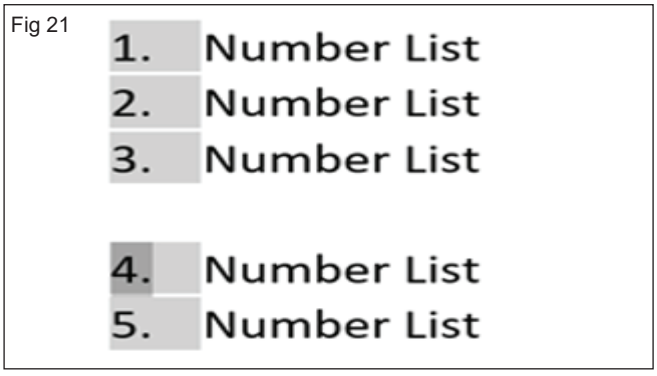
2 Ctrl+click or right-click the item, and then click Continue numbering. (Fig 20)

Fig 20



3 Then Bulleting Number List will continue to start from as above. (Fig 21)

Fig 21



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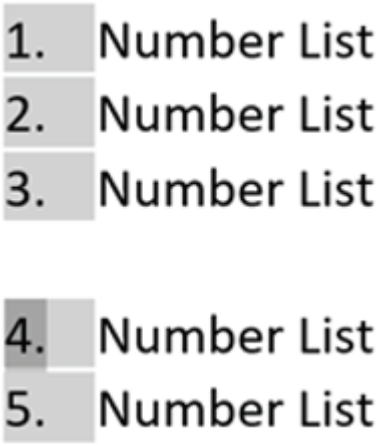
TASK 6: **Set starting number values**

1 Double-click the numbers in the list. The text won't appear selected. (Fig 22)

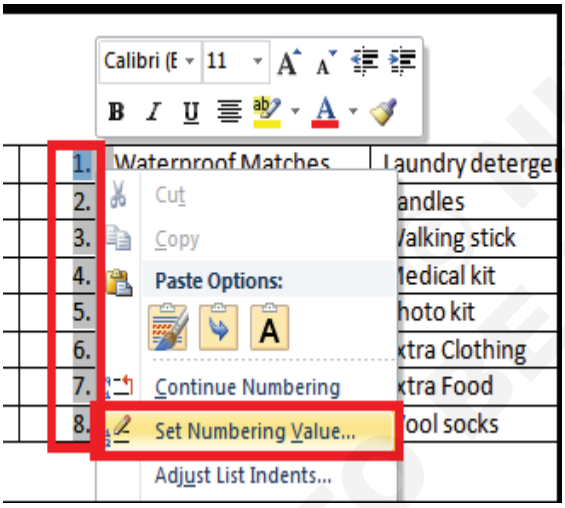
Fig 22



2 Right-click the number you want to change.

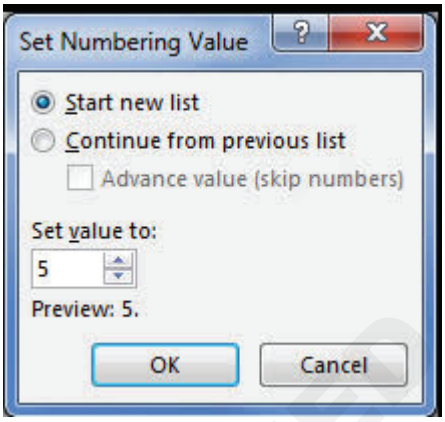
3 Click Set Numbering Value. (Fig 23)

Fig 23



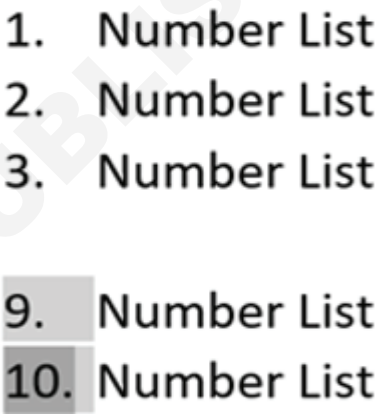
4 In the Set value to: box, use the arrows to change the value to the number you want. For Example Set Value by 9 then click OK. (Fig 24)

Fig 24



5 Then the result will be followed list by 9. (Fig 25)

Fig 25



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Create and manage reference elements

Objectives: At the end of this exercise you shall be able to
- **insert footnotes and endnotes**
- **modify footnote and endnote properties**
- **create and modify bibliography citation sources**
- **insert citations for bibliographies.**

Requirements

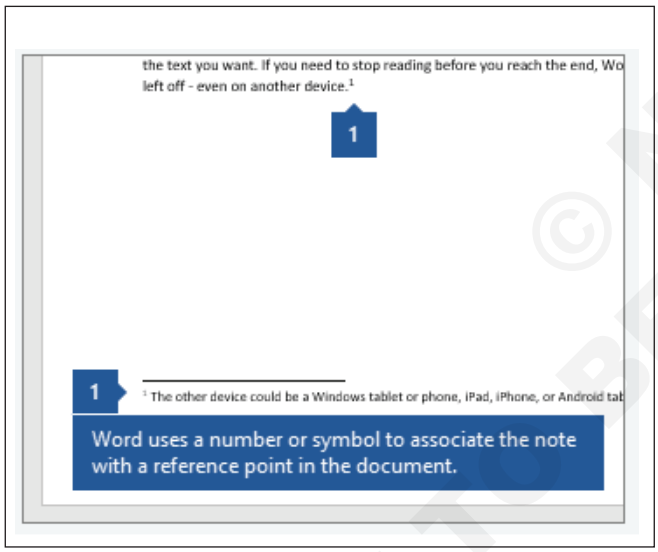
Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

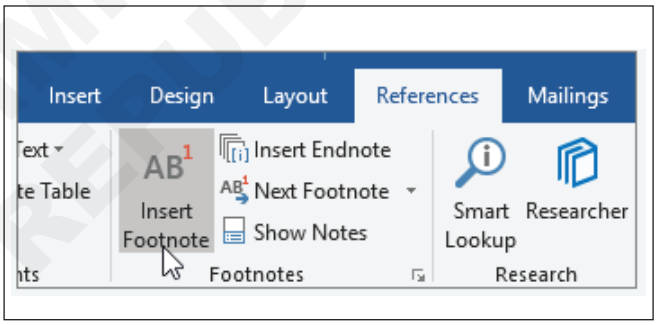
TASK 1: **Insert footnotes and endnotes**

Footnotes appear at the bottom of the page and endnotes come at the end of the document. A number or symbol on the footnote or endnote matches up with a reference mark in the document.



1 Click where you want to reference to the footnote or endnote.

2 On the References tab, select Insert Footnote or Insert Endnote.



3 Enter what you want in the footnote or endnote.

4 Return to your place in the document by double-clicking the number or symbol at the beginning of the note

TASK 2: **Modify footnote and endnote properties**

Footnote font, footnote font size, footnote superscript, and footnote spacing - this video will explain how to change these attributes.

Change the footnote font size, and formatting

To change the font, size and formatting of footnotes:

1 Click the HOME tab, and then in the Styles group, click the arrow for more options. Or, press ALT+CTRL+SHIFT+S.

2 At the bottom of the Styles pane, click the Manage Styles button.

3 For Sort order, choose Alphabetical.

4 Do one of the following:
- To change the formatting of the footnote numbers, select the Footnotes Reference Style.
- If you want to change the formatting of the footnote text at the bottom of the page, select the Footnote Text Style.

5 Click Modify, and then change the formatting options (font, size, and so on). For even more formatting options, click the Format button in the lower-left corner.

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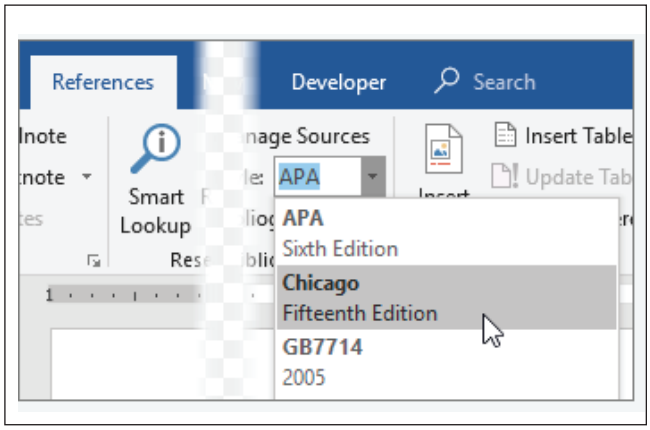
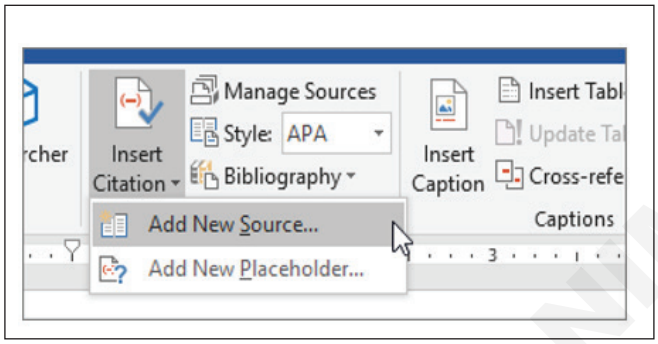
TASK 3: **Create and modify bibliography citation sources**

1 Put your cursor at the end of the text you want to cite.

2 Go to References > Style, and choose a citation style.



3 Select Insert Citation.

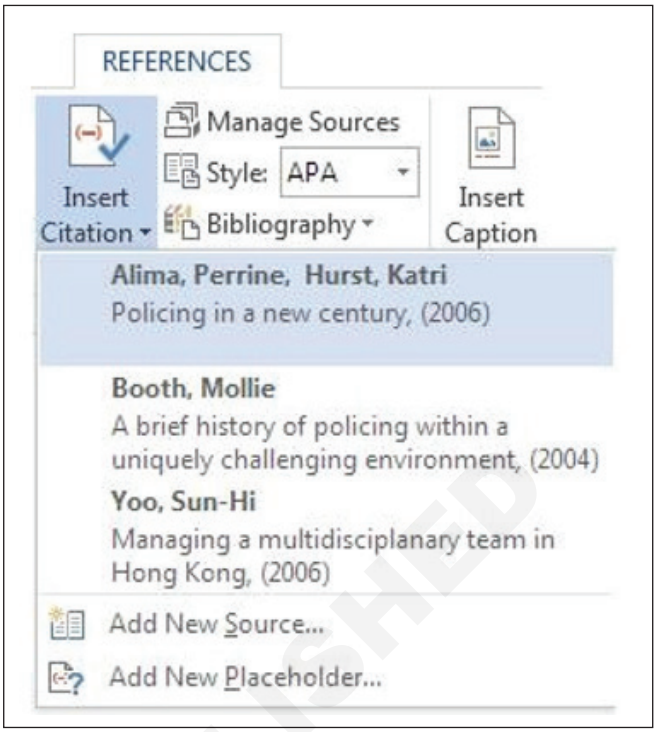


4 Choose Add New Source and fill out the information about your source.

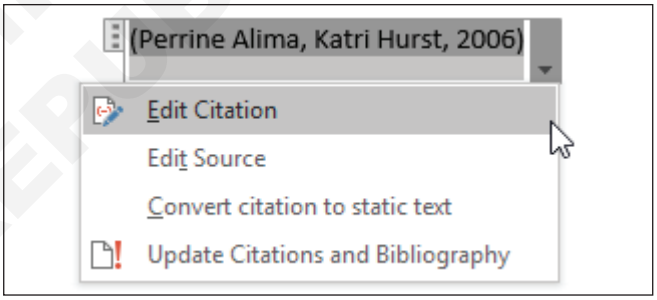
Once you've added a source to your list, you can cite it again:

1 Put your cursor at the end of the text you want to cite.

2 Go to References > Insert Citation, and choose the source you are citing.



5 To add details, like page numbers if you're citing a book, select Citation Options, and then Edit Citation.



Create a bibliography

With cited sources in your document, you're ready to create a bibliography.

1 Put your cursor where you want the bibliography.

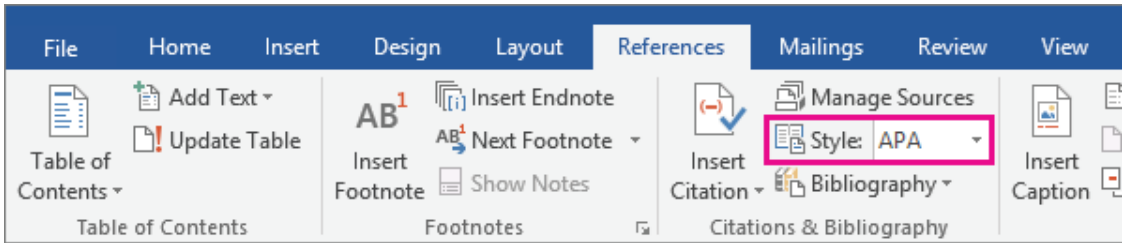
2 Go to References > Bibliography, and choose a format.

TASK 4: **Insert citations for bibliographies**

Add a new citation and source to a document

1 On the References tab, in the Citations & Bibliography group, click the arrow next to Style and click the style that you want to use for the citation and source. For example, social sciences documents usually use the MLA or APA styles for citations and sources.

2 Click at the end of the sentence or phrase that you want to cite.



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3 On the Reference tab, click Insert Citation and then do one of the following:

- To add the source information, click Add New Source, and then, in the Create Source dialog box, click the arrow next to Type of Source, and select the type of source you want to use (for example, a book section or a website).
- To add a placeholder, so that you can create a citation and fill in the source information later, click Add New Placeholder. A question mark appears next to placeholder sources in Source Manager.

4 If you chose to add a source, enter the details for the source. To add more information about a source, click the Show All Bibliography Fields check box.

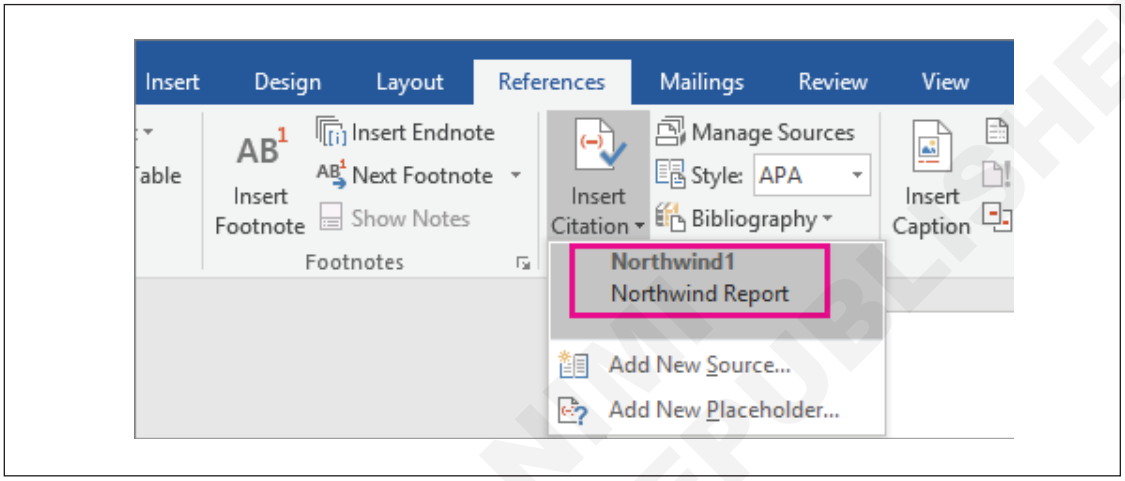
5 Click OK when finished. The source is added as a citation at the place you selected in your document.

When you've completed these steps, the citation is added to the list of available citations. The next time you quote this reference, you don't have to type it all out again. You just add the citation to your document. After you've added a source, you may find you need to make changes to it at a later time.

Add citations to your document

1 Click at the end of the sentence or phrase that you want to cite, and then on the References tab, in the Citations & Bibliography group, click Insert Citations.

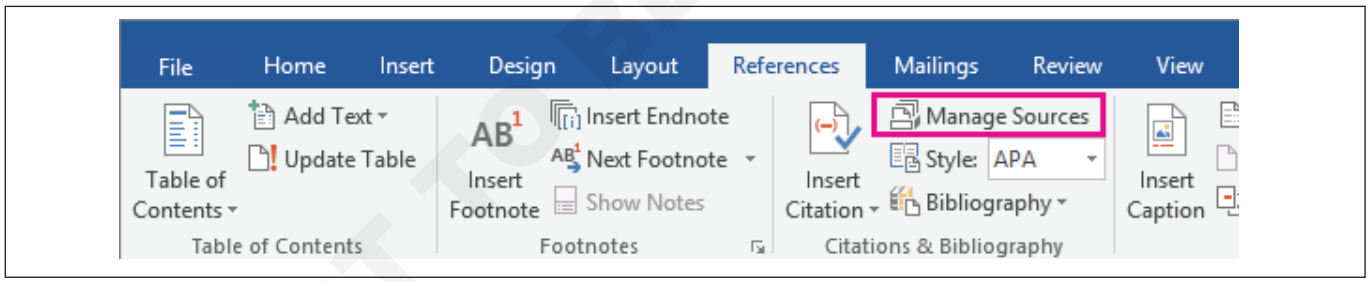
2 From the list of citations under Insert Citation, select the citation you want to use.



Find a source

The list of sources that you use can become quite long. At times, you might need to search for a source that you cited in another document.

1 On the References tab, in the Citations & Bibliography group, click Manage Sources.



If you open a new document that does not yet contain citations, all of the sources that you used in previous documents appear under Master List.

If you open a document that includes citations, the sources for those citations appear under Current List. All the sources that you have cited, either in previous documents or in the current document, appear under Master List.

2 To find a specific source, do one of the following:

- In the sorting box, sort by author, title, citation tag name, or year, and then look for the source that you want in the resulting list.
- In the Search box, type the title or author for the source that you want to find. The list dynamically narrows to match your search term.

Edit a source

1 On the References tab, in the Citations & Bibliography group, click Manage Sources.

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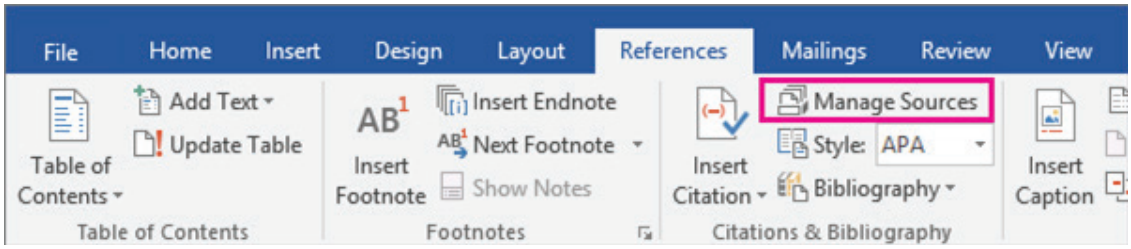
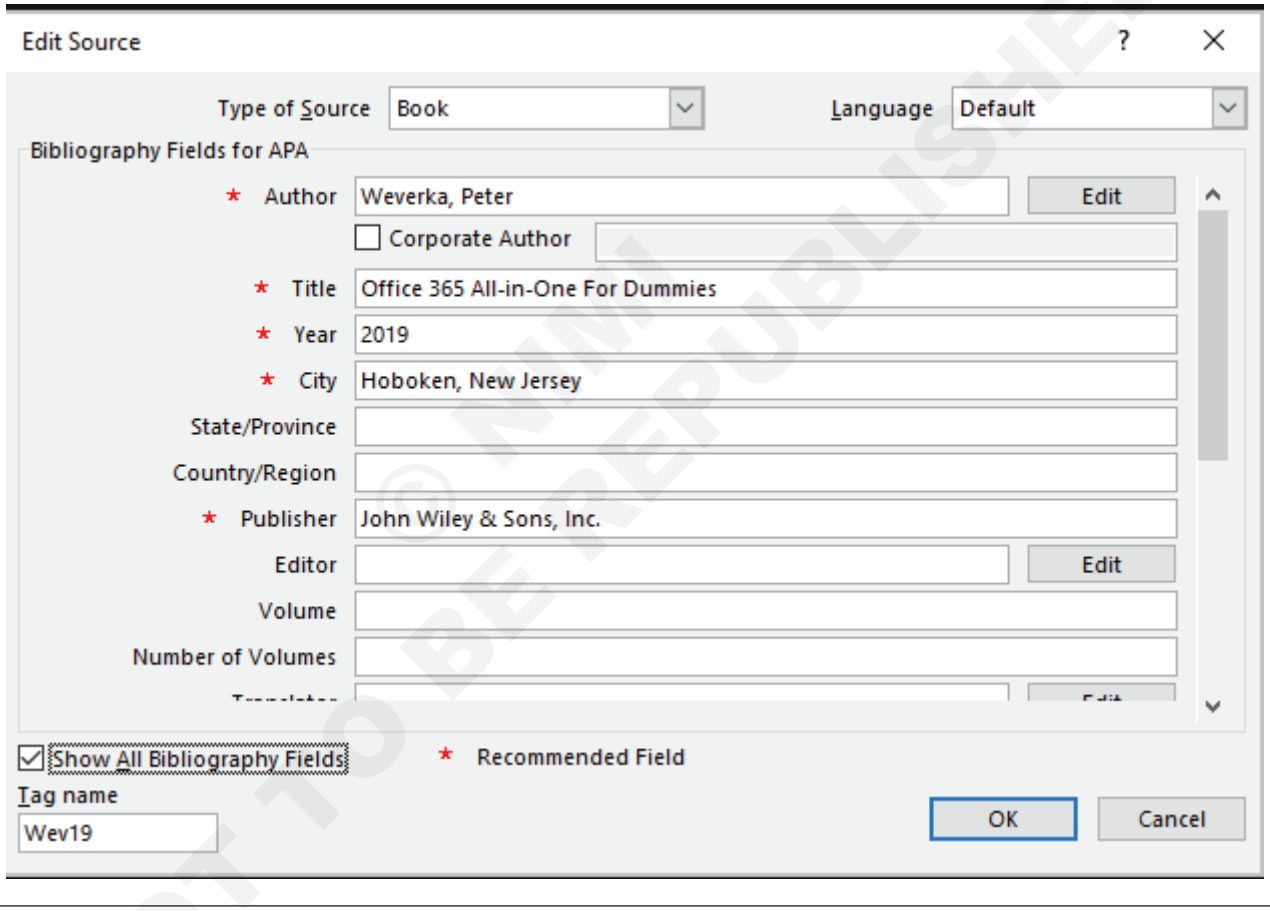


2 In the Source Manager dialog box, under Master List or Current List, select the source you want to edit, and then click Edit.

Note: To edit a placeholder to add citation information, select the placeholder from Current List and click Edit.

3 In the Edit Source dialog box, make the changes you want and click OK.



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Create and manage reference tables

Objectives: At the end of this exercise you shall be able to
- **insert tables of contents**
- **customize tables of contents**
- **insert bibliographies.**

Requirements

Tools/Equipment/Machines

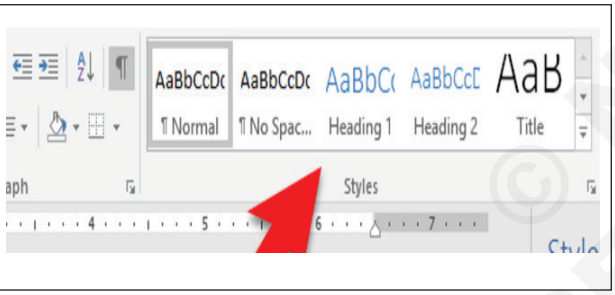
- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

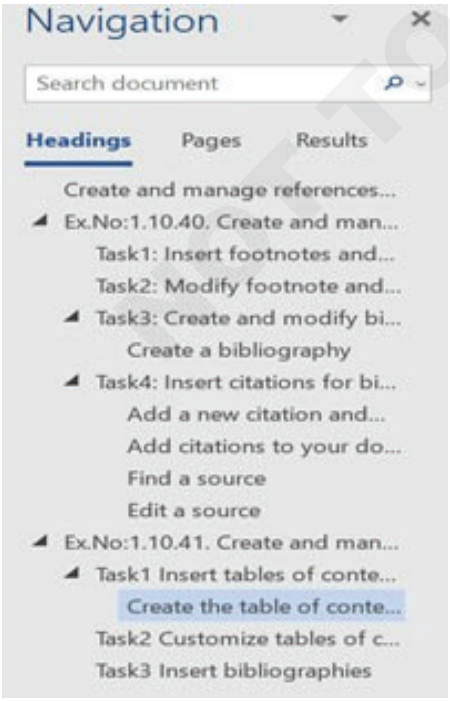
TASK 1: **Insert tables of contents**

Create the table of contents

Note: Before Creating Table of contents, keep your Documents Heading using formatted by Styles group by Heading1, Heading2, Heading3 and Etc.



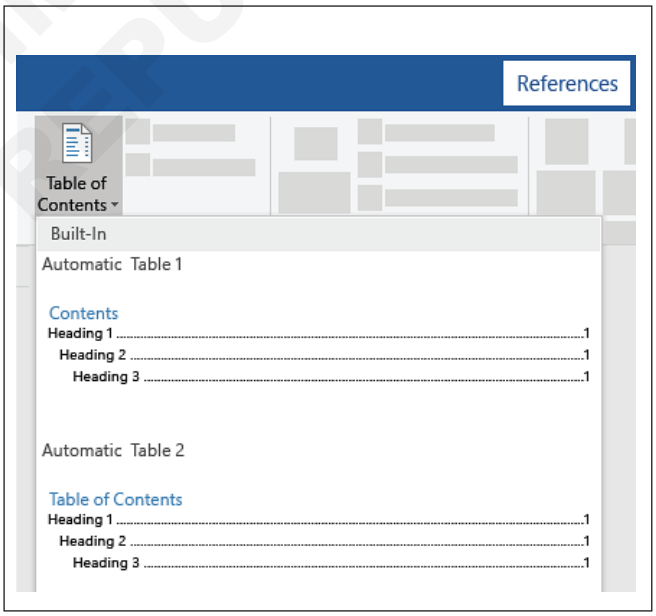
To View Headings **Ctrl + F**



1 Then Put your cursor where you want to add the table of contents.

Note: Preparable First Page will be used to table of contents as Index of Book.

2 Go to References > Table of Contents. and choose an automatic style.



3 If you make changes to your document that affect the table of contents, update the table of contents by right- clicking the table of contents and choosing Update Field.

Example : Result

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Table of Contents

Create and manage references (3Hrs.) 1

Ex.No:1.10.40. Create and manage reference elements (1.4 Hrs) 1

Task1: Insert footnotes and endnotes 1

Task2: Modify footnote and endnote properties 1

Task3: Create and modify bibliography citation sources 2

Create a bibliography 3

Task4: Insert citations for bibliographies 3

Add a new citation and source to a document 3

Add citations to your document 4

Find a source 5

Edit a source 5

Ex.No:1.10.41. Create and manage reference tables (1.6 Hrs) 6

Task1 Insert tables of contents 6

Create the table of contents 6

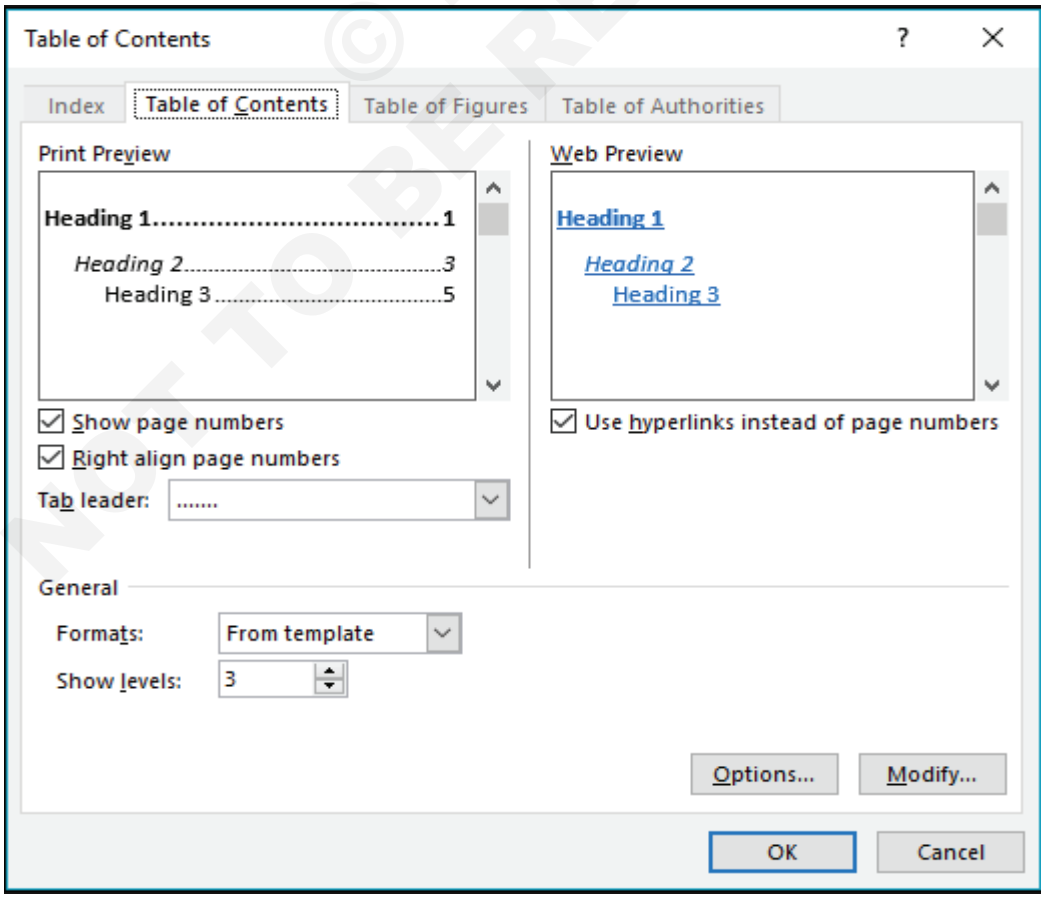
Task2 Customize tables of contents 8

Task3 Insert bibliographies 8

TASK 2: **Customize tables of contents**

1 Go to References > Table of Contents.

2 Select Custom table of contents.



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3 Use the settings to show, hide, and align page numbers, add or change the tab leader, set formats, and specify how many levels of headings to show.

- **Print Preview** displays an example of how your table of contents looks in a document with the settings that you have chosen.
- **Web Preview** shows how your table of contents looks on the web. By default, headings use hyperlinks rather than numbers. When you click an entry in the table of contents, it takes you to that heading. If you clear the Use hyperlinks instead of page numbers box, you see standard numbers with tab leaders.
- **Show page numbers** toggles the page numbers and tab leader on or off.
- **Right align page numbers** puts your page numbers along the right margin of the page. Clear the box to put the page numbers next to the headings.
- Tab leader gives you a drop down to select different styles of leaders, such as dots (default), dashes, or a solid line. Select (none) to turn tab leaders off.
- Formats lets you preselect different table of contents styles.
- Show level adjusts the number of heading levels (provided your document has multiple levels) you see in the table of contents.
- Options lets you choose the styles to use to build your table of contents, such as multiple headings, headers, footers, comment text, etc.

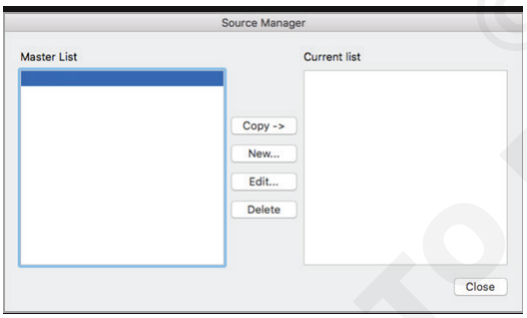
Note: Heading choices are reflected back and forth with the Show level setting. For example, if you set 3 levels to show, headings 1, 2, and 3 will be checked under Available styles:

- Modify sets the indentation and style used on the table of contents entries. Use Modify in the Style dialog to make finer changes.
- OK saves your changes and returns to the document.
- Cancel discards your changes and returns to the document.

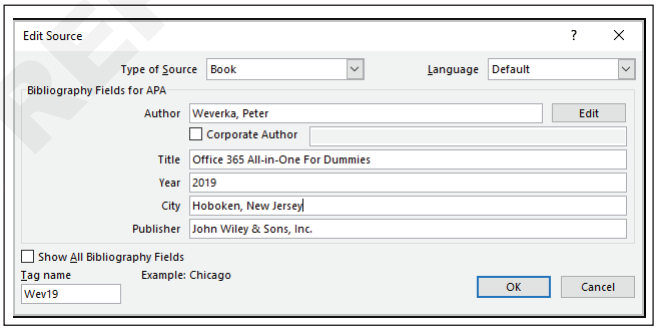
TASK 3: **Insert bibliographies**

Create a bibliography

1 Before Inserting Bibliography Update the details in Go to References > Manager Sources.



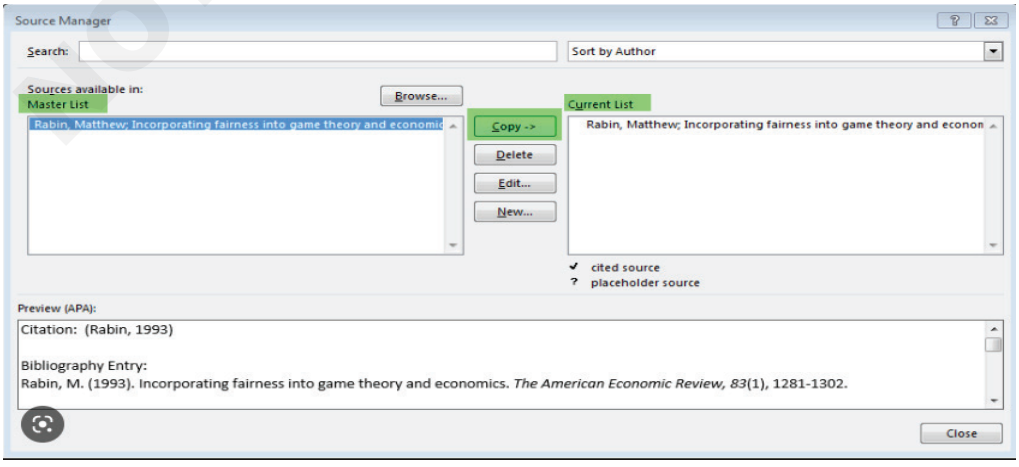
2 Select New to Create the Master List about the Author of the Book, Title, Year, City and Publisher.



3 Click OK

4 After Master List Created we can view

5 Click close.



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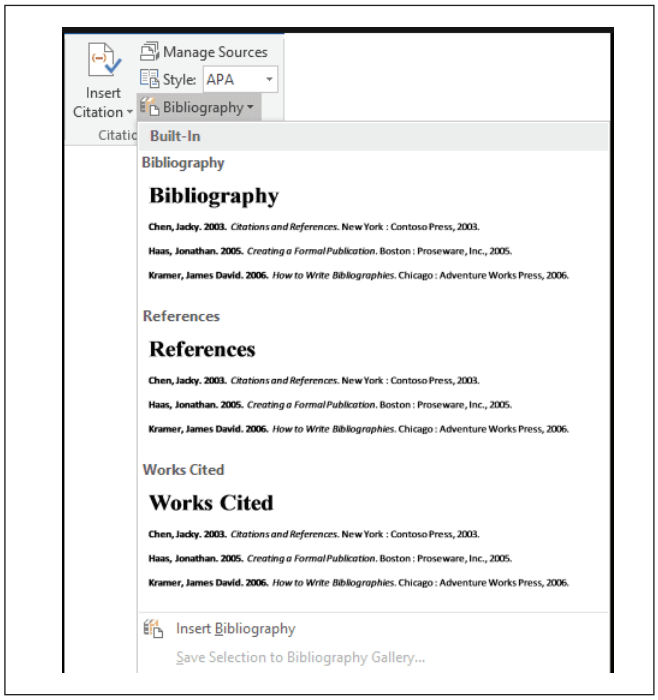
With cited sources in your document, you're ready to create a bibliography.



1 Put your cursor where you want the bibliography.

2 Go to References > Bibliography, and choose a format.

3 After Inserted Bibliography / References / Works Cited

Bibliography

E, A. (2022). Computer Operator and Programing Assistant. Chennai: NIMI, Chennai.

References

E, A. (2022). Computer Operator and Programing Assistant. Chennai: NIMI, Chennai.

Works Cited

E, A. (2022). Computer Operator and Programing Assistant. Chennai: NIMI, Chennai.

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Insert illustrations and text boxes

Objectives: At the end of this exercise you shall be able to
- **insert shapes, pictures, 3D models, smart art graphics, screenshots and screen clippings.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Insert shapes**

Steps to Add Shapes in MS Word

Step 1: On the navigation menu click on the insert option. (Fig 1)

Step 2: In the illustration section select the shapes option as shown in the figure: (Fig 2)

Fig 1

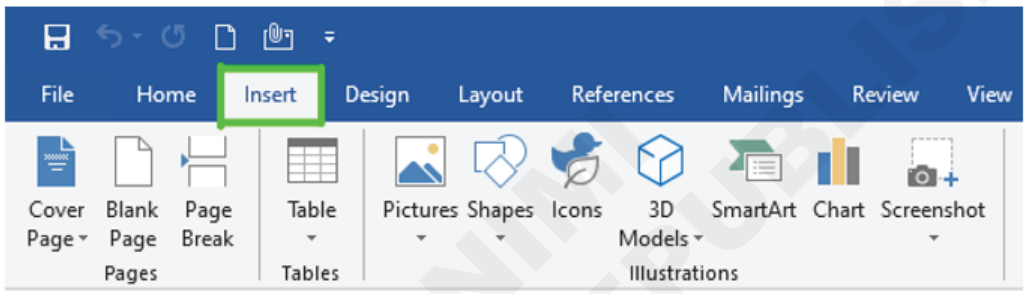
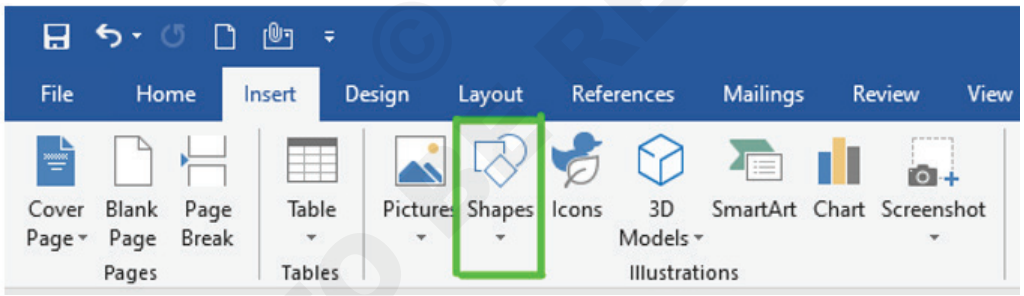


Fig 2



Step 3: A list of shapes will pop up on the screen where you can select different types of shapes. (Fig 3)

There are total of 8 sections in shapes

1 Lines
2 Rectangles
3 Basic Shapes
4 Block Arrows
5 Equation Shapes
6 Flowcharts
7 Stars and Banners
8 Callouts

Step 4: Now select a shape as per your need. (Fig 4)

Step 5: Next drag the cursor on your current page to draw the shape.

Step 6: Finally shape is added on the current page of the document as shown in the figure (Fig 5)

Step 7: Now click on the drag button to set the size of the shape as shown in the figure (Fig 6)

After you add one or more shapes, you can add text, bullets, and numbering to them, and you can change their fill, outline, and other effects on the Format tab.

Step 8: On the navigation menu click on the format option to give color, layout, style to the shape. (Fig 7)

Step 9: Under the shape style section click on the drop-down arrow to open the style panel. (Fig 8)

Step 10: A theme style color panel will open where you can select different types of color styles for the shape as shown in the figure: (Fig 9)

Step 11: Select the color of your choice.(Fig 10)

Step 12: You can also choose a different color pattern from other theme fills options as shown in the figure: (Fig 11)

Step 13: You can also select a different color from the shape fill option.(Fig 12)

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Fig 3

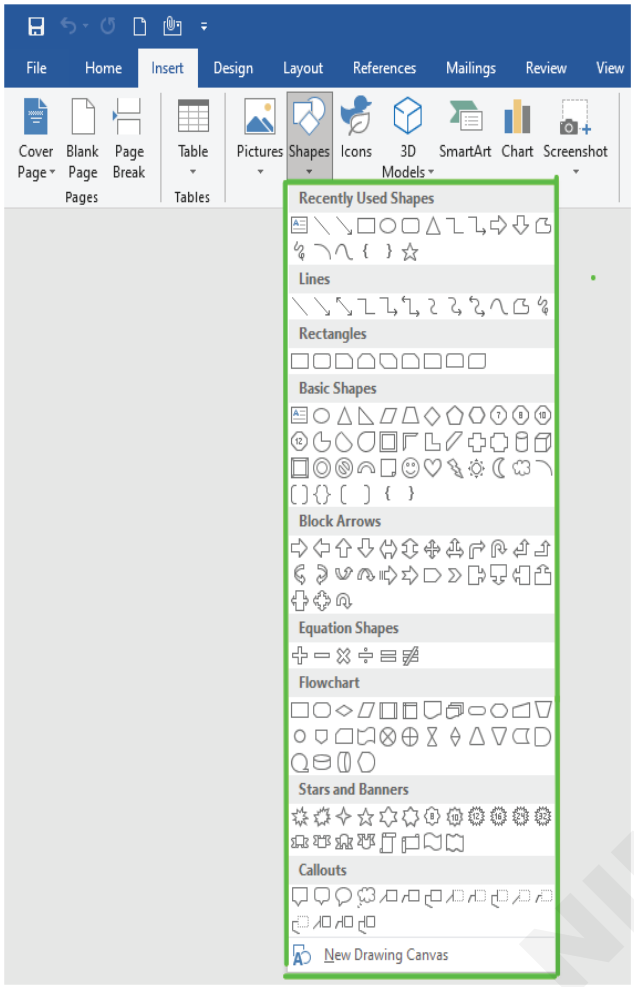


Fig 4

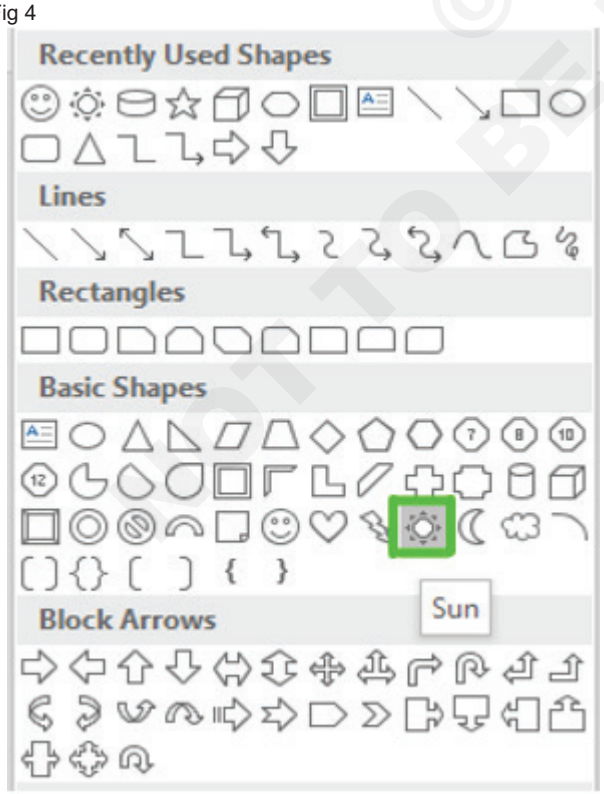


Fig 5

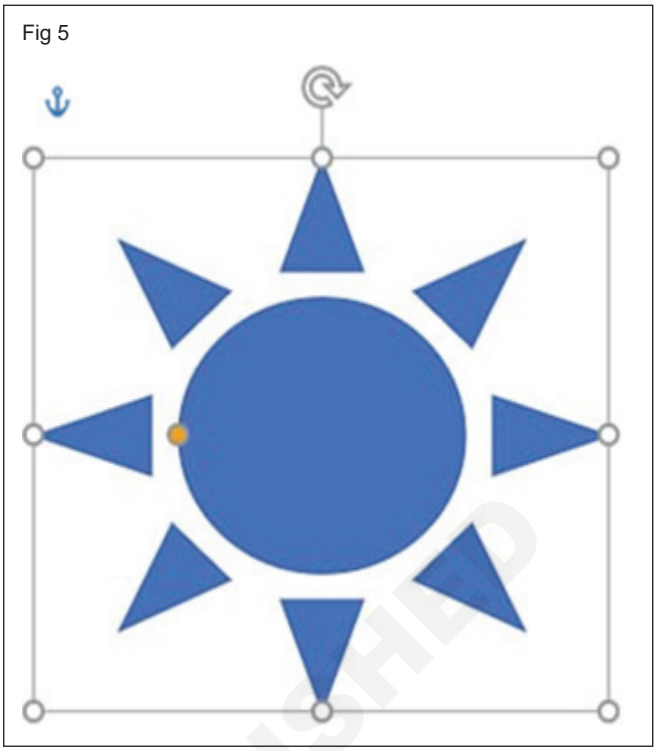
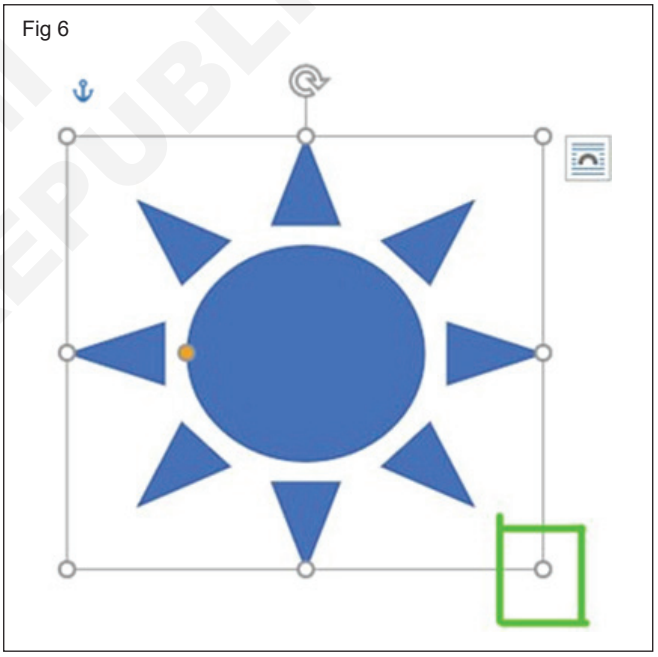


Fig 6



Step 14: Next click on the shape outline option to give an outline to the shape. (Fig 13)

Step 15: Select the color from the theme colors panel as shown in the figure: (Fig 14)

Step 16: Next click on the shape effects option. (Fig 15)

Step 17: Now select the option from the menu as per your requirement. (Figs 16&17)

Finally, the shape is inserted in your document. (Fig 18)

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Fig 7

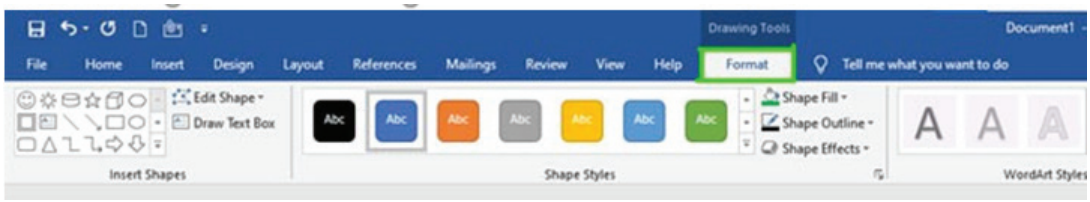

Fig 8

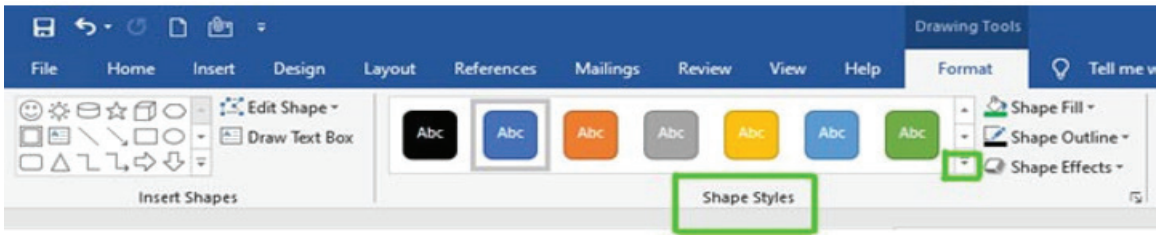

Fig 9

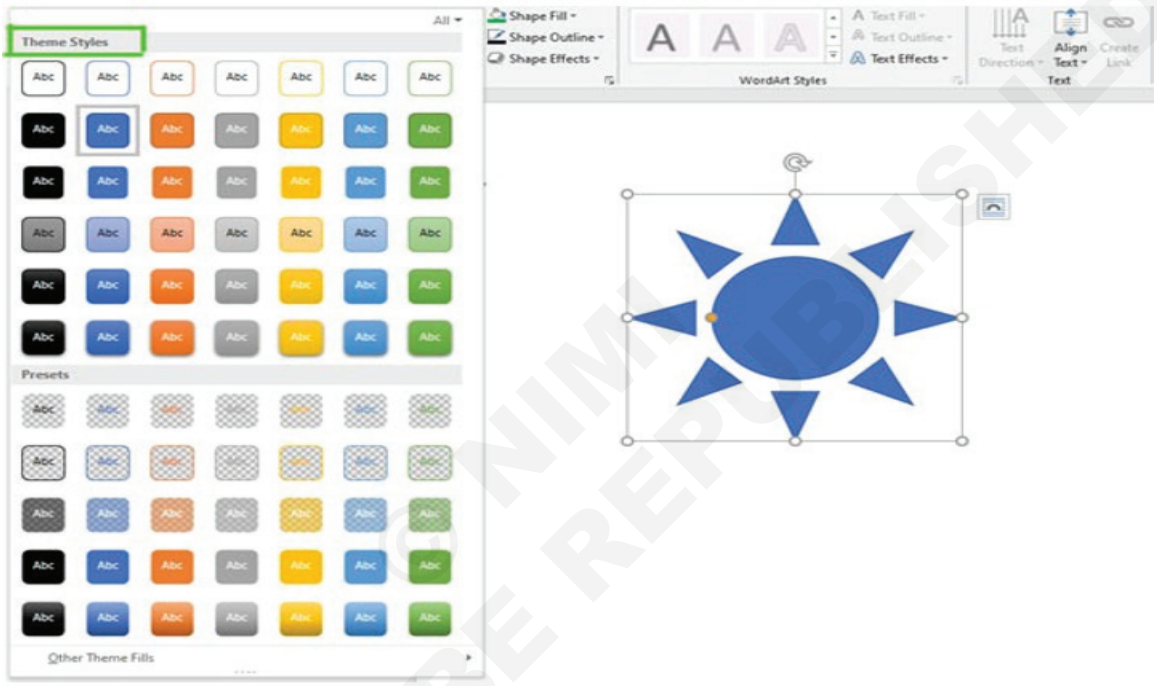

Fig 10

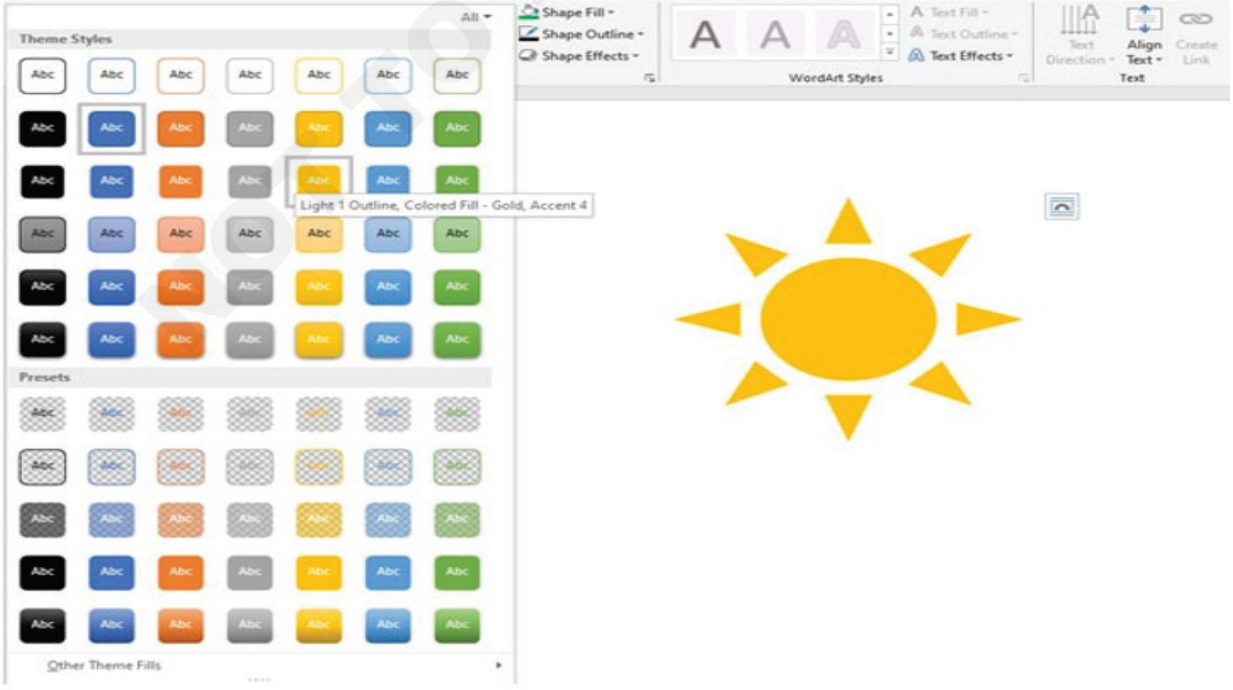

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Fig 11

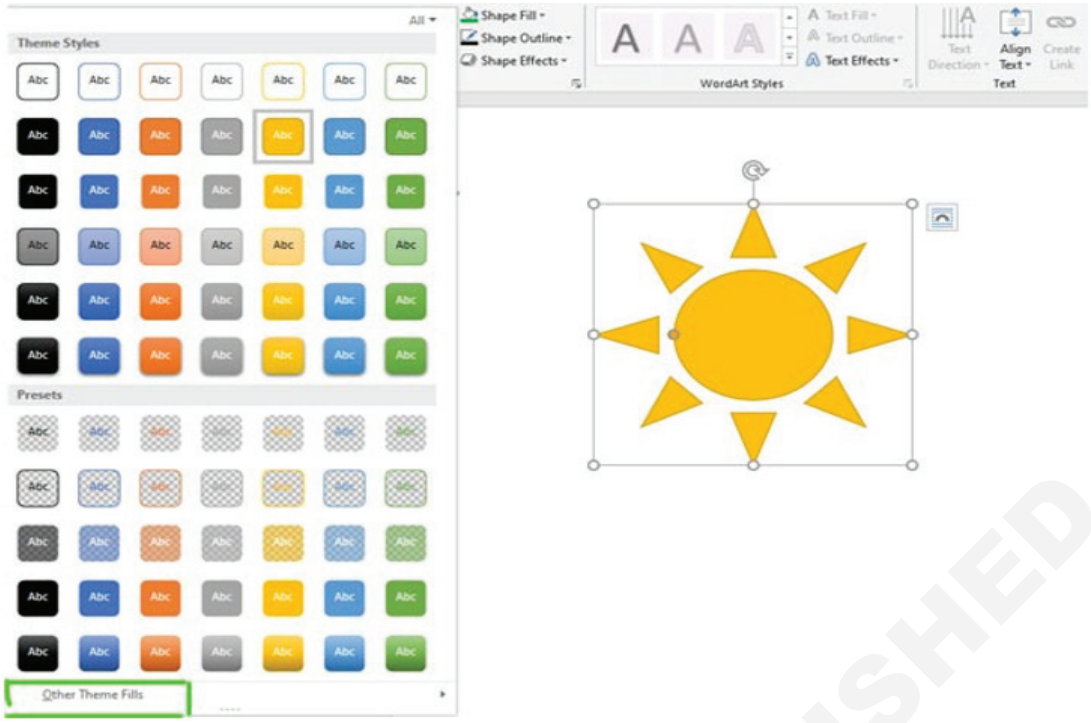

Fig 12

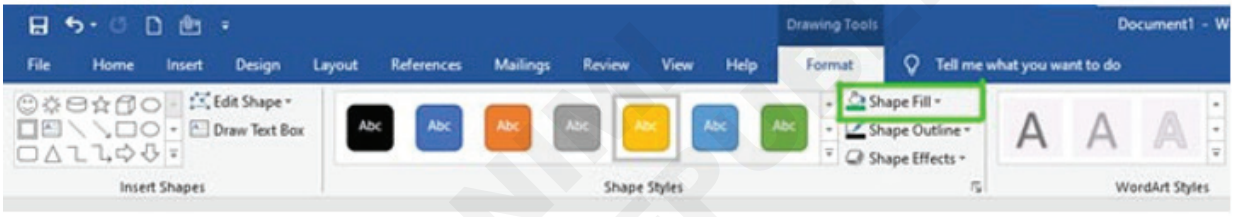

Fig 13

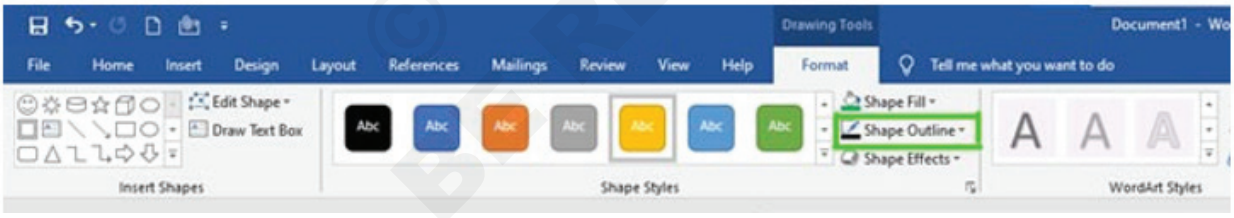

Fig 14

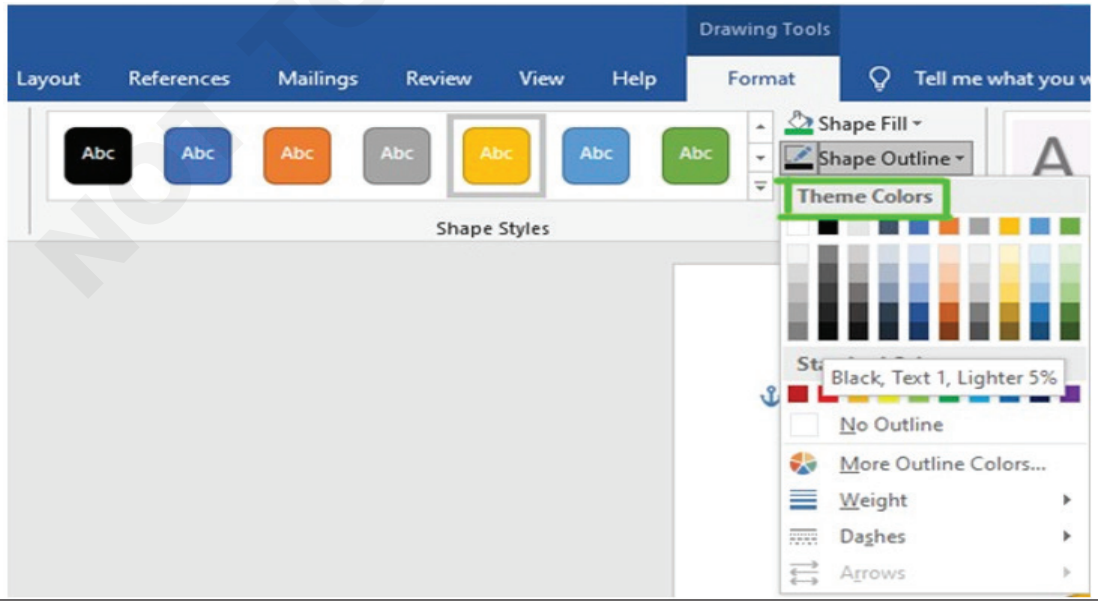

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Fig 15

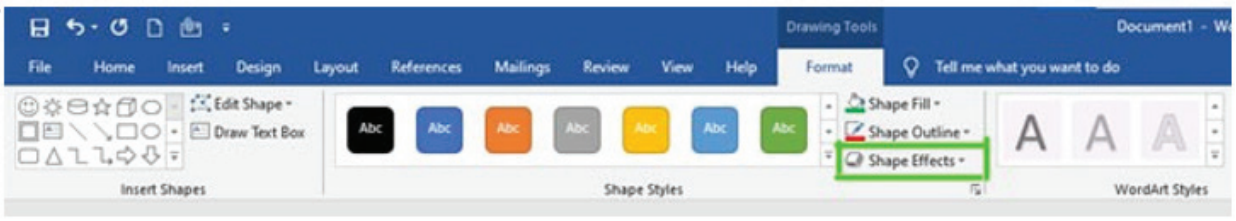

Fig 16

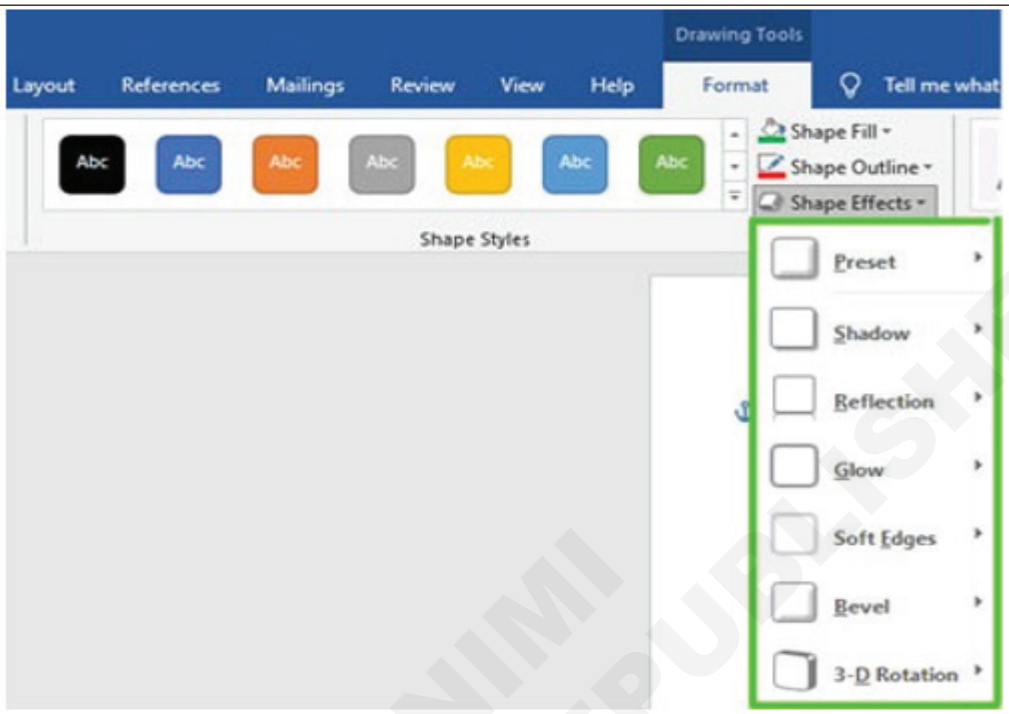

Fig 17

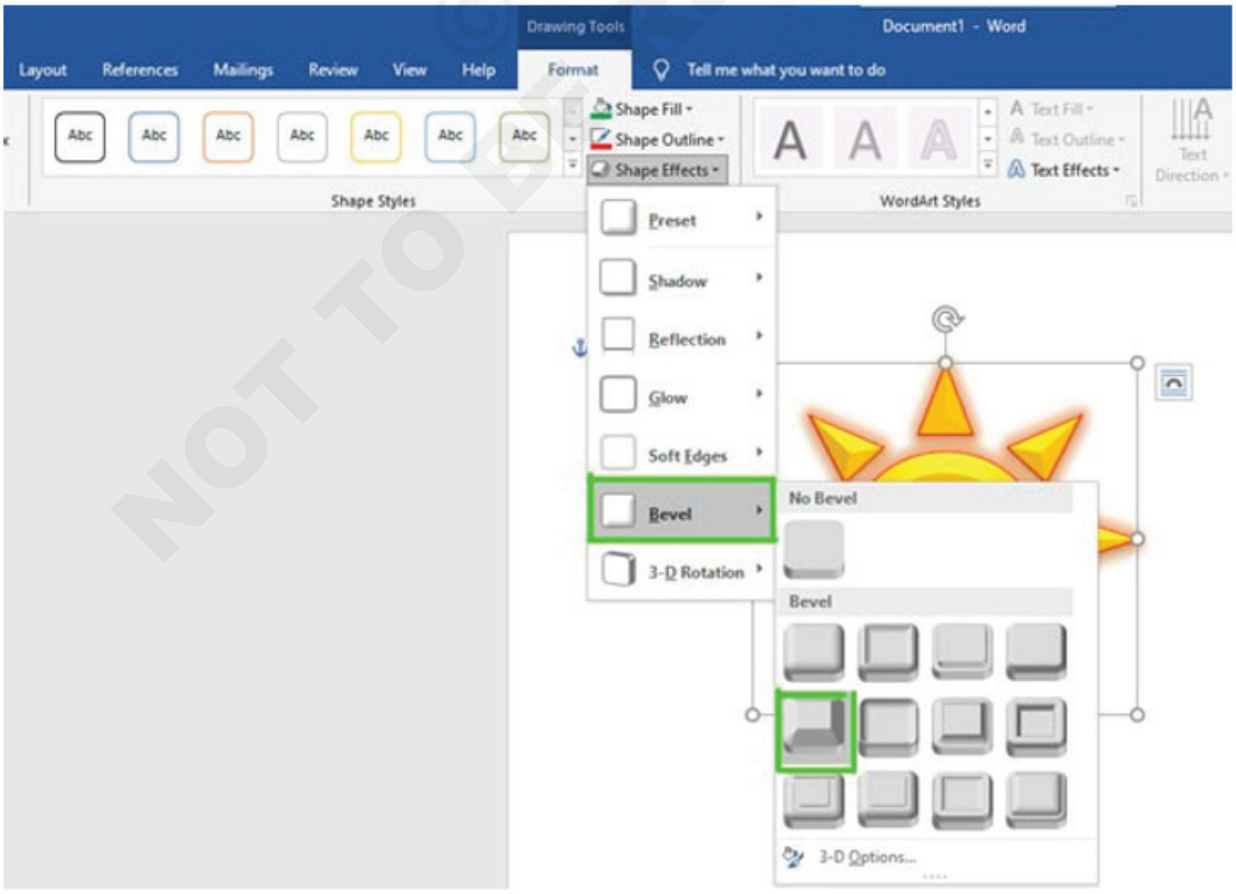

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Fig 18

TASK 2: **Insert pictures**

How to insert pictures from Files in MS Word?

Step 1: Select the insert option from the navigation menu. (Fig 19)

Step 2: Now select the picture option as shown: (Fig 20)

Fig 19

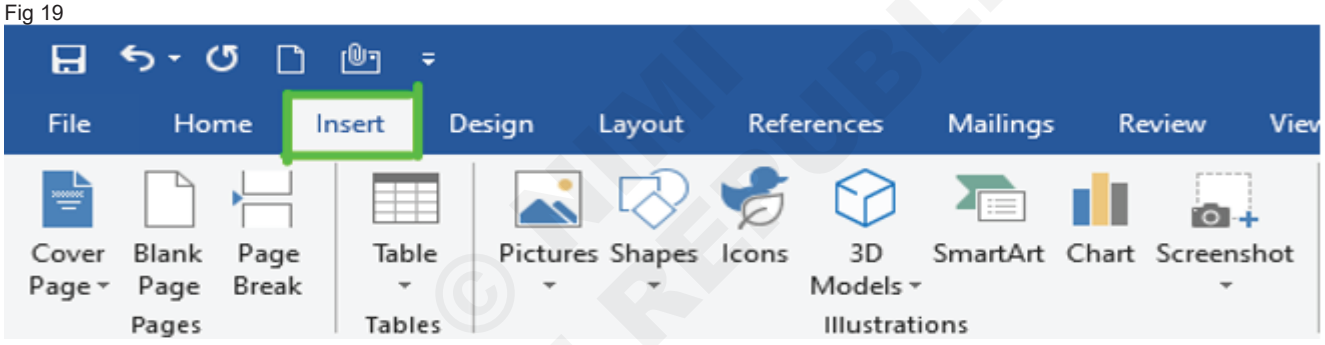
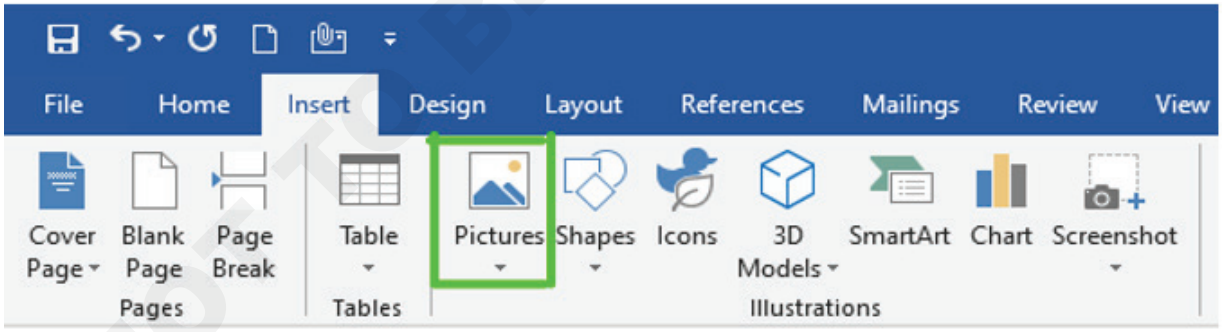


Fig 20



Step 3: There are two ways to insert a picture:

- This Device - You can insert a picture file from your computer.
- Online Pictures - You can also insert pictures from online sites.

Step 4: Select this device option as shown: (Fig 21)

Step 5: A insert picture dialog box will open.

Step 6: Select the drive or folder from the left panel menu

Step 7: Next select the picture/image you want to insert in your document.

Step 8: Click on the insert option as shown: (Fig 22)

Step 9: Now you can set or resize the size of your picture according to your requirement using the dot button. (Fig 23)

Step 10: To give styles to the picture click on the format option from the navigation menu. (Fig 24)

Step 11: Click on drop-down arrow and Select picture style as per your choice. (Fig 25)

Finally, pictures/images are added to your document. (Fig 26)

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Fig 21

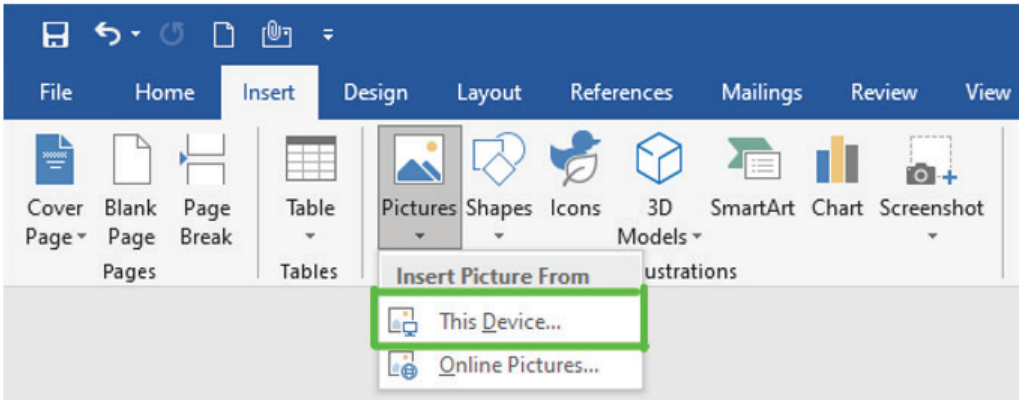

Fig 22

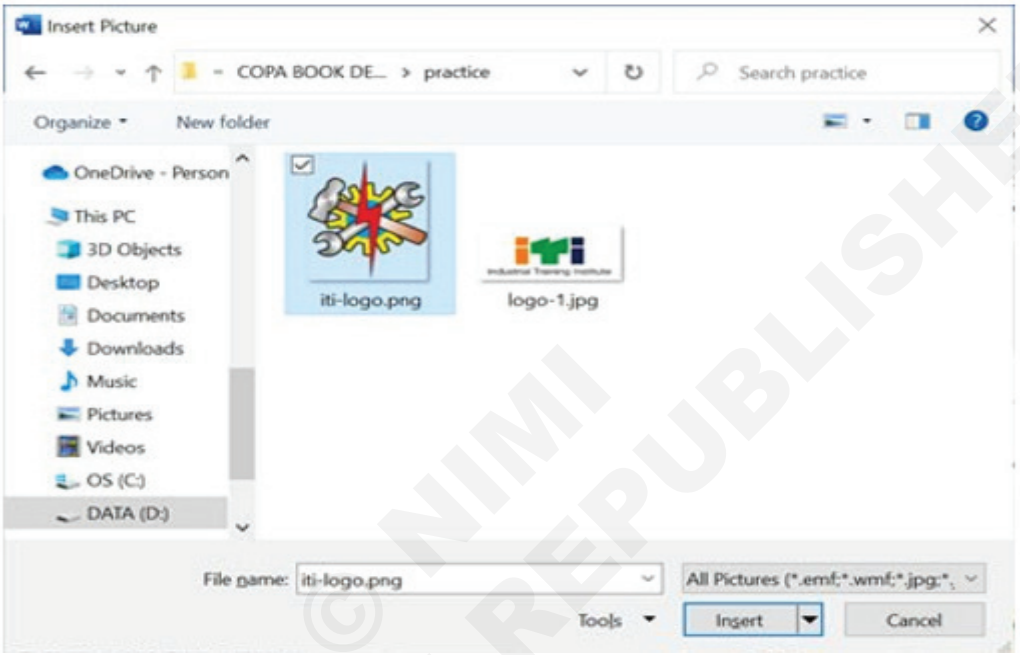

Fig 23

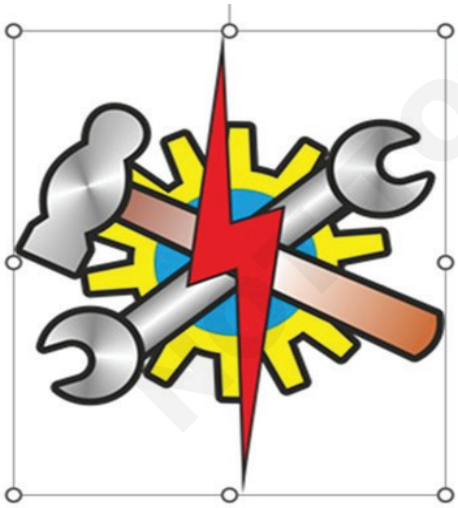

Fig 24

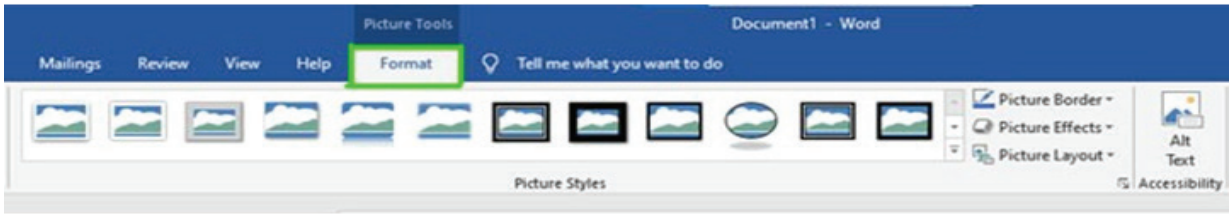

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Fig 25

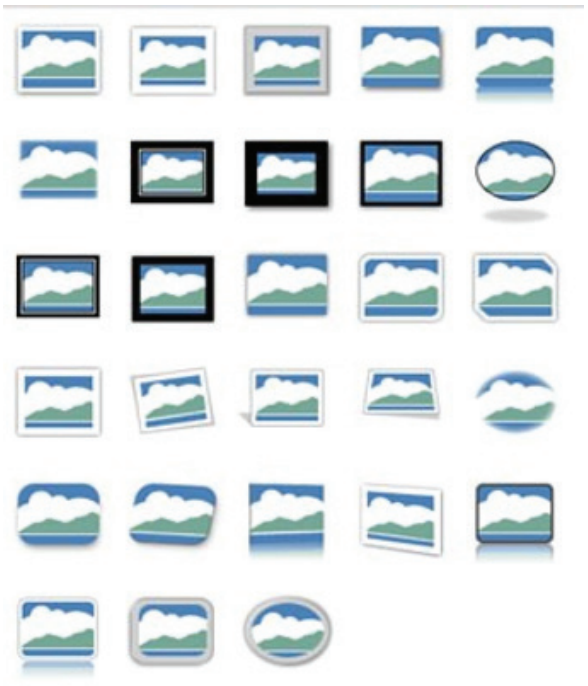


Fig 26

How to insert Online Images in MS Word?

Step 1: Select the insert option from the navigation menu. (Fig 27)

Step 2: Now select the picture option and insert picture dialog box will open.

Step 3: Select the online pictures option as shown: (Fig 28)

Fig 27

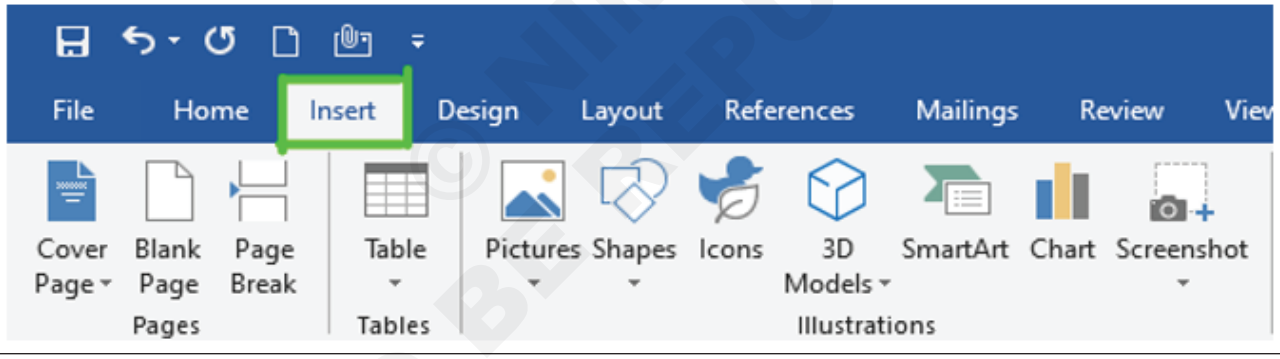
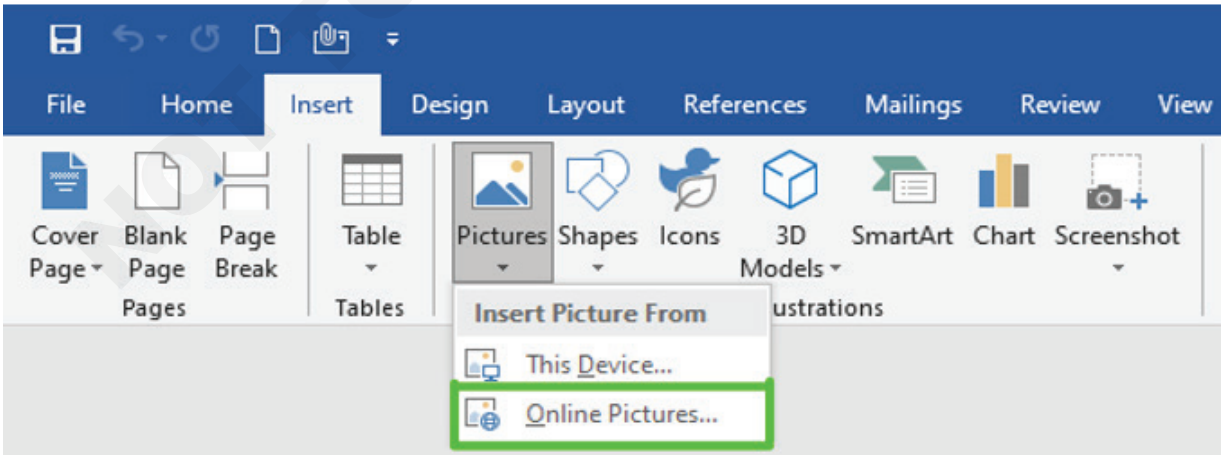


Fig 28



Step 4: A online pictures dialog box will open where you can search a variety of online pictures. (Fig 29)

Step 5: Search the picture/image name in the search bar. (Fig 30)

Step 6: Select the picture and then click on the insert button as shown:

Finally, online images will be added to your document (Fig 31).

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Fig 29

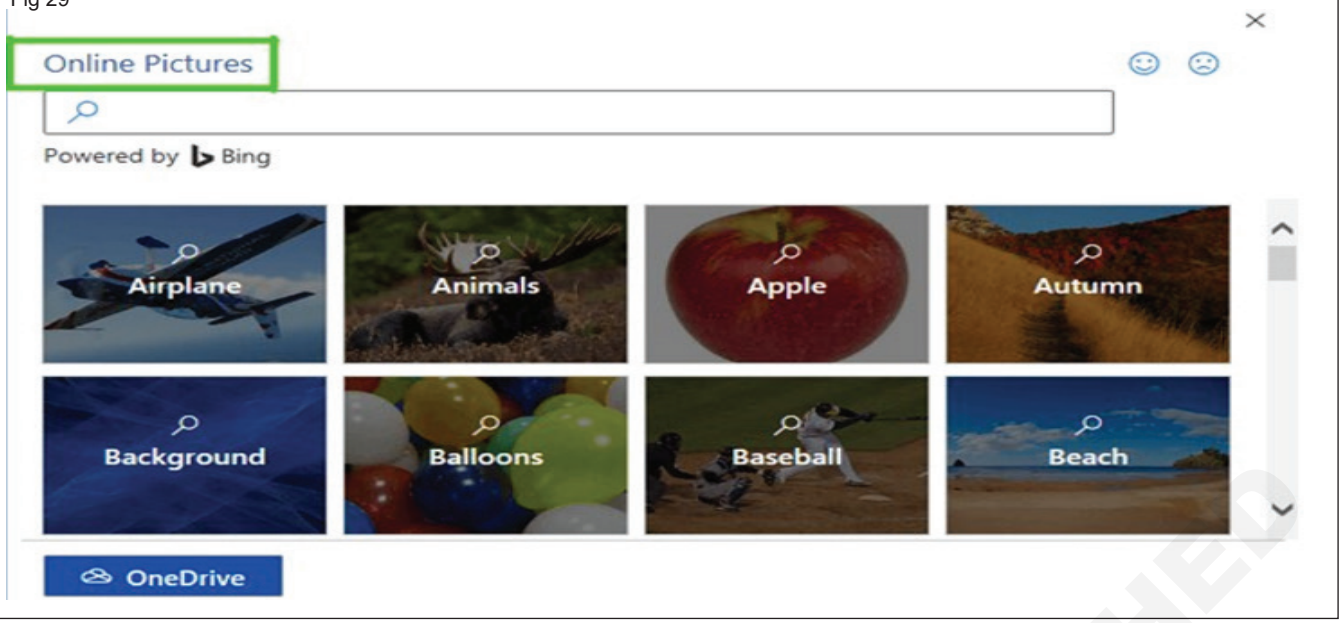

Fig 30

Fig 31

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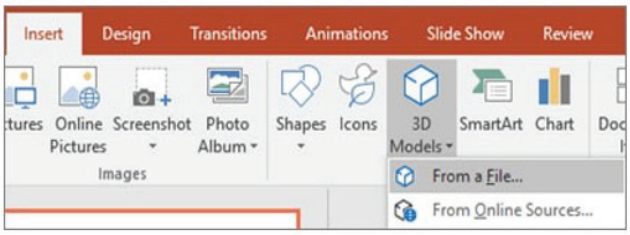
TASK 3: **Insert 3D models**

Add 3D objects from a local file

1 You insert 3D models into your files much the same way as other images. On the Insert tab of the ribbon select 3D Models and then From a File. (Fig 32)

Fig 32



2 Once it's inserted you can use the controls to manipulate the image: (Fig 33)

Fig 33

3 1 Use the 3D control to rotate or tilt your 3D model in any direction. Just click, hold and drag with your mouse.

2 Drag the image handles in or out to make your image larger or smaller.

4 You can still use the rotation handle 3 to rotate your image clockwise or counter-clockwise, but you'll get a much better experience using the 3D rotation control we talked about above.

Add 3D Models from our online library

1 To select a 3D Model from our online library, choose 3D Models > From Online Sources. In the dialog box that appears you can browse, or search for, 3D images from the catalog. (Fig 34)

2 Select one or more images and click Insert. (Fig 35)

Change how your 3D models look in Office

1 When you insert a 3D model into your Office file you'll get a contextual tab on the ribbon under 3D Model Tools called Format. On the format tab there are some handy controls to help you customize how your 3D images are going to look.

2 The 3D Model Views gallery gives you a collection of preset views that you can use on your image. For example you can quickly select the head-on view or the top-down view. (Fig 36)

3 If you've got multiple 3D models and you're having trouble selecting the one you want to work with, click the Selection Pane to turn on the list of objects. Then you can easily select the image or images that you want to select. (Fig 37)

4 The Align tool helps you place your image on the page or slide-at the top or side, for example.

Fig 34

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Fig 35

Fig 36

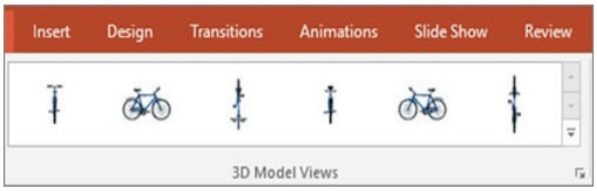


Fig 37

5 Pan & Zoom gives you control of how your 3D image fits within the frame. Click the Pan & Zoom button, then click and drag the object within the frame to move it. Use the Zoom arrow on the right-side of the frame to make the object appear larger or smaller within the frame.

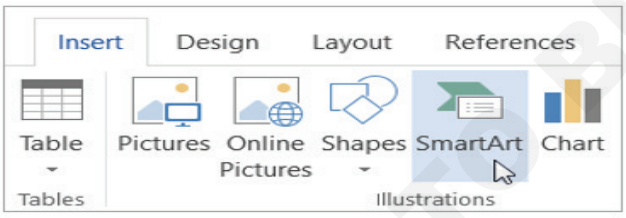
6 Once you have your 3D images inserted you can do all kinds of exciting things with them, such as using PowerPoint's Morph Transition to make the object appear to rotate or spin.

TASK 4: **Insert Smart Art graphics**

Insert a SmartArt graphic and add text to it

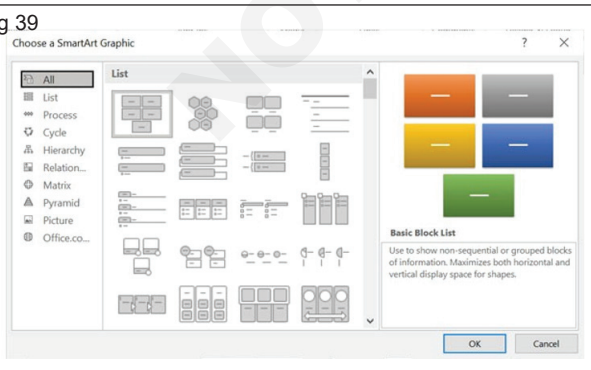
1 On the Insert tab, in the Illustrations group, click SmartArt. (Fig 38)

Fig 38



2 In the Choose a SmartArt Graphic dialog box, click the type and layout that you want. (Fig 39)

Fig 39



3 Enter your text by doing one of the following:

- Click [Text] in the Text pane, and then type your text. (Fig 40)

4 After Text Typed will be shown here. (Fig 41)

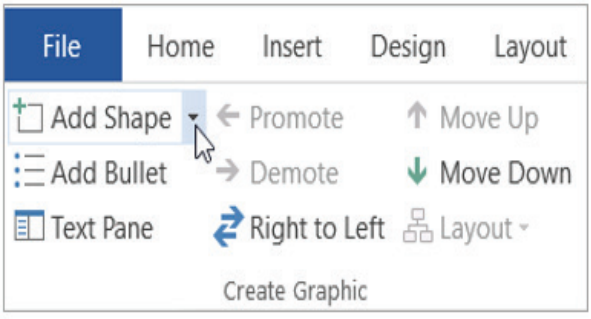
Add or delete shapes in your SmartArt graphic

1 Click the SmartArt graphic that you want to add another shape to.

2 Click the existing shape that is located closest to where you want to add the new shape.

3 Under SmartArt Tools, on the Design tab, in the Create Graphic group, click the arrow next to Add Shape. (Fig 42)

Fig 42



- If you don't see the SmartArt Tools or Design tabs, make sure that you've selected the SmartArt graphic. You may have to double-click the SmartArt graphic to open the Design tab.

4 Do one of the following:

- To insert a shape after the selected shape, click Add Shape After.
- To insert a shape before the selected shape, click Add Shape Before.

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Fig 40

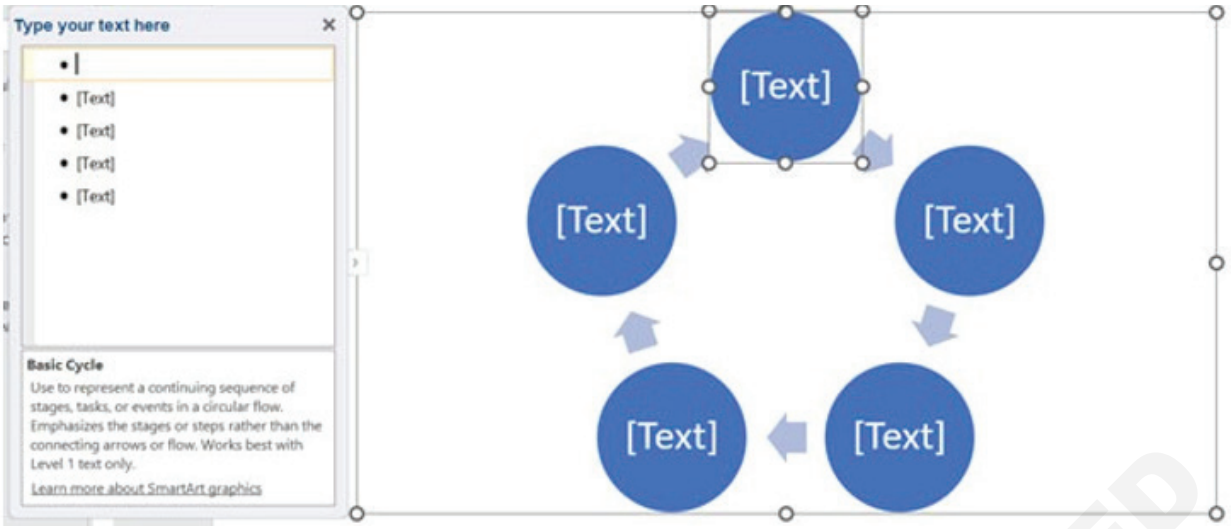
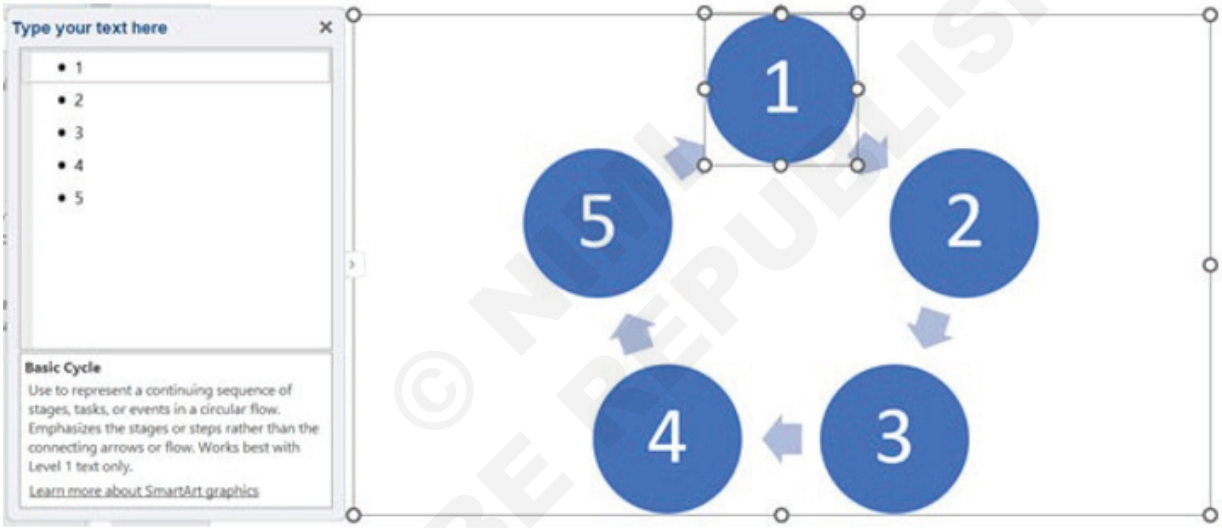


Fig 41

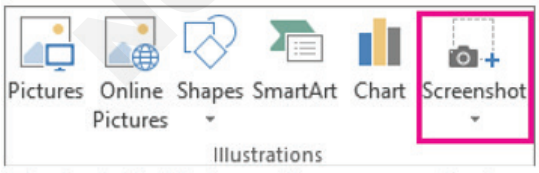


TASK 5: **Insert screenshots and screen clippings**

1 Click in the document at the location where you want to add the screenshot.

2 On the Insert tab, in the Illustrations group, click Screenshot. (Fig 43)

Fig 43



3 The Available Windows gallery appears, showing you all the windows that you currently have open. Do one of the following:

- To insert a screenshot of an entire window into your document, click the thumbnail image of that window.
- To add a selected portion of the first window shown in the Available Windows gallery, click Screen Clipping; when the screen turns white and the pointer becomes a cross, press and hold the left mouse button and drag to select the part of the screen that you want to capture. (Fig 44)

4 The window or portion of the screen you selected is automatically added to your document. You can use the tools on the Picture Tools tab to edit and enhance the screenshot. (Fig 45)

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Fig 44

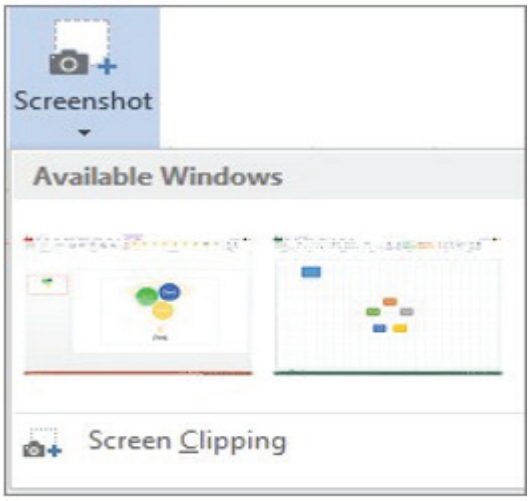
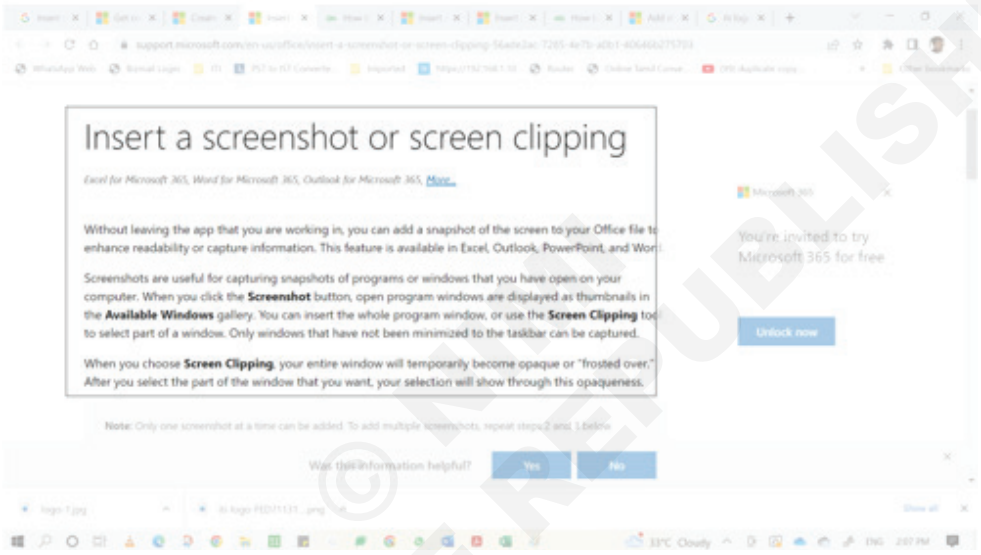


Fig 45

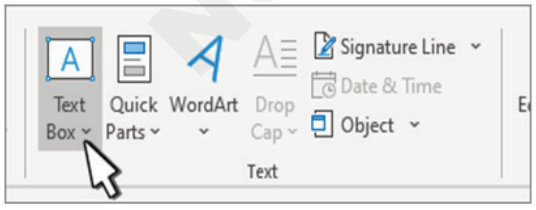


TASK 6: **Insert text boxes**

Add a text box

1 Go to Insert > Text Box, and then select one of the pre-formatted text boxes from the list, select More Text Boxes from Office.com, or select Draw Text Box. (Figs 46 & 47)

Fig 46



2 If you select Draw Text Box, click in the document, and then drag to draw the text box the size that you want. (Fig 48)

3 To add text, select inside the box and type or your paste text. (Fig 49)

If you aren't using a mouse

1 Press and release ALT, N, and then press X.

2 Press the arrow keys to select the text box that you want, and then press ENTER.

3 Type the text that you want.

4 When you are finished typing and want to switch back to editing text in your document, press ESC.

Copy a text box

1 Select the border of the text box that you want to copy.

2 Press Ctrl+C.

Note: Make sure the pointer is on the border of the text box, not inside it. If the pointer is inside, pressing Ctrl+C will copy the text, not the text box.

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Fig 47

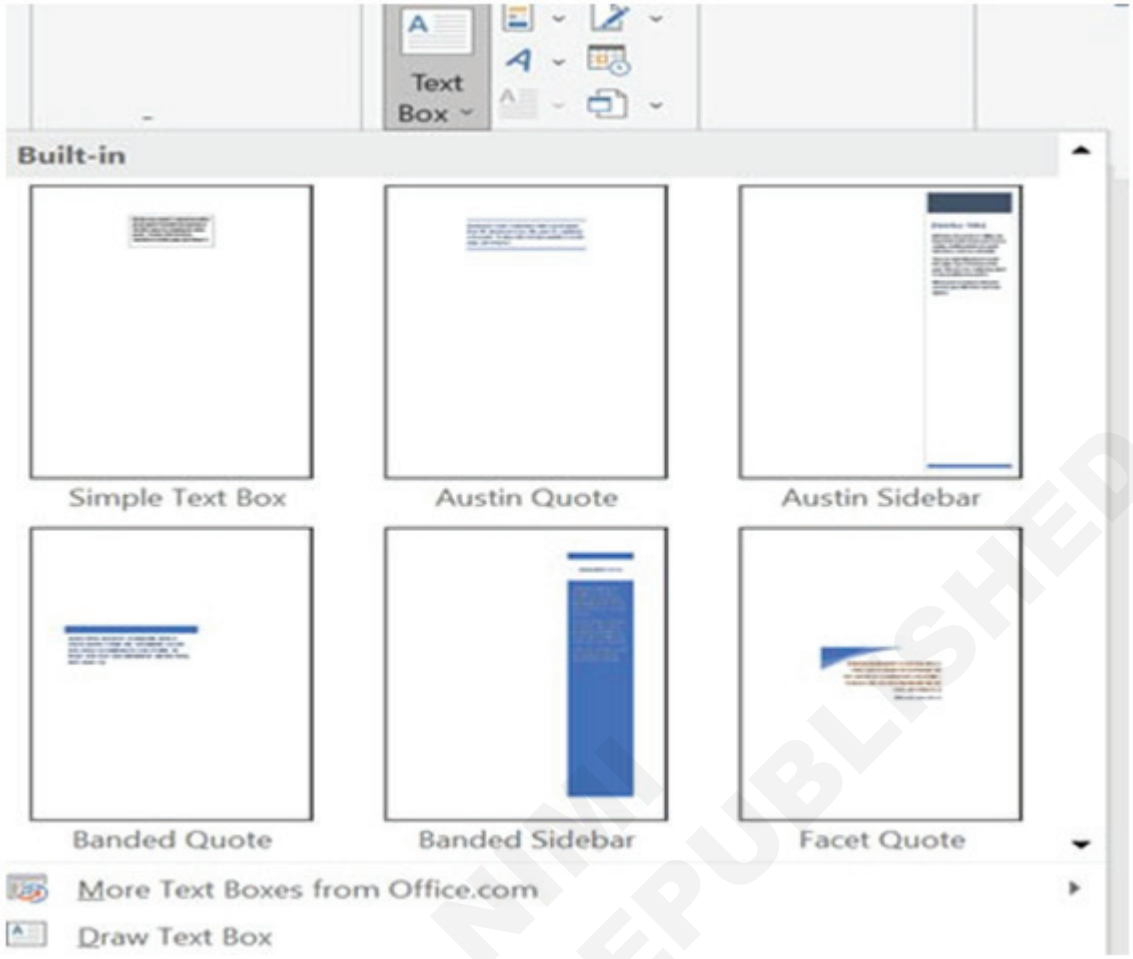

Fig 48

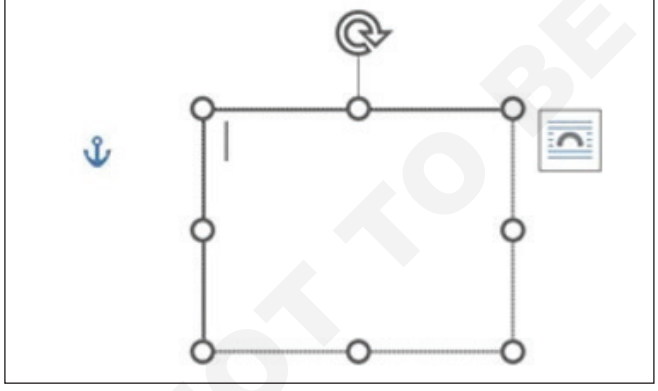

Fig 49

3 Select a location and press Ctrl+V to paste the text box.

Delete a text box

- Select the border of the text box that you want to delete, and then press Delete.

Note: Make sure the pointer is on the border of the text box and not inside it. If the pointer is inside the box, pressing Delete will delete the text inside the text box, not the box.

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Format illustrations and text boxes

Objectives: At the end of this exercise you shall be able to
- **apply artistic effects, picture effects and picture styles**
- **remove picture backgrounds**
- **format graphic elements, SmartArt graphics & 3D models.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

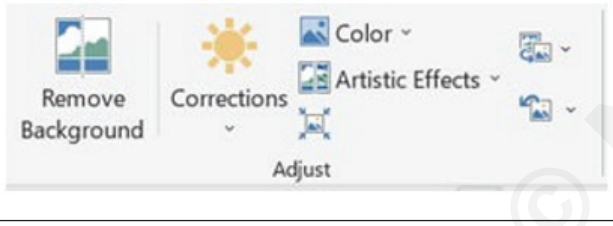
TASK 1: **Apply artistic effects**

Apply artistic effects

1 Select the picture.

2 Select Picture Format and select Artistic Effects. (Fig 1)

Fig 1



3 Hover over the options to preview them, then select the one you want. (Fig 2)

Note: You can apply only one artistic effect at a time to a picture, so applying a different artistic effect will remove the previously applied artistic effect. (Figs 3a&3b)

Fig 2

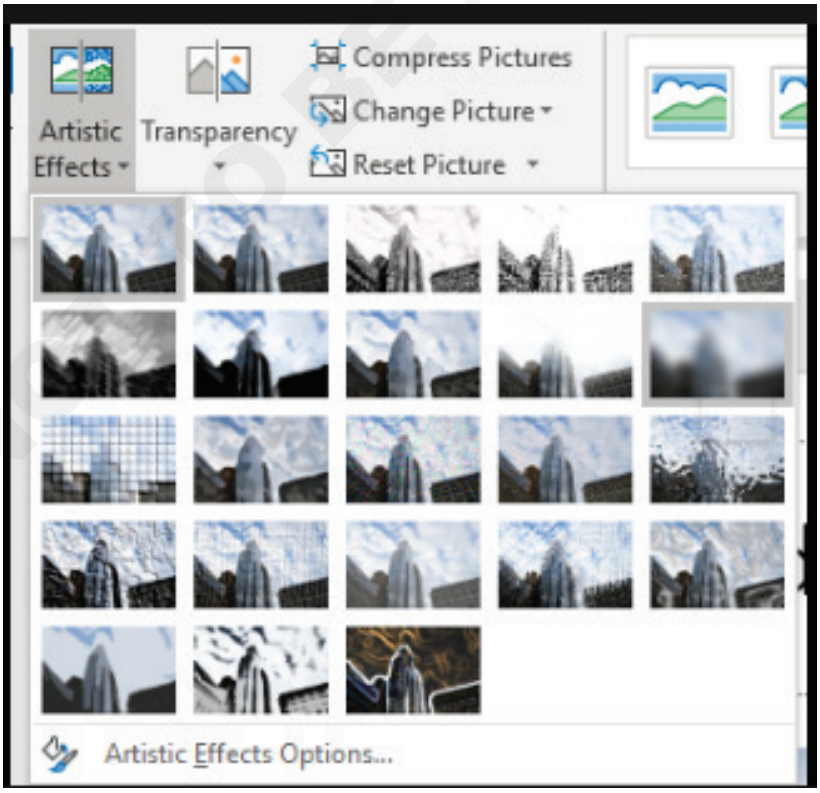


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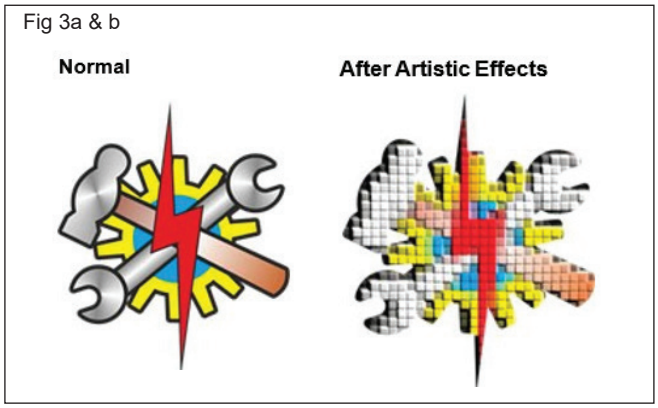
Fig 3a & b



TASK 2: **Apply picture effects and picture styles**

Apply picture effects

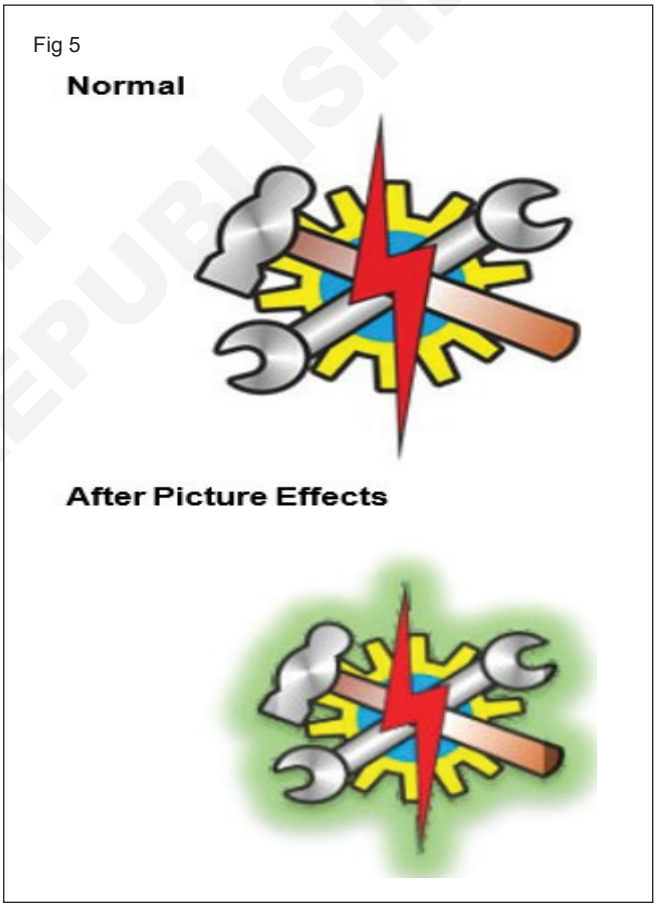
1 Select the picture.

2 Select Picture Format and select Picture Effects. (Fig 4)

Fig 4

3 Select the one you want: Shadow, Reflection, Glow, Soft Edges, Bevel, or 3-D Rotation. (Fig 5)

Fig 5



TASK 3: **Remove picture backgrounds**

1 Select the picture that you want to remove the background from.

2 On the toolbar, select Picture Format > Remove Background, or Format > Remove Background. (Fig 6)

If you don't see Remove Background, make sure you have selected a picture. You might have to double-click the picture to select it and open the Picture Format tab.

3 The default background area will be colored magenta to mark it for removal, while the foreground will retain its natural coloring.

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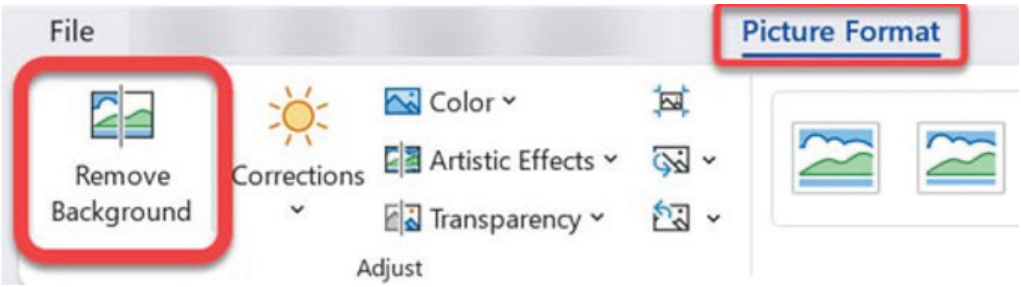
Fig 6



Default Background (Fig 7)

Fig 7

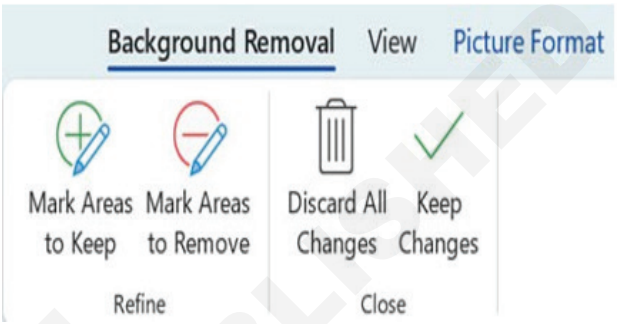
After Remove Background Choose (Fig 8)

Fig 8

4 If the default area isn't correct, go to Background Removal > Picture Tools and do one or both of the following:

- If parts of the picture that you want to keep are magenta (marked for removal), select Mark Areas to Keep and use the free-form drawing pencil to mark the areas on the picture that you want keep.
- To remove more parts of the picture, select Mark Areas to Remove and use the drawing pencil to mark those areas. (Fig 9)

Fig 9



5 When you're done, select Keep Changes or Discard All Changes.

To save the image in a separate file for later use, right- click the image and select Save as Picture. (Fig 10)

Fig 10

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TASK 4: **Format graphic elements**

1 Click in your document where you want to create the drawing/Picture.

2 On the Insert tab, in the Illustrations group, click Shapes or Picture (Fig 11)

3 You can do any of the following on the Format tab, which appears after you insert a drawing shape / Picture:

- Select the picture.
- Select Picture Format

Picture Format

- Select the Shape
- Select Shape Format

Shape Format (Fig 12)

Fig 11

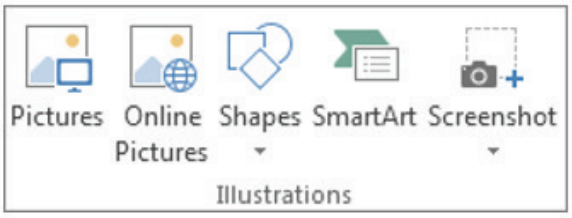
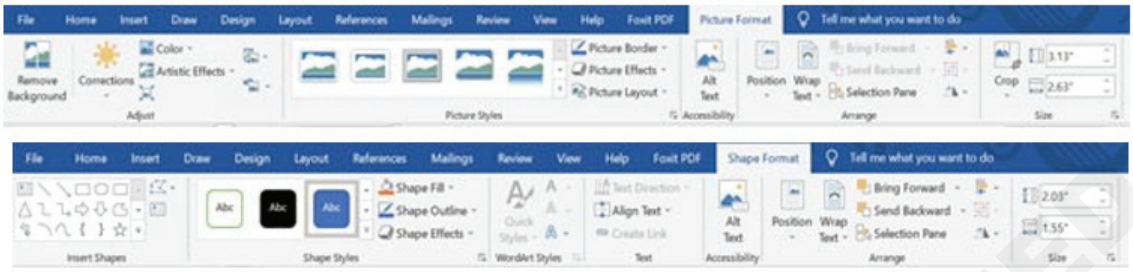


Fig 12



TASK 5: **Format SmartArt graphics**

You can customize the look of each shape in the SmartArt graphic.

1 Click the SmartArt shape you want to format.

2 Click the Format tab under SmartArt Tools.

3 Use the options in the Shape Styles group to format each shape. (Fig 13)

Fig 13

TASK 6: **Format 3D models**

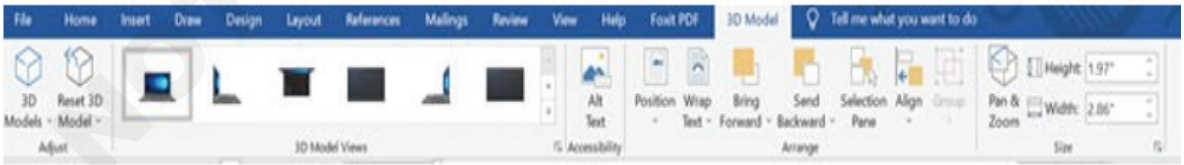
You can customize the look of each shape in the 3D Models .

1 Click the 3D Models you want to format.

2 Click the Format tab under 3D Models Tools.

Use the options in the 3D Model View group to format each shape (Fig 14)

Fig 14



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Add text to graphic elements

Objectives: At the end of this exercise you shall be able to
- **add and modify text in text boxes**
- **add and modify text in shapes**
- **add and modify SmartArt graphic content.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Add and modify text in text boxes**

1 Click Insert > Draw Text Box

2 Draw a text box close to the shape.

3 Click inside the text box, and start typing.

Note: The text box will not move when you move the shape unless you group the text box and shape.

Note: To get more on this Ref Ex.1.11.42 Task 6

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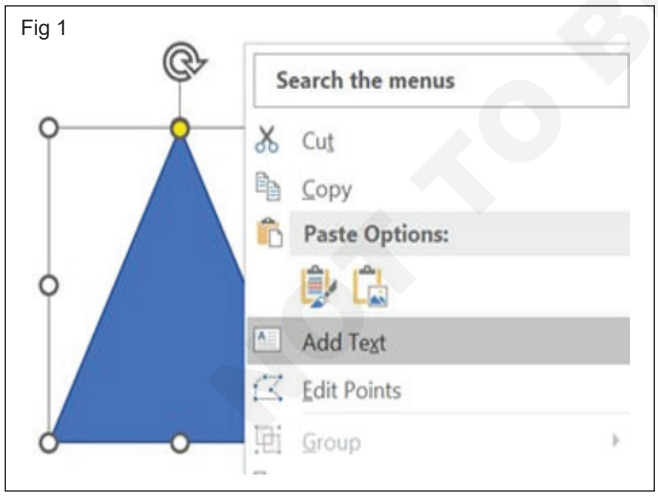
TASK 2: **Add and modify text in shapes**

1 Click Insert > Shapes

2 Draw the shape.

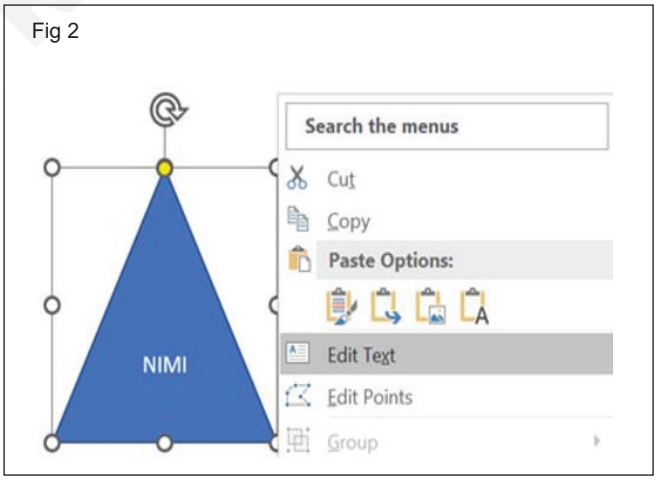
3 Click inside the Shape or Right Click the shape and choose Add Text then start typing. (Fig 1)

Fig 1



4 To Modify Click inside the Shape or Right Click the shape and choose Edit Text then start typing. (Fig 2)

Fig 2



Note: The text box will not move when you move the shape unless you group the text box and shape.

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TASK 3: **Add and modify SmartArt graphic content**

Refer Ex.No.1.11.42 - Task 4. Insert Smart Art graphics

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Modify graphic elements

Objectives: At the end of this exercise you shall be able to
- **position objects**
- **wrap text around objects**
- **add alternative text to objects for accessibility.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Position objects**

Position images, text boxes, shapes on the page

1 To change the position, on the Picture Format (Graphics Format, Shape Format) tab, in the Arrange group, click the Position button (Fig 1).

2 Choose More Layout option (Fig 2)

3 Using these options, position the object in a specific location relative to the page margins.

Fig 1

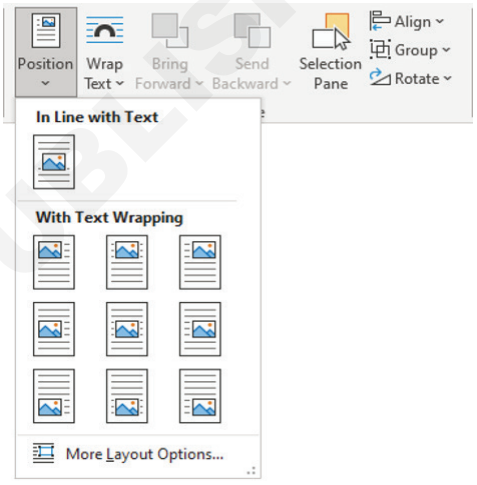
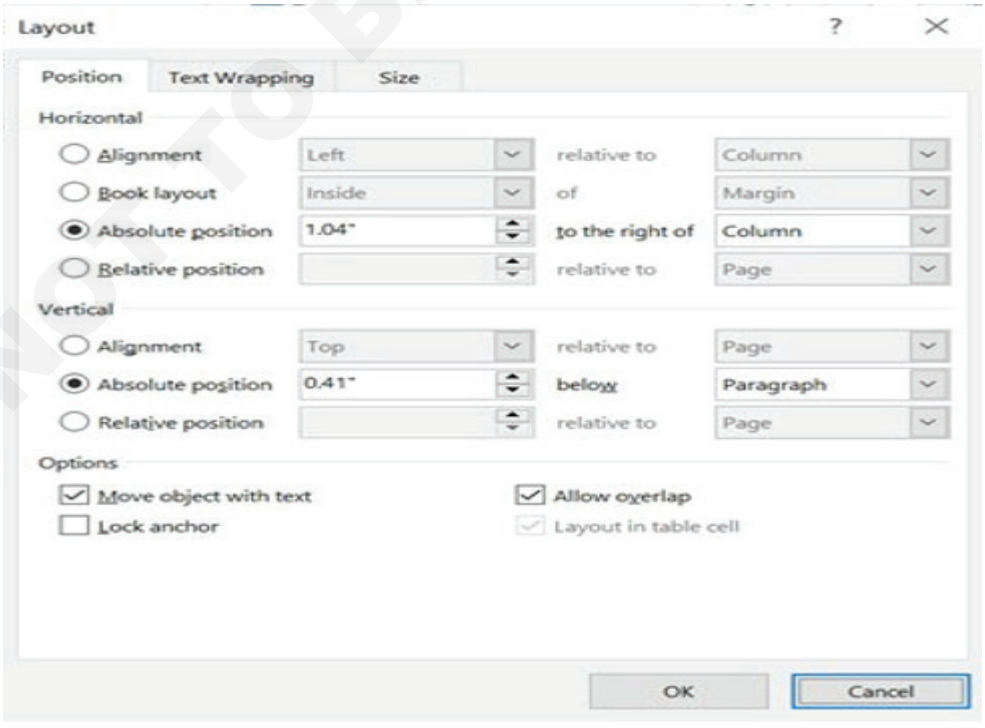


Fig 2



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TASK 2: **Wrap text around objects**

Change text wrapping

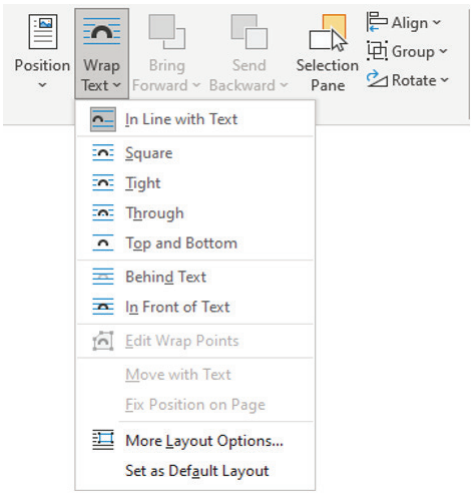
By default, Word inserts (see examples below):

- Pictures (images and photos), charts in line with the text.
- Text boxes, shapes in front of the text.
- WordArt objects behind the text.

To change the way how text should wrap the object, select it, then do one of the following:

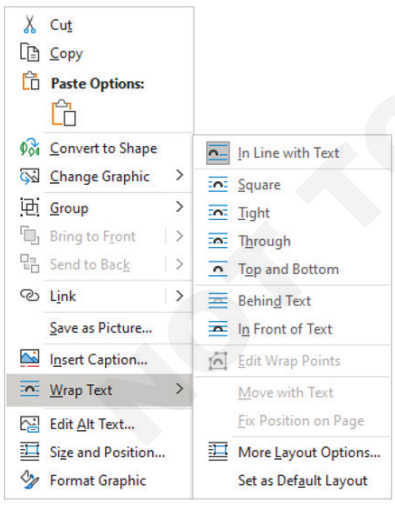
- On the Picture Format (Shape Format, Graphics Format) tab, in the Arrange group, click the Wrap Text button: (Fig 3)

Fig 3



- Right-click on the object, then choose Wrap Text in the popup menu: (Fig 4) or

Fig 4

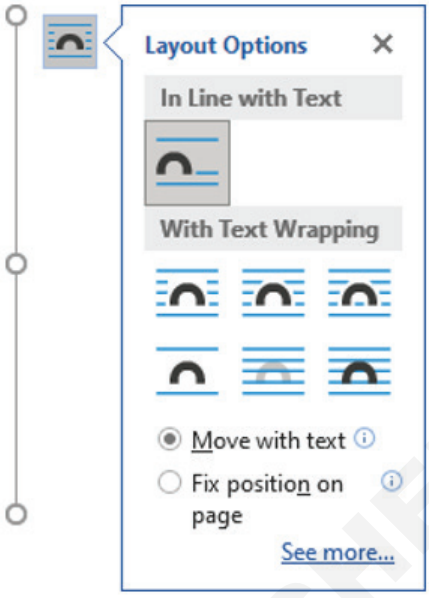


- Click the Layout Options button that appears next to the selected figure: (Fig 5)

From the Wrap Text list, choose the option you prefer:

- In **Line with Text places** an object in a paragraph on the same line as the surrounding text. The text does not wrap around it.

Fig 5



- **Square wraps** the text around the picture or shape on all sides at right angles (a square pattern) as if it is rectangular. The text fills the remaining rectangular region.

This option is the most common form of text wrapping

- **Tight wraps** the text around the edges of the figure. The text follows the shape.

  This option is most useful for larger images covering most of the page width.(Figs 6,7 & 8)

Fig 6

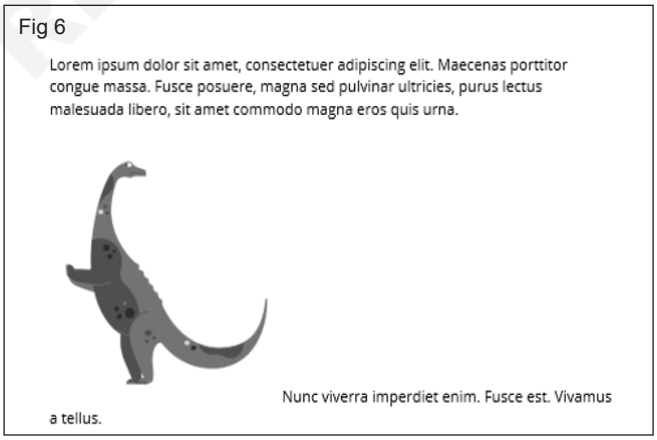


Fig 7

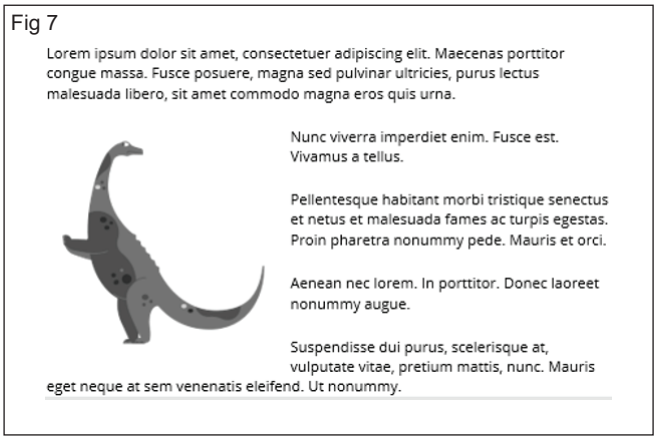


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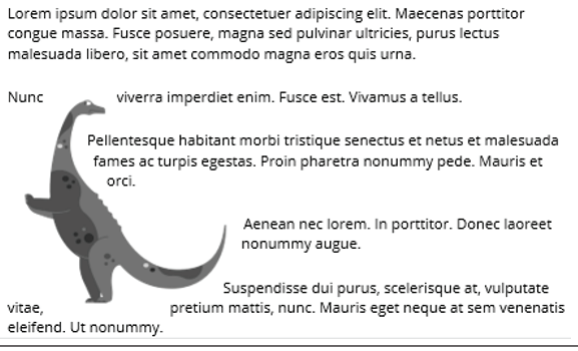
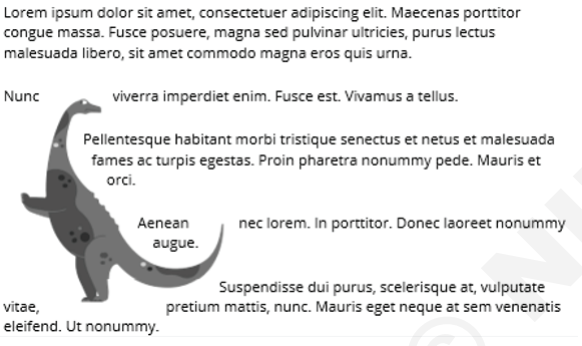
Fig 8



- **Through wraps** the text around the picture or shape edges, including any white gaps. If there is no white space in the image or shape, text wrapping works the same as Tight.

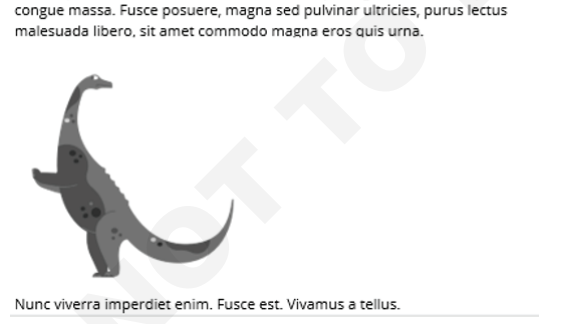
  This option is an advanced setting because you pull or drag image and shape points in and out of their original borders: (Fig 9)

Fig 9



- Top and Bottom wraps the text above and below the figure to keep the image on its line. There is no text on either side of it. (Fig 10)

Fig 10



- **Behind Text places** the figure behind, or underneath, any existing text. The text does not wrap around it.

  The picture looks like a watermark or background image. (Fig 11)

Note: Use the Selection pane when working with objects behind the text.

- **In Front of Text places** the object on top of the text. The text is not wrapped, so some of it may be blocked depending on the figure's transparency. (Fig 12)

Fig 11

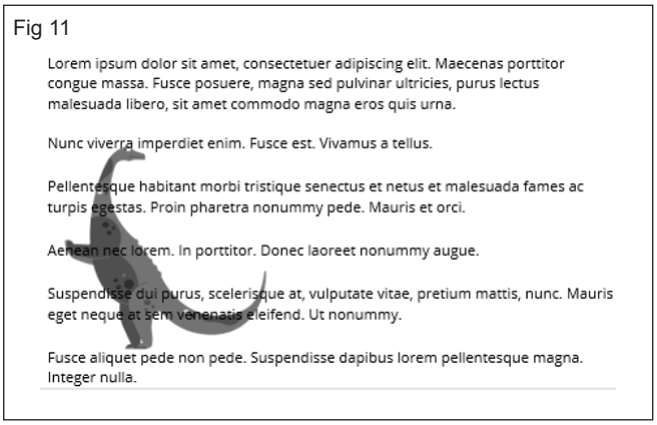
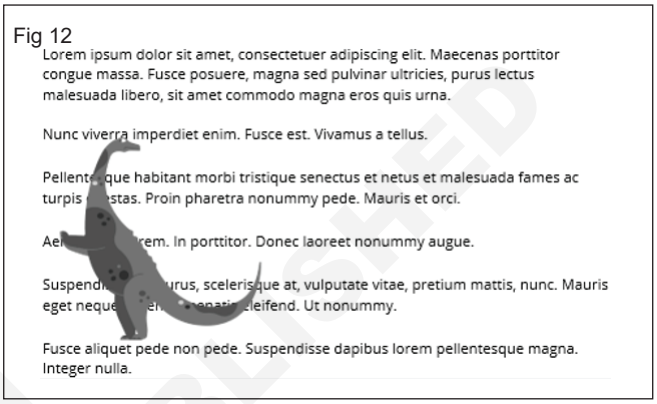


Fig 12



Note: Figures that use the Square, Tight, Through, Top and Bottom, Behind Text, or In Front of Text wrapping style are all considered floating.

Position a figure to a paragraph or page

Also, Word offers two options for all wrapping styles except In line with Text (for floating figures): or

- Move with Text moves the figure along with the surrounding text.

  If a figure is positioned inside the paragraph, and you delete or add any content before the paragraph, the figure moves with the paragraph.

- Fix Position on Page keeps the figure at the same place on the page when text is added or removed.

  If the paragraph where the figure is located (that paragraph contains anchor) moves to the next page, the figure moves and keeps its position relative to the page. (Figs 13 &14)

Note: The same options you can find in the Layout dialog box, on the Position tab, in the Options section: (Fig 15)

Checking the Move object with text check box is equivalent to the Move with Text option from the Wrap Text dropdown list. Unchecking the Move object with text check box is equivalent to the Fix Position on Page option.

Wrap text on both sides, or one side only

1 To change additional options, choose More Layout Options... from the Wrap Text dropdown list or the See more... link in the Layout Options menu.

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Fig 13

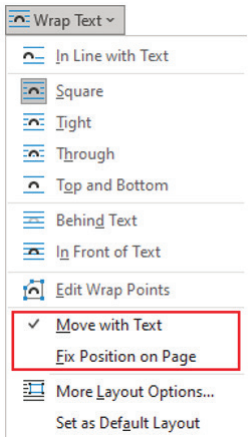


Fig 14

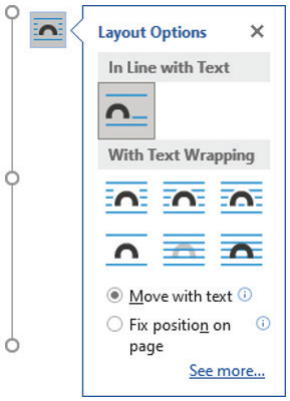
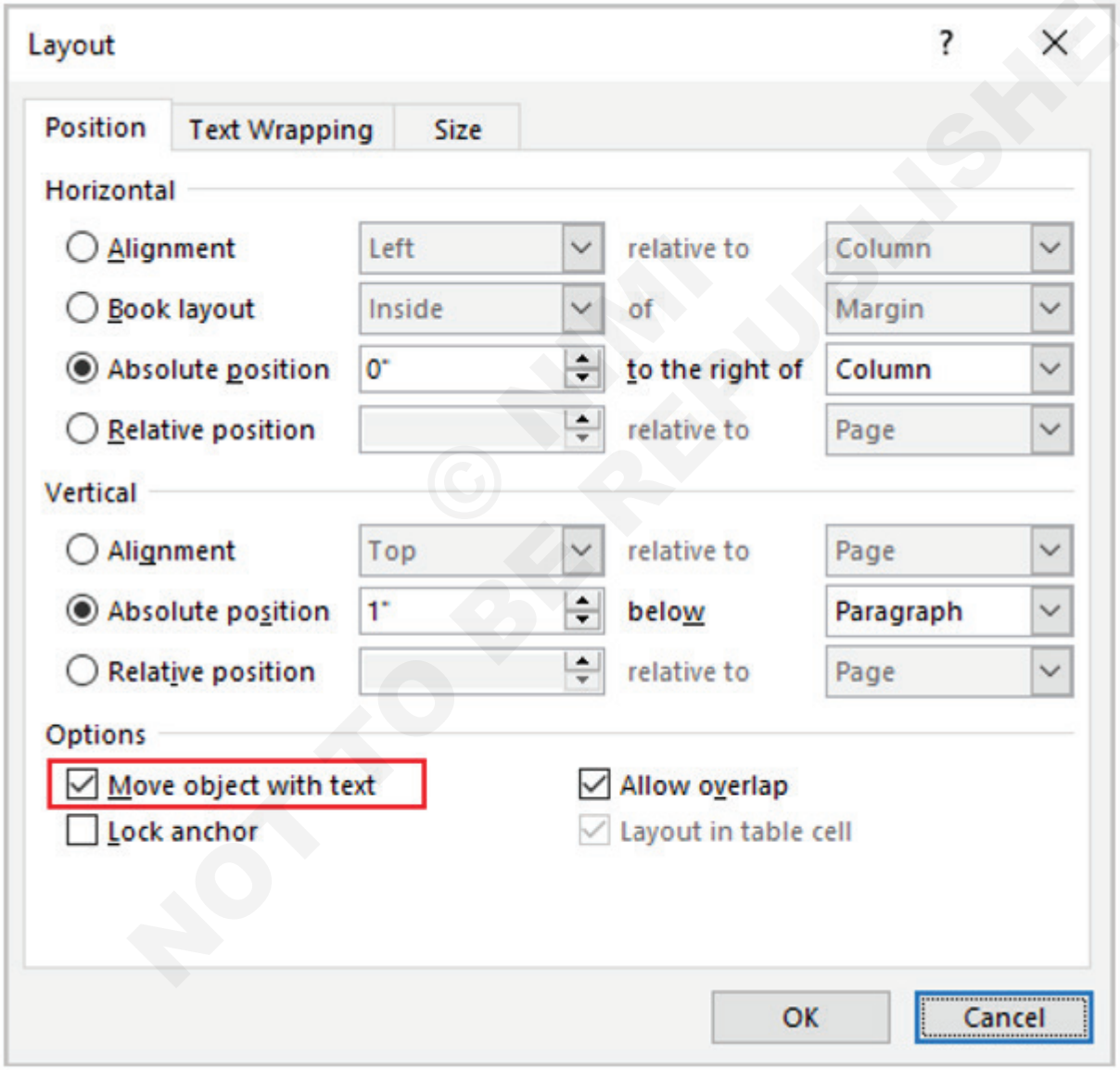


Fig 15



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2 In the Layout dialog box, on the Text Wrapping tab: (Fig 16)

- In the Wrapping style group, choose any style exact In line with text (see above).
- In the Wrap text group (available for the Square, Tight, and Thought wrapping styles), choose any of the additional options:
- Both sides wraps text around either side of the image or shape: (Fig 17)

Fig 16

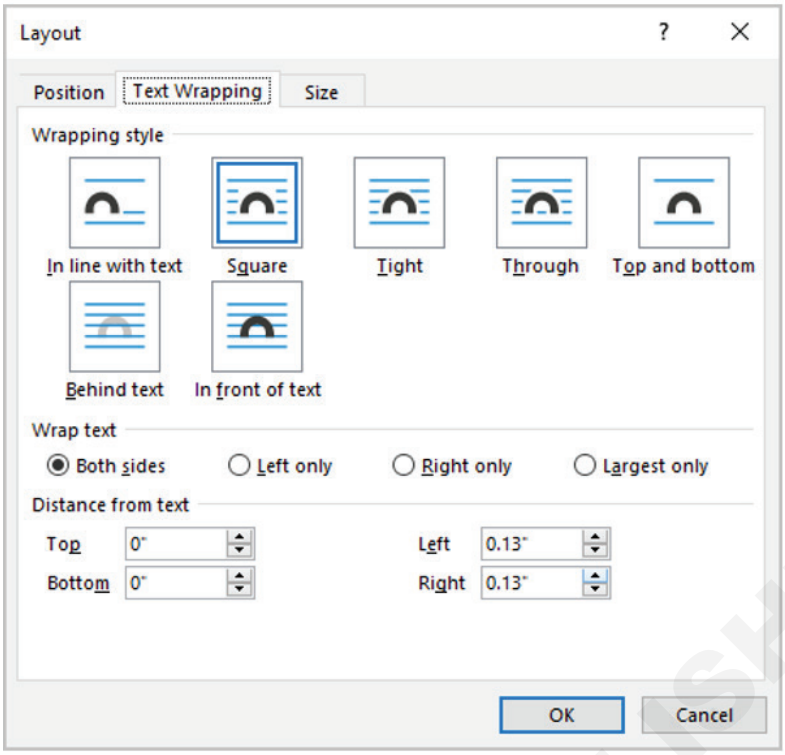
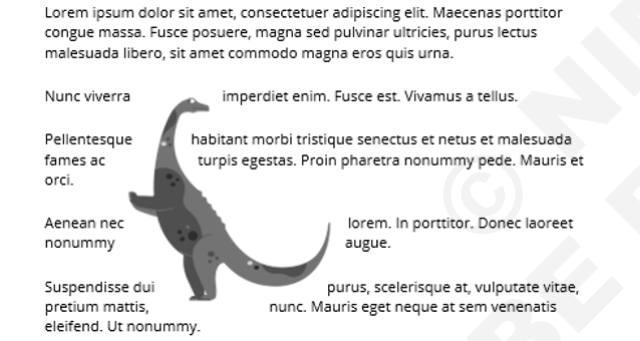
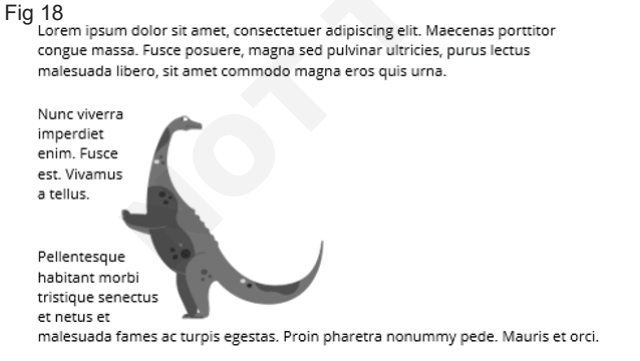


Fig 17



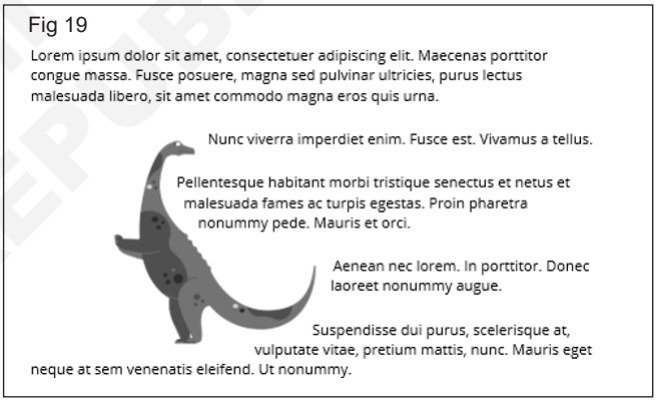
- Left only wraps text around only the left side of the image or shape: (Fig 18)

Fig 18



- Right only wraps text around only the right side of the image or shape: (Fig 19)
- Largest only wraps text on the side of the image or shape with the larger distance from the margin.

Fig 19



Change the distance between text and object

- To change the distance between text and the visual object, open the Layout dialog box by one of the following methods:
- On the Picture Format (Shape Format, Graphics Format) tab, in the Arrange group, click the Wrap Text button, then select More Layout Options...
- Right-click on the object, click the Wrap Text list, then select More Layout Options... in the popup menu.
- Click the See more... link in the Layout Options menu.

In the Layout dialog box, on the Text Wrapping tab, in the Distance from text section, enter custom values for the distance between the text and the picture independently for:

- Top and Bottom (available for the Square, Tight, Thought, and Top and Bottom wrapping styles),

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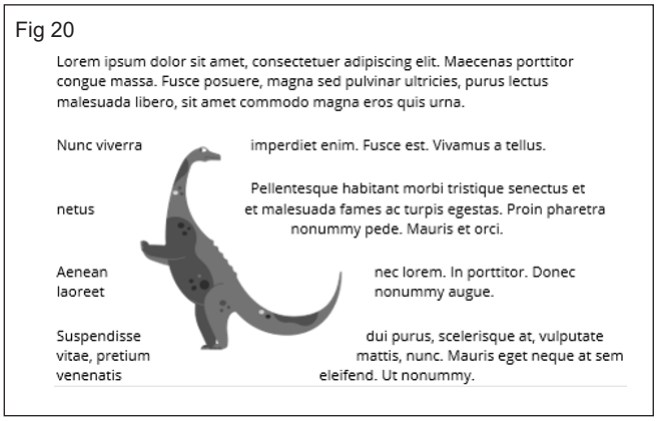
- Left and Right (available for the Square, Tight, and Thought wrapping styles).

For example, with the 0.3-inch distance on all sides: (Fig 20)

Fig 20

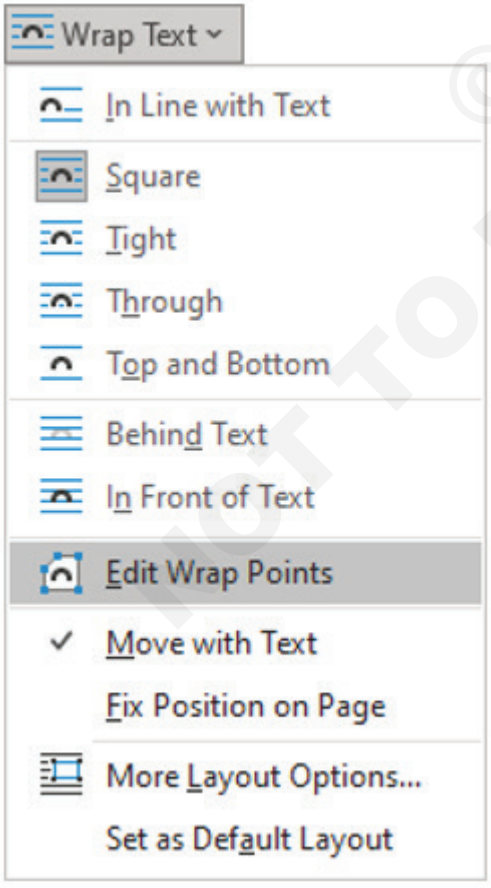


Edit hyphenation points

To use the Tight or Through options effectively, you may need to adjust the wrapping points for the image or shape. To edit wrap points, select the object, then activate the Edit Wrap Points view by one of the following methods:

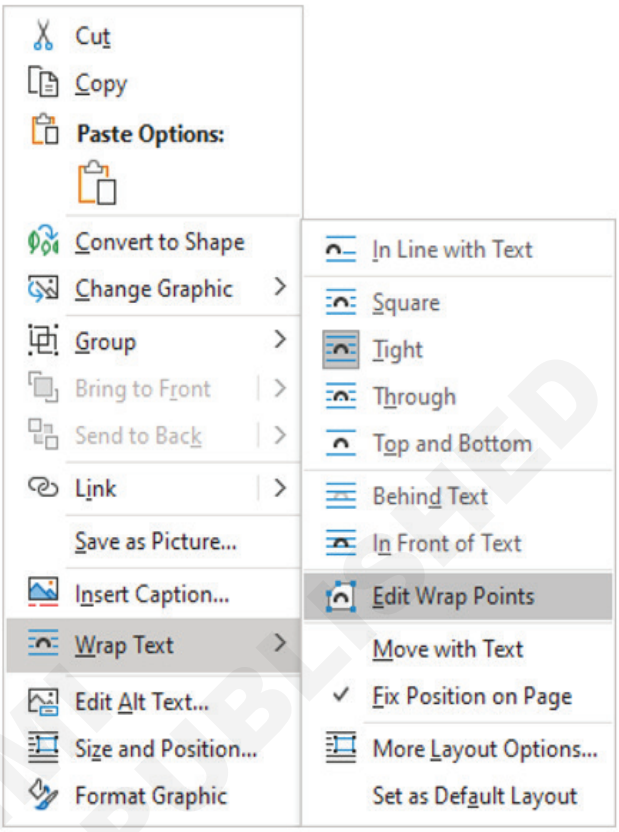
- Picture Format (Shape Format, Graphics Format) tab, in the Arrange group, click the Wrap Text button. Then choose Edit Wrap Points from the Wrap Text dropdown list: (Fig 21)

Fig 21



- Right-click on the object and select Wrap Text -> Edit Wrap Points in the popup menu: (Fig 22)

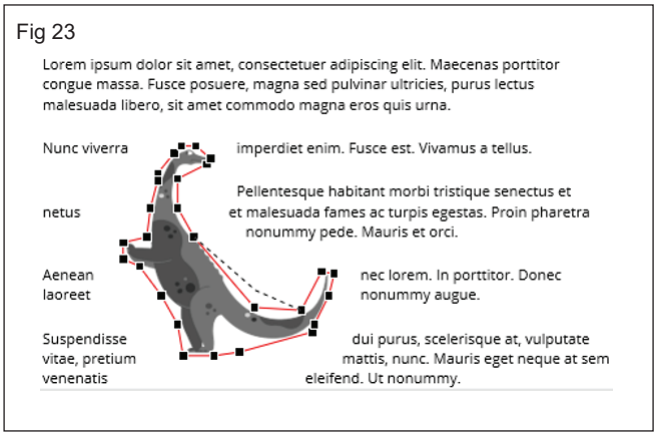
Fig 22



- In the Edit Wrap Points view, drag the red lines to adjust where the text wraps (Fig 23)

Note: There is no way to add points. You can move existing wrap points however you want

Fig 23



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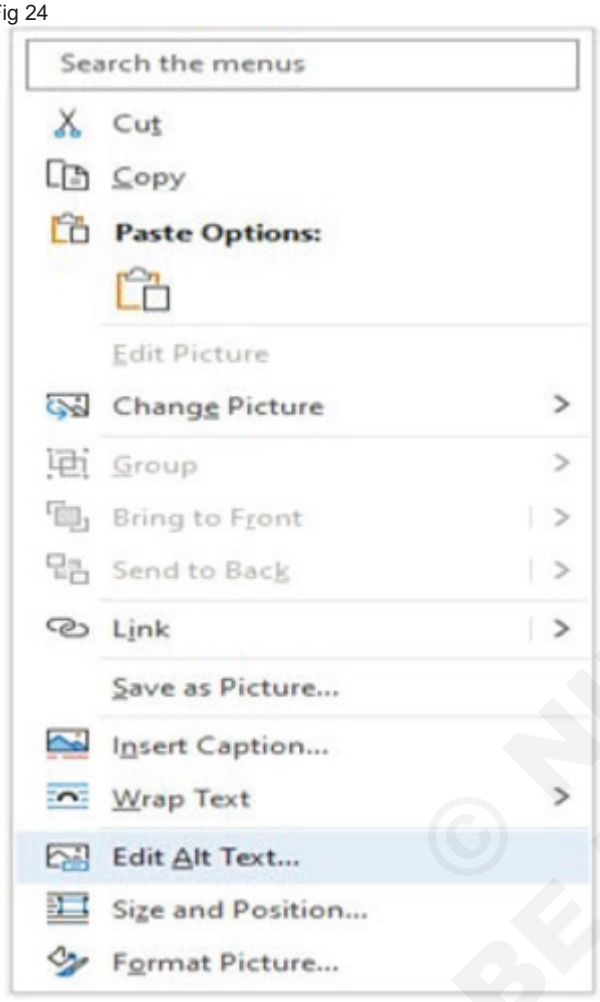
TASK 3: **Add alternative text to objects for accessibility**

Add alt text

1 Do one of the following:

- Right-click the object and select Edit Alt Text (Fig 24)

Fig 24



- Select the object and then select the format menu for the object, for example, Picture Format. Select Alt Text.

Note: To add alt text to the entire SmartArt graphic or chart, click the border of the SmartArt graphic or chart, and not an individual shape or piece.

2 In the Alt Text pane, type 1-2 sentences in the text box to describe the object and its context to someone who cannot see it. (Fig 25 & 26)

Mark visuals as decorative

1 To open the Alt Text pane, do one of the following:

- Right-click an image, and then select Edit Alt Text.
- Select an image, select Format > Alt Text.

2 Select the Mark as decorative checkbox. The text entry field becomes grayed out.

Fig 25

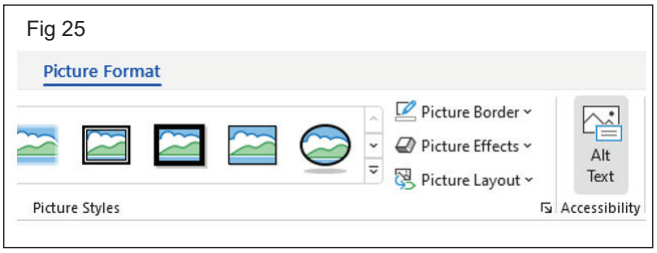
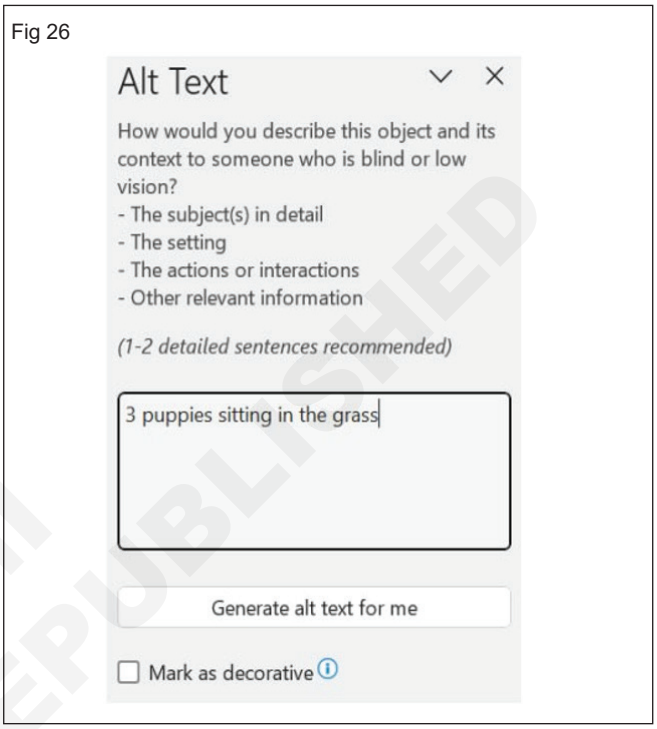


Fig 26



Toggle Automatic Alt Text on and off

If you don't want automatically generated alt text to be added to inserted pictures, you can turn off the automatic alt text option. If you change your mind later, you can just as easily turn it back on.

1 Select File > Options > Accessibility.

2 In the Automatic Alt Text section, select or unselect the Automatically generate alt text for me option, and then select OK.

Approve the automatic alt text

You can approve the auto-generated alt text in Microsoft 365.

1 If the alt text is satisfactory, select the Approve alt text checkbox. (Fig 27)

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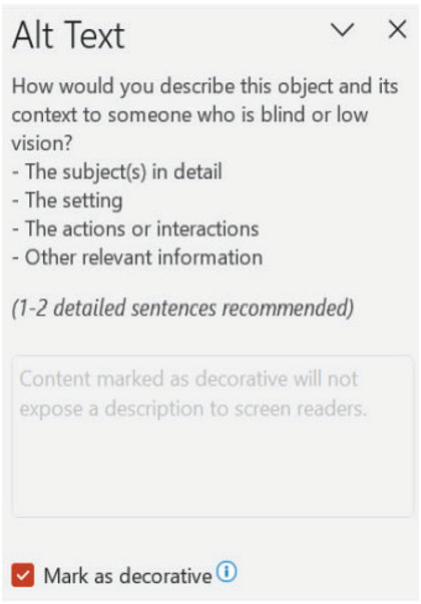
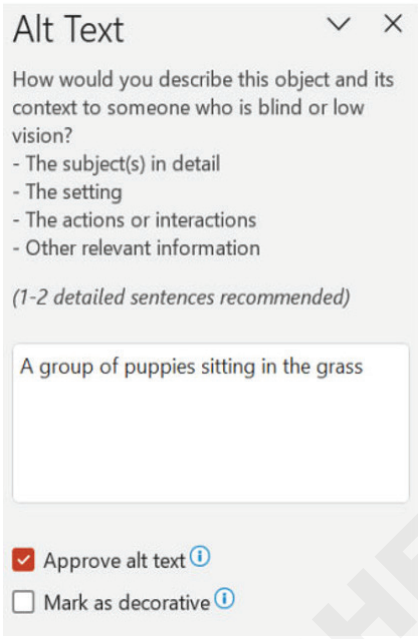
Fig 27





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Add and manage comments

Objectives: At the end of this exercise you shall be able to
- **add comments, review and reply to comments, resolve comments, delete comments.**

Requirements

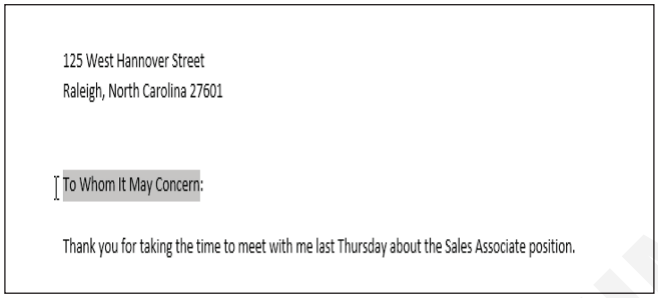
Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

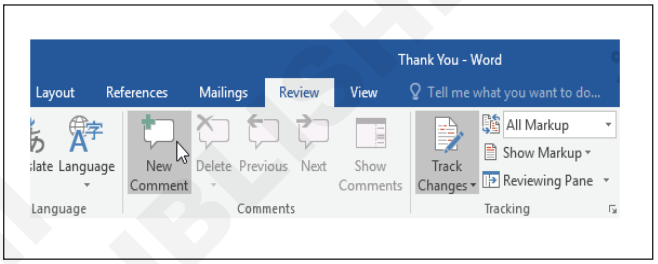
PROCEDURE

TASK 1: **To add comments**

1 **Highlight some text**, or place the **insertion point** where you want the comment to appear.



2 From the **Review** tab, click the **New Comment** command.



3 Type your comment. When you're done, you can close the comment box by pressing the **Esc** key or by clicking anywhere outside the comment box.

TASK 2: **Review and reply to comments**

1 To Review and reply a comment, go to the comment, and select **Reply**.

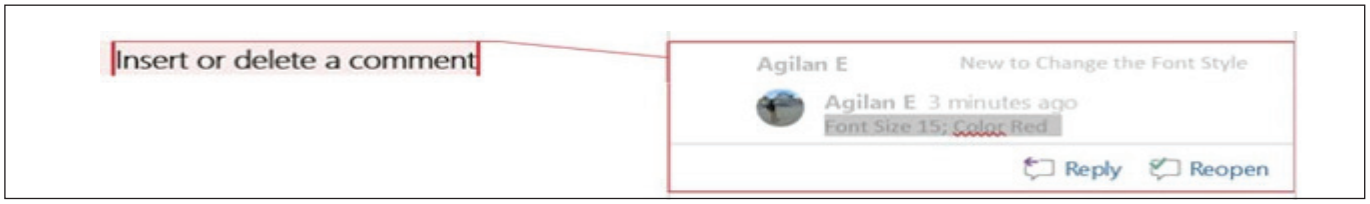
2 Type your Reply comment. If you want to make changes to any of your comments.

Resolve comments

1 To resolve a comment, go to the comment, and select Resolve.

2 Then comment box will be disabled.

3 If you want to update comment then select Reopen.



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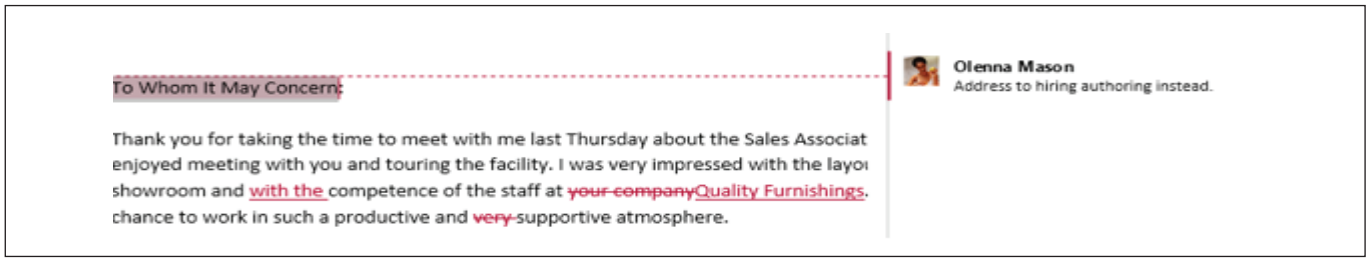
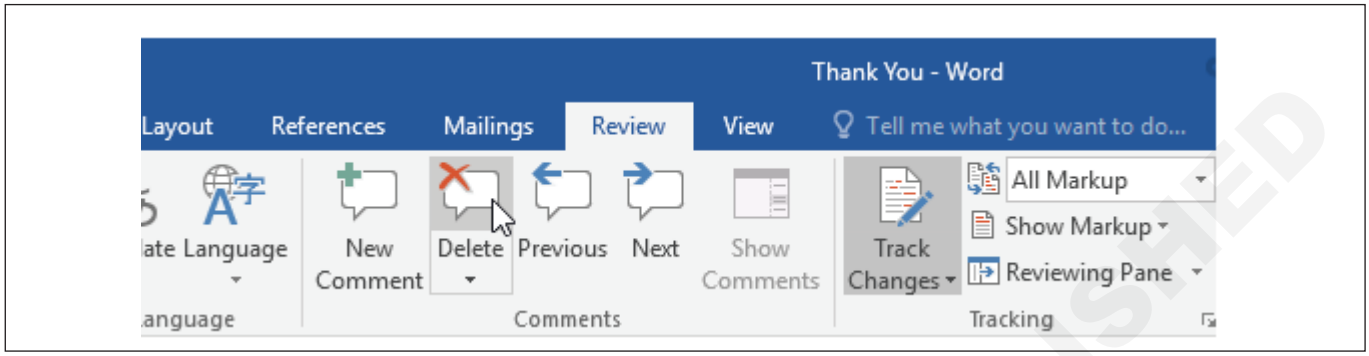
To delete comments

1 Select the comment you want to delete.

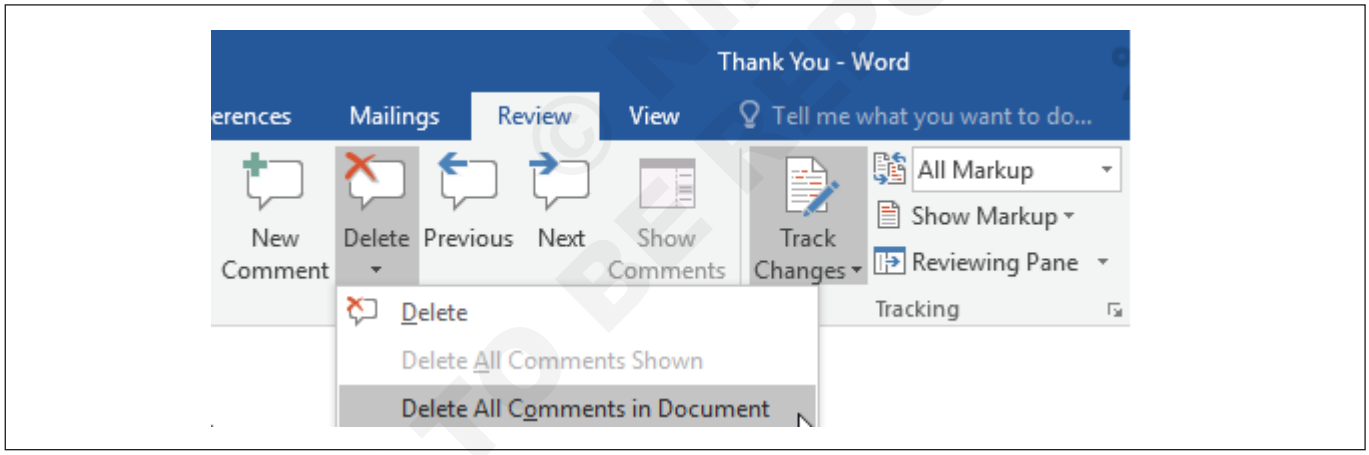


2 From the **Review** tab, click the **Delete** command.



3 The comment will be deleted.

To delete all comments, click the **Delete** drop-down arrow and select **Delete All Comments in Document.**



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Manage change tracking

Objectives: At the end of this exercise you shall be able to

- **track changes, review tracked changes, accept and reject tracked changes & lock and unlock change tracking.**

Requirements

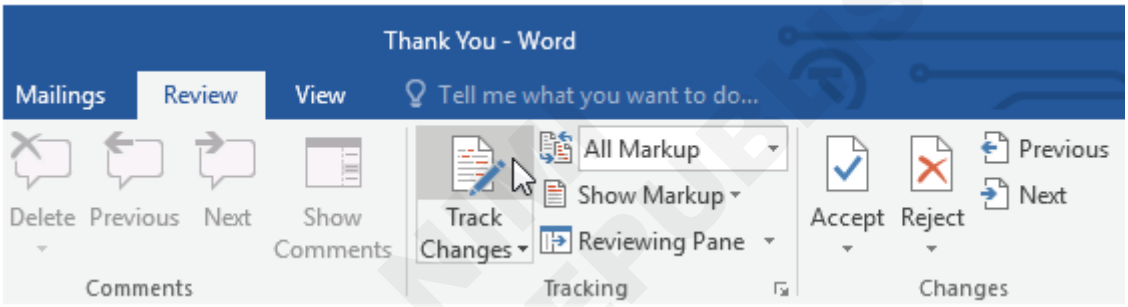
Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

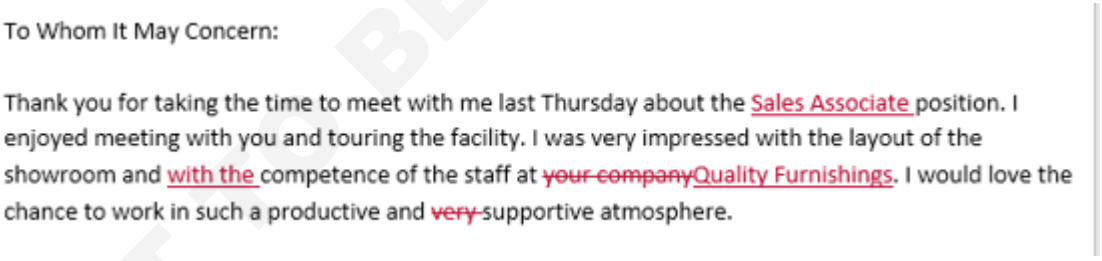
TASK 1: **To turn on Track Changes**

1 From the **Review tab,** click the **Track Changes** command.



2 Track Changes will be turned on. From this point on, any changes you make to the document will appear as colored markups.

Your tracked changes may look different from those seen above, depending on your computer's markup settings.



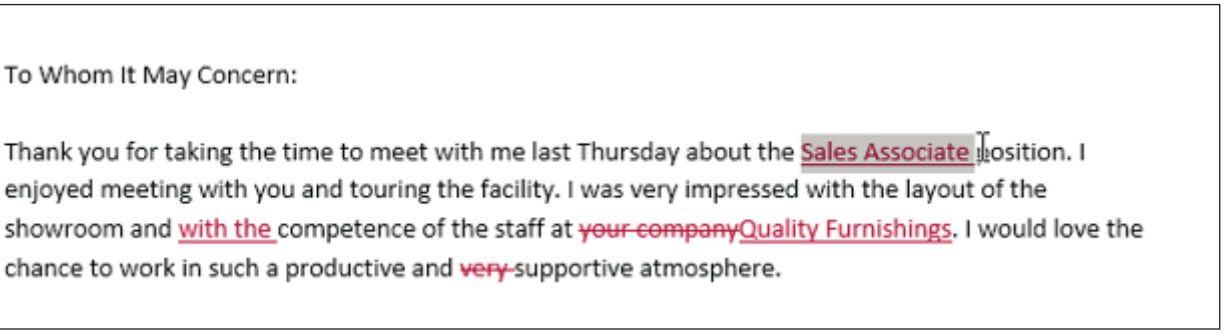
Reviewing changes

Tracked changes are really just suggested changes. To become permanent, they must be accepted. On the other hand, the original author may disagree with some of the tracked changes and choose to **reject** them.

To accept or reject changes:

1 Select the change you want to accept or reject.

2 From the **Review** tab, click the **Accept or Reject** command.



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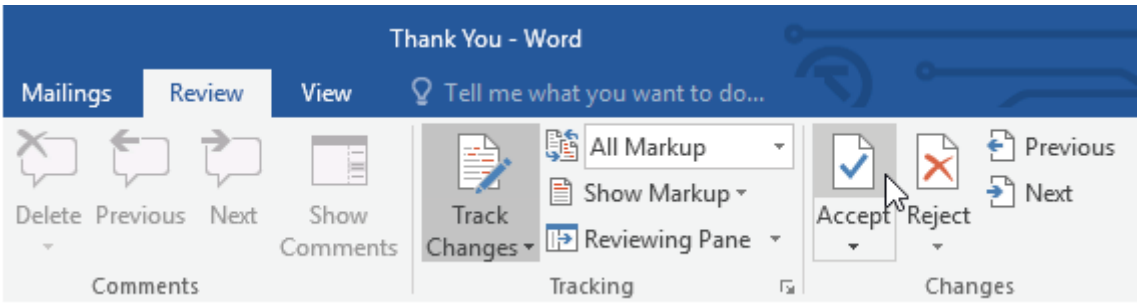


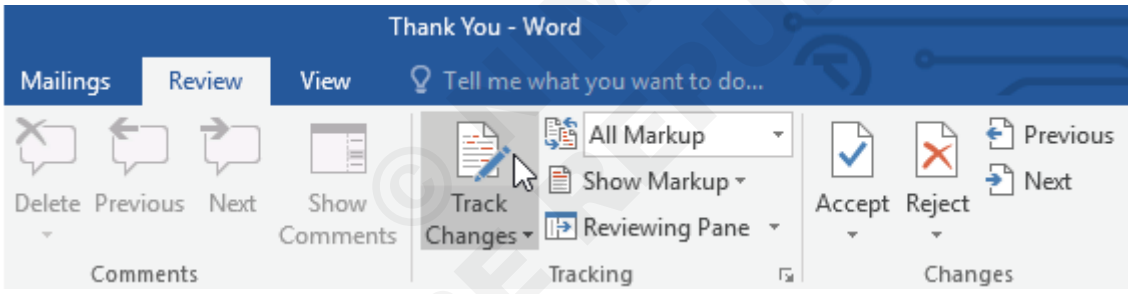
3 The markup will disappear, and Word will automatically jump to the next change. You can continue accepting or rejecting each change until you have reviewed all of them.

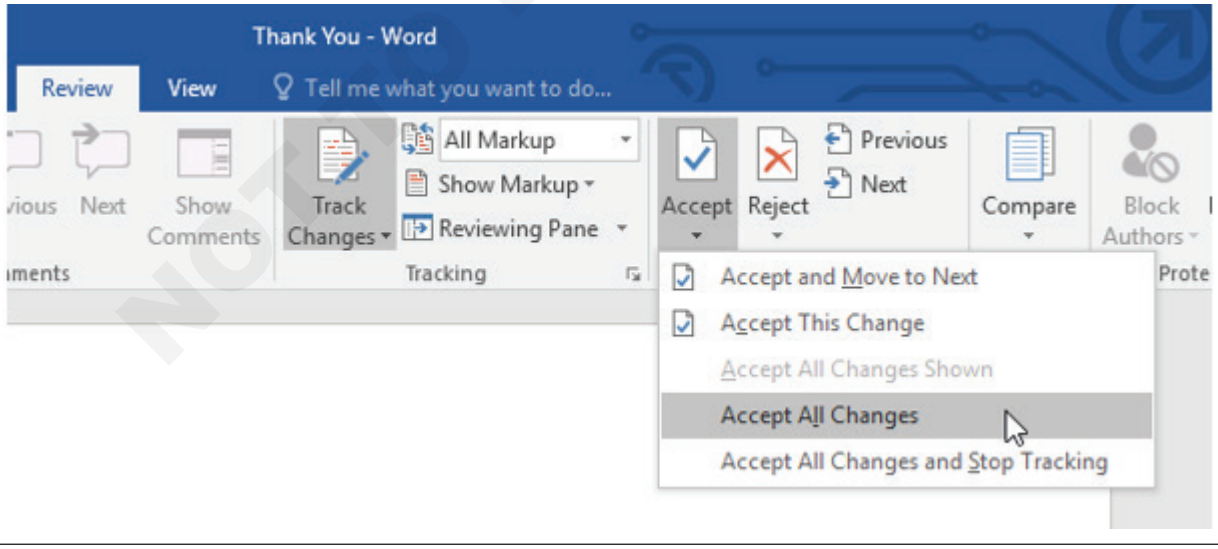
4 When you're finished, click the **Track Changes** command to **turn off** Track Changes.

To accept all changes at once, click the Accept drop-down arrow, then select Accept All. If you no longer want to track your changes, you can select Accept All and Stop Tracking.

To Whom It May Concern:

Thank you for taking the time to meet with me last Thursday about the Sales Associate position. I enjoyed meeting with you and touring the facility. I was very impressed with the layout of the showroom and with the competence of the staff at ~~your company~~Quality Furnishings. I would love the chance to work in such a productive and ~~very~~ supportive atmosphere.





Track Changes viewing options : If you have a lot of tracked changes, they may become distracting if you're trying to read through a document. Fortunately, Word provides a few ways to customize how tracked changes appear:

- **Simple Markup:** This shows the final version without inline markups. Red markers will appear in the left margin to indicate where a change has been made.

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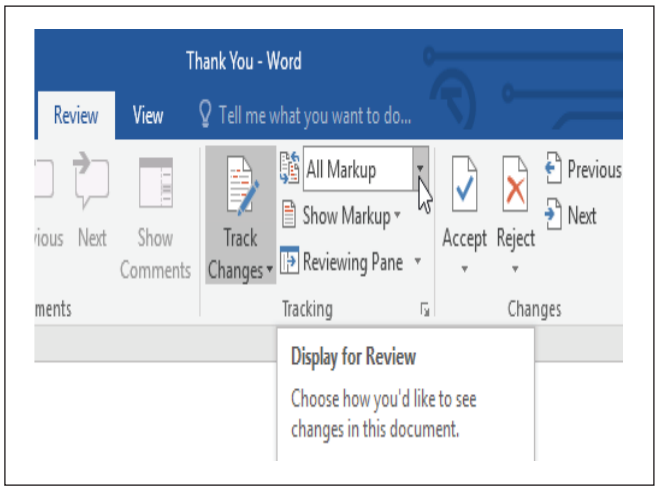
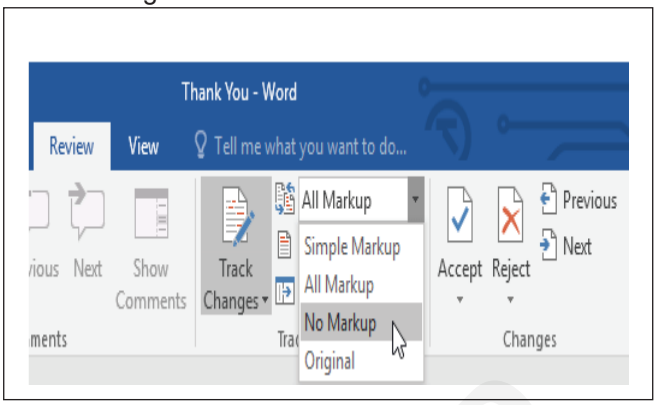
- **All Markup:** This shows the final version with inline markups.
- **No Markup:** This shows the final version and hides all markups.
- **Original:** This shows the original version and hides all markups.

To hide tracked changes:

1 From the **Review** tab, click the **Display for Review** command to the right of the Track Changes command.

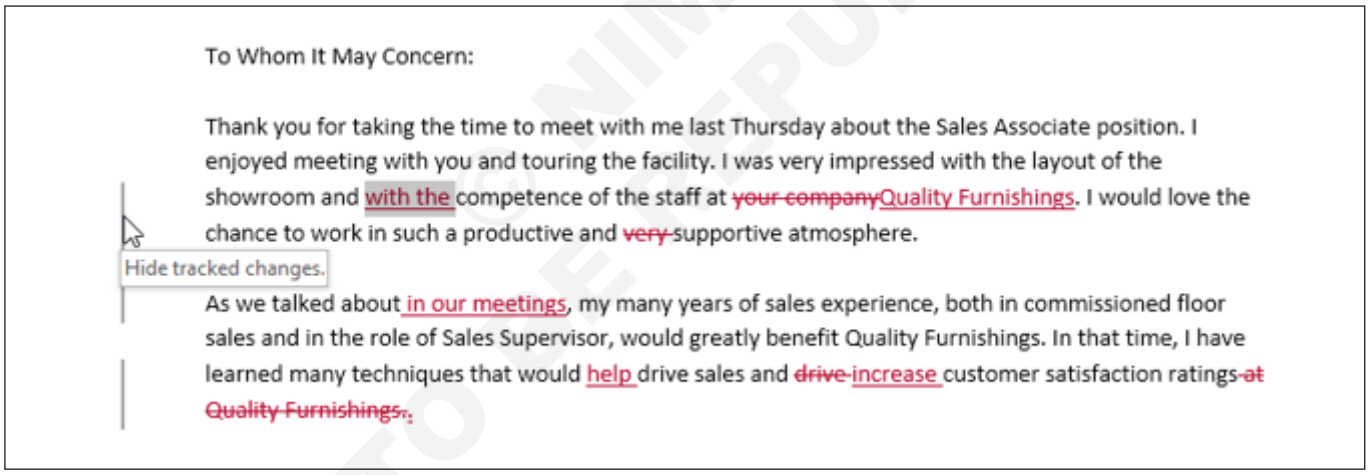


2 Select the desired option from the drop-down menu. In our example, we'll select **No Markup** to preview the final version of the document before accepting the changes.



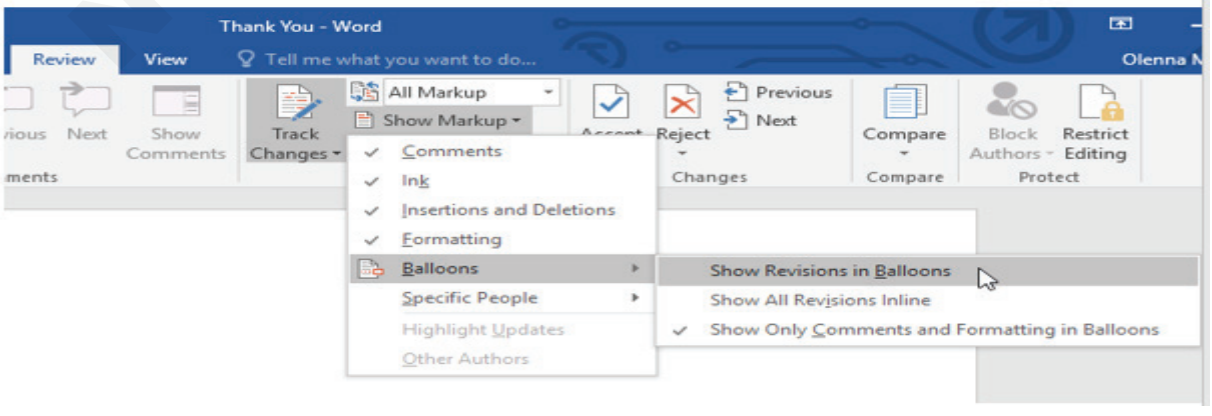
You can also click the marker in the left margin to switch between **Simple Markup** and **All Markup**.

Remember that hiding Track Changes is not the same as **reviewing changes.** You will still need to **accept or reject** the changes before sending out the final version of your document.



To show revisions in balloons: Most revisions appear **inline,** meaning the text itself is marked. You can also choose to show the revisions in balloons, which moves most revisions to the right margin. Removing inline markups can make the document easier to read, and balloons also offer more detailed information about some markups.

1 From the **Review** tab, click **Show Markup > Balloons > Show Revisions in Balloons.**



2 Most revisions will appear in the right margin, although any added text will still appear inline.

To go back to inline markups, you can select either **Show All Revisions Inline or Show Only Comments and Formatting in Balloons.**

Lock and unlock change tracking

- In Word, click on Review > Track Changes > Lock Tracking.
- Enter a password.

Now that Track Changes is locked, it can't be disabled without the password. Other users also cannot accept or reject changes. This lets you manage the changes, enter the password, and then accept or reject changes to settle on its final form.

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Perform mail merge

Objectives: At the end of this exercise you shall be able to
- **create envelopes, labels, new mailing list & perform mail merge using an existing list.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Create envelopes**

Create an Envelope

1 Click the Mailings tab.

2 Click the Envelopes button in the Create group.

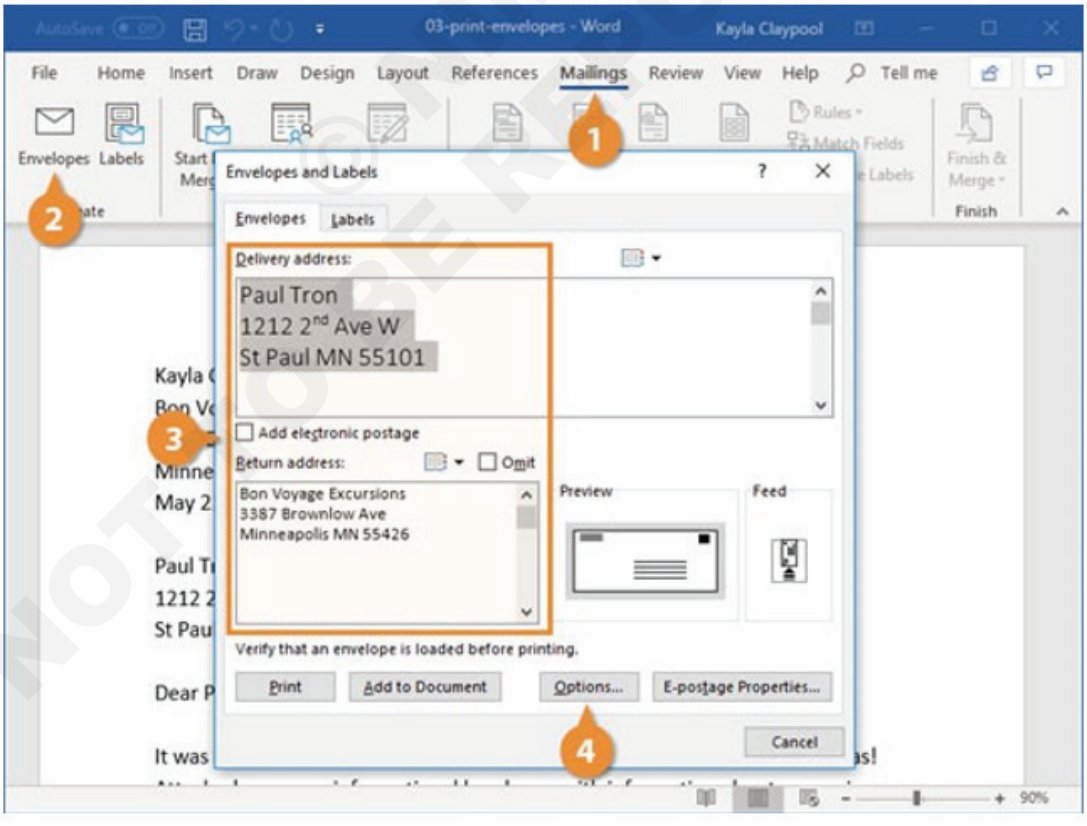
3 Enter a Delivery and Return Addresses.

If you select a delivery address in the document before clicking the Envelopes button, it will be automatically filled in.

Click the Insert Address button, select the profile you want to use, and select a contact.

4 (Optional) Click Options

The Envelope Options dialog box opens, with two tabs of options to set up the envelope.



5 Select your envelope's options.

- Envelope Options: Specify the envelope size, customize the font used in the return and delivery addresses, and adjust the location of the addresses on the envelope.
- Printing Options: You can specify how the envelope is fed to the printer. This setting will vary, depending on the printer you're using.

6 Click OK.

The envelope options are saved.

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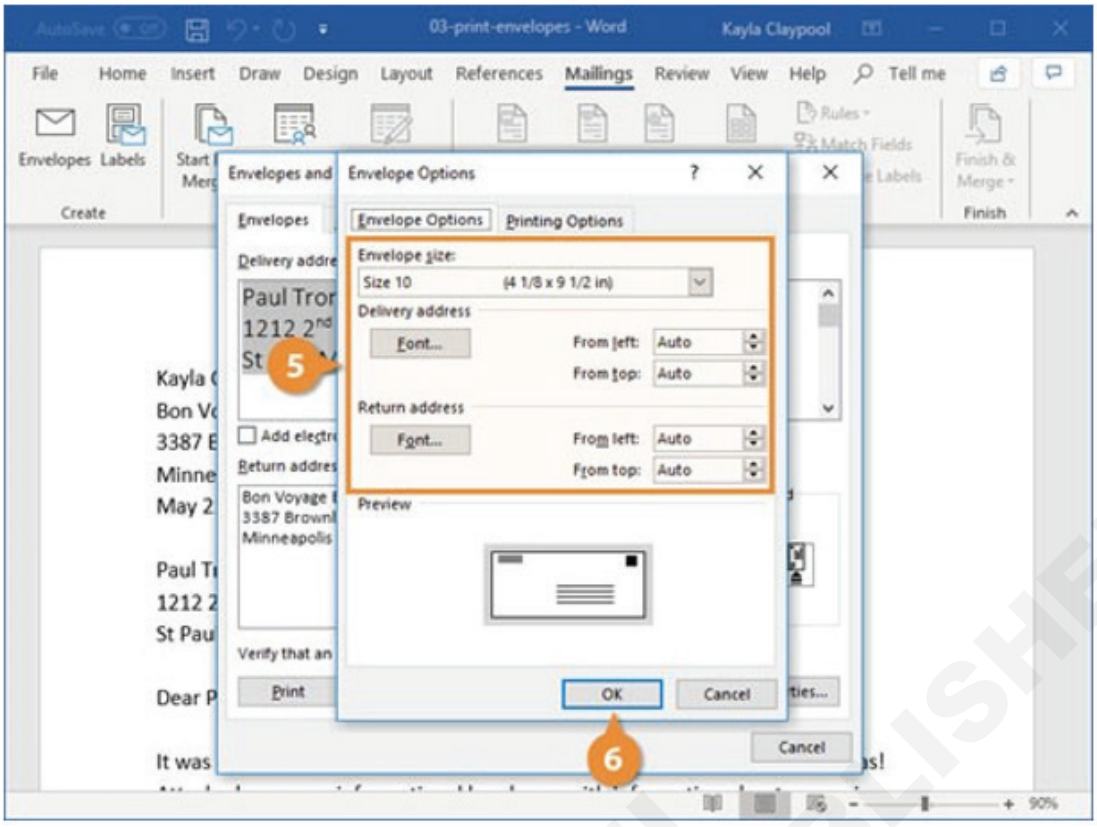
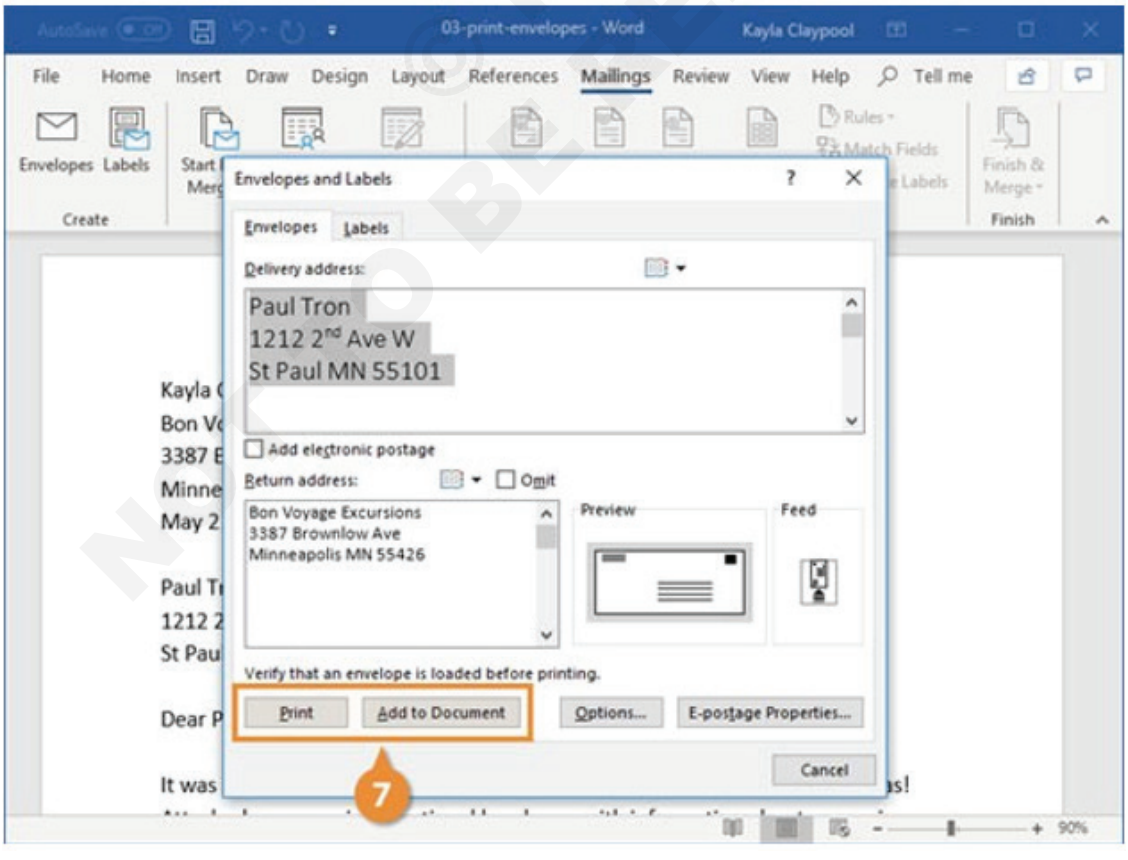


7 Click Print to print the envelope, or click Add to Document to add the envelope as a new page in the current document.

The envelope is sent to the printer or added as its own page to the current document, depending on your action



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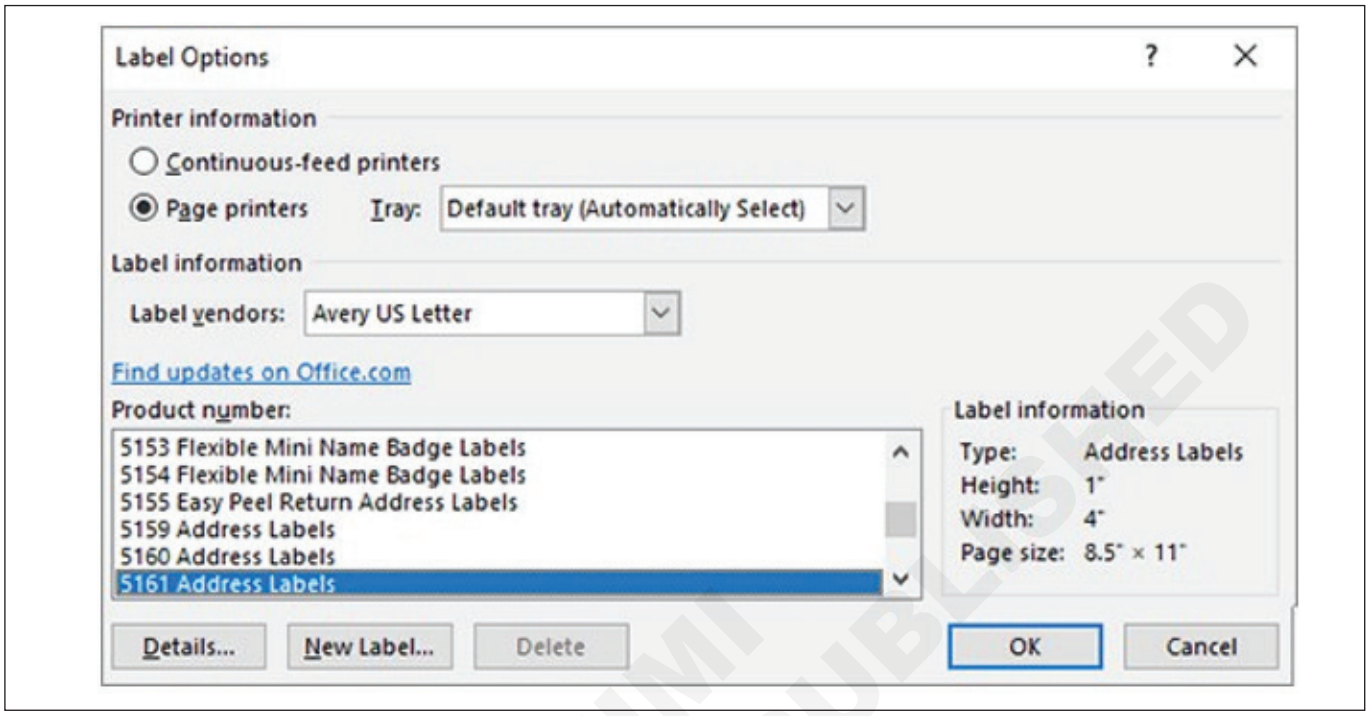
TASK 2: **Create labels**

Create and print a page of identical labels

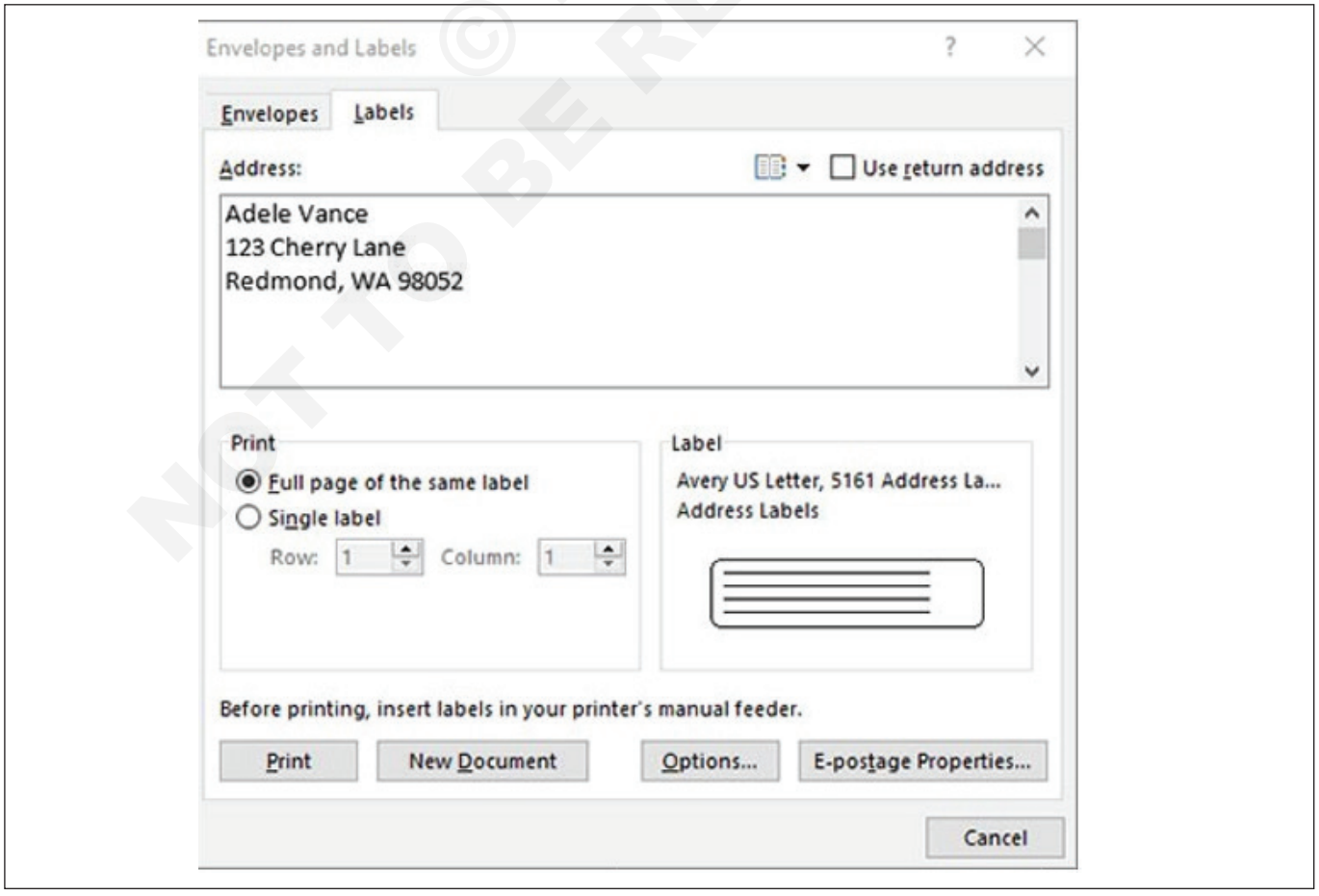
1 Go to Mailings > Labels.

2 Select Options and choose a label vendor and product to use. Select OK.

If you don't see your product number, select New Label and configure a custom label.



3 Type an address or other information in the Address box (text only).



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To use an address from your contacts list select Insert Address.

4 To change the formatting, select the text, right-click, and make changes with Font or Paragraph.

5 Select OK.

6 Select Full page of the same label.

7 Select Print, or New Document to edit, save and print later.

If you need just one label, select Single label from the Mailings > Labels menu and the position on the label sheet where you want it to appear. Select OK, the destination, and Save.

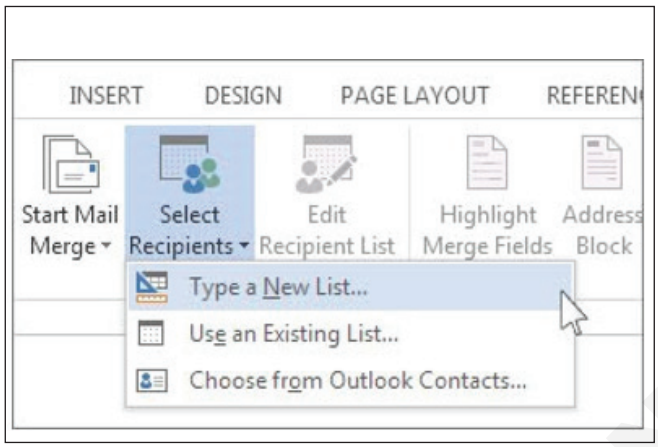
Tip: Print your labels to a sheet of paper before loading labels into the printer to make sure the text aligns with the labels.

TASK 3: **Create a new mailing list**

Create a new mail merge list

1 Go to File > New > Blank Document > Mailings.

2 Choose Select Recipients > Type a New List.

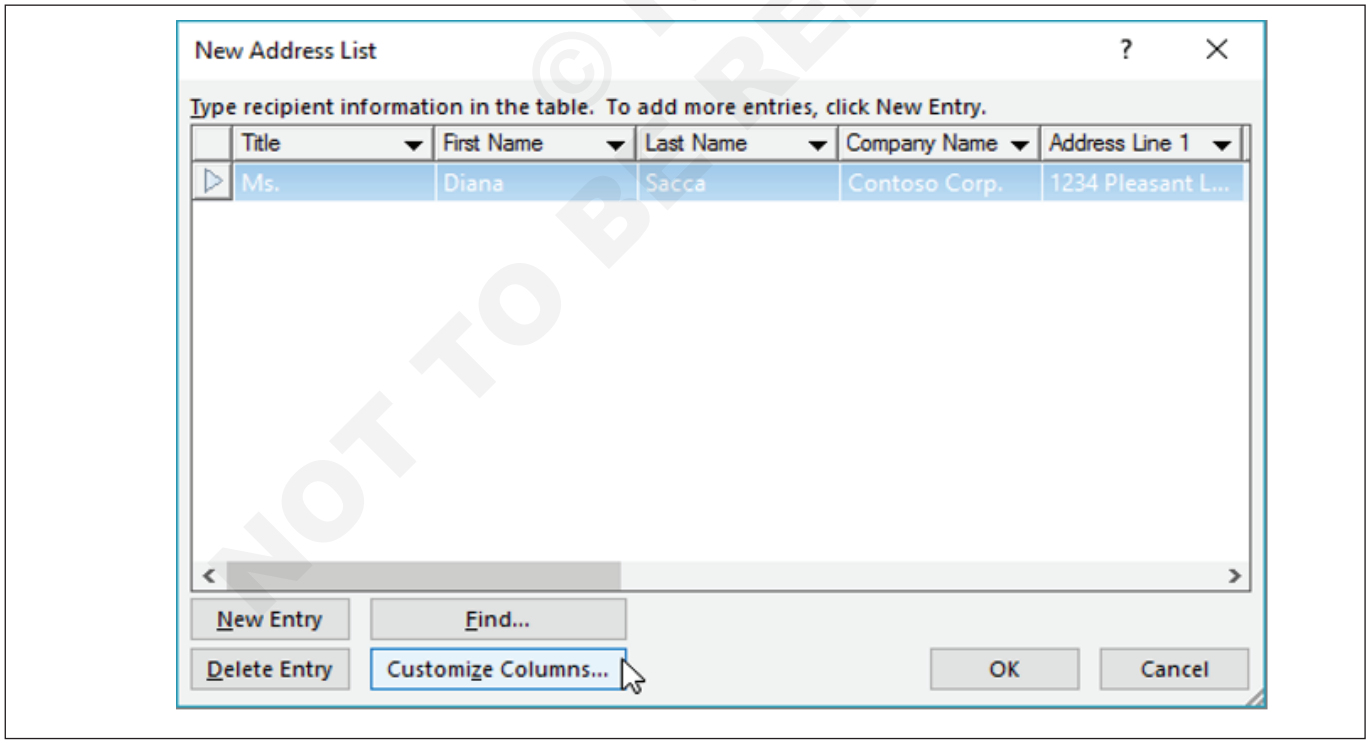


3 In the New Address List dialog box type recipient information in each column as appropriate.

4 For each new record, select Add New.

5 If you need more columns, such as for an order number, follow these steps:

a In the New Address List dialog box choose Customize Columns.



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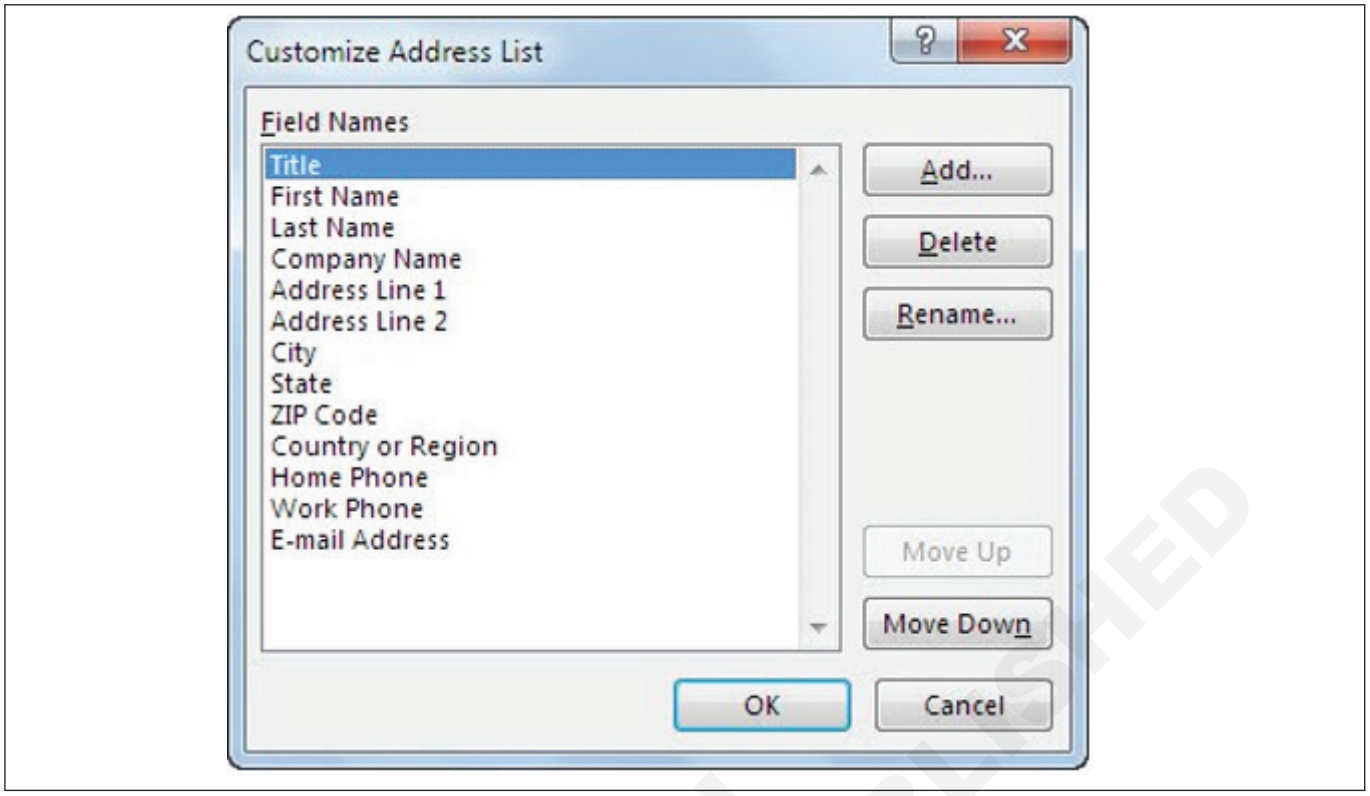
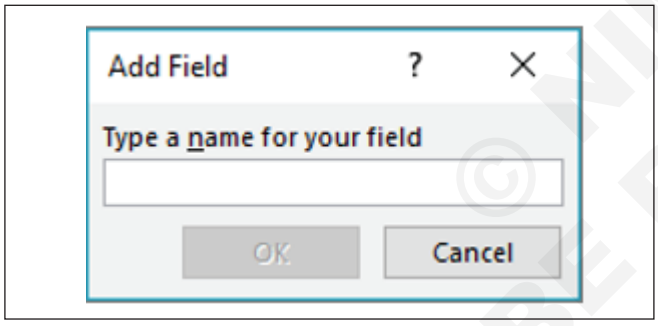
b Choose Add



c Type a field name and then select OK.



d Repeat steps b and c for each column or field to add.

6 When you're done adding all the people you want to your list, choose OK.

7 In the Save Address List dialog box, give your new file a name, and then choose Save.

You can now insert mail merge fields in your document.

TASK 4: **Perform mail merge using an existing list**

Existing list

An existing list might be an Excel spreadsheet, Access database, or some other type of database. To use it as your data source, choose Use an Existing List.

Important: No matter what type of file you use as a data source, be sure to save it on your local computer or a file share; saving at an HTTP location isn't supported for mail merge.

Note: Mail merge lets you creats batch if documents that are personalised for each recipient. For example1 Bulk Email 2 Letters 3 Forms 4 Fax distribution 5 Directories.

It is most commonly used to print or email multiple recipients from letters.

- Excel spreadsheet An Excel spreadsheet works well as a data source for mail merge if all data is well-formatted and on one sheet so that it can be read by Word.
- Access database With Access, you can select data from any table or query defined in the database.
- Other database files To access other kinds of data sources, you'll run the Data Connection Wizard:

1 Go to Mailings > Select Recipients > Use an Existing List, then choose New Source to open the Data Connection Wizard.

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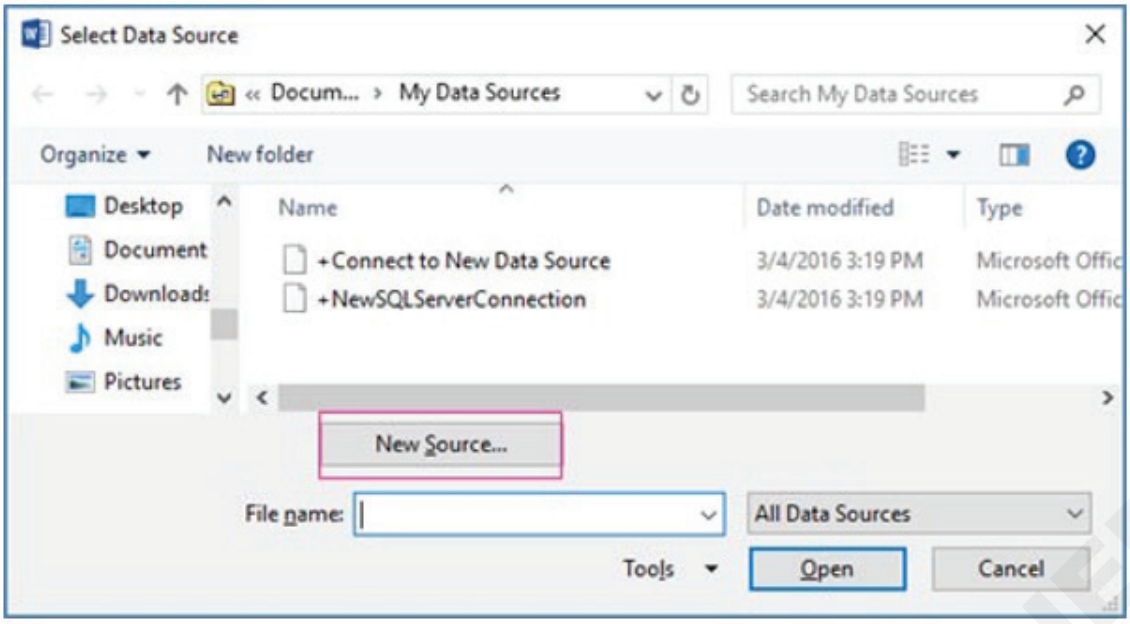
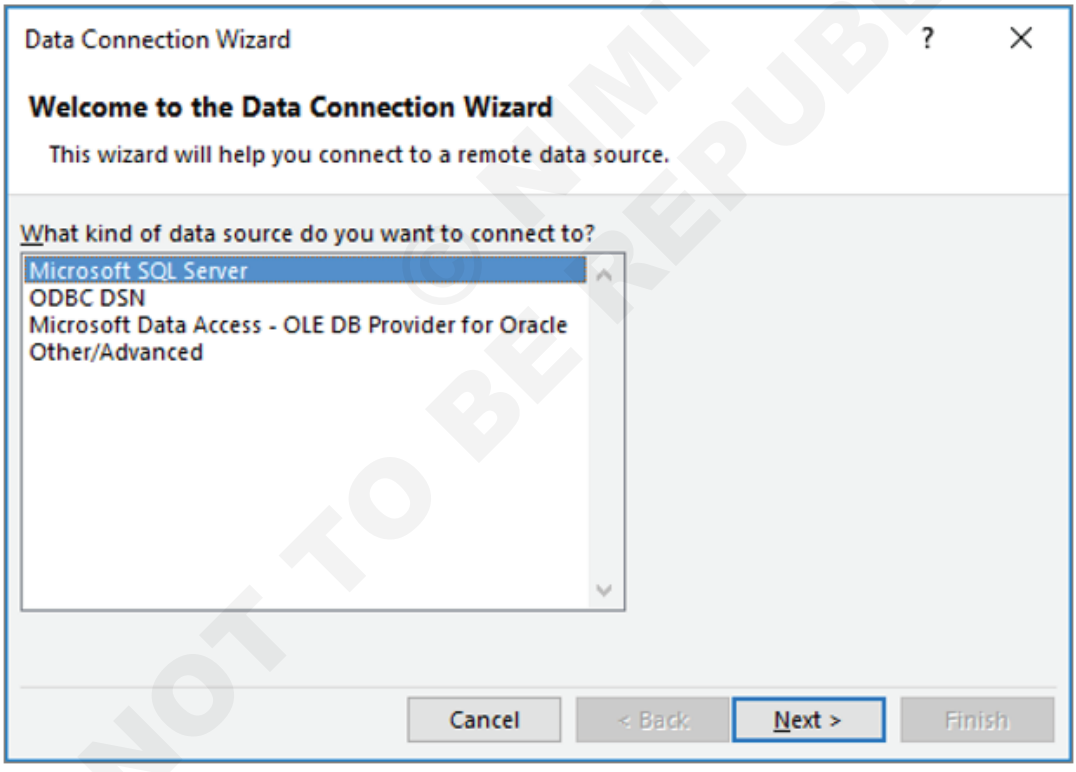


2 Choose the type of data source you want to use for the mail merge, and then select Next.

3 Follow the prompts in the Data Connection Wizard to complete the data connection to the merge document.



Add individual merge fields

To include data like phone numbers or email addresses, you insert those merge fields specifically. Also, a merge field like First Name doesn't have to be part of an Address Block or Greeting Line. If you want to personalize a document by including your recipients' first names, insert the First_Name merge field on its own.

1 Click or tap where you want the merge field.

2 Choose the down-arrow under Insert Merge Field, and select a field.

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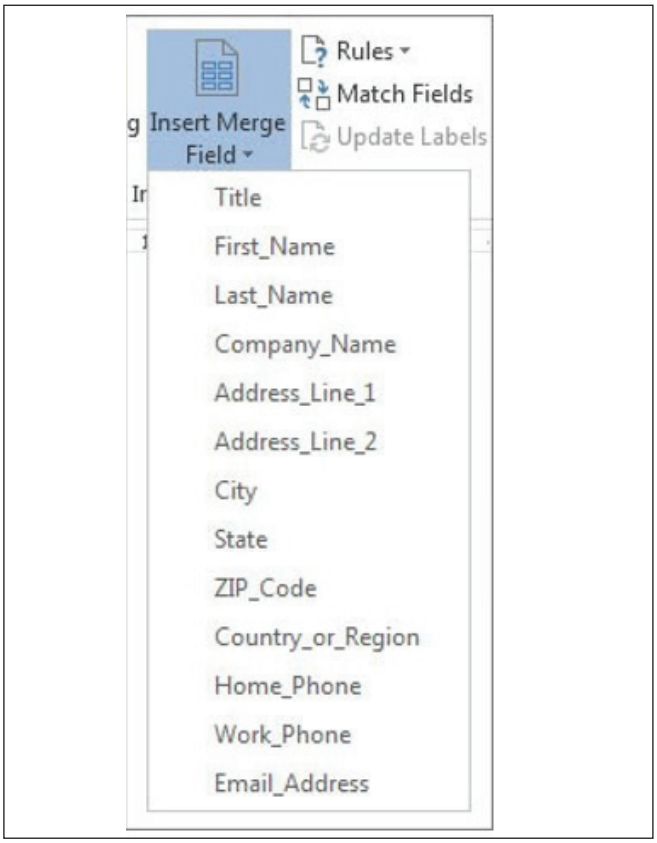


3 If you don't see your field name in the list, choose Insert Merge Field.

4 Choose Database Fields to see the list of fields that are in your data source.

5 Choose Insert.

Students Address List

Name: «First_Name»

Address: «Address_Line_1»

City: «City»

State: «State»

Pin code: «ZIP_Code»

View mail merge

1 Choose Mailings > Click Preview Result

Students Address List

Name: Ramkumar

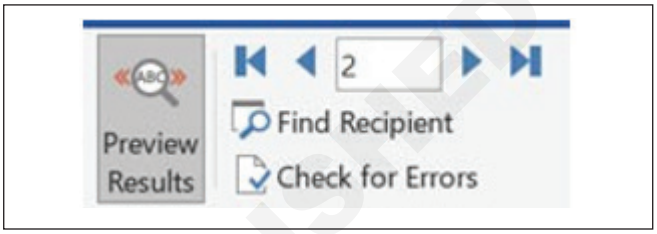
Address: Perumbakkam

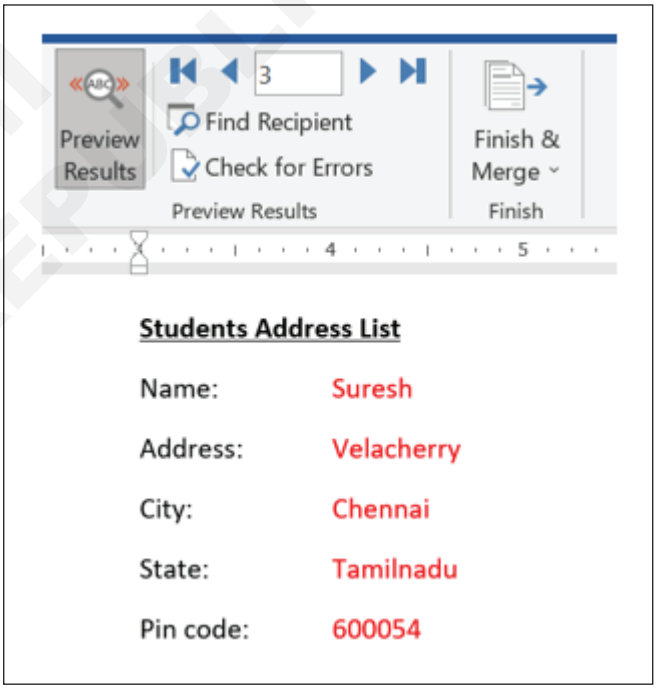
City: Chennai

State: Tamilnadu

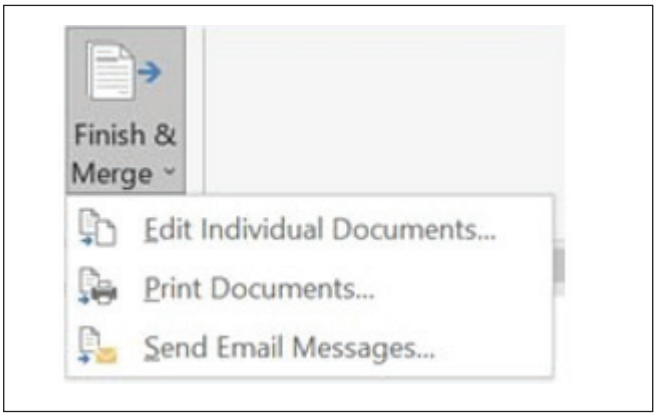
Pin code: 600131

2 Click Next, Previous, Frist and Last to view all the available list in database.





3 Click Finish & Merge to Send as Email or Print Documents.



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Open files in MS Excel

Objectives: At the end of this exercise you shall be able to
- **open MS Excel**
- **create a new Excel file**
- **create a new Excel file from a template**
- **open an existing Excel file.**

Requirements

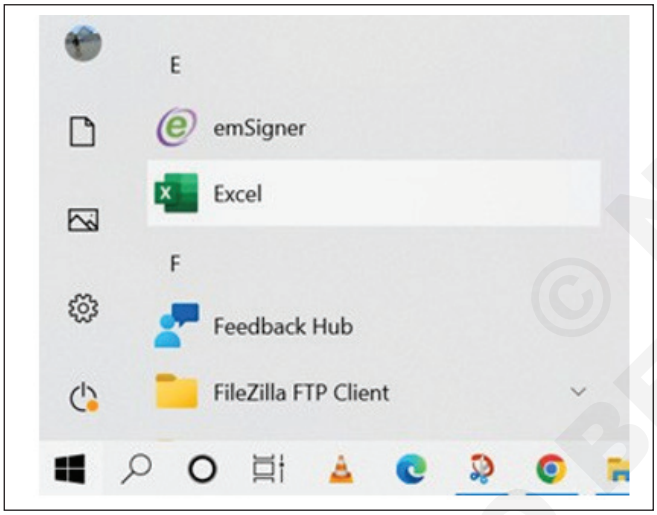
Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

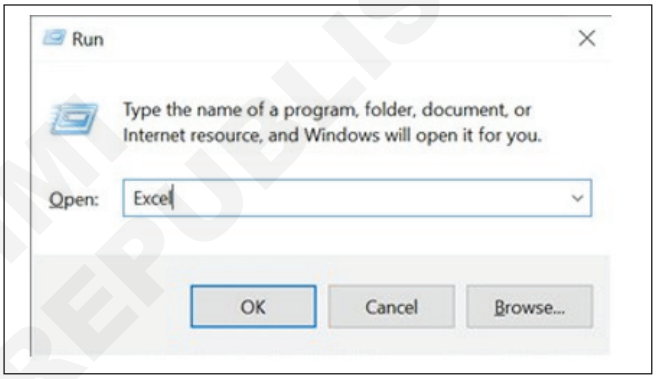
PROCEDURE

TASK 1: **Open MS Excel**

1 Click Windows Start Button > Choose Excel from Start Menu.



Or Select **Ctrl + R** > Type Excel > Click OK



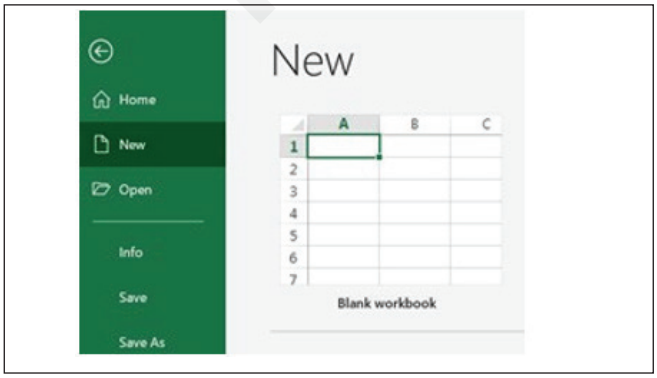
2 Microsoft Excel Application will start to open.

TASK 2: **Create a new Excel file**

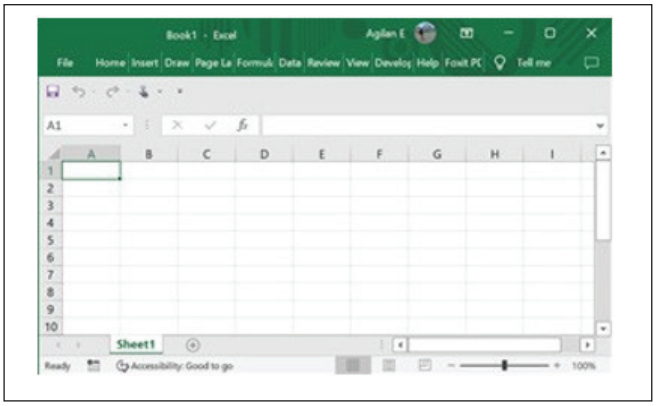
Create a workbook

1 Open Excel.

2 Select Blank workbook or press Ctrl+N.



3 Start typing.



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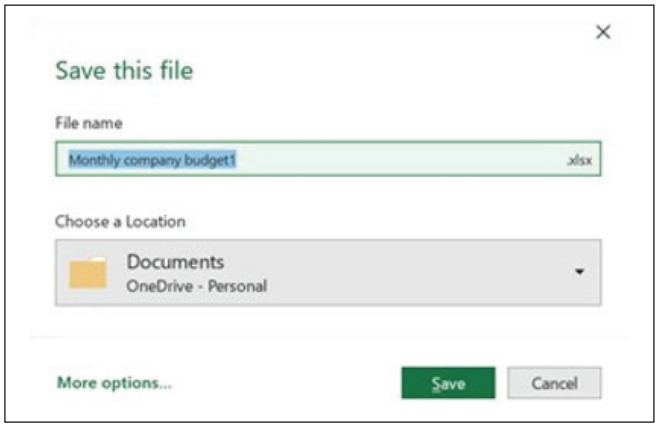
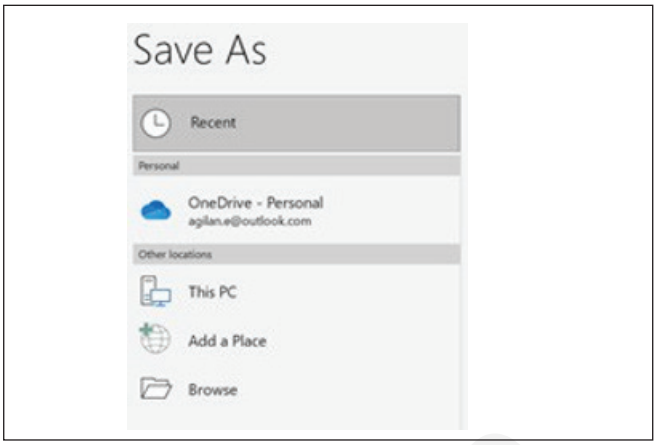
Save your workbook

Wherever you want to save your workbook on your computer or the web, you do all your saving on the File tab > Save or press Ctrl+S to save first time or you need to use Save As to save your existing workbook in a different location, or to create a copy of your workbook in the same or another location.

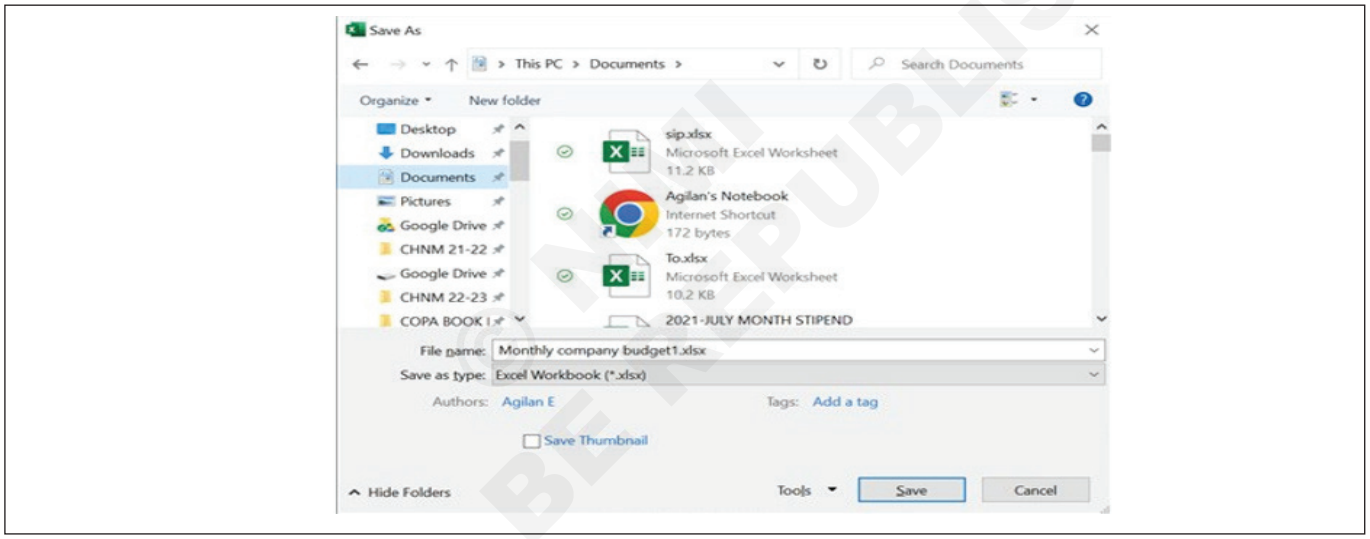
1 File tab > Save or press Ctrl+S to save first time



2 Choose a Location or More option to Browse the Local Drive.

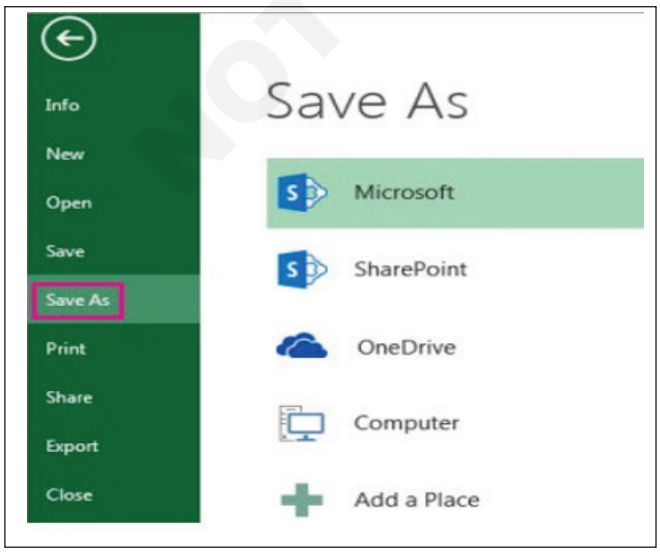


3 Browse the Location where you want to save and Name the Filename and Choose the File Type.XLSX then Click Save.

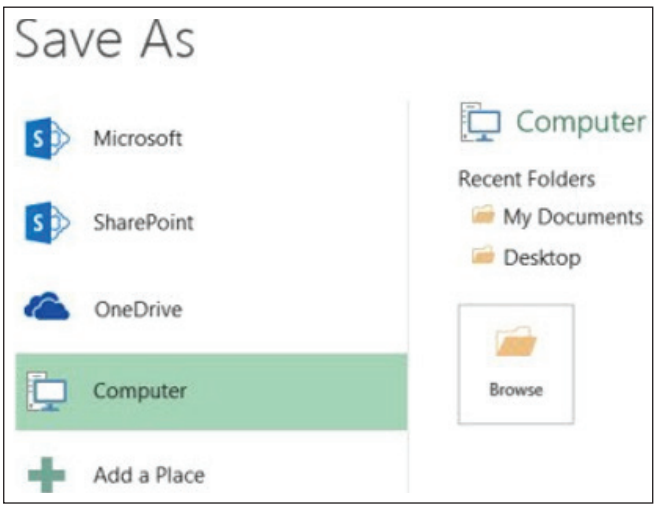


Save As your workbook

1 Click File > Save As.



2 Under Save As, pick the place where you want to save your workbook. For example, to save to your desktop or in a folder on your computer, click Computer.



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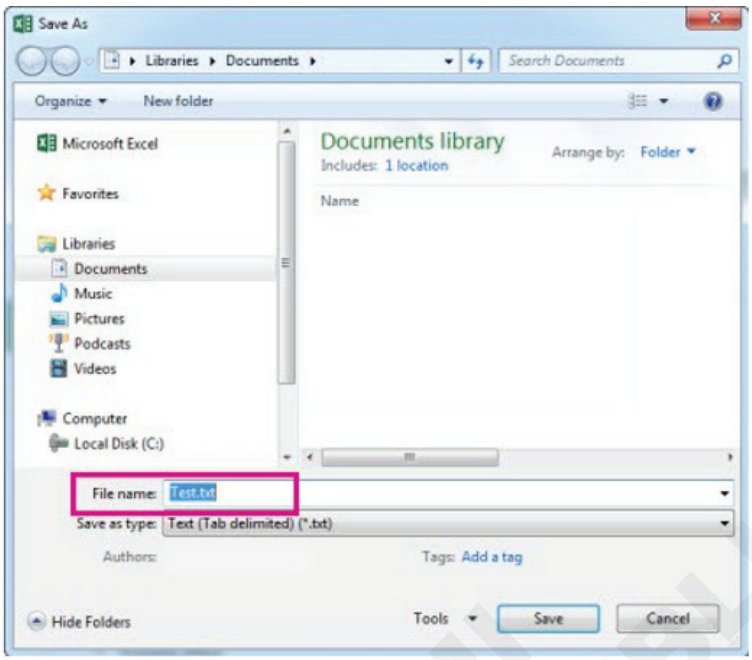
3 Click Browse to find the location where you want in your Documents folder.

4 In the File name box, enter a name for a new workbook. Enter a different name if you're creating a copy of an existing workbook.

5 To save your workbook in a different file format **(like .xls or .txt),** in the Save as type list (under the File name box), pick the format you want.

6 Click Save



TASK 3: **Create a new Excel file from a template**

Create a workbook from a template

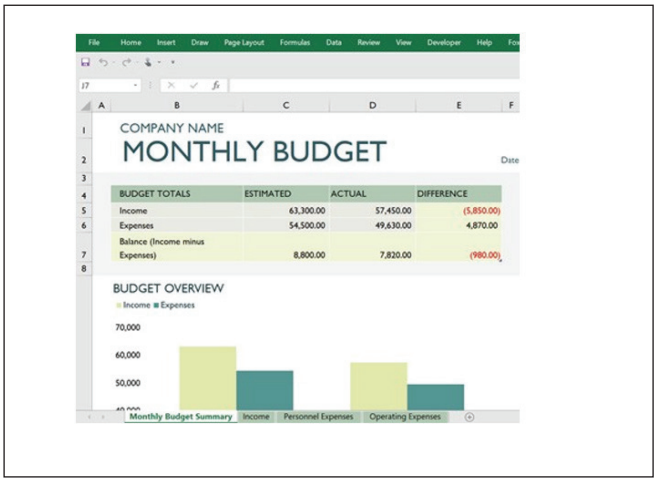
1 Select File > New.

2 Select More template

3 Search or choose from available Template.

4 Double-click a template and Click Create

5 Click and Entry the Datas to use the Template.



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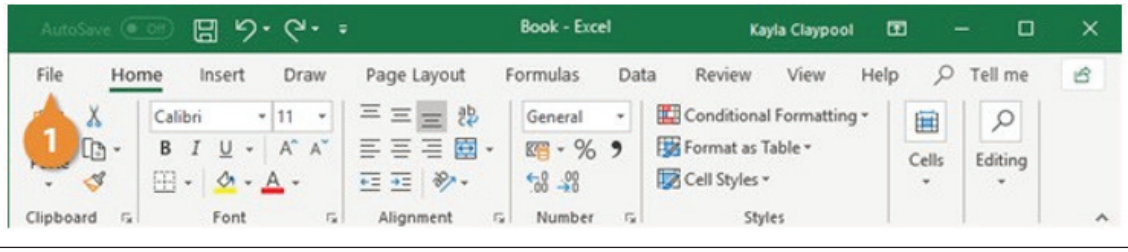
TASK 4: **Open an existing Excel file**

Open a Workbook

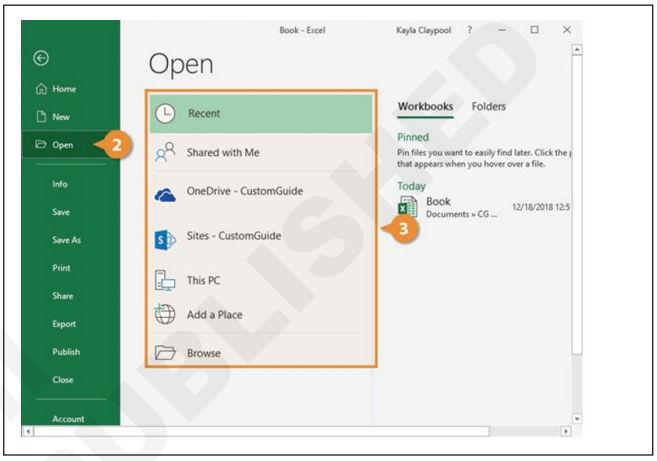
You can locate a workbook on your computer and simply double-click it to open it, but you can also open a workbook from within the Excel program.

1 Click the File tab.



2 Click Open. or

Press Ctrl + O to quickly display the Open tab of the Backstage view.



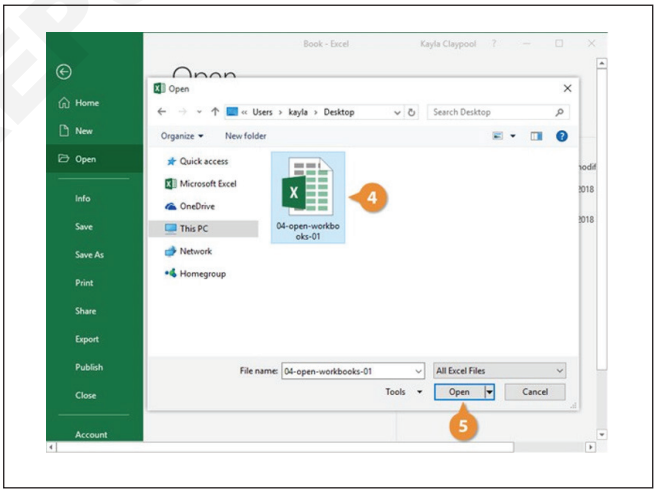
3 Select the location where the file is saved.

You can choose from:

- Recent: Recent files you've worked on.
- Shared with Me: Files others have shared with you on OneDrive or SharePoint Online.
- OneDrive: Microsoft's cloud-based storage.
- This PC: Browse files on your local computer.
- Browse: Opens a dialog box where you can browse through your computer's folders, drives, and network shares.

4 Select the file you want to open.

5 Click Open.



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Import data

Objectives: At the end of this exercise you shall be able to
- **import data from txt files**
- **import data from csv files.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Import data from txt files**

Import a text file by opening it in Excel

You can open a text file that you created in another program as an Excel workbook by using the Open command. Opening a text file in Excel does not change the format of the file — you can see this in the Excel title bar, where the name of the file retains the text file name extension (for example, .txt or .csv).

1 Go to File > Open and browse to the location that contains the text file.

2 Select Text Files in the file type dropdown list in the Open dialog box.

3 Locate and double-click the text file that you want to open.

- If the file is a text file (.txt), Excel starts the Import Text Wizard. When you are done with the steps.

4 Click Finish to complete the import operation.

— — — — — —

TASK 2: **Import data from csv files**

1 Go to File > Open or On the Data tab, in the Get & Transform Data group, click From Text/CSV In the Import Data dialog box.

2 Locate and double-click the CSV file that you want to open.

- If the file is a .csv file, Excel automatically opens the text file and displays the data in a new workbook.

3 Click Finish to complete the import operation.

— — — — — —

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Navigate within workbooks

Objectives: At the end of this exercise you shall be able to
- **search data**
- **navigate to named cells, ranges or workbook elements**
- **insert and remove hyperlinks.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

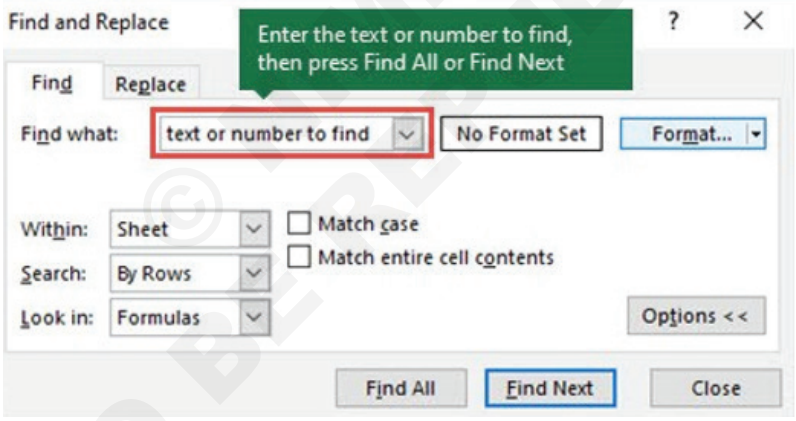
PROCEDURE

TASK 1: **Search data**

Find

To find something, press **Ctrl+F**, or go to Home > Editing > Find & Select > Find.

Note: In the following example, we've clicked the Options >> button to show the entire Find dialog. By default, it will display with Options hidden.



1 In the Find what: box, type the text or numbers you want to find, or click the arrow in the Find what: box, and then select a recent search item from the list.

Tips: You can use wildcard characters — question mark (?), asterisk (*), tilde (~) — in your search criteria.

2 Click Find All or Find Next to run your search.

3 Click Options>> to further define your search if needed:

- Within: To search for data in a worksheet or in an entire workbook, select Sheet or Workbook.
- Search: You can choose to search either By Rows (default), or By Columns.
- Look in: To search for data with specific details, in the box, click Formulas, Values, Notes, or Comments.

Note: Formulas, Values, Notes and Comments are only available on the Find tab; only Formulas are available on the Replace tab.

- Match case - Check this if you want to search for case-sensitive data.
- Match entire cell contents - Check this if you want to search for cells that contain just the characters that you typed in the Find what: box.

4 If you want to search for text or numbers with specific formatting, click Format, and then make your selections in the Find Format dialog box.

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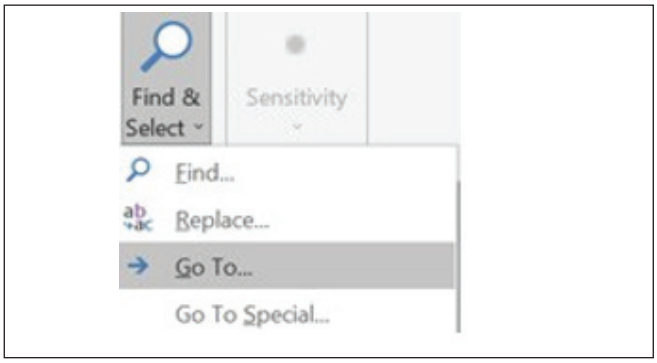
TASK 2: **Navigate to named cells, ranges or workbook elements**

You can find a named range by using the Go To feature which navigates to any named range throughout the entire workbook.

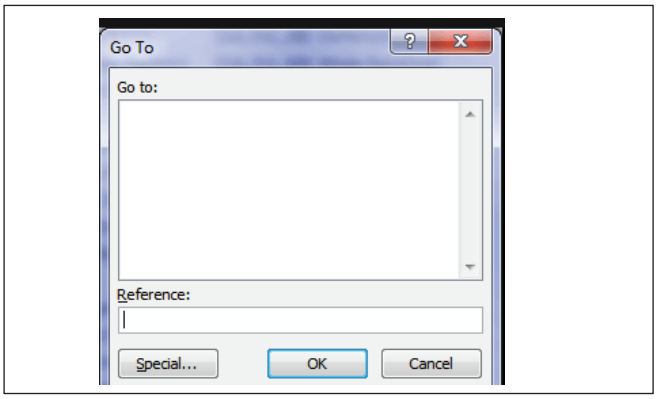
1 You can find a named range by going to the Home tab, clicking Find & Select, and then Go To.

Or, press **Ctrl+G** on your keyboard.



2 In the Go to box, double-click the named range you want to find.

3 Click OK



Notes:

- To go to a cell or range on another sheet, enter the following in the Reference box: For example: sheet2!$D$12 to go to a cell, and sheet3!$C$12:$F$21 to go to range.
- You can enter multiple named ranges or cell references in the Reference box. Separating each with a comma, like this: Price, Type, or B14:C22,F19:G30,H21:H29. When you press Enter or click OK, Excel will highlight all the ranges.

TASK 3: **Insert and remove hyperlinks**

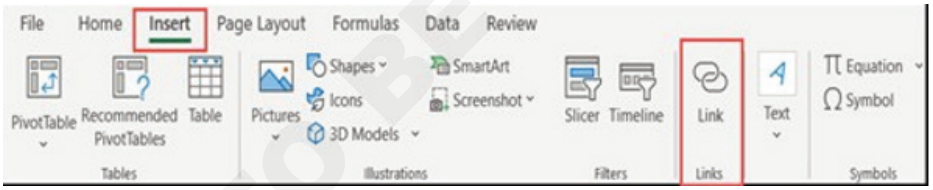
A hyperlink in Excel is a link to a specific file, document, location, web, and email address. By using the hyperlink users can go to a specific file, document, or location.

Hyperlinks are easy to recognize as these are underlined blue or purple-colored highlighted text.

Users can add hyperlinks manually to Excel. Excel also automatically creates a hyperlink when users enter any web address or email address in a cell.

1 First, go to the “Insert” tab and then click on the “Link” icon under the “Link” group.

Add Hyperlink to an Existing Workbook



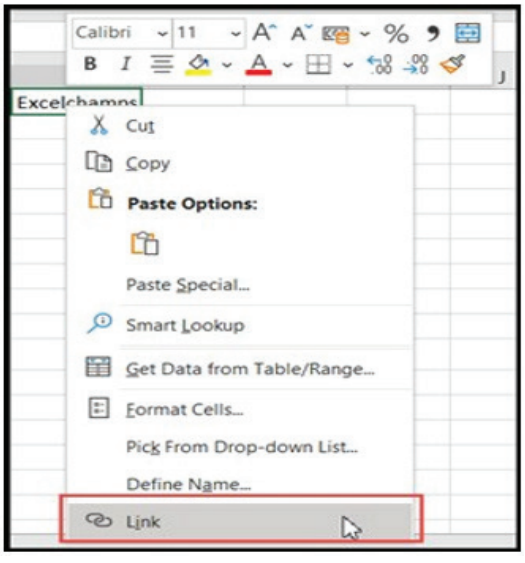
2 Or, right click on the cell, where you want to add the hyperlink, and then click on the “Link” option from the pop-up menu.

3 Or, press the **CTRL + K** shortcut from the keyboard.

4 Once you follow any of the above steps, you will get the “Insert Hyperlink” window opened.

5 After that, select the “Existing File or Web Page” option and then select the location where that file or document is placed.

6 Now, select the file or document and then enter the text in the “Text to display” column which you want to display as a hyperlinked name, and click OK.



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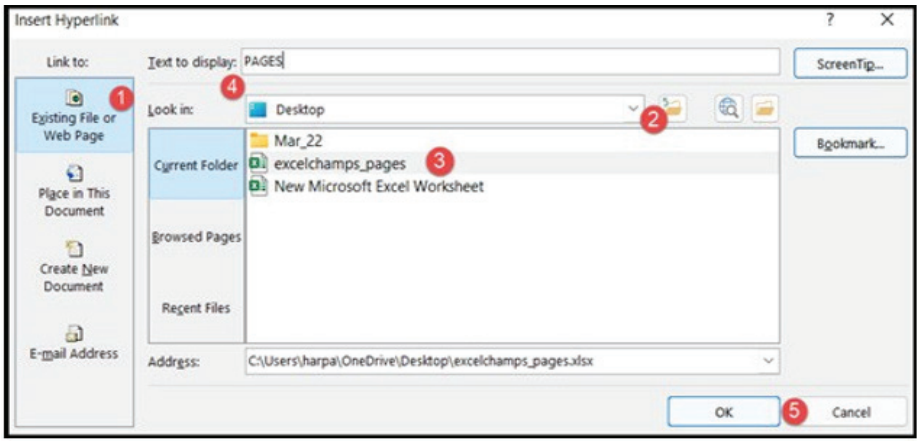
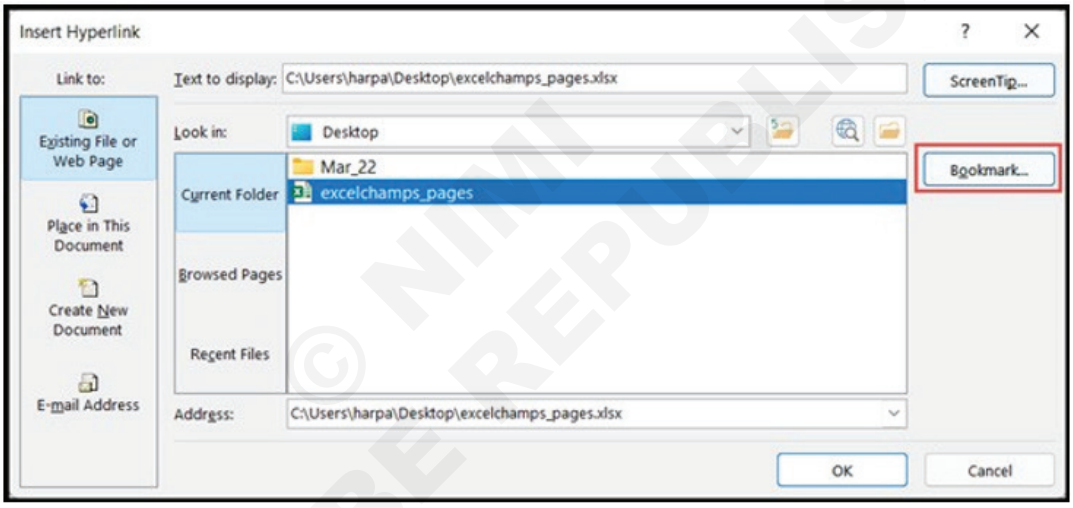


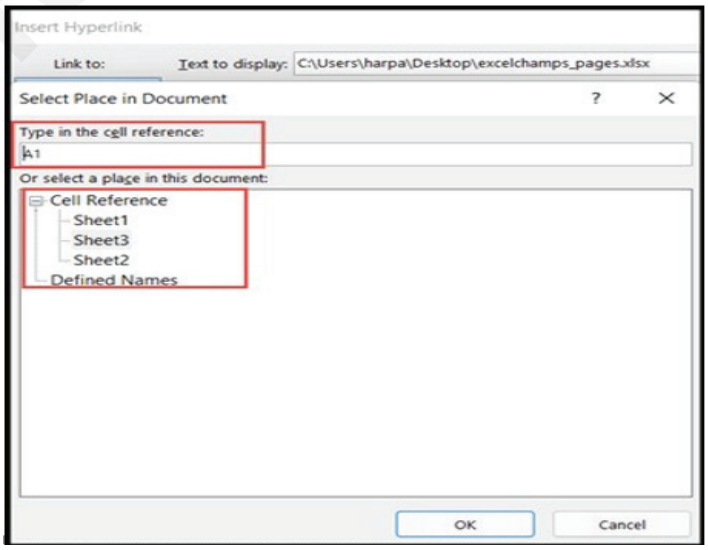
Add Hyperlink to a Specific Sheet of an Existing Workbook

1 First, select the “Existing File or Web Page” option and then select the location where that file or document is placed

2 After that, select the file or document and then click on the “Bookmark” button.



3 Now, select the specific sheet and the targeted cell of that existing sheet and click OK.



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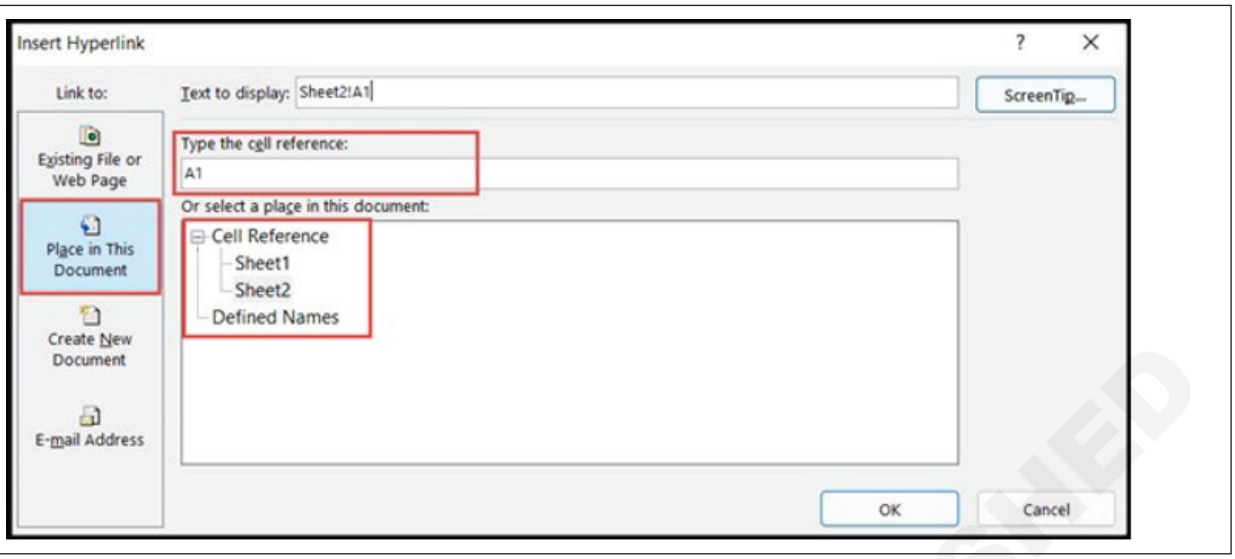
Add Hyperlink to a Specific Sheet of the Current Workbook

1 First, select the “Place in This Document” option and you will get all the sheets of the current workbook

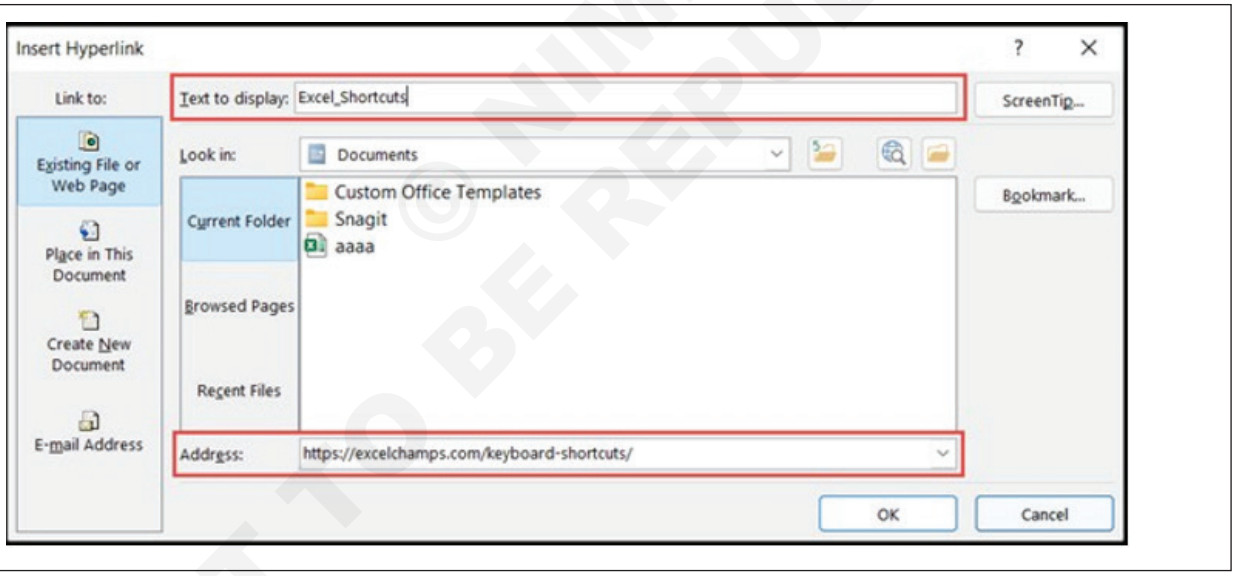
2 After that, select the specific sheet and the targeted cell and click OK.



Add Hyperlink to a Web Address

1 First, open the web page in the browser and copy the web address and paste it into the “Address” column in the “Insert Hyperlink” window.

2 After that, enter the text in the “Text to display” column that you want to display as a hyperlinked name, and then click OK.



Add Hyperlink to Open a New Workbook

1 First, select the “Create New Document” option and enter the name of the new workbook in the “Name of new document” column.

2 After that, enter the text in the “Text to display” column that you want to display as a hyperlinked name.

3 Now, click on the change button if want to change the saving location of the new workbook and click OK.

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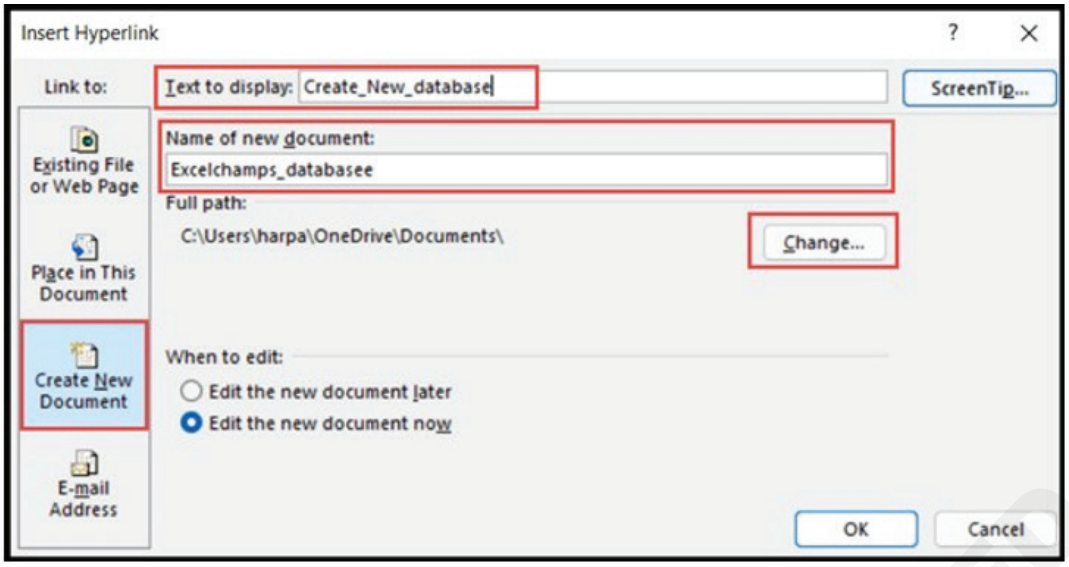
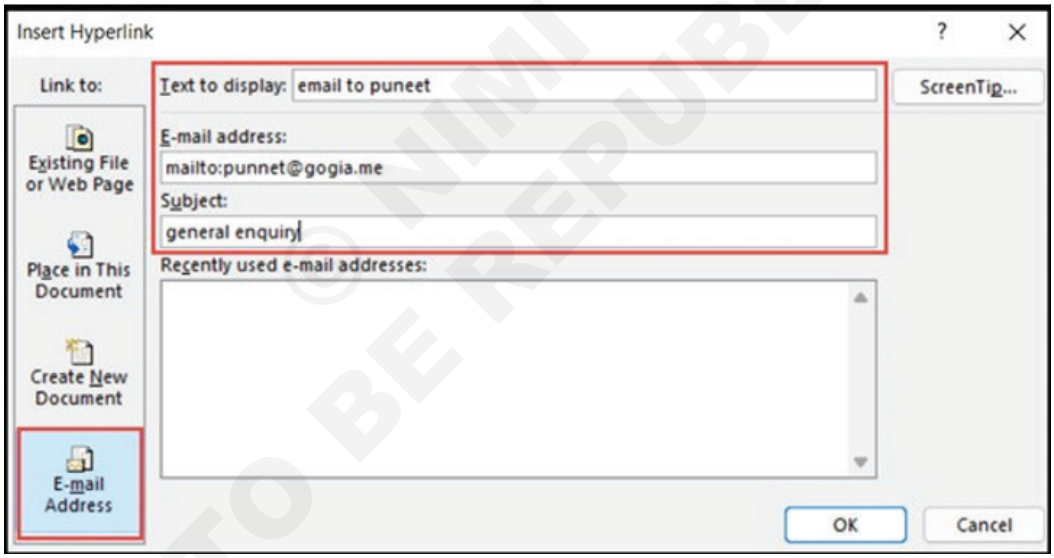


Add Hyperlink to an Email Address

1 First, select the “E-mail Address” option and then enter the email id in the “E-mail address:” column and enter the email subject in the “Subject” column.

2 After that, enter the text in “Text to display” which you want to display as a hyperlinked name, and click OK.

3 You can even directly enter the email address in the cell and Excel will auto-create the hyperlink to that email.



Remove Hyperlinks in Excel

Removing hyperlinks from Excel is way easy and quick than adding or creating hyperlinks. Excel allows users to remove the hyperlinks just in two clicks as mentioned below.

1 To remove a hyperlink from a cell, right click on a cell containing a hyperlink and then click on **“Remove Hyperlink”** from the pop-up menu.

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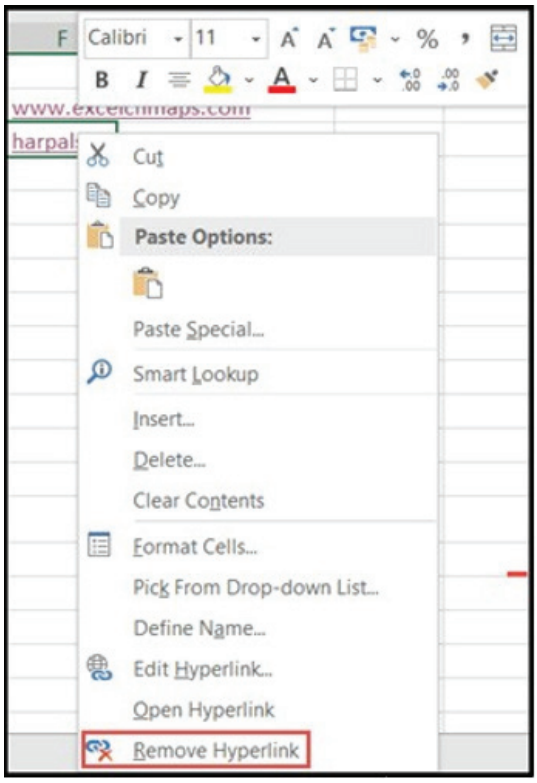
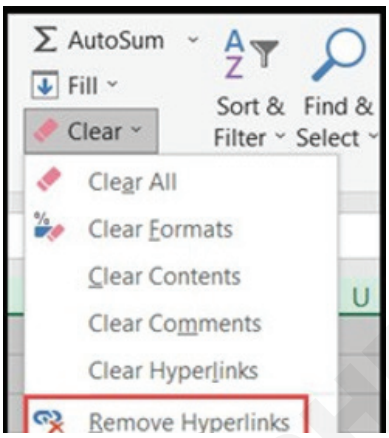
2 To remove hyperlinks from multiple cells, select the cells together and right click and select **"Remove Hyperlinks"** from the pop-up menu.



3 To remove the hyperlinks, form the current worksheet, select the whole worksheet by pressing **CTRL+A** from the keyboard.

4 Now, go to the "Home" tab and click on the **"Clear"** icon drop-down arrow and then select **"Remove Hyperlinks".**



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Format worksheets and workbooks

Objectives: At the end of this exercise you shall be able to
- **modify page setup**
- **adjust row height and column width**
- **customize headers and footers.**

Requirements

Tools/Equipment/Machines

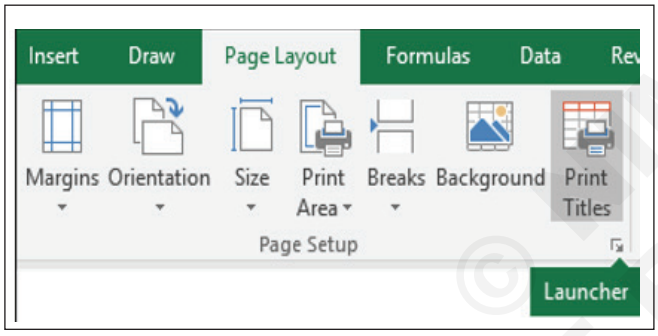
- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Modify page setup**

1 Page Setup

Use the Page Setup dialog box to set up layout and print options of a page.



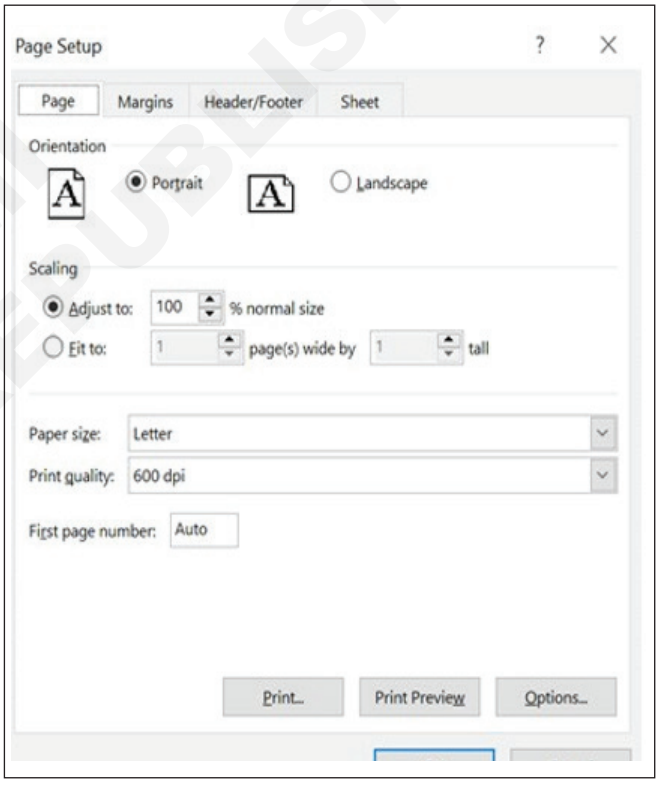
Click on the Page Layout tab, then in the Page Setup group, click the Dialog Box Launcher

Orientation Choose between landscape and portrait.

Scaling Enlarges or reduces the worksheet or selection when you print so that it fits on the specified number of pages.

- Adjust to When you select Adjust to, you can enter a percentage in the % normal size box.
- Fit to When you select Fit to, you can enter a number in the page(s) wide by box and the tall box. To fill the paper width and use as many pages as necessary, type 1 in the pages(s) wide by box and leave the tall box blank.

Paper size: In this box, click Letter, Legal, or other size options to indicate the size that you want to use for your printed document or envelope.



Print quality: In this box, click a resolution to specify the print quality for the active worksheet. Resolution is the number of dots per linear inch (dpi) that appear on the printed page.

First page number: In this box, enter Auto to start numbering pages at “1” (if it is the first page of the print job) or at the next sequential number (if it is not the first page of the print job). Enter a number to specify a starting page number other than “1.”

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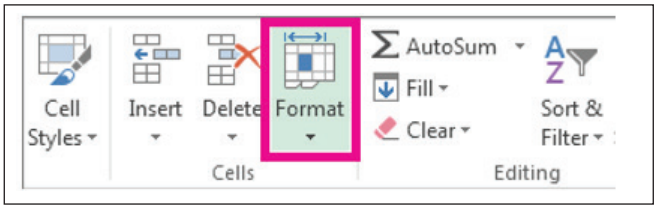
TASK 2: **Adjust row height and column width**

Set a column to a specific width

1 Select the column or columns that you want to change.

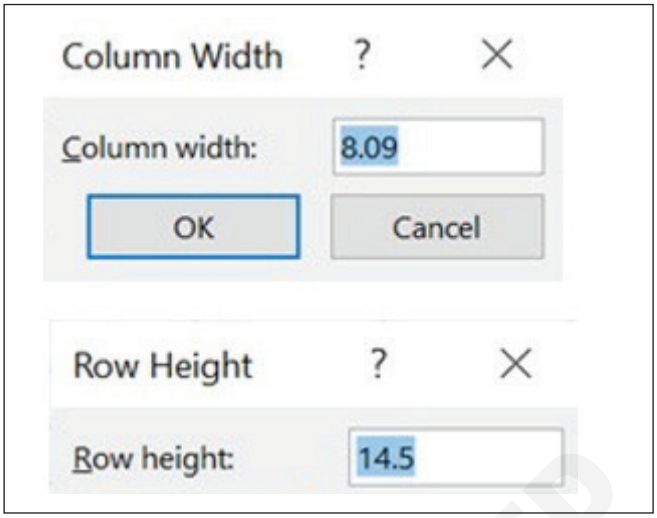
2 On the Home tab, in the Cells group, click Format.



3 Under Cell Size, click Column Width or Row Height

4 In the Column width and Row Height box, type the value that you want

5 Click OK.

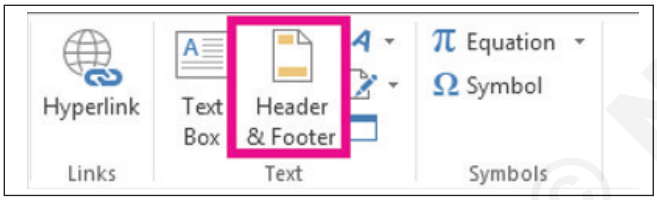


TASK 3: **Customize headers and footers**

Add or change headers or footers in Page Layout view

1 Click the worksheet where you want to add or change headers or footers.

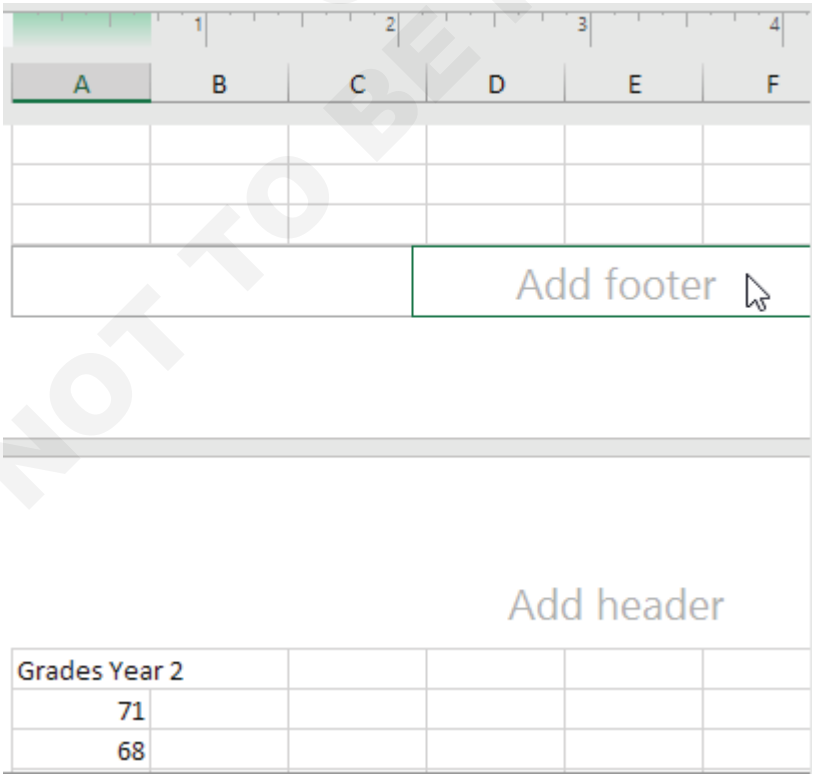
2 On the Insert tab, in the Text group, click Header & Footer.



Excel displays the worksheet in Page Layout view.

3 To add or edit a header or footer, click the left, center, or right header or footer text box at the top or the bottom of the worksheet page (under Header, or above Footer).

4 Type the new header or footer text.



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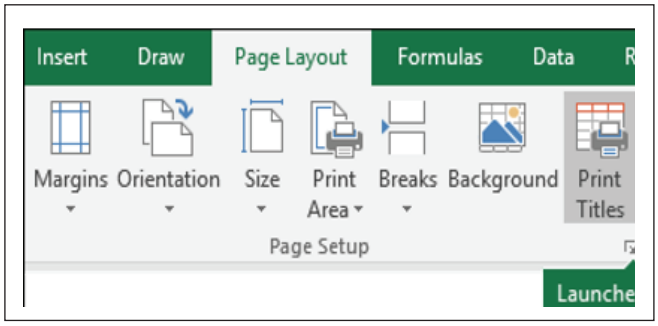
Add or change headers or footers in Page Setup

1 Use the Page Setup dialog box to set up Header and Footer of a page.



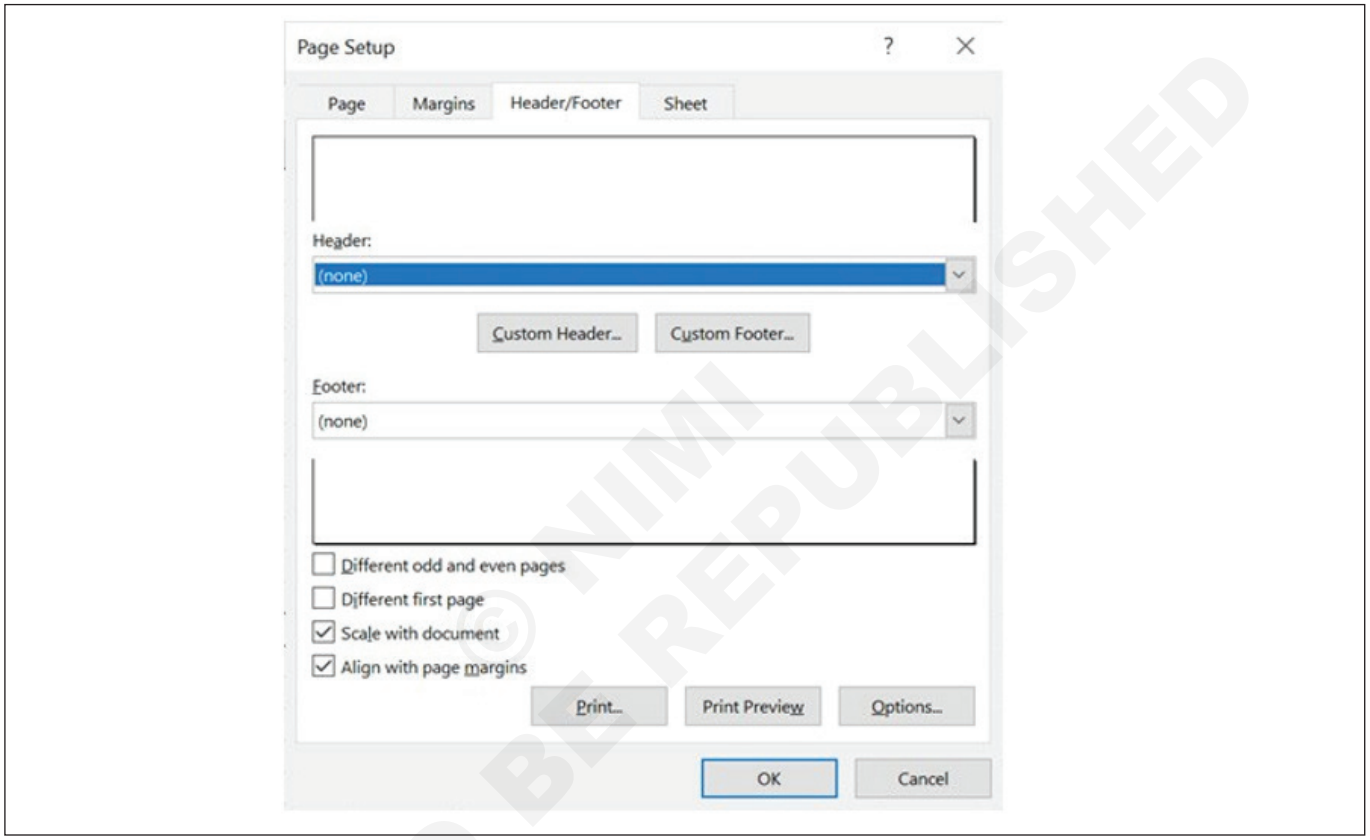
2 Click on the Page Layout tab, then in the Page Setup group, click the Dialog Box Launcher .

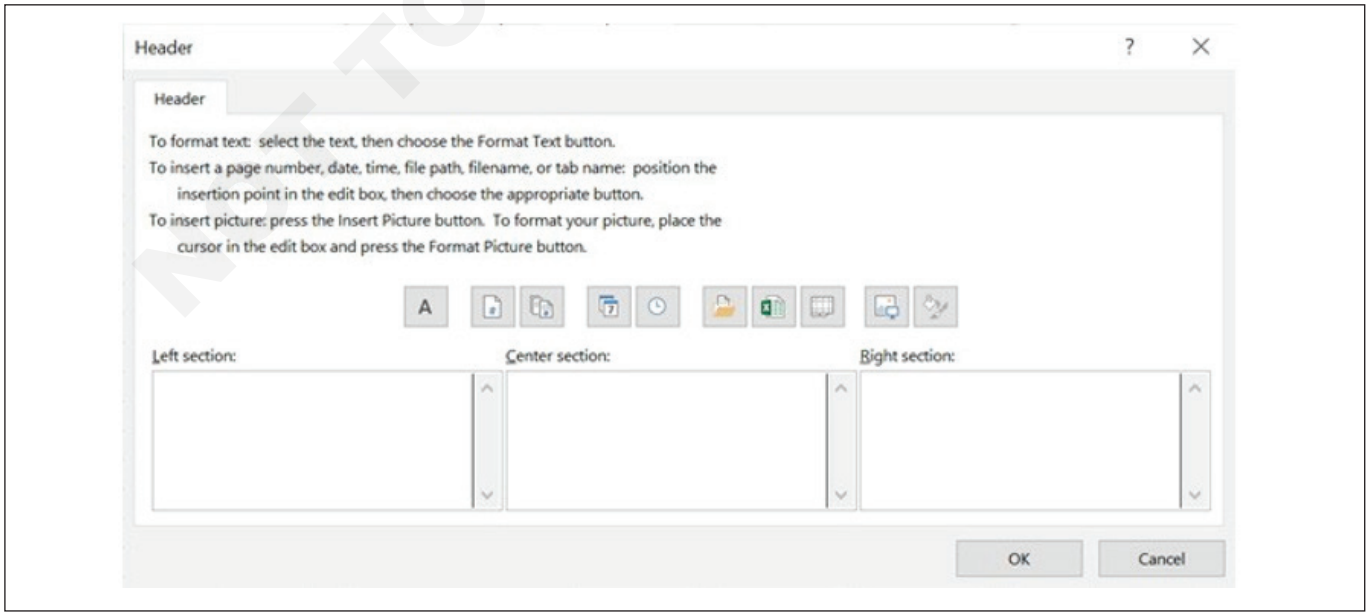
3 Choose Header/Footer

4 Choose Custom Header or Custom Footer.

5 Insert Text, Page Number, Date , Time, Image and etc,. you want to keep as Header or Footer in Left Section / Centre Section / Right Section

6 Click OK





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Customize options and views

Objectives: At the end of this exercise you shall be able to
- **display and modify content in different views**
- **freeze rows and columns**
- **change window views**
- **modify basic workbook properties**
- **display formulas.**

Requirements

Tools/Equipment/Machines

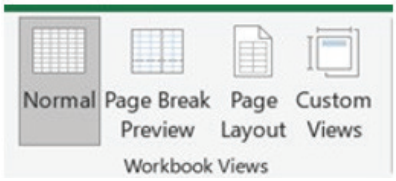
- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Display and modify content in different views**

There are three built-in view types, Normal, Page Break Preview and Page Layout, as well as a set of customizable view options.

Using view types effectively is an essential part of worksheet management and layout design.



Normal View Excel

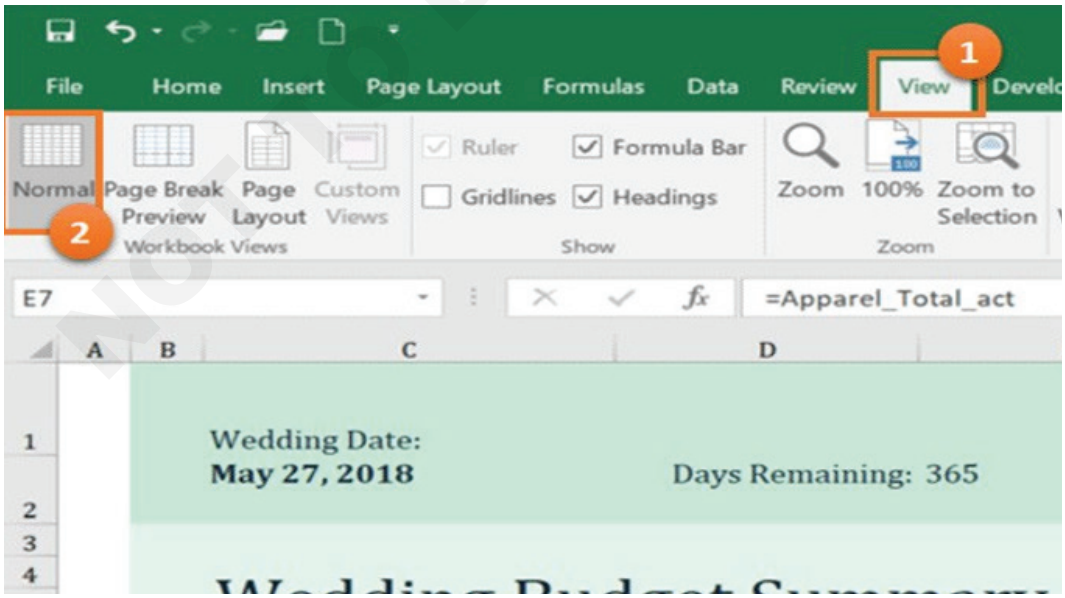
The Excel normal view, which is also the default view for all worksheets, is the easiest view to use for managing data, creating formulas and formatting rows and columns. When you open a new workbook or sheet, it will usually open with this view activated.

To set a worksheet to Normal view:

1 Click on the View tab on the Ribbon.

2 In the Workbook Views group, click on Normal.

The Normal view in Excel is the most commonly used view and arguably the best view for adding data to a worksheet.



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Page Break Preview Excel

The Page Break Preview in Excel is a very powerful print preview that allows you to manually move page breaks and reorganize a worksheet into pages for printing. You can break off columns or rows in exactly the best spot by moving the blue lines of the Excel 2016 Page Break Preview.

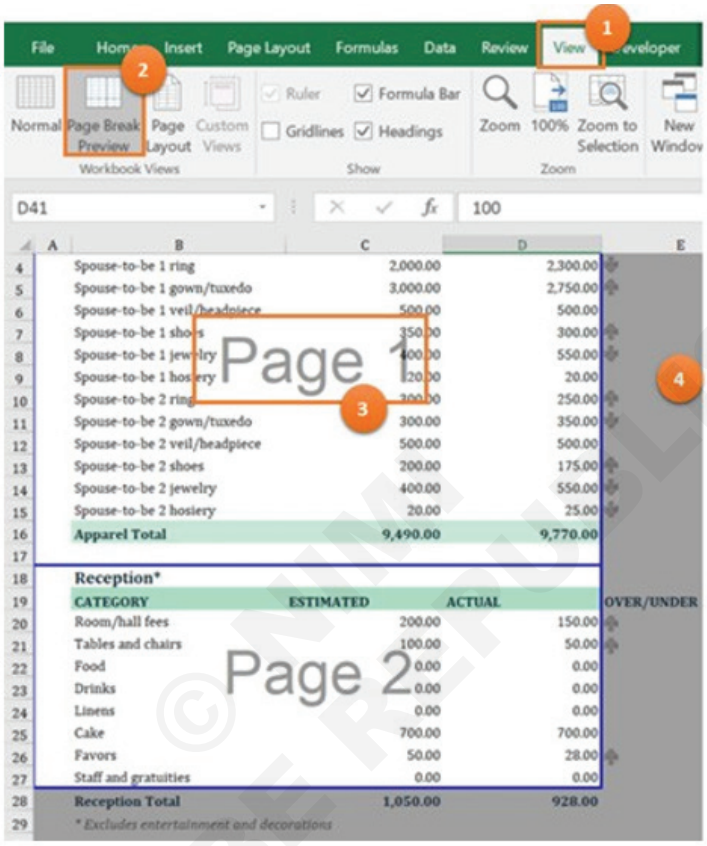
To use the Excel Page Break Preview:

1 Click on the View tab on the Ribbon.

2 In the Workbook Views group, click on Page Break Preview.

3 The feint watermarks denoting Page 1 and Page 2, is an indication of how many pages the worksheet contains and will print to.

4 All the data (numbers, icons, text, etc.) in the dark grey area, will be excluded when you print the worksheet.



To resize pages and include or exclude rows or columns

1 Click the vertical blue line and hold down the left mouse button to drag the line to the left or right to include or exclude columns. This line sets the width of the page. Excel will automatically resize the data on the page to fit the width you drag this line to, which can sometimes lead to printed data being too small to read.

2 Click the horizontal blue line and hold down the left mouse button to drag the line up or down to include or exclude rows. This line sets the height of the page. Excel will automatically resize the data on the page to fit the height you drag this line to, which can also sometimes lead to the data, when printed, being too small to read.

It is quick and easy to manipulate a worksheet in this view to ensure it prints over the exact number of pages required.

Page Layout View Excel

You use the Excel Page Layout View to add design elements to the headers and footers of a worksheet, such as company logos, page numbers, document names, dates and times. These elements are not usually visible in other view types, but will print with each page of the workbook.

To navigate to the MS Excel Page Layout View:

1 Click on the View tab on the Ribbon.

2 In the Workbook Views group, click on Page Layout View.

In the Page Layout View, an Excel worksheet can be created, managed, formatted and edited as if it is a page in a regular MS Word document.

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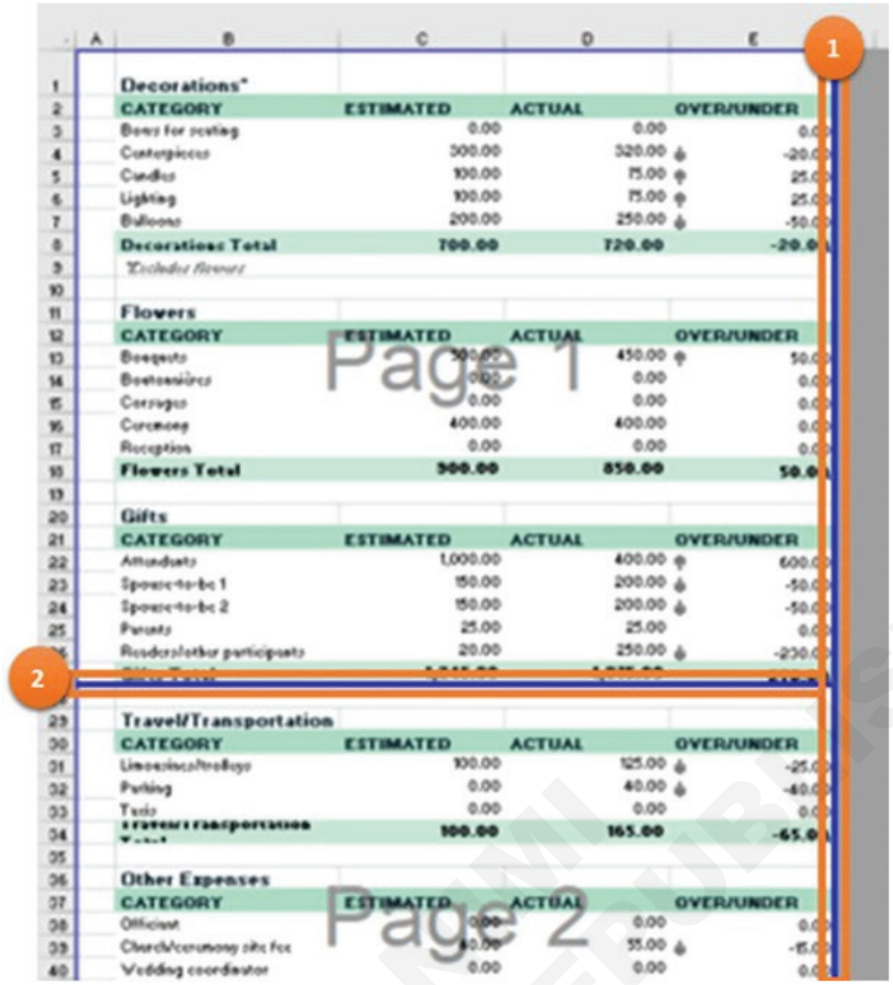

Key features and actions that can be effected in this layout is:

1 Use the horizontal ruler to resize page margin width.

2 Use the vertical ruler for resizing page margin height.

3 Click in the Header area to add content.

4 Click in the Footer area to add content.

You can add automatic page numbers, date, time, where the file is saved, the file name, worksheet name, images such as a company logo, typed words and numbers and more, to the header or footer region of the worksheet.

Add content to the Excel Header and Footer areas in three simple steps:

1 Click in the Header or Footer area.

2 Click on the Header & Footer Tools contextual tab (remember this only appears if you have clicked in a header or footer area).

3 Select content to add to the Header or Footer.

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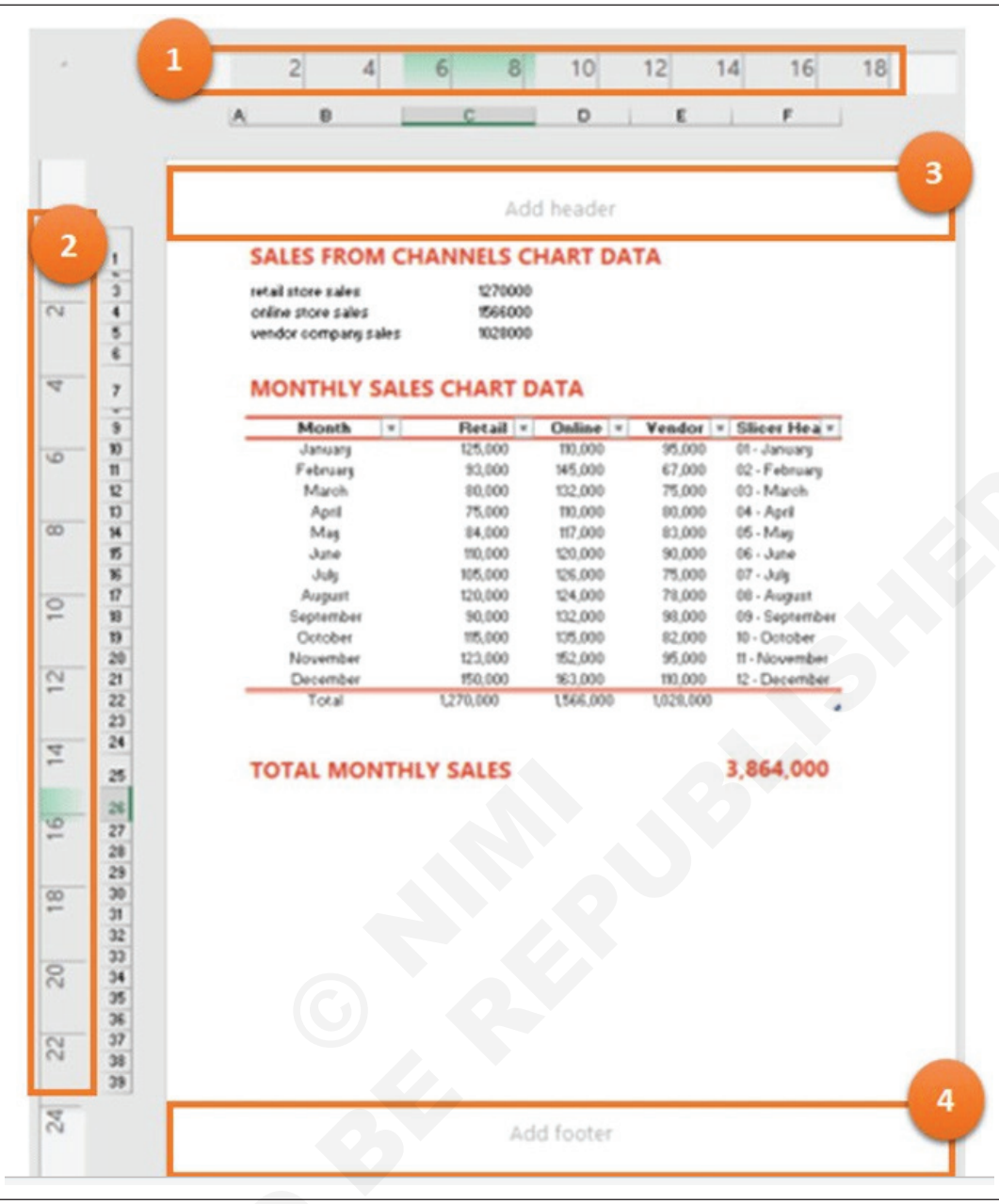

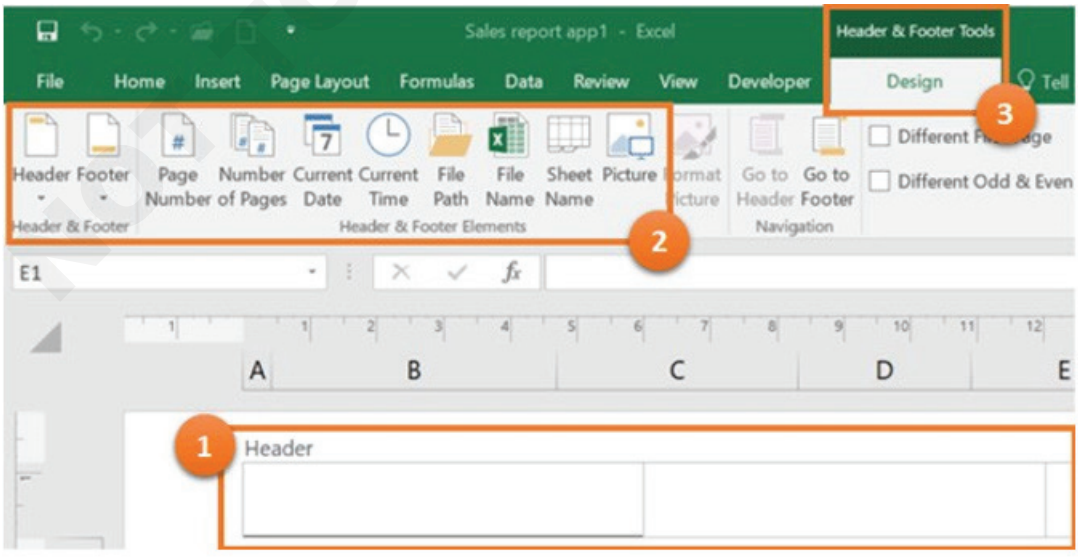

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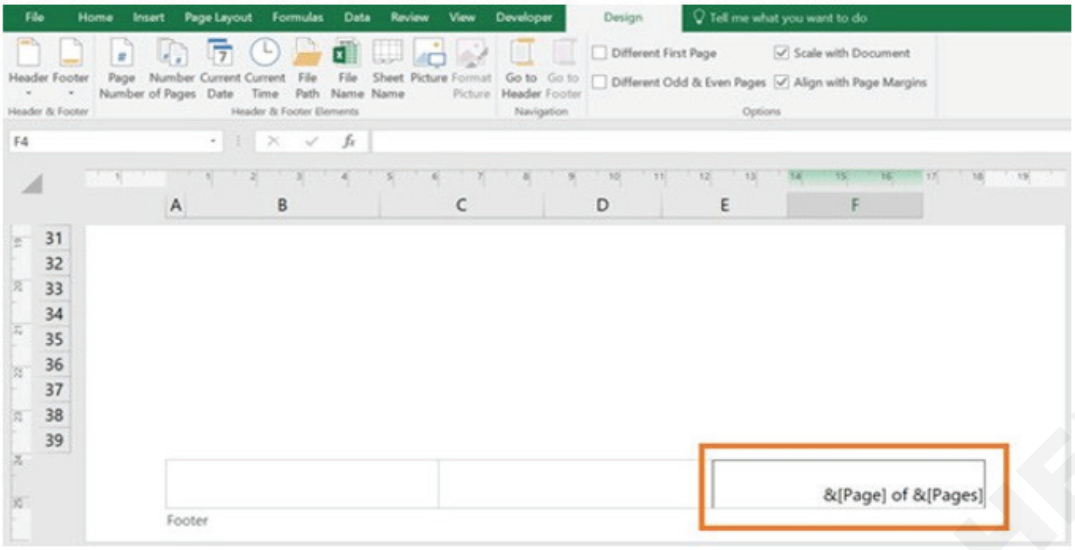
Don't be alarmed when content you add to the header or footer displays strangely as in the area outlined in orange in the screenshot below. This is Microsoft Excel's way of storing the content, and when you exit the Header and Footer region or print the worksheet, these strange characters will disappear.



The Page Layout view in Excel will help you to create professional and aesthetically pleasing worksheets for printing or sharing in PDF format, in no time at all!

Custom Views Excel

If none of the views listed above is exactly what you are looking for, Microsoft has added a further customizable view type, aptly named Custom Views. This option allows you to set the exact view and print settings you prefer and allows you to then apply this view to other worksheets on demand.

To trial the Custom View feature in Excel:

1 Open an existing worksheet.

2 Adjust the zoom to 50%. (A quick way to zoom in and out, is to hold down the control key on your keyboard whilst using the scrolling wheel on the mouse to zoom in and out).

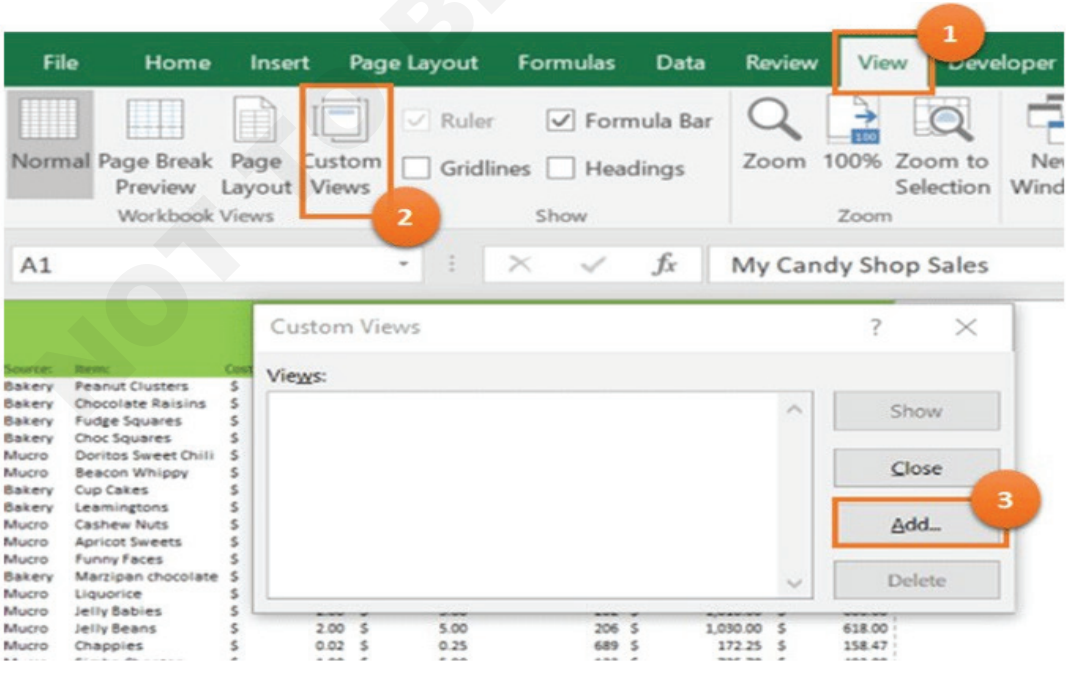
3 Click on the View tab on the Ribbon and in the Show group, untick the Gridlines and Headings boxes.

To save the custom view created in the three steps above:

1 Click on the View tab on the Ribbon.

2 In the Workbook Views group, click on Custom Views.

3 In the Custom Views dialog box, click on Add.



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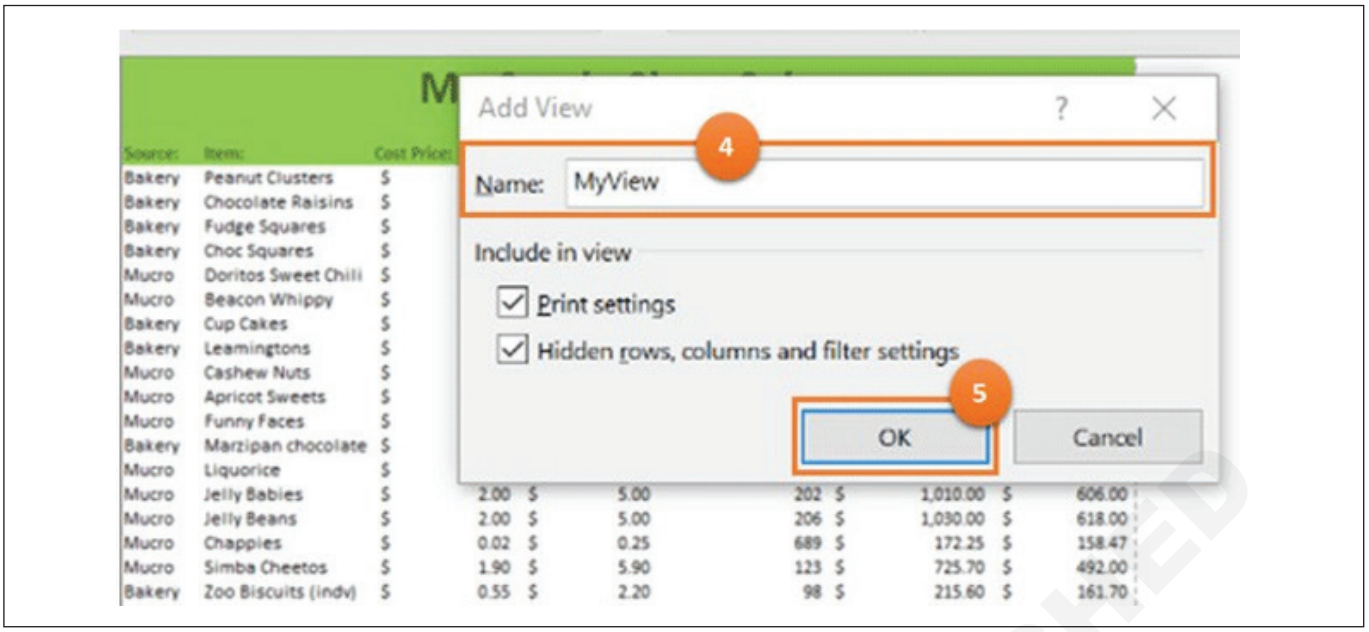
4 Give your custom view a name, for example, MyView.

5 Press OK to save the Custom View.



To apply the Custom View created in the steps above:

1 Change the zoom and re-display the gridlines and headings.

2 Click on the View tab on the Ribbon.

3 In the Workbook Views group, click on Custom Views.

4 In the Custom Views dialog box, select the name of the Custom View you created and press SHOW to apply it.

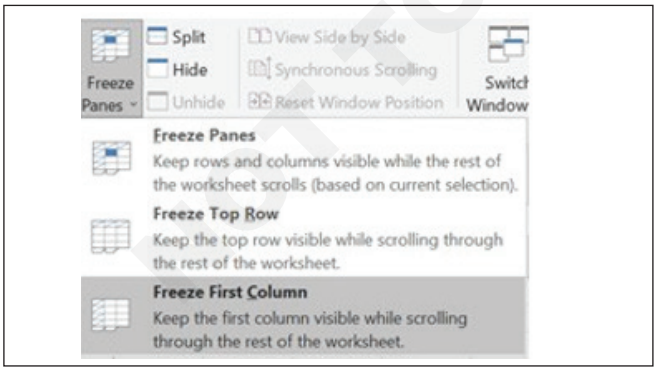
The benefit of this View is that you can zoom in and out of a worksheet or change other view settings to make it more convenient to use the worksheet whilst editing it or adding data. Once you are done, you can quickly return to your preferred view via the named Custom View you created.

TASK 2: **Freeze rows and columns**

Freeze the first column

- Select the Second column.
- Select View > Freeze Panes > Freeze First Column.

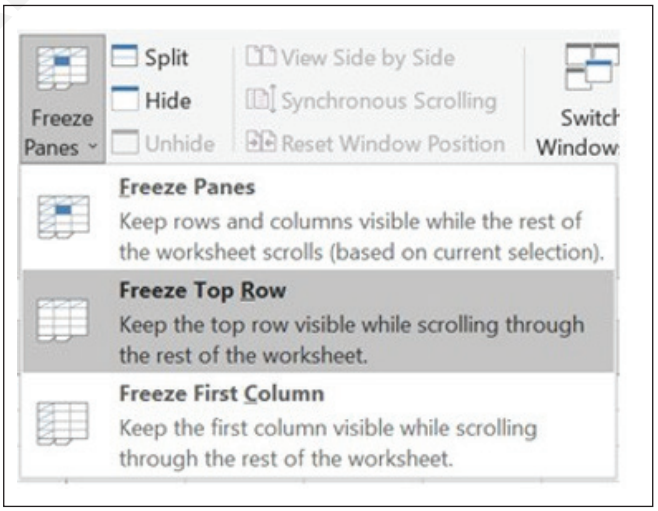
The faint line that appears between Column A and B shows that the first column is frozen.



Freeze the first row

1 Select the Second row

2 Select View > Freeze Panes > Freeze Top Row.



Freeze columns and rows

1 Select the cell below the rows and to the right of the columns you want to keep visible when you scroll.

2 Select View > Freeze Panes > Freeze Panes.

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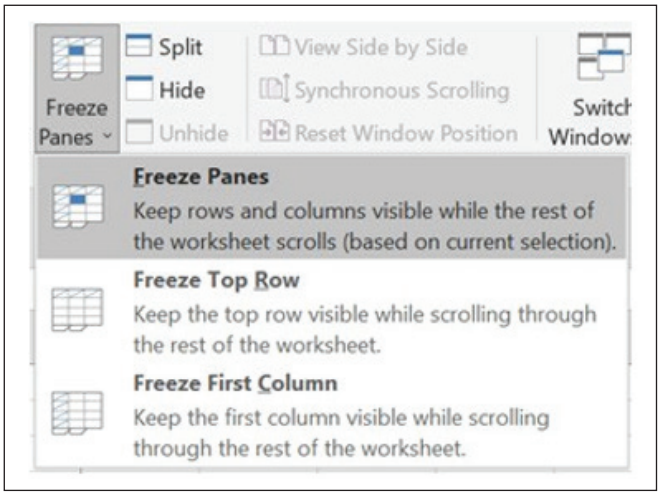

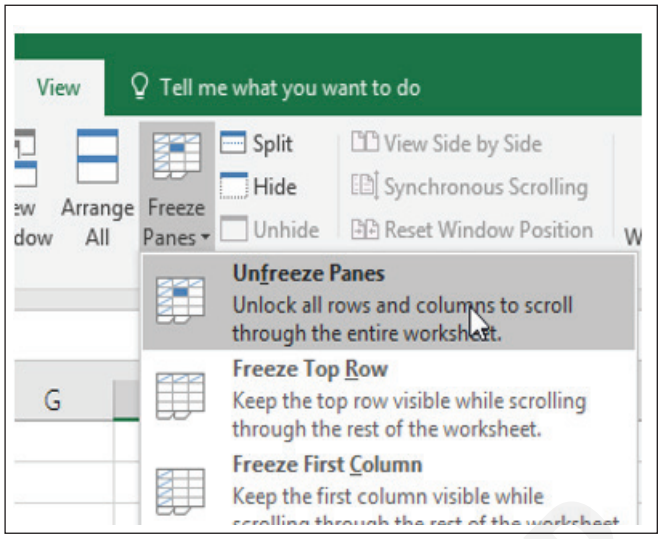

Unfreeze rows or columns

- On the View tab > Window > Unfreeze Panes.

Note: If you don't see the View tab, it's likely that you are using Excel Starter. Not all features are supported in Excel Starter.

TASK 3: **Change window views**

Switch to full or normal screen view in Excel

To view more data on the screen, you can temporarily switch to full screen view. Full screen view hides the Microsoft Office Fluent user interface Ribbon, the formula bar, and the status bar. To have access to the hidden elements again, you have to return to normal screen view.

- To switch to full screen view, press **CTRL+SHIFT+F1.**
- To return to normal screen view, press **CTRL+SHIFT+F1** again.

Tip: Still can't see everything? Press ALT+SPACE and select Maximize.

TASK 4: **Modify basic workbook properties**

1 Click the File tab.

2 Click Info.

3 Click Properties at the top of the page, and then select Advanced Properties.

Notes:

- In Access you'd select View and edit database properties
- In Project you'd select Project Information
- In Publisher you'd select Publication Properties
- Currently, you can't view or create custom properties for Visio files

4 Click the Custom tab.

- In the Name box, type a name for the custom property, or select a name from the list.
- In the Type list, select the data type for the property that you want to add.
- In the Value box, type a value for the property. The value that you type must match the selection in the Type list.

TASK 5: **Display formulas**

Show/Hide Formulas

By default, Excel displays the results of formulas in the worksheet instead of showing the actual formulas. However, you can choose to have Excel display the formulas so you can see how they're put together.

1 Click the Formulas tab.

2 Click the Show Formulas button.

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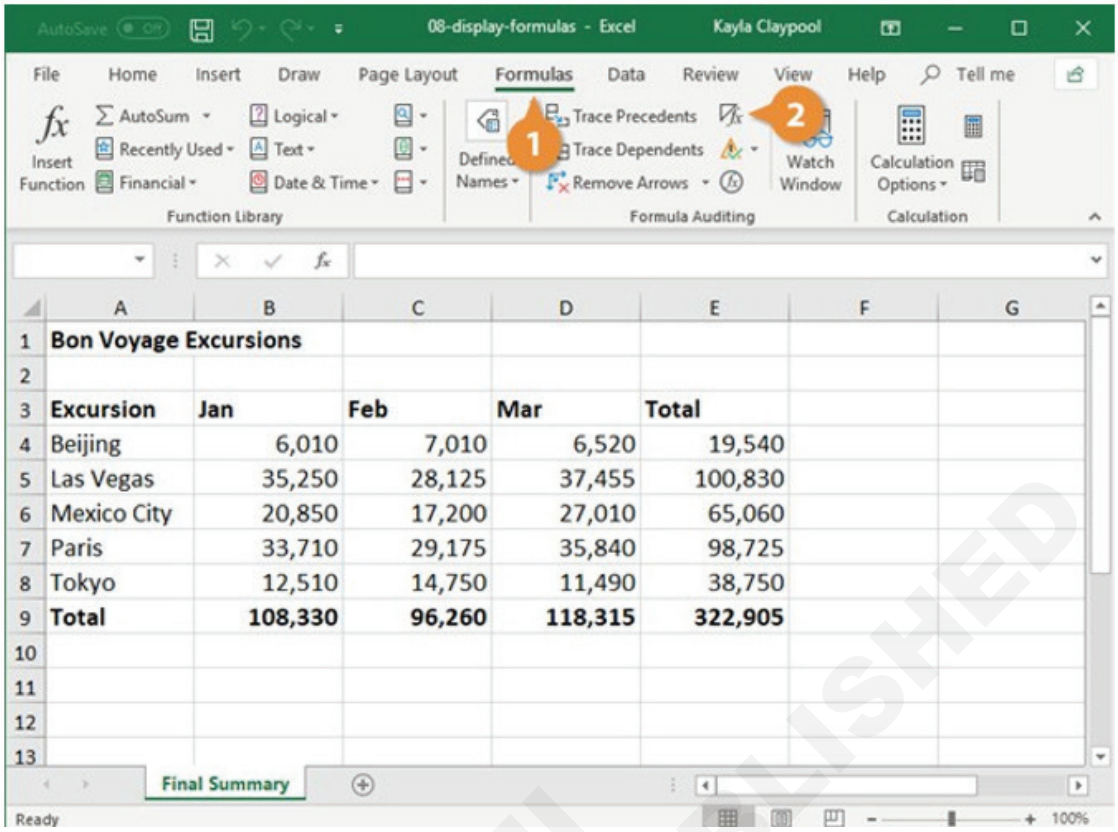
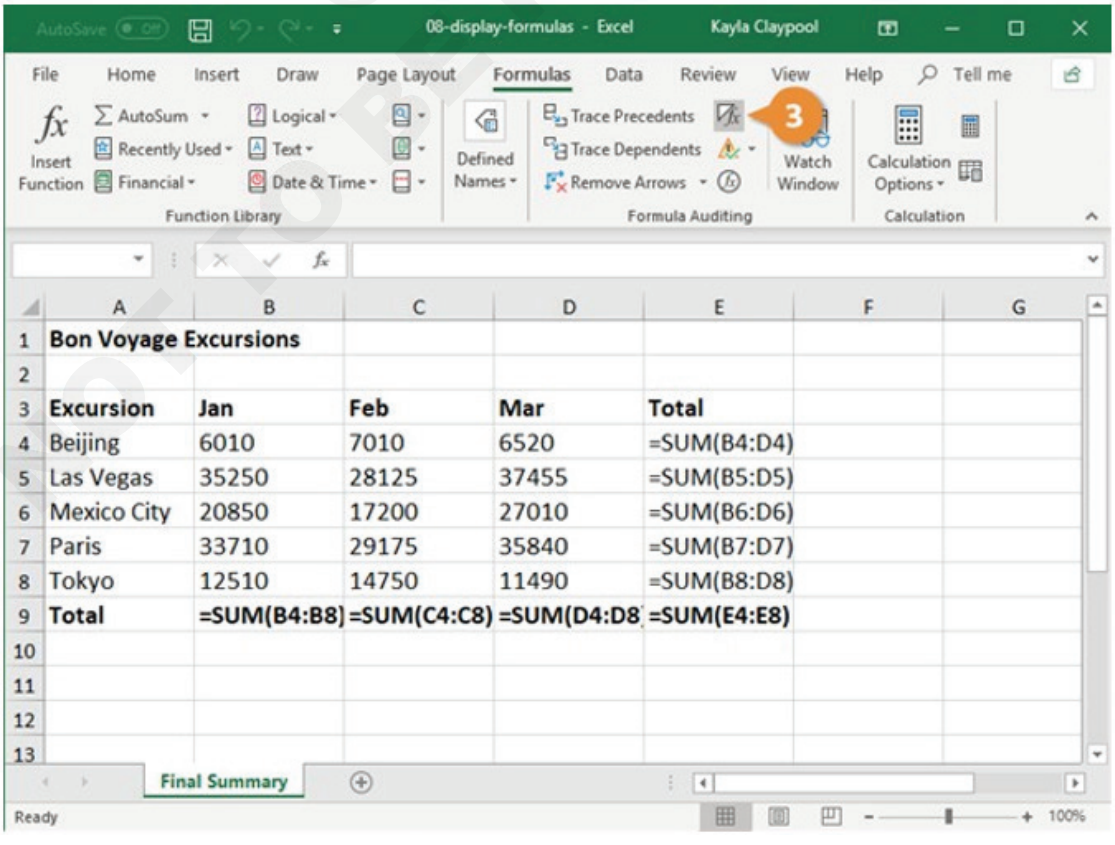


Formulas are displayed in the worksheet and the columns widen to accommodate the formulas, if necessary.

If you display formulas and then select a cell that contains a formula, colored lines appear around cells that are referenced by the formula.

3 Click the Show Formulas button again to hide the formulas.



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Formulas are no longer displayed and the columns return to their original sizes.

Highlight Formulas

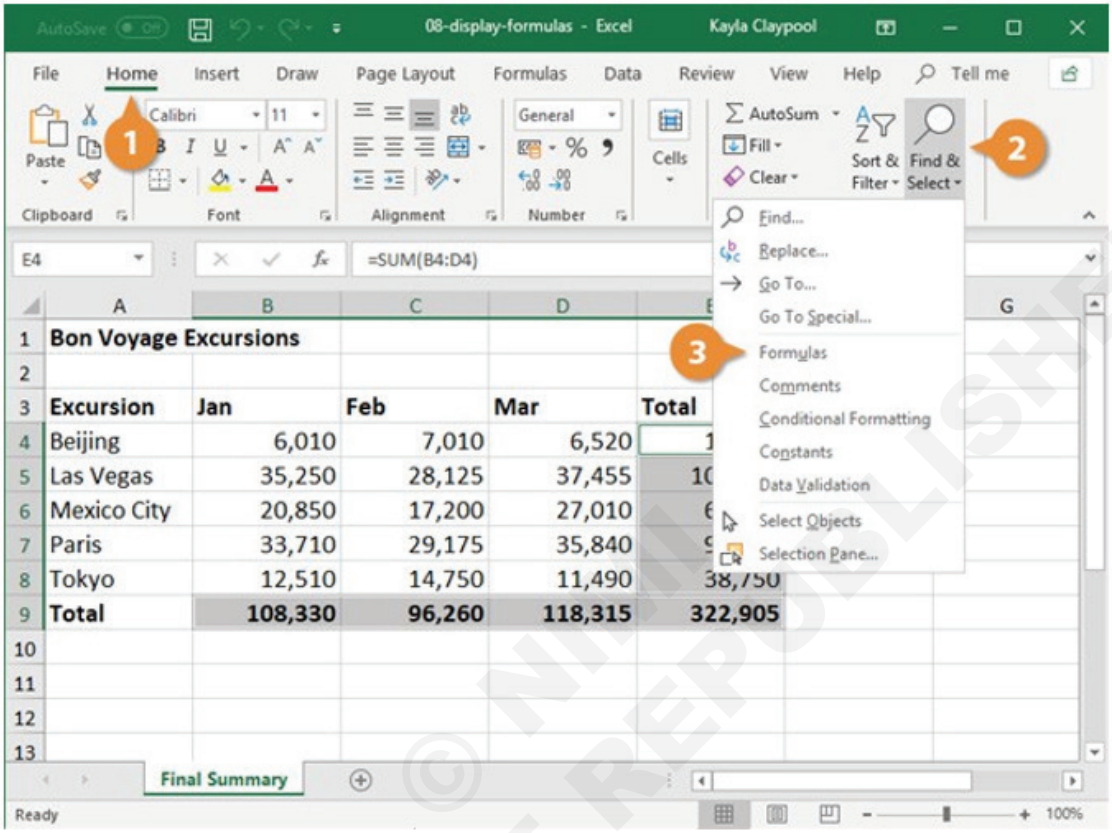
If you don't want to see the actual formulas, but want to know which cells contain them, highlight cells with formulas instead.

1 Click the Home tab.

2 Click the Find & Select button.

3 Select Formulas.

Any cells that contain a formula are highlighted; however, this doesn't change the cell formatting. When you click any other cell in the worksheet, the highlighted cells are unselected.



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Configure content for collaboration

Objectives: At the end of this exercise you shall be able to
- **set a print area**
- **save workbooks in alternative file formats**
- **configure print settings.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Set a print area**

There are two ways to specify the workbook data that is printed: setting the print area and adjusting the page breaks.

Set the Print Area

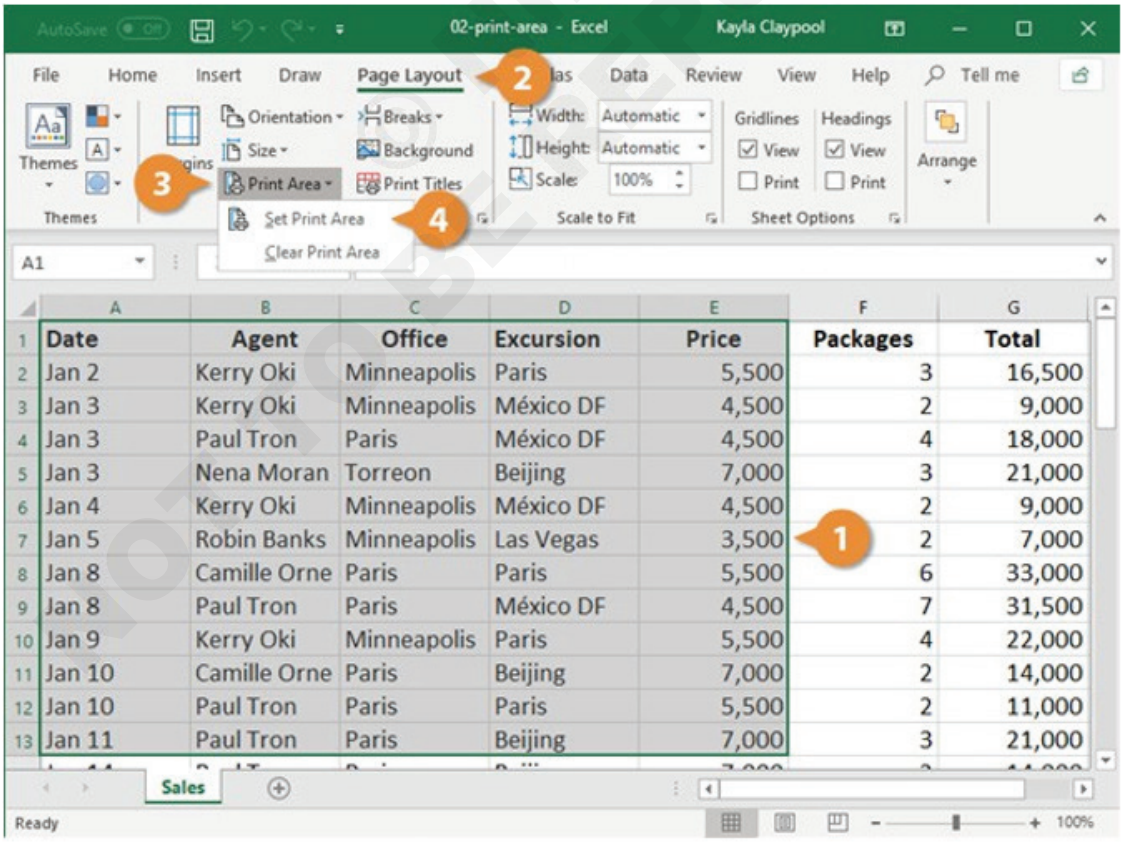
Sometimes you may only want to print part of a worksheet. You can define an area so that any time you print, only that cell range is printed.

1 Select the cells you want to print.

2 Click the Page Layout tab.

3 Click the Print Area button.

4 Select Set Print Area.



	Date	Agent	Office	Excursion	Price	Packages	Total
2	Jan 2	Kerry Oki	Minneapolis	Paris	5,500	3	16,500
3	Jan 3	Kerry Oki	Minneapolis	México DF	4,500	2	9,000
4	Jan 3	Paul Tron	Paris	México DF	4,500	4	18,000
5	Jan 3	Nena Moran	Torreon	Beijing	7,000	3	21,000
6	Jan 4	Kerry Oki	Minneapolis	México DF	4,500	2	9,000
7	Jan 5	Robin Banks	Minneapolis	Las Vegas	3,500	2	7,000
8	Jan 8	Camille Orne	Paris	Paris	5,500	6	33,000
9	Jan 8	Paul Tron	Paris	México DF	4,500	7	31,500
10	Jan 9	Kerry Oki	Minneapolis	Paris	5,500	4	22,000
11	Jan 10	Camille Orne	Paris	Beijing	7,000	2	14,000
12	Jan 10	Paul Tron	Paris	Paris	5,500	2	11,000
13	Jan 11	Paul Tron	Paris	Beijing	7,000	3	21,000

Once a print area is set, add additional print areas by selecting the additional cells, clicking the Print Area button, and selecting Add to Print Area.

A dark gray border appears around the print area. When you print, only the cells within that range appear on the page.

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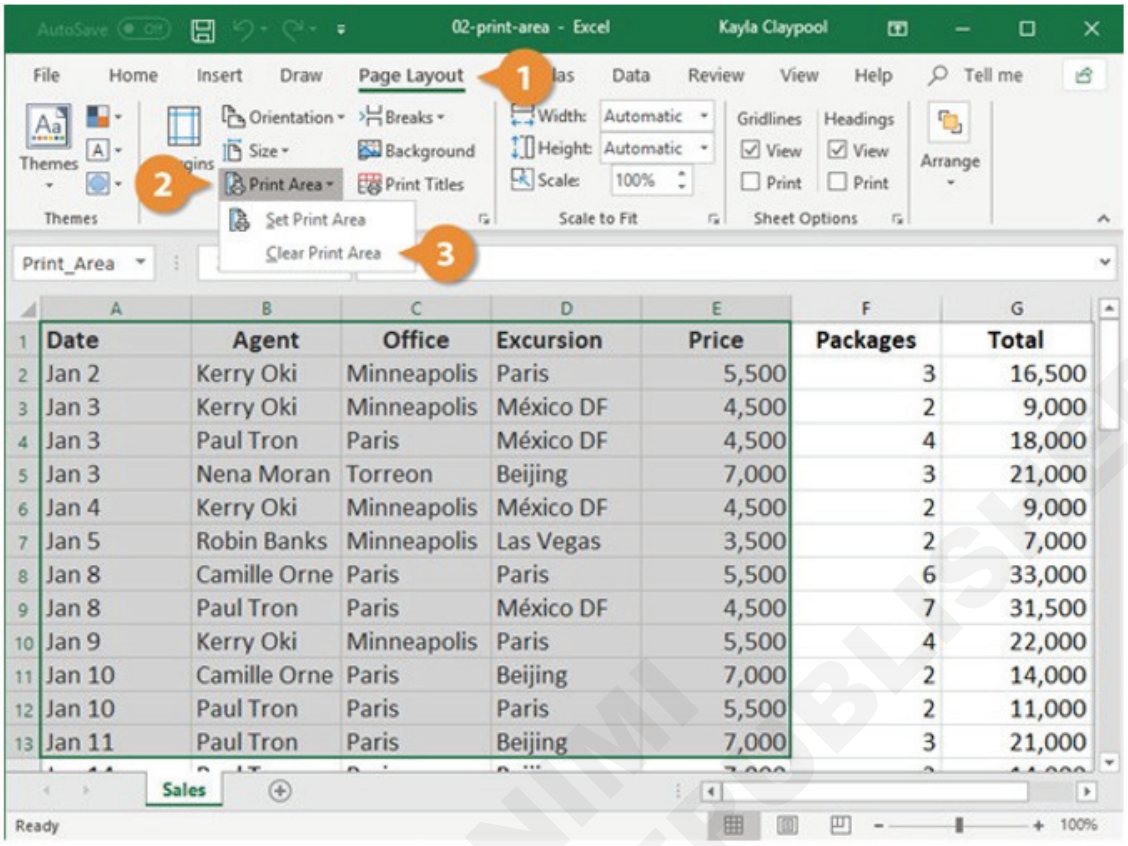
Remove a Print Area

1 Click the Page Layout tab.

2 Click the Print Area button.

3 Select Clear Print Area.

The print area is cleared and the entire worksheet will print once again.



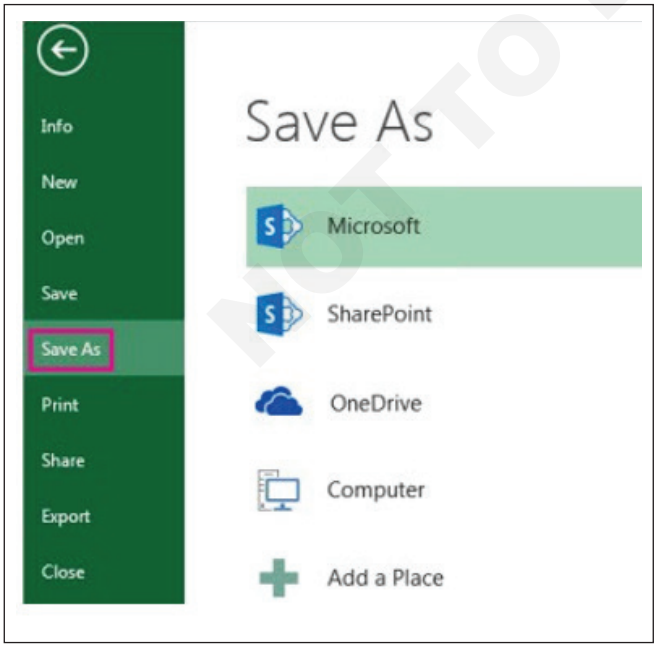
	A	B	C	D	E	F	G
1	Date	Agent	Office	Excursion	Price	Packages	Total
2	Jan 2	Kerry Oki	Minneapolis	Paris	5,500	3	16,500
3	Jan 3	Kerry Oki	Minneapolis	México DF	4,500	2	9,000
4	Jan 3	Paul Tron	Paris	México DF	4,500	4	18,000
5	Jan 3	Nena Moran	Torreon	Beijing	7,000	3	21,000
6	Jan 4	Kerry Oki	Minneapolis	México DF	4,500	2	9,000
7	Jan 5	Robin Banks	Minneapolis	Las Vegas	3,500	2	7,000
8	Jan 8	Camille Orne	Paris	Paris	5,500	6	33,000
9	Jan 8	Paul Tron	Paris	México DF	4,500	7	31,500
10	Jan 9	Kerry Oki	Minneapolis	Paris	5,500	4	22,000
11	Jan 10	Camille Orne	Paris	Beijing	7,000	2	14,000
12	Jan 10	Paul Tron	Paris	Paris	5,500	2	11,000
13	Jan 11	Paul Tron	Paris	Beijing	7,000	3	21,000

TASK 2: **Save workbooks in alternative file formats**

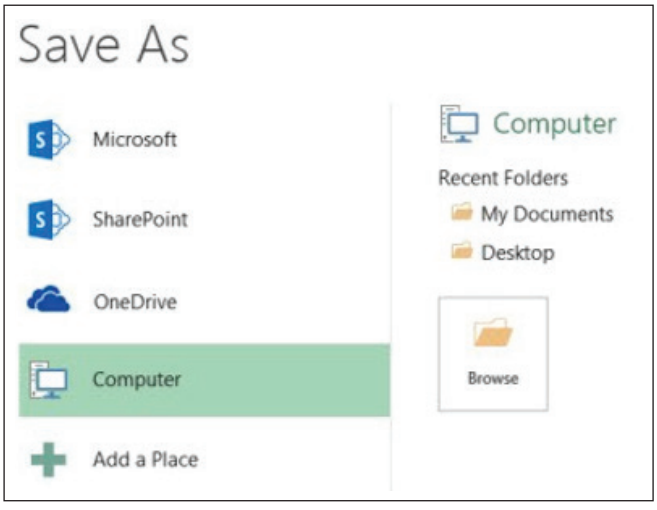
For a list of file formats (also called file types) you can (and can't) open or save in **Excel.**

1 Open the workbook you want to save.

2 Click File > Save As.



3 Under Places, pick the place where you want to save the workbook. For example, pick OneDrive to save it to your Web location or Computer to save it in a local folder like your Documents.



4 In the Save As dialog box, navigate to the location you want.

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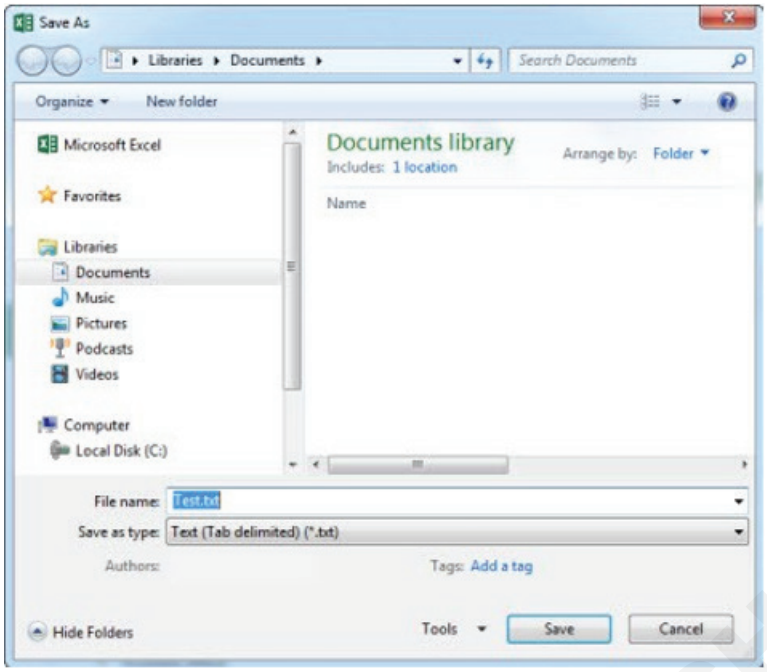
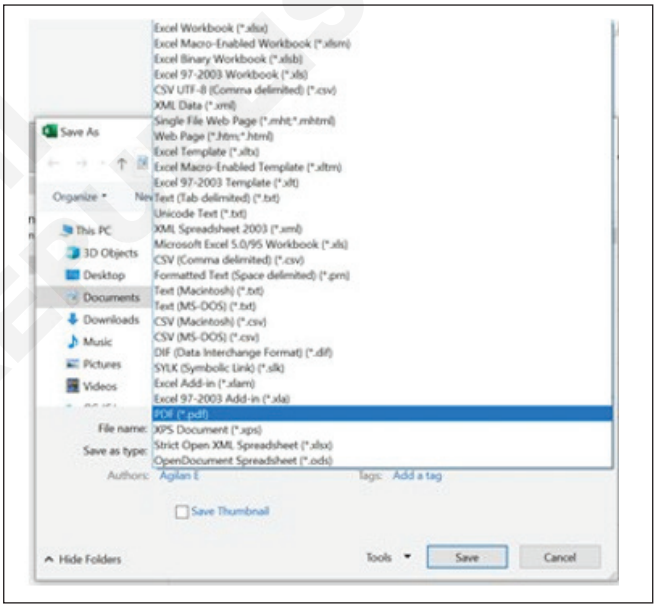


5 In the Save as type list, click the file format you want. Click the arrows to scroll to file formats that aren't visible in the list.

6 In the File name box, accept the suggested name or type a new name for the workbook



TASK 3: **Configure print settings**

Option #1 How to Print entire workbook with N number of copies in MS Excel

Step 1: Go to Excel Sheet, which a user wants to print. Open the File

menu bar and click on print

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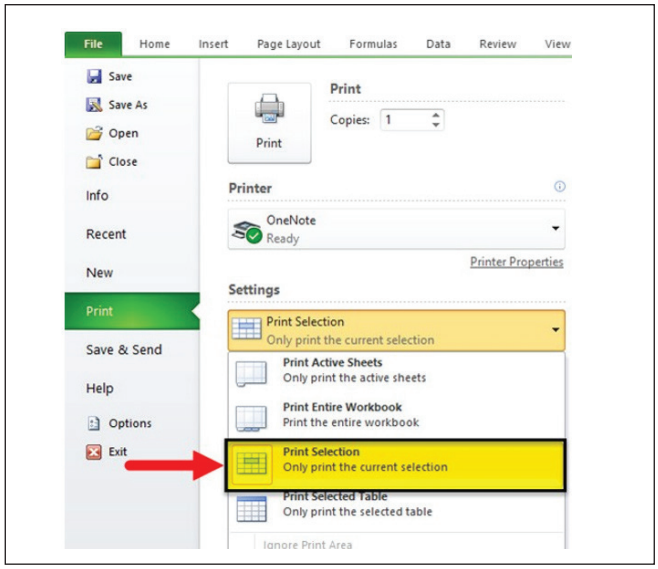
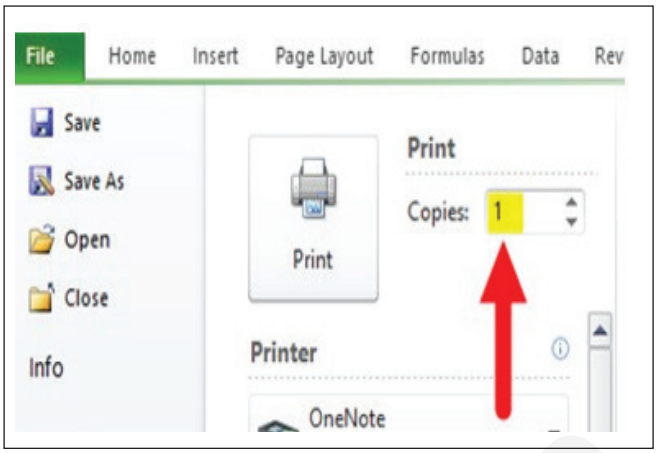
Step 2: Now Print setting will open, then under the Setting section, select 'Print

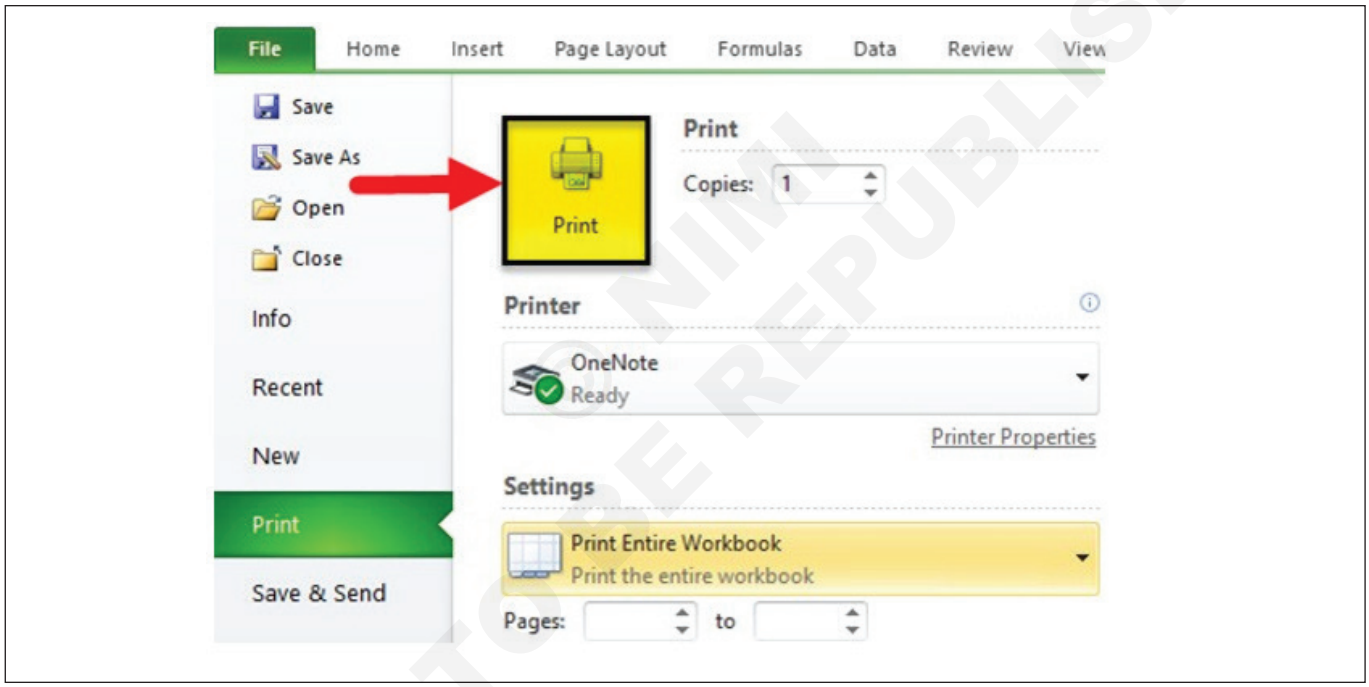
Entire workbook'



Step 3: Now click on the number of copies needed by the user



Step 4: To print the workbook, click on the print button.



Summary: As the user has given instruction in print command, it will print that no of pages with an entire workbook.

Step 1: Go to Excel Sheet, which a user wants to print, and select the area that needs to be printed.

Option #2 How to Print selected area workbook with the page orientation in MS Excel

	A	B	C	D	E	F
1	Name	CMP Rs.	P/E	Mar Cap Rs.Cr.	NP Qtr Rs.Cr.	Sales Qtr Rs.Cr.
2	Hind. Unilever	₹ 1,732.20	₹ 64.05	₹ 374,960.49	₹ 1,525.00	₹ 9,234.00
3	Colgate-Palm.	₹ 1,227.95	₹ 45.69	₹ 33,398.48	₹ 196.37	₹ 1,168.03
4	P & G Hygiene	₹ 9,289.65	₹ 74.80	₹ 30,154.89	₹ 144.11	₹ 791.80
5	Gillette India	₹ 6,498.10	₹ 92.05	₹ 21,177.31	₹ 65.35	₹ 456.51
6						

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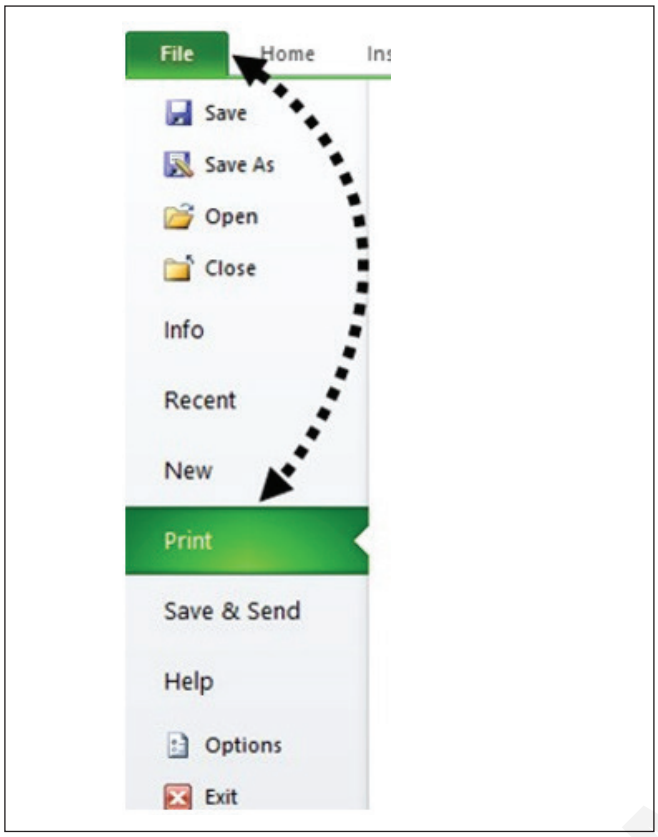
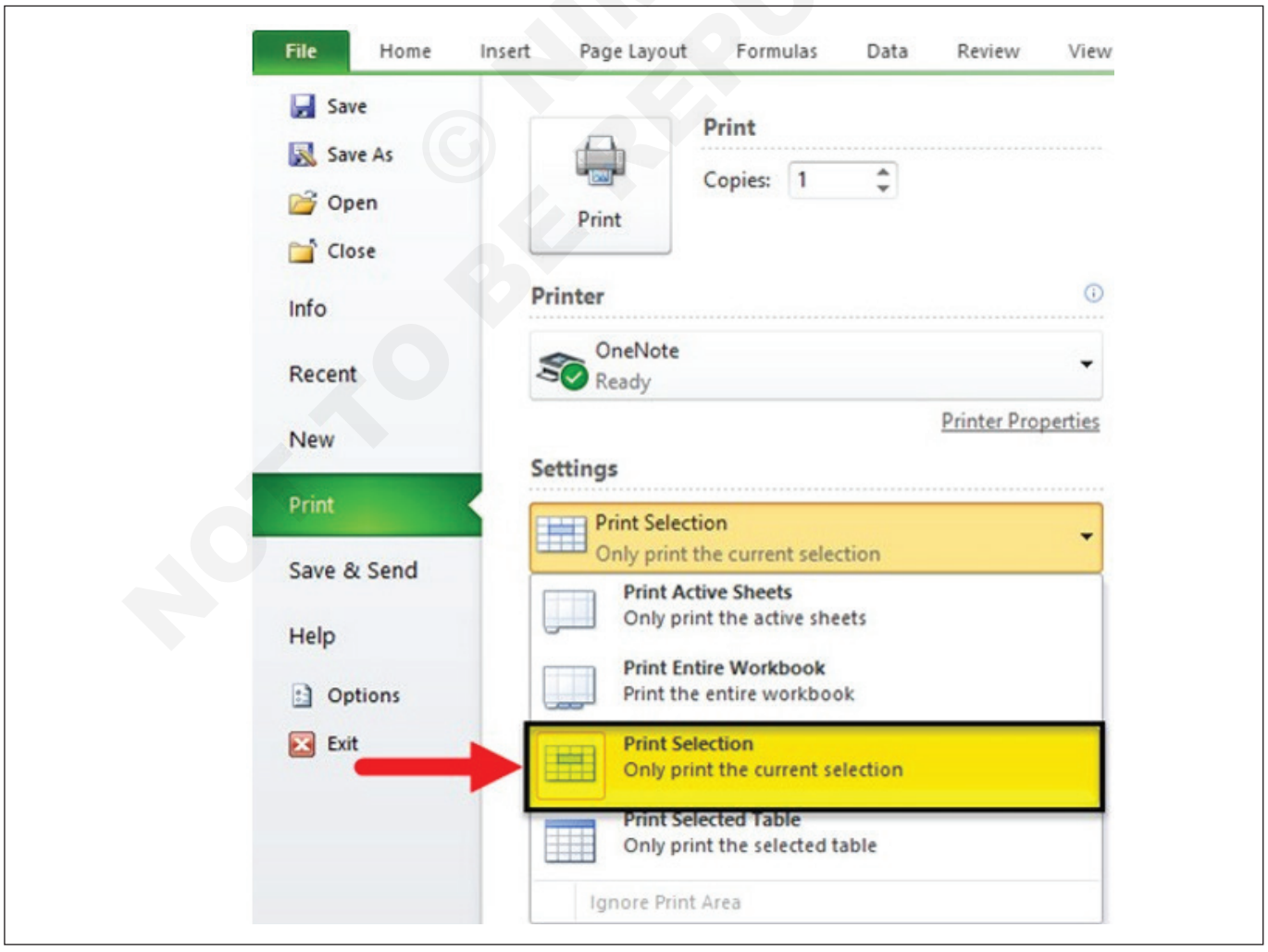
Step 2: Open the File menu bar and click on the Print tab.



Step 3: Now Print setting will open, then under the Setting section, select 'Print selection'



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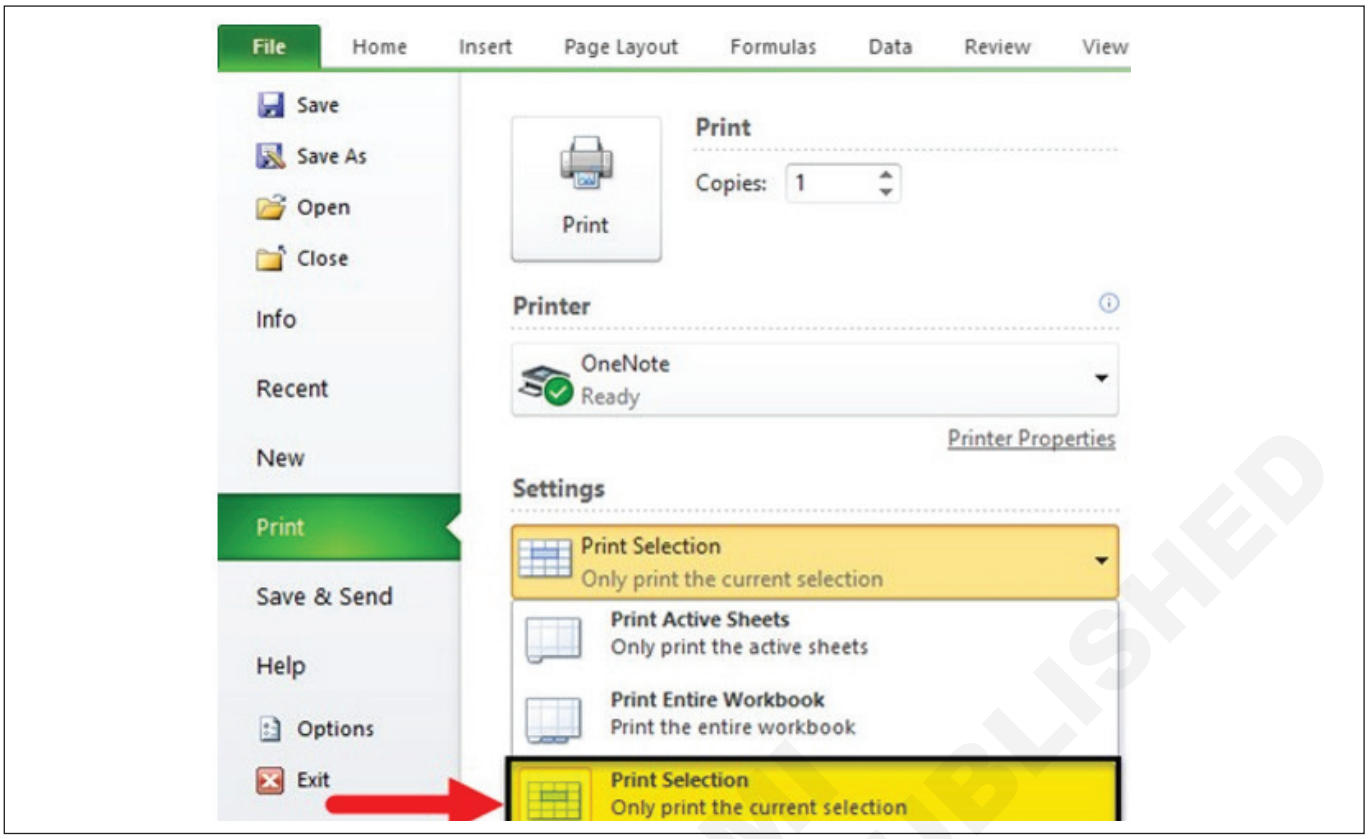
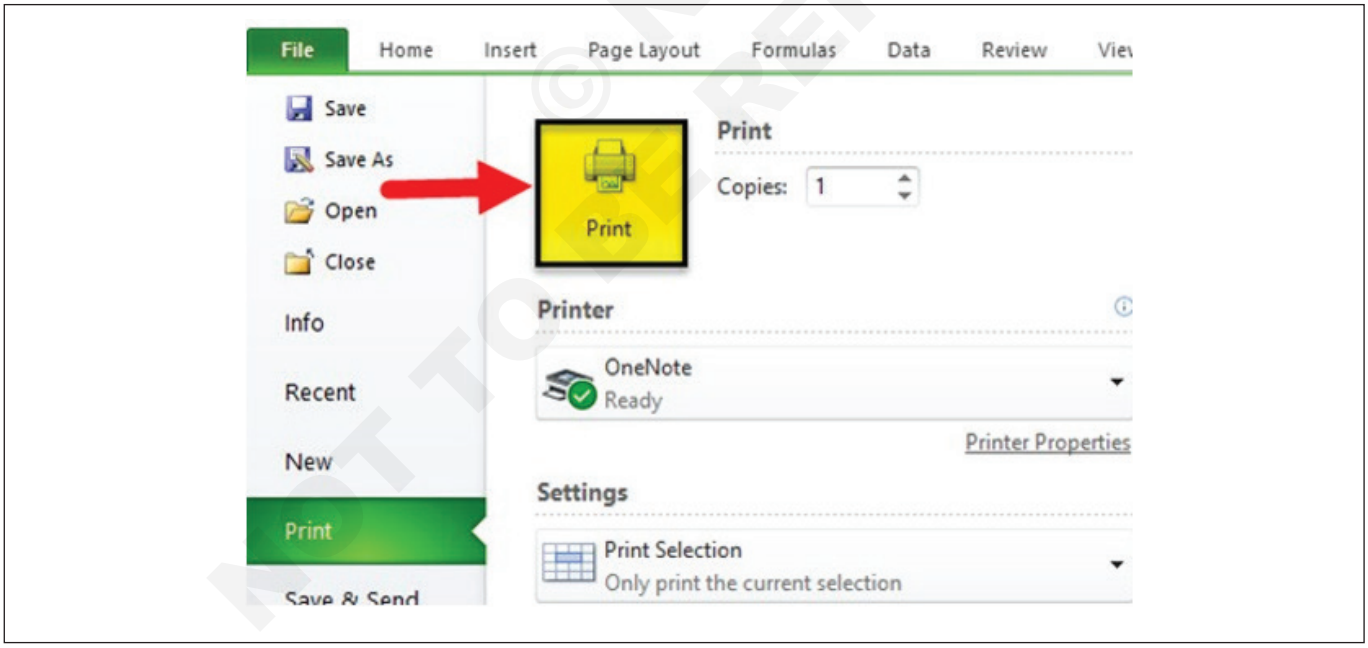
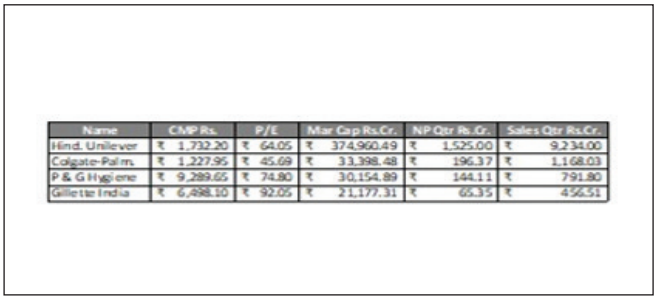
Step 4: Now click on the orientation of the page needed by the user.



Step 5: Click on the print button to print the workbook as per the setting.



Summary: As per the given instruction in the print command, it will print with the selected area only in landscape orientation.



Name	CMP Rs.	P/E	Mar Cap Rs.Cr.	NP Qtr Rs.Cr.	Sales Qtr Rs.Cr.
Hind. Unilever	₹ 1,732.20	₹ 64.05	₹ 374,960.49	₹ 1,525.00	₹ 9,234.00
Colgate-Palm.	₹ 1,227.95	₹ 45.69	₹ 33,398.48	₹ 196.37	₹ 1,168.03
P & G Hygiene	₹ 9,289.65	₹ 74.80	₹ 30,154.89	₹ 144.11	₹ 791.80
Gillette India	₹ 6,488.10	₹ 92.05	₹ 21,177.31	₹ 65.35	₹ 456.51

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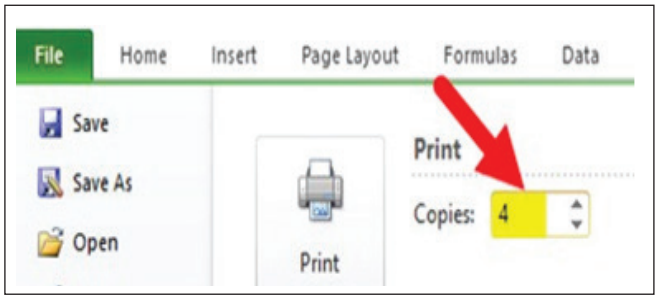
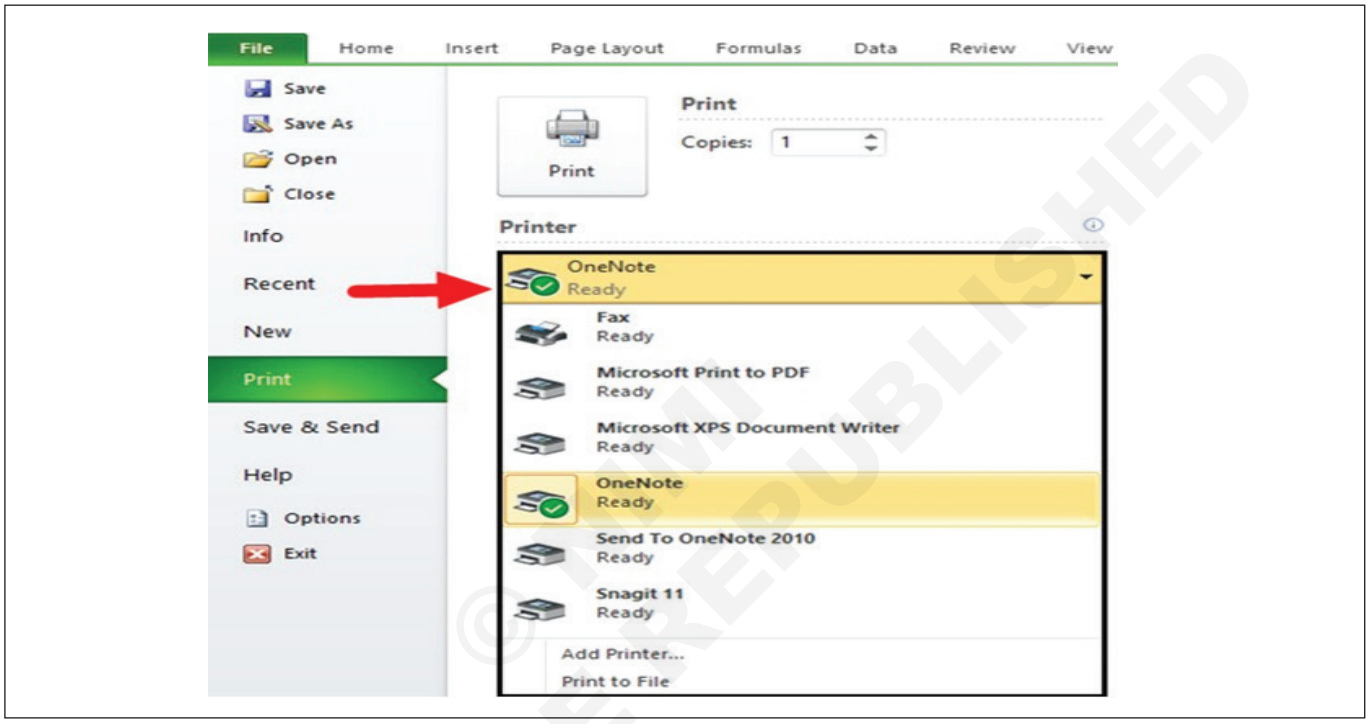
Print Settings

Multiple Copies: If a user wants to print more than one copy, he just needs to count how many copies he wants to print in the Copies section.



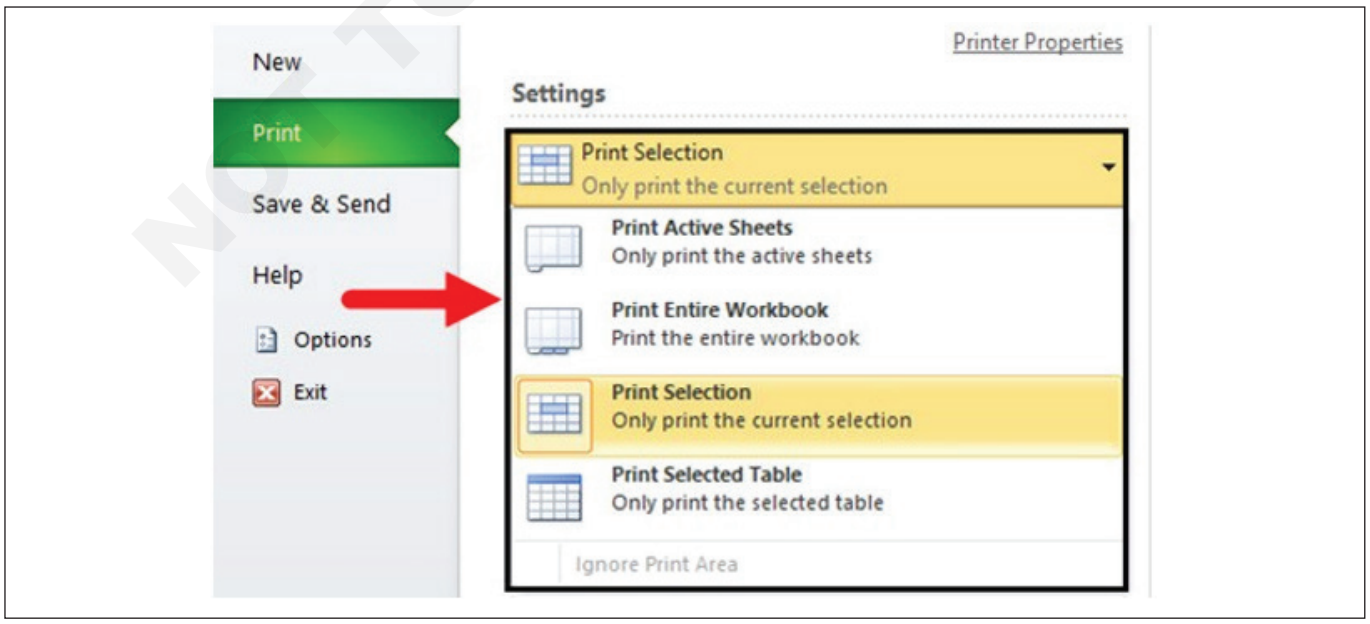
Select Printer: There are multiple options to save the workbook; as per the users need; he can select options in the added printer, save as PDF, OneNote, XPS document writer, send FAX or add any new printer.



Print selection: This option will print only the current selection in the print command.

Print Active sheets: This option will print only the active sheet in the workbook.

Print Entire Workbook: This option will print all the workbook pages.



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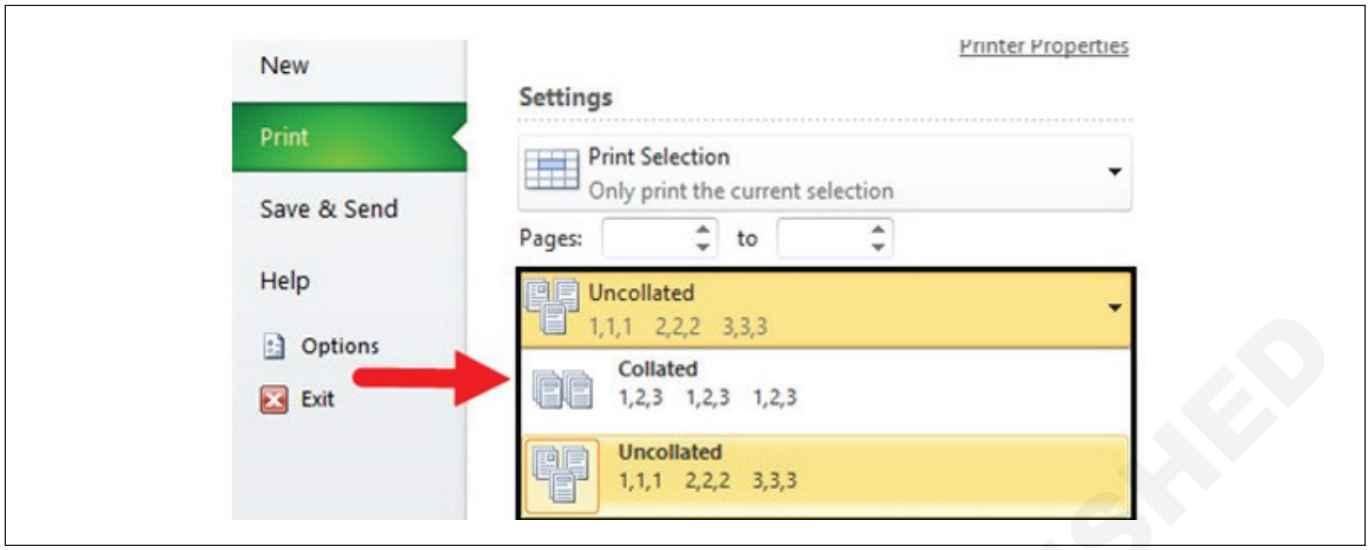
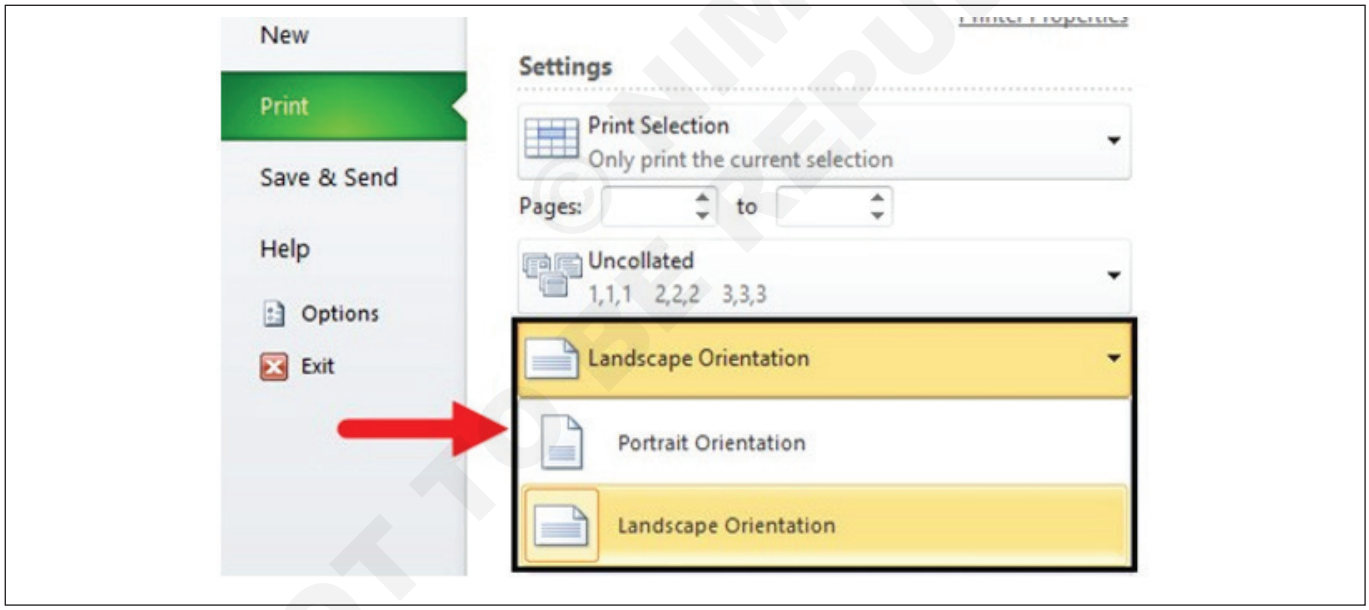
Collated: If a user's workbook contains multiple pages, then there is an option to switch between Collated and Uncollated for a print command.

For example, if the user wants to print 10 copies from a workbook, Collated prints the entire first copy and then the entire second copy.

Or if the user is selecting Uncollated prints 10 copies of page 1, 10 copies of page 2, etc.



Orientation: A user can switch between Portrait Orientation (best when more rows but fewer columns on a page) and Landscape Orientation (best when more columns but fewer rows on a page).



Page Margins: If a user wants to adjust the page margins, he can do so by following the below steps.

Step 1 – By selecting one of the pre-defined margins (Normal, Wide, or Narrow) from the Margins drop-down list.

Step 2 – Or click the 'Show Margins' icon at the bottom right of the window. Now a user can drag the lines to change the page margins manually.

Scaling: If a user wants to fit more and more data on a single page, then he can fit the sheet on one page. To get these settings, he needs to follow the below process.

- Select **'Fit Sheet on One Page'** from the Scaling drop-down list.

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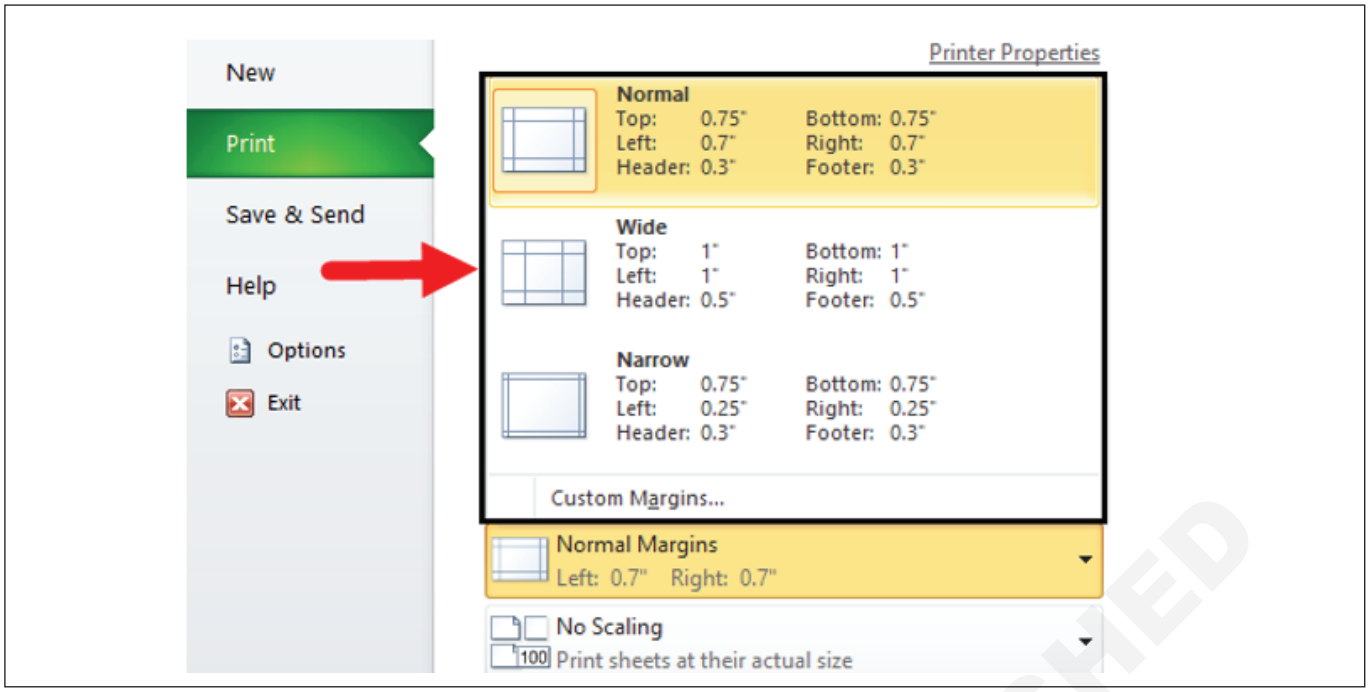

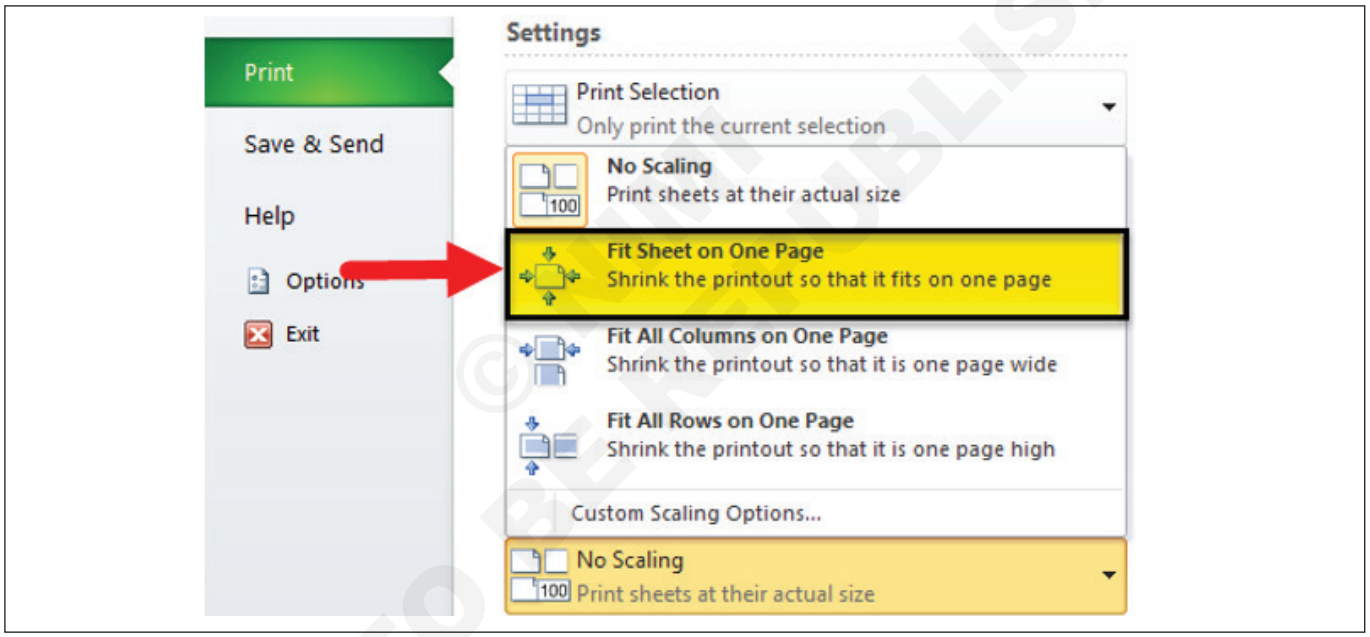

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Manipulate data

Objectives: At the end of this exercise you shall be able to
- **paste data by using special paste options**
- **fill cells by using Auto Fill**
- **insert and delete multiple columns or rows**
- **insert and delete cells.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Paste data by using special paste options**

Paste menu options (on the ribbon)

Select Home, select the clipboard icon (Paste) and pick the specific paste option you want. For example, to paste only formatting from the copied cell, select Formatting . This table shows the options available in the Paste menu:

Icon	Option name	What is pasted
	Paste	All cell contents.
	Keep Source Column Widths	Copied cell content along with its column width.
	Transpose	Reorients the content of copied cells when pasting. Data in rows is pasted into columns and vice versa.
	Formulas	Formula(s), without formatting or comments.
	Values	Formula results, without formatting or comments.
	Formatting	Only the formatting from the copied cells.
	Values & Source Formatting	Values and formatting from copied cells.
	Paste Link	Reference to the source cells instead of the copied cell contents.
	Picture	Copied image.
	Linked Picture	Copied image with a link to the original cells (if you make any changes to the original cells those changes are reflected in the pasted image).

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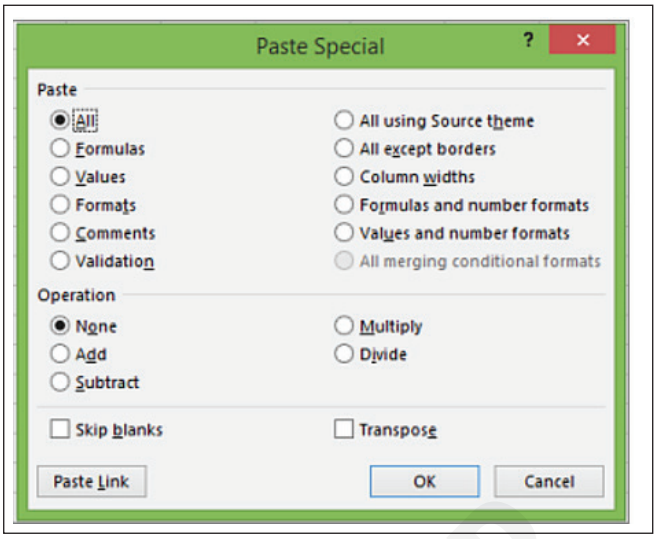
Paste Special

To use options from the Paste Special box, select Home, select the clipboard icon (Paste), and select Paste Special.

Keyboard Shortcut: Press **Ctrl+Alt+V.**

In the Paste Special box, pick the attribute you want to paste.

Note: Depending on the type of data you copied and the Paste option you picked, some other options might be grayed out.



Paste option	Action
All	Pastes all cell contents and formatting of the copied data.
Formulas	Pastes only the formulas of the copied data as entered in the formula bar.
Values	Pastes only the values of the copied data as displayed in the cells.
Formats	Pastes only cell formatting of the copied data.
Comments and Notes	Pastes only comments and notes attached to the copied cell.
Validation	Pastes data validation rules for the copied cells to the paste area.
All using Source theme	Pastes all cell contents in the document theme formatting that is applied to the copied data.
All except borders	Pastes all cell contents and formatting applied to the copied cell except borders.
Column widths	Pastes the width of one copied column or range of columns to another column or range of columns.
Formulas and number formats	Pastes only formulas and all number formatting options from the copied cells.
Values and number formats	Pastes only values and all number formatting options from the copied cells.
All merging conditional formats	Pastes the contents and conditional formatting options from the copied cells.

You can also specify a mathematical operation to apply to the copied data.

Operation	Action
None	Specifies that no mathematical operation will be applied to the copied data.
Add	Adds the copied data to the data in the destination cell or range of cells.
Subtract	Subtracts the copied data from the data in the destination cell or range of cells.
Multiply	Multiplies the copied data with the data in the destination cell or range of cells.
Divide	Divides the copied data by the data in the destination cell or range of cells.
Other options	**Action**
Skip blanks	Avoids replacing values in your paste area when blank cells occur in the copy area when you select this check box.
Transpose	Changes columns of copied data to rows and vice versa when you select this check box.
Paste Link	Click to create a link to the copied cell(s).

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Verify and fix cell references in a pasted formula

> **Note: Cell references are automatically adjusted when you cut (not copy) and paste formulas.**

After you paste a copied formula, you should verify that all cell references are correct in the new location. The cell references may have changed based on the reference type (absolute, relative, or mixed) used in the formula.

For example, if you copy a formula in cell A1 and paste it two cells down and to the right (C3), cell references in the pasted formula will change as follows:

This reference:	Changes to:
$A$1 (absolute column and absolute row)	$A$1
A$1 (relative column and absolute row)	C$1
$A1 (absolute column and relative row)	$A3
A1 (relative column and relative row)	C3

If cell references in the formula don't give you the result you want, try switching to different reference types:

1 Select the cell containing the formula.

2 In the formula bar , select the reference you want to change.

3 Press F4 to switch between the reference combinations, and choose the one you want.

TASK 2: **Fill cells by using Auto Fill**

1 Select one or more cells you want to use as a basis for filling additional cells.

For a series like 1, 2, 3, 4, 5..., type 1 and 2 in the first two cells. For the series 2, 4, 6, 8..., type 2 and 4.

For the series 2, 2, 2, 2..., type 2 in first cell only.

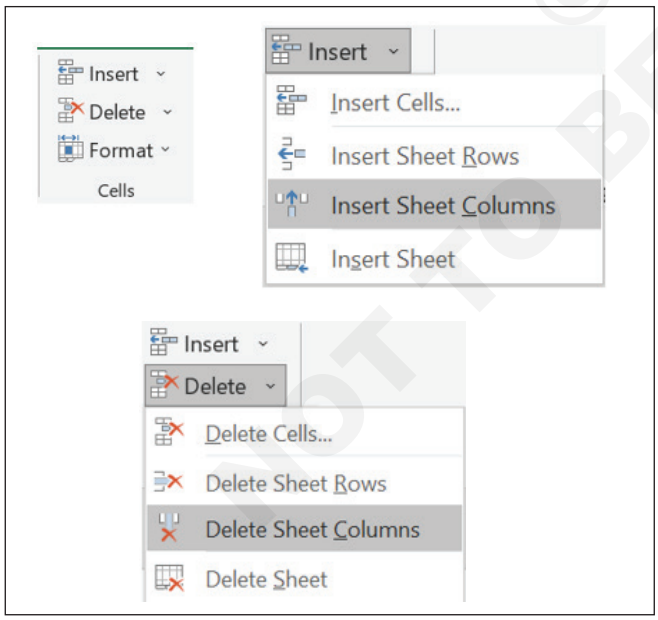
2 Drag the fill handle .

3 If needed, click Auto Fill Options and choose the option you want.

TASK 3: **Insert and delete multiple columns or rows**

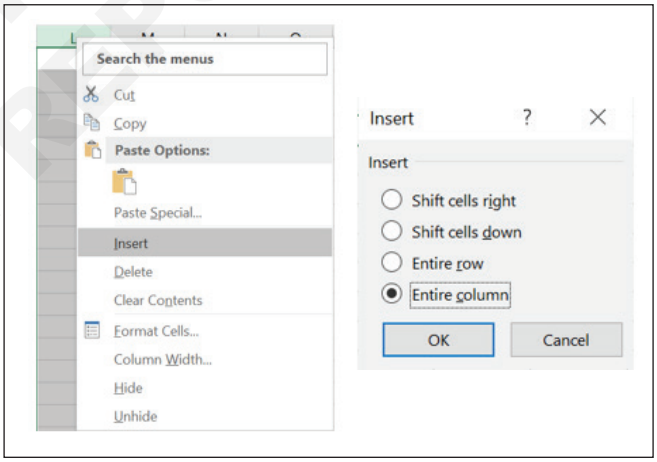
Insert or delete a column

1 Select any cell within the column, then go to Home > Insert > Insert Sheet Columns or Delete Sheet Columns.



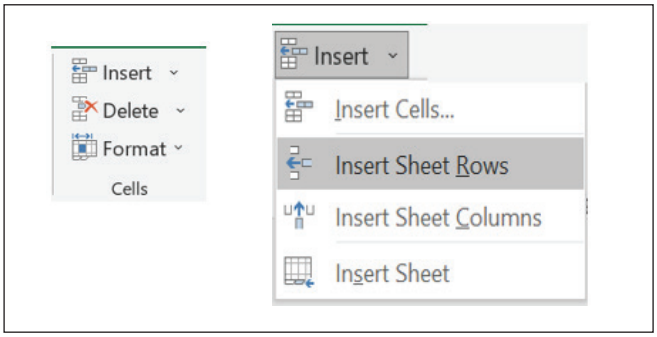
2 Alternatively, right-click the top of the column, and then select Insert or Delete.

3 Click OK



Insert or delete a row

1 Select any cell within the row, then go to Home > Insert > Insert Sheet Rows or Delete Sheet Rows.



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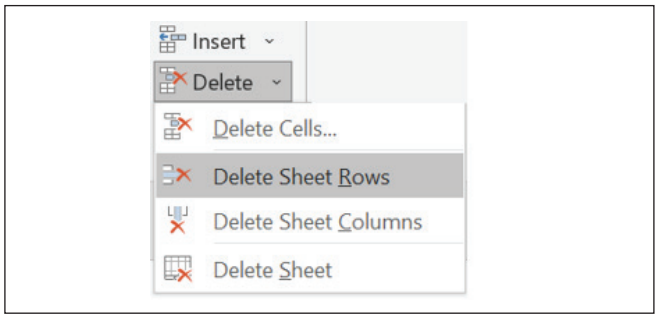
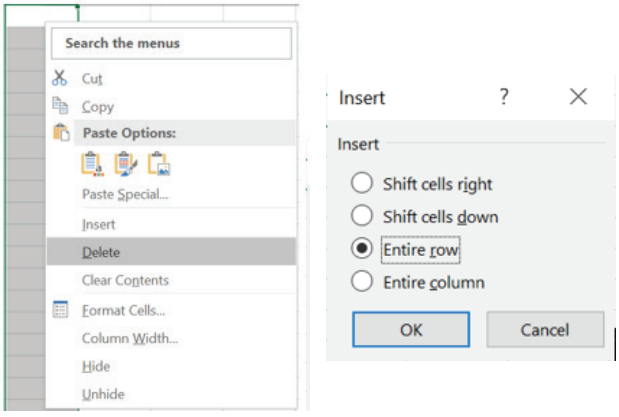


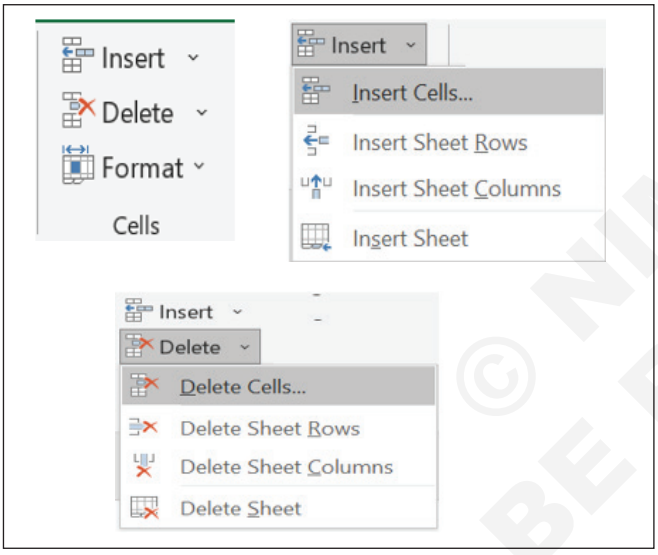
2 Alternatively, right-click the row number, and then select Insert or Delete.



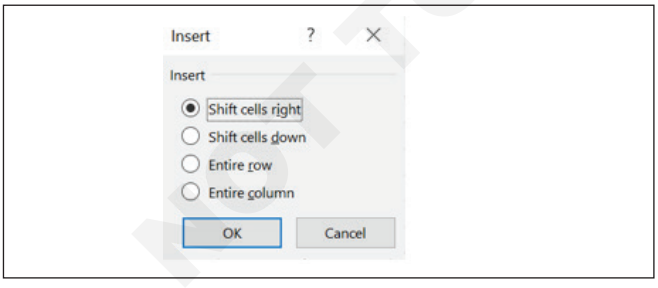
TASK 4: **Insert and delete cells**

Insert or delete a Cell

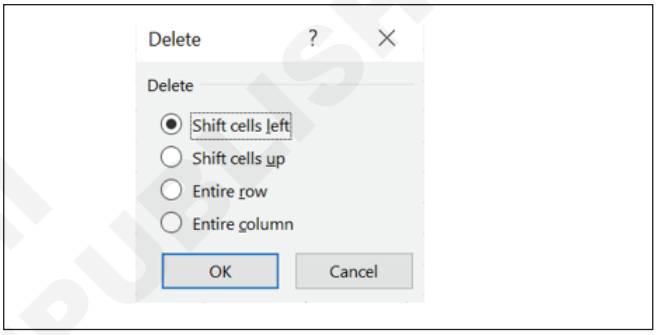
1 Select any cell within the column or Row, then go to Home > Insert > Insert Cell or Delete Cell.



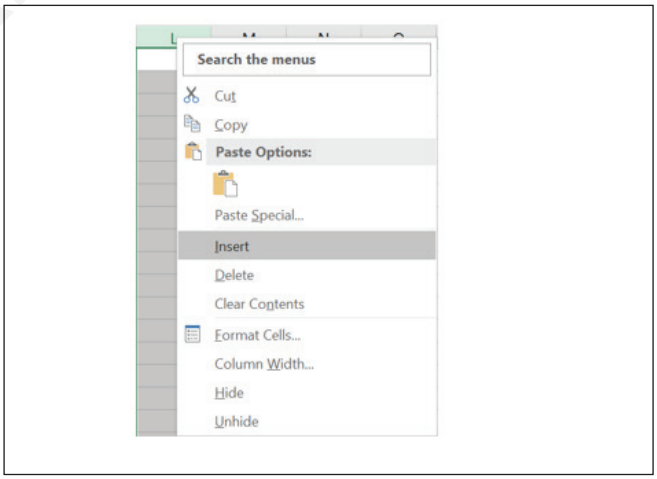
2 Choose Shift Cell right or Shift cell down while Inserting Cell and Click OK



3 Choose Shift Cell Left or Shift cell up while Deleting Cell and Click OK.



4 Alternatively, right-click the top of the column, and then select Insert or Delete.



5 Follow the Steps 2 and 3 then Click OK

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Format cells and ranges

Objectives: At the end of this exercise you shall be able to

- **merge and Unmerge cells**
- **modify cell alignment, orientation and indentation**
- **format cells using Format Painter**
- **wrap text within cells**
- **apply number formats**
- **apply cell formats from the Format cells dialog box**
- **apply cell styles**
- **clear cell formatting**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

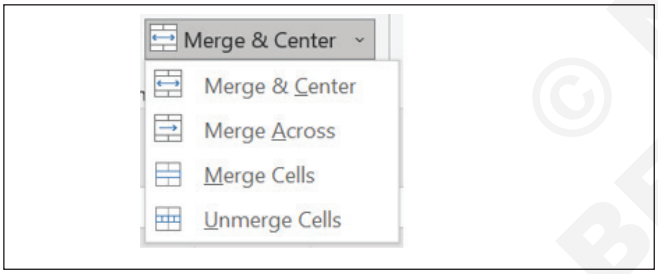
PROCEDURE

TASK 1: **Merge and Unmerge cells**

Merge cells

1 Select the cells to merge.

2 Select Merge & Center.



Unmerge cells

1 Select the Merge & Center down arrow.

2 Select Unmerge Cells.

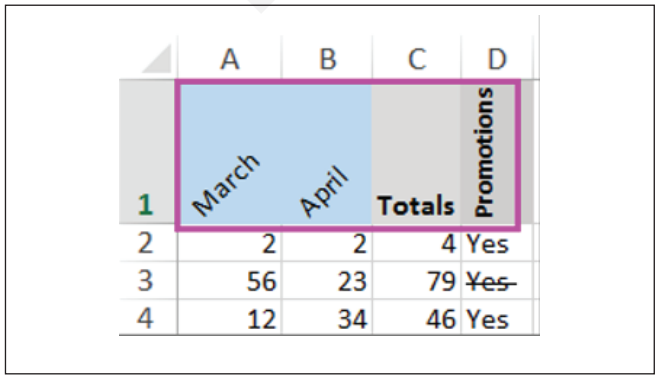
TASK 2: **Modify cell alignment, orientation and indentation**

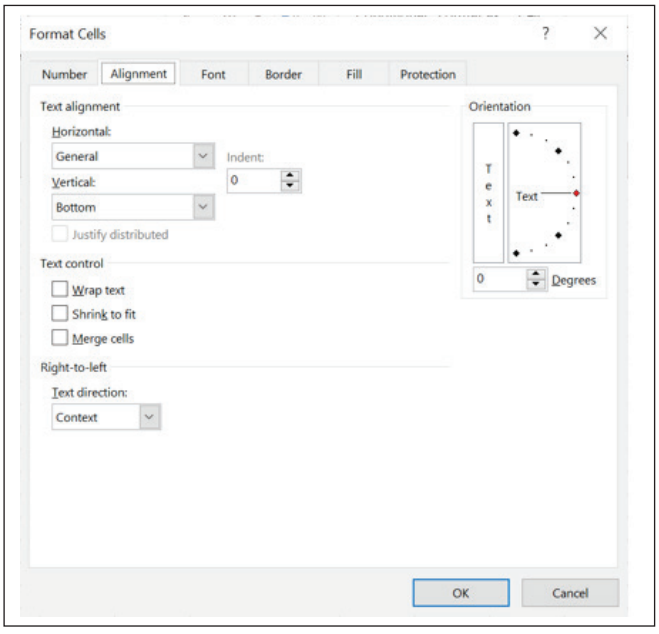
Change the orientation of text in a cell

1 Select a cell, row, column, or a range.

2 Select Home > Orientation , and then select an option.

You can rotate your text up, down, clockwise, or counterclockwise, or align text vertically:





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Rotate text to a precise angle

1 Select a cell, row, column, or a range.

2 Select Home > Orientation > Format Cell Alignment.

3 Under Orientation on the right side, in the Degrees box, use the up or down arrow to set the exact number of degrees that you want to rotate the selected cell text.

Positive numbers rotate the text upward. Negative numbers rotate the text downward.

Align a column or row

Begin by selecting the cell or cells you want to align. You can align text in a single cell, a range of cells, a row or rows, a column or columns, or the entire worksheet. (Use Ctrl+A to select all cells.)

1 Select the cells you want to align.

2 On the Home tab, in the Alignment group, select a horizontal alignment option:

Align Left Center Align Right

3 On the Home tab, in the Alignment group, select a vertical alignment option:

Top Align Middle Align Bottom Align

TASK 3: **Format cells using Format Painter**

1 Select the cell with the formatting you want to copy.

2 Select Home > Format Painter.

3 Drag to select the cell or range you want to apply the formatting to.

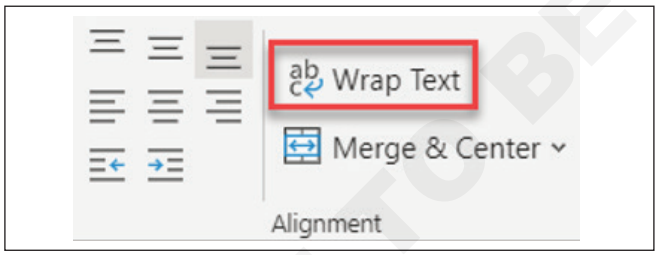
4 Release the mouse button and the formatting should now be applied.

TASK 4: **Wrap text within cells**

Wrap text automatically

1 n a worksheet, select the cells that you want to format.

2 On the Home tab, in the Alignment group, click Wrap Text. (On Excel for desktop, you can also select the cell, and then press Alt + H + W.)



Adjust the row height to make all wrapped text visible

1 Select the cell or range for which you want to adjust the row height.

2 On the Home tab, in the Cells group, click Format.

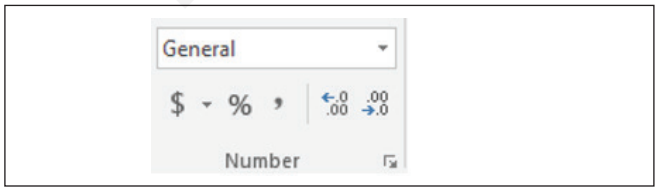
3 Under Cell Size, do one of the following:

- To automatically adjust the row height, click AutoFit Row Height.
- To specify a row height, click Row Height, and then type the row height that you want in the Row height box

TASK 5: **Apply number formats**

1 Select a cell or a cell range.

2 On the Home tab, select Number from the drop-down.



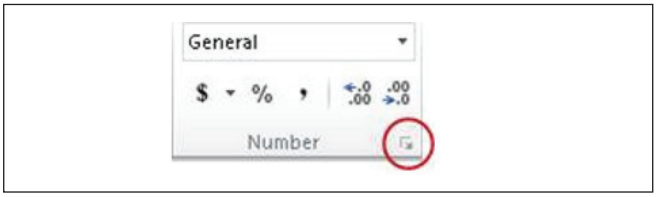
Or, you can choose one of these options:

- Press CTRL + 1 and select Number.
- Right-click the cell or cell range, select Format Cells… , and select Number.
- Select the small arrow, dialog box launcher, and then select Number.

3 Select the format you want.

Number formats

To see all available number formats, click the Dialog Box Launcher next to Number on the Home tab in the Number group.



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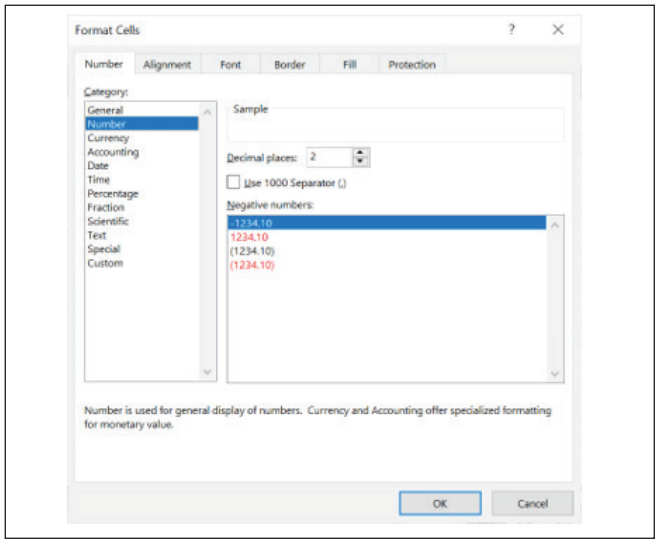
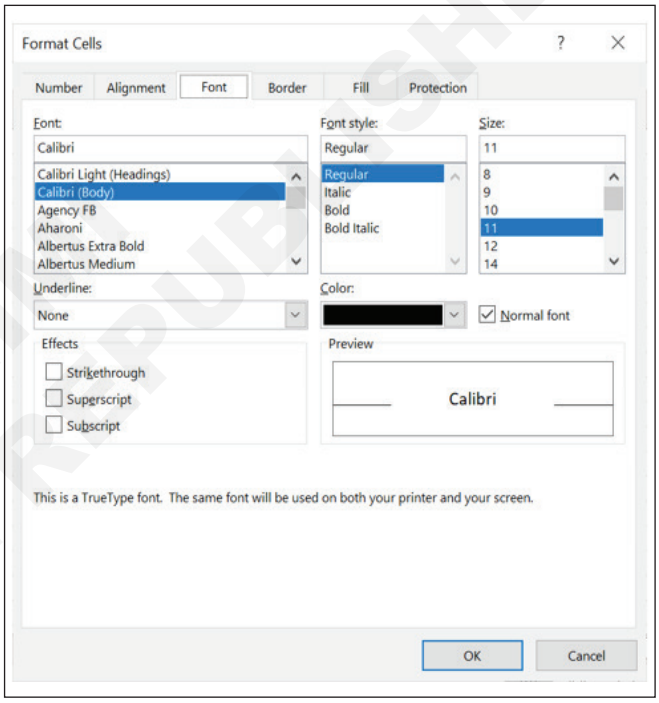


TASK 6: **Apply cell formats from the Format cells dialog box**

Formal Cells

1 Select the cells.

2 Go to the ribbon to select changes as Bold, Font Color, or Font Size.



Apply Excel Styles

1 Select the cells.

2 Select Home > Cell Style and select a style.

Modify an Excel Style

1 Select the cells with the Excel Style.

2 Right-click the applied style in Home > Cell Styles.

3 Select Modify > Format to change what you want.

TASK 7: **Apply cell styles**

Apply a cell style

1 Select the cells that you want to format.

2 On the Home tab, in the Styles group, click the More dropdown arrow in the style gallery, and select the cell style that you want to apply.

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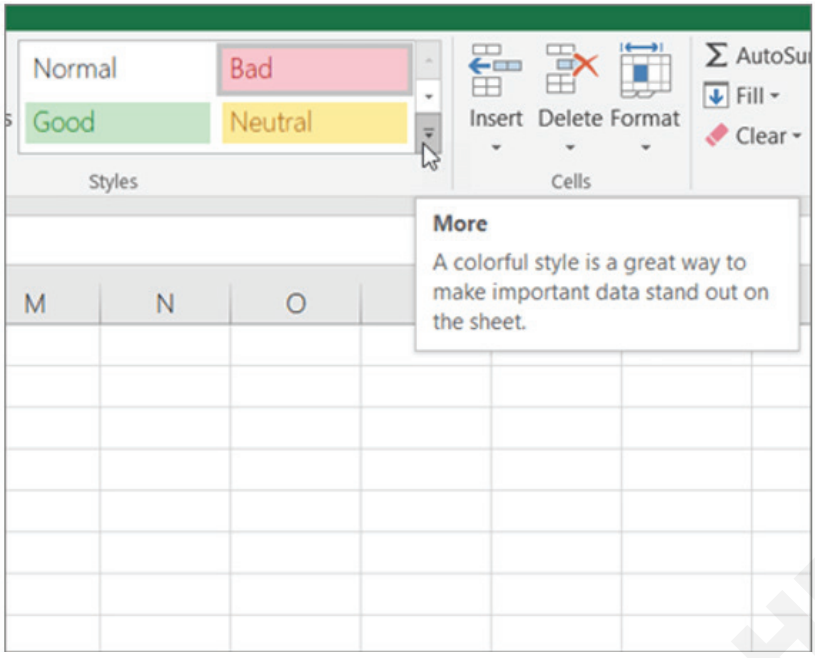
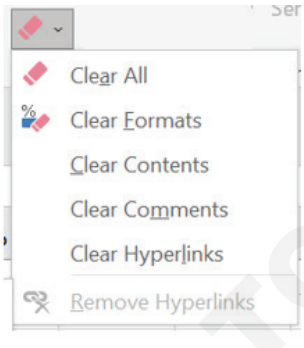


TASK 8: **Clear cell formatting**

1 Select the cells, rows, or columns that you want to clear.

Tip: To cancel a selection of cells, click any cell on the worksheet.

2 On the Home tab, in the Editing group, click the arrow next to the Clear button , and then do one of the following:



- To clear all contents, formats, and comments that are contained in the selected cells, click Clear All.
- To clear only the formats that are applied to the selected cells, click Clear Formats.
- To clear only the contents in the selected cells, leaving any formats and comments in place, click Clear Contents.
- To clear any comments or notes that are attached to the selected cells, click Clear Comments and Notes.
- To clear any hyperlinks that are attached to the selected cells, select Clear Hyperlinks.

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Define and reference named ranges

Objectives: At the end of this exercise you shall be able to
- **define a named range**
- **name a table**
- **summarize data visually Insert spark lines**
- **apply built in conditional formatting**
- **remove conditional formatting**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Define a named range**

How to create an Excel named range

There are 3 ways to define a name in Excel: Name Box, Define Name button, and Excel Name Manager.

Type a name in the Name Box

The Name Box in Excel is fastest way to create a named range:

1 Select a cell or a range of cells that you want to name.

2 Type a name into the Name Box.

3 Press the Enter key.

A new Excel named range is created!

Range A1:A10 → Item_List

Item_list

	A	B
1	Apples	200
2	Orange	150
3	Banana	100
4	Banana	100
5	Orange	150
6	Apples	200
7	Apples	200
8	Orange	150
9	Apples	200
10	Apples	200

Create a name by using the Define Name option

1 Select the cell(s).

Range B1:B10 → Sales

sales

	A	B
1	Apples	200
2	Orange	150
3	Banana	100
4	Banana	100
5	Orange	150
6	Apples	200
7	Apples	200
8	Orange	150
9	Apples	200
10	Apples	200

2 On the Formulas tab, in the Define Names group, click the Define Name button.

3 In the New Name dialog box, specify three things:
- In the Name box, type the range name.
- In the Scope dropdown, set the name scope (Workbook by default).
- In the Refers to box, check the reference and correct it if needed.

4 Click OK to save the changes and close the dialog box.

Note. By default, Excel creates a name with absolute references. If you'd rather have a relative named range, remove the $ sign from the reference.

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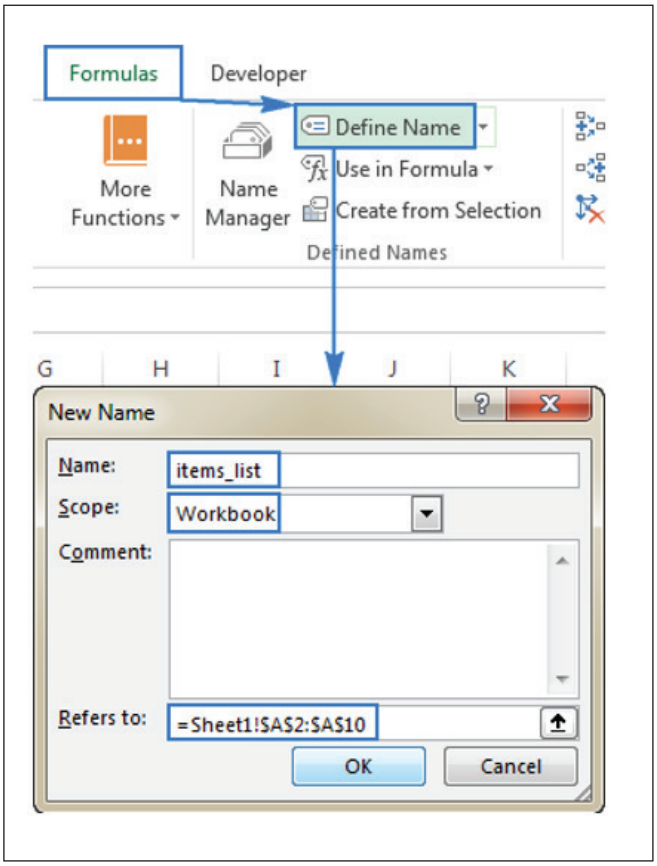


Compared to the previous method, using Define Name in Excel takes a few extra clicks, but it also provides a couple more options such as setting the name's scope and adding a comment that explains something about the name. Additionally, Excel's Define Name feature allows you to create a name for a constant or formula.

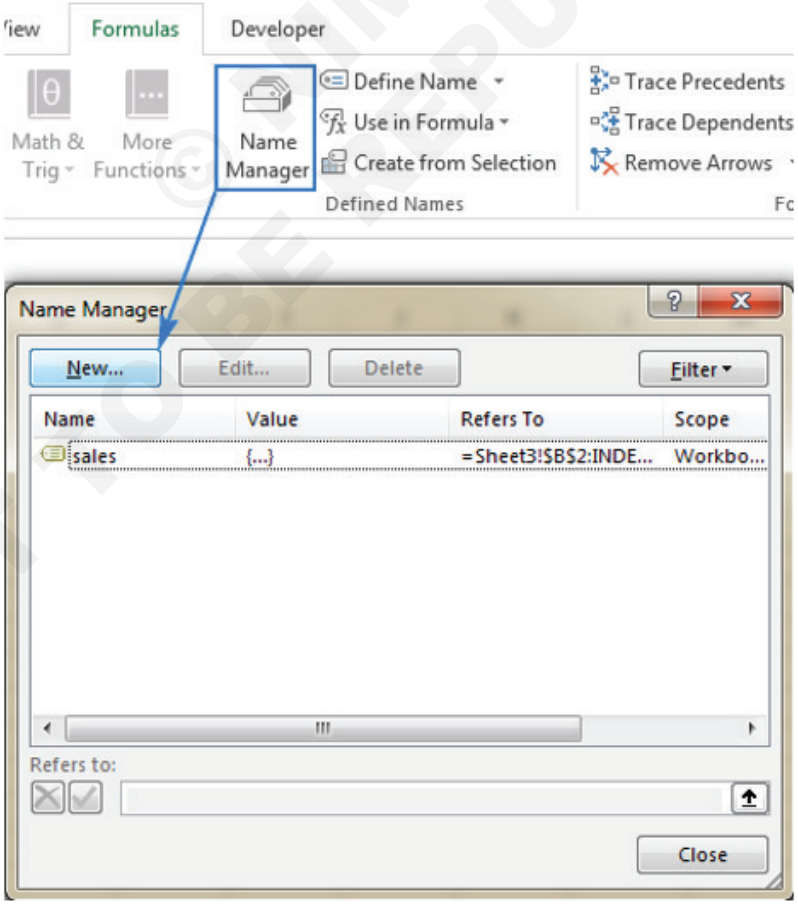
Make a named range by using Excel Name Manager

The Name Manager in Excel is used to work with existing names. However, it can help you build a new name too.

1 Go to the Formulas tab > Defined Names group, click Name Manager. Or, just press Ctrl + F3 (my preferred way).

2 In the top left hand corner of the Name Manager dialog window, click the New… button:

3 This will open the New Name dialog box where you configure a name as demonstrated in the previous section



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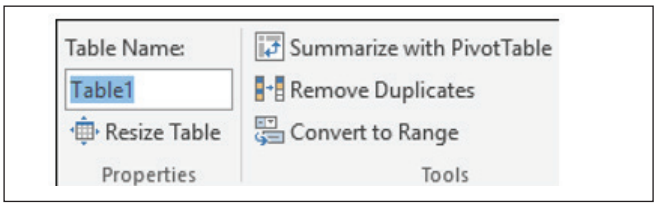
TASK 2: **Name a table**

To rename a table

1 Click on the table.

2 Go to Table Tools > Design > Properties > Table Name.

3 Highlight the table name and enter a new name.

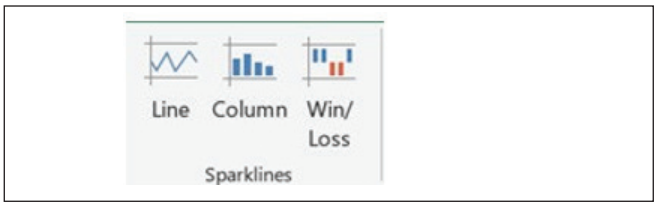


TASK 3: **Summarize data visually Insert spark lines**

Add a Sparkline

1 Select a blank cell at the end of a row of data.

2 Select Insert and pick Sparkline type, like Line, or Column.



3 Select cells in the row and OK in menu.

4 More rows of data? Drag handle to add a Sparkline for each row.

Format a Sparkline chart

1 Select the Sparkline chart.

2 Select Sparkline and then select an option.

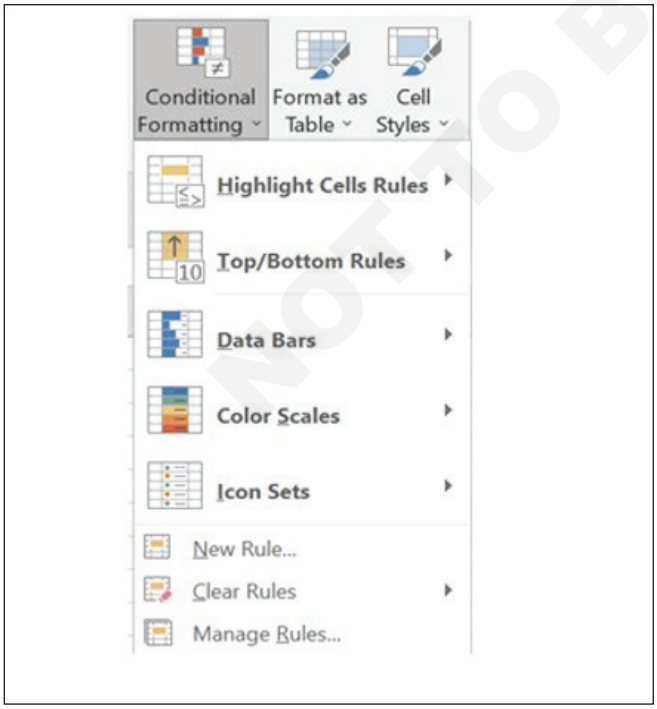
- Select Line, Column, or Win/Loss to change the chart type.
- Check Markers to highlight individual values in the Sparkline chart.
- Select a Style for the Sparkline.
- Select Sparkline Color and the color.
- Select Sparkline Color > Weight to select the width of the Sparkline.
- Select Marker Color to change the color of the markers.

TASK 4: **Apply built in conditional formatting**

Apply conditional formatting

1 Select the range of cells, the table, or the whole sheet that you want to apply conditional formatting to.

2 On the Home tab, click Conditional Formatting.



3 Do one of the following:

To highlight	Do this
Values in specific cells. Ex: numbers between 50 and 100	Point to Highlight Cells Rules or Top/Bottom Rules, and then click the appropriate option.
The relationship of values in a cell range. Examples are comparisons of prices or populations in the largest cities.	Point to Data Bars, and then click the fill that you want.
The relationship of values in a cell range. Example is sales distributions across regions.	Point to Color Scales, and then click the scale that you want.
A cell range that contains three to five groups of values, where each group has its own threshold. For example you might assign a 5-point rating system for automobiles and apply a set of five icons.	Point to Icon Sets, and then click a set.

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Temperature information with conditional formatting applied that shows top 10% and bottom 10% values

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	Avg Hi	40	38	44	46	51	56	67	72	70	59	45	41
3	Avg Lo	34	33	39	41	45	48	51	55	54	45	41	38

Temperature information with 3-color scale conditional formatting applied

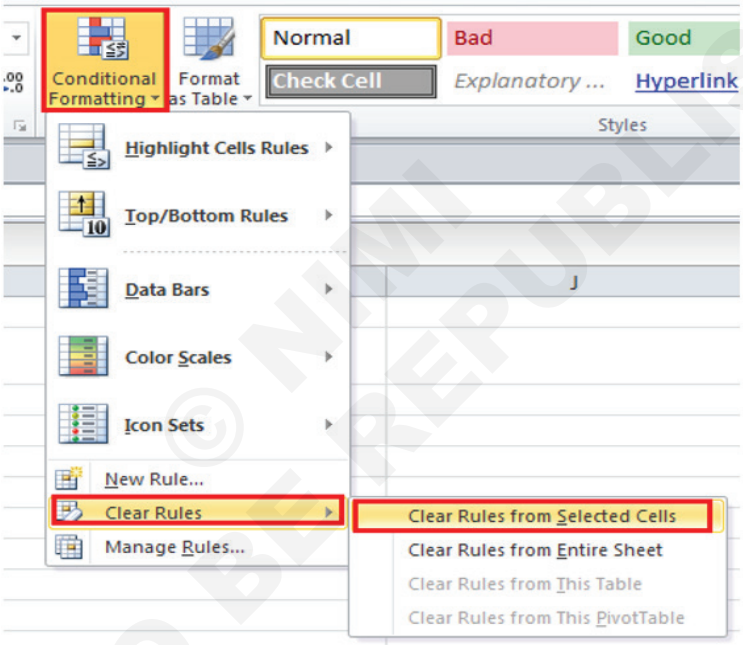
	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	Avg Hi	40	38	44	46	51	56	67	72	70	59	45	41
3	Avg Lo	34	33	39	41	45	48	51	55	54	45	41	38

TASK 5: **Remove conditional formatting**

To delete the selected range conditional formatting, please do as this:

1 Select the range that you want to remove the conditional formatting.

2 Click Home > Conditional Formatting > Clear Rules > Clear Rules from Selected Cells. See screenshot:



3 And the selected conditional formatting has been removed. See screenshots:

Click Home > Conditional Formatting > Clear Rules > Clear Rules from Entire Sheet, and the entire worksheet conditional formatting will be removed.

To delete the entire worksheet conditional formatting, please do as follows:

	A	B	C
103	Name	Gendar	Age
104	Jim	M	12
105	Lucy	F	13
106	Bob	M	12
107	Alexia	M	11
108	Nelly	F	12
109	Freda	M	13
110	Nocial	F	12
111	Joanna	F	13
112	Mignon	M	11

	A	B	C
103	Name	Gendar	Age
104	Jim	M	12
105	Lucy	F	13
106	Bob	M	12
107	Alexia	M	11
108	Nelly	F	12
109	Freda	M	13
110	Nocial	F	12
111	Joanna	F	13
112	Mignon	M	11

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Create and format tables

Objectives: At the end of this exercise you shall be able to
- **create excel tables from cell ranges**
- **apply table styles**
- **convert tables to cell ranges.**

Requirements

Tools/Equipment/Machines

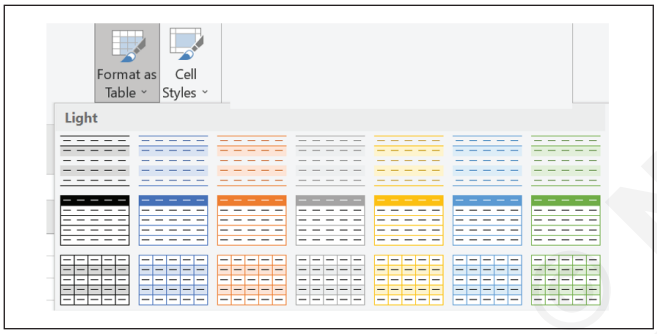
- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Create excel tables from cell ranges**

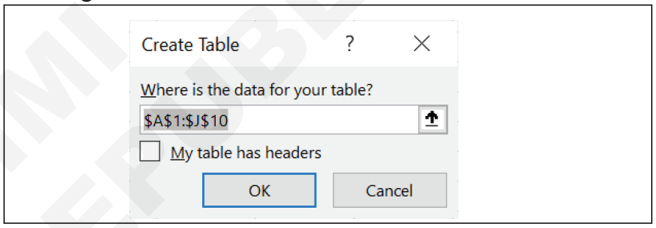
1 Select a cell within your data.

2 Select Home > Format as Table.



3 Choose a style for your table.

4 In the Format as Table dialog box, set your cell range.



5 Mark if your table has headers.

6 Select OK.

— — — — — —

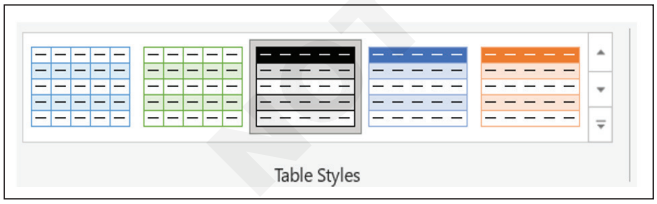
TASK 2: **Apply table styles**

Apply a table style to an existing table

1 Select any cell in the table.

2 Select Home > Format as Table or Design Table

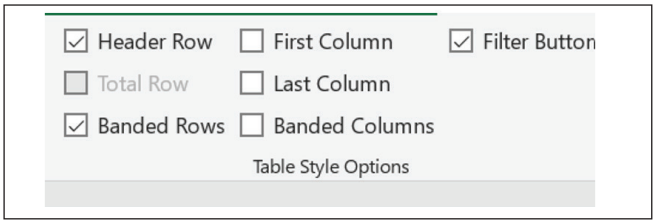
3 In the Table Styles gallery, select the table style you want to apply.



Change the table style options

To change the design of the table, do one or more of the following:

- To add special formatting to the first row in a table, select Design > Header Row.
- To add special formatting to the last row in a table, select Design > Total Row.
- To alternate row or column colors and make tables easier to read, select Design > Banded Rows or Design > Banded Columns.



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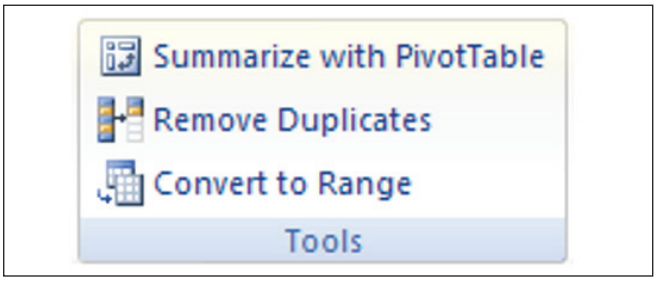
TASK 3: **Convert tables to cell ranges**

1 Click anywhere in the table and then go to Table Tools > Design on the Ribbon.

2 In the Tools group, click Convert to Range.

-OR-

Right-click the table, then in the shortcut menu, click Table > Convert to Range.



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Managing tables and its data

Objectives: At the end of this exercise you shall be able to
- **add or remove table rows and columns**
- **configure table style options**
- **insert and configure total rows.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No..

PROCEDURE

TASK 1: **Add or remove table rows and columns**

Refer Model 15 – Task 3 Insert and delete multiple columns or rows

TASK 2: **Configure table style options**

1 Select any cell within the table, or range of cells you want to format as a table.

2 On the Home tab, click Format as Table.

3 Click the table style that you want to use.

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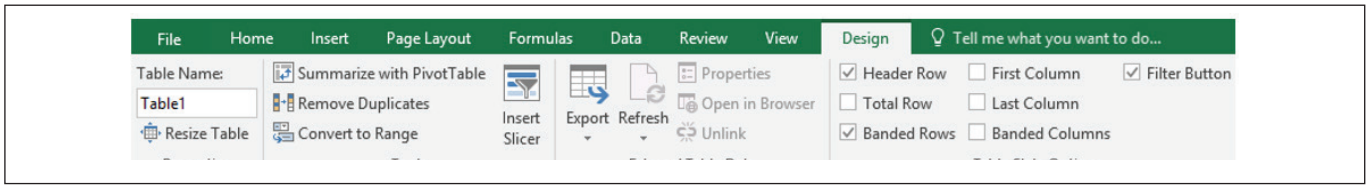
TASK 3: **Insert and configure total rows**

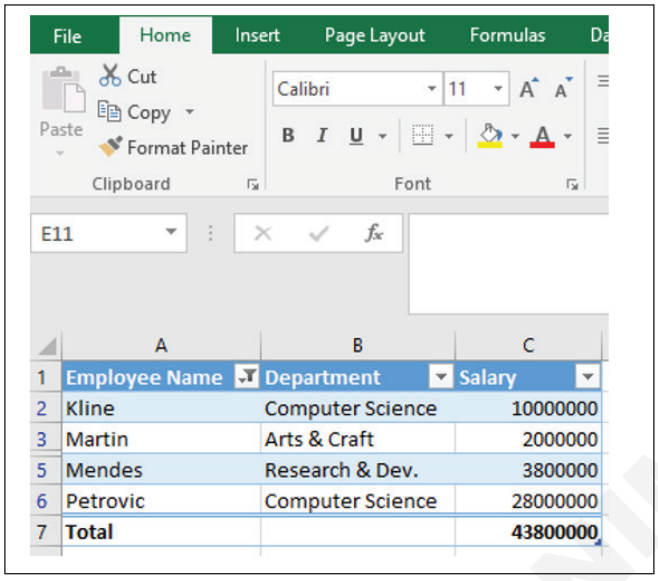
You can add totals to a table by selecting the Total Row checkbox on the Design tab. You can also add a function from the total row drop-down.

1 Select a cell in a table.

2 Select Design > Total Row.

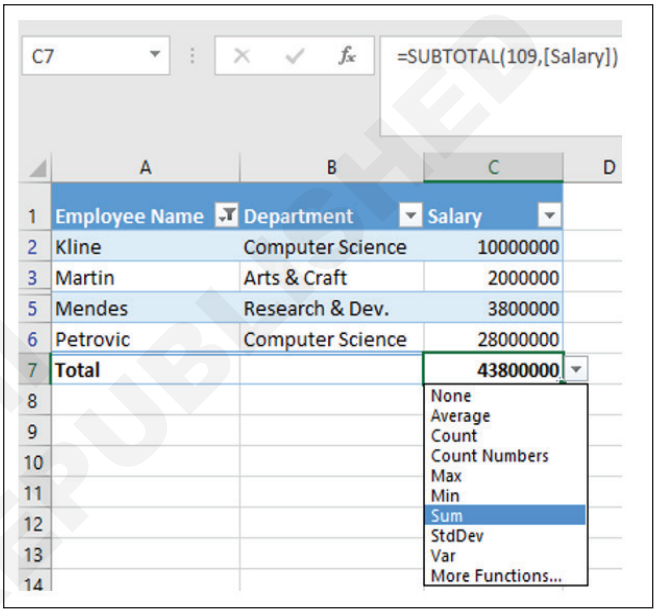


3 The Total row is added to the bottom of the table.



Note: To add a new row, uncheck the Total Row checkbox, add the row, and then recheck the Total Row checkbox.

4 From the total row drop-down, you can select a function, like Average, Count, Count Numbers, Max, Min, Sum, StdDev, Var, and more.



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Filter and sort table data

Objectives: At the end of this exercise you shall be able to
- **filter records**
- **sort data by multiple columns.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

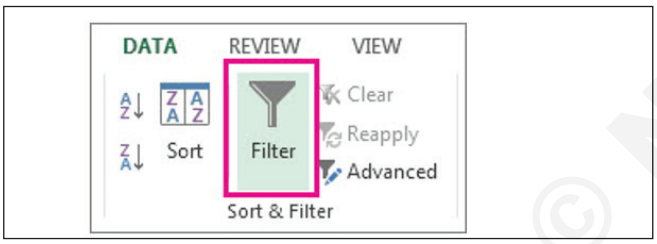
TASK 1: **Filter records**

Use filters to temporarily hide some of the data in a table, so you can focus on the data you want to see.

Filter a range of data

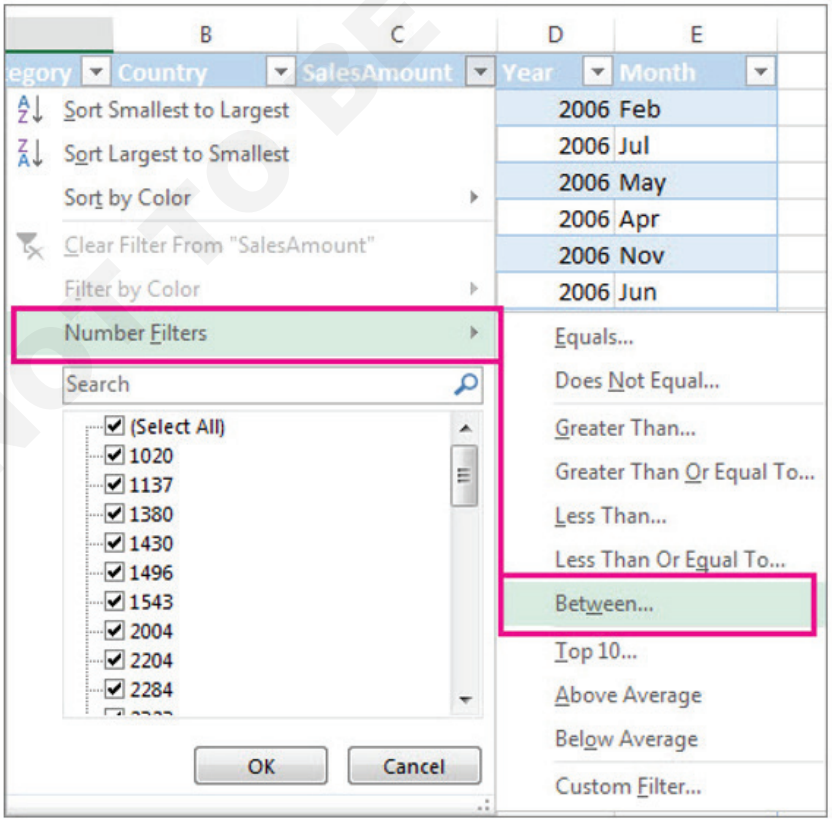
1 Select any cell within the range.

2 Select Data > Filter.



3 Select the column header arrow .

4 Select Text Filters or Number Filters, and then select a comparison, like Between.



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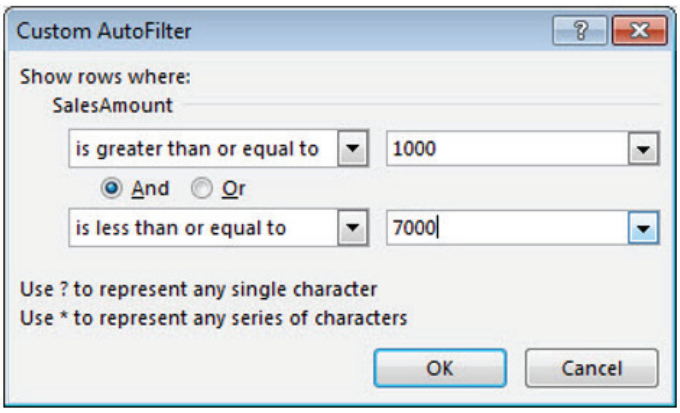
5 Enter the filter criteria and select OK.



Filter data in a table

When you Create and format tables, filter controls are automatically added to the table headers.

	A	B	C	D	E	F	G
1	Product	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Grand Total	Average Sales
2	Chocolade	$ 744.60	$ 162.56	$ 68.85	$ 306.00	$ 1,282.01	$ 320.50
3	Gumbär Gummibärchen	$ 5,079.60	$ 1,249.20	$ 2,061.17	$ 2,835.68	$ 11,225.65	$ 2,806.41
4	Maxilaku	$ 1,605.60	$ 620.00	$ 835.00	$ -	$ 3,060.60	$ 765.15
5	NuNuCa Nuß-Nougat-Crème	$ 193.20	$ 865.20		$ 493.50	$ 1,551.90	$ 517.30
6	Pavlova	$ 1,685.36	$ 2,646.08	$ 1,849.70	$ 999.01	$ 7,180.15	$ 1,795.04
7	Schoggi Chocolade	$ 1,755.00	$ 5,268.00	$ 2,195.00	$ 1,756.00	$ 10,974.00	$ 2,743.50
8	Scottish Longbreads	$ 1,267.50	$ 1,062.50	$ 492.50	$ 1,935.00	$ 4,757.50	$ 1,189.38
9	Sir Rodney's Marmalade		$ 4,252.50	$ 1,360.80	$ 1,701.00	$ 7,314.30	$ 2,438.10
10	Sir Rodney's Scones	$ 1,418.00	$ 756.00	$ 1,733.00	$ 1,434.00	$ 5,341.00	$ 1,335.25
11	Tarte au sucre	$ 4,728.00	$ 4,547.92	$ 5,472.30	$ 6,014.60	$ 20,762.82	$ 5,190.71
12	Teatime Chocolate Biscuits	$ 943.89	$ 349.60	$ 841.80	$ 204.70	$ 2,339.99	$ 585.00
13	Valkoinen suklaa	$ 845.00		$ 385.94	$ 942.50	$ 2,173.44	$ 724.48
14	Zaanse koeken	$ 817.00	$ 285.95	$ 668.80	$ 1,159.00	$ 2,930.75	$ 732.69
15	Total	$21,082.75	$22,065.51	$17,964.86	$19,780.99	$ 80,894.11	$ 1,626.42

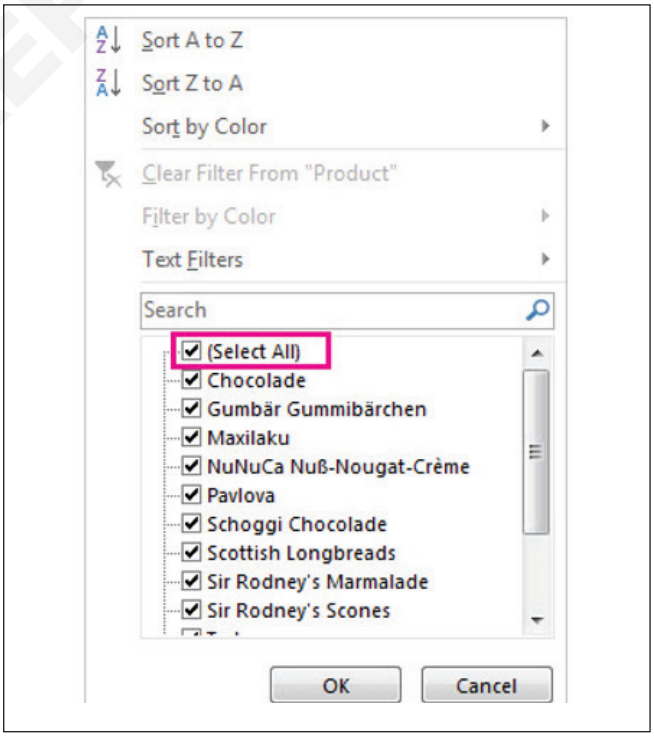
1 Select the column header arrow for the column you want to filter.

2 Uncheck (Select All) and select the boxes you want to show.

3. Click OK.

The column header arrow → changes to a Filter icon.

Select this icon to change or clear the filter



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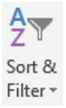
TASK 2: **Sort data by multiple columns**

Sort the table

1 Select a cell within the data.

2 Select Home > Sort & Filter.



Or, select Data > Sort.

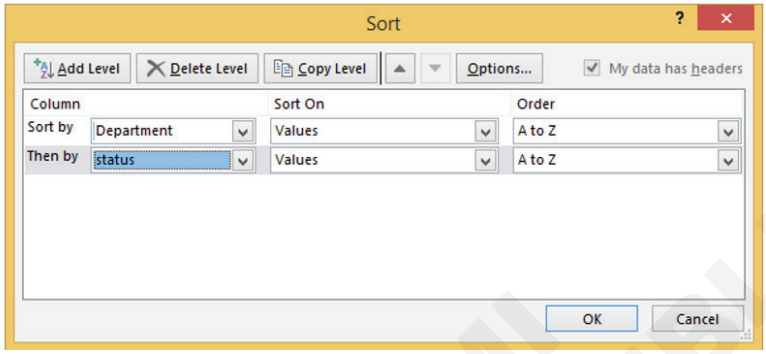
3 Select an option:

- Sort A to Z - sorts the selected column in an ascending order.
- Sort Z to A - sorts the selected column in a descending order.
- Custom Sort - sorts data in multiple columns by applying different sort criteria.

Here's how to do a custom sort:

i Select Custom Sort.

ii Select Add Level.



iii For Column, select the column you want to Sort by from the drop-down, and then select the second column you Then by want to sort. For example, Sort by Department and Then by Status.

iv For Sort On, select Values.

v For Order, select an option, like A to Z, Smallest to Largest, or Largest to Smallest.

vi For each additional column that you want to sort by, repeat steps 2-5.

Note: To delete a level, select Delete Level.

vii Check the My data has headers checkbox, if your data has a header row.

viii Select OK

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COPA - Perform Operations using Formulas and Functions

Insert references

Objectives: At the end of this exercise you shall be able to
- **insert relative, absolute and mixed references**
- **reference named ranges and named tables in formulas.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

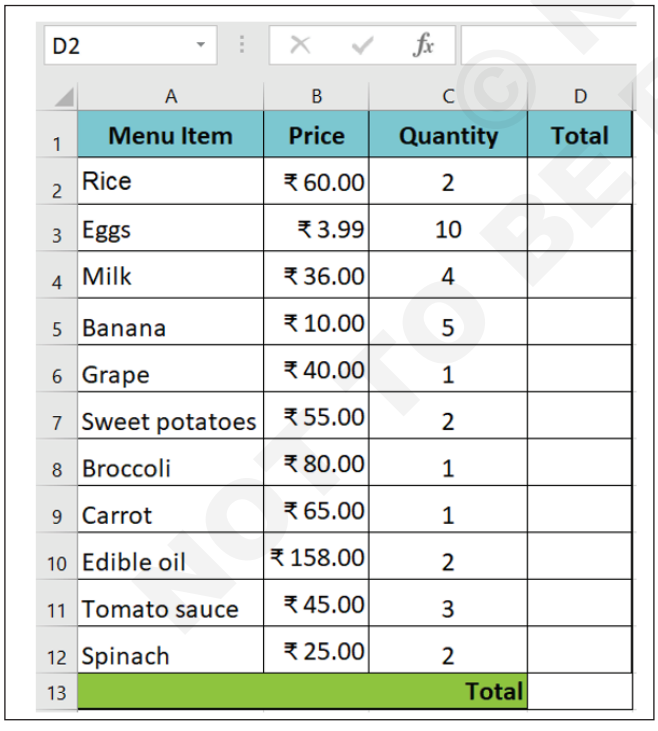
PROCEDURE

TASK 1: **Insert relative, absolute and mixed references**

To create and copy a formula using **relative references:**

In the following example, we want to create a formula that will multiply each item's price by the quantity. Rather than create a new formula for each row, we can create a single formula in cell D2 and then copy it to the other rows. We'll use relative references so the formula correctly calculates the total for each item.

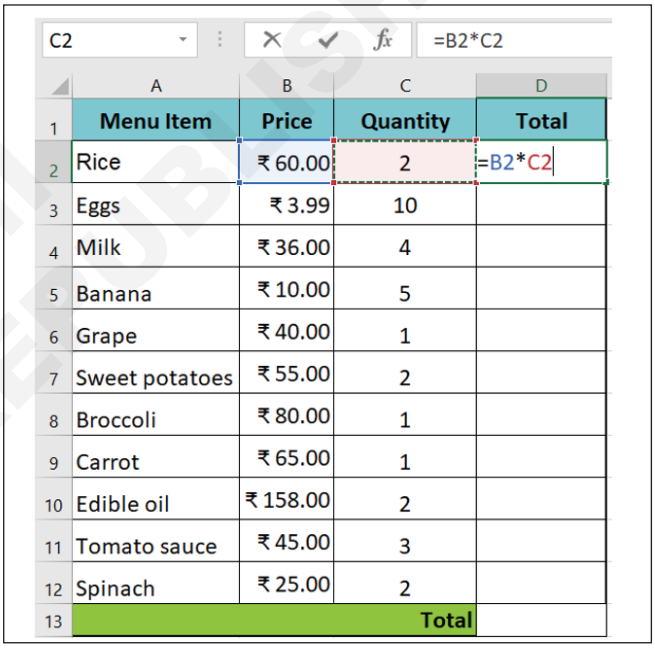
1 Select the cell that will contain the formula. In our example, we'll select cell D2.

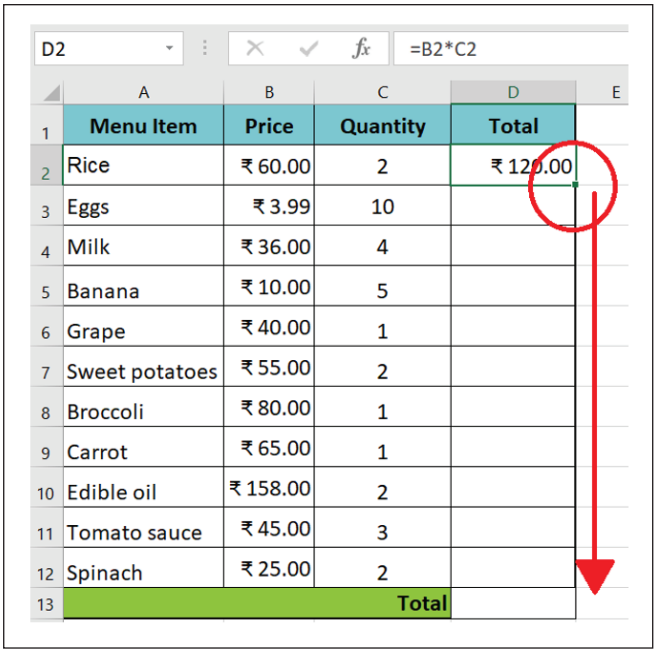


2 Enter the formula to calculate the desired value. In our example, we'll type =B2*C2.

3 Press Enter on your keyboard. The formula will be calculated, and the result will be displayed in the cell.

4 Locate the fill handle in the lower-right corner of the desired cell. In our example, we'll locate the fill handle for cell D2.





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5 Click, hold, and drag the fill handle over the cells you wish to fill. In our example, we'll select cells D3:D12.

6 Release the mouse. The formula will be copied to the selected cells with relative references and the values will be calculated in each cell.

D2 =B2*C2

	A	B	C	D
1	Menu Item	Price	Quantity	Total
2	Rice	₹ 60.00	2	₹ 120.00
3	Eggs	₹ 3.99	10	₹ 39.90
4	Milk	₹ 36.00	4	₹ 144.00
5	Banana	₹ 10.00	5	₹ 50.00
6	Grape	₹ 40.00	1	₹ 40.00
7	Sweet potatoes	₹ 55.00	2	₹ 110.00
8	Broccoli	₹ 80.00	1	₹ 80.00
9	Carrot	₹ 65.00	1	₹ 65.00
10	Edible oil	₹ 158.00	2	₹ 316.00
11	Tomato sauce	₹ 45.00	3	₹ 135.00
12	Spinach	₹ 25.00	2	₹ 50.00
13			Total	

You can double-click the filled cells to check their formulas for accuracy. The relative cell references should be different for each cell, depending on its row.

TRUE =B7*C7

	A	B	C	D
1	Menu Item	Price	Quantity	Total
2	Rice	₹ 60.00	2	₹ 120.00
3	Eggs	₹ 3.99	10	₹ 39.90
4	Milk	₹ 36.00	4	₹ 144.00
5	Banana	₹ 10.00	5	₹ 50.00
6	Grape	₹ 40.00	1	₹ 40.00
7	Sweet potatoes	₹ 55.00	2	=B7*C7
8	Broccoli	₹ 80.00	1	₹ 80.00
9	Carrot	₹ 65.00	1	₹ 65.00
10	Edible oil	₹ 158.00	2	₹ 316.00
11	Tomato sauce	₹ 45.00	3	₹ 135.00
12	Spinach	₹ 25.00	2	₹ 50.00
13			Total	

To create and copy a formula using absolute references: In our example, we'll use the 5% GST tax rate in cell E1 to calculate the GST tax for all items in column D. We'll need to use the absolute cell reference $E$1 in our formula. Because each formula is using the same tax rate, we want that reference to remain constant when the formula is copied and filled to other cells in column D.

1 Select the cell that will contain the formula. In our example, we'll select cell D3.

2 Enter the formula to calculate the desired value. In our example, we'll type =(B3*C3)*$E$1.

C3 =(B3*C3)*$E$1

	A	B	C	D	E
1			GST Tax		5.0%
2	Menu Item	Price	Quantity	Sales Tax	Total
3	Rice	₹ 60.00	=(B3*C3)*$E$1		
4	Eggs	₹ 3.99	10		
5	Milk	₹ 36.00	4		
6	Banana	₹ 10.00	5		
7	Grape	₹ 40.00	1		
8	Sweet potatoes	₹ 55.00	2		
9	Broccoli	₹ 80.00	1		
10	Carrot	₹ 65.00	1		
11	Edible oil	₹ 158.00	2		
12	Tomato sauce	₹ 45.00	3		
13	Spinach	₹ 25.00	2		
14			Total		

3 Press Enter on your keyboard. The formula will calculate, and the result will display in the cell.

4 Locate the fill handle in the lower-right corner of the desired cell. In our example, we'll locate the fill handle for cell D3.

5 Click, hold, and drag the fill handle over the cells you wish to fill, cells D4:D13 in our example.

6 Release the mouse. The formula will be copied to the selected cells with an absolute reference, and the values will be calculated in each cell.

D3 =(B3*C3)*$E$1

	A	B	C	D	E
1			GST Tax		5.0%
2	Menu Item	Price	Quantity	Sales Tax	Total
3	Rice	₹ 60.00	2	₹ 6.00	
4	Eggs	₹ 3.99	10	₹ 2.00	
5	Milk	₹ 36.00	4	₹ 7.20	
6	Banana	₹ 10.00	5	₹ 2.50	
7	Grape	₹ 40.00	1	₹ 2.00	
8	Sweet potatoes	₹ 55.00	2	₹ 5.50	
9	Broccoli	₹ 80.00	1	₹ 4.00	
10	Carrot	₹ 65.00	1	₹ 3.25	
11	Edible oil	₹ 158.00	2	₹ 15.80	
12	Tomato sauce	₹ 45.00	3	₹ 6.75	
13	Spinach	₹ 25.00	2	₹ 2.50	
14			Total		

You can double-click the filled cells to check their formulas for accuracy. The absolute reference should be the same for each cell, while the other references are relative to the cell's row.

Be sure to include the dollar sign ($) whenever you're making an absolute reference across multiple cells. The dollar signs were omitted, this caused the spreadsheet to interpret it as a relative reference, producing an incorrect result when copied to other cells.

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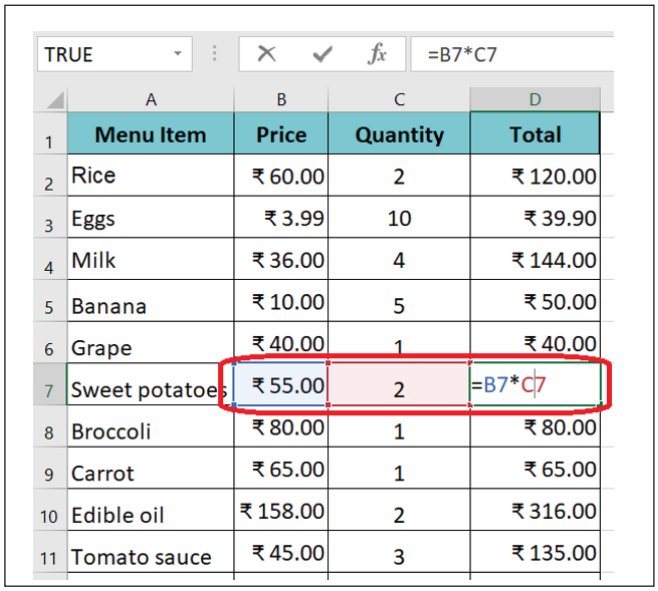


	A	B	C	D
1	Menu Item	Price	Quantity	Total
2	Rice	₹ 60.00	2	₹ 120.00
3	Eggs	₹ 3.99	10	₹ 39.90
4	Milk	₹ 36.00	4	₹ 144.00
5	Banana	₹ 10.00	5	₹ 50.00
6	Grape	₹ 40.00	1	₹ 40.00
7	Sweet potatoes	₹ 55.00	2	=B7*C7
8	Broccoli	₹ 80.00	1	₹ 80.00
9	Carrot	₹ 65.00	1	₹ 65.00
10	Edible oil	₹ 158.00	2	₹ 316.00
11	Tomato sauce	₹ 45.00	3	₹ 135.00

Mixed Reference

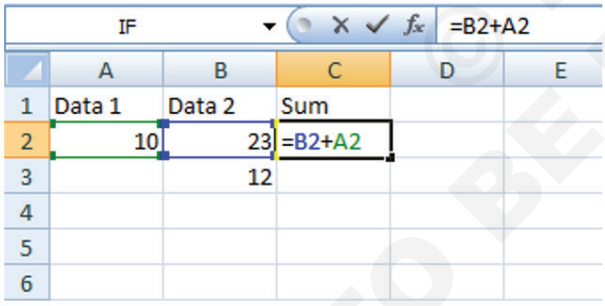
Mixed Reference is a type of Absolute reference in which either the column is made constant or the row is made constant.

For example:

- $F1: In this the column F is constant.
- F$1: In this the row 1 is constant.

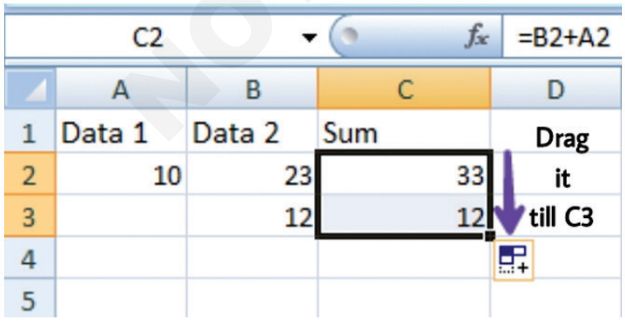
T0 perform Mixed Reference:

Step 1: Write the formula in any cell. We write the formula(=B2+A2) in cell C2 and press enter.

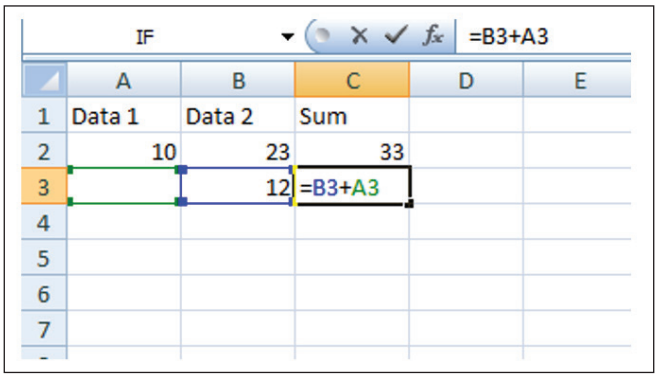


Step 2: Click and hold on to the Fill handle.

Step 3: Drag it to the cell you want to fill. We drag it till cell C3.

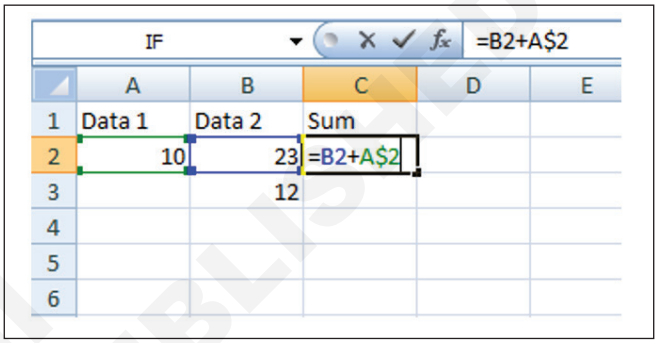


Step 4: We did not make row 2 of column A constant, thus we see that as we copy the formula to cell C3, A2 changes to A3 i.e. the addition is performed between A2 and B2, A3 and B3.



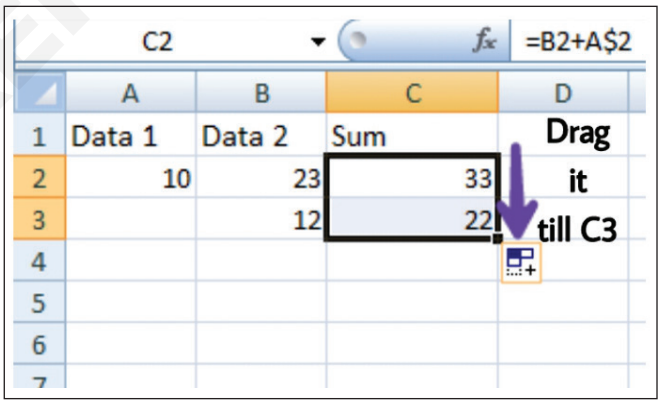
We make row 2 of column A constant by adding a dollar sign before 2.

Step 5: Write the formula in any cell. We write the formula(=B2+A$2) in cell C2 and press enter.

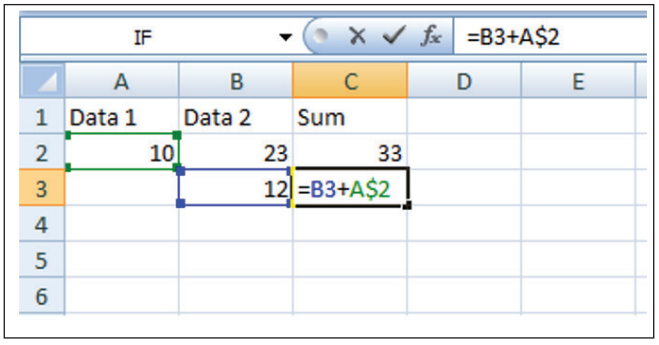


Step 6: Click and hold on to the Fill handle.

Step 7: Drag it to the cell you want to fill. We drag it till cell C3.



Step 8: We made row 2 of column A constant, thus we see that as we copy the formula to cell C3, A2 does not change to A3 i.e. A2 is added to cell B2 and B3.



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TASK 2: **Reference named ranges and named tables in formulas**

Reference named ranges

Use the same table used in **EX.NO.15.57** Define and reference named ranges and Task1: Define a named range to execute this Exercise

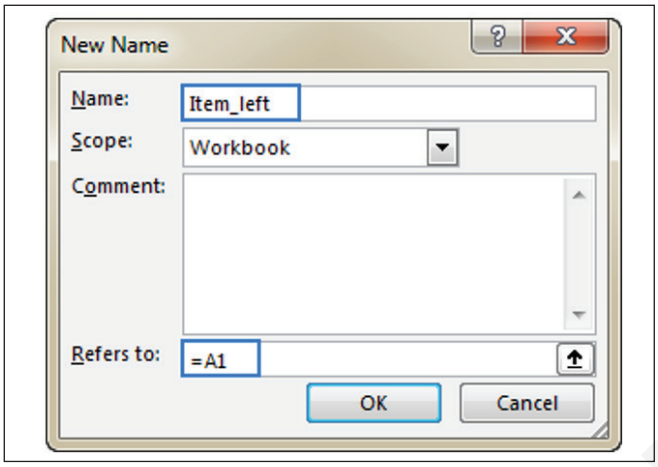
1 Select cell B1.

2 Press Ctrl + F3 to open Excel Name Manager, and click the New…

3 In the Name box, type the desired name, say, item_left.

4 In the Refers to box, type =A1.

5 Click OK.

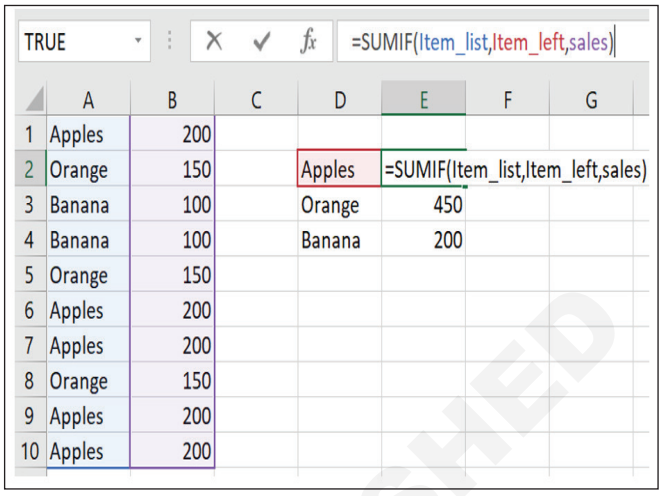


Now, let's see what happens when we use the item_left name in a formula, for example:

=SUMIF(items_list, item_left, sales)

Where items_list refers to $A$2:$A$10 and sales refers to $B$2:$B$10 in the table below.

When you enter the formula in cell E2, and then copy it down the column, it will calculate the total sales for each product individually because item_left is a relative name and its reference adjusts based on the relative position of the column and row where the formula is copied:



Reference Named Table

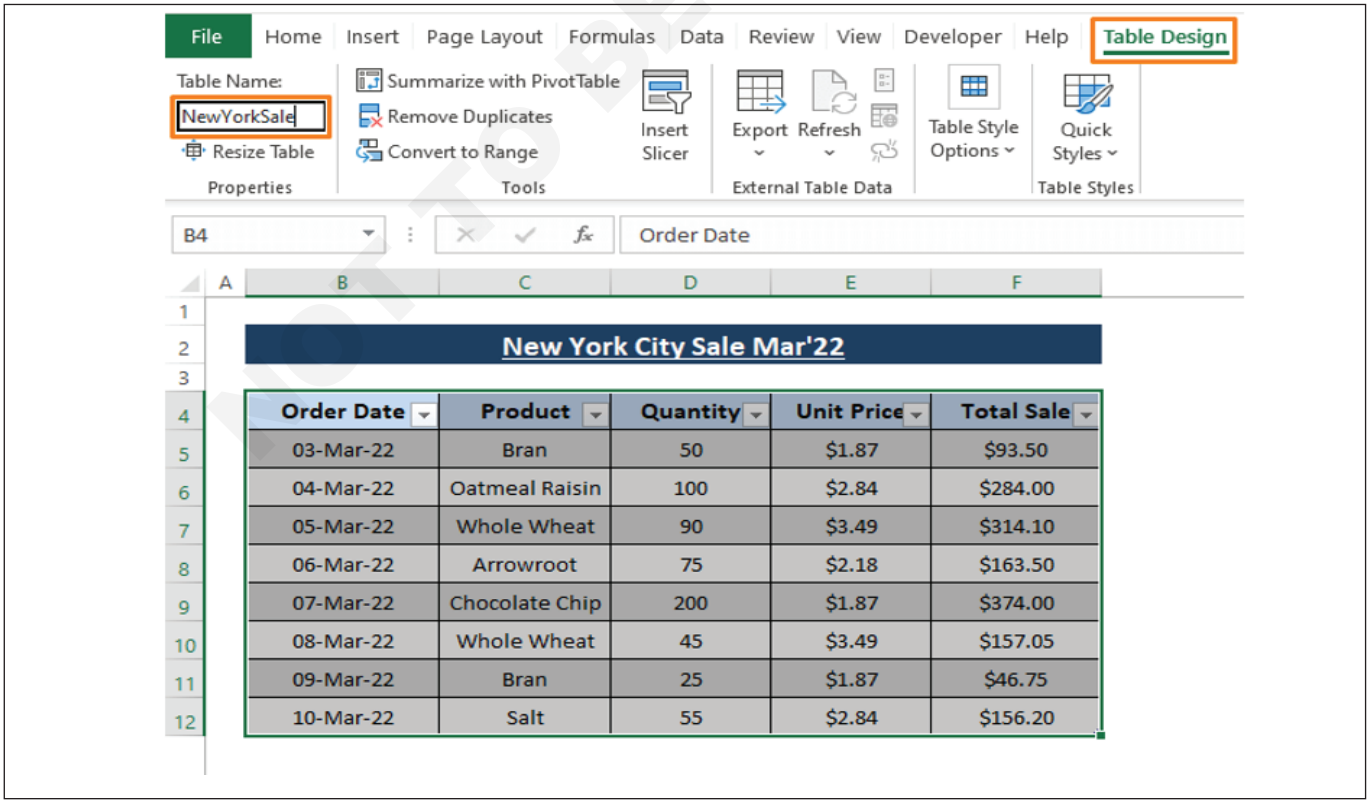
1 Select the entire Table or place the cursor in any cell. Excel displays the Table Design tab instantly.

2 Click on the Table Design.

3 Assign a Table name (i.e., NewYorkSale) under the Table Name dialog box in the Properties section.

4 Press ENTER. Excel then assigns the name to this Table.

5 Repeat the Steps for the other 2 Tables (i.e., BostonSale, LosAngelesSale).



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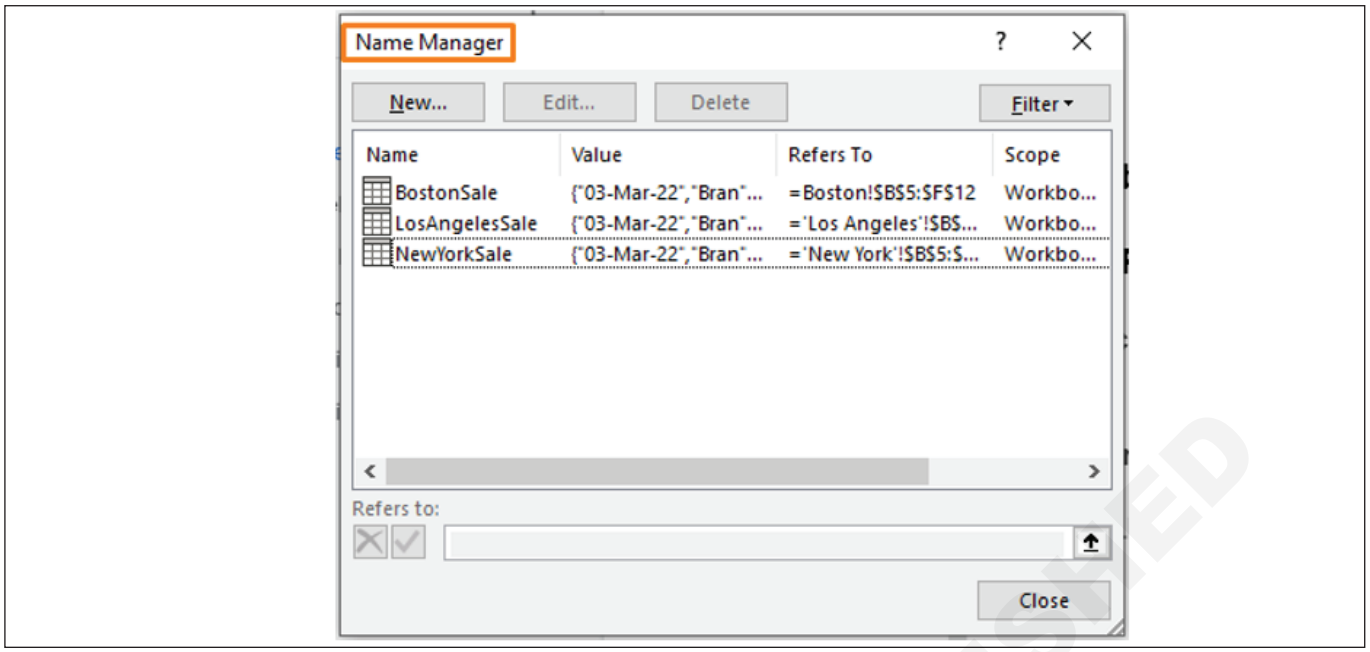
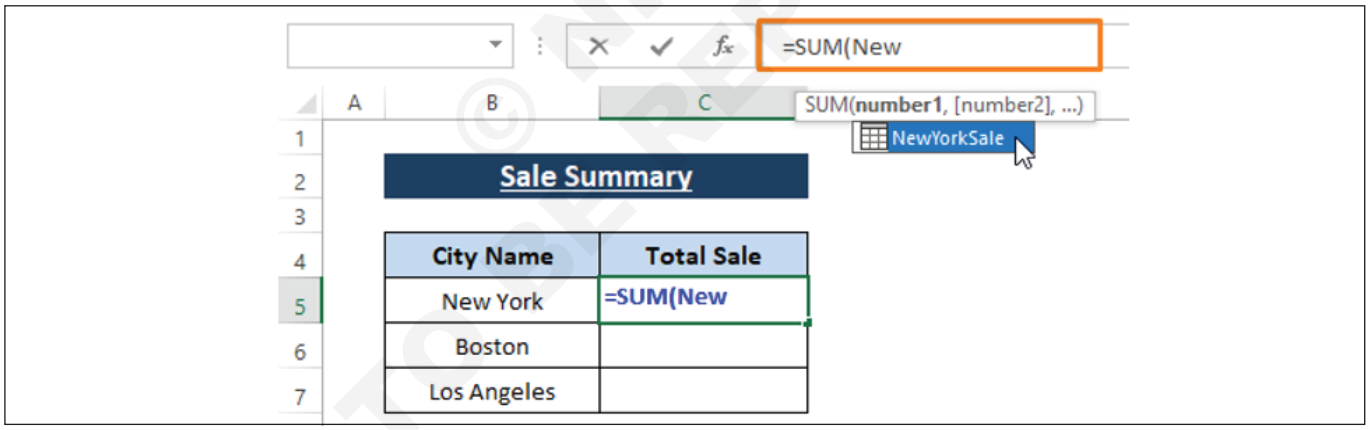
6 You can check the naming using Formulas > Name Manager (in the Defined Names section). And you see all the assigned Table names in the Name Manager window.



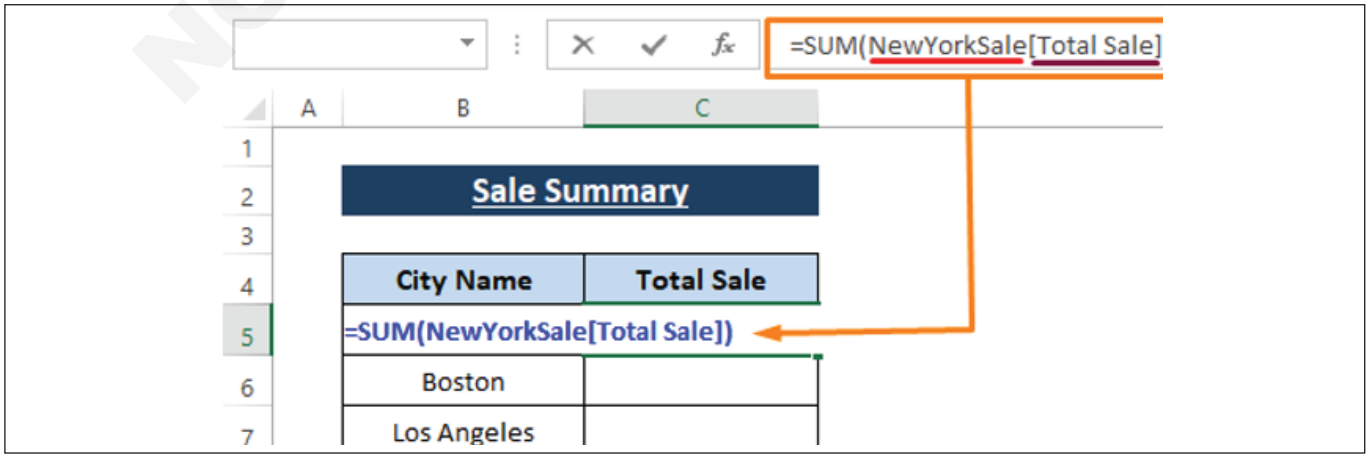
Since we have assigned the Tables specific names to easily refer to them, now we move to reference them in formulas. Follow the below methods to reference Tables in another sheet.

Refer a Table in Another Sheet Using Structured Reference

Step 1: Start typing a formula after inserting an Equal Sign (=) in the Formula bar. Then, type a Table name to reference it as shown in the image below. Excel brings up the Table reference; double click on it.



Step 2: After referring to the Table, type a third bracket (i.e.,[ ). Excel shows column names to select from. Double click on Total Sale and close the brackets as pictured below.



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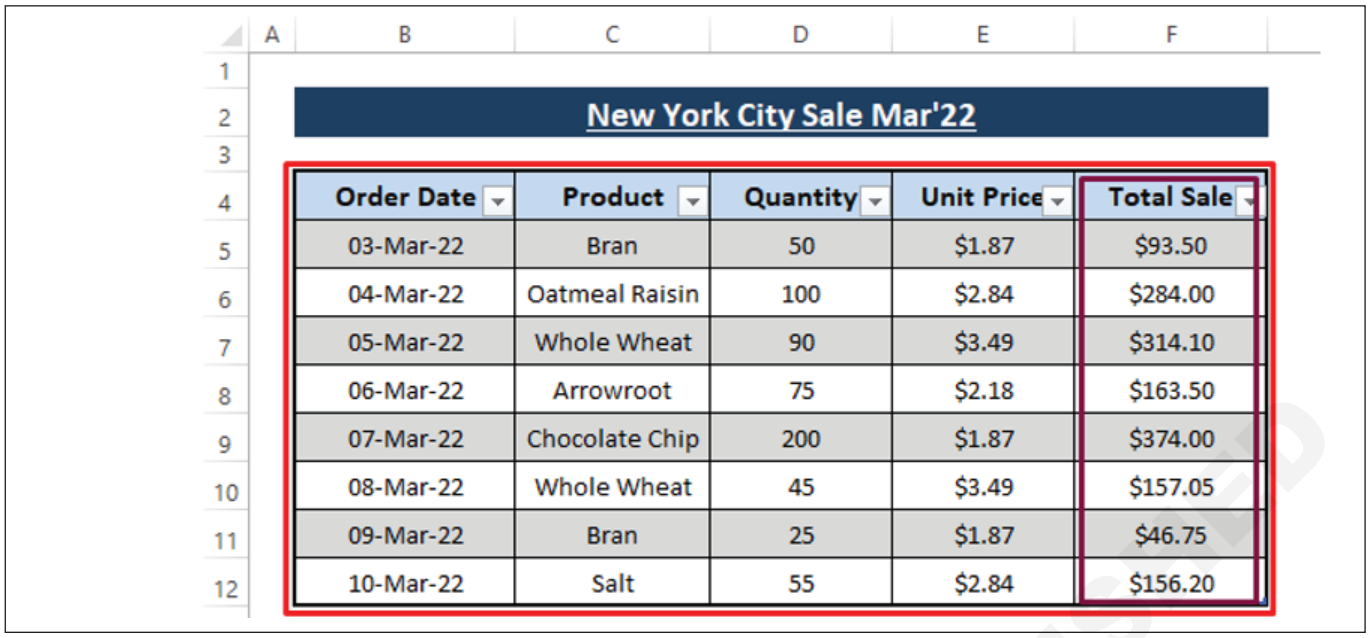
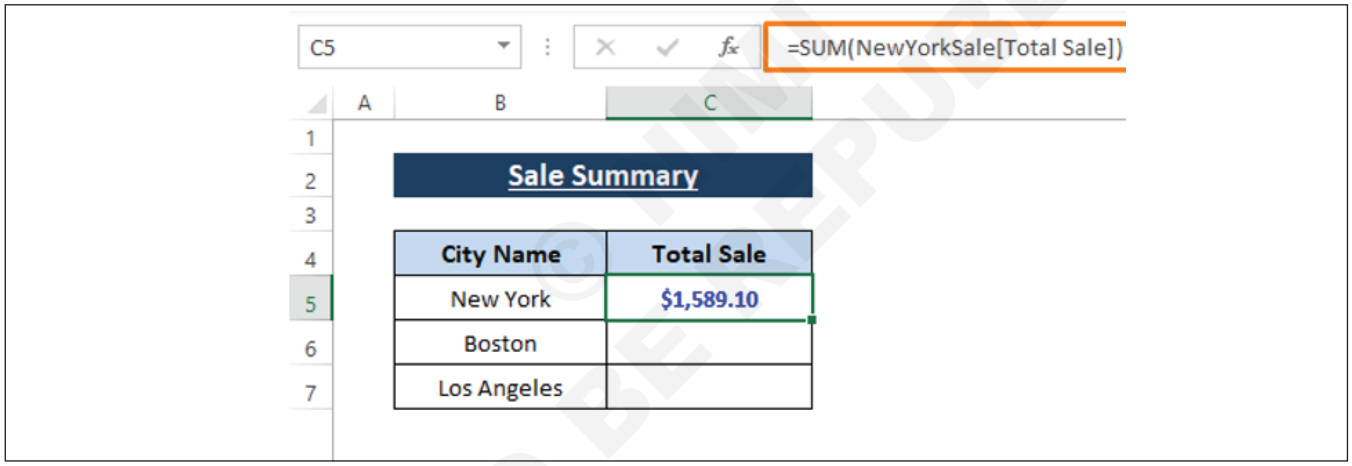
We assign New York Sale Table at first then one of its columns (i.e., Total Sale) later. We indicate both arguments in colored rectangles.



New York City Sale Mar'22

Order Date	Product	Quantity	Unit Price	Total Sale
03-Mar-22	Bran	50	$1.87	$93.50
04-Mar-22	Oatmeal Raisin	100	$2.84	$284.00
05-Mar-22	Whole Wheat	90	$3.49	$314.10
06-Mar-22	Arrowroot	75	$2.18	$163.50
07-Mar-22	Chocolate Chip	200	$1.87	$374.00
08-Mar-22	Whole Wheat	45	$3.49	$157.05
09-Mar-22	Bran	25	$1.87	$46.75
10-Mar-22	Salt	55	$2.84	$156.20

Step 3: Use the ENTER key to apply the formula in the C5 cell.

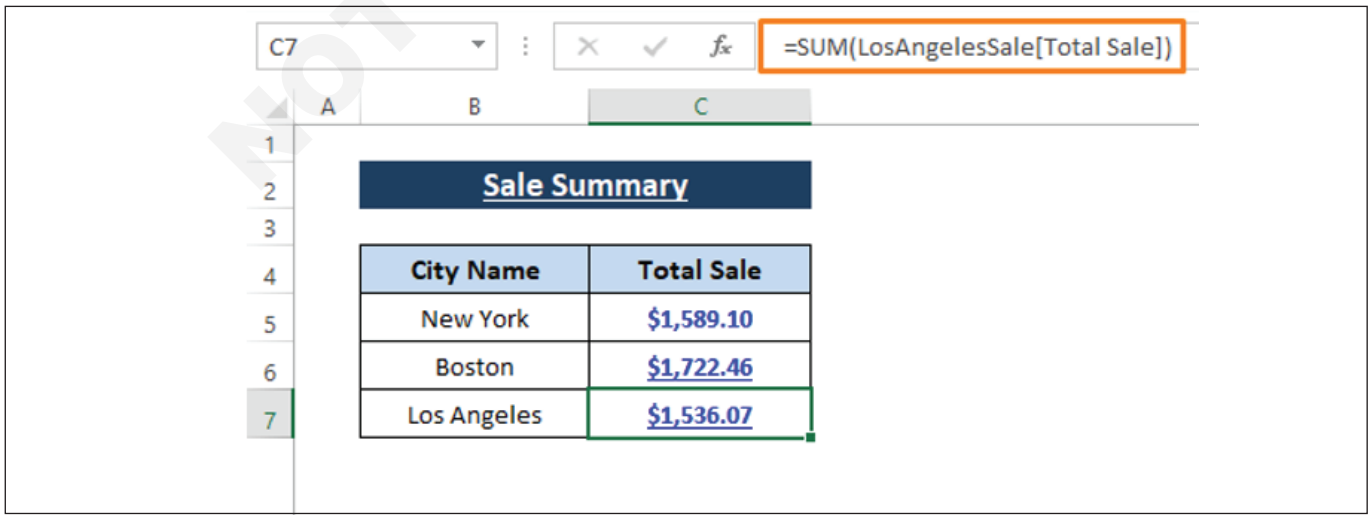


Sale Summary

City Name	Total Sale
New York	$1,589.10
Boston	
Los Angeles	

Follow Steps 1, 2, and 3 to reference other Tables in the respective cells. After referencing Excel shows the sum of the Total Sale columns of respective Tables as depicted in the below image.

You can reference any Table just by assigning its name in the formula along with the column header you want to deal with.



Sale Summary

City Name	Total Sale
New York	$1,589.10
Boston	$1,722.46
Los Angeles	$1,536.07

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Calculate and transform data

Objectives: At the end of this exercise you shall be able to
- **perform calculations using AVERAGE(), MIN(), MAX() and SUM()**
- **count cells by using COUNT(), COUNTIF() and COUNTBLANK()**
- **perform conditional operations by using the IF() function.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

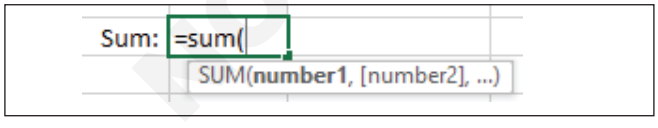
PROCEDURE

TASK 1: **Perform calculations using AVERAGE(), MIN(), MAX() and SUM()**

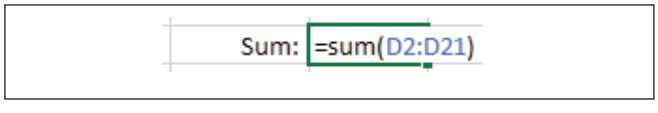
1 Create a Table and fill the respective data.

	A	B	C	D	E
1	Order No	Date	Customer	Amount	Address
2	1	01-Oct-22	Customer1	1500	Chennai
3	2	02-Oct-22	Customer2	2500	Mumbai
4	3	03-Oct-22	Customer3	2100	Delhi
5	4	04-Oct-22	Customer4	1000	Chennai
6	5	05-Oct-22	Customer5	900	
7	6	08-Oct-22	Customer6	4300	Delhi
8	7	09-Oct-22	Customer7	5300	Chennai
9	8	10-Oct-22	Customer8	3500	Mumbai
10	9	11-Oct-22	Customer9	2300	Delhi
11	10	12-Oct-22	Customer10	2400	Chennai
12	11	15-Oct-22	Customer11	1500	
13	12	16-Oct-22	Customer12	2500	Delhi
14	13	17-Oct-22	Customer13	2100	Chennai
15	14	18-Oct-22	Customer14	1000	Mumbai
16	15	19-Oct-22	Customer15	900	
17	16	22-Oct-22	Customer16	4300	Culcatta
18	17	23-Oct-22	Customer17	5300	Chennai
19	18	24-Oct-22	Customer18	3500	Bengalure
20	19	25-Oct-22	Customer19	2300	Bengalure
21	20	26-Oct-22	Customer20	1750	Bengalure

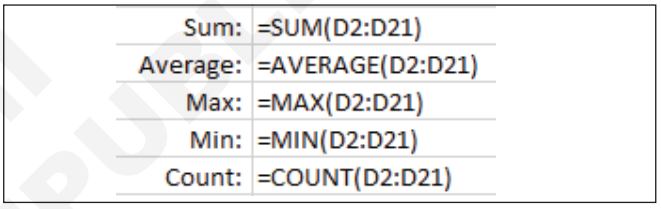
2 Select any cell in the sheet to execute the Excel formulas all start with an = sign, followed by the function name and a section in parentheses to provide ranges or arguments. Start out by typing =sum(



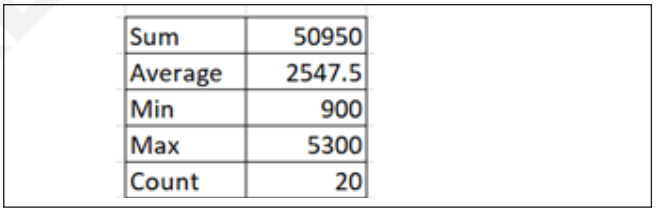
3 Sum requires a range of cells you want to add together. You can type your range in, or you can select it using your mouse or input device. In this case, we will select D2:D21. Next up you can close the parenthesis, although newer versions of Excel will auto close it for you.



4 Repeat the same step of 2 and 3 for other functions also



5 The result will be

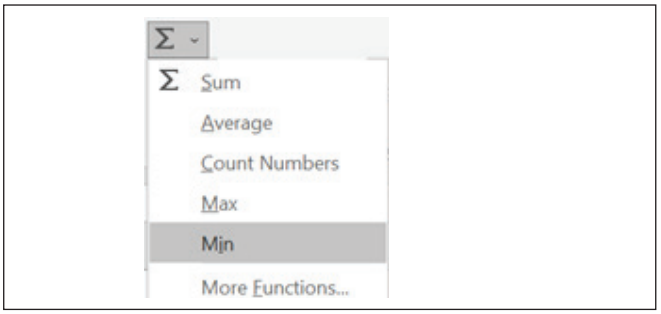


Sum	50950
Average	2547.5
Min	900
Max	5300
Count	20

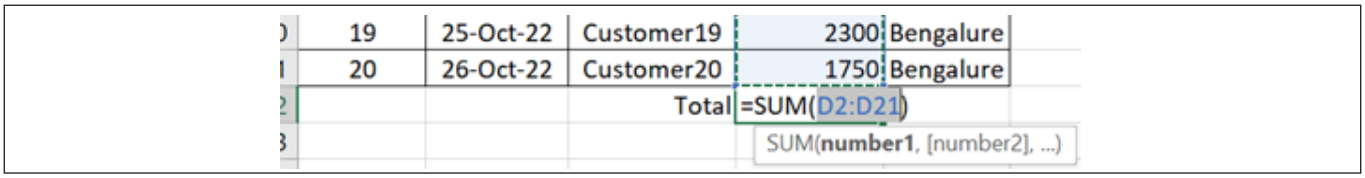
Additional Tips

Option1: Auto SUM Functions

1 Select bottom of last row on the empty cell the choose the appropriate function you want.



2 Then Excel will select the range of data to calculate automatically.



3 Click Enter to view the value of the function.

Option2:

In the bottom right of the screen, select range the data Excel provide you with a Sum, Average, and Count by default, and can be configured by right-clicking on it to provide minimum, maximum, and numerical count.

TASK 2: **Count cells by using COUNT(), COUNTIF() and COUNTBLANK()**

1 Use the same table used in Task 1: and Repeat the Sept 1 and Sept 2 to execute the Count Functions.

- COUNT: To count cells that contain numbers in Amount Column.
- COUNTA: To count cells that are not empty in Address Column.
- COUNTIF: To count cells that meets a specified criteria as “Chennai” in Address Column.
- COUNTBLANK: To count cells that are blank inn Address Column.

COUNT()	=COUNT(D2:D21)
COUNTA()	=COUNTA(E2:E21)
COUNTIF()	=COUNTIF(E2:E21,"Chennai")
COUNTBLANK()	=COUNTBLANK(E2:E21)

2 Result will be.

COUNT()	20
COUNTA()	17
COUNTIF()	6
COUNTBLANK()	3

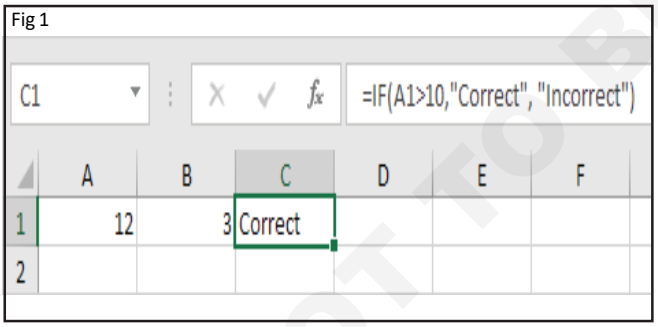
TASK 3: **Perform conditional operations by using the IF() function**

If Function

The IF function checks whether a condition is met, and returns one value if TRUE and another value if FALSE.

1 Select cell C1 and enter the following function. (Fig 1) = 1F (A1 >10,”Correct,”incorrect”)

Fig 1



The IF function returns Correct because the value in cell A1 is higher than 10.

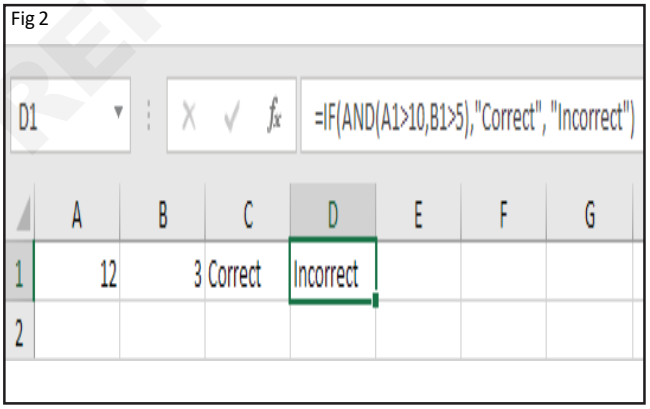
And Function

The AND Function returns TRUE if all conditions are true and returns FALSE if any of the conditions are false.

2 Select cell D1 and enter the following formula. (Fig 2) = 1F(AND(A1)10,B1>5), ”Correct,”incorrect”

The AND function returns FALSE because the value in cell B1 is not higher than 5. As a result the IF function returns Incorrect.

Fig 2

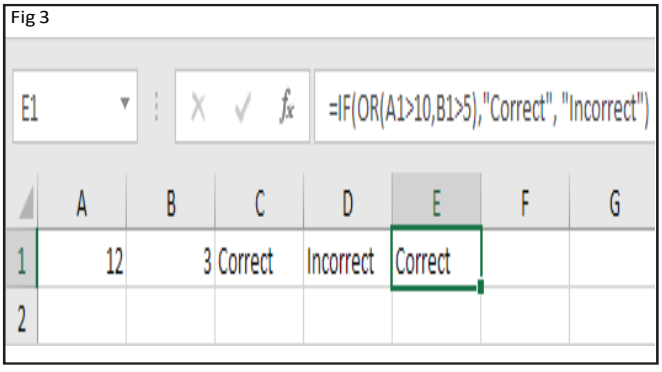


Or Function

The OR function returns TRUE if any of the conditions are TRUE and returns FALSE if all conditions are false.

3 Select cell E1 and enter the following formula. (Fig 3) = 1F(Or(A1)10,B1>5), ”Correct,”incorrect”)

Fig 3



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Format and modify text

Objectives: At the end of this exercise you shall be able to
- **format text using RIGHT(),LEFT() and MID() functions**
- **format text using UPPER(), LOWER() and LEN() functions**
- **format text using CONCAT() and TEXTJOIN() functions.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

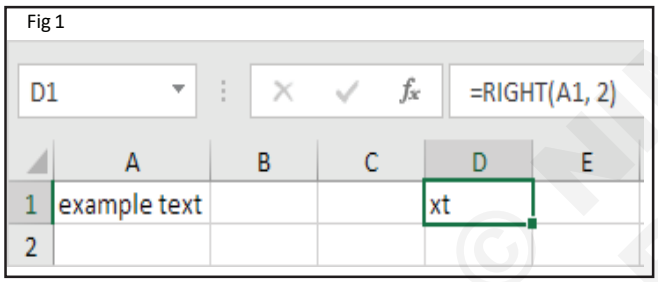
PROCEDURE

TASK 1: **Format text using RIGHT(),LEFT() and MID() functions**

Right

1 Extract the rightmost characters from a string, use the RIGHT function. (Fig 1) = Right (A1,2)

Fig 1



Left

2 Extract the leftmost characters from a string, use the LEFT function. (Fig 2) = Left (A1,4)

Mid

4 Extract a substring, starting in the middle of a string, use the MID function. (Fig 3) =MID(A1,53)

Fig 2

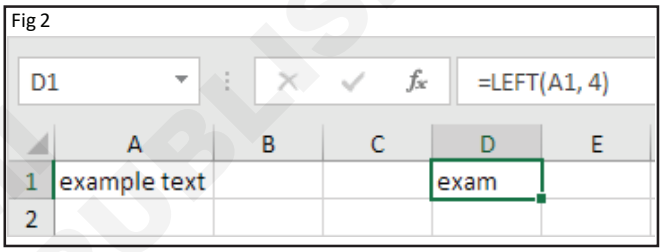
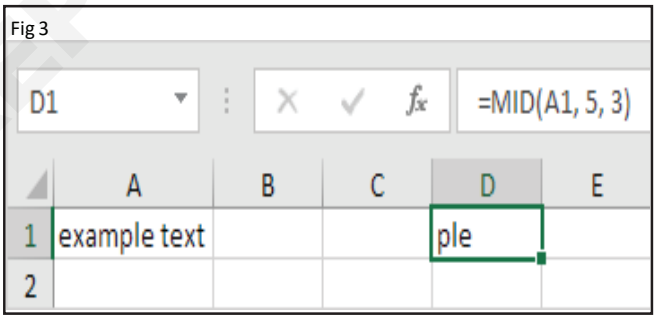


Fig 3



Note: started at position 5 (p) with length 3(ple).

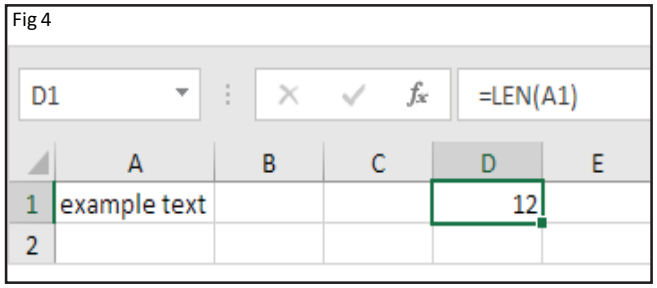
TASK 2: **Format text using UPPER(), LOWER() and LEN() functions**

Len

1 Get the length of a string, use the LEN function. (Fig 4) =LEN(A1)

Note: space (position 8) included!

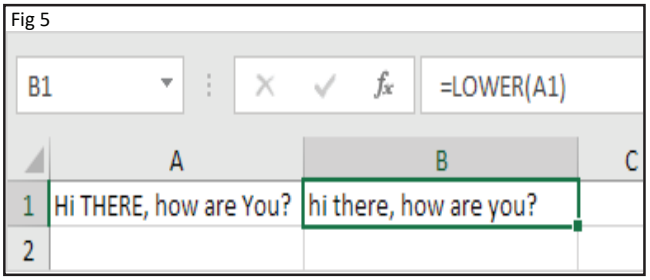
Fig 4



Lower/Upper Case

1 Use the LOWER function to convert all letters in a text string to lowercase. (Fig 5)=LOWER(A1)

Fig 5



2 Use the UPPER function to convert all letters in a text string to uppercase. (Fig 6)=UPPER(A1)

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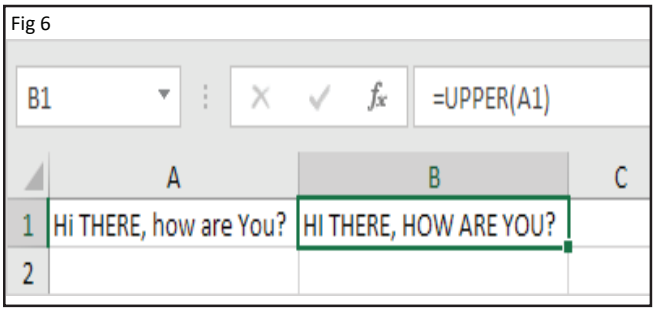
Fig 6



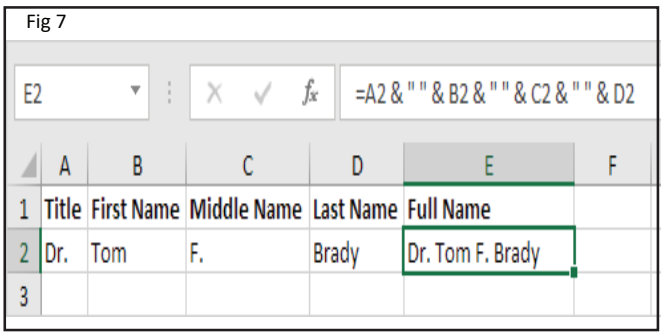
TASK 3: **Format text using CONCAT() and TEXTJOIN() functions**

Concatenate Strings

This example illustrates four different ways to concatenate (join) strings in Excel.

1 Simply use the & operator to join strings. (Fig 7)=A2&""&B2&""&C2&" "D)2

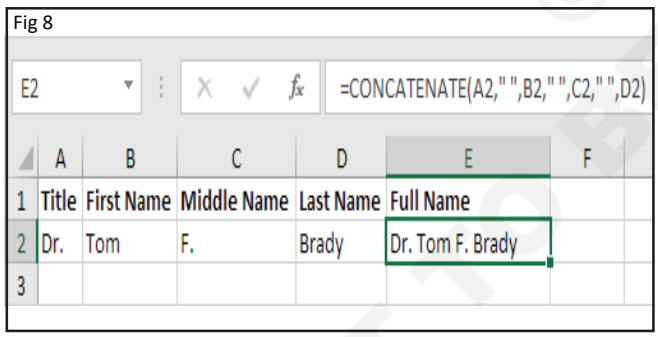
Fig 7



Note: to insert a space, use " "

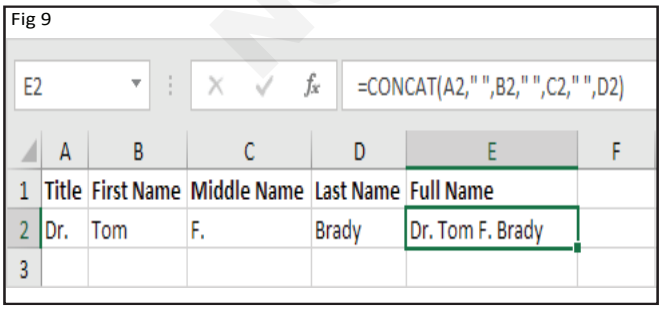
2 The **CONCATENATE** function produces the exact same result. (Fig 8) = **CONCATENATE (A2," "B2", " "C2""",D2")**

Fig 8



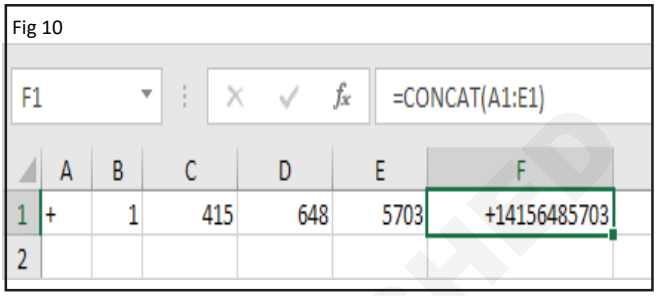
3 The **CONCAT** function in Excel 2016 produces the exact same result. (Fig 9) = CONCAT**(A2," "B2", " "C2""",D2")**

Fig 9



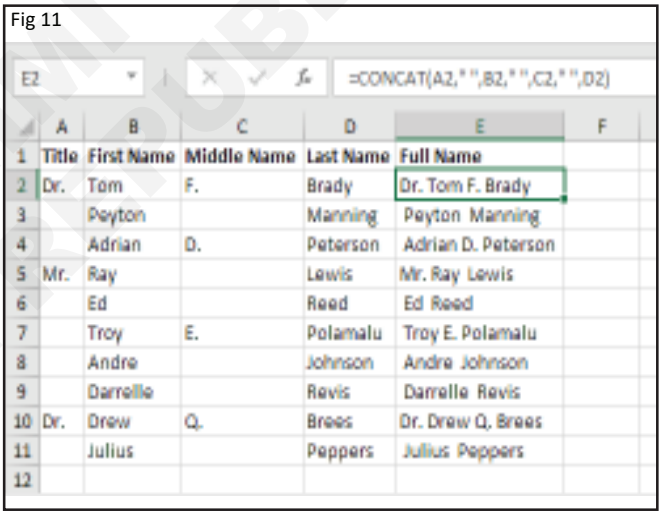
4 The **CONCAT** function can also join a range of strings. If user don't need a delimiter (space, comma, dash, etc.) this can be useful. (Fig 10) =CONCAT(A1:E1)

Fig 10



5 The **CONCAT** function cannot ignore empty cells. Take a look at all the extra spaces in column E below if drag the function in cell **E2** down to cell **E11.** (Fig 11)

Fig 11

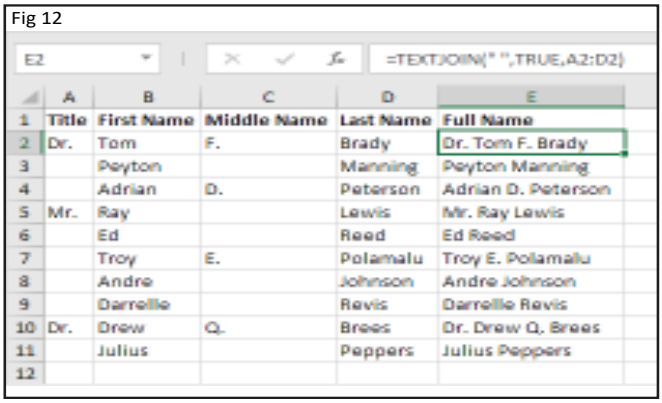


6 The **TEXTJOIN** function in Excel 2016 is that it can ignore empty cells (if the second argument is set to TRUE). (Fig 12)

Note: the TEXTJOIN function joins a range of strings using a delimiter (first argument).

6 Get it check with your instructor.

Fig 12



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Create Charts

Objectives: At the end of this exercise you shall be able to
- **create charts**
- **create chart sheets.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Create charts**

1 Create a Table

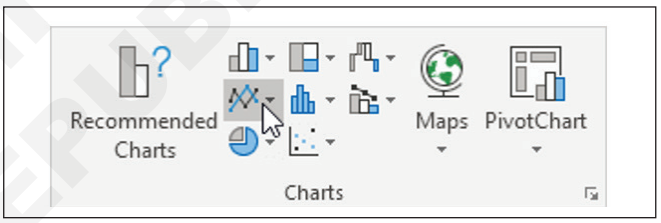
2 Select data the range A1:D13for the chart.

	A	B	C	D
1	**Month**	**Books**	**Pencil**	**Pen**
2	JAN	100	50	68
3	FEB	90	80	70
4	MAR	102	58	43
5	APR	80	100	50
6	MAY	70	90	80
7	JUN	60	102	58
8	JUL	55	80	100
9	AUG	90	70	90
10	SEP	80	55	102
11	OCT	110	90	80
12	NOV	95	80	70
13	DEC	100	110	43

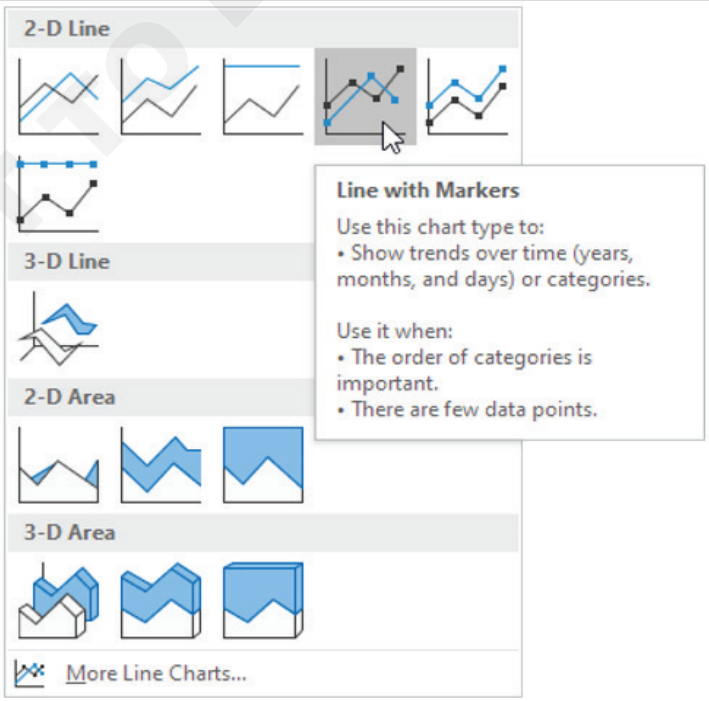
3. Select Insert > Recommended Charts.

4 Select a chart on the Recommended Charts tab, to preview the chart.

5 Or On the Insert tab, in the Charts group, click the Line symbol.



6 Click Line with Markers.



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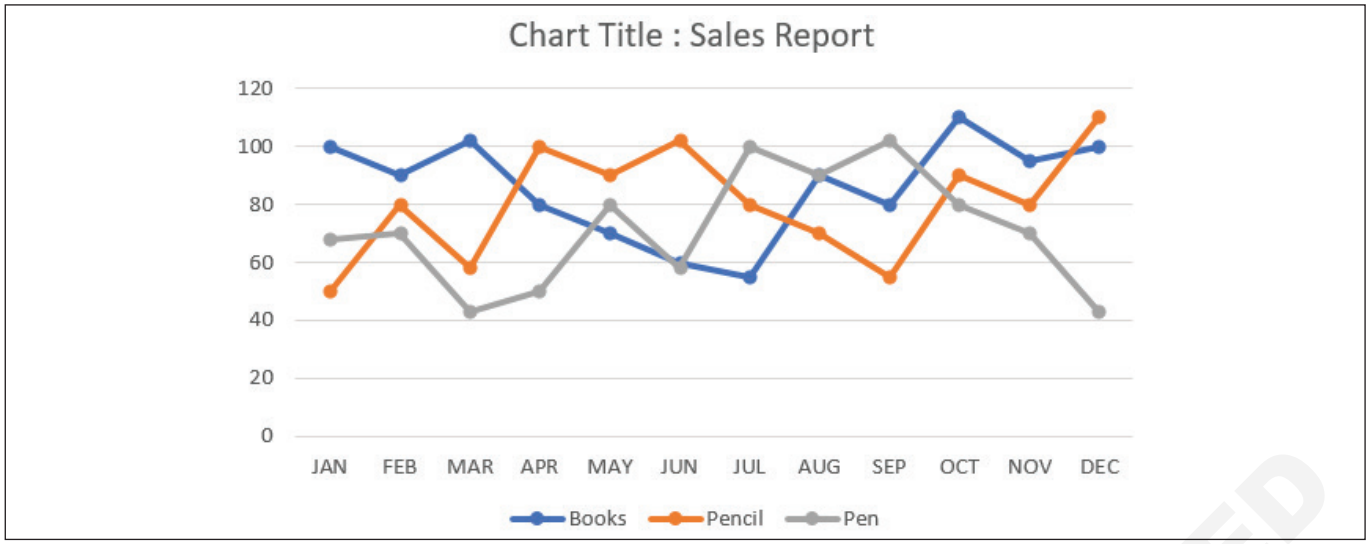
Result:



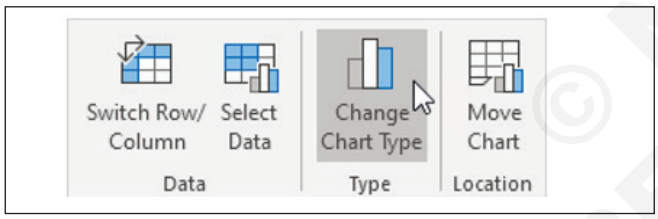
Note: enter a title by clicking on Chart Title. For example: Sales Report.

Change Chart Type

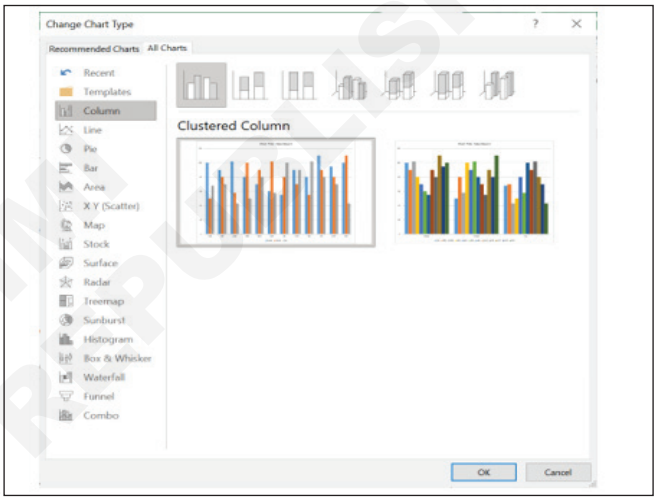
You can easily change to a different type of chart at any time using table or chart.

1 Select the chart.

2 On the Chart Design tab, in the Type group, click Change Chart Type.

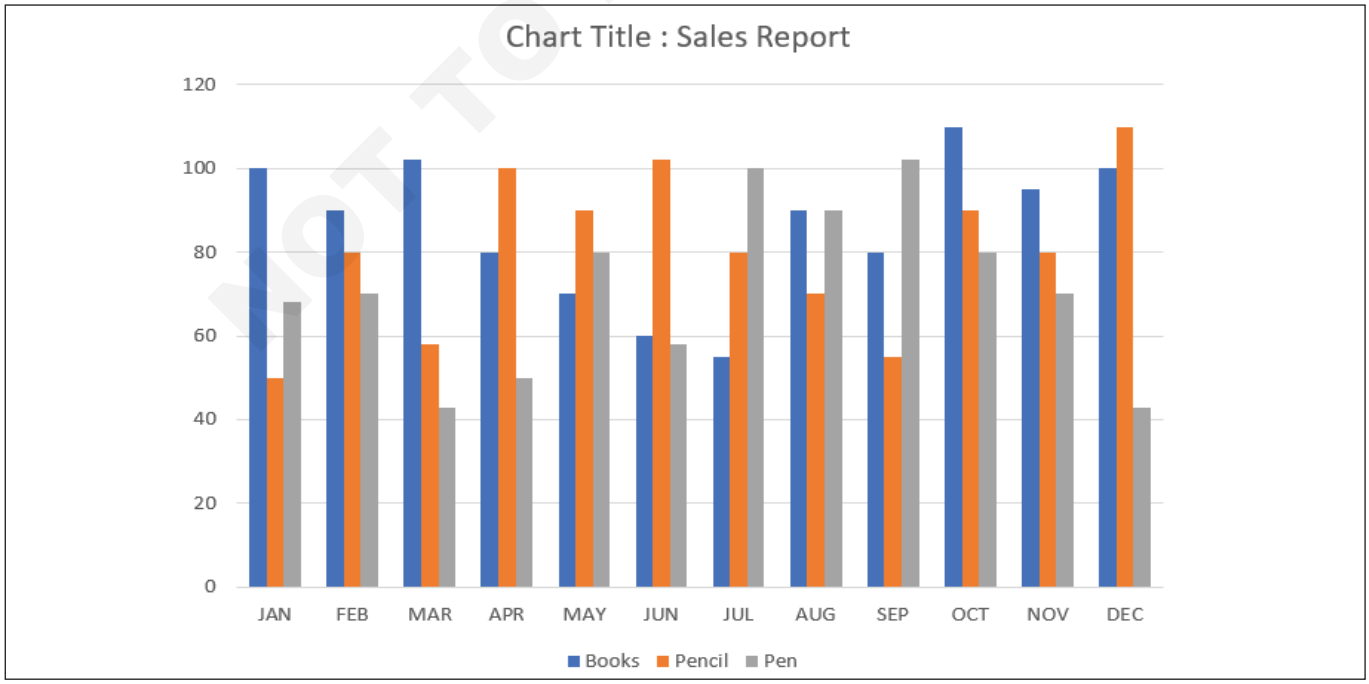


3 On the left side, click Column.



4 Click OK.

Result:



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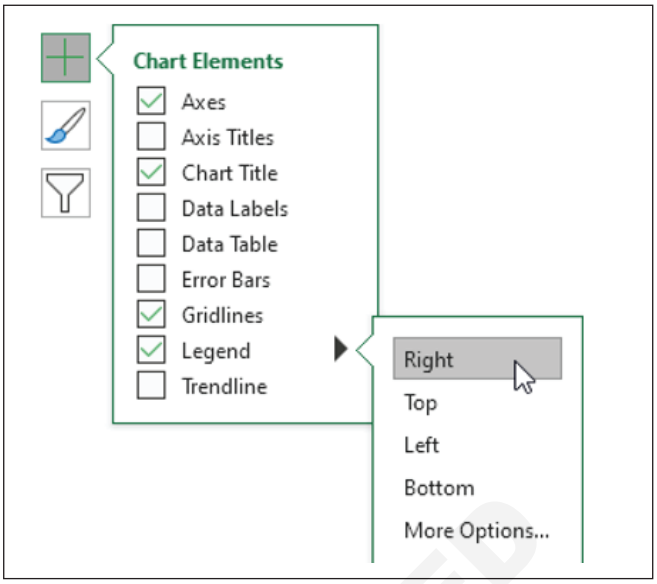
Legend Position

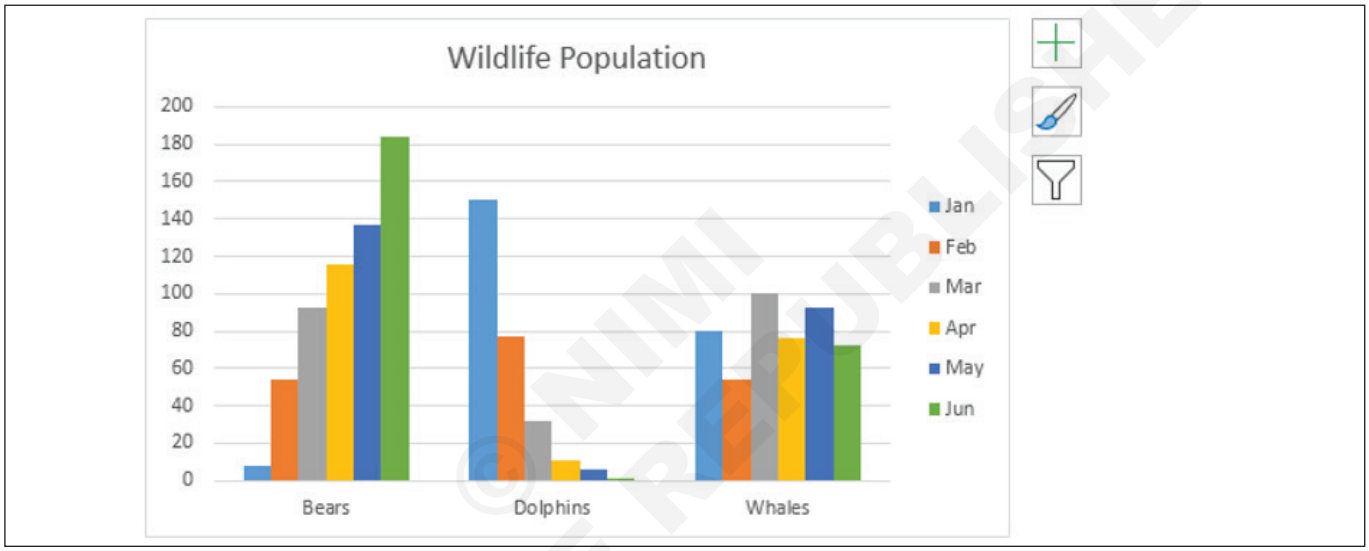
To move the legend to the right side of the chart, execute the following steps.

1 Select the chart.

2 Click the + button on the right side of the chart, click the arrow next to Legend and click Right.

Result:





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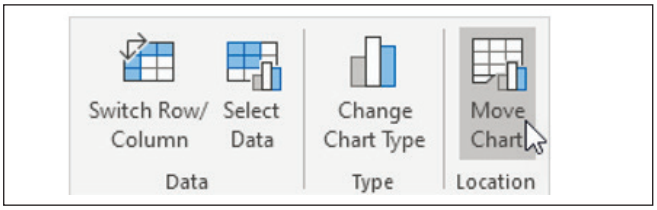
TASK 2: **Create chart sheets**

So far, we have only seen charts on the same worksheet as the source data (embedded charts). However, you can also move a chart to a separate sheet that only contains a chart (chart sheet).

To move a chart to a chart sheet, execute the following steps.

1 Select the chart.

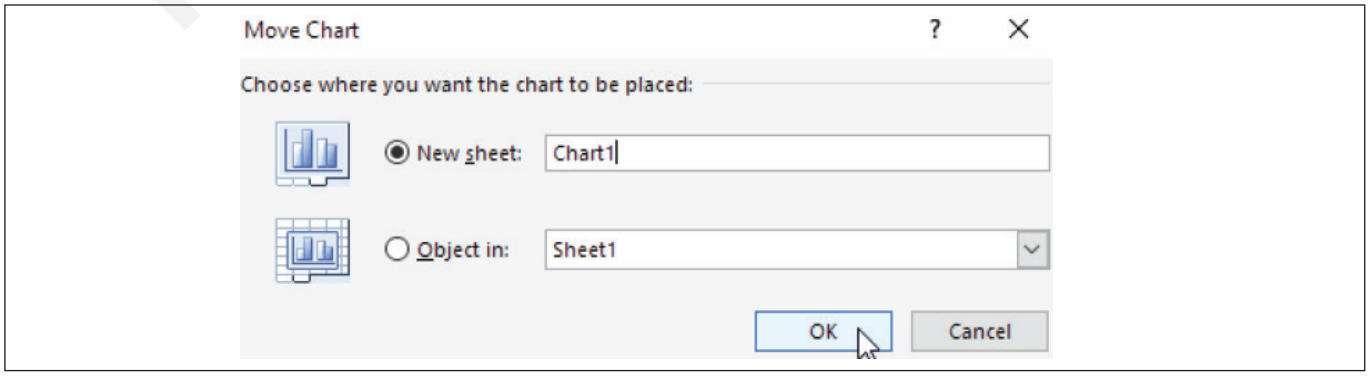
2 On the Chart Design tab, in the Location group, click Move Chart.



The Move Chart dialog box appears.

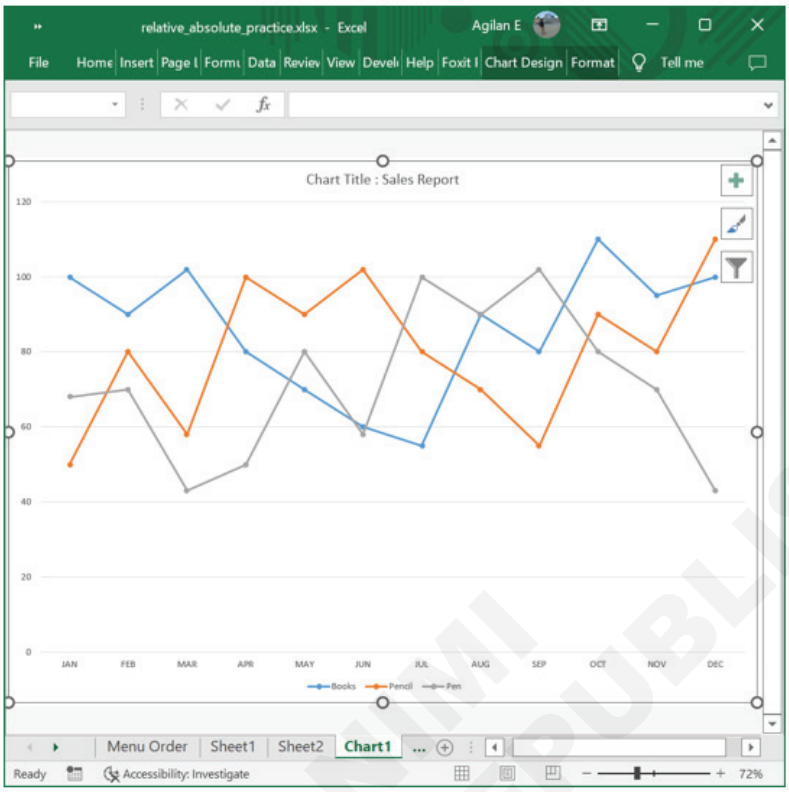
3 Click New sheet and enter a name.

4 Click OK.



Result

Note: repeat these steps, but instead of New sheet at step 3, click Object in, to move the chart back to the same worksheet as the source data.



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Modify charts

Objectives: At the end of this exercise you shall be able to
- **add data series to charts**
- **switch between rows and columns in source data**
- **add and modify chart elements**
- **add trend lines to chart.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Add data series to charts**

Ref - EX.1.18.64 - Task 1 – Table and Chart to execute this exercise.

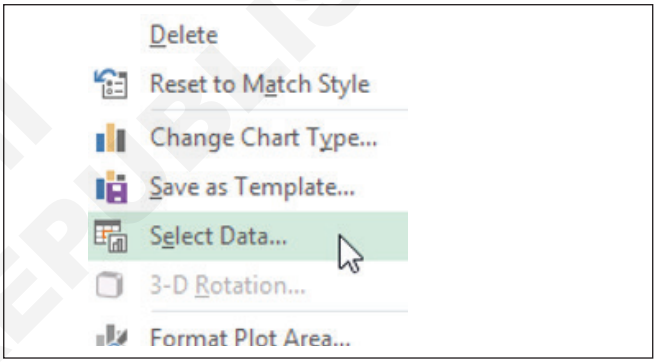
1 On the worksheet that contains your chart data, in the cells directly next to or below your existing source data for the chart, enter the new data series you want to add.

2 Click the worksheet that contains your chart.

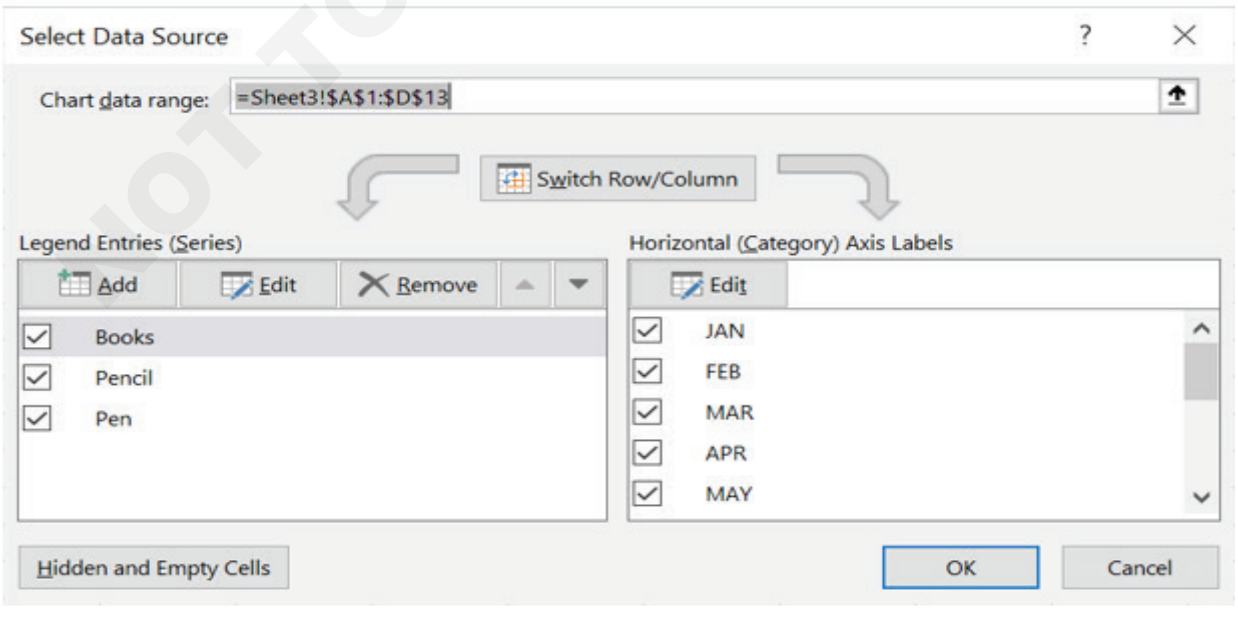
3 Right-click the chart, and then choose Select Data.

The Select Data Source dialog box appears on the worksheet that contains the source data for the chart.

4 Add, Edit and Remove the new data series appears under Legend Entries (Series) and Horizontal(Category) Axis Lables in the Select Data Source dialog box.



5 After required changes completed then Click OK to close the dialog box and to return to the chart sheet.



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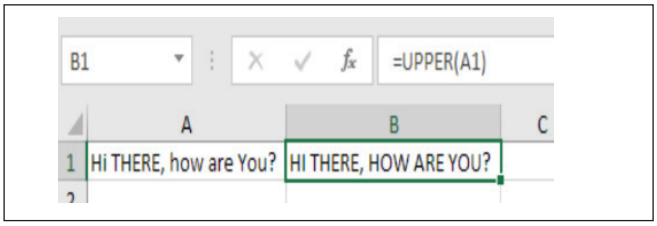
TASK 2: **Switch between rows and columns in source data**

Ref - EX.1.18.64 - Task 1 – Use the same Table and Chart to execute this exercise.

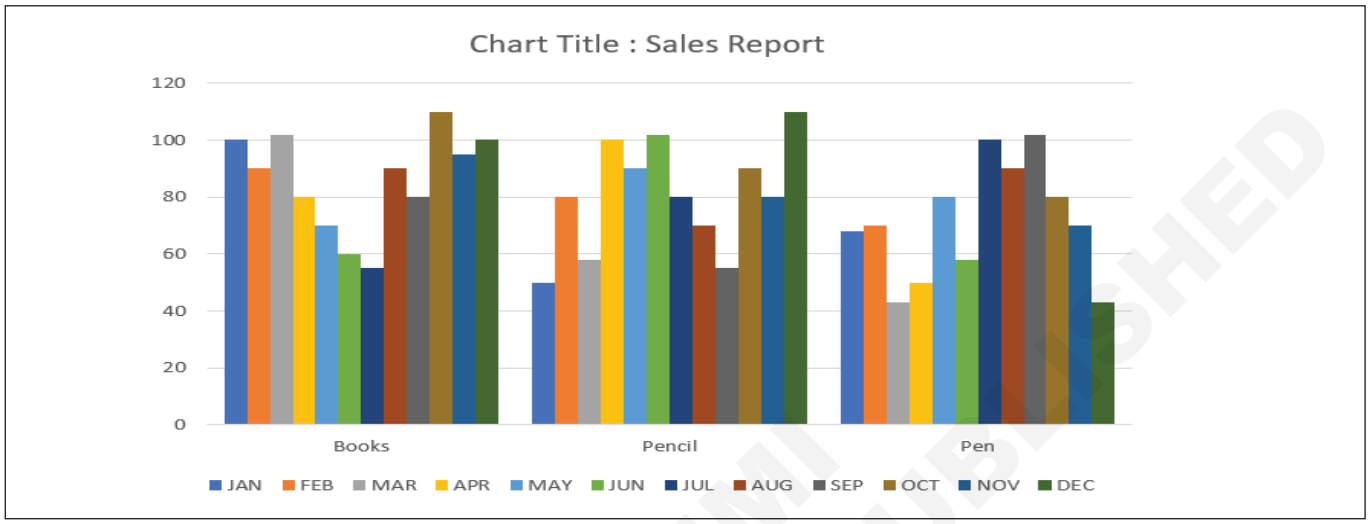


If you want to display the Items (instead of the months) on the horizontal axis, execute the following steps.

1 Select the chart.

2 On the Chart Design tab, in the Data group, click Switch Row/Column.

Result:



TASK 3: **Add and modify chart elements**

Ref - EX.1.18.64 - Task 1 – Table and Chart to execute this exercise.

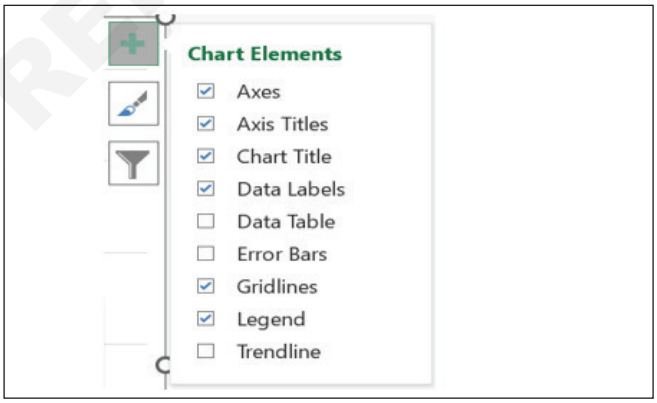


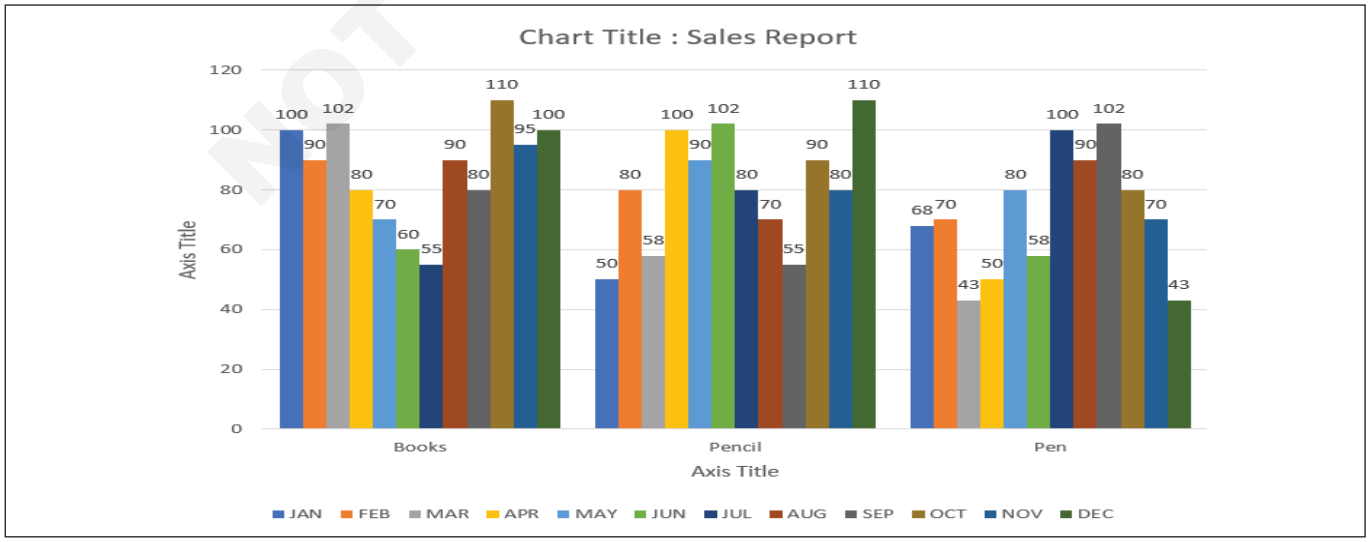
Chart Elements

You can use data labels to focus your readers' attention on a single data series or data point.

1 Select the chart.

2 Click the + button on the right side of the chart and click the check box next to Data Labels.

Result:



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TASK 4: **Add trend lines to chart**

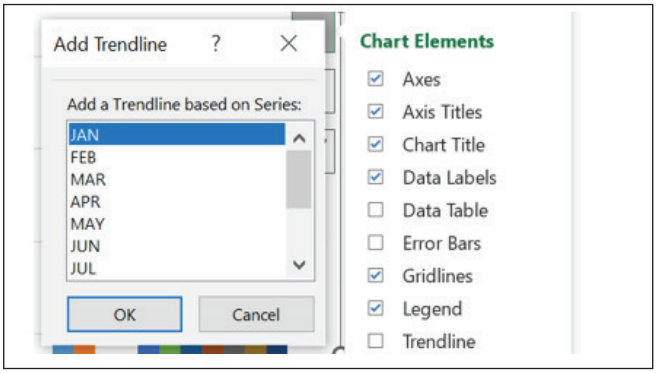
Ref - EX.1.18.64 - Task 1 – Use the same Table and Chart to execute this exercise.

1 Select a chart.

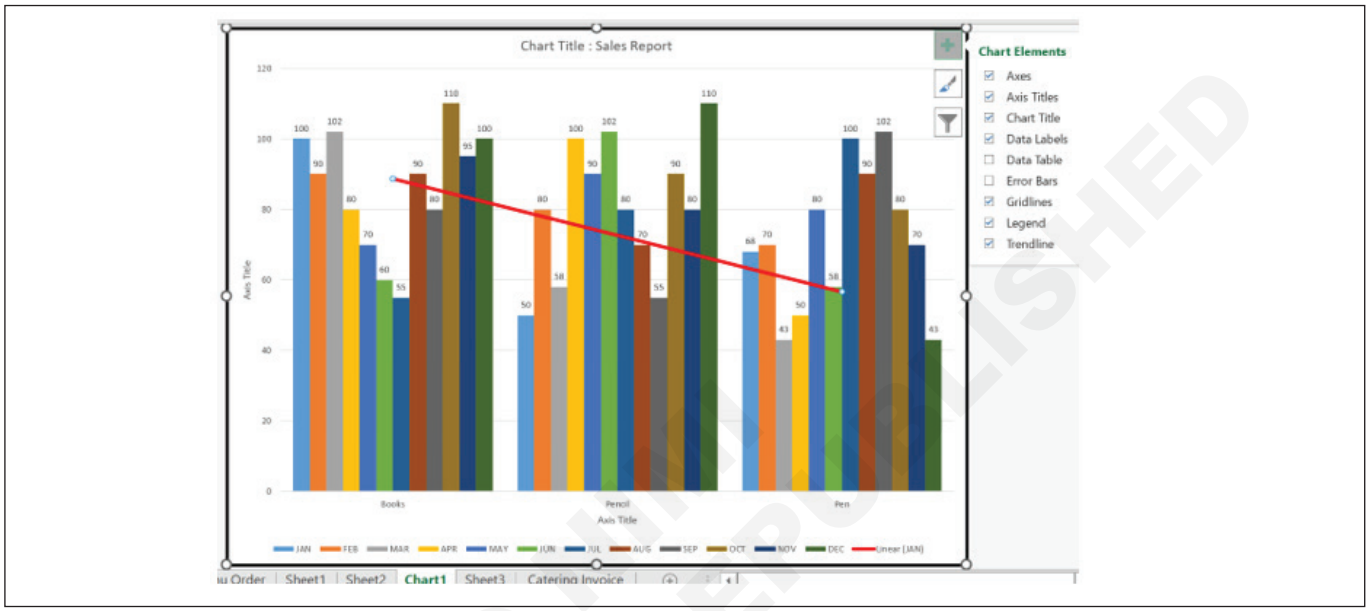
2 Select the + to the top right of the chart.

3 Select Trendline.

4 In the Add Trendline dialog box, select any data series options you want, and click OK.



Result:



Format a trendline

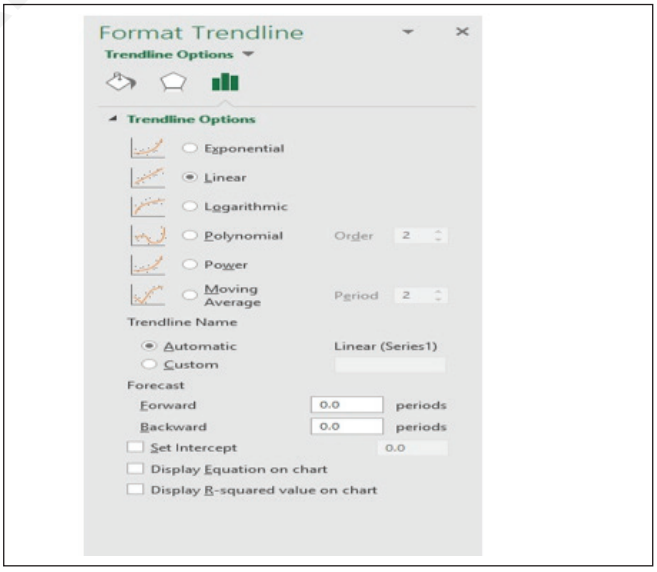
1 Click anywhere in the chart.

2 On the Format tab, in the Current Selection group, select the trendline option in the dropdown list.

3 Click Format Selection.

4 In the Format Trendline pane, select a Trendline Option to choose the trendline you want for your chart. Formatting a trendline is a statistical way to measure data:

5 Set a value in the Forward and Backward fields to project your data into the future.



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Format charts

Objectives: At the end of this exercise you shall be able to
- **apply chart layouts**
- **apply chart styles**
- **add alternative text to charts for accessibility.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Apply chart layouts**

Ref - EX.1.18.64 - Task 1 – Use the same Table and Chart to execute this exercise.

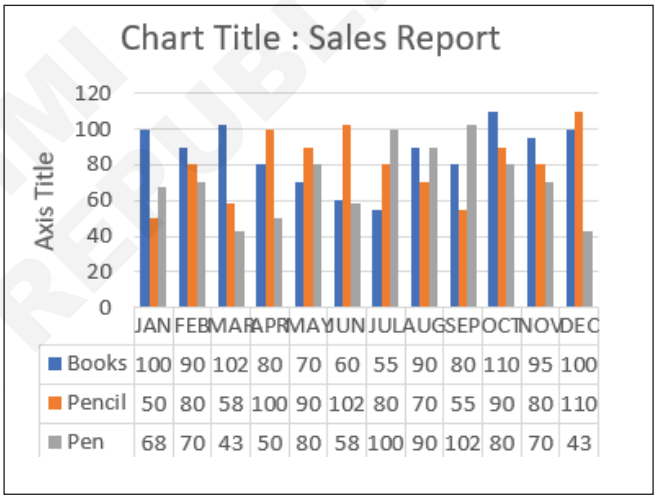
1 Click the chart that you want to format.

This displays the Chart Tools, adding the Design, Layout, and Format tabs.

2 On the Design tab, in the Chart Layouts group, click the Quick layout that you want to use.

3 Choose the any Chart layout that you want to create.

4 Result: Layout5 selected



TASK 2: **Apply chart styles**

Ref - EX.1.18.64 - Task 1 – Use the same Table and Chart to execute this exercise.

1 Click the chart that you want to format.

This displays the Chart Tools, adding the Design, Layout, and Format tabs.

2 On the Design tab, in the Chart Styles group, click the chart style that you want to use.

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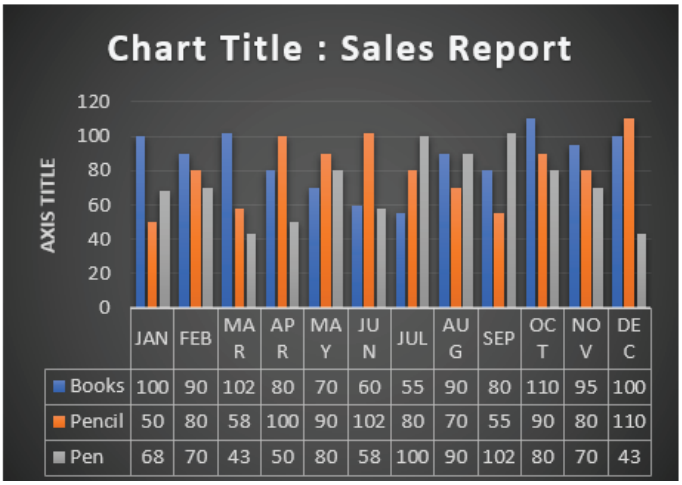
3 Choose the any Chart Style that you want to create.

4 Result: Style 8 selected



TASK 3: **Add alternative text to charts for accessibility**

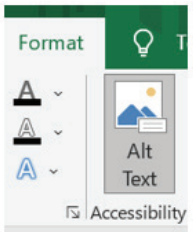
Ref - EX.1.18.64 - Task 1 – Use the same Table and Chart to execute the this exercise.

Add alt text to a chart

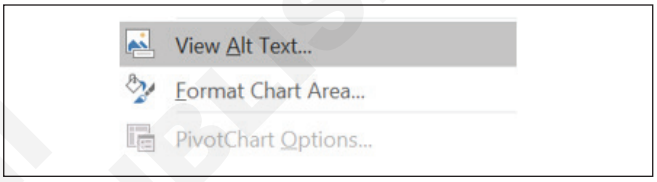
1 Select the entire chart.

2 Do one of the following:

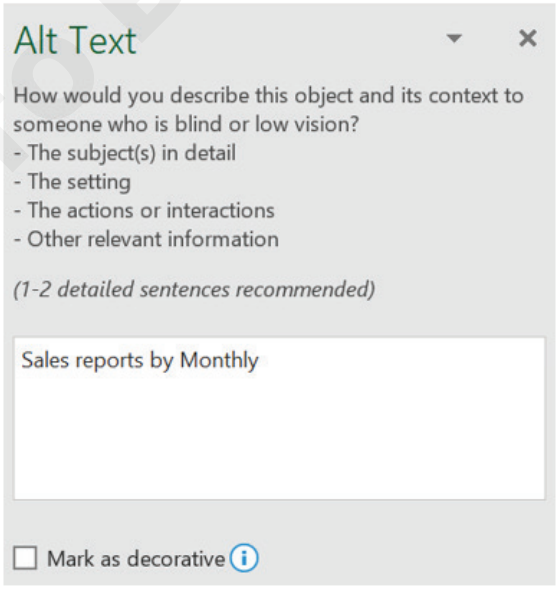
- Select Format > Alt Text.



- Right-click the chart, and select Edit Alt Text.



3 In the Alt Text pane, enter alt text describing the chart.



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Create Pivot Tables

Objectives: At the end of this exercise you shall be able to
- **create Pivot tables from cell ranges**
- **manipulate fields (columns) to get desired analysis**
- **use Filters for pivot tables**
- **represent data as Count, Sum, Average & % of row / column**
- **group data in Columns & rows for aggregate reports.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Create Pivot tables from cell ranges**

1 Open a new file and enter the data in the subsequent cells as shown in Fig 1.

	A	B	C	D	E	F
1	Sl.No.	Name	Quali	Trade	Age	
2	1	Amarnath C.	Dip	D/Civil	21	
3	2	Azhaganantham G	NTC	MMV	24	
4	3	Balamurugan K.	PT-Dip	MMV	26	
5	4	Devadoss J	NTC	Fitter	32	
6	5	Easwaran V.	Dip	MMV	21	
7	6	Ganapathy V.	NTC	Turner	28	
8	7	George Franklin T.	Dip	MMV	20	
9	8	Jayaraman V.	NTC	Elec	31	
10	9	Jeyachandran P.	NTC	Turner	30	
11	10	Jeyachandran S.	NTC	Fitter	30	
12	11	Kalaivanan S.	NTC	Turner	33	
13	12	Krishanaraj S.	NTC	Turner	30	
14	13	Lashmanan H	Dip	Turner	22	
15	14	Leelavathi V.	Dip	MRTV	21	
16	15	Madasamy M.	NTC	Elec	32	
17	16	Mahalakshmi C	Dip	MRTV	21	
18	17	Muthiah K.	NTC	Fitter	27	
19	18	Narayana Prumal	NTC	MMV	35	
20	19	Palaniswami	Dip	Turner	25	
21	20	Periasamy R.	Dip	MRAC	25	
22	21	Ramiza Banu N.	Dip	MRTV	23	
23	22	Ravindranath K.	Dip	MRAC	27	
24	23	Sasidharan K.	Dip	MRAC	24	
25	24	Sathya raj D.	NTC	Fitter	27	
26	25	Soundararajan S.	NTC	Turner	34	
27	26	Sudhaa Dridhe	Dip	MRTV	21	
28	27	Thaniyarasu	Dip	MMV	21	
29	28	Tharmaraj L.	PT-Dip	Fitter	25	
30	29	Tillai Bala Sundaram N.	NTC	Turner	29	

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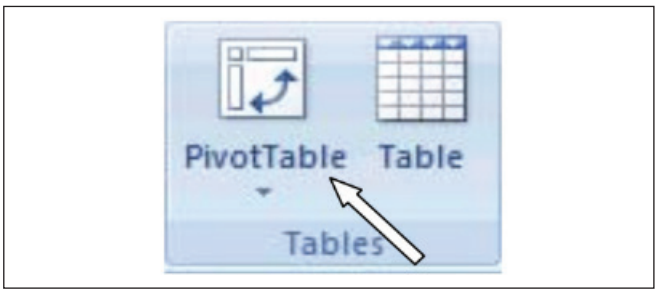
2 Click A1 inside the table to make the active cell.

3 Select Insert tab.

4 Click button in Tables group as shown in Fig 2.

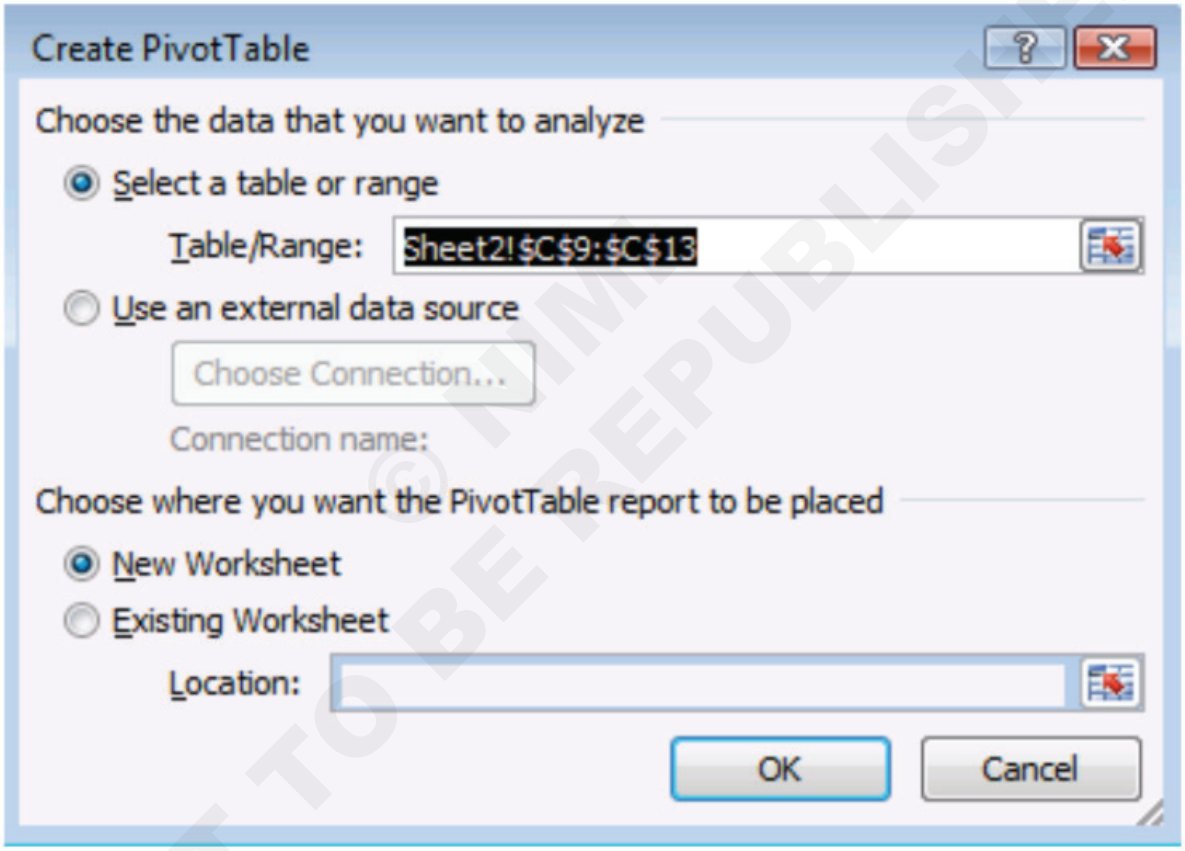


"Create Pivot Table" dialog box will appear as shown in Fig 3 with auto selected table range.

5 Click OK button in the above dialog box.

A new worksheet will appear in the workbook, with a special pane at right side of the screen as shown in Fig 4.

6 Drag the "Trade" field and drop it under Row Labels pane and the screen appears as shown in Fig 5.



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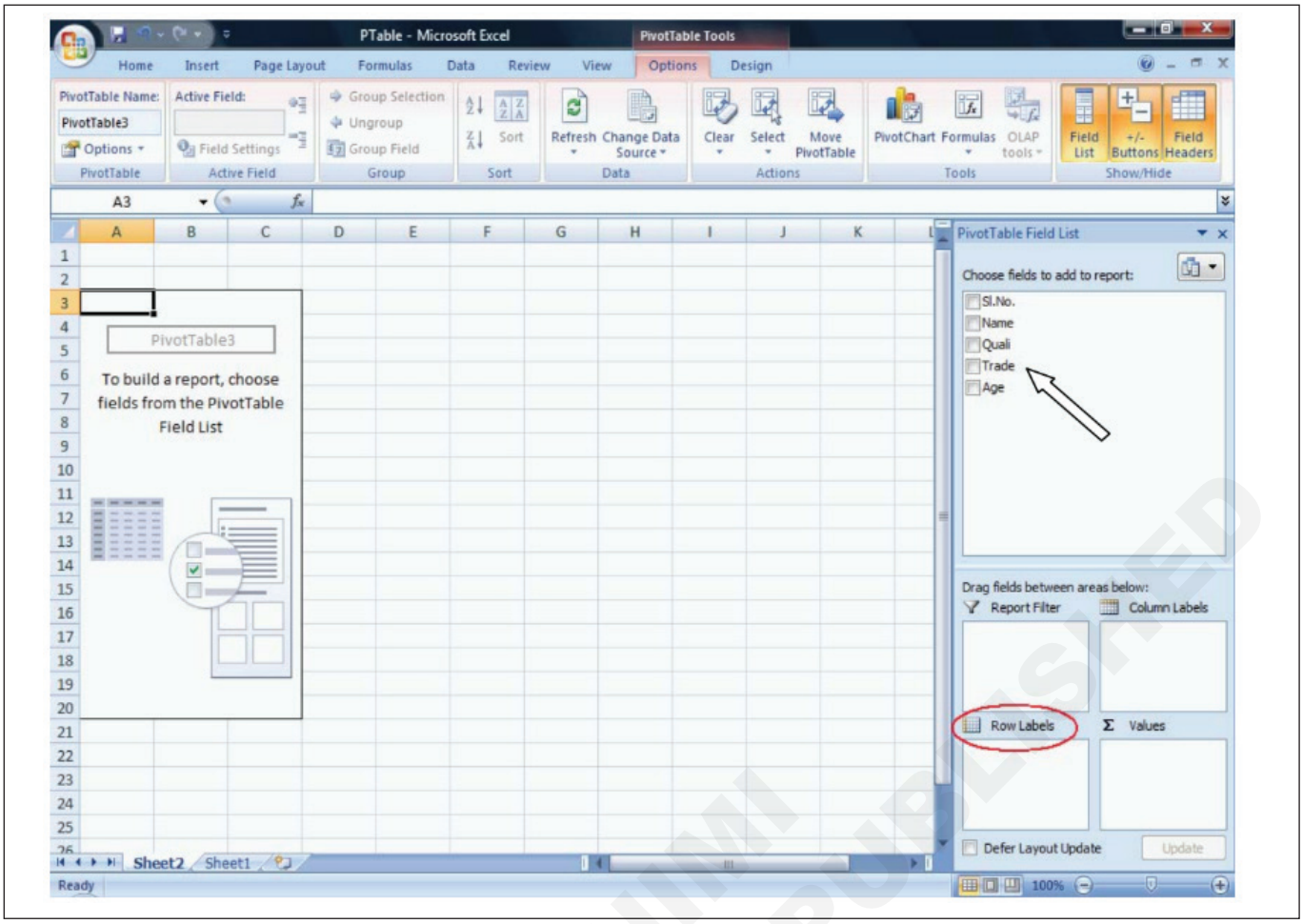

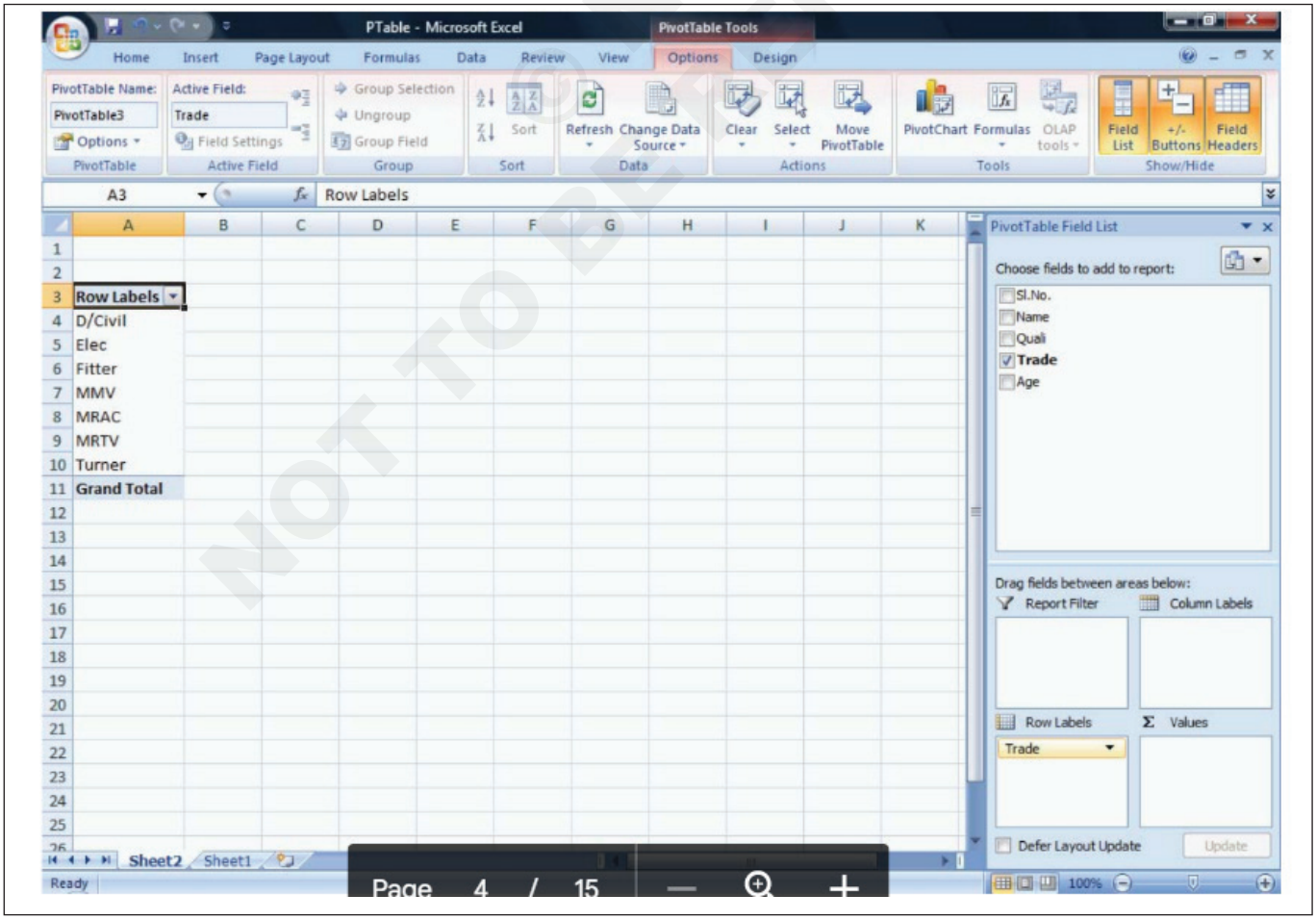

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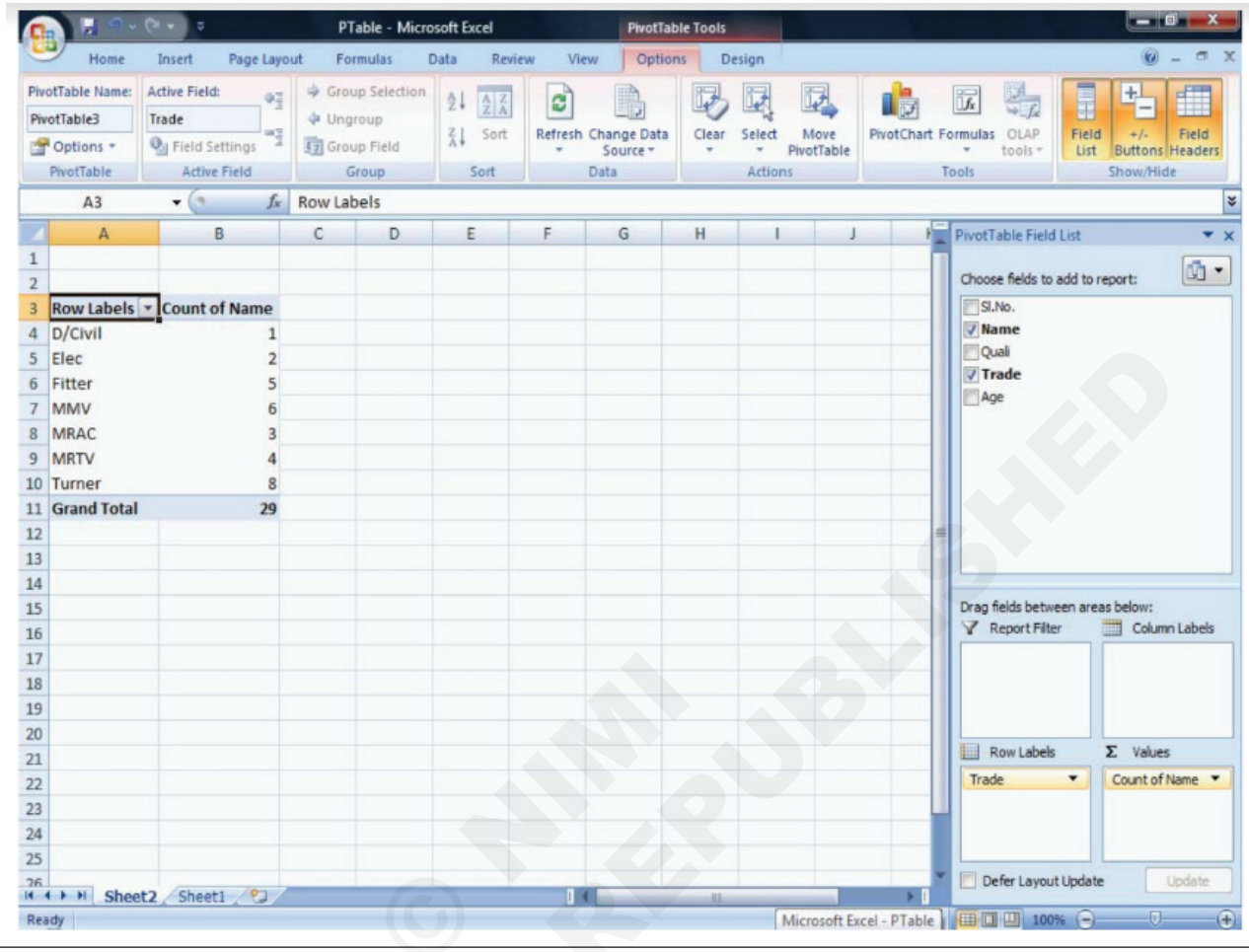
7 Drag the “Name” field and drop it under Σ Values pane and the screen changes its appearance as shown in Fig 6.



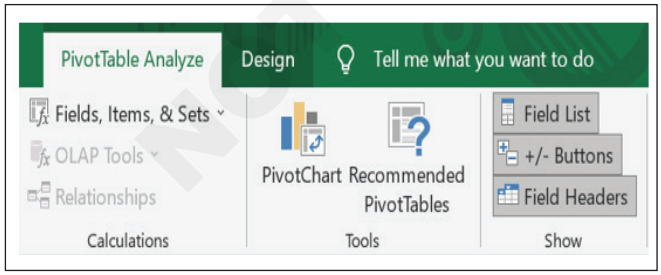
8 Drag the “Trade” field and put it outside of the pane.

9 Drag the “Quali” field and drop it under Row Labels pane.

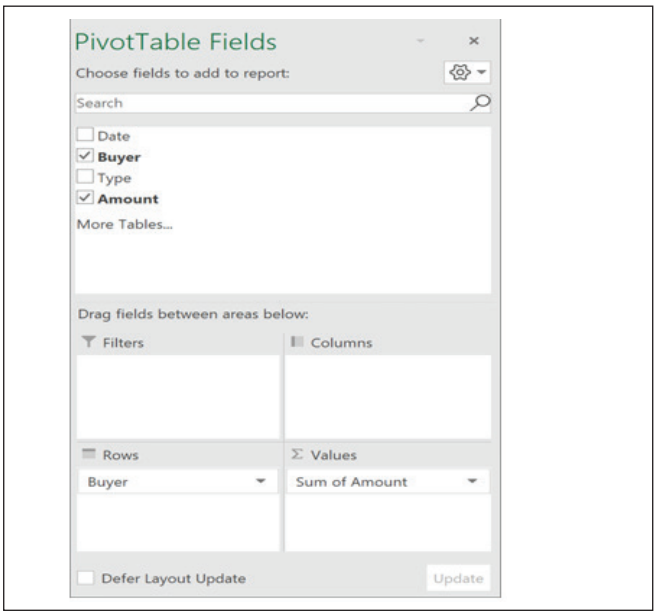
10 Drag the “Name” field & “Age” field and drop it under Σ Values pane.

TASK 2: **Manipulate fields (columns) to get desired analysis**

1 PivotTable Tools on the ribbon and click Analyze> Field List.



2 The Field List has a field section in which you pick the fields you want to show in your PivotTable, and the Areas section (at the bottom) in which you can arrange those fields the way you want.



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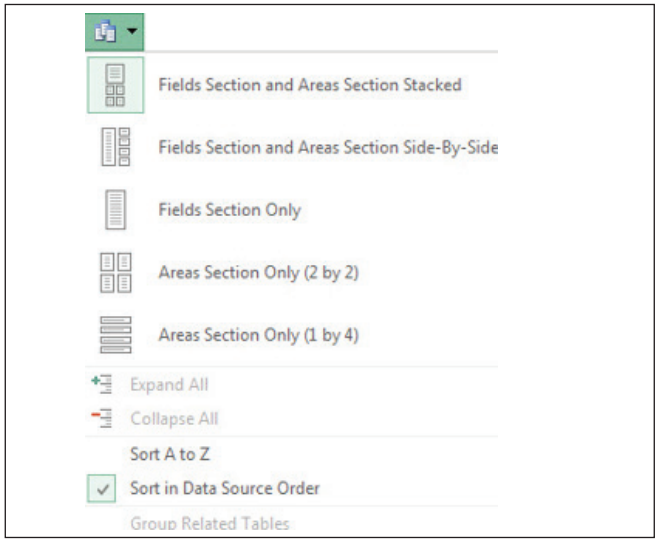
3 If you want to change how sections are shown in the Field List, click the Tools button and then pick the layout you want.



Add, rearrange, and delete fields in the Field List

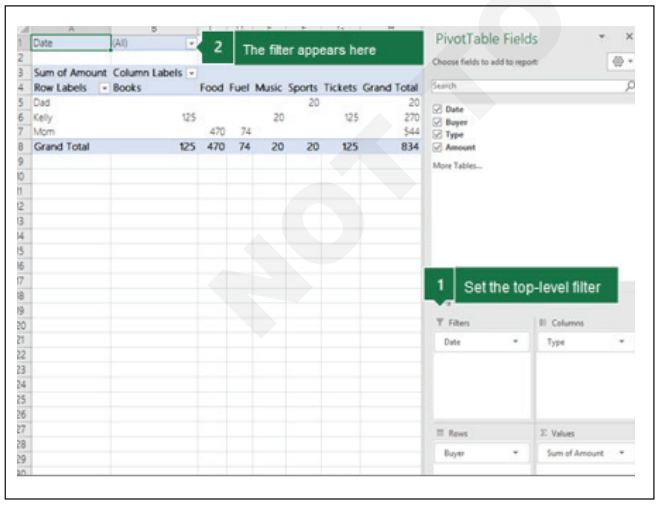
1 Use the field section of the Field List to add fields to your PivotTable, by checking the box next to field names to place those fields in the default area of the Field List.

NOTE: Typically, nonnumeric fields are added to the Rows area, numeric fields are added to the Values area, and Online Analytical Processing (OLAP) date and time hierarchies are added to the Columns area.

2 Use the areas section (at the bottom) of the Field List to rearrange fields the way you want by dragging them between the four areas.

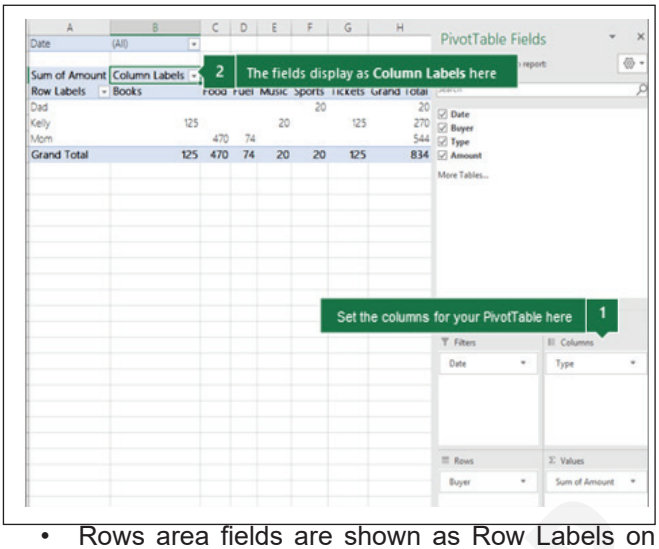
3 Fields that you place in different areas are shown in the PivotTable as follows:

- Filters area fields are shown as top-level report filters above the PivotTable, like this:

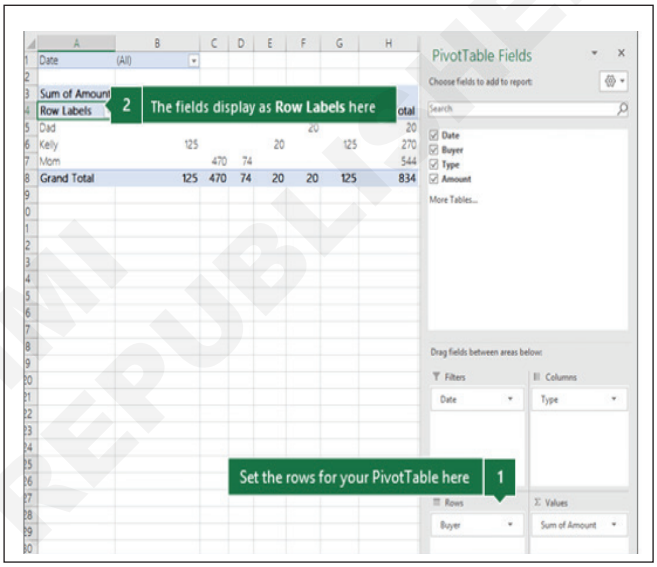


- Columns area fields are shown as Column Labels at the top of the PivotTable, like this:

4 Depending on the hierarchy of the fields, columns may be nested inside columns that are higher in position.

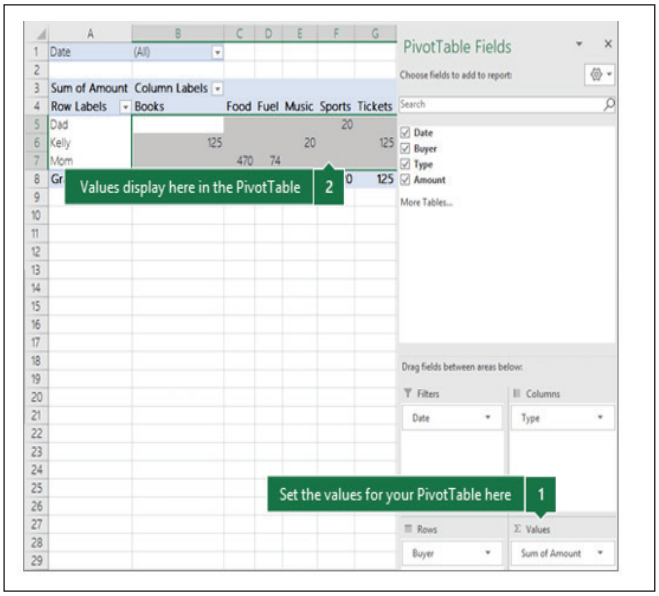


- Rows area fields are shown as Row Labels on the left side of the PivotTable, like this:



5 Depending on the hierarchy of the fields, rows may be nested inside rows that are higher in position.

- Values area fields are shown as summarized numeric values in the PivotTable, like this:



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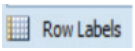
If you have more than one field in an area, you can rearrange the order by dragging the fields into the precise position you want.

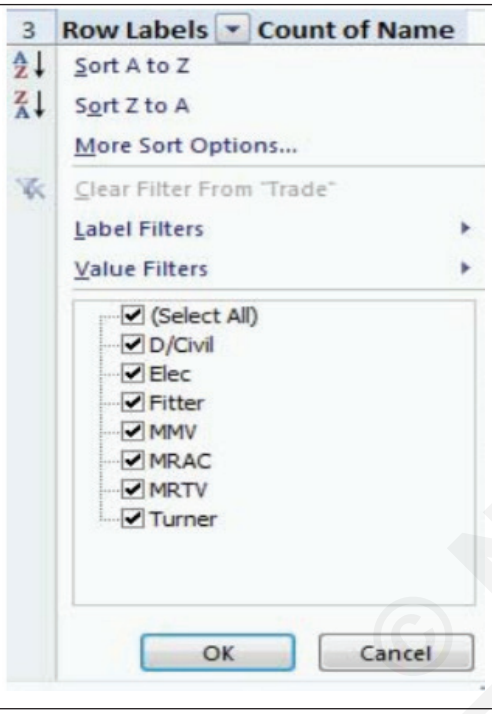
6 To delete a field from the PivotTable, drag the field out of its areas section. You can also remove fields by clicking the down arrow next to the field and then selecting Remove Field.

TASK 3: **Use Filters for pivot tables**

1 Repeat the Steps 6 and 7 from **Task I or use the same table.**

2 Click on the Drop down arrow near the 

A context menu will appear.



3 Select

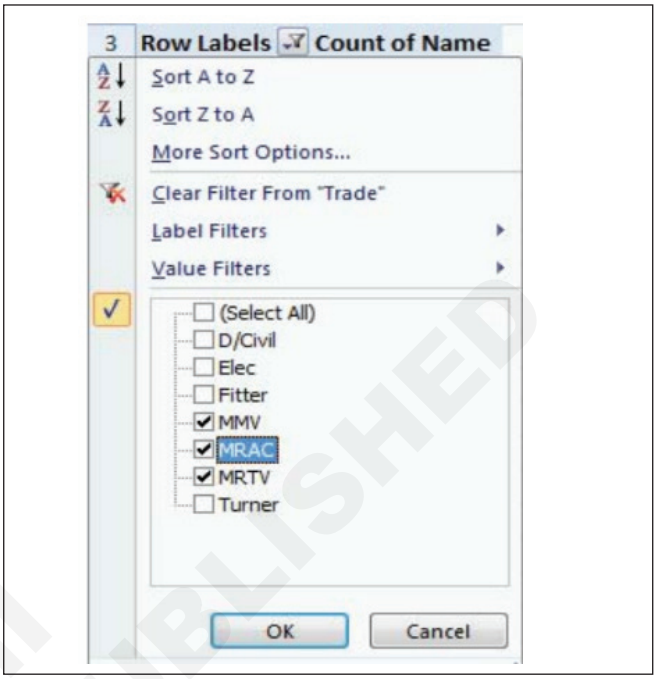
to arrange the name reversely.

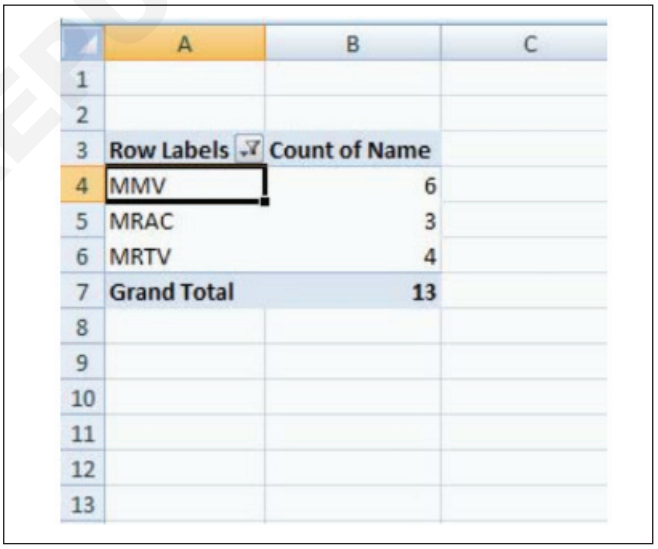
You can change the order manually also by dragging the names here and there

4 Deselect some trade name by clicking on the check box near it.

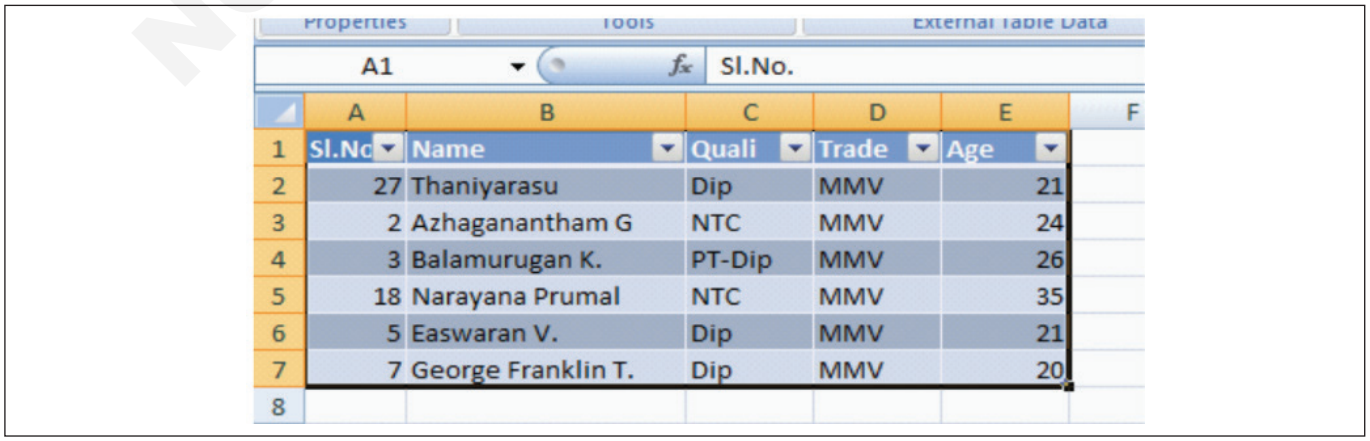
Now the worksheet will appear.

5 Double click on B4, to view the details of MMV group.





	A	B	C
1			
2			
3	Row Labels	Count of Name	
4	MMV	6	
5	MRAC	3	
6	MRTV	4	
7	Grand Total	13	
8			
9			
10			
11			
12			
13			



Properties Tools External Table Data

A1 fx Sl.No.

	A	B	C	D	E	F
1	Sl.No	Name	Quali	Trade	Age	
2	27	Thaniyarasu	Dip	MMV	21	
3	2	Azhaganantham G	NTC	MMV	24	
4	3	Balamurugan K.	PT-Dip	MMV	26	
5	18	Narayana Prumal	NTC	MMV	35	
6	5	Easwaran V.	Dip	MMV	21	
7	7	George Franklin T.	Dip	MMV	20	
8						

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TASK 4: **Represent data as Count, Sum, Average & % of row / column**

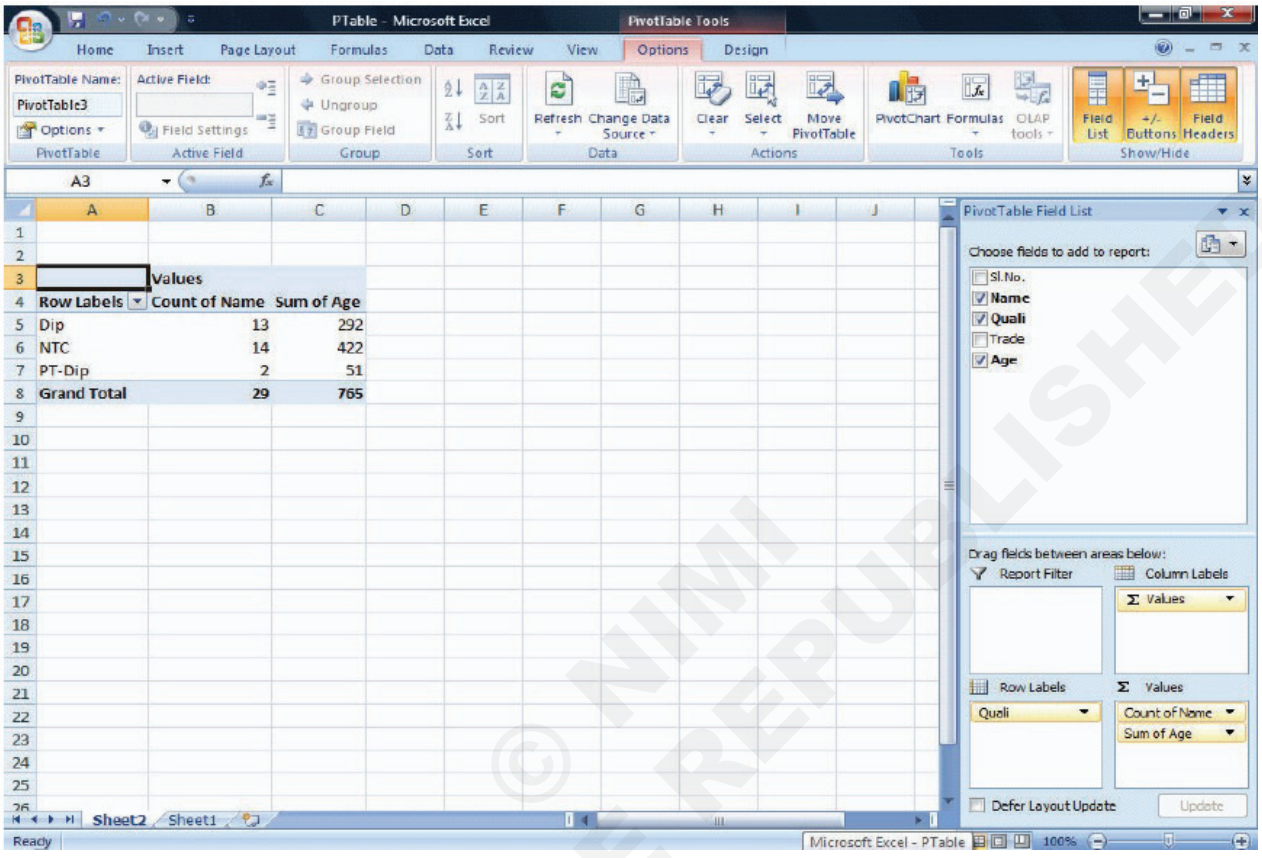
The appearance of the screen.

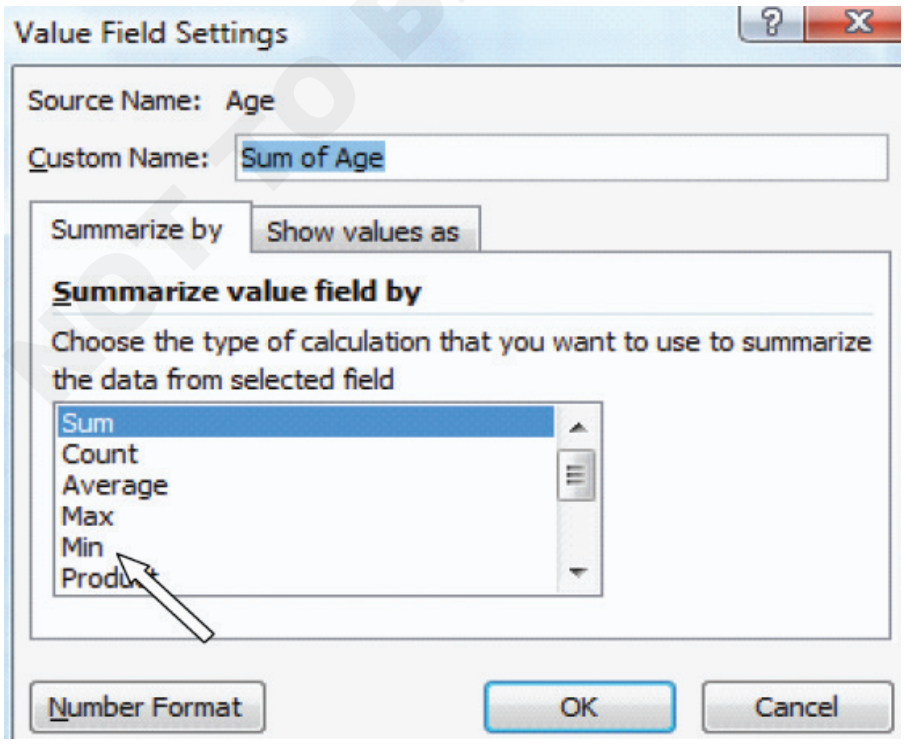
Here Excel uses "Count" function to find the number of persons under each qualification and "Sum" function to add the age of persons under each qualification.

1 Double click on the word "Sum of Age".

A "Value Field Setting" dialog box will appear.

2 Select Min option and press OK





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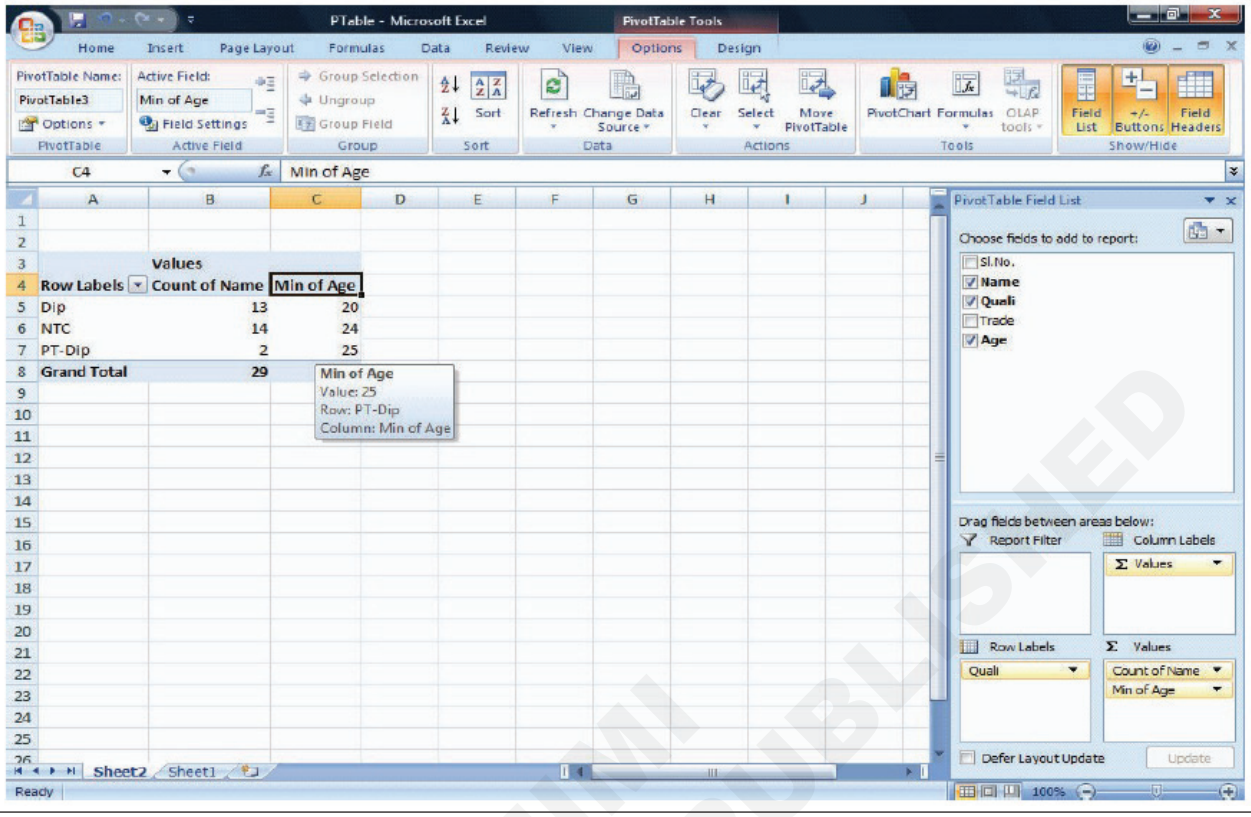
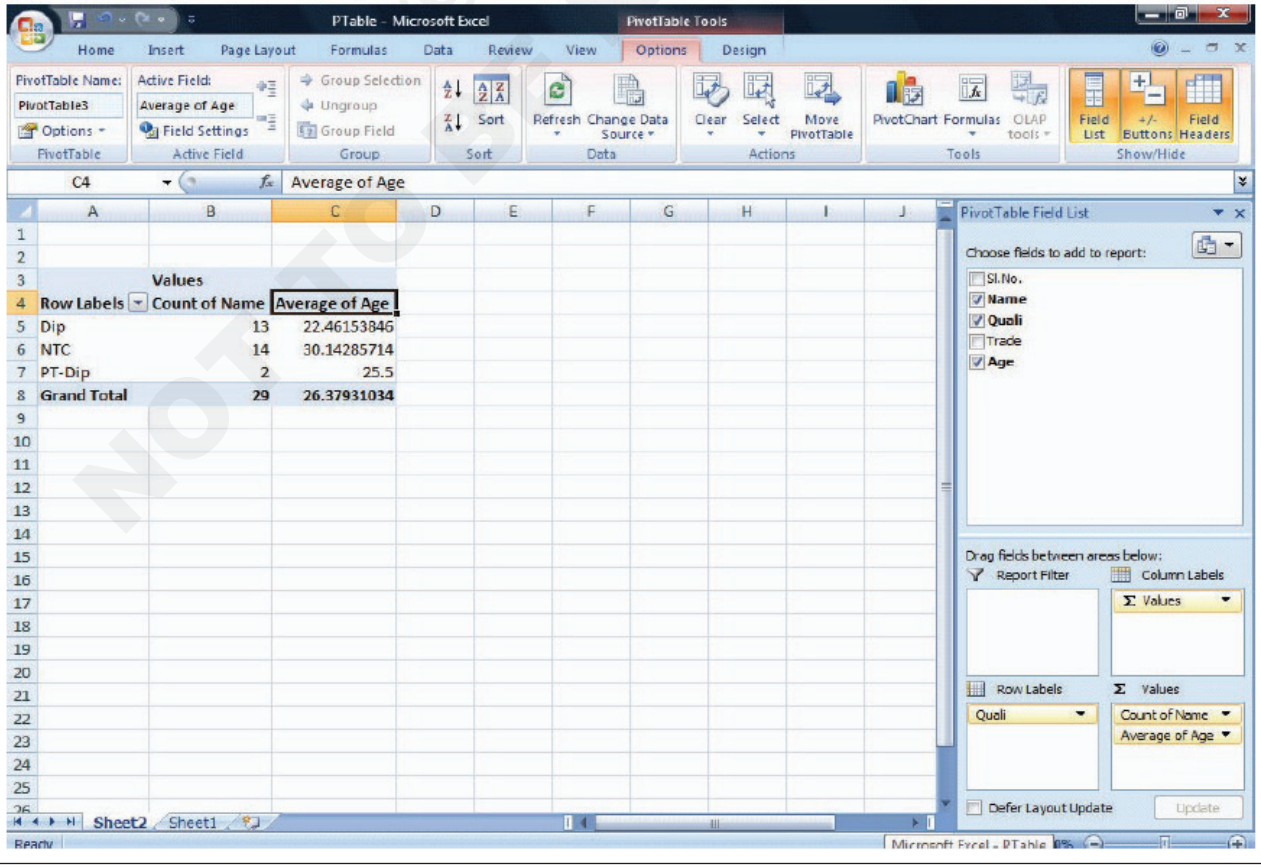
Now it will display the Minimum age comes under each qualification.

3 Double click on the word “Min of Age”.

4 Select Average option and press OK.



Now it will display the Average age comes under each qualification.



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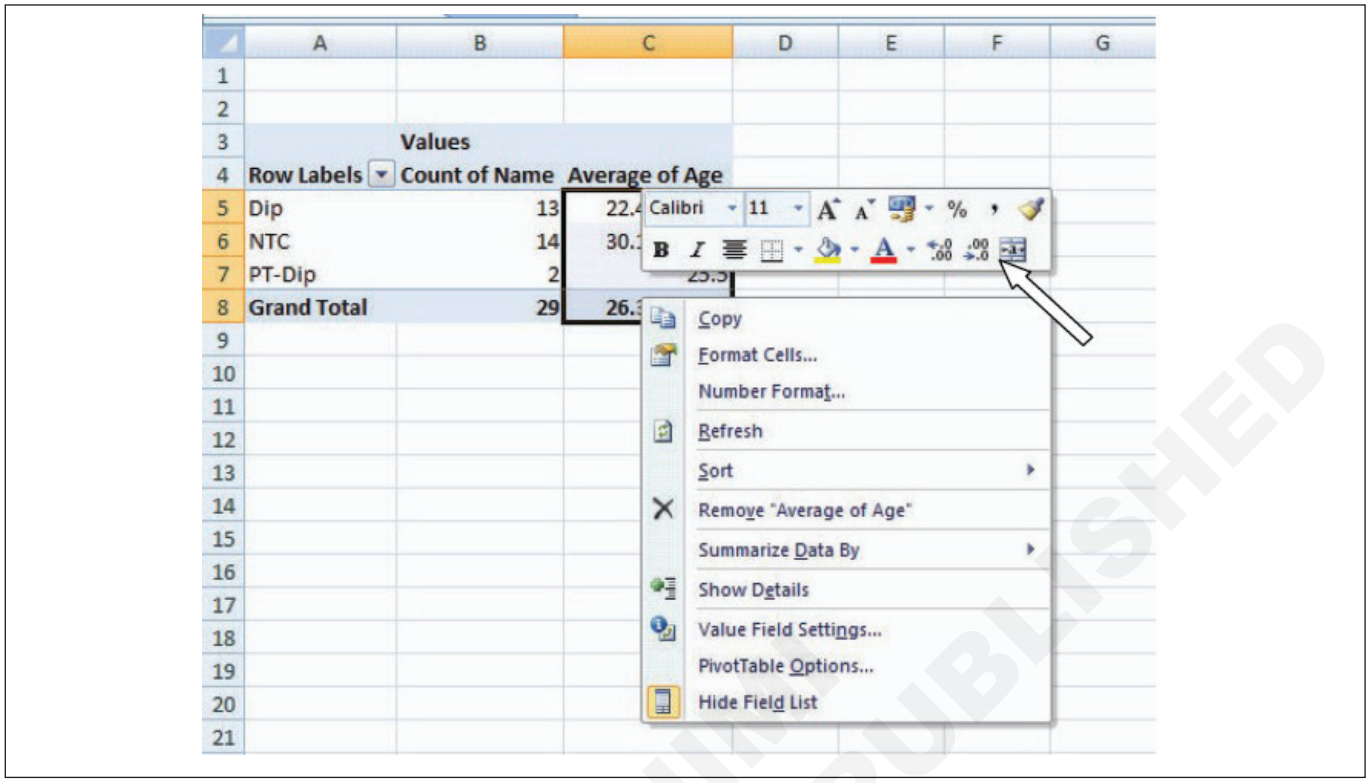
5 Select c5 to c8.

6 Click the mouse right button.

Mini Toolbar buttons will appear on the screen.

7 Select "Decrease Decimal" to show fewer decimal places.



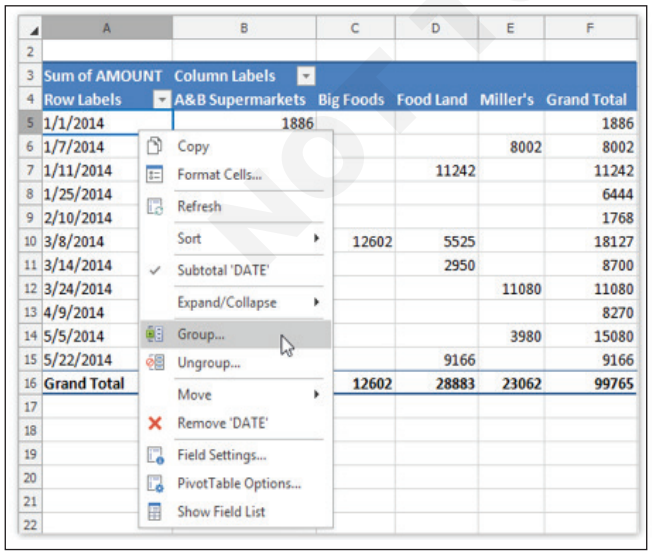
TASK 5: **Group data in Columns & rows for aggregate reports**

Group Items in a Pivot Table

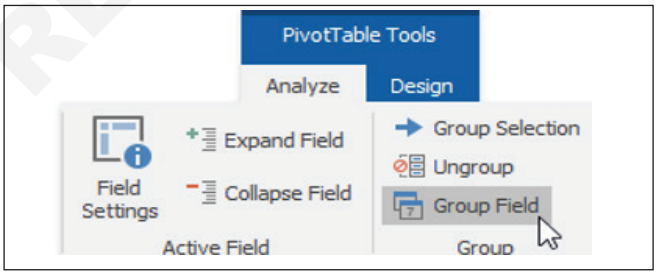
Grouping can help you get a clearer view of data and show only data you want to analyze. The following topic describes how to group dates, numbers or selected items in a pivot table.

Group a Pivot Table by Date

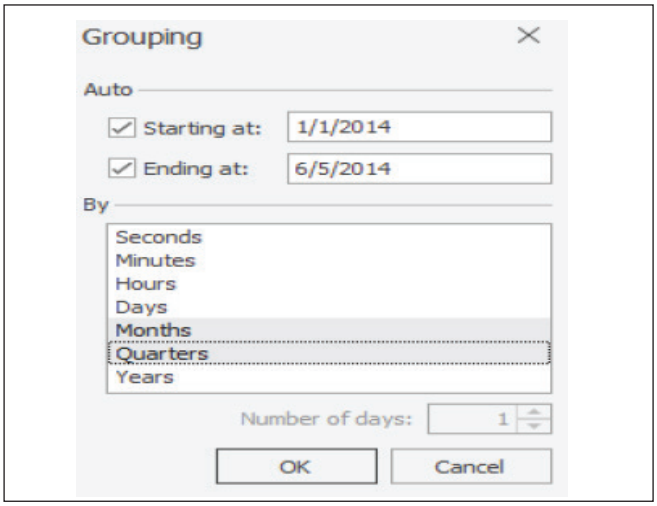
1 Right-click a cell within a row or column field containing dates and select Group...



...or on the PivotTable Tools | Analyze tab, in the Group, click the Group Field button.



2 The Grouping dialog is invoked. Type the first and last date or time you want to group by, select one or more date or time intervals for grouping and click OK.



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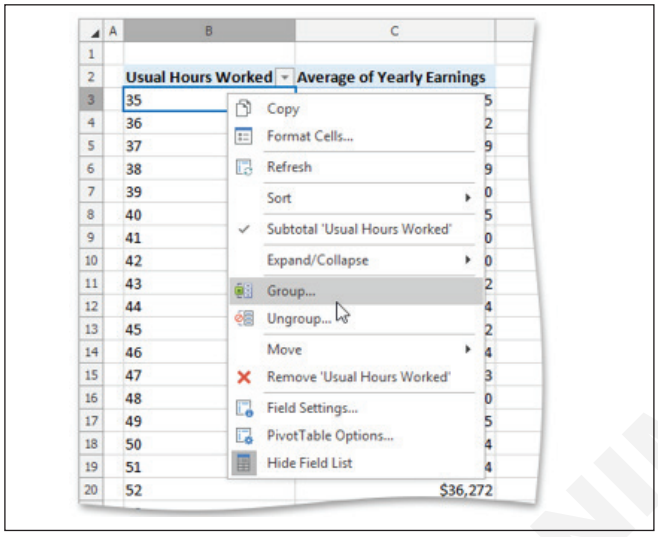
3 As a result, the date field will be grouped as shown in the image below.

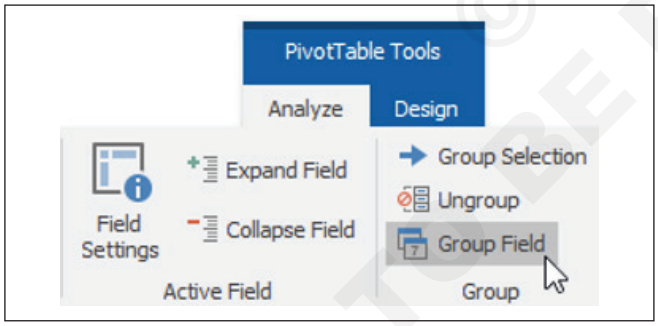
Sum of AMOUNT	Column Labels				
Row Labels	A&B Supermarkets	Big Foods	Food Land	Miller's	Grand Total
Qtr1					
Jan	$ 8,330.00		$ 11,242.00	$ 8,002.00	$ 27,574.00
Feb	$ 1,768.00				$ 1,768.00
Mar	$ 5,750.00	$ 12,602.00	$ 8,475.00	$ 11,080.00	$ 37,907.00
Qtr2					
Apr	$ 8,270.00				$ 8,270.00
May	$ 11,100.00		$ 9,166.00	$ 3,980.00	$ 24,246.00
Jun	$ 10,311.00	$ 2,592.00	$ 10,866.00		$ 23,769.00
Grand Total	$ 45,529.00	$ 15,194.00	$ 39,749.00	$ 23,062.00	$ 123,534.00

Group a Pivot Table by Numbers

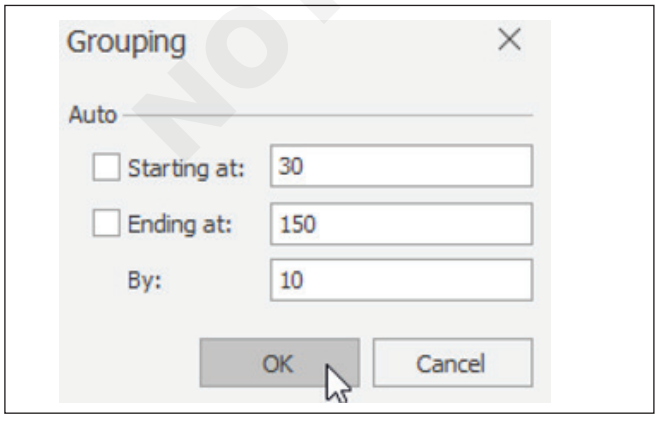
1 Right-click a cell within a row or column field containing numeric values and select Group...



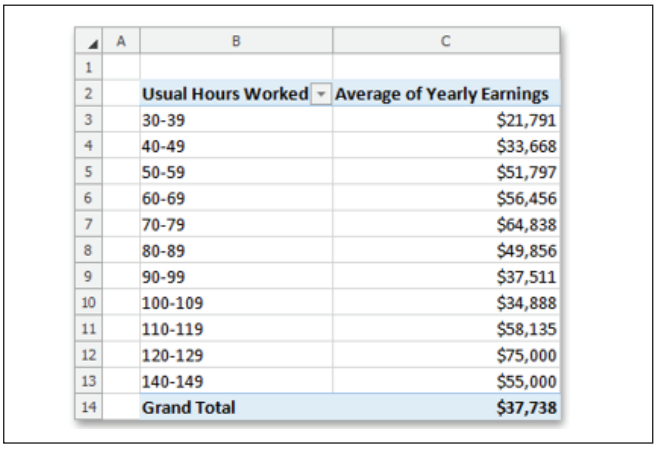
...or on the PivotTable Tools | Analyze tab, in the Group, click the Group Field button.



2 The Grouping dialog is invoked. Type in start value, end value, interval and click OK.



3 The result is shown in the image below.

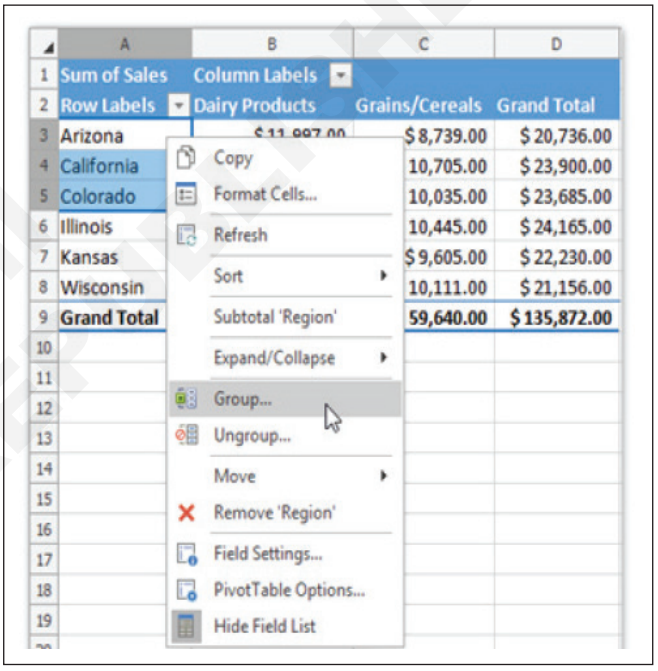


Usual Hours Worked	Average of Yearly Earnings
30-39	$21,791
40-49	$33,668
50-59	$51,797
60-69	$56,456
70-79	$64,838
80-89	$49,856
90-99	$37,511
100-109	$34,888
110-119	$58,135
120-129	$75,000
140-149	$55,000
Grand Total	$37,738

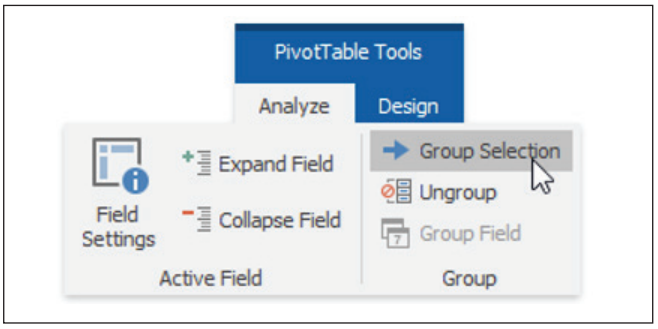
Group Selected Items

1 Select the items that you want to group.

2 Right-click the selected range and select the Group item from the context menu...



...or on the PivotTable Tools | Analyze tab, in the Group, click the Group Selection button.



3 As a result, the selected range will be combined into a single group. To rename the group, select the group header, press F2 and type the required name.

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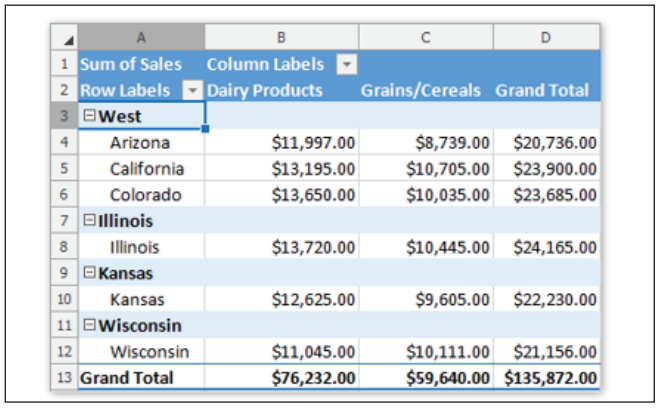
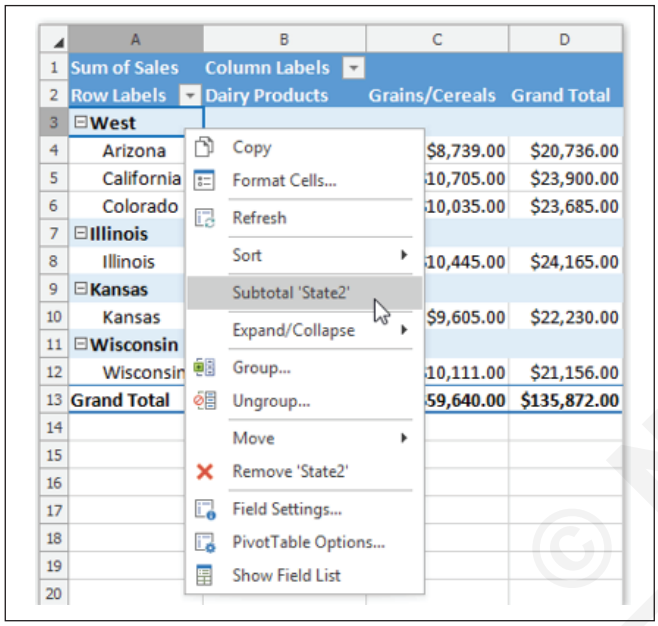
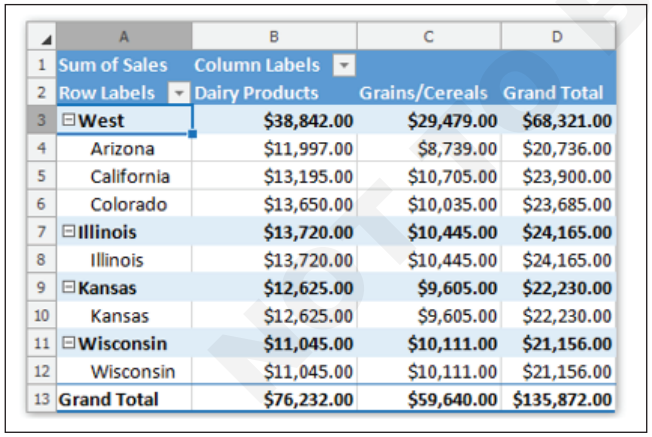


	A	B	C	D
1	Sum of Sales	Column Labels		
2	Row Labels	Dairy Products	Grains/Cereals	Grand Total
3	West			
4	Arizona	$11,997.00	$8,739.00	$20,736.00
5	California	$13,195.00	$10,705.00	$23,900.00
6	Colorado	$13,650.00	$10,035.00	$23,685.00
7	Illinois			
8	Illinois	$13,720.00	$10,445.00	$24,165.00
9	Kansas			
10	Kansas	$12,625.00	$9,605.00	$22,230.00
11	Wisconsin			
12	Wisconsin	$11,045.00	$10,111.00	$21,156.00
13	Grand Total	$76,232.00	$59,640.00	$135,872.00

4 You can also enable or disable displaying the subtotal for the created group. To do that, right-click the group header and select the Subtotal 'Field Name' item.



5 The resulting report is shown in the image below.

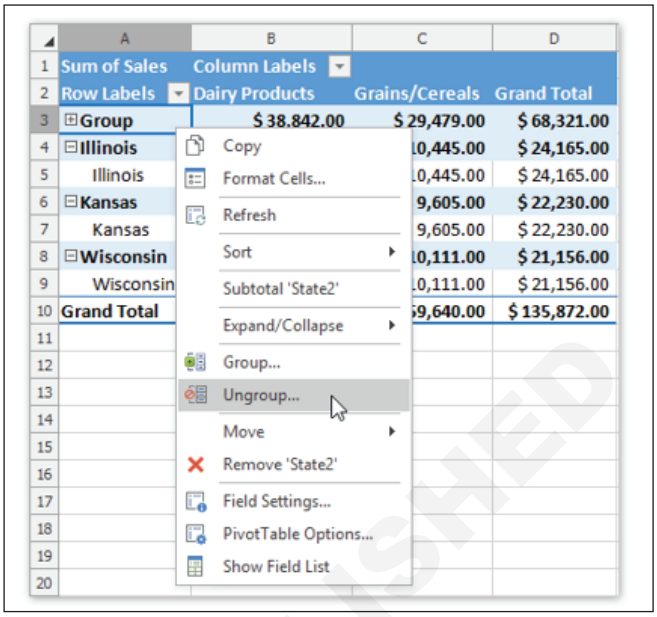


	A	B	C	D
1	Sum of Sales	Column Labels		
2	Row Labels	Dairy Products	Grains/Cereals	Grand Total
3	West	$38,842.00	$29,479.00	$68,321.00
4	Arizona	$11,997.00	$8,739.00	$20,736.00
5	California	$13,195.00	$10,705.00	$23,900.00
6	Colorado	$13,650.00	$10,035.00	$23,685.00
7	Illinois	$13,720.00	$10,445.00	$24,165.00
8	Illinois	$13,720.00	$10,445.00	$24,165.00
9	Kansas	$12,625.00	$9,605.00	$22,230.00
10	Kansas	$12,625.00	$9,605.00	$22,230.00
11	Wisconsin	$11,045.00	$10,111.00	$21,156.00
12	Wisconsin	$11,045.00	$10,111.00	$21,156.00
13	Grand Total	$76,232.00	$59,640.00	$135,872.00

Ungroup Data

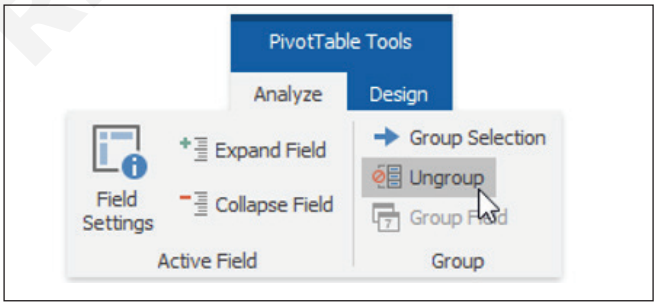
To ungroup data in a pivot table, do one of the following.

- Right-click the grouped field and select Ungroup... from the context menu.



- Select any cell in the grouped field and on the Pivot Table Tools | Analyze tab, in the Group, click the Ungroup button.

Note that ungrouping a numeric or date and time field will remove all groups for that field. If you ungroup a group of selected items, only the selected items will be ungrouped.



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Open files in MS PowerPoint

Objectives: At the end of this exercise you shall be able to
- **open MS PowerPoint**
- **create a new PowerPoint file**
- **create a new PowerPoint file from a template**
- **open an existing PowerPoint file.**

Requirements

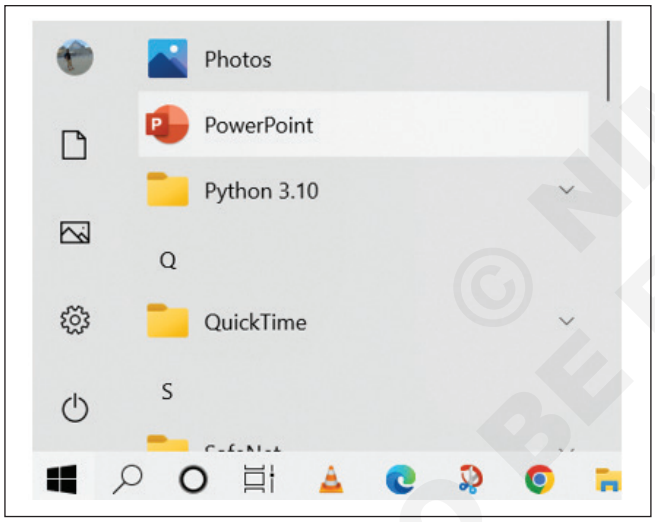
Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

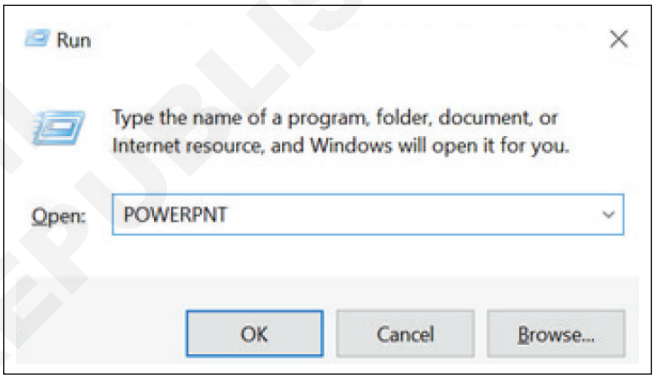
PROCEDURE

TASK 1: **Open MS PowerPoint**

1 Click Windows Start Button > Choose Excel from Start Menu.



Or Select **Ctrl + R** > Type POWERPNT > Click OK



2 Microsoft Power Point Application will start to open.

TASK 2: **Create a new PowerPoint file**

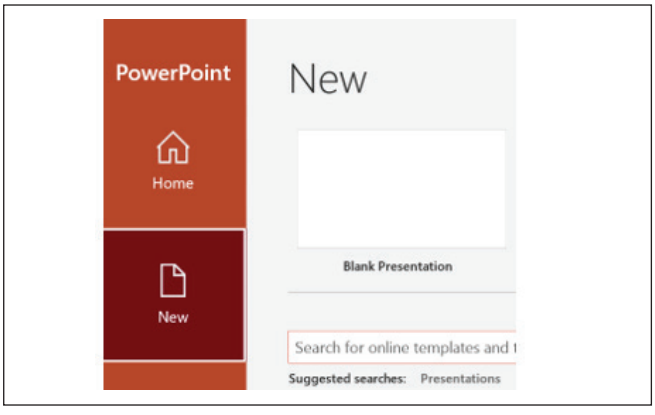
Create a presentation

1 Open PowerPoint.

2 In the left pane, select New or press **Ctrl+N.**

3 Select an option:

- To create a presentation from scratch, select Blank Presentation.



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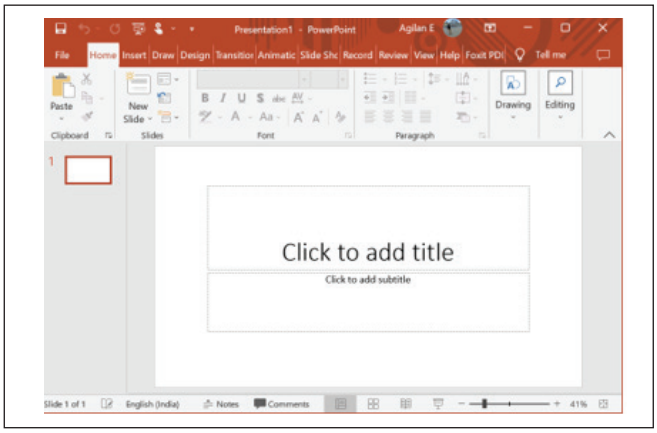
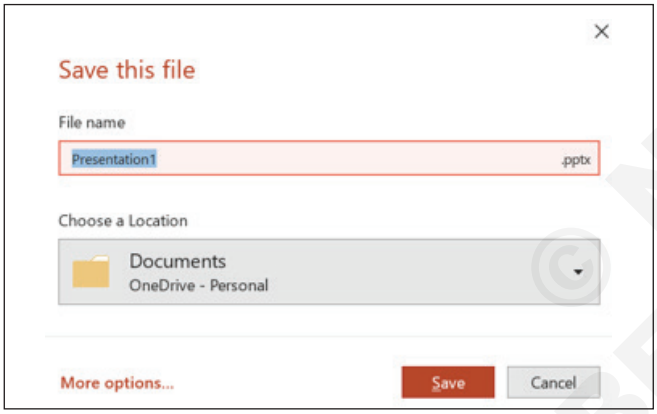
4 By default, Title Slide will appear then Start typing Title and Subtitle.



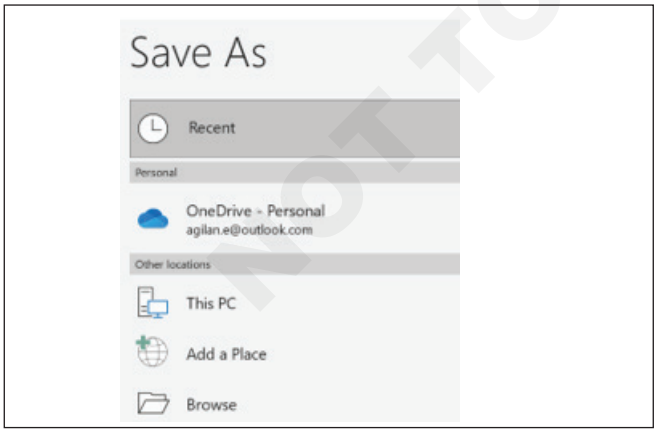
Save your workbook

Wherever you want to save your presentation on your computer or the web, you do all your saving on the File tab > Save or press **Ctrl+S** to save first time or you need to use Save As to save your existing presentation in a different location, or to create a copy of your presentation in the same or another location.

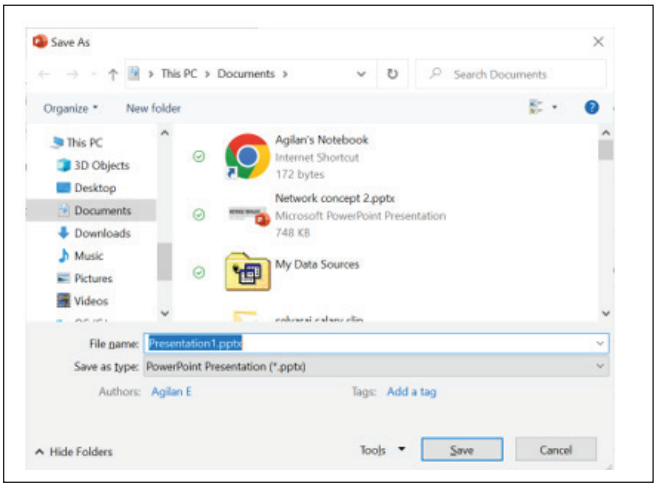
1 File tab > Save or press **Ctrl+S** to save first time



2 Choose a Location or More option to Browse the Local Drive.

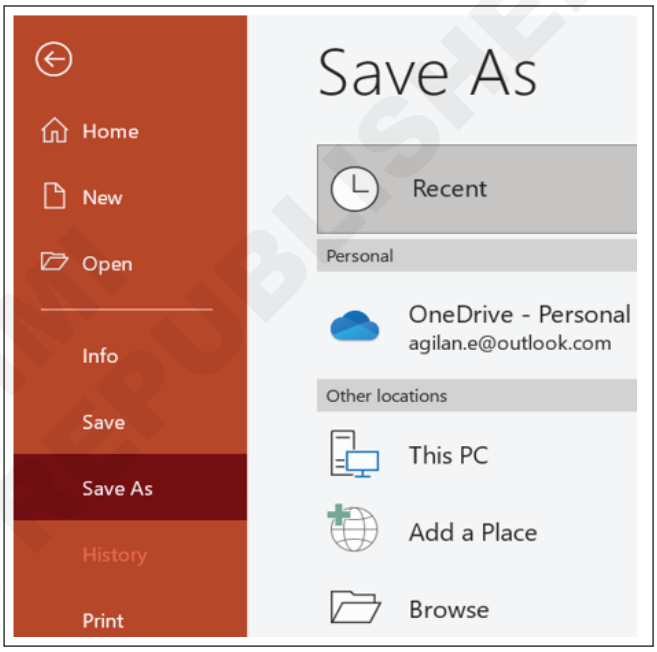


3 Browse the Location where you want to save and Name the Filename and Choose the File Type.PPTX then Click Save.

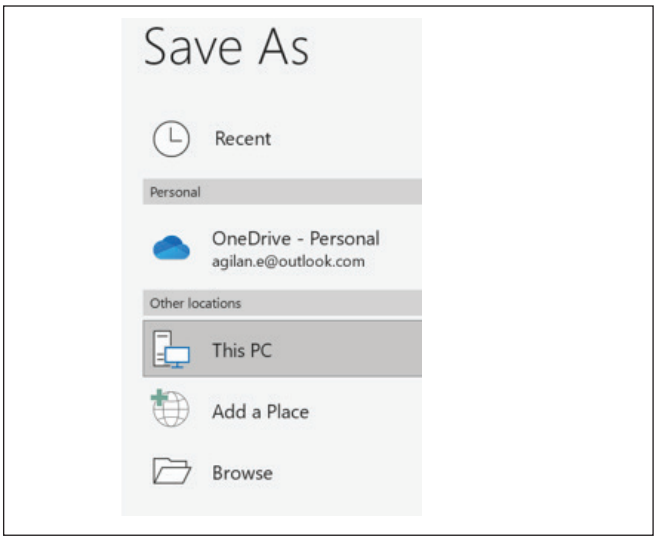


Save As your workbook

1 Click File > Save As.



2 Under Save As, pick the place where you want to save your workbook. For example, to save to your desktop or in a folder on your computer, click This PC.



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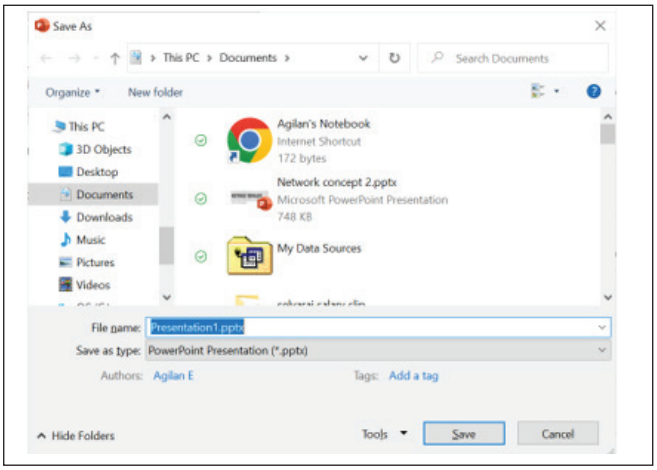
3 Click Browse to find the location you want in your Documents folder.

4 In the File name box, enter a name for a new Presentation. Enter a different name if you're creating a copy of an existing Presentation.

5 To save your Presentation in a different file format **(like .pdf or .pptx)**, in the Save as type list (under the File name box), pick the format you want.

6 Click Save



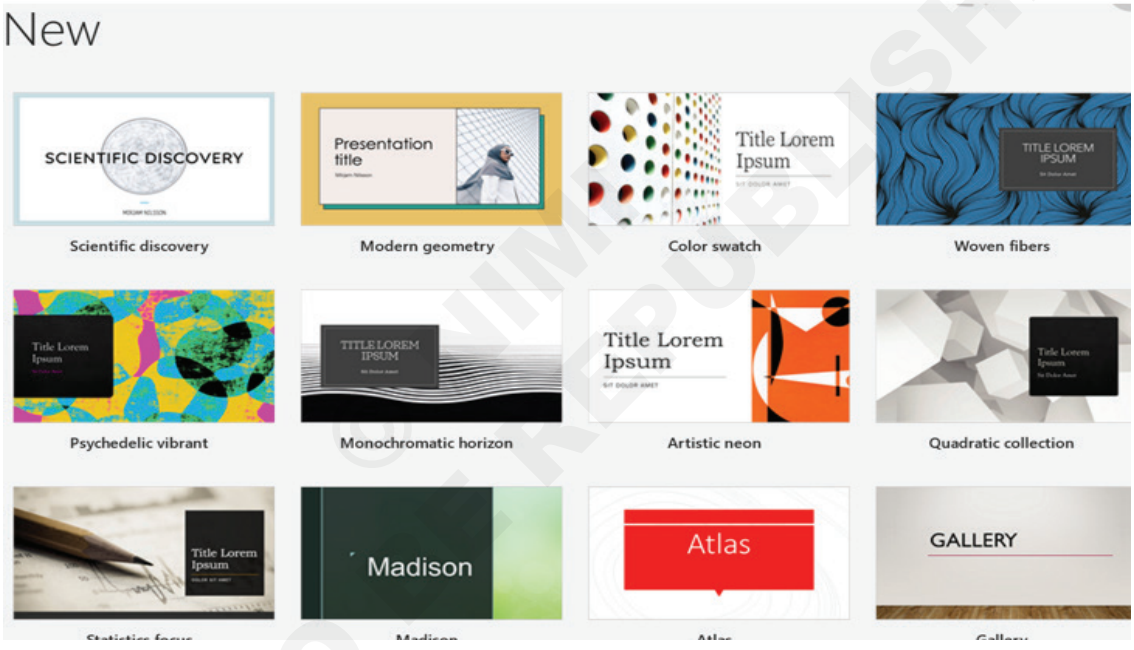
TASK 3: **Create a new PowerPoint file from a template**

Create a Presentation from a template

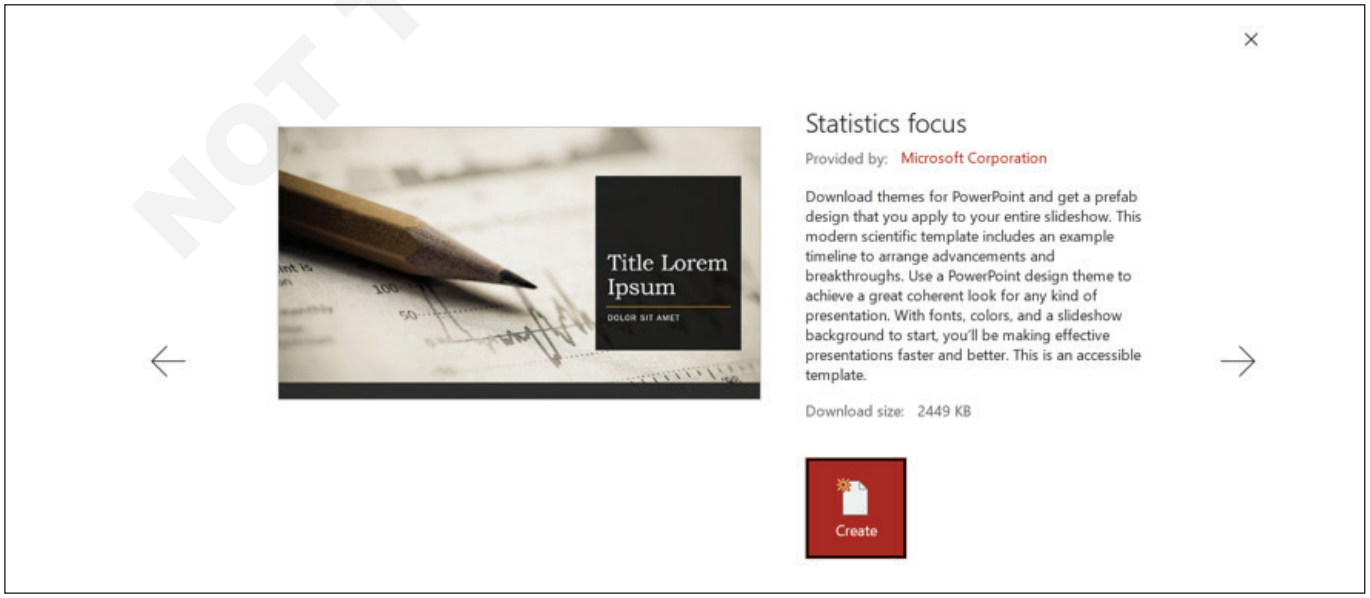
1 Select File > New.

2 Select More template

3 Search or choose from available Template.



4 Choose a template and Click Create



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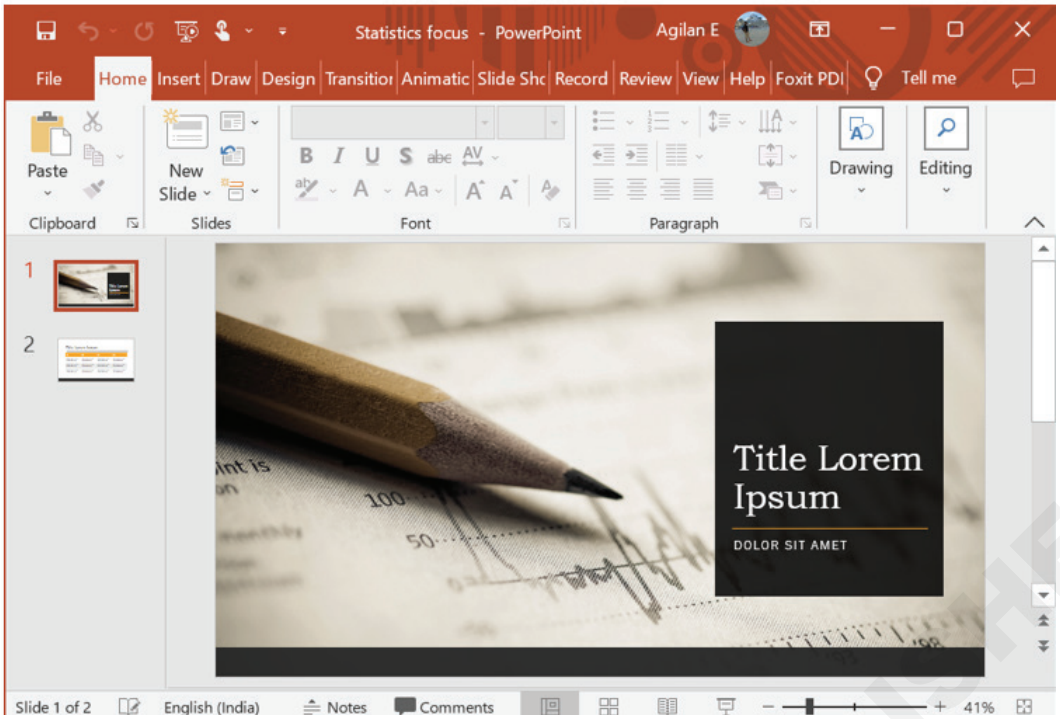
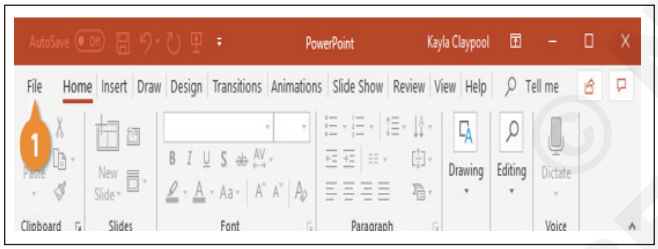
5 Click and Edit the text from the Template.



TASK 4: **Open an existing PowerPoint file**

Open an Existing Presentation

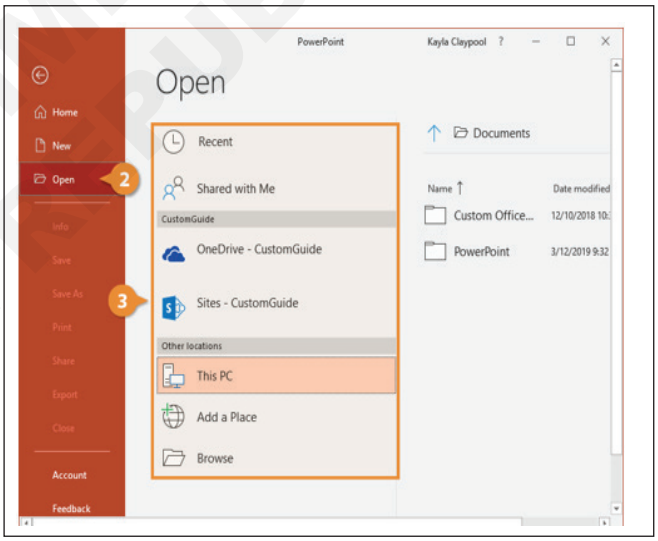
1 Click the File tab.



2 Click Open.

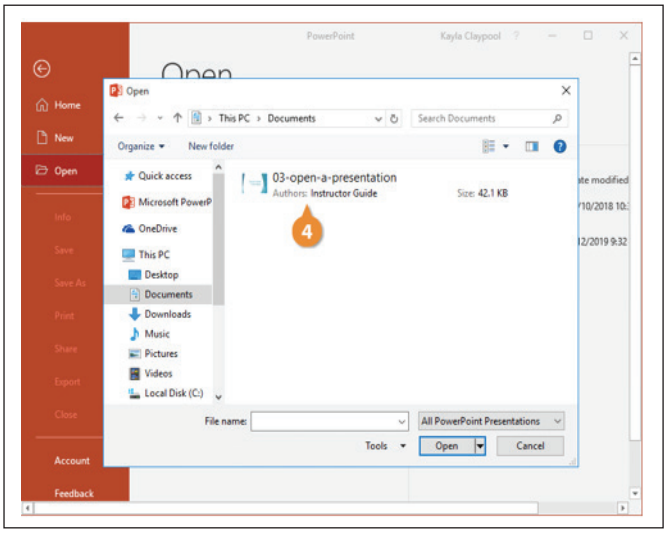
Press **Ctrl + O.**

The Open screen appears and gives you a few ways to find a presentation to open.



3 Select the location where the file is saved.

- Recent displays a list of presentations that you've recently opened.
- Shared with Me displays files others have shared with you on OneDrive or SharePoint Online.
- OneDrive and/or SharePoint let you browse through your files stored on these cloud services, if you have them.
- This PC lets you browse through your Documents folder for files to open.
- Browse opens a dialog box, where you can browse through your computer's folders, drives, and network shares.



4 Locate and double-click the file you want to open.

The presentation opens in PowerPoint and you can begin making edits.

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Format PowerPoint Presentations

Objectives: At the end of this exercise you shall be able to
- **add slides, add titles and text**
- **select slide layouts**
- **add PowerPoint templates**
- **duplicate slides.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

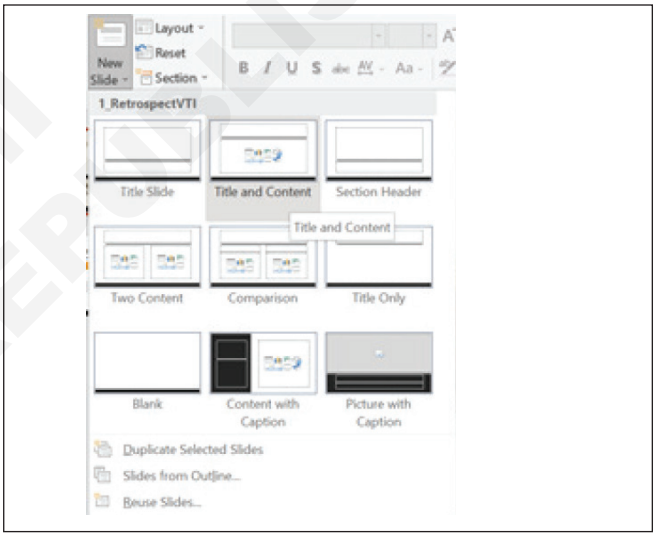
TASK 1: **Add slides**

1 Select the slide you want your new slide to follow.

2 Select Home > New Slide or Ctrl M.

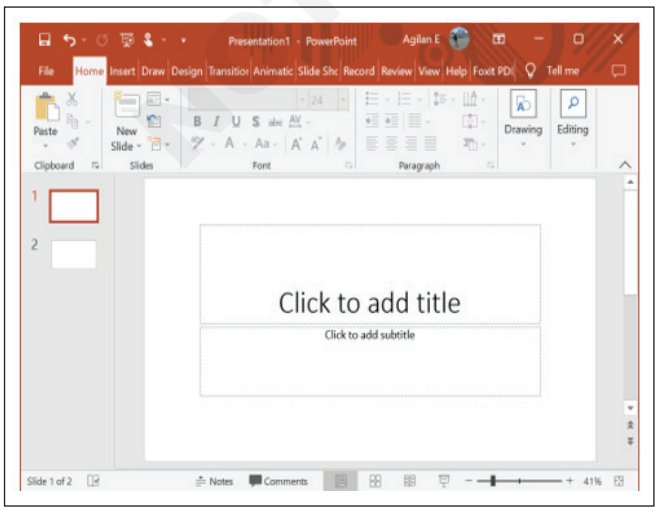
3 Select a Tile and Content Slide layout and choose respective other layouts where ever its required.

4 Then Select the text box and type the required content of the Presentation.

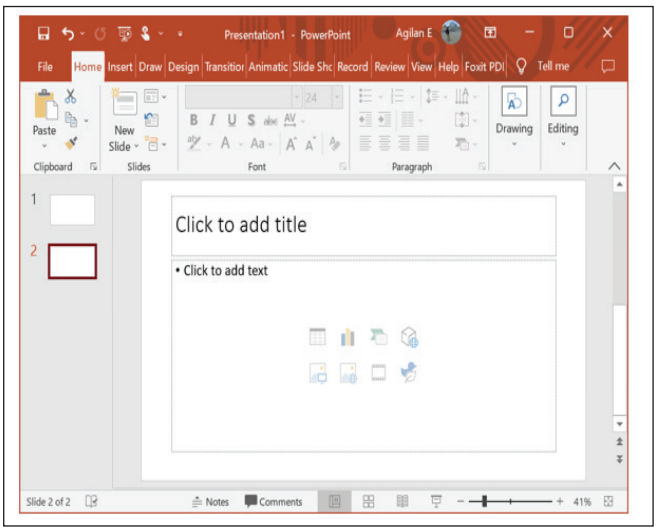


TASK 2: **Add titles and text**

1 From the previous exercise and Tasks add the text into Text boxes where ever its available as Click to add Title and Click to add subtitle in Title Slide:



2 Click to add Title and Click to add text content slide.



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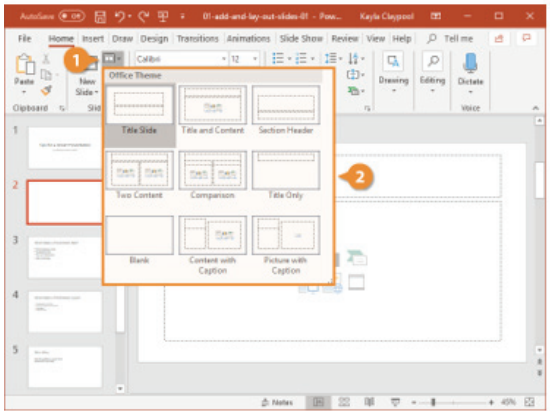
TASK 3: **Select slide layouts**

Change the Slide Layout

If you don't like the layout that has been assigned to the new slide by default, choose a new one. PowerPoint gives you nine different layouts to choose from, and you can even create your own custom layouts.

1 With the slide selected, click the Slide Layout button in the Slides group.

2 Select a new layout.



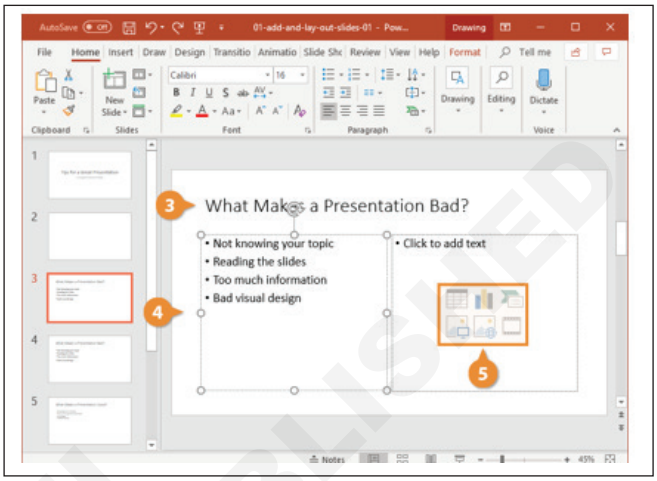
A new slide with the selected layout is inserted into the presentation.

3 Click in the title placeholder and type your text.

4 Click in a content placeholder and type your text.

5 Select a graphic type and insert the desired graphic.

If you later decide to change the layout, the text and pictures are automatically moved and resized according to the new layout.



TASK 4: **Add PowerPoint templates**

Refer EX.1.20.68 – Task 3

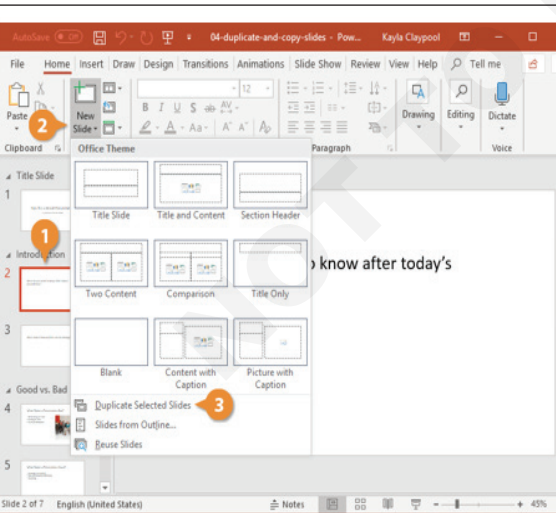
TASK 5: **Duplicate slides**

Duplicate a Slide

1 Select the slide you want to duplicate.

2 Click the New Slide list arrow.

3 Select Duplicate Selected Slides.



Press **Ctrl + D** or right-click the slide and select Duplicate Slide.

The slide is duplicated and is positioned right after the original slide.

Copy a Slide

If you want to create a copy in another spot in the presentation, use copy and paste instead.

1 Select the slide you want to copy.

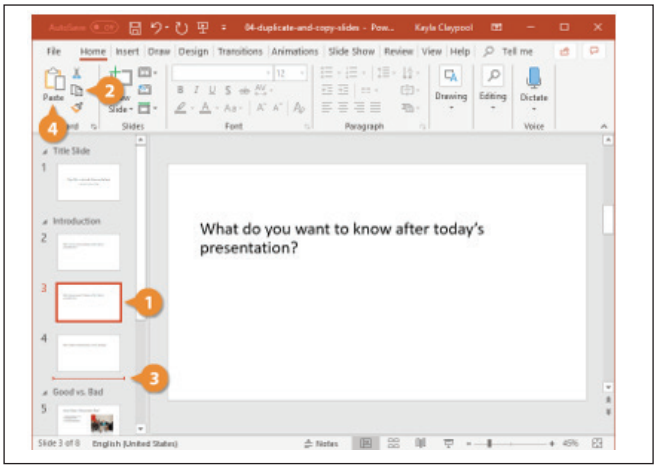
2 Click the Copy button on the Home tab.

Press **Ctrl + C**.

3 Click in a new location in the Thumbnails pane where you want to place the copy.

4 Click the Paste button.

Press **Ctrl + V**.



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Modify slide masters, handout masters, and note masters

Objectives: At the end of this exercise you shall be able to
- **change the slide master theme or background**
- **modify slide master content**
- **modify slide layouts.**

Requirements

Tools/Equipment/Machines

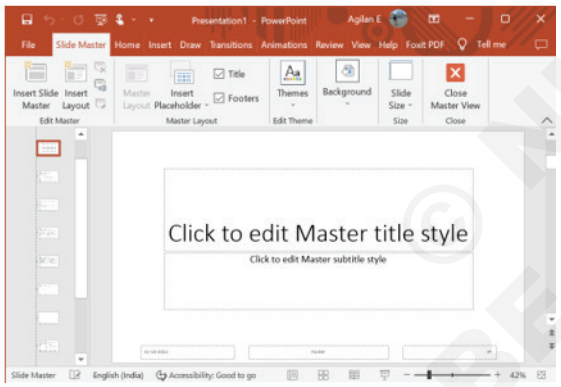
- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

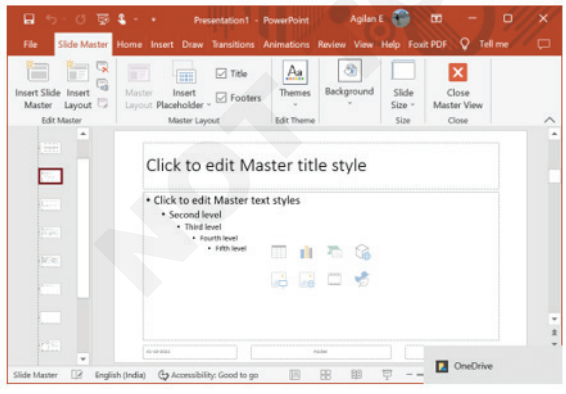
TASK 1: **Change the slide master theme or background**

1 On the View tab, click Slide Master. In Slide Master view, the slide master appears at the top of the thumbnail pane with related layouts beneath it.

Title Slide:

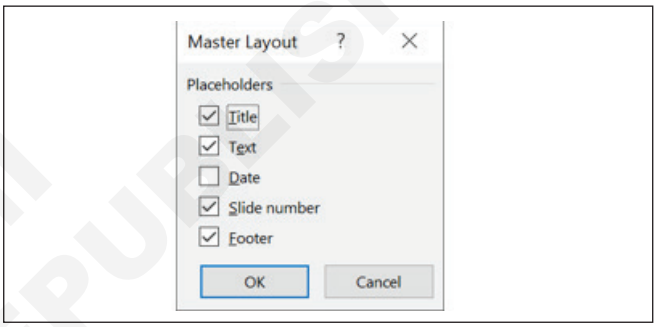


Title and Content Slide:

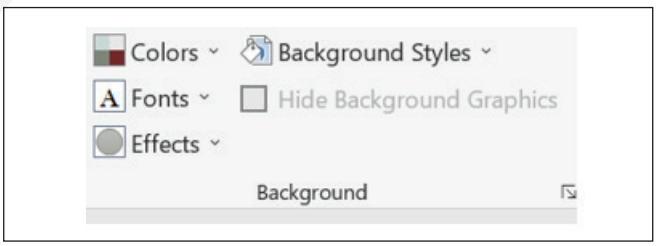


2 Click to select the master slide, and then click Master Layout on the Slide Master tab.

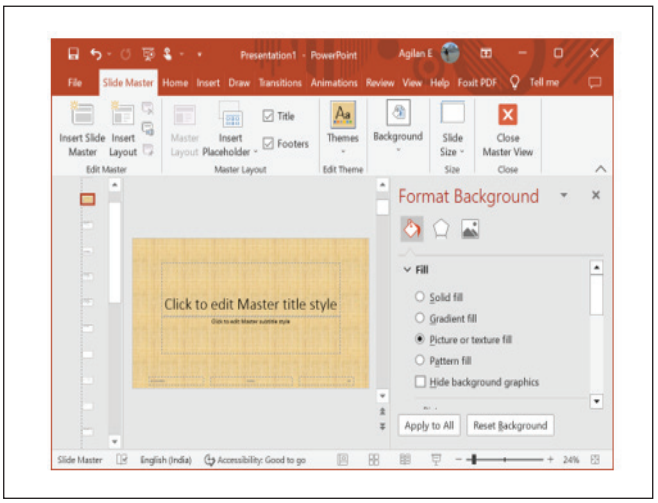
3 To show or hide the title, text, date, slide numbers, or footer placeholders on the slide master, check the boxes to show, or clear the boxes to hide the placeholders.



4 To change the background style, click Background Styles, and then choose a background style.



5 Choose format background to modify the fill of the background.



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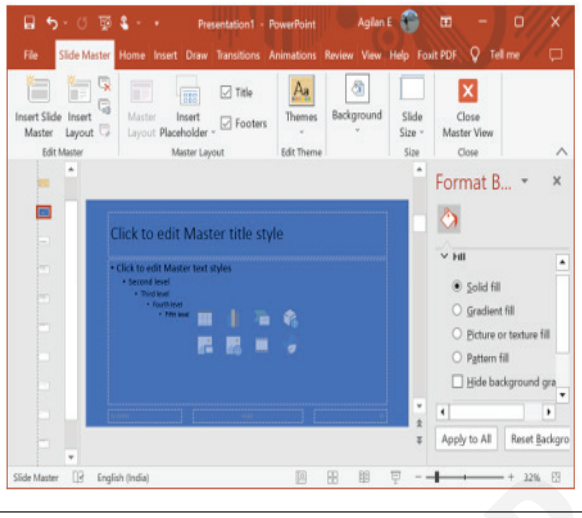
6 On the Slide Master tab, click Close Master View.



TASK 2: **Modify slide master content**

Change the slide master

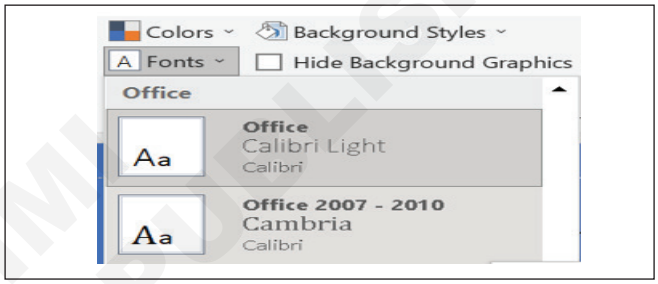
1 Select View > Slide Master.

2 Make the text, color, and alignment changes you want.

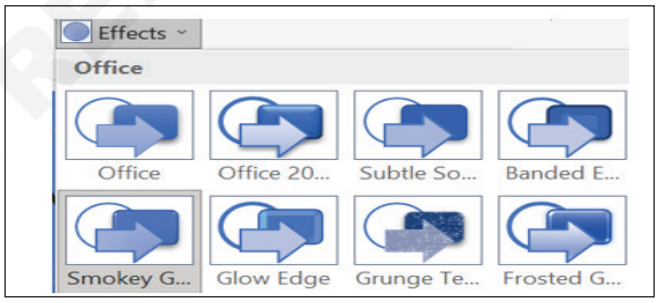
If you want to use a predefined theme, select that first by clicking Themes on the Slide Master tab. Then proceed with selecting Colors, Fonts, Effects, and Background Styles.

Color:

Fonts:



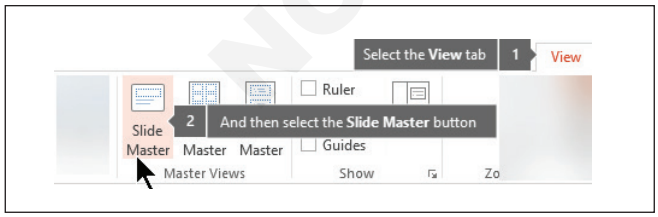
Effect:



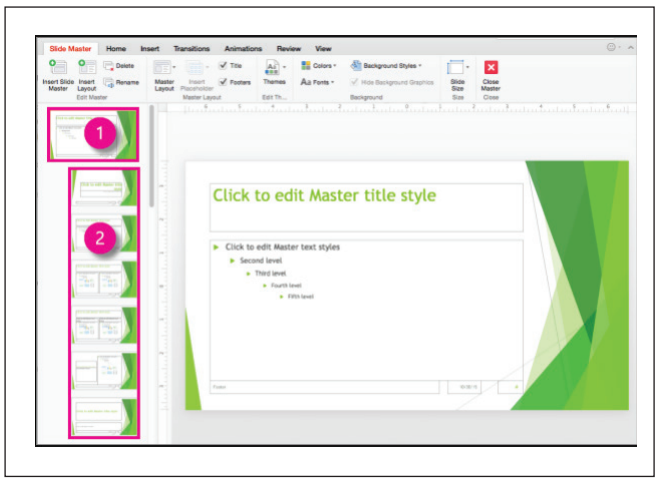
3 When you're done, select Close Master View

TASK 3: **Modify slide layouts**

1 Open Slide Master view, on the **View** tab, select **Slide Master**:



2 Slide master > Layout masters > Choose Layout and Insert or Modify.



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Change presentation options and views

Objectives: At the end of this exercise you shall be able to
- **change slide size**
- **display presentations in different views.**

Requirements

Tools/Equipment/Machines

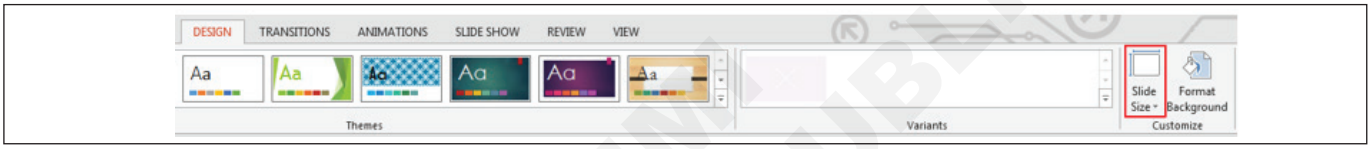
- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

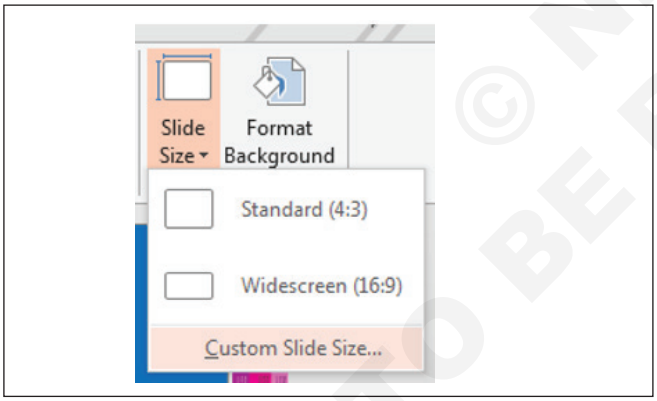
TASK 1: **Change slide size**

Change the slide size

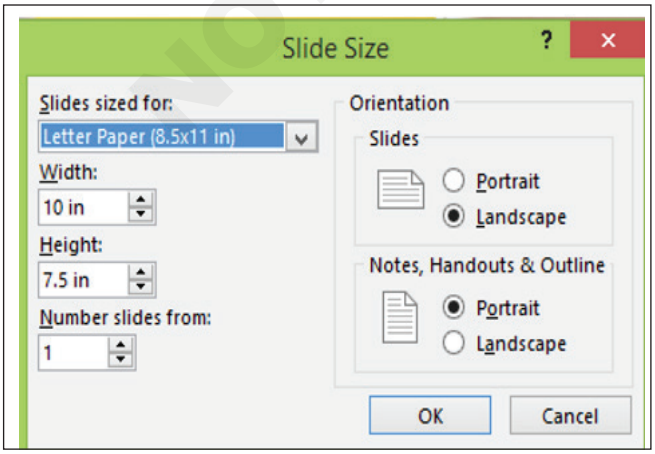
1 On the Design tab, in the Customize group at the far right end, click Slide Size.



2 Click Custom Slide Size.



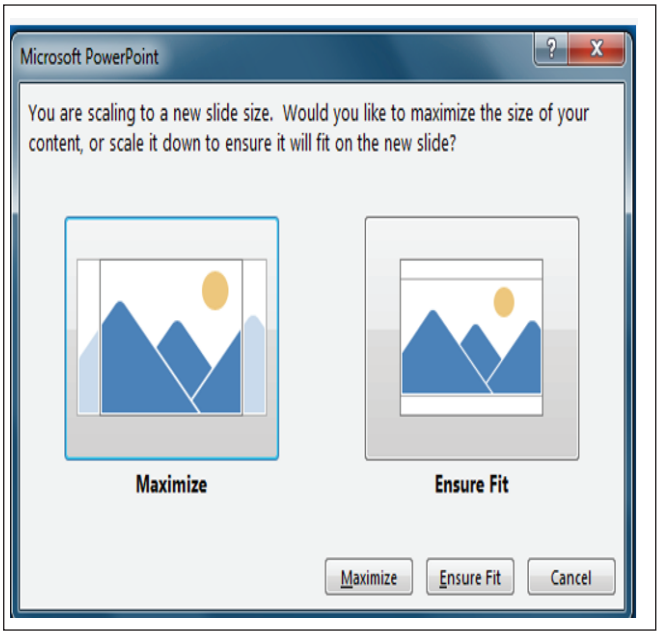
3 In the Slides sized for list, click the size you want to use, or use the Width and Height boxes to select custom sizes.



4 Click OK.

5 PowerPoint now asks you to choose between maximizing the size of your content on the new layout (to do this, click Maximize) or scaling it down so that all of the content fits into the new layout (to do this, click Ensure Fit).

Note: If you choose to maximize, some content might fall outside the print margins.



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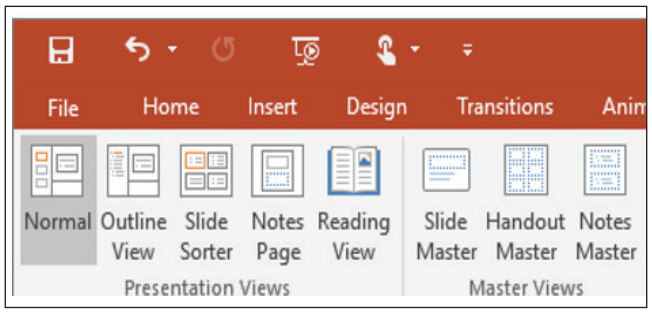
TASK 2: **Display presentations in different views**

You can view your PowerPoint file in a variety of ways. Some views are helpful when you're creating your presentation, and some are most helpful for delivering your presentation.

You can find the different PowerPoint view options on the View tab, as shown below.



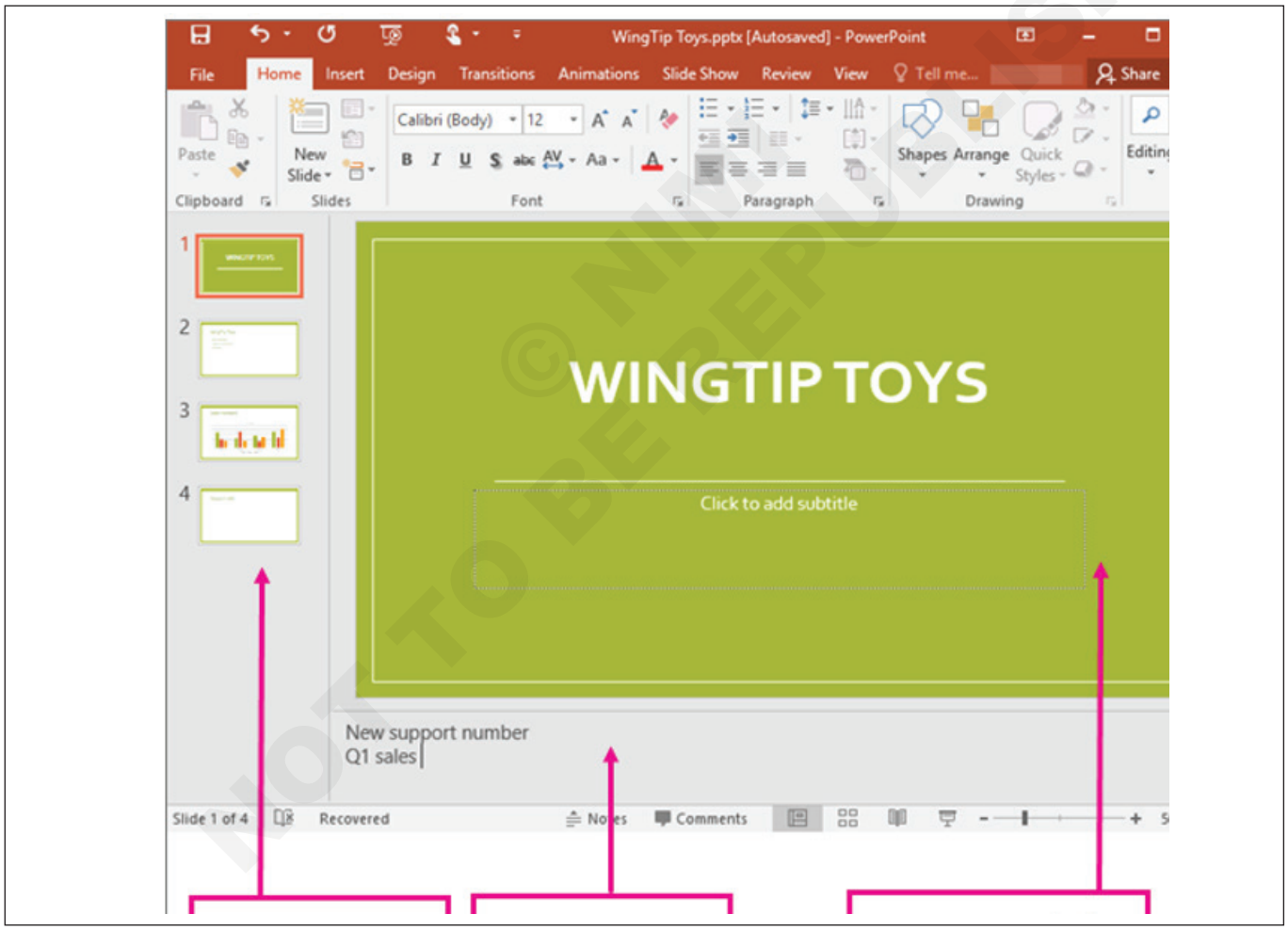
You can also find the most frequently used views on the task bar at the bottom right of the slide window, as shown below.

Views for creating your presentation

Normal view

You can get to Normal view from the task bar at the bottom of the slide window, or from the View tab on the ribbon.

Normal view is the editing mode where you'll work most frequently to create your slides. Below, Normal view displays slide thumbnails on the left, a large window showing the current slide, and a section below the current slide where you can type your speaker notes for that slide.



Slide Sorter view

You can get to Slide Sorter view from the task bar at the bottom of the slide window, or from the View tab on the ribbon.

Slide Sorter view (below) displays all the slides in your presentation in horizontally sequenced, thumbnails. Slide show view is helpful if you need to reorganize your slides—you can just click and drag your slides to a new location, or add sections to organize your slides into meaningful groups.

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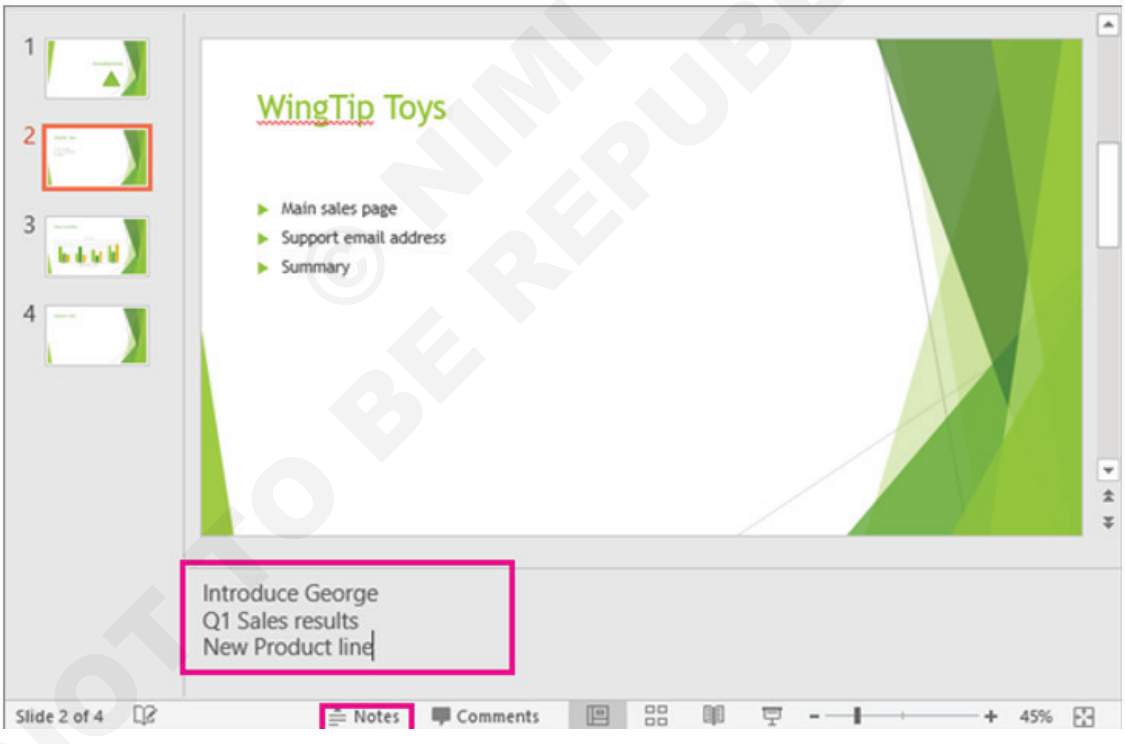
Notes Page view

You can show or hide your speakers notes with the Notes button Notes at the bottom of the slide window, or you can get to Notes Page view from the View tab on the ribbon.

The Notes pane is located beneath the slide window. You can print your notes or include the notes in a presentation that you send to the audience, or just use them as cues for yourself while you're presenting.



Outline view

You can get to Outline view from the View tab on the ribbon. (In PowerPoint 2013 and later, you can no longer get to Outline view from Normal view. You have to get to it from the View tab.)

Use Outline view to create an outline or story board for your presentation. It displays only the text on your slides, not pictures or other graphical items.

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Master views

To get to a master view, on the View tab, in the Master Views group, choose the master view that you want.

Master views include, Slide, Handout, and Notes. The key benefit to working in a master view is that you can make universal style changes to every slide, notes page, or handout associated with your presentation.

Views for delivering and viewing a presentation

Slide Show view

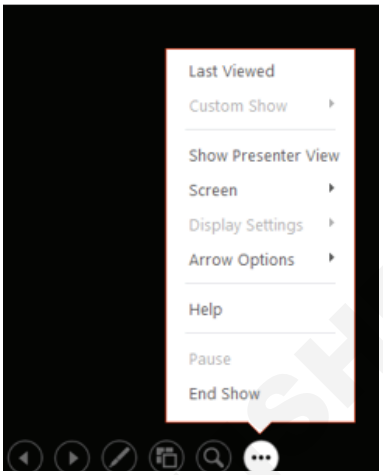
You can get to SlideShow view from the task bar at the bottom of the slide window.

Use Slide Show view to deliver your presentation to your audience. Slide Show view occupies the full computer screen, exactly the way your presentation will look on a big screen when your audience sees it.

Presenter view

To get to Presenter view, in Slide Show view, in the lower left corner of the screen, click , and then click Show Presenter View (as shown below).

Use Presenter view to view your notes while delivering your presentation. In Presenter view, your audience cannot see your notes.



Reading view

You can get to Reading view from the task bar at the bottom of the slide window.

Most people reviewing a PowerPoint presentation without a presenter will want to use Reading view. It displays the presentation in a full screen like Slide Show view, and it includes a few simple controls to make it easy to flip through the slides.

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Save and share PowerPoint Presentations

Objectives: At the end of this exercise you shall be able to
- **save presentations in alternative file formats**
- **configure different Print settings**
- **share presentations electronically.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

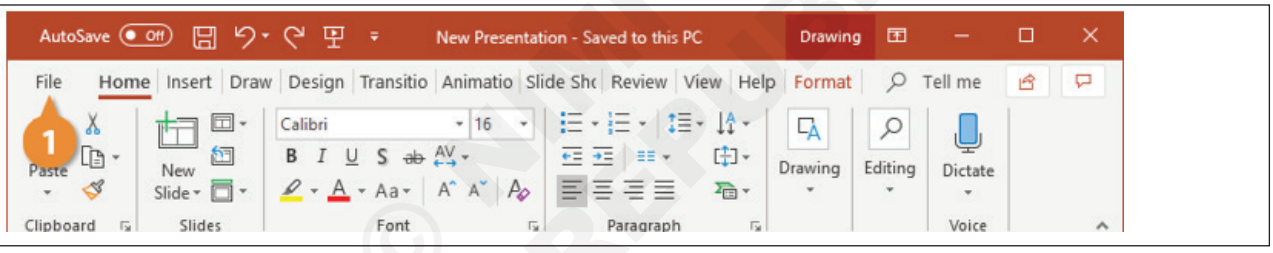
PROCEDURE

TASK 1: **Save presentations in alternative file formats**

Save to Different File Formats

PowerPoint files are normally saved as PowerPoint Presentations, but you can save the information to other file formats as well. For example, you may want to save your file as a **PDF** so that someone who doesn't have PowerPoint can view the presentation.

1 Click the File tab.



2 Click Save As.

3 Choose where you want to save your file.

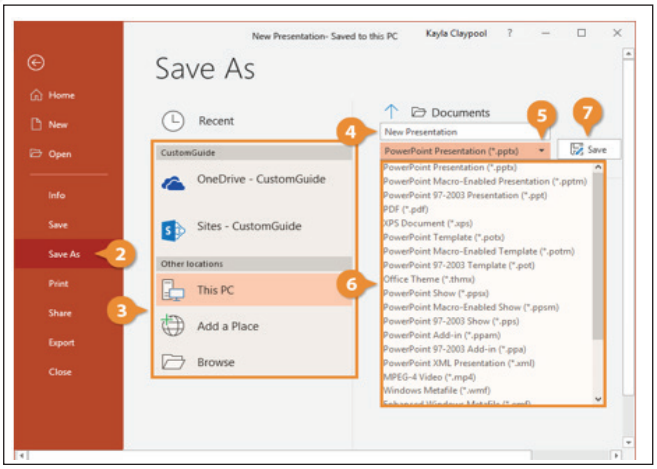
4 (Optional) Enter a new File name.

5 Click the Save as type list arrow.

You can choose to save your presentation as any of the file types in the drop-down list.

6 Select a file format.

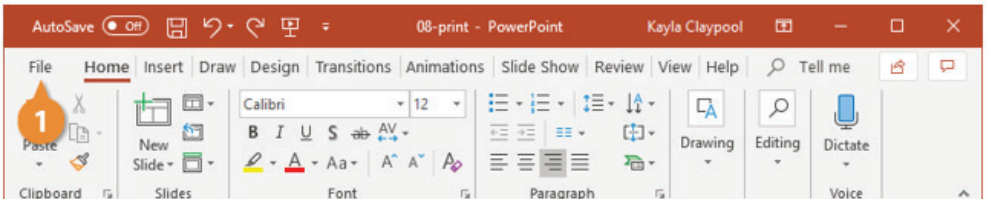
7 Click Save.



TASK 2: **Configure different Print settings**

Once you have created a presentation, and your computer is connected to a printer, you can print a copy. Before you do this, it's a good idea to preview how it's going to look.

1 Click the File tab.



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2 Select Print.

Press **Ctrl + P**.

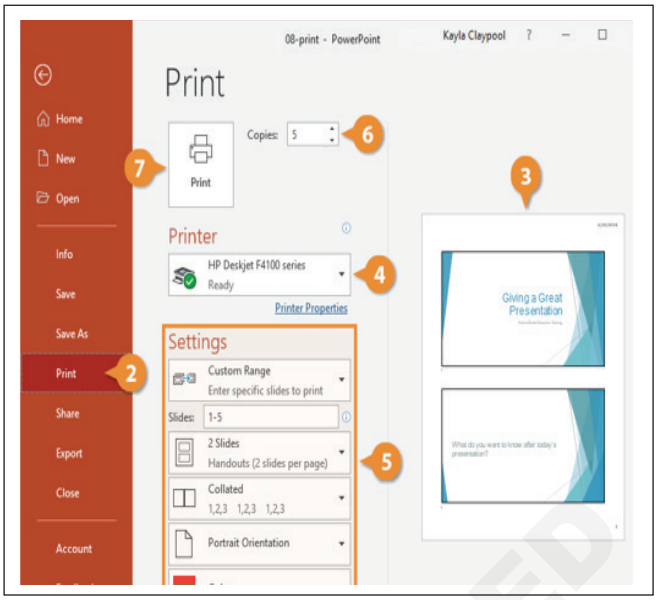
3 Examine the print preview on the right side of the screen, making sure that the preview looks the way you want it.

4 Select the correct printer by clicking the Printer list arrow and selecting it from the list.

5 Adjust the printer settings using the options below the printer, described in the table below.

6 Choose the number of copies in the Copies text field.

7 Click Print.

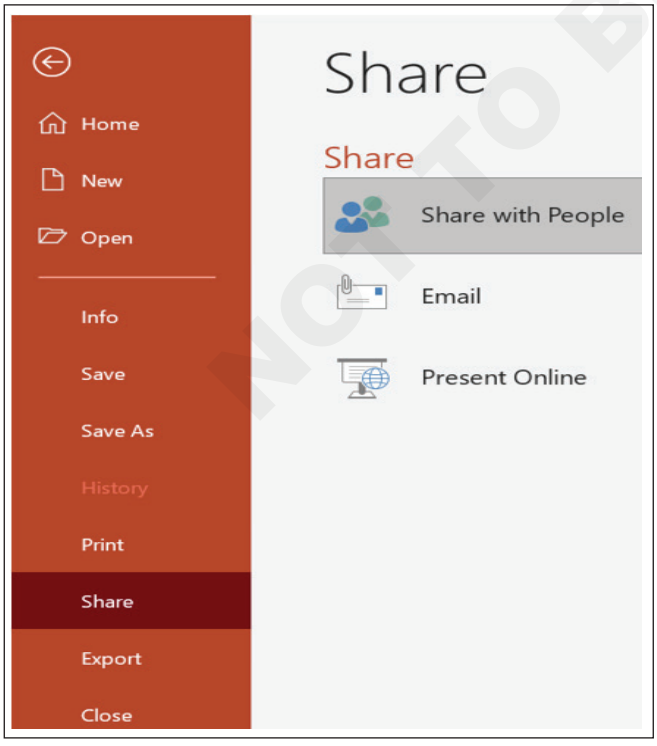


Print Settings	
Print Range	Print the whole presentation, a selection, a certain slide range, a single slide, or a custom range.
Print Layout	Determine what you want to print on each page. You can print a single slide, multiple sides, slide notes, handouts, and more.
Collate	Collating prints multiple copies of the presentation all the way through (1, 2, 3; 1, 2, 3), while printing uncollated prints multiple copies of each slide together (1, 1; 2, 2; 3, 3).
Orientation	Changes the page orientation of the printed page, portrait or landscape.
Color	Select whether to print the presentation in full color, grayscale, or pure black and white.

TASK 3: **Share presentations electronically**

1 Click File > Share.

2 You Can share the document by Share with people or Email or Present Online or Post Blog.



3 If you want to choose the option of Share with People then Save your document in OneDrive Cloud, if it's not already there.

4 The Share window displays if your document is not currently saved in OneDrive. Select the OneDrive option, then name your document and select OK.

Note: Before Sharing, please ensure that Sender and receiver must have Microsoft Outlook Email Account or Microsoft O365 subscribed organization email account.

5 Enter email addresses of the people you want to share with and make choices for permission you want to allow.

6 Type a message if you want, and select Send.

The people you're sharing with will get mail from you, with a link to your document.

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Configure and present slide shows

Objectives: At the end of this exercise you shall be able to
- **hide unwanted slides while presenting**
- **configure slide show options**
- **present slide shows by using Presenter View.**

Requirements

Tools/Equipment/Machines

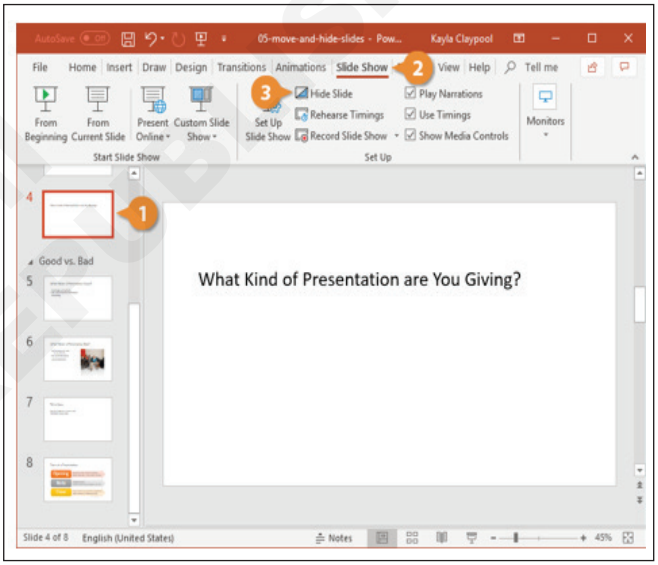
- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Hide unwanted slides while presenting**

Hide a Slide

If you don't want a slide to be included in the final slide show, you can hide it from your audience. It won't show up when you play the slide show, but you will still see it in the editing views so you can bring it back in the future.



1 Select the slide you want to hide.

2 Click the Slide Show tab.

3 Click Hide Slide.

Right-click the slide and select Hide Slide.

The slide number is crossed out, indicating that it is hidden.

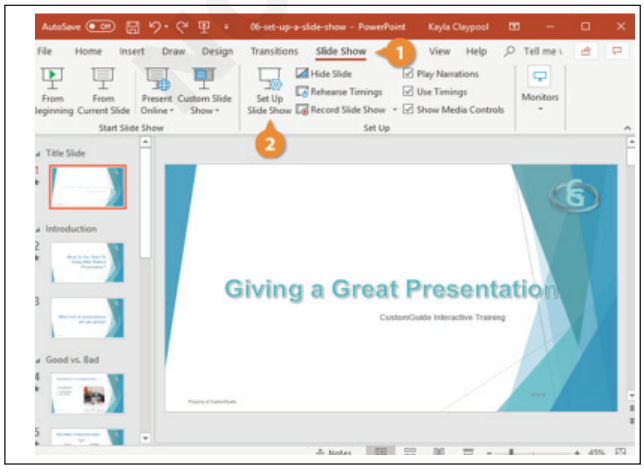
To unhide a slide, select it and then click Hide Slide again.

TASK 2: **Configure slide show options**

Set Up Slide Shows

1 Click the Slide Show tab on the ribbon.

2 Click the Set Up Slide Show button to view more options.



3 Make any desired changes to the settings.

- Show Type: Select the type of presentation you are giving.
- Show Options: Adjust looping, narration, animation, graphics, pen, and laser options.
- Show Slides: Select which slides to show in the presentation.
- Advance Slides: Choose to advance slides manually or automatically.
- Multiple Monitors: Set up for presenting using multiple monitors.

4. Click OK.

Now the slide show will play according to the settings you chose

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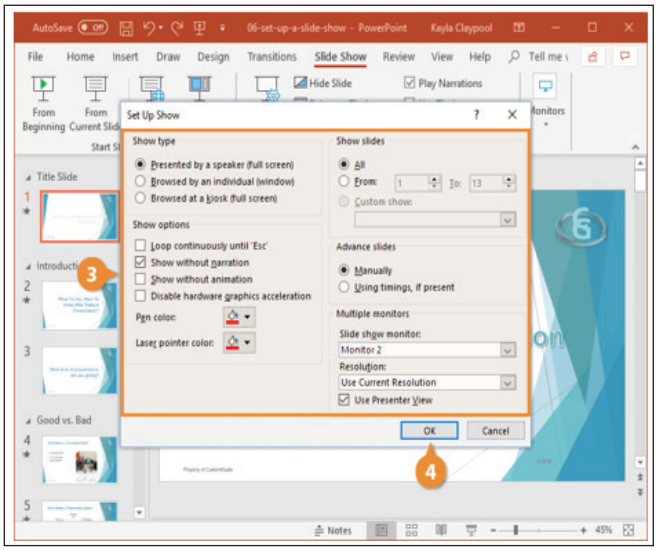
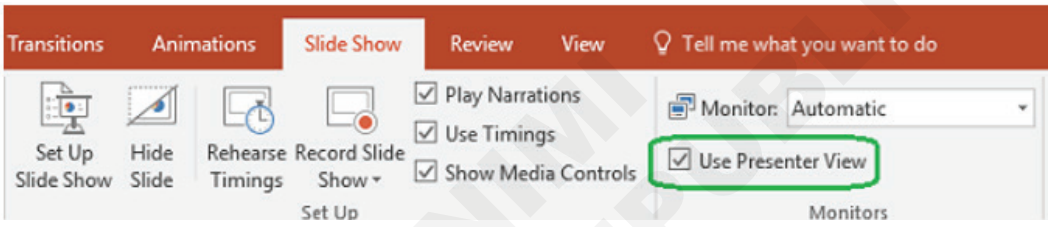


TASK 3: **Present slide shows by using Presenter View**

PowerPoint Presenter View shows you the current slide, the next slide, and your speaker notes, to help you focus while presenting and connect with your audience.

1 Select the Slide Show tab.

2 Select the Use Presenter View checkbox.



3 Select which monitor to display Presenter View on.

4 Select From Beginning or press **F5**.

In Presenter View, you can:

- See your current slide, next slide, and speaker notes.
- Select the arrows next to the slide number to go between slides.
- Select the pause button or reset button to pause or reset the slide timer in the upper left.
- See the current time to help you pace your presentation.
- Select the font icons to make the speaker notes larger or smaller.
- Select the annotations pen icon to draw on the screen in real time, or select a laser pointer.
- Select the thumbnail icon to see all the slides in your presentation and quickly jump to another slide.
- Select the magnifying glass icon to zoom in on a particular part of a slide.
- The screen icon let's you make the screen temporarily black to focus the attention on you.
- Select END SLIDESHOW when you're done presenting.

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Prepare presentations for collaboration

Objectives: At the end of this exercise you shall be able to
- **protect presentations by using passwords**
- **export presentations to other formats.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

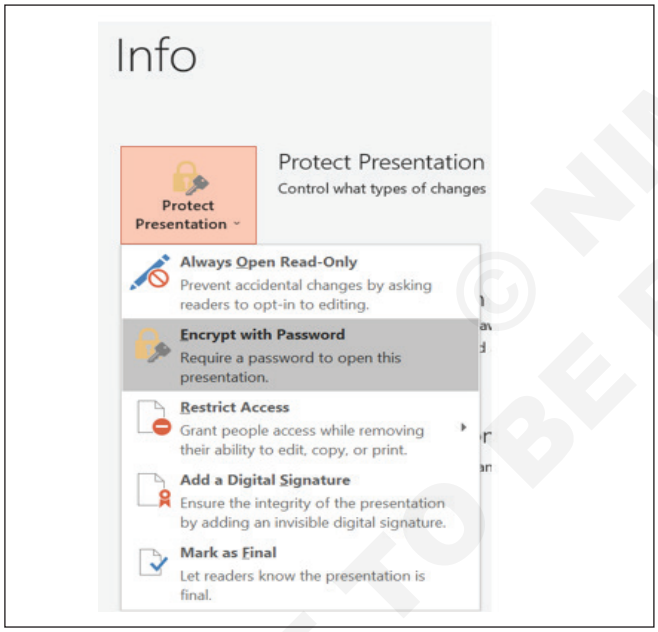
PROCEDURE

TASK 1: **Protect presentations by using passwords**

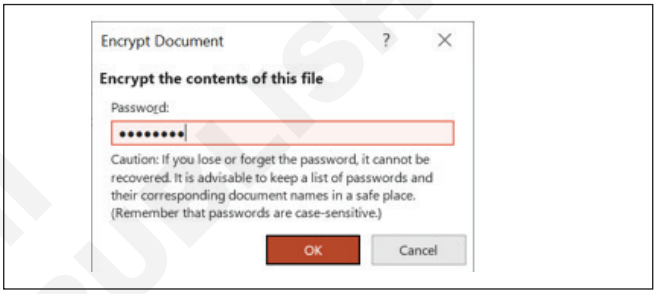
Add password protection to a file

1 Select File > Info.

2 Select Protect Presentation > Encrypt with Password.



3 In the Password box, enter the password you'd like to use. Select OK.



4 PowerPoint prompts you to confirm the password by entering it once more.

5 Save the file to ensure the password takes effect.

Password protection isn't supported in PowerPoint for ODP (Open Document Presentation) files.

Remove a password from a file

Removing a password from a document is a simple process, but you have to know the original password.

1 Open the presentation whose password you want to remove.

2 Select File > Info.

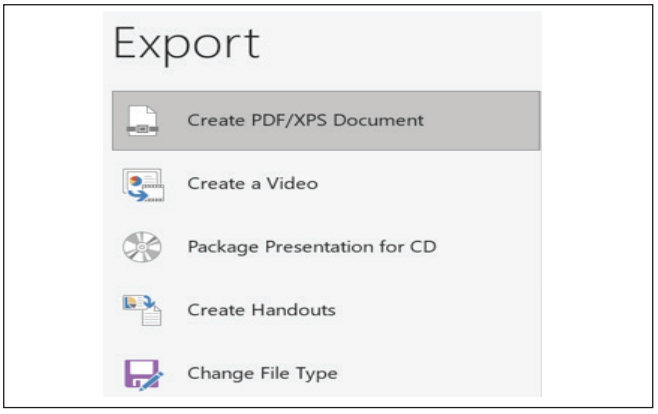
3 Select Protect Presentation > Encrypt with Password.

4 Clear or remove the password in the Password box, and then click OK.

TASK 2: **Export presentations to other formats**

1 File > Export helps you change your presentation into a different format, such as PDF, video, or Word-based handouts. All these options are covered below.

2 If you simply want to "export" a file (in its current .pptx format) to a different storage system, such as a flash drive, plug that flash drive into your computer and use File > Save As (or Save a Copy) to save to that new location.



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Insert text and paragraphs

Objectives: At the end of this exercise you shall be able to
- **find and replace text**
- **insert symbols and special characters**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Find and replace text**

Find Text

Find makes it very easy to find specific words and phrases in a presentation.

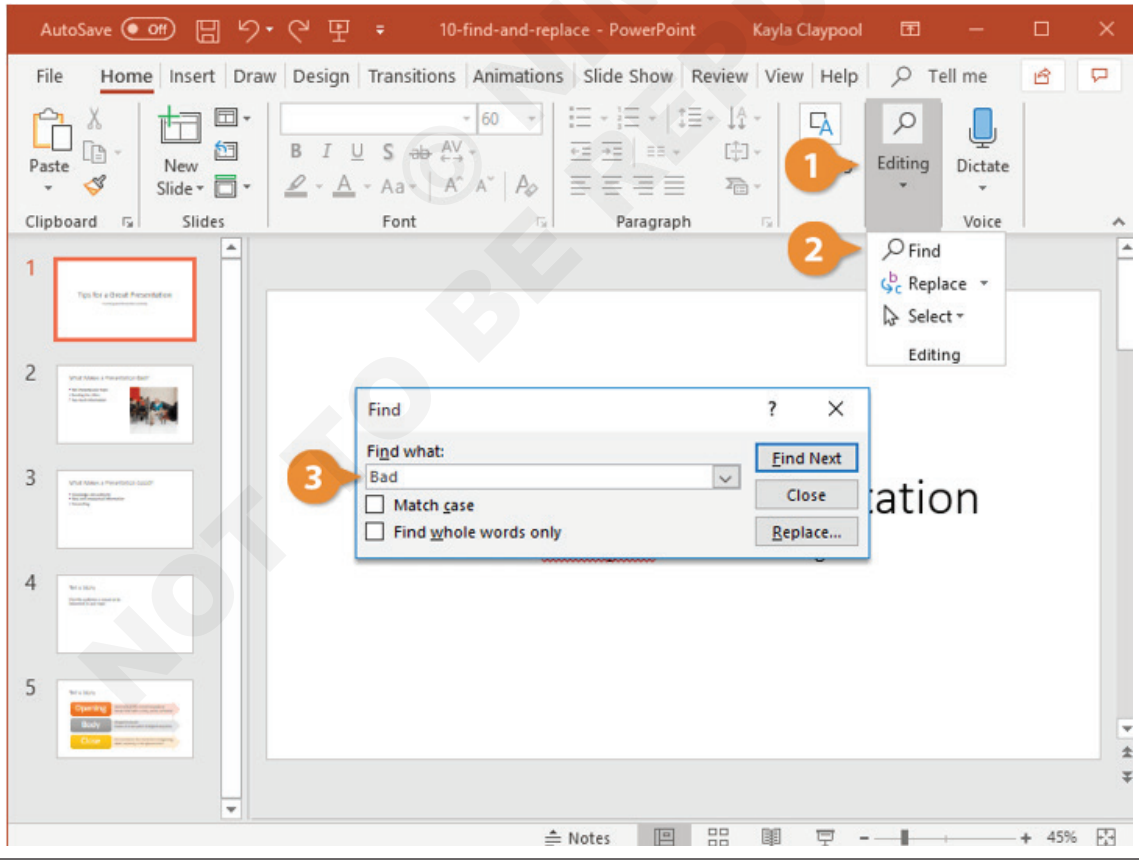
1 If necessary, expand the Editing group on the Home tab.

2 Click the Find button.

Press **Ctrl + F.**

3 Type the text you want to locate in the Find what text box.

If you want to search for a specific case or only whole words, select the check boxes located below the text field.



4 Click Find Next until you find what you need.

5 Click Close when you're finished.

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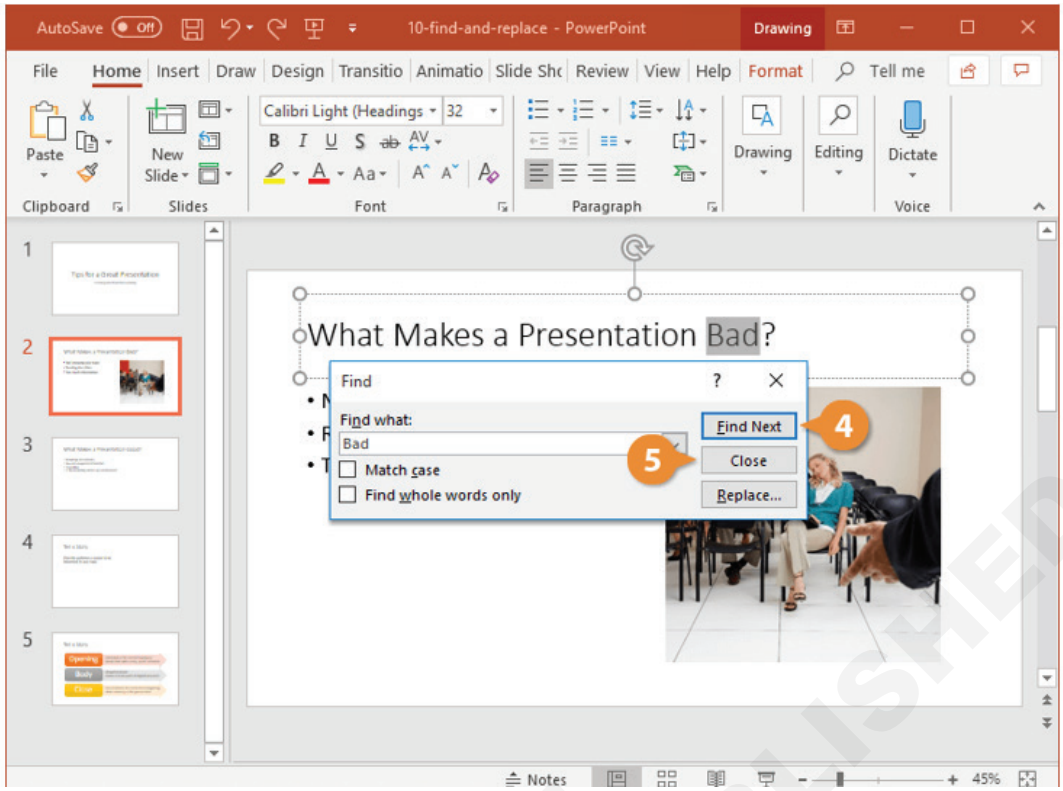


Replace Text

The Replace tool finds specific words and phrases, and then replaces them with something else.

1 If necessary, expand the Editing group on the Home tab.

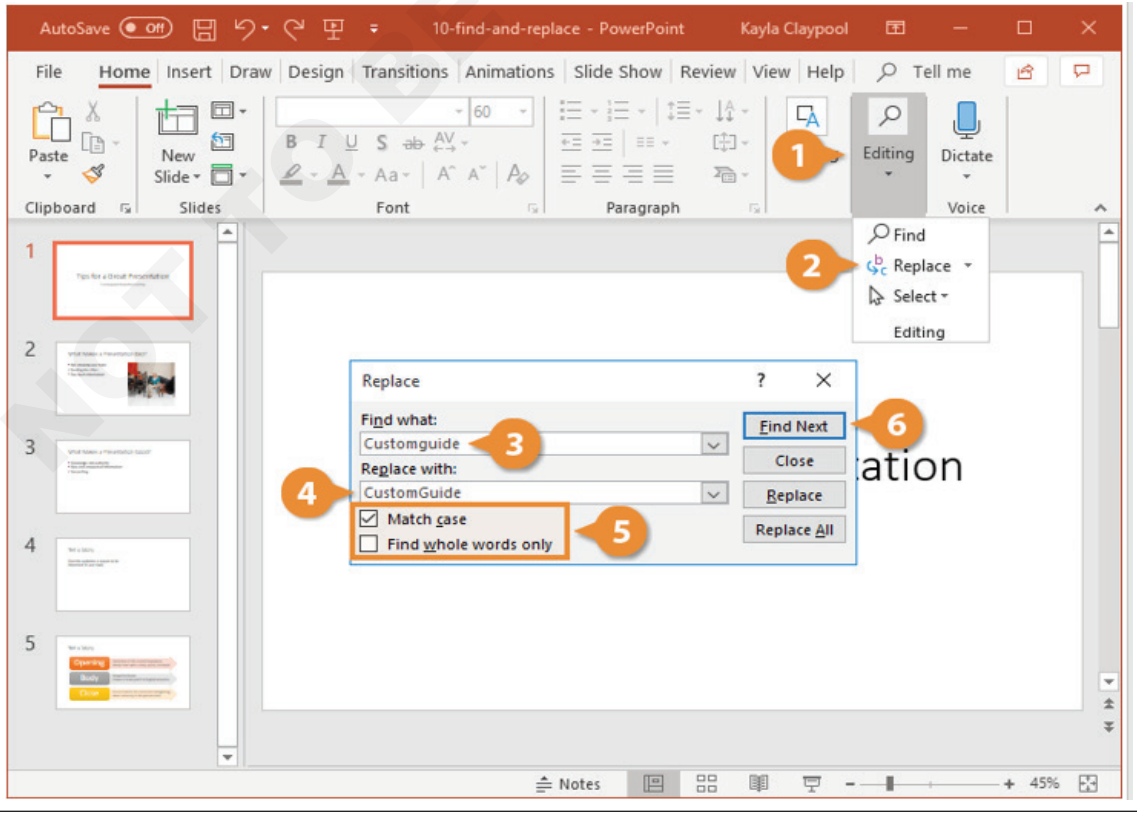
2 Click the Replace button.

3 Type the word you need to replace in the Find what text box.

4 Enter the replacement word in the Replace with text box.

5 If necessary, select a search option.

6 Click Find Next to find the first instance.



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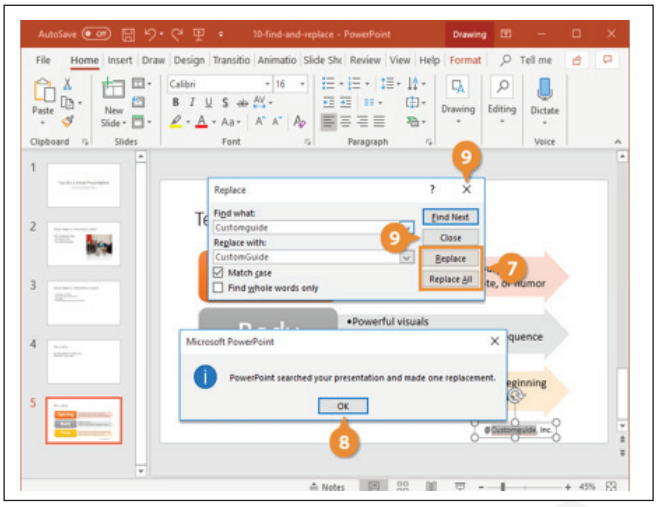
7 Select a replacement option.
   - Replace: Replaces one instance at a time.
   - Replace All: Replaces every instance at once.

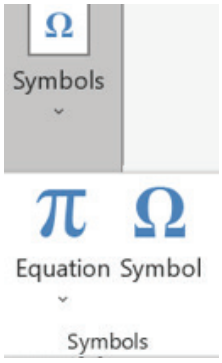
8 (Optional) If you chose Replace All, click OK when the dialog box appears.

9 Click Close when you're done.



TASK 2: **Insert symbols and special characters**

1 Go to Insert > Symbol.

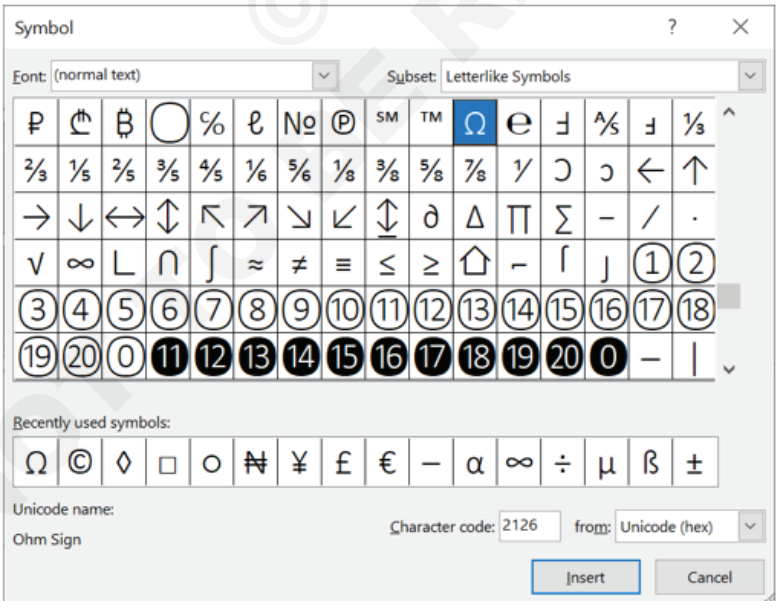


2 Pick a symbol, or choose More Symbols.

3 Choose the Symbol and Scroll up or down to find what you want to insert.

4 When you find the symbol or special character you want, double-click it or choose Insert then symbol will be inserted in your file.

5 Select Close.



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Format text and paragraphs

Objectives: At the end of this exercise you shall be able to
- **apply text effects**
- **apply formatting by using Format Painter**
- **set line and paragraph spacing and indentation**
- **apply built-in styles to text**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Apply text effects**

Change Font Type

One way to emphasize text in a presentation is by changing its font type. A font type is a set of characters with the same design and shape.

1 Select the text you want to change.

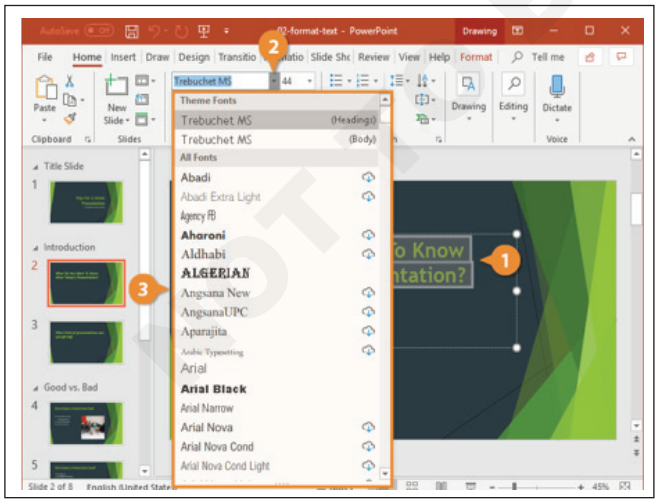
If you want all of text in a text box to change, you can just select the text box.

2 Click the Font list arrow.

Preview a font by hovering over it in the menu.

3 Select a new font.

Use the Font list arrow on the Mini Toolbar that appears near the mouse when you have selected text.



Change Font Size

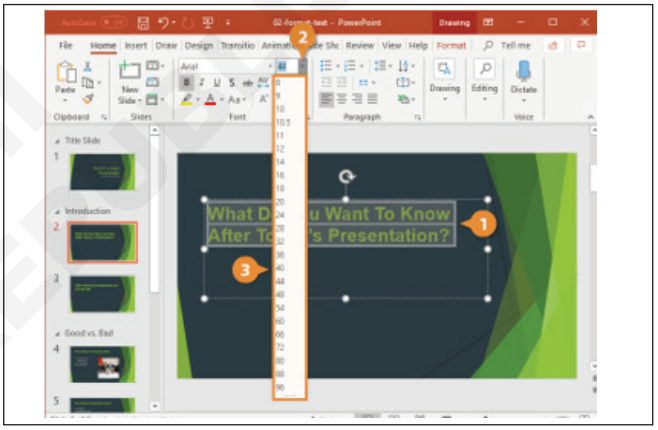
1 Select the text you want to change.

2 Click the Font Size list arrow.

Preview a font size by hovering over it in the menu.

3 Select a font size.

Use the Font Size list arrow on the Mini Toolbar.



Change Font Color

Changing font color is yet another way to emphasize text in a presentation.

1 Select the text you want to change.

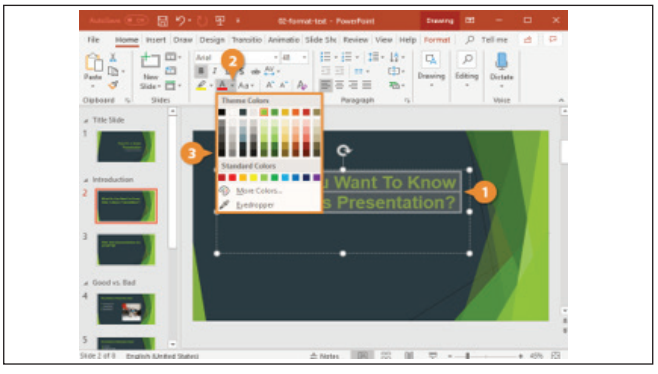
2 Click Font Color list arrow.

The colors that appear at the top coordinate with your current presentation theme.

Preview a font color by hovering over it in the menu.

3 Select a new color.

Use the Font Color list arrow on the Mini Toolbar.



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The Font Color button always displays the color that was used most recently. To quickly apply this color to other selected text, simply click the Font Color button instead of the list arrow.

Apply Text Effects

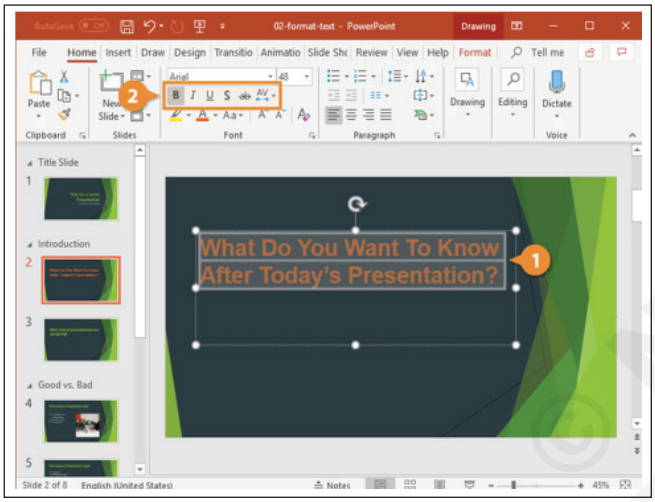
In addition to changing font type, size, and color, you can also emphasize the text in a presentation by changing the text effects. The most common and popular styles are bold, italic, and underline, but other styles such as shadow and strikethrough are also useful.

1 Select the text you want to change.

2 Select a font style like Bold, Italic, or Underline.

Shortcuts

- To bold, **Ctrl + B.**
- To italicize, **Ctrl + I.**
- To underline, **Ctrl + U.**



To remove a font style from selected text, simply click the style button again, or use the Clear All Formatting button.

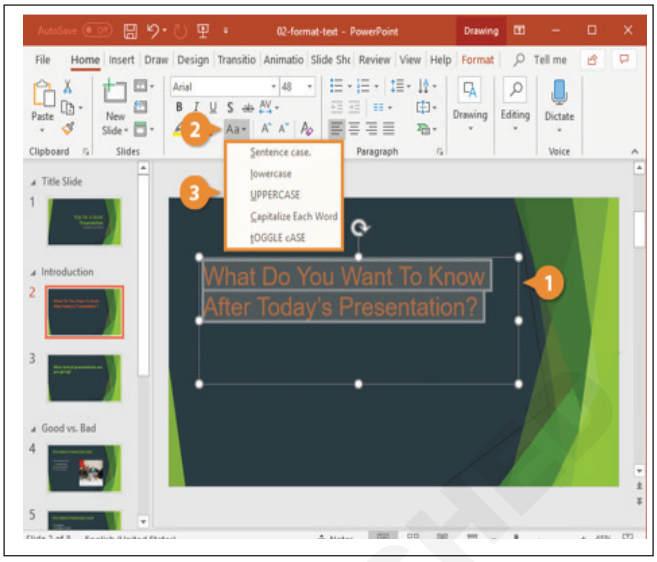
Change the Case

If you want to change the letter case for an entire block of text, it's simple to switch to lowercase, uppercase, sentence case, or capitalize each word without manually changing each letter. You can also reverse the case of selected text with the toggle case option.

1 Select the text.

2 Click the Change Case button.

3 Select a case option.



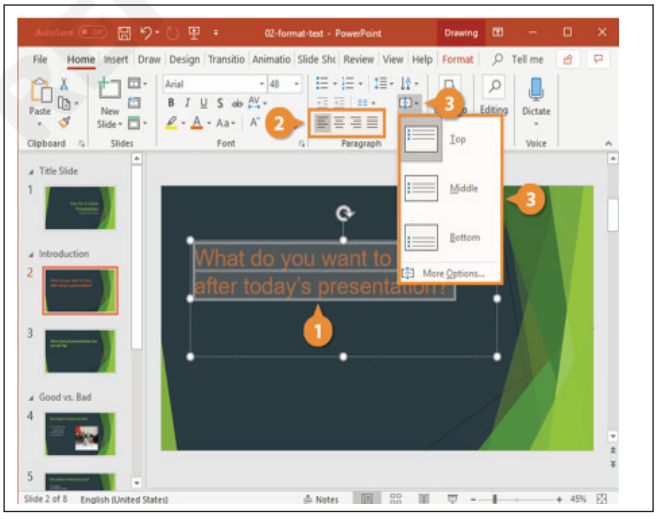
Align Text

There are a couple of different ways to align the text in a text box. You can select from both horizontal and vertical alignment options.

1 Select the text.

2 Select a horizontal alignment option.

3 Select a vertical alignment option.



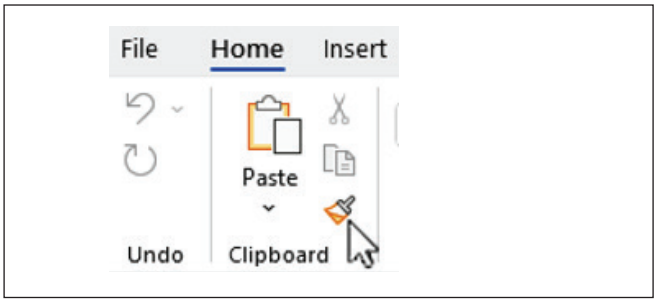
TASK 2: **Apply formatting by using Format Painter**

1 Select the text or graphic that has the formatting that you want to copy.

> **Note: If you want to copy text formatting, select a portion of a paragraph. If you want to copy text and paragraph formatting, select an entire paragraph, including the paragraph mark.**

2 To choose Format Painter:

On the Home tab, select Format Painter in the Clipboard group.



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3 The cursor changes to a paintbrush icon.

4 Use the brush to paint over a selection of text or graphics to apply the formatting. This only works once. To change the format of multiple selections in your document, you must first double-click Format Painter.

5 To stop formatting, press ESC

TASK 3: **Set line and paragraph spacing and indentation**

Line spacing (single-space, double-space, and so on) and vertical alignment (top, bottom, or middle) are available from menu buttons on the Home tab of the Ribbon, in the Paragraph group:

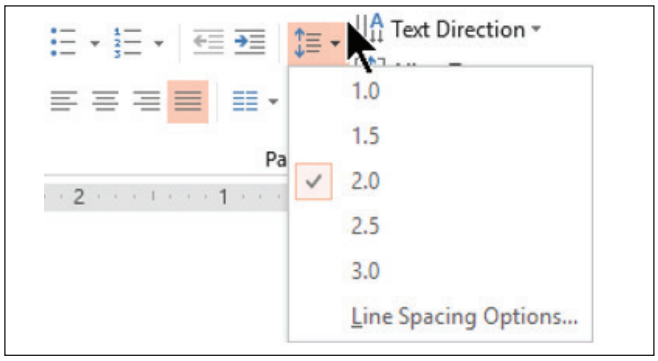


Figure 1: Line spacing

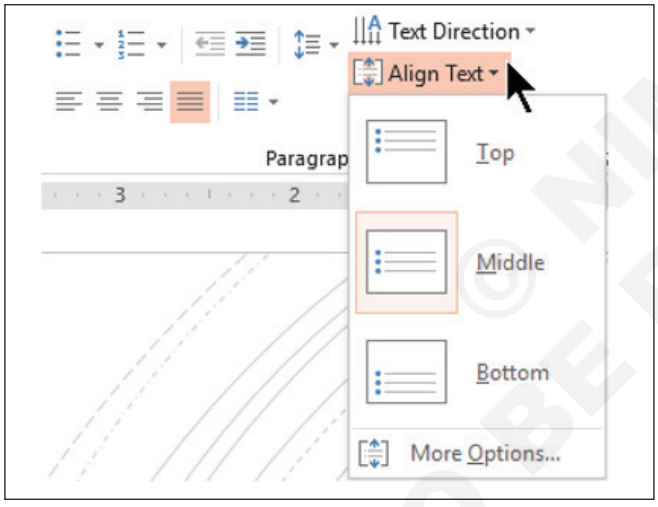
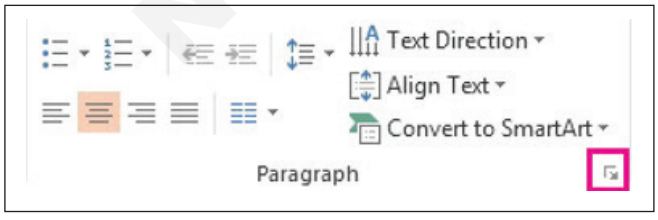


Figure 2: Vertical alignment

There are more detailed spacing options available in the Paragraph dialog box:

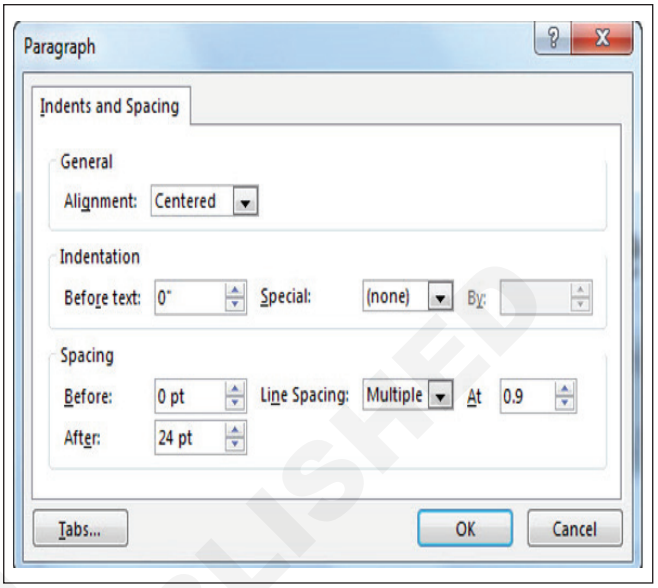
1 On the slide, select the text that you want to change.

2 Click Home, and in the Paragraph group, click the dialog box launcher.



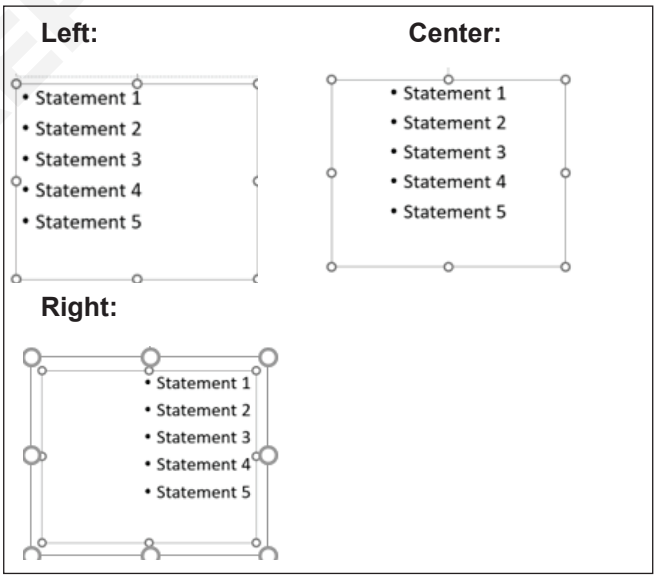
The Paragraph dialog box appears:

Here are the options available in the dialog box:



Alignment

- To change the horizontal placement of text, in the Alignment box, choose Left, Center, Right, Justified, or Distributed.



Indentation

- To add indentation or change the amount of indentation before text.
- Select the text you want to change, then do one of the following:
- To increase or decrease the left indent of the whole paragraph, on the Home tab, in the Paragraph group, click Increase List Level or Decrease List Level.

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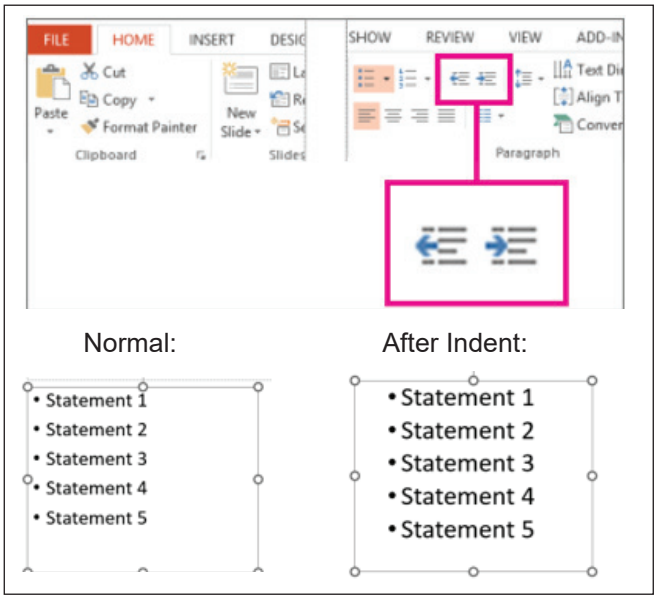
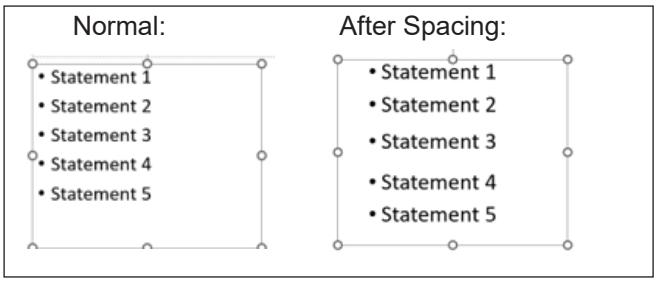


Spacing

- To change the spacing above or below a paragraph, type or click the arrows next to Before or After. This number can be any whole number or a decimal, such as 6.5.
- To change the spacing above and within a paragraph, use the Line Spacing options: Single, 1.5 Lines, or Double. Or select Exactly and then add a point value (between 0 and 1584) in the At box.



Note: If you keep adding lines until you run out of room in a placeholder, AutoFit adjusts line spacing and font size to fit all list items in the placeholder. When this happens, the AutoFit Options control appears. To turn off AutoFit, click AutoFit Options, and then click Stop Fitting Text to This Placeholder.

TASK 4: **Apply built-in styles to text**

Insert WordArt

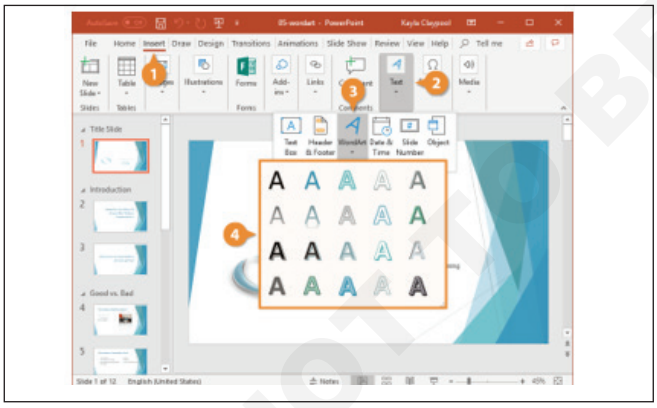
1 Click the Insert tab.

2 Expand the Text group on the ribbon.

3 Click WordArt.

A gallery of WordArt options appears.

4 Choose a WordArt style.



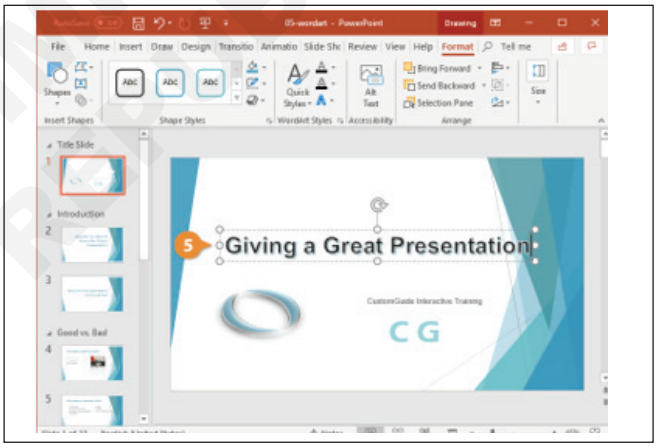
To change the WordArt style of selected text, click the Format tab, select Quick Styles, and make a selection.

5 Type to replace the placeholder text.

You can also modify your WordArt text using the options in the Font group on the Home tab.

Format WordArt

You can also format WordArt after it has been inserted. For example, you can change the text fill and outline color, choose a new WordArt style, or apply a text effect.

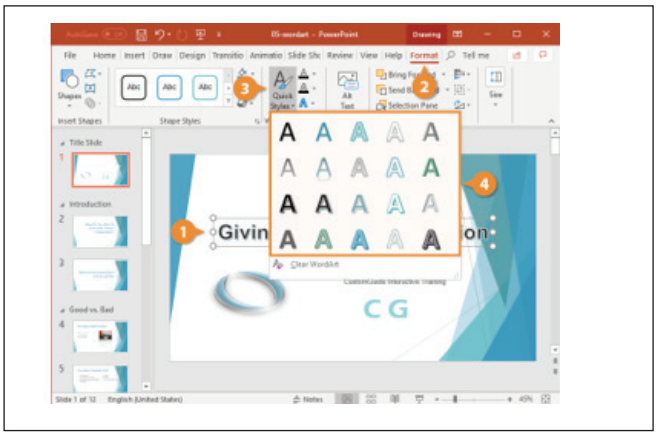


1 Select the WordArt.

2 Click the Format tab.

3 In the WordArt Styles group, click Quick Styles.

4 Select another style.



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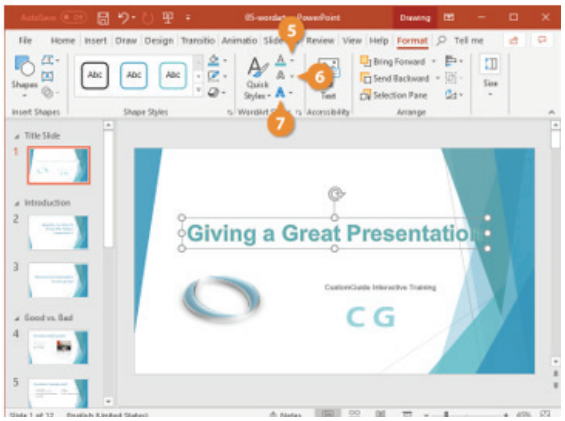
5 Click the Text Fill list arrow and select an option to change the fill.

You can fill WordArt with pictures, gradients, and textures, or you can simply pick a solid color.

6 Click the Text Outline list arrow and select an option to change the outline.

7 Click the Shape Effects button and select an option to add a shape effect.

You can apply as many effects as you want, but a simple look usually works best.



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Create and configure sections

Objectives: At the end of this exercise you shall be able to
- **format text in multiple columns**
- **text and image presentation styles**
- **clear formatting**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Format text in multiple columns**

Add Multiple Columns

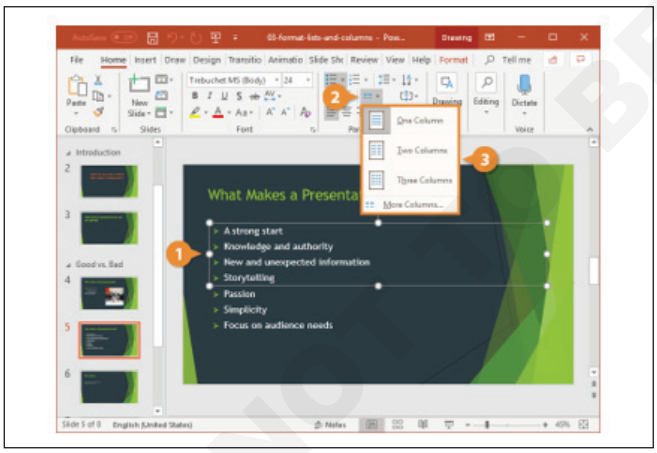
When you have text on a slide, PowerPoint automatically puts it in one column, but you can break it into multiple columns if that's more fitting.

1 Select the text box with items you wish to convert to columns.

Even if text flows outside of a text box, it doesn't automatically break into columns.

2 Click the Add or Remove Columns button on the Home tab.

3 Select a column option.

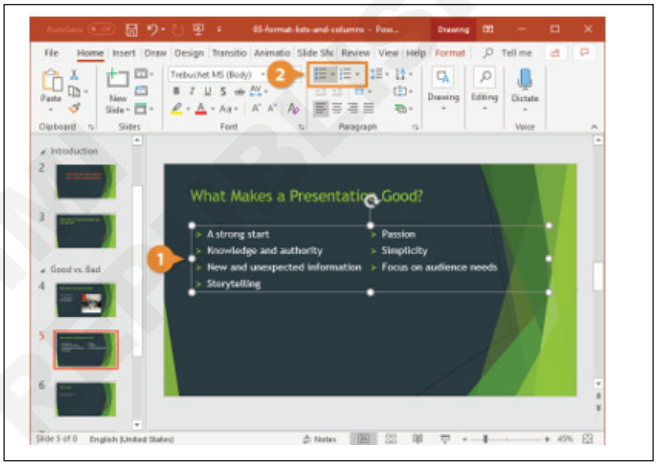


Numbered and Bulleted Lists

Use bulleted lists when the order of items in a list doesn't matter, such as listing items you need to buy. When the sequence of items in a list does matter, such as to present step-by-step instructions, use a numbered list instead.

1 Select the text box with the items you wish to convert to a list.

2 Click the Numbering button or the Bullets button.



To remove bullets and numbering from a list, select the list and click the Bullets or Numbering button in the Paragraph group.

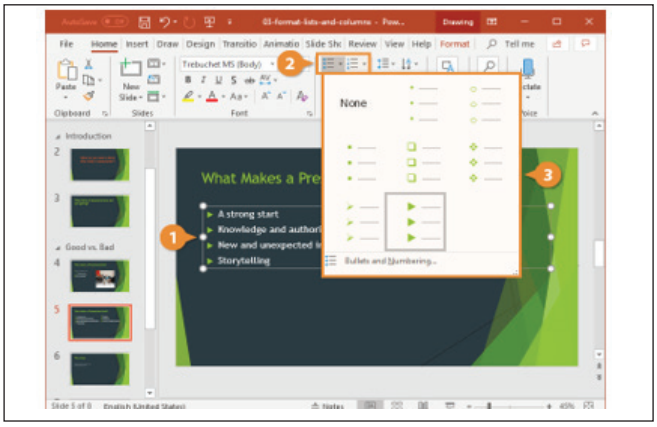
Change the List Style

If you don't like the bullet character or number style that has been assigned to your list by default, you can always change it.

1 Select the items with the style you wish to change.

2 Click the Numbering or Bullets button list arrow.

3 Select a new style.



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The new bullet character or number style is applied to the selected paragraph(s).

Keyboard Shortcuts for Working with Lists

Keystroke	Action
Enter	Inserts a new paragraph with the same formatting as the previous one.
Tab	Demotes the paragraph one level.
Shift + Tab	Promotes the paragraph one level.

TASK 2: **Text and image presentation styles**

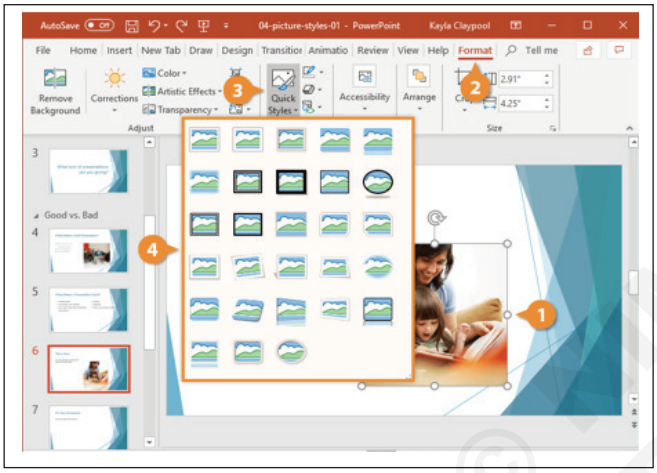
Choose a image Style

1 Select the picture.

2 Click the Format tab on the ribbon.

3 Click the Quick Styles button in the Picture Style group.

4 Select a style.



Modify a Style

After a style has been applied, modify different elements of the preset style for a more customized look.

1 Select the picture.

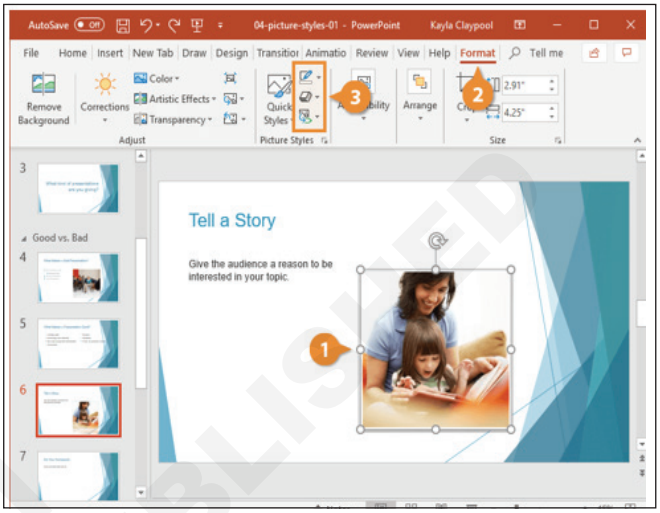
2 Click the Format tab on the ribbon.

3 Use the tools in the Picture Styles group to edit the picture style.

- **Picture Border:** Adjust the border color and thickness.
- **Picture Effects:** Add or remove complicated effects like glow and bevel.
- **Picture Layout:** Add text and reshape the picture to create SmartArt.

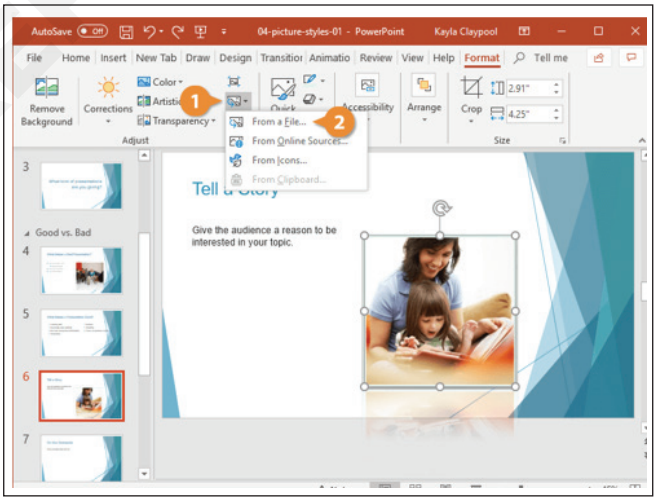
Change the Picture

You can swap one picture for another while keeping any of the picture style options that are already applied.



1 With the picture selected, click the Change Picture button in the Adjust group on the Format tab.

2 Select the type of picture you want to insert.



3 Navigate to and select a new picture.

4 Click Open or Insert.

The picture is swapped out, but the style remains the same.

TASK 3: **Clear formatting**

Undo formatting

Select Undo to undo the last formatting change.

Clear All Formatting

1 Select the text with the formatting you want to clear.

2 Select Home > Clear All Formatting or press Ctrl + Spacebar.

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Create tables

Objectives: At the end of this exercise you shall be able to
- **insert tables in PowerPoint**
- **apply built-in table styles**
- **create tables by specifying rows and columns**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

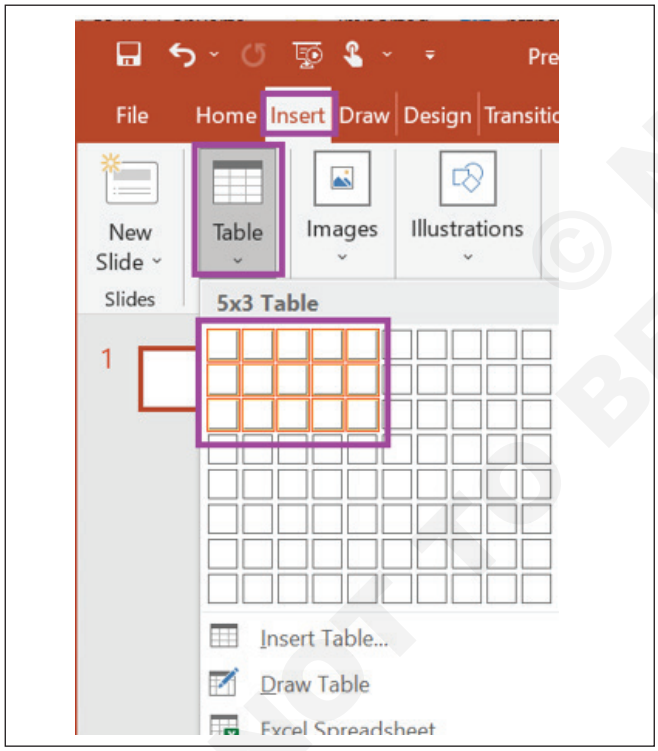
PROCEDURE

TASK 1: **Insert tables in PowerPoint**

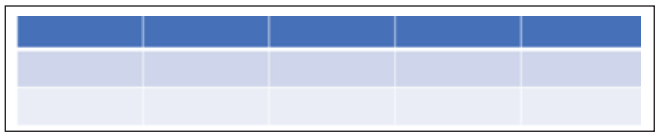
Create a table of up to 10 columns and 8 rows

1 Select the slide that you want to add a table to.

2 On the Insert tab, select Table.

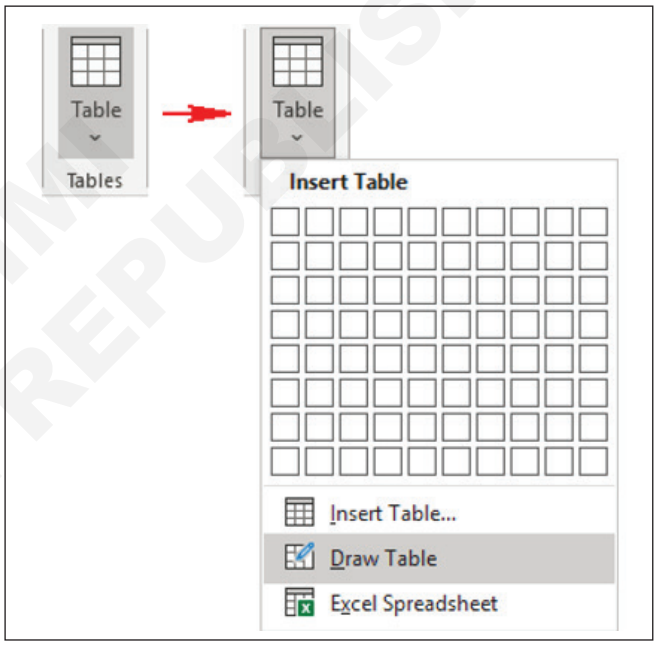


3 Move or drag the cursor right (to select columns) and down (to select rows) the grid to select as many cells as you need (5 X 3) to create the table.



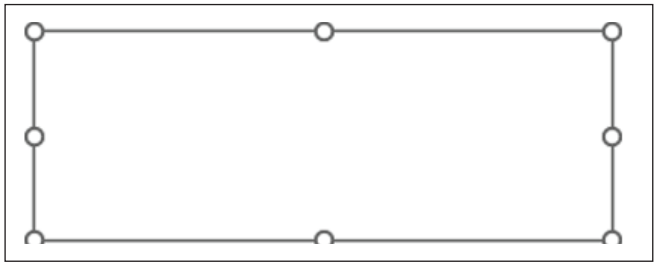
Draw a table

To manually create an empty table, on the Inserts tab, in the Tables group, click the Table button, then select Draw Table from the dropdown list:



The cursor changes to the pencil that allows drawing cells directly on the slide:

1 Hold the mouse button and move the pencil cursor to draw a rectangle that will be the outer frame of a new table:



After releasing the mouse button, the outer frame of a new table appears, and PowerPoint displays the Table Design and Layout tabs:

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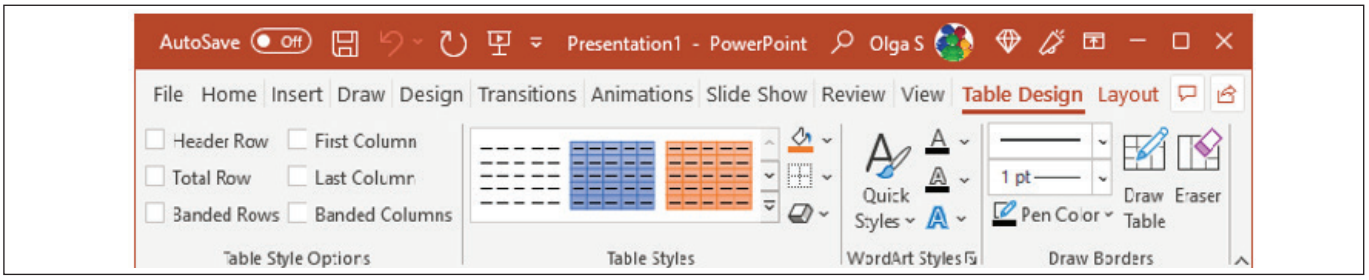
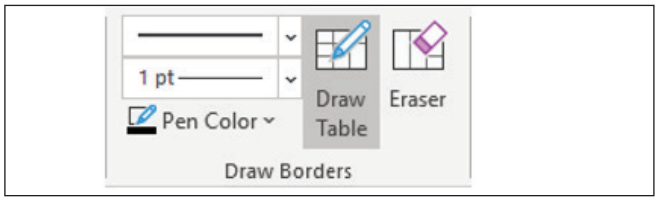
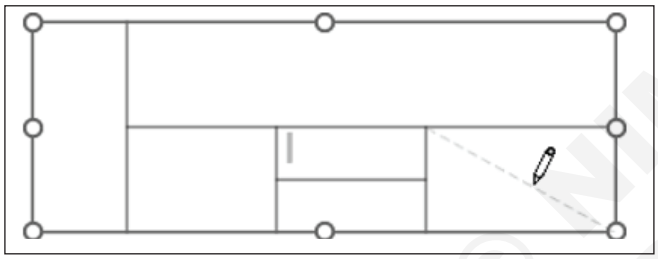


2 On the Table Design tab, in the Draw Borders group, click the Draw Table button to re-enable the drawing if it is not already enabled:

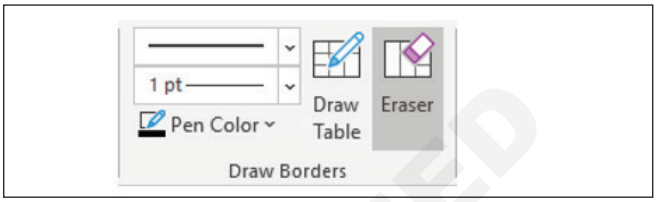


3 Press the mouse button and move the pencil cursor to draw the desired rows and columns.

When you start moving the cursor vertically or horizontally, PowerPoint tries to keep the line straight and exactly vertical or horizontal, or diagonal between two corners of existing cells.



Note: If you draw a line in the wrong way, click the Eraser button in the Draw Borders group of the Table Design tab to remove it:



4 To stop drawing, do one of the following:

- Click the Draw Table button again,
- Click anywhere on a slide outside the table,
- Press Esc

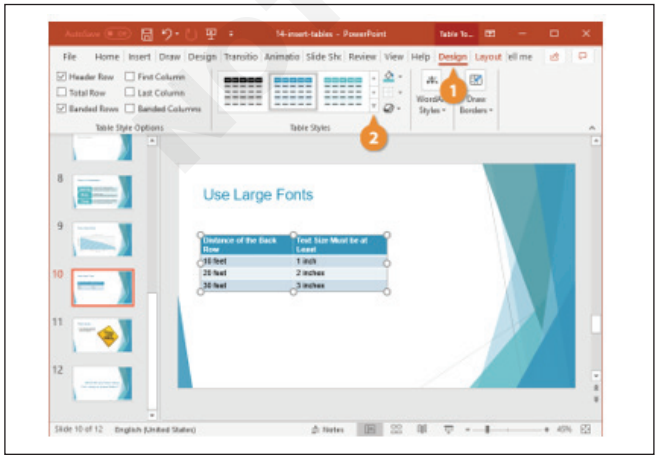
TASK 2: **Apply built-in table styles**

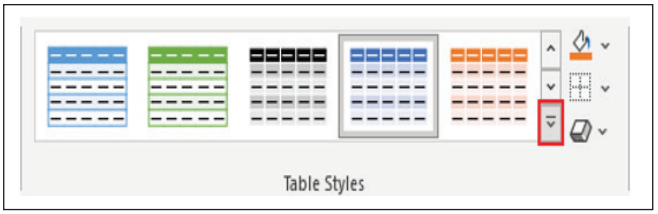
Format Table

Formatting a table is an easy way to spice up its appearance. A table style is a set of different formatting commands that can be applied to a table in a single step.

1 With the table selected, click the Design tab under Table Tools.

2 Click the Table Styles gallery More button.





3 Select a new table style.

4 Click an option in the Table Style Options group:

- **Header Row:** Specifically formats the top row of the table to stand out from the other table rows.
- **Total Row:** Displays special formatting for the last row of the table.
- **Banded Rows:** Formats even rows differently than odd rows to make the table data easier to read.
- **First Column:** Displays special formatting for the first column of the table.
- **Last Column:** Displays special formatting for the last column of the table.
- **Banded Columns:** Formats even columns differently than odd columns to make the table data easier to read.

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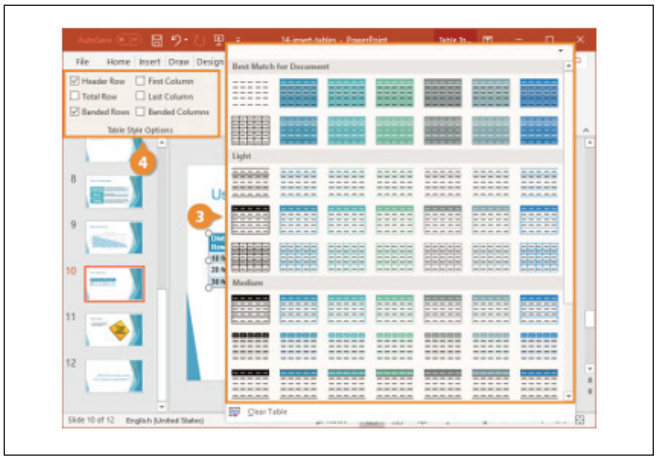
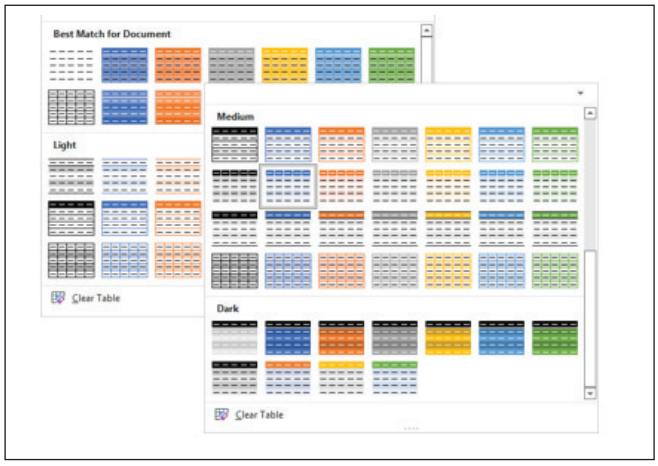




If you want to further customize the table formatting, select specific cells or cell ranges and use the Shading, Borders, and Effects buttons in the Table Styles group.

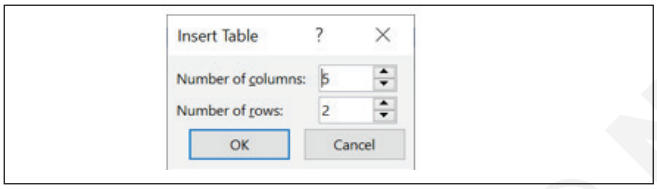
TASK 3: **Create tables by specifying rows and columns**

Insert a Table

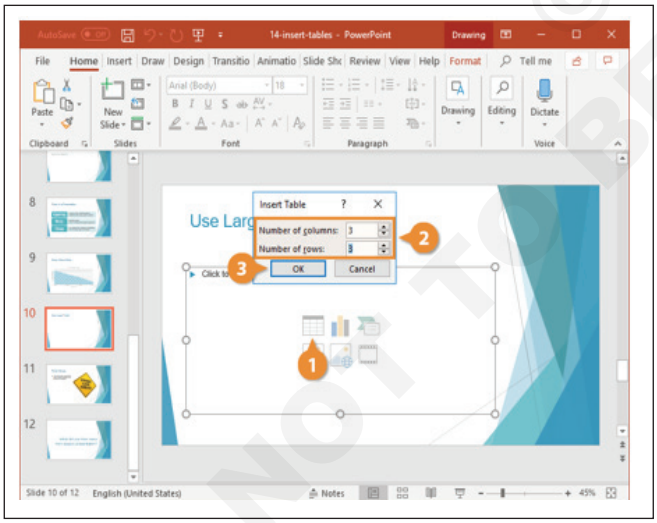
1 Click the Insert Table content placeholder.

You can also insert a table by clicking the Insert tab on the ribbon and then the Table button.

2 Specify the number of columns and rows.



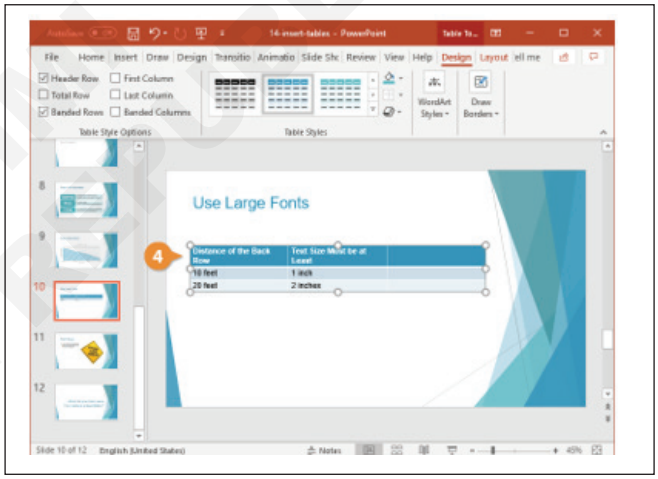
3 Click OK.



4 Click in a cell and type in your information.

Navigation shortcuts:

- Press the Tab key to move to the next adjacent cell.
- Use arrow keys to move one cell at a time.



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Modify tables

Objectives: At the end of this exercise you shall be able to
- **insert and delete table rows and columns**
- **configure cell margins and spacing**
- **merge and split cells**
- **resize tables, rows, and columns.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

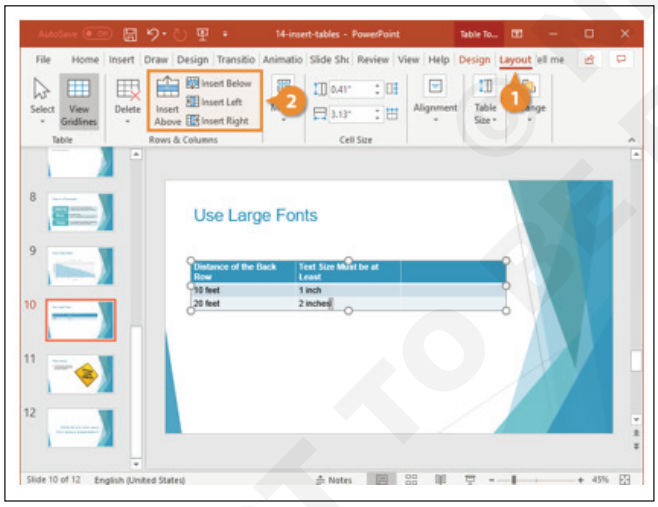
TASK 1: **Insert and delete table rows and columns**

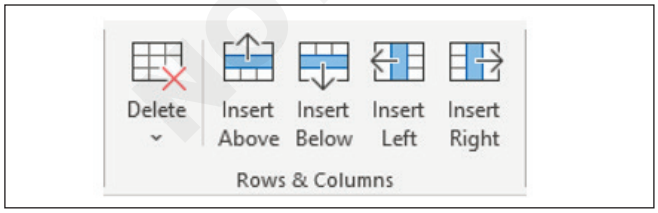
Add Rows or Columns

You can make a table larger by inserting rows and columns.

1 With the table selected, click the Layout tab.

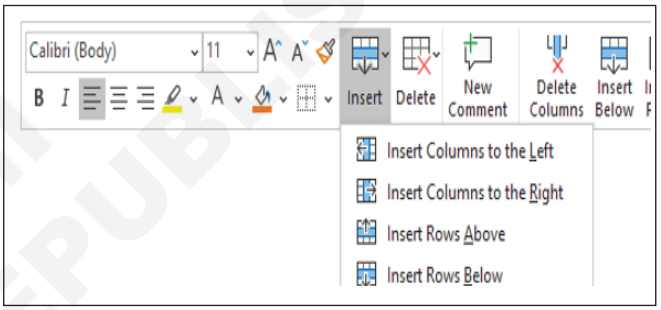
2 Use the buttons in the Rows & Columns group to add additional table cells.





3 Or Right-click and select the Insert dropdown list in the Mini toolbar:

The new rows or columns are added based on the position of the cursor in the table.



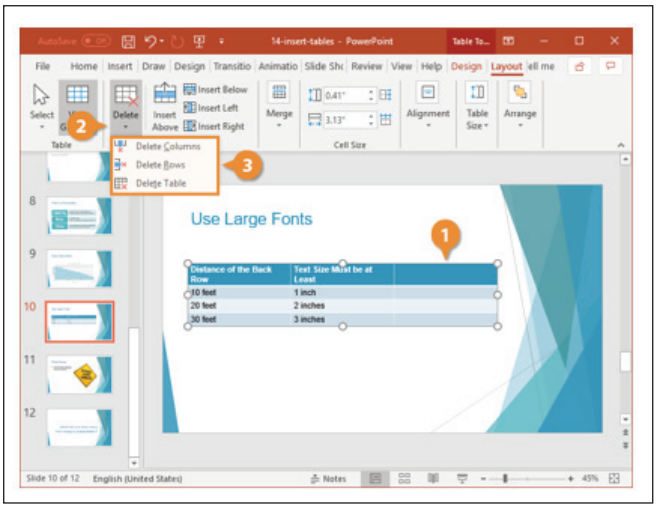
Delete Rows or Columns

You can make a table smaller by deleting rows and columns.

1 Click in the row or column you want to delete.

2 Click the Delete button on the Layout tab.

3 Choose a deletion option.



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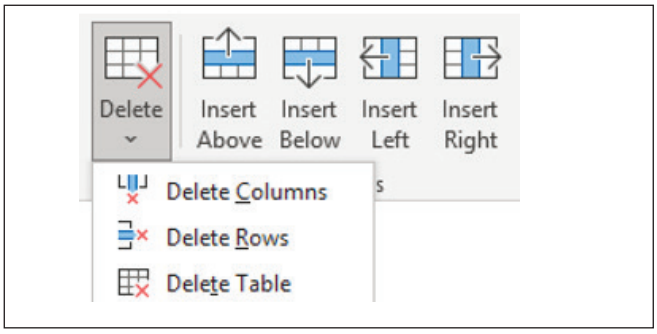
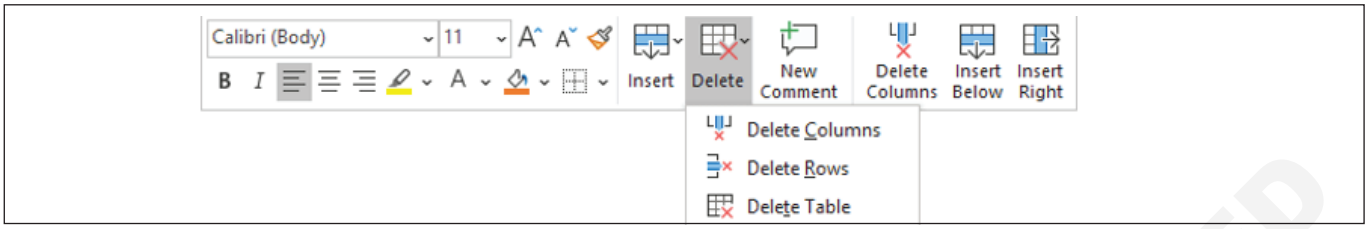


4 Or Right-click and select the Delete dropdown list in the Mini toolbar:

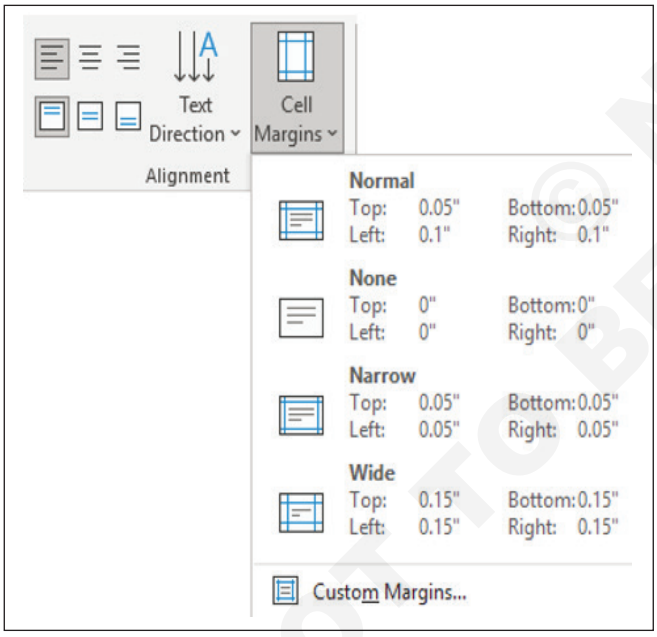


TASK 2: **Configure cell margins and spacing**

Change the cell margins

To change the cell spacing, select a cell or several cells, then do one of the following:

- On the Table Layout tab, in the Alignment group, click the Cell Margins dropdown list, and choose one of the following options:



a Normal,

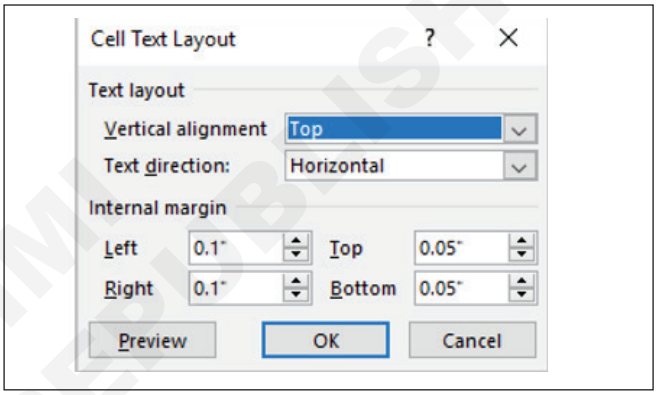
b None,

c Narrow,

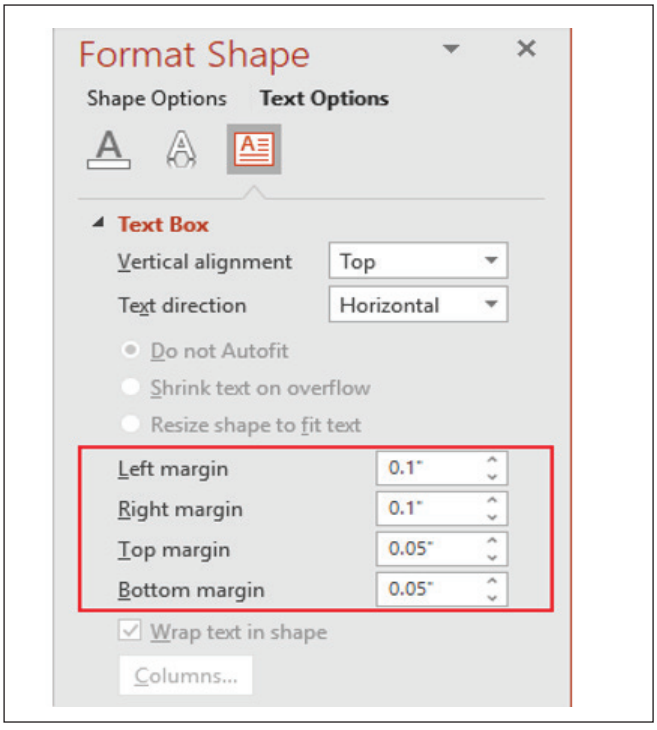
d Wide,

e Click Custom Margins...

In the Cell Text Layout dialog box, in the Internal margin section, type or select values you prefer:



- Right-click on the selection, then choose Format Shape... in the popup menu. On the Format Shape pane, on the Text Options tab, in the Textbox group, type or select the appropriate values in the Left margin, Right margin, Top margin, and Bottom margin fields:



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For example:

Normal margins: - Top – 0.05 inches - Bottom – 0.05 inches - Left – 0.1 inches - Right – 0.1 inches	Custom margins: - Top – 0.3 inches - Bottom – 0.3 inches - Left – 0.3 inches - Right – 0.3 inches
Wide margins: - Top – 0.15 inches - Bottom – 0.15 inches - Left – 0.15 inches - Right – 0.15 inches	**None** margins: - Top – 0 inches - Bottom – 0 inches - Left – 0 inches - Right – 0 inches

TASK 3: **Merge and split cells**

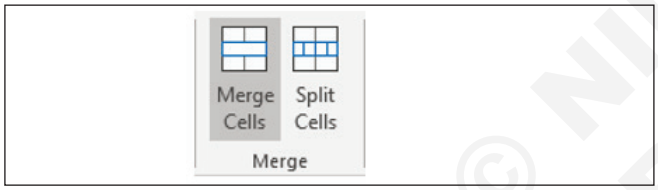
Merge cells

To combine multiple table cells into one cell, do the following:

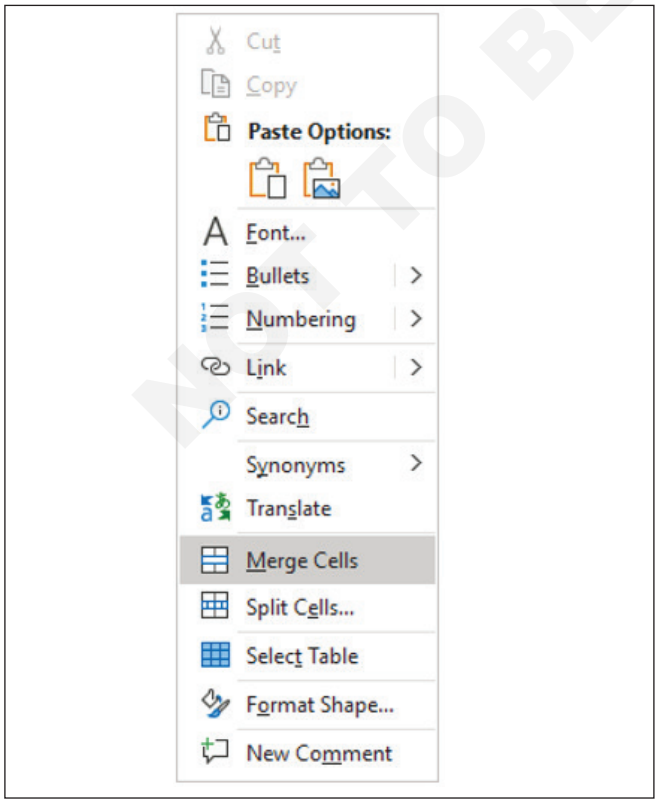
1 Select the cells that you want to combine.

2 Do one of the following:

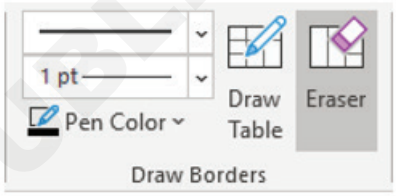
- On the Table Layout tab, in the Merge group, click the Merge Cells button:



- Right-click and select Merge Cells in the popup menu:



Note: You can also use the drawing tools: activate the table, then on the Table Design tab, in the Draw Borders group, click the Eraser button



When the cursor changes to an eraser, click the border you no more need to merge cells. After finishing, click the Eraser button again or press the Esc key

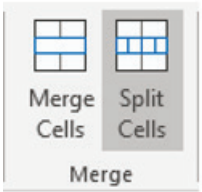
Split cells

To split the table cell or cells into multiple cells, do the following:

1 Activate or select the cell or cells you want to split.

2 Do one of the following:

- On the Table Layout tab, in the Merge group, click the Split Cells button:



- Right-click and select Split Cells in the popup menu:

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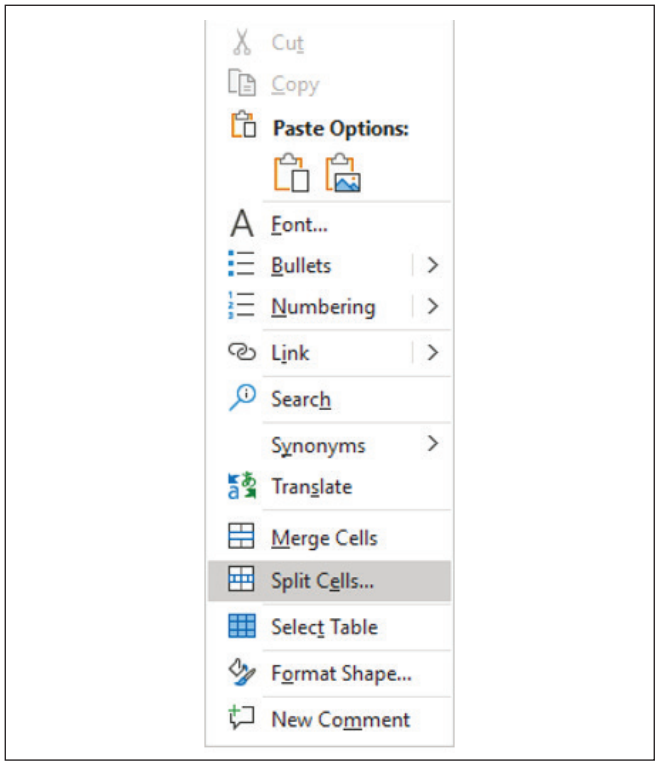
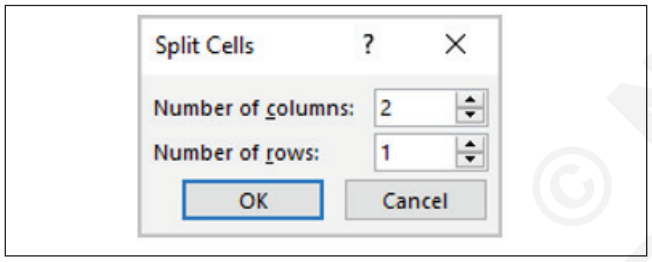
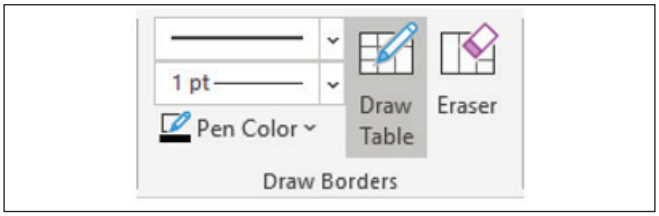


3 In the Split Cells dialog box, enter or choose the number of columns and rows to which you need to split the selection:



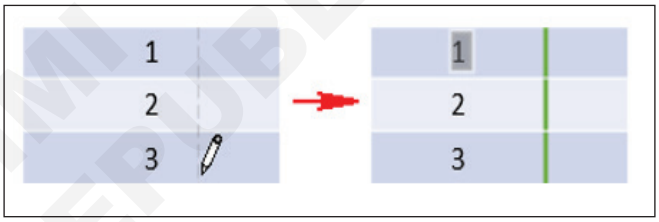
Every cell in the selection will be split into the specified number of columns and rows.

Note: You can also use the drawing tools: activate the table, then on the Table Design tab, in the Draw Borders group, click the Draw button:



When the cursor changes to a pencil, drag from the point from the cell border at which you want to start the split down to the cell border at which you want to stop it. A dashed line indicates the split location while you're drawing. When you release the cursor, a border of the currently selected line style, width, and color replaces the dashed line:

After finishing, click the Draw button again, click anywhere outside the table, or press the Esc key to stop drawing mode.

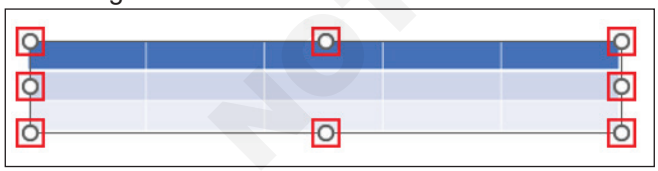


TASK 4: **Resize tables, rows, and columns**

Resize a table and table elements

To change the size of a table, activate the table (click anywhere in the table to see the Table Design and Layout tabs), and then do any of the following:

- Drag the sizing handles to change the height, width, or height and width of the table:

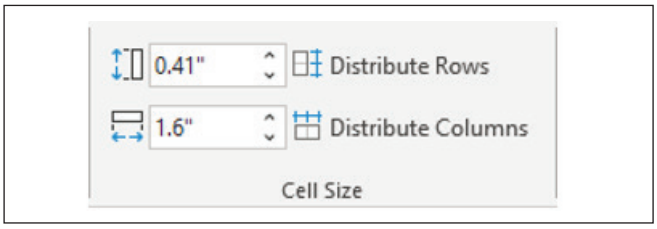


- On the Table Layout tab, in the Table Size group, set the Height and Width to specific dimensions:

Note: On the Table Layout tab, in the Table Size group, select the Lock Aspect Ratio checkbox before changing the table size if you don't want to change the table shape.

To change the width or height of the table elements, do one of the following:

- Select the table element or elements (cell or cells, column or columns, row or rows) you want to change, then do one of the following:
  - On the Table Layout tab, in the Cell Size group:



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- To change the width of the selection, enter a new number in the Width field, then press Enter,
- To change the height of the selection, enter a new number in the Height field, then press Enter.

Note: You can click the arrows at the right of the appropriate field to increase or decrease the value by one unit at a time.

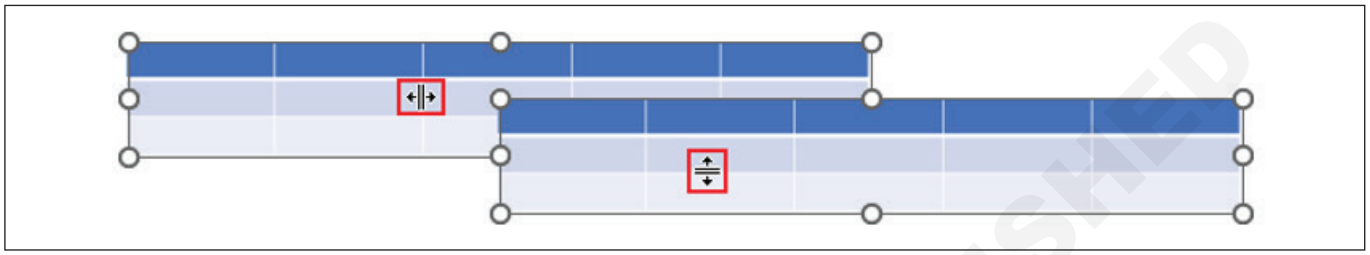
- Click the Distribute Rows button to make the rows equal width within the selection.
- Click the Distribute Columns button to make the columns equal width within the selection.
- Double-click the right border of a column or the bottom border of a row to size them to fit its widest or longest content.

Notes:

1 Setting the width of a column to less than is necessary to display the content of a cell wraps the content within the cell.

2 Setting the height of a row to less than is necessary to display its content sets the height to the minimum.

- Point to the inner border of any cell. After the cursor changes to a double-headed arrow, drag the border as you desire:



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Create and modify bulleted text

Objectives: At the end of this exercise you shall be able to
- **format paragraphs as numbered and bulleted lists**
- **change bullet characters and number formats**
- **increase and decrease list indents**
- **set starting number values**
- **restart and continue list numbering on different slides.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Format paragraphs as numbered and bulleted lists**

Refer Ex.1.9.39. Create and modify lists - Task 1

TASK 2: **Change bullet characters and number formats**

Refer Ex.1.9.39. Create and modify lists - Task 2

TASK 3: **Increase and decrease list indents**

Refer Ex.1.9.39. Create and modify lists - Task 4

TASK 4: **Set starting number values**

Refer Ex.1.9.39. Create and modify lists - Task 6

TASK 5: **Restart and continue list numbering on different slides**

Refer Ex.1.9.39. Create and modify lists - Task 5

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Create and manage reference elements (hyperlinks)

Objectives: At the end of this exercise you shall be able to
- **create hyperlinks within presentations**
- **create hyperlinks in presentations for files and other sources.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

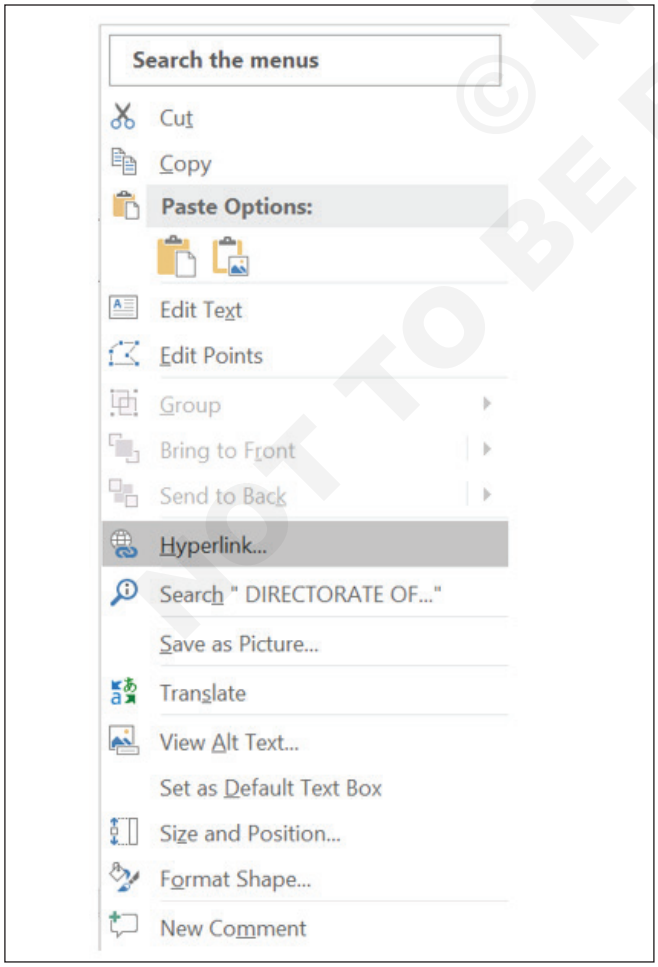
TASK 1: **Create hyperlinks within presentations**

To add a hyperlink to your presentation, do the following:

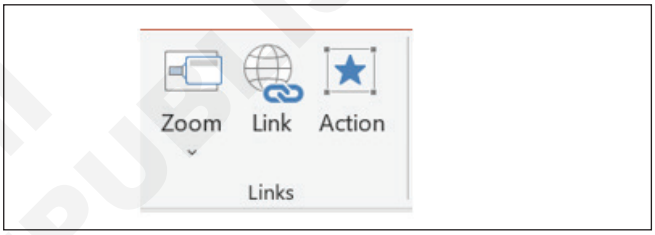
1 Choose any shape or a textbox or Picture on the slide:

Directorate of Employment & Training (Training wing)

2 Select the text, right-click on it and then select the Hyperlink list and then Insert Link... in the popup menu:



3 Or Insert tab Select Link from the links group to Insert Hyperlink



4 To enter the address of some web site:

- Select Existing File or Web Page in the Link to list,
- Insert hyperlink address by:
- Typing it in the Address textbox
- Or Selecting the website using the Browse the Web button - ,
- Optionally, change the text for the link in the Text to display textbox,
- Optionally, enter the screen tip using the ScreenTip... button,
- Click OK.

Result: While Presentation Click option will be enabled on the hyperlinked Text. So Single click direct to open the website link by default browser.

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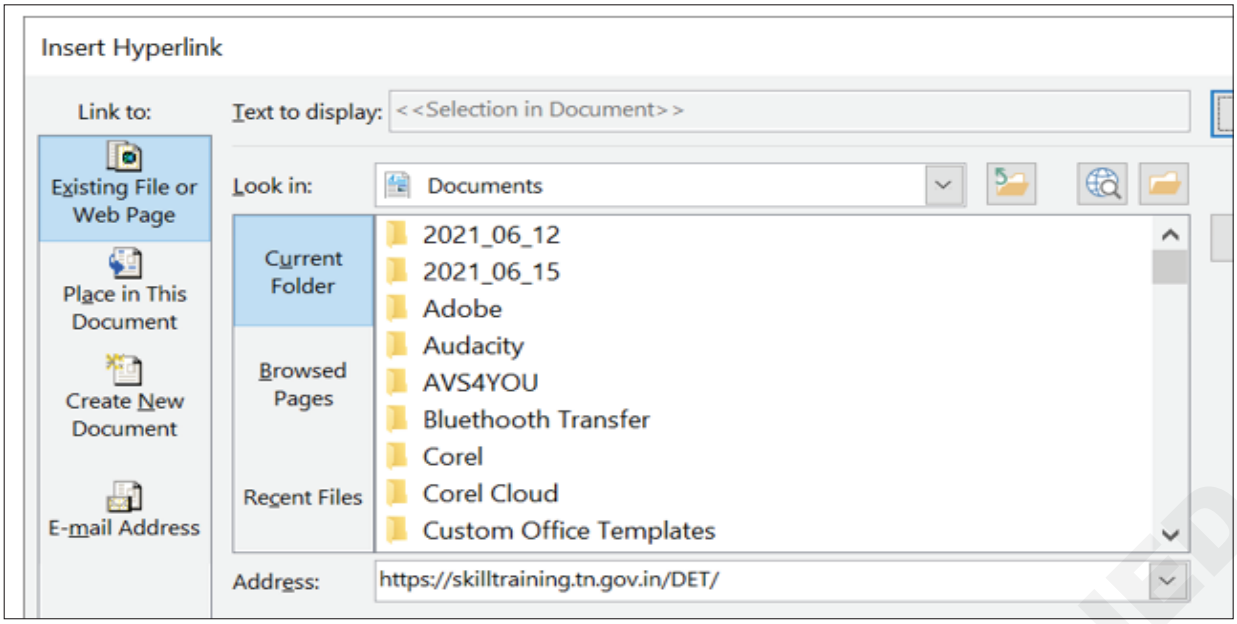
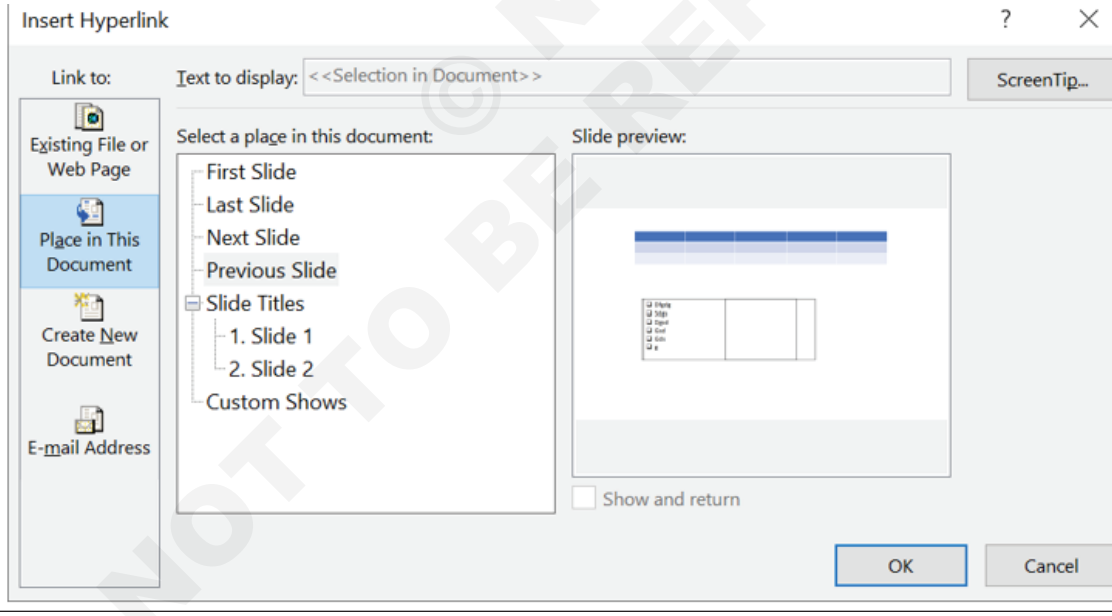


TASK 2: **Create hyperlinks in presentations for files and other sources**

Repeat the step from 1 to 3

To enter the hyperlink to the Place with in this PPT:

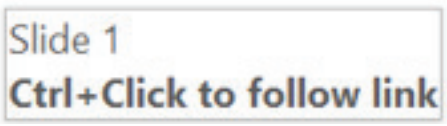


1 Select Existing Slide from

- First Slide
- Last Slide
- Next Slide
- Previous Slide
- Or Slide Titles ---- from all the available slide

2 Click OK.

Result: While Presentation Click option will be enabled on the hyperlinked Text. So Single click direct to open the Slide.



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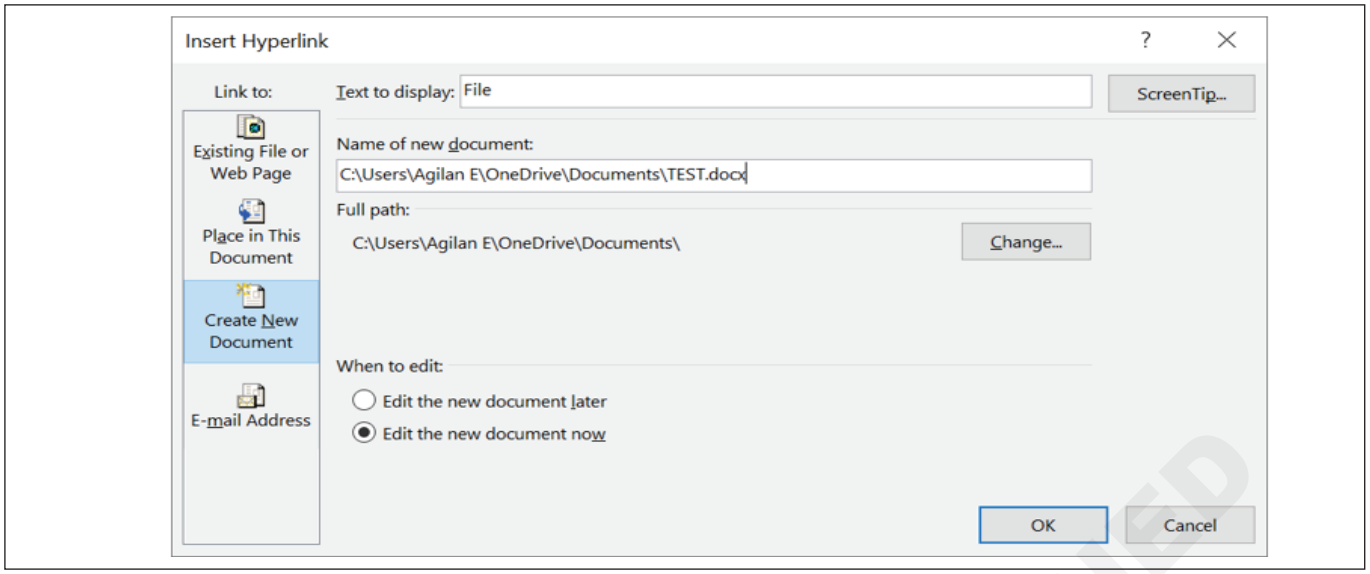
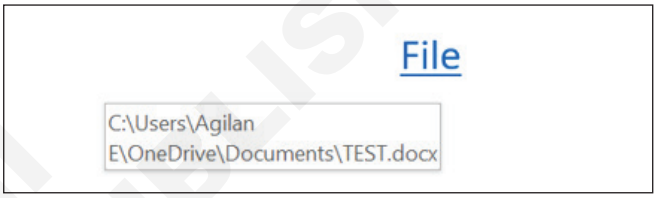
2 To enter the hyperlink to the Create New Document:

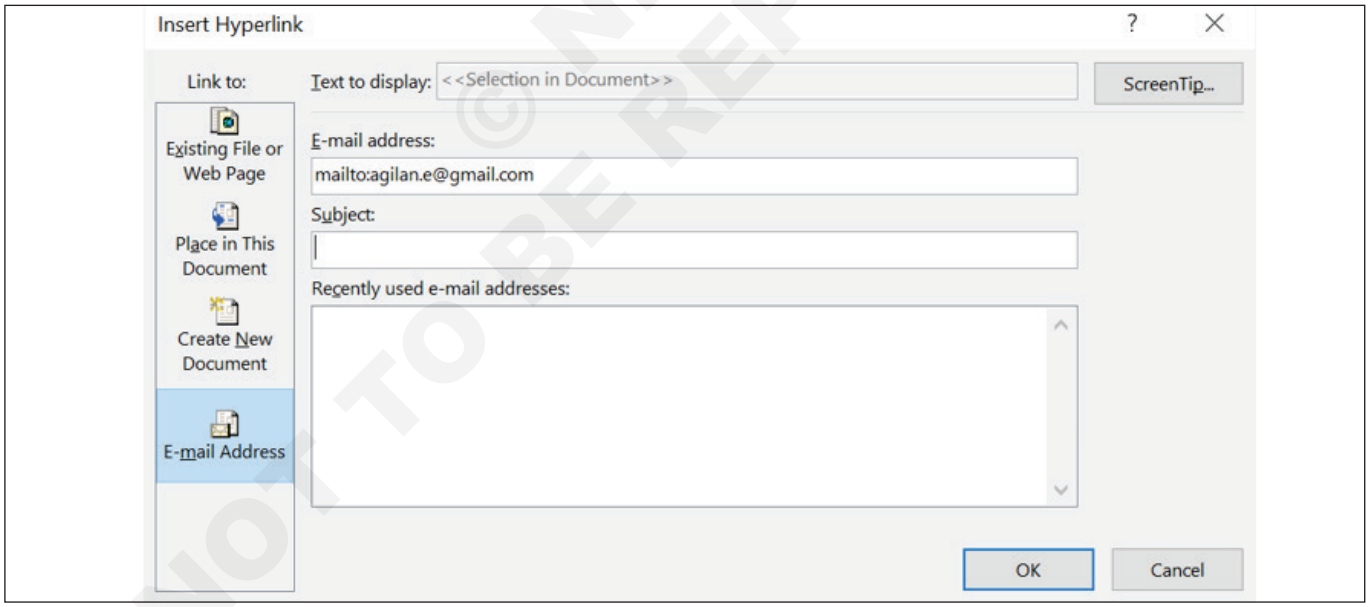


- Click Change to browse file located in Local PC or Type the document full path with name of the file including extension
- Click OK

Result: While Presentation Click option will be enabled on the hyperlinked Text. So Single click direct to open the Slide.



To enter the hyperlink the e-mail address:



- Select E-mail Address in the Link to list,
- Enter the e-mail address in the E-mail address textbox,
- Optionally:
- change the text for the link in the Text to display textbox,
- enter the screen tip using the ScreenTip... button,
- insert the subject for e-mails in the Subject textbox,
- Click OK

Result: While Presentation Click option will be enabled on the hyperlinked Text. So Single click direct to send the mail by Email Agent (Outlook) configured on your computer.

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Insert illustrations and text boxes

Objectives: At the end of this exercise you shall be able to
- **insert shapes**
- **insert pictures**
- **insert SmartArt graphics**
- **insert screenshots and screen clippings**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Insert shapes**

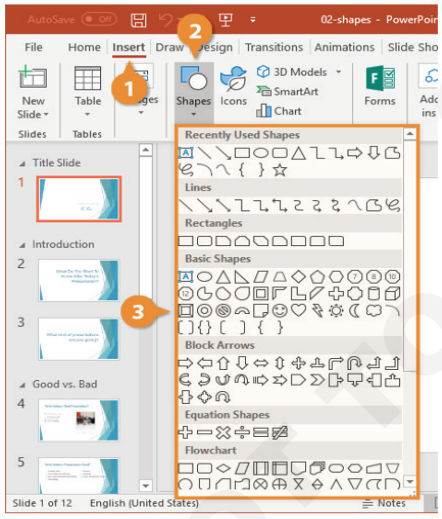
Insert a Shape

1 Click the Insert tab.

2 Click Shapes.

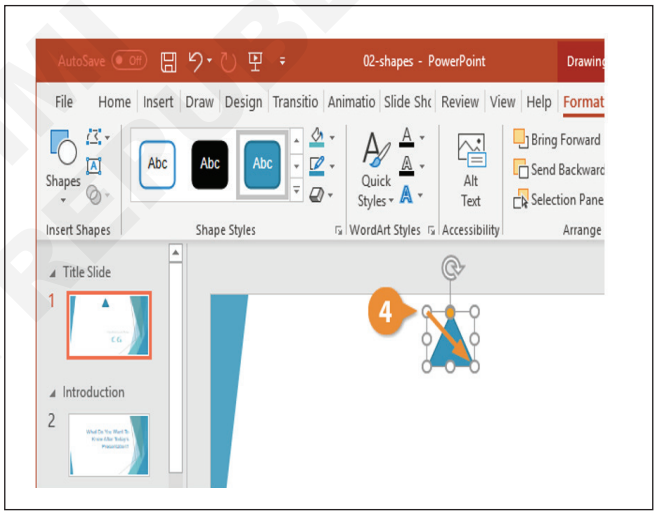
A menu appears showing all available shapes.

3 Select the shape you want to insert.

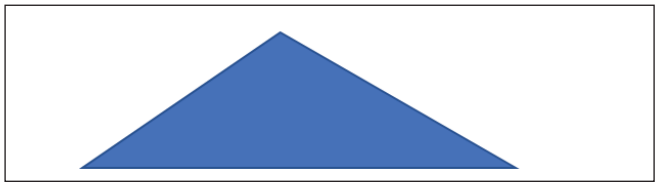


4 Click where you want to place the shape, or click and drag to “draw” the shape onto the screen.

To draw a straight line, perfect square or circle, or to constrain the dimensions of other shapes, press and hold the Shift key as you drag.



The shape is inserted onto the slide and the Format contextual tab appears on the ribbon under Drawing Tools.



TASK 2: **Insert pictures**

Insert Pictures with Placeholders

The quickest way to insert a picture is to use a content placeholder that is already on your slide.

1 Click the content placeholder’s Pictures or Online Pictures button.

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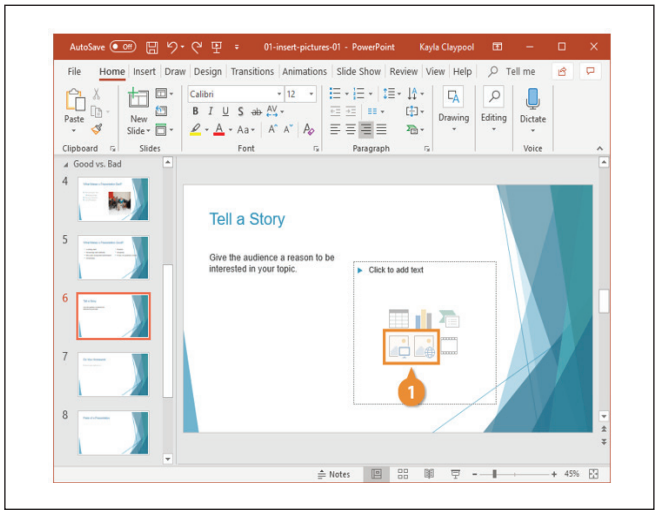
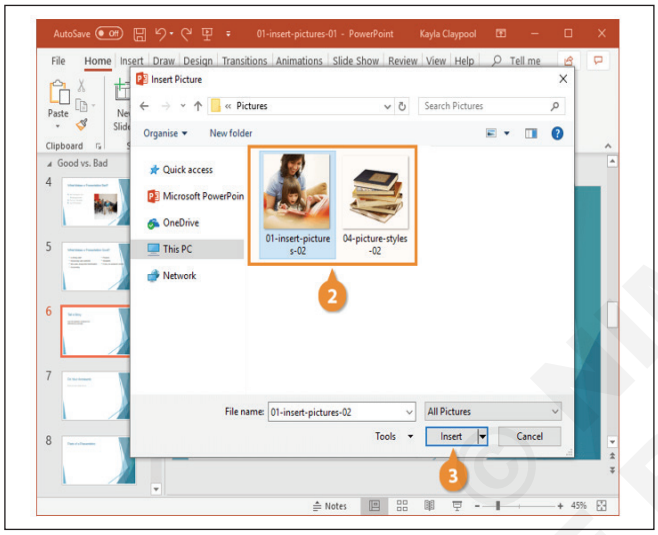


2 Navigate to the picture you want to use and select it.

3 Click Insert.



The picture is inserted, and the Format tab appears on the ribbon.

To remove an image, just select it and press the Delete key.

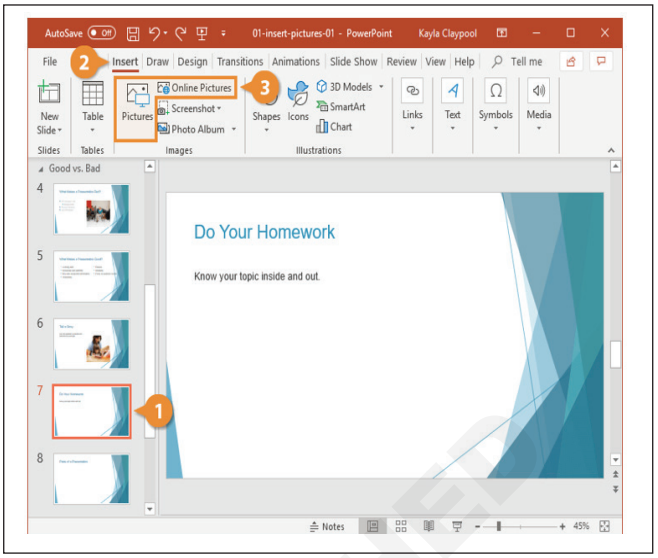
Insert Pictures with the Ribbon

You can also use the ribbon to insert pictures if there are no content placeholders available.

1 Select the slide where you want to add a picture.

2 Click the Insert tab.

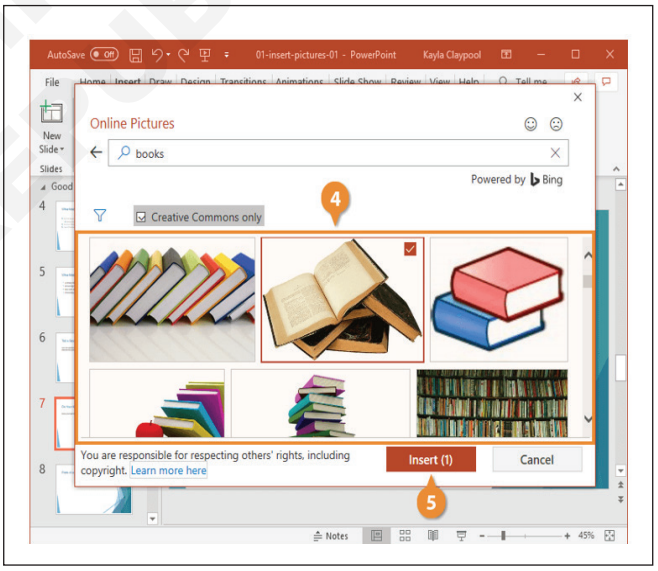
3 Click Pictures or Online Pictures.



4 Navigate to or search for the picture you want to use and select it.

To insert more than one picture at a time, press and hold down Ctrl as you click each image.

5 Click Insert.



TASK 3: **Insert SmartArt graphics**

Insert SmartArt

The SmartArt feature lets you create and customize designer-quality diagrams. You can even convert bulleted lists into a diagram using the SmartArt diagram tools.

1 Click the Insert tab.

2 Click the SmartArt button on the ribbon.

You can also click the SmartArt icon in a content placeholder.

3 Select a category.

4 Select a graphic.

A preview and a description appear on the right.

5 Click OK.

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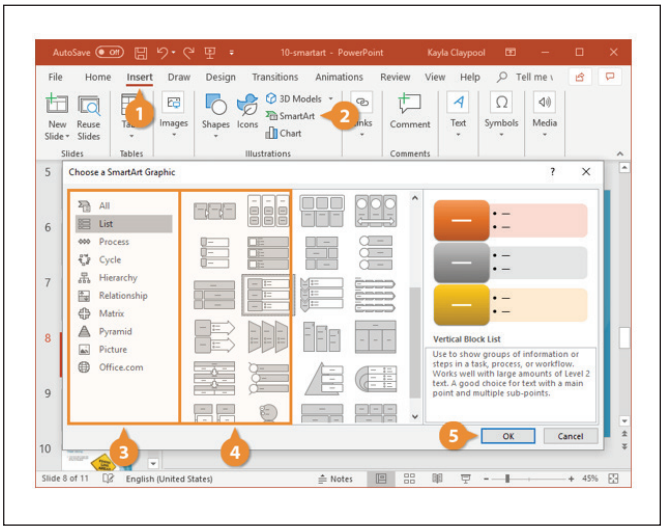
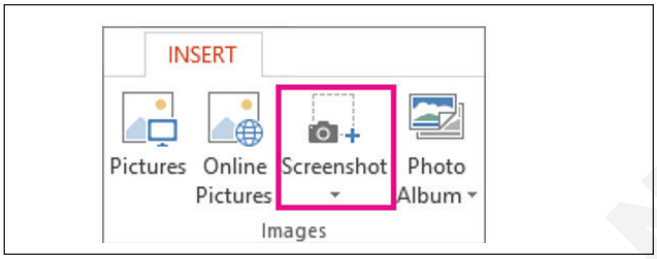


The SmartArt graphic is inserted into the presentation.

SmartArt Graphic Types	
List	Show non-sequential information.
Process	Show steps in a process or timeline.
Cycle	Show a continual process.
Hierarchy	Create an organization chart or decision tree.
Relationship	Illustrate connections.
Matrix	Show how parts relate to a whole.
Pyramid	Show proportional relationships with the largest component on the top or bottom.
Picture	Create a SmartArt graphic that incorporates pictures.

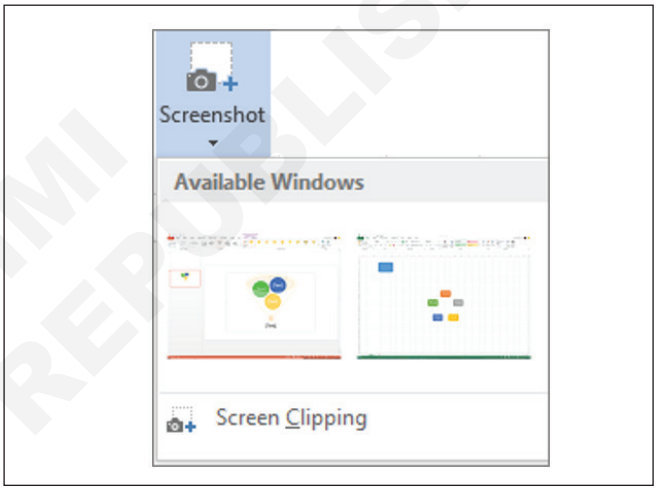
TASK 4: **Insert screenshots and screen clippings**

1 In PowerPoint: On the Insert tab, in the Images group, click Screenshot.



2 The Available Windows gallery appears, showing you all the windows that you currently have open. Do one of the following:

- To insert a screenshot of an entire window into your document, click the thumbnail image of that window.
- To add a selected portion of the first window shown in the Available Windows gallery, click Screen Clipping; when the screen turns white and the pointer becomes a cross, press and hold the left mouse button and drag to select the part of the screen that you want to capture.



3 The window or portion of the screen you selected is automatically added to your document. You can use the tools on the Picture Tools tab to edit and enhance the screenshot.

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Format illustrations and text boxes

Objectives: At the end of this exercise you shall be able to
- **apply artistic effects**
- **apply picture effects and picture styles**
- **remove picture backgrounds**
- **crop images**
- **format graphic elements**
- **format SmartArt graphics**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Apply artistic effects**

Insert a Shape

Apply Artistic Effects

1 Select the picture.

2 Select Picture Tools > Format and select Artistic Effects.

3. Hover over the options to preview them and select the one you want.

Before:

After Artistic Effects:

TASK 2: **Apply picture effects and picture styles**

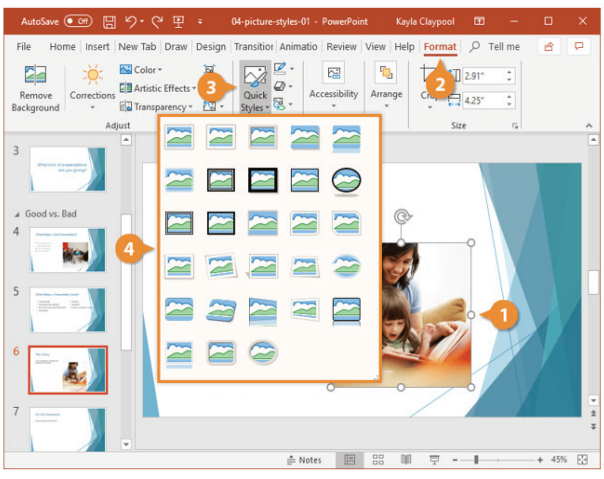
Choose a Style

1 Select the picture.

2 Click the Format tab on the ribbon.

3 Click the Quick Styles button in the Picture Style group.

4 Select a style.



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Before:

After:

Modify a Style

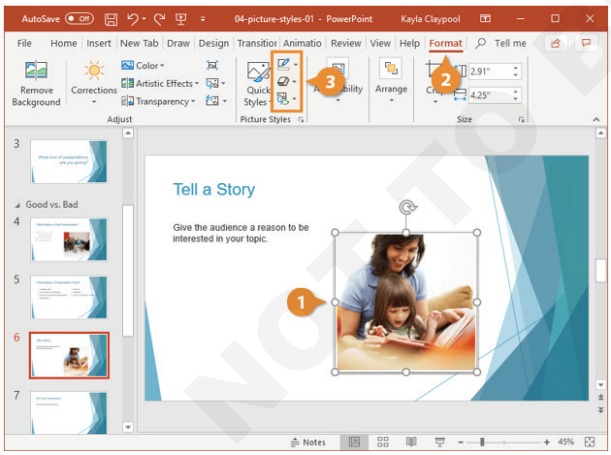
After a style has been applied, modify different elements of the preset style for a more customized look.

1 Select the picture.

2 Click the Format tab on the ribbon.

3 Use the tools in the Picture Styles group to edit the picture style.

- **Picture Border:** Adjust the border color and thickness.
- **Picture Effects:** Add or remove complicated effects like glow and bevel.
- **Picture Layout:** Add text and reshape the picture to create SmartArt.



Before:

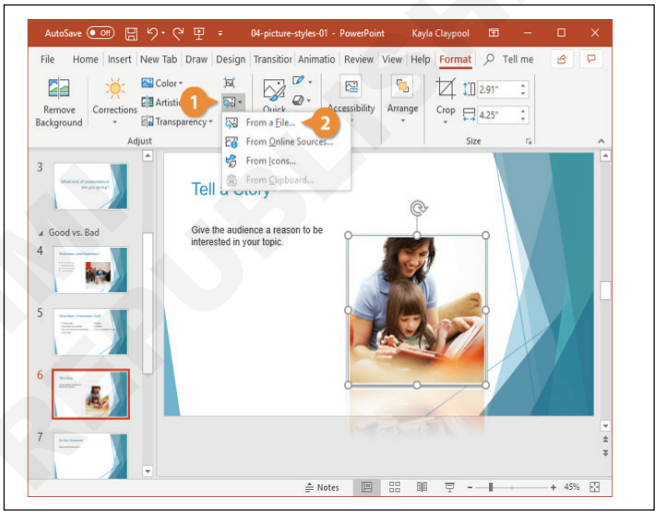
After:

Change the Picture

You can swap one picture for another while keeping any of the picture style options that are already applied.

1 With the picture selected, click the Change Picture button in the Adjust group on the Format tab.

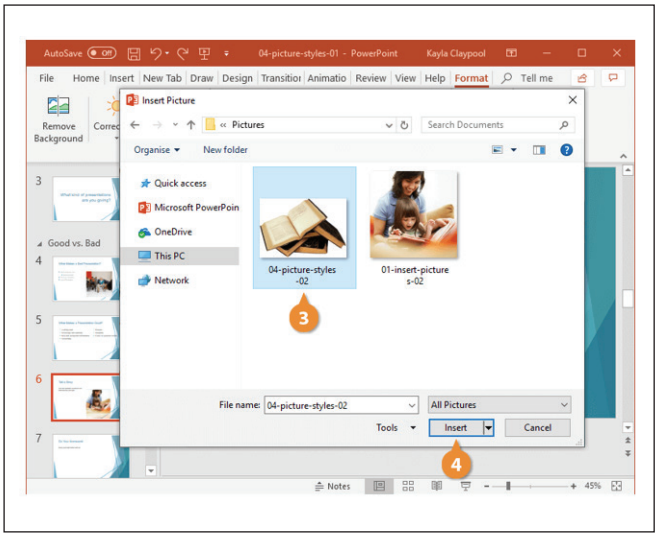
2 Select the type of picture you want to insert.



3 Navigate to and select a new picture.

4 Click Open or Insert.

The picture is swapped out, but the style remains the same.



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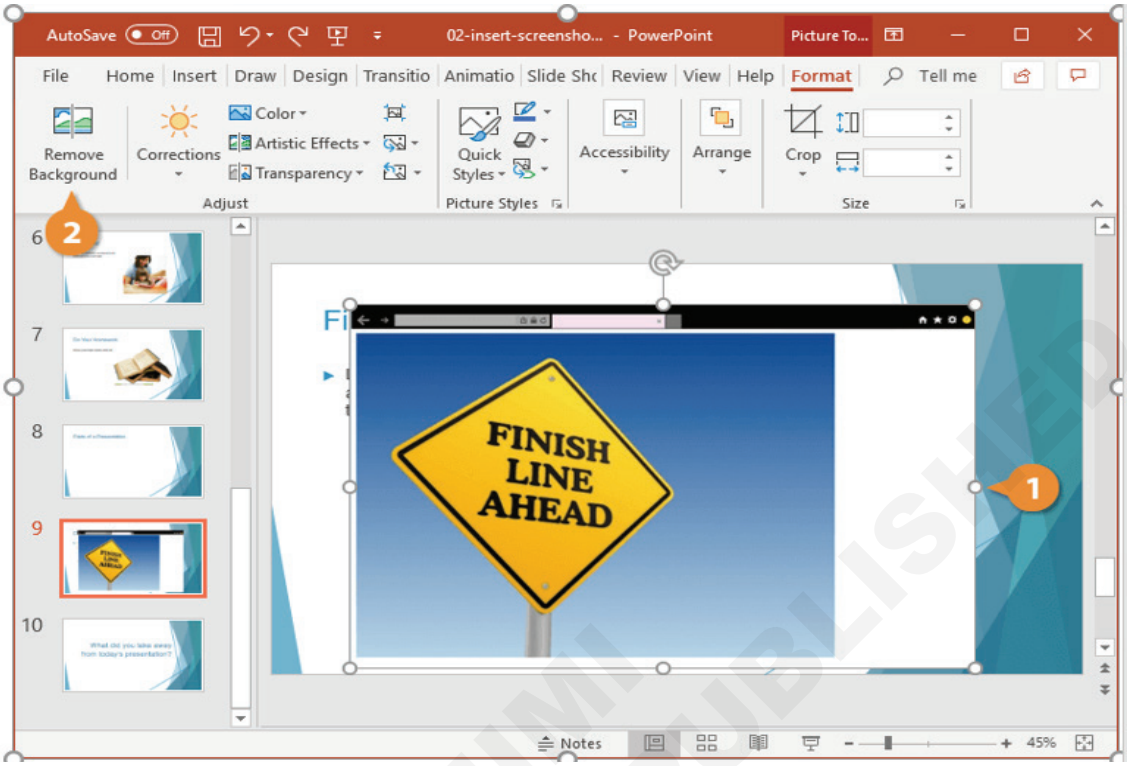
TASK 3: **Remove picture backgrounds**

Remove a Background

You can remove the background of any screenshot, picture, or graphic in your presentation.

1 Select the picture with a background you want to remove.

2 Click Remove Background on the Format tab.



A new tab appears on the ribbon, and the picture is highlighted with a bright magenta color. Any magenta areas will be removed.

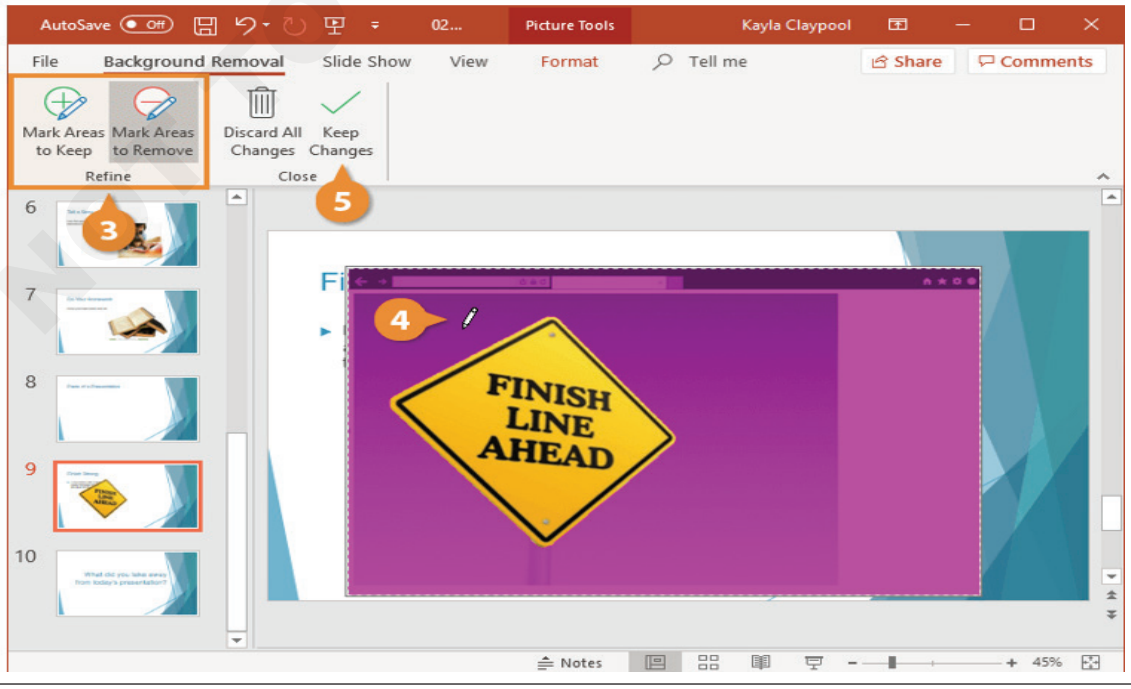
Click and drag the box around what you want to keep.

3 Click a Mark Areas button in the Refine group:

- Mark Areas to Keep: Draw lines over the areas of a picture you want to keep.
- Mark Areas to Remove: Draw lines over the areas of a picture you want to remove.

4 Click and drag over a section of the picture to either add or remove it.

5 Click Keep Changes.



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To restore the background, select the image, click the Remove Background button, and click Discard All Changes.

Result:

TASK 4: **Crop images**

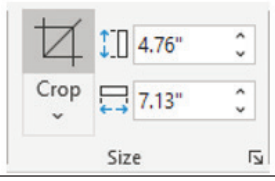
Crop a picture by handles

To use the simplest way to crop a picture by using the cropping handles, do the following:

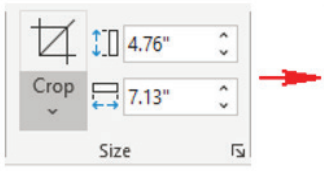
1 Click on the picture to select it.

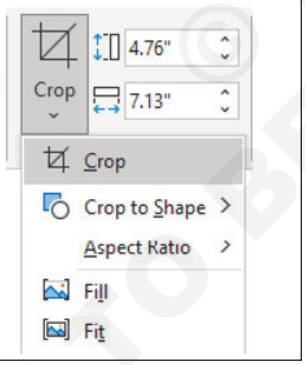
Note: You can't crop multiple pictures at once.

2 On the Picture Format tab, in the Size group, click the Crop button:

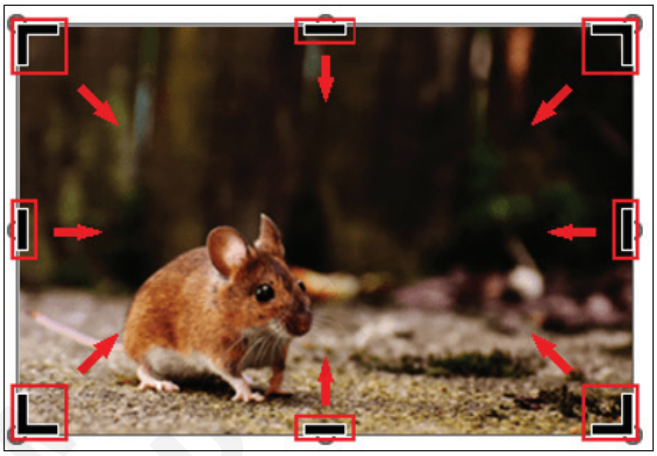


Note: You can also open the Crop dropdown list and choose the Crop command:



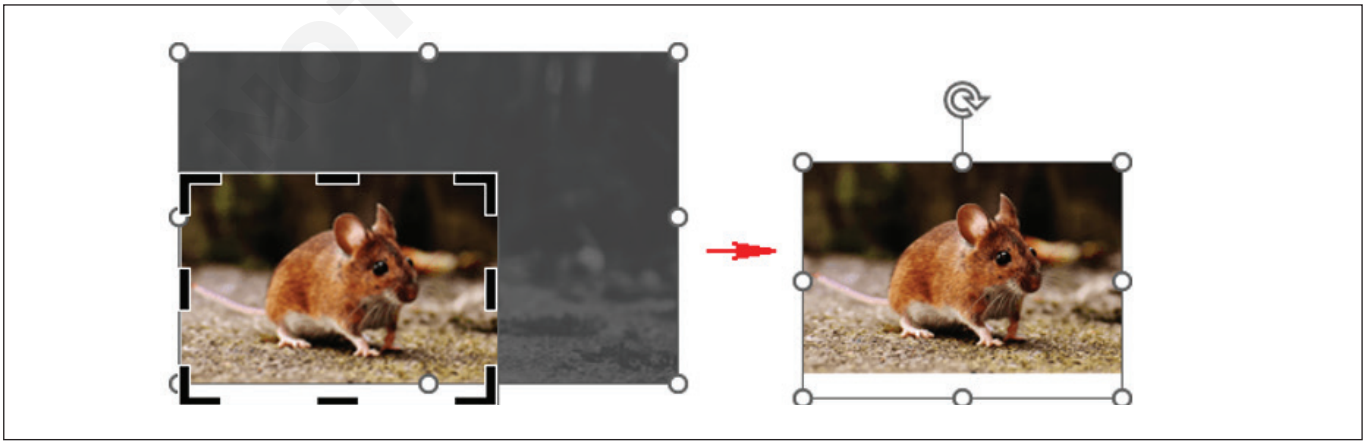


3 Drag the black handles that appear in corners and on the sides of the image to crop unneeded areas:



Areas that will be excluded from the cropped picture are shaded:

4 Repeat until all unnecessary areas of the image have been removed. When you finish, click outside the picture boundaries or click the Crop button again to apply the crop effect.



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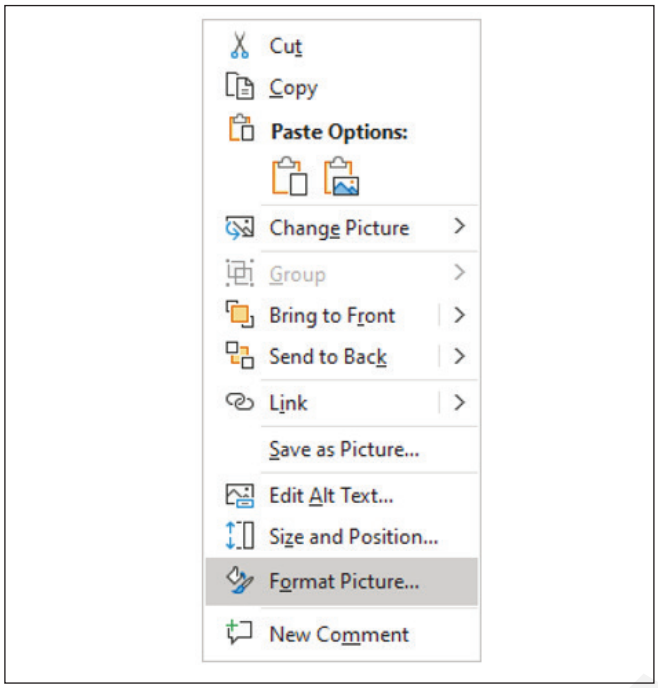
Crop a picture "by the numbers"

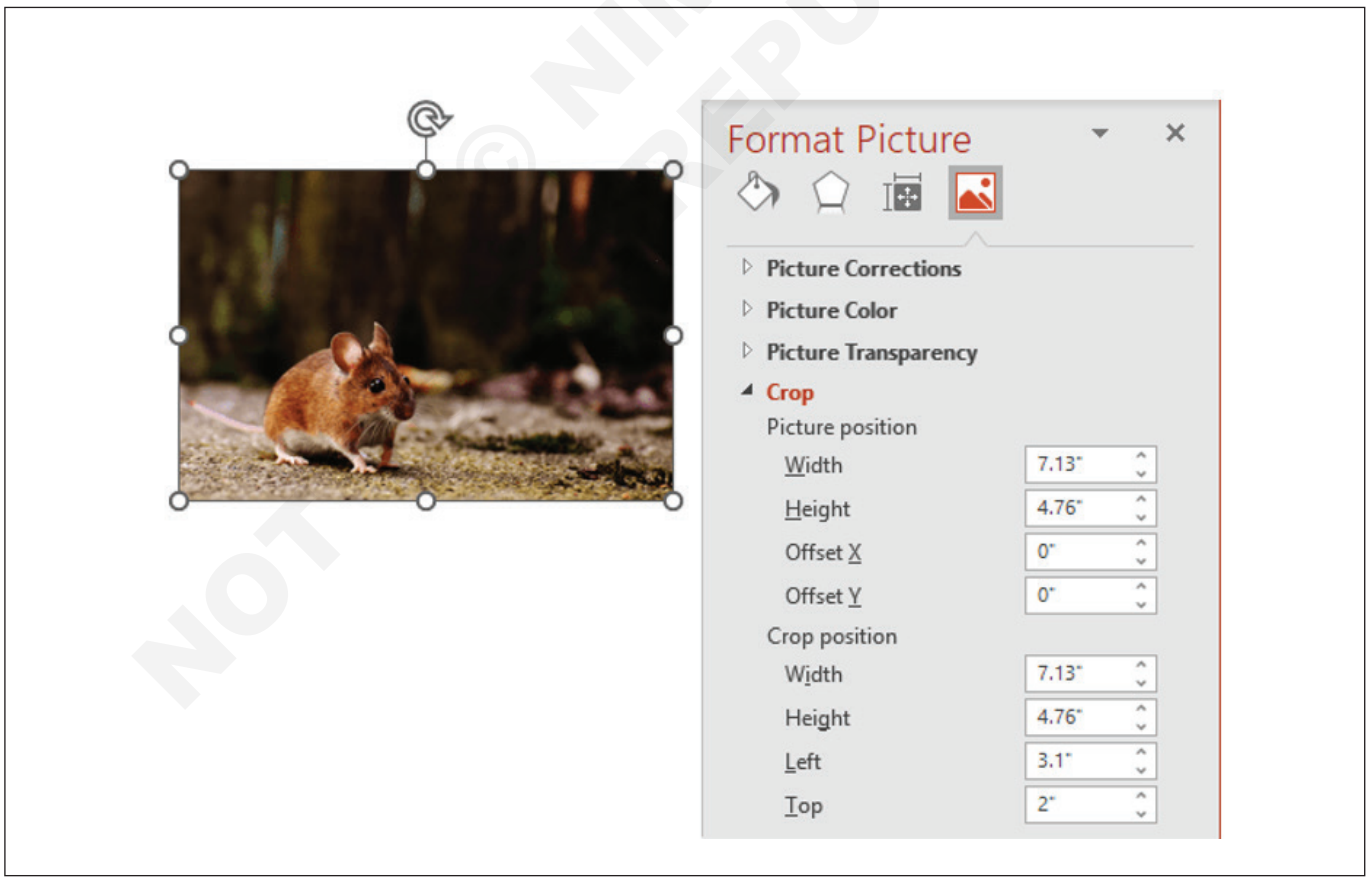
To crop a picture "by the numbers" by using the Crop settings on the Format Picture pane, do the following:

1 Right-click the picture and choose Format Picture... in the popup menu:



2 On the Format Picture pane, in the Picture group, in the Crop section:

- Under Picture position:
  - Select or enter values in the Width and Height fields to resize the picture and keep the frame dimensions,
  - Select or enter desired values in the Offset X and Offset Y fields:
- Under Crop positions:
  - Decrease the value in the Width field to crop the picture from the right,
  - Decrease the value in the Height field to crop the picture from the bottom,
  - Choose or type values in the Left and Top fields to crop the picture from those sides, respectively:



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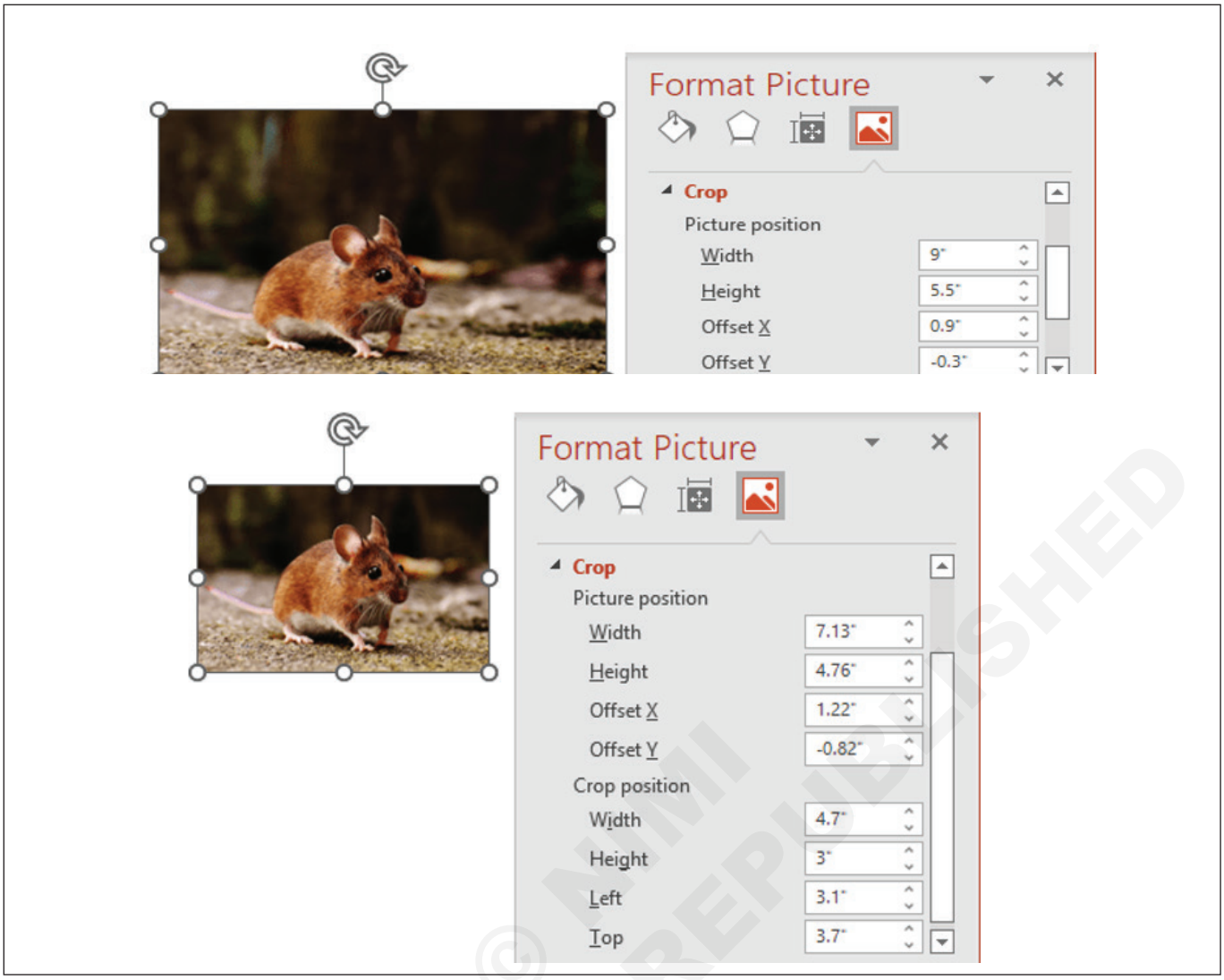
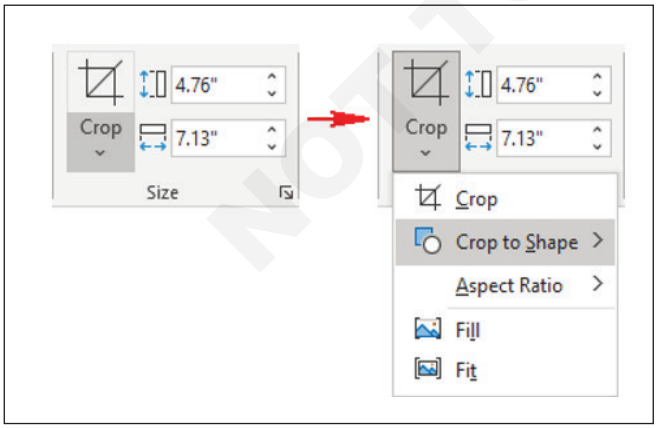


Crop a picture to a shape

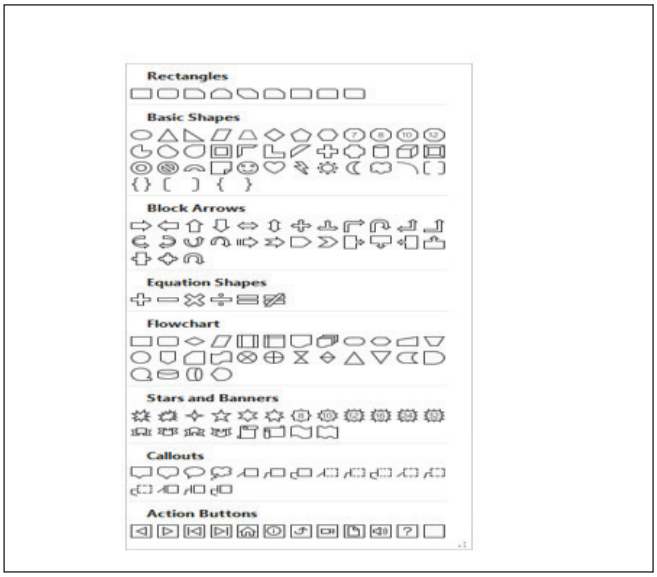
To crop a picture to a shape, do the following:

1 Click on the picture to select it.

2 On the Picture Format tab, in the Size group, click the Crop button and then choose Crop to Shape from the dropdown list:



3 Select the shape from the gallery that opens:



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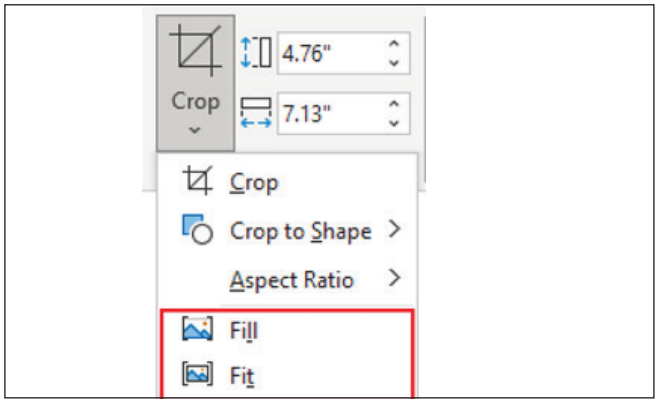
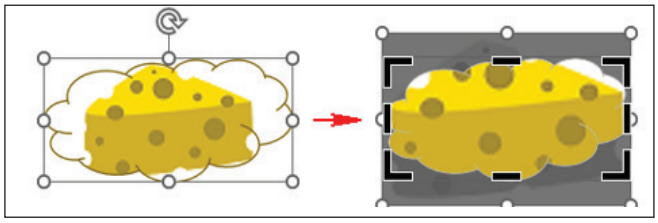
Fill or fit an image in the shape

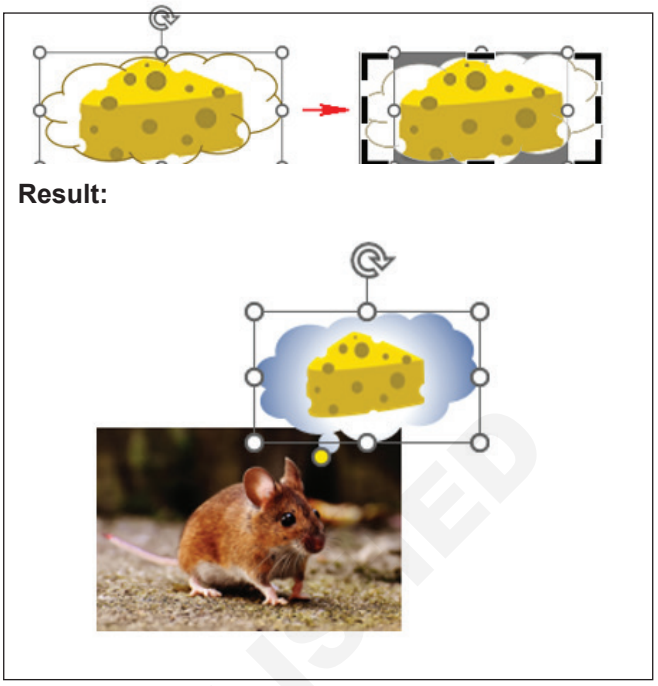
PowerPoint offers two features for images that can help to position them in shape:



- The Fill option adjusts the image size to match the shape's height or width, whichever is bigger:



- The Fit option adjusts the image size so that both the height and width match the shape:



TASK 5: **Format graphic elements**

Adjust the brightness, contrast, or sharpness

1 Select the picture.

2 Select Picture Tools > Format and select Corrections.

3 Hover over the options to preview them and select the one you want.

Apply Artistic Effects

1 Select the picture.

2 Select Picture Tools > Format and select Artistic Effects.

3 Hover over the options to preview them and select the one you want.

Change the color

1 Select the picture.

2 Select Picture Tools > Format and select Color.

3 Hover over the options to preview them and select the one you want.

Apply Picture Effects

1 Select the picture.

2 Select Picture Tools > Format and select Picture Effects.

3 Select the one you want: Shadow, Reflection, Glow, Soft Edges, Bevel, or 3-D Rotation.

Add a border

1 Select the picture.

2 Select Picture Tools > Format and select a border.

Compress the picture

1 Select the picture.

2. Select Picture Tools > Format and select Compress Pictures.

3 Select the options you want and select OK.

Reset the picture

1 Select the picture.

2 Select Picture Tools > Format and select Reset picture

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TASK 6: **Format SmartArt graphics**

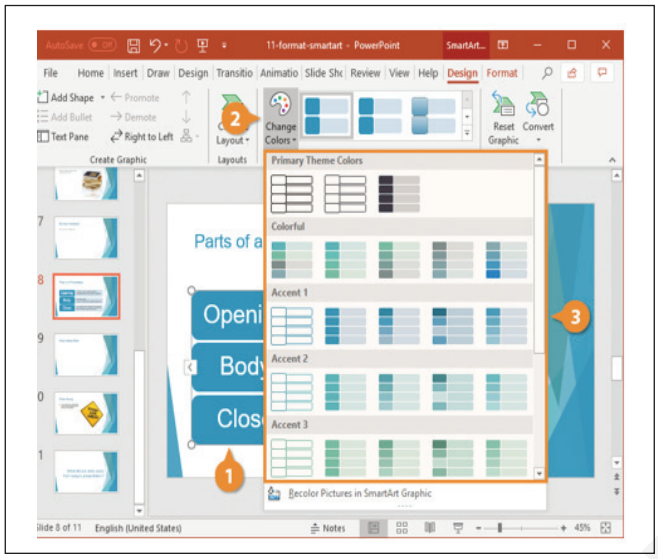
Format SmartArt

PowerPoint has a variety of SmartArt layouts and styles that allow you to format your SmartArt graphics with the click of a button.

1 Select the SmartArt graphic.

2 Click the Change Colors button on the SmartArt Tools Design tab.

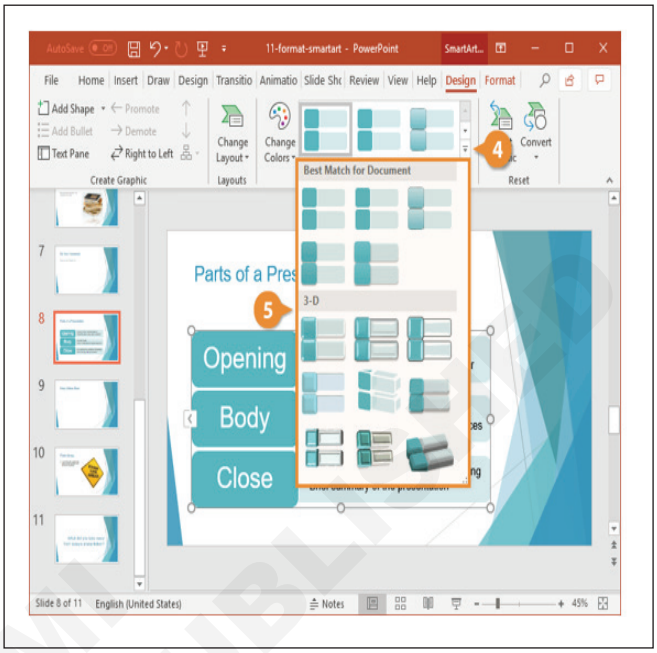
3 Select a color from the menu.



4 Click the More button for the SmartArt Styles gallery.

Even though there are some pretty wild styles available, it's best to keep it simple.

5 Select a style.



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Add and modify text in graphic elements

Objectives: At the end of this exercise you shall be able to
- **add and modify text in text boxes**
- **add and modify text in shapes**
- **add and modify SmartArt graphic text**
- **create, insert and modify charts**

Requirements

Tools/Equipment/Machines

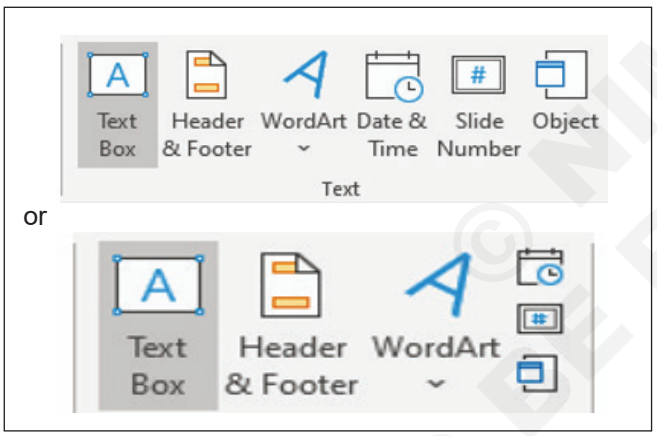
- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

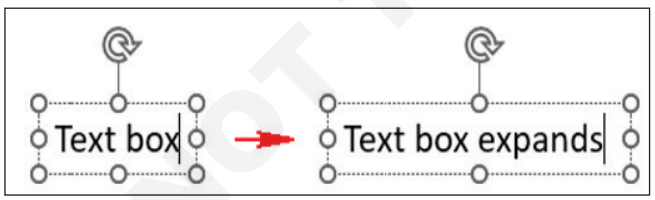
TASK 1: **Add and modify text in text boxes**

Insert a text box on a slide

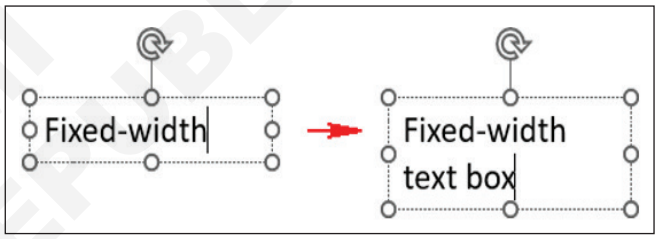
To insert a text box, on the Insert tab, in the Text group, click the Text Box button:



- To create a text box that expands to fit whatever you type on one line, just click the slide where you want the text box to be placed and then enter the text:



- To create a fixed-width text box, drag a box to where you want the text box to be placed and then enter the text:



The text field adjusts to fit the height of one line but retains the width you specify. When the text reaches the right border of the field, a new line is automatically added, and the text wraps. As the text is entered, the width of the box stays the same, but the height increases as needed to accommodate all the text.

Delete text in a slide

To delete only one or a few characters, do the following:

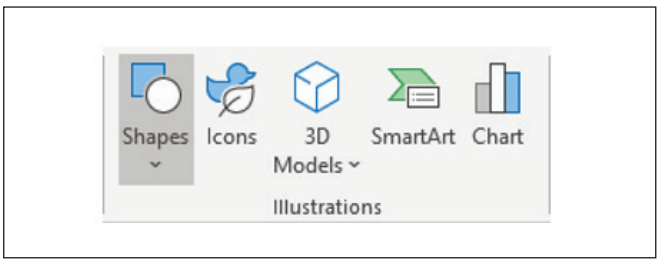
1 Position the cursor immediately to the left (right) of the text you want to delete.

2 Press the Delete (Backspace) key once for each character you want to delete.

To delete any amount of text, select the text you want to delete, then press the Delete key or the Backspace key.

TASK 2: **Add and modify text in shapes**

To insert a shape on the slide, on the Insert tab, in the Illustrations group, click the Shapes button, and then select the shape you want to insert from the Shapes dropdown list:



To add text directly into shapes, do one of the following:

- Select a shape, then enter the text you want to display on the shape.

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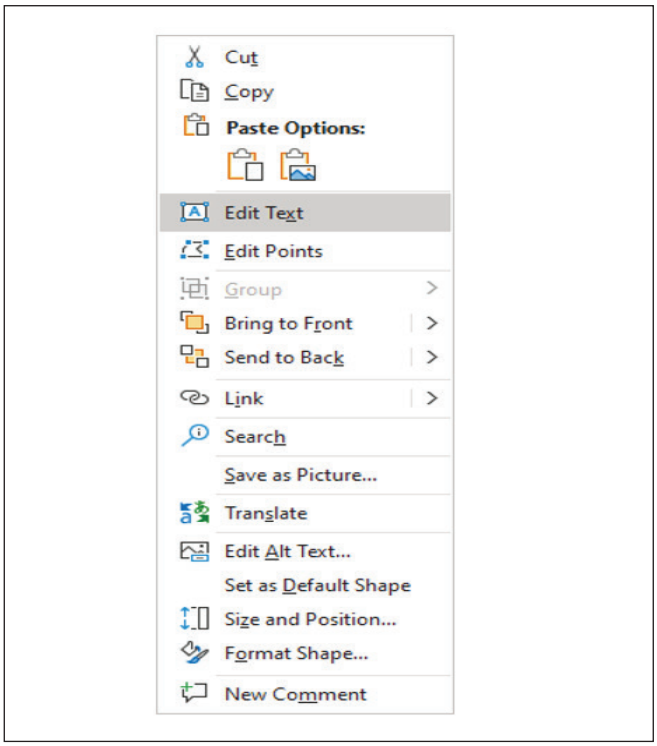
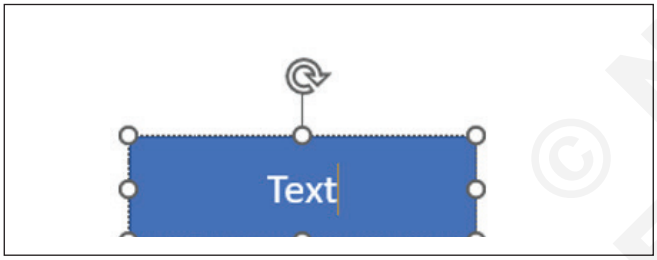
- Right-click a shape and choose Edit Text in the popup menu:

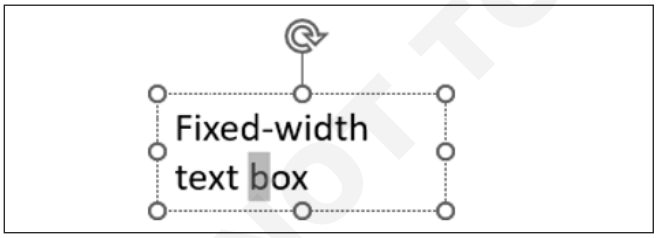


- Double-click the shape - the cursor appears to indicate the location of the text; start typing.



Select text

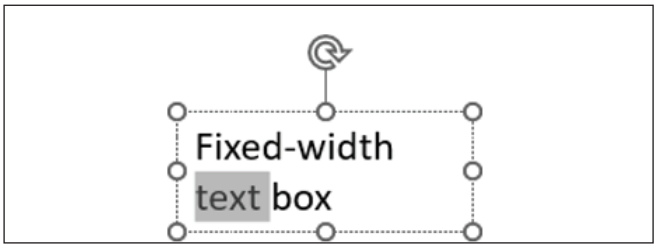
To select one character in the PowerPoint presentation slide, do one of the following:



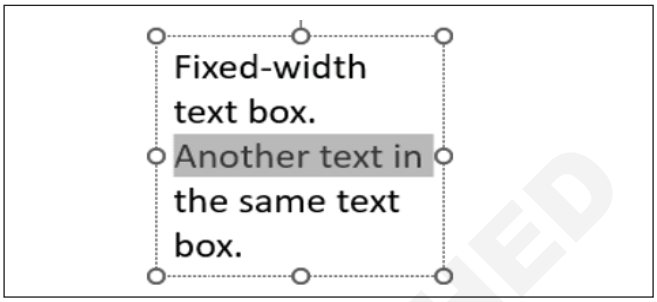
- **Using the keyboard:** place the cursor at the beginning of the text (at the end of the text) and then press Shift+ the right arrow (the left arrow) to select a character/word/line
- **Using the mouse:** click in front of the character/ word/ line (after the character/word/ line) and hold while you drag your cursor to select it:.

To select a single word in the PowerPoint presentation slide, do one of the following:

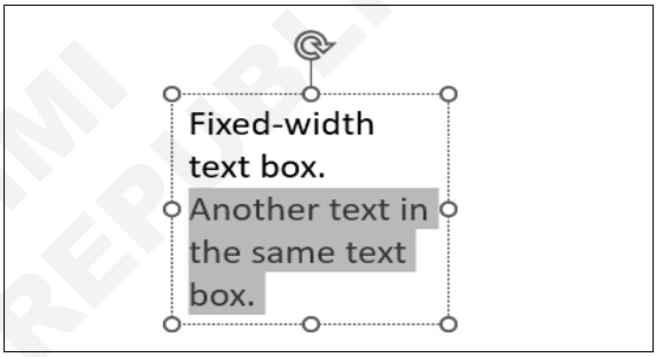
To select a line in the PowerPoint presentation slide, do one of the following:



To select a paragraph in the PowerPoint presentation slide, do one of the following:



To select a fragment in the PowerPoint presentation slide, do one of the following:



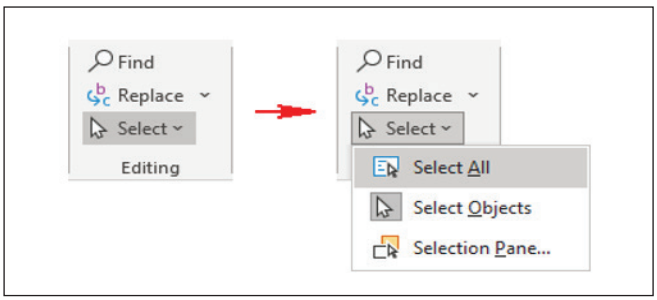
- Using the keyboard: place the cursor at the beginning of the fragment you want to select (at the end), and press Shift+ the right arrow (the left arrow).

To select the line, press Shift+ the arrow down (the arrow up).

- Using the mouse: click in front of the fragment's first letter (after the fragment's last letter), hold Shift, and then click after the last letter of the fragment you want to select (in front of the first letter of the fragment).

To select all the content in the current placeholder, do one of the following:

- On the Home tab, in the Editing group, click the Select button, and then click Select All:
- Press **Ctrl+A.**



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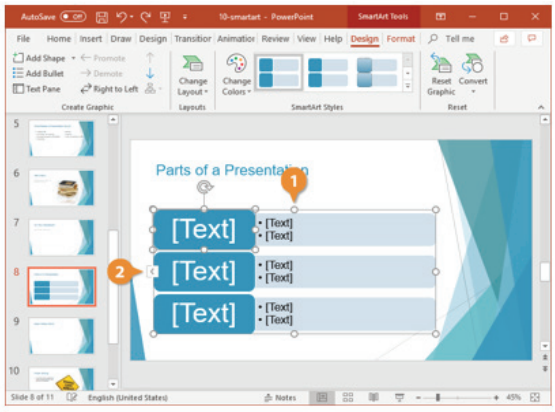
TASK 3: **Add and modify SmartArt graphic text**

Populate SmartArt Graphics

There are two ways to add text to a SmartArt graphic: using the Text pane or the graphic itself.

1 Select the SmartArt Diagram.

2 Click the arrow at the left edge of the SmartArt graphic.

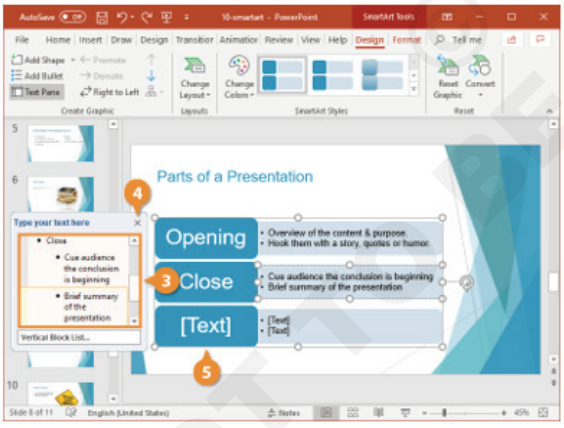


3 Type text for each bullet in the Text pane.

4 Click the Text pane's Close button or click outside the SmartArt diagram.

5 Select any unused shapes in the graphic.

6 Press the Backspace or Delete key to remove them from the graphic.

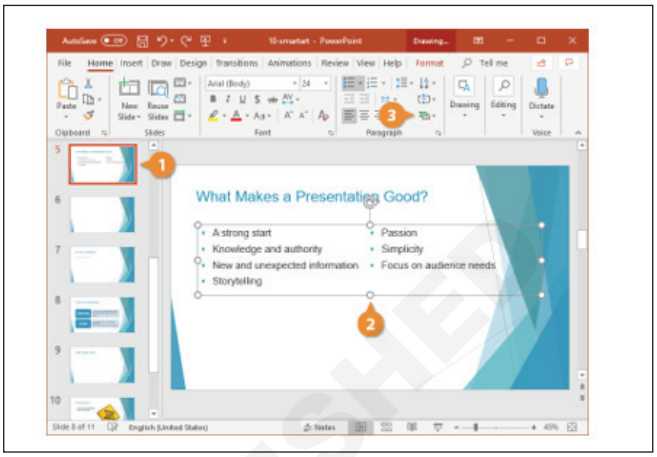


Convert a List to a SmartArt Graphic

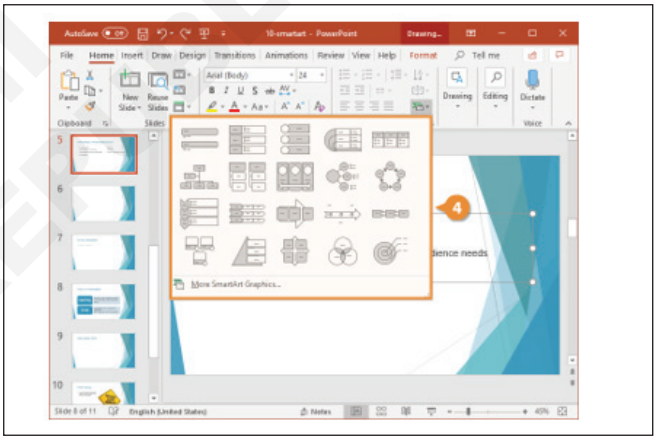
1 Select the slide with the list you want to convert to SmartArt.

2 Select the list text box.

3 Click the Convert to SmartArt Graphic button on the Home tab.



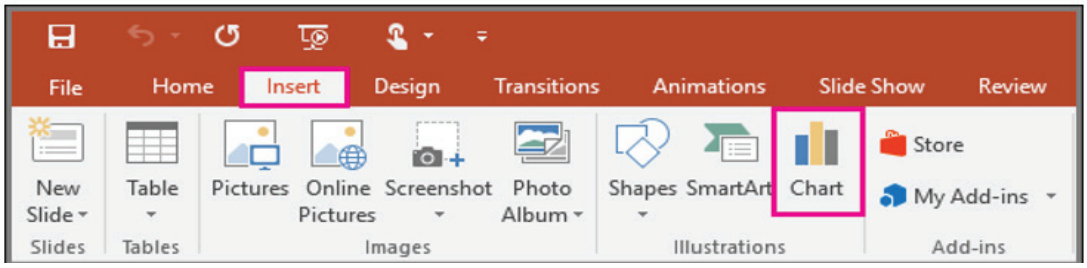
4 Select a SmartArt style.



5 Resize and position the graphic as needed.

TASK 4: **Create, insert and modify charts**

1 Click Insert > Chart.



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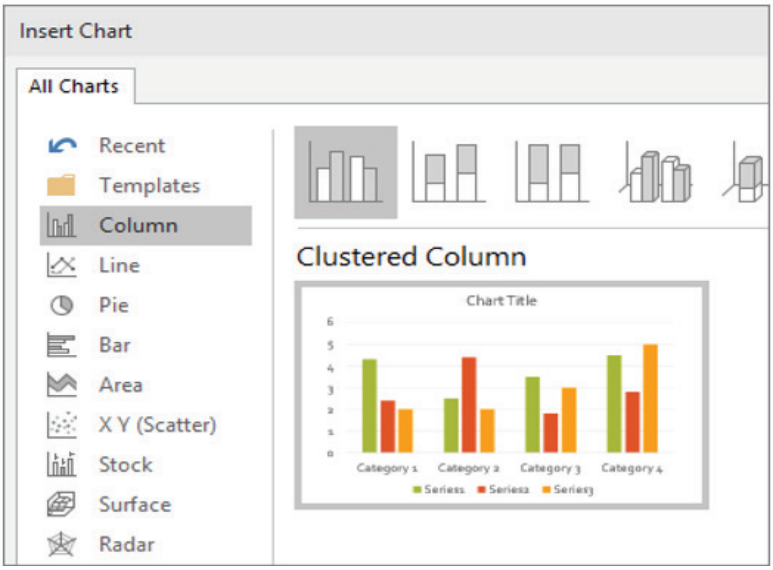
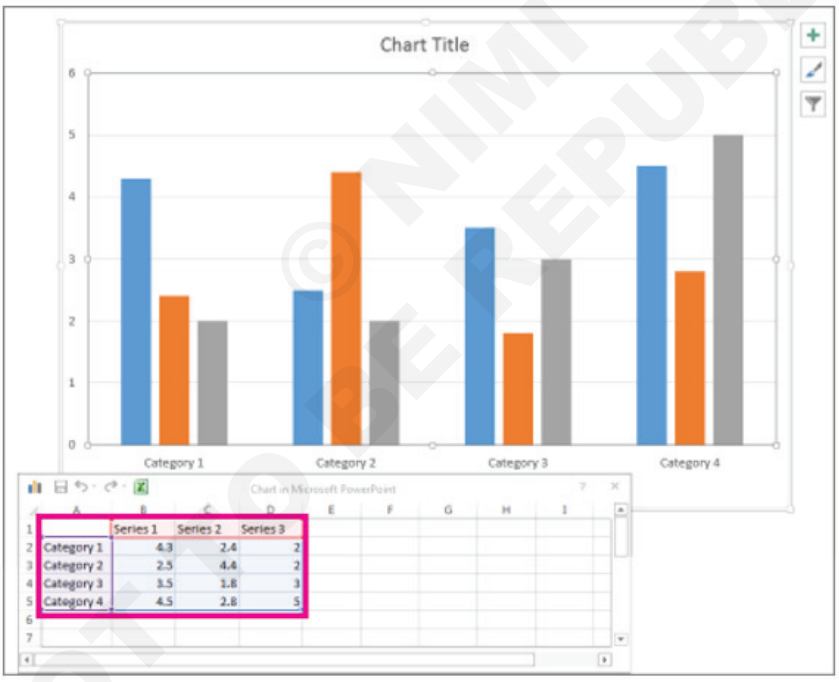
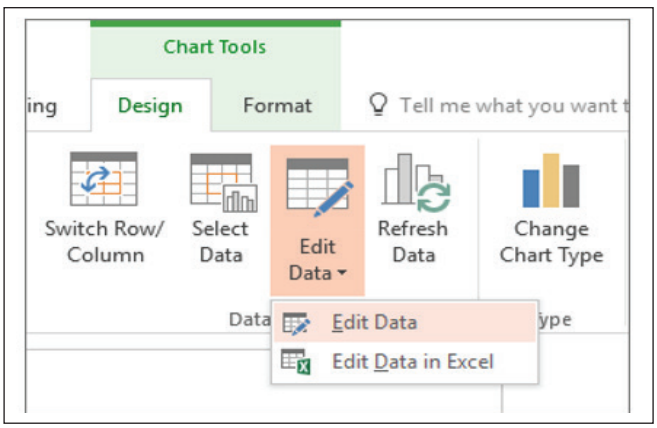
2 Click the chart type and then double-click the chart you want.



3 In the worksheet that appears, replace the placeholder data with your own information.



4 When you insert a chart, small buttons appear next to its upper-right corner. Use the Chart Elements button to show, hide, or format things like axis titles or data labels. Or use the Chart Styles button to quickly change the color or style of the chart.



Change chart data on a slide

1 On the slide, select the chart that you want to change. The Chart Design Tools contextual tab appears at the top of the PowerPoint window.

2 Under Chart Tools, on the Chart Design tab, in the Data group, click Edit Data.

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3 Done one of the following:

- To edit data in PowerPoint, click Edit Data. This will open a window from your spreadsheet.
- To edit data directly in Excel, click Edit Data in Excel.

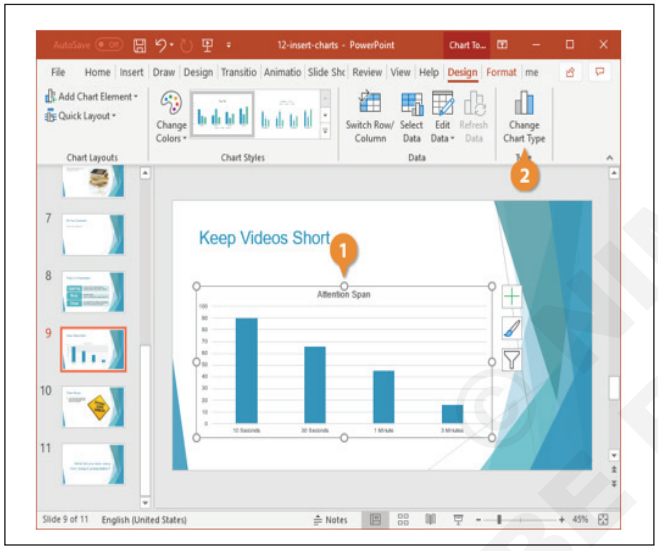
4 Make the changes you want. They will be reflected in the chart in PowerPoint.

Change the Chart Type

Different types of charts are better for presenting different types of information. For example, a column chart is great for comparing values of different items, but not for illustrating trends or relationships. If you find that a chart you've created isn't the best fit for your data, you can switch to a different chart type.

1 Select the chart.

2 Click the Change Chart Type button on the Chart Tools Design tab.

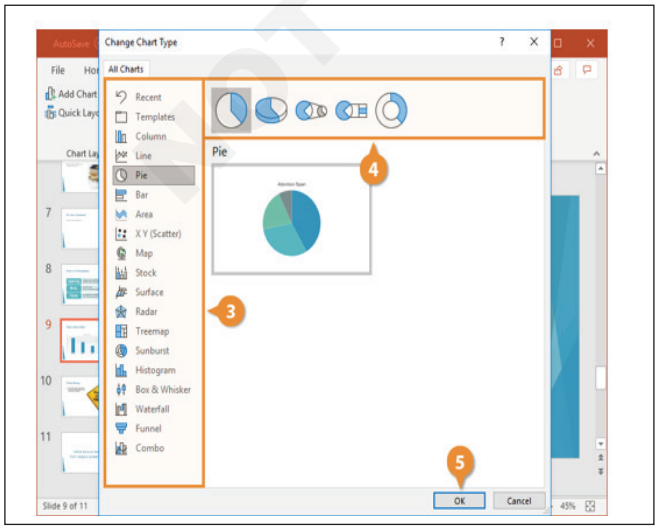


You see all available categories at the left.

3 Choose a category.

4 Select a chart type.

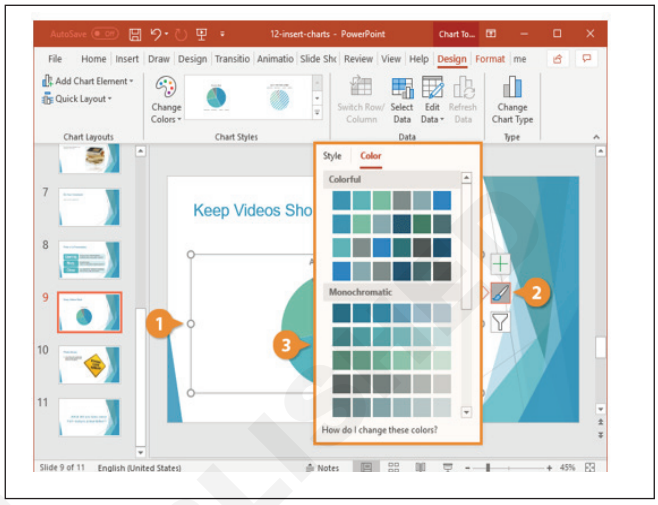
5 Click OK.



Format a Chart

There are a number of formatting tools available to change the look of your chart and modify elements for the chart type you chose. The options to format are available on the Chart Tools Design and Format tabs, but you can also use the Chart Tools shortcuts that appear to the right of a chart when it's selected.

1 Select a chart or chart element.



2 Click the Chart Styles button.

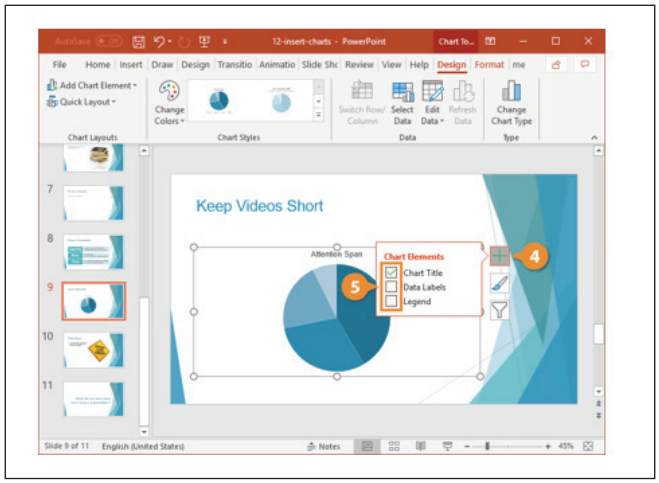
3 Select a style or color option.

- Chart Styles: Change the overall visual style of the chart.
- Chart Colors: Select from an array of color schemes designed to coordinate with the current presentation theme.

4 Click the Chart Elements button.

This is where you add or remove things like titles, labels, and the legend. What you see here will vary depending on the type of chart you have inserted.

5 Turn the chart elements on or off.



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Add Audio elements

Objectives: At the end of this exercise you shall be able to
- **import audio files in presentations**
- **configure audio playback options.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Import audio files in presentations**

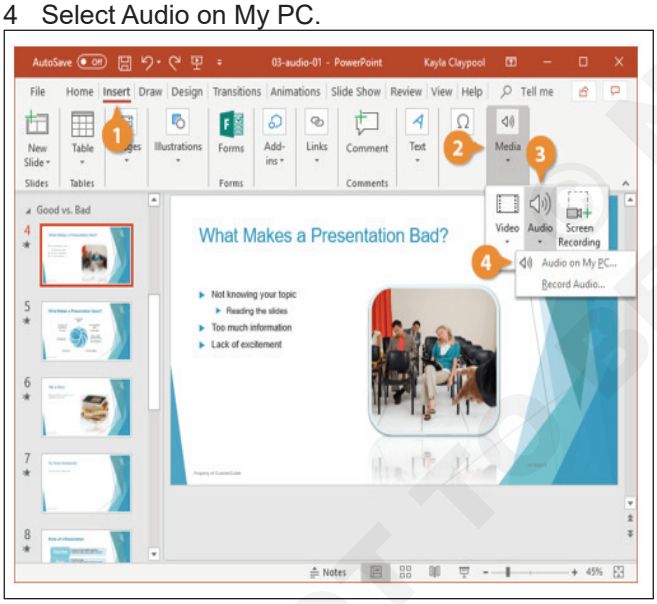
Add Audio to a Slide

1 Click the Insert tab on the ribbon.

2 If necessary, click to expand the Media group.

3 Click Audio.

4 Select Audio on My PC.



5 Navigate to and select a sound clip.

6 Click Insert.

A sound icon appears on the slide and Audio Tools tabs appear on the ribbon where you can adjust the audio.

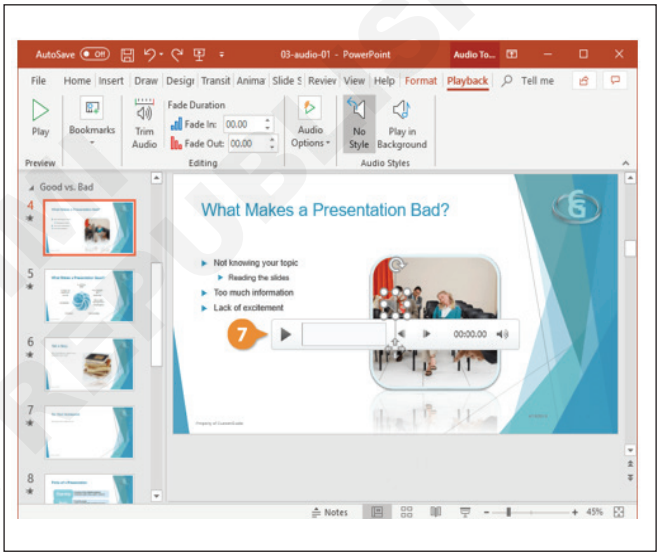
7 Click Play to test your audio.

Record Audio

If you need a very specific sound that you can't find online or that isn't already saved to your computer, you can record a sound yourself instead.

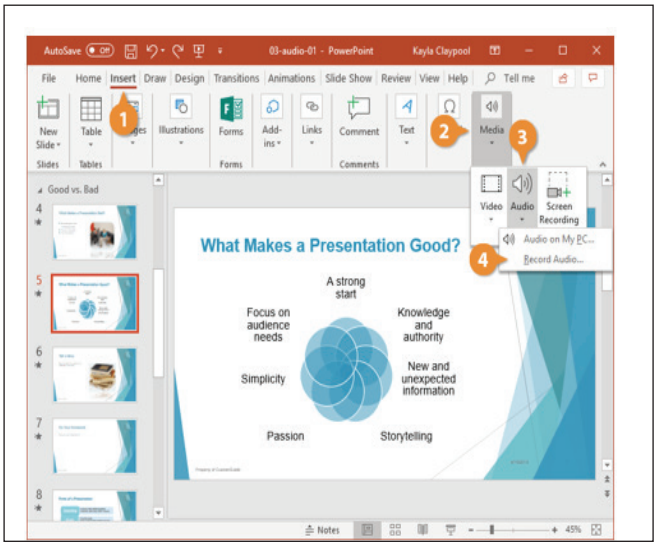
1 Click the Insert tab on the ribbon.

2 Click to expand the Media group.



3 Click Audio.

4 Select Record Audio.



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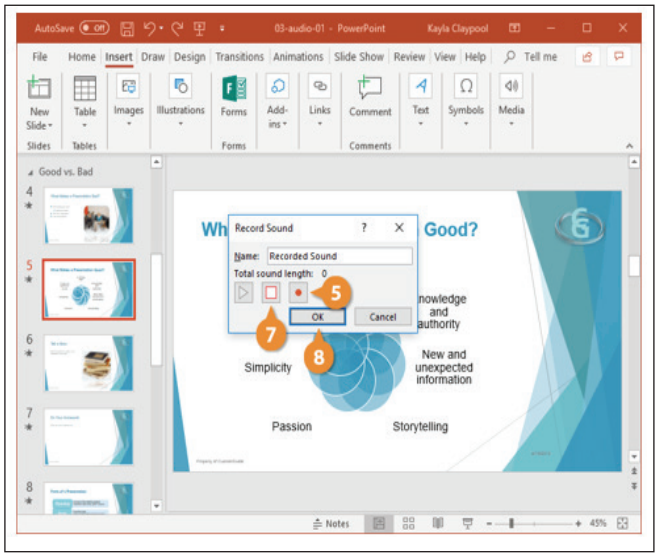


5 Click Record.

6 Record your audio.

7 Click the Stop button.

8 Click OK to save it.

TASK 2: **Configure audio playback options**

Audio Options

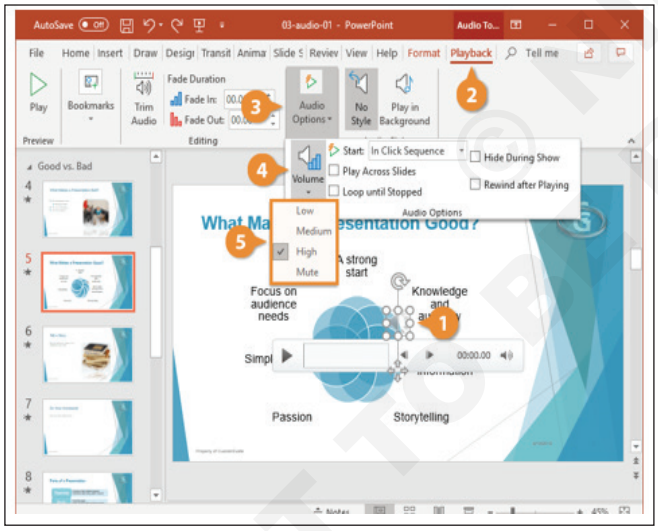
1 Select the audio clip.

2 Click the Playback tab.

3 Expand the Audio Options group.

4 Click the Volume button.

5 Select a volume option.

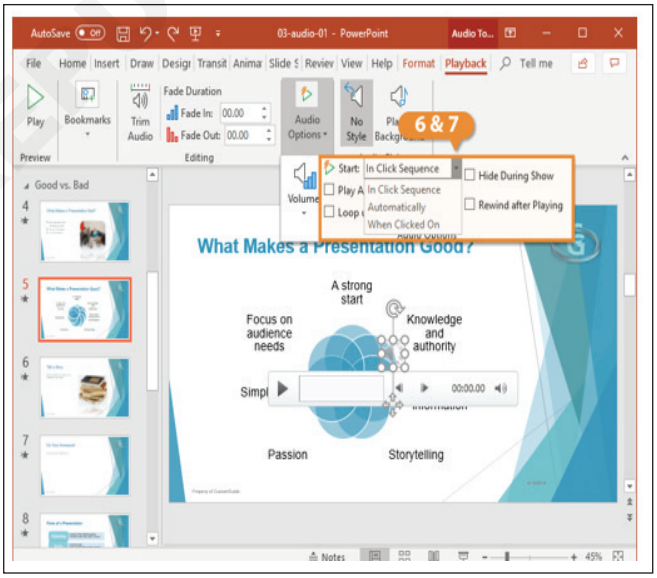


6 Click the Start list arrow and select an option.

- **Automatically:** Audio begins when you enter the slide.
- **On Click:** Audio is paused until you click the mouse.

7 Use the check boxes in the Audio Options group to adjust any other settings.

- **Play Across Slides:** The audio will continue to play as you switch to the next slides.
- **Loop until Stopped:** The audio will replay in a loop while you remain on this slide during the presentation.
- **Hide During Show:** The audio icon will be hidden during the presentation.
- **Rewind after Playing:** The audio will play once and then automatically rewind.



There are additional useful options on the Playback tab, such as setting the audio to fade in or out, trimming the audio down, or inserting a bookmark.

To remove audio, just select the sound icon and press the Delete key on your keyboard.

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Add video elements

Objectives: At the end of this exercise you shall be able to
- **import video files in presentations**
- **resize video to fit slide**
- **configure video playback options.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Import video files in presentations**

Add Video to a Slide

Insert a Video from Your Computer

Videos that are inserted from a file are embedded directly into the PowerPoint presentation, so the presentation file size will increase when videos are inserted.

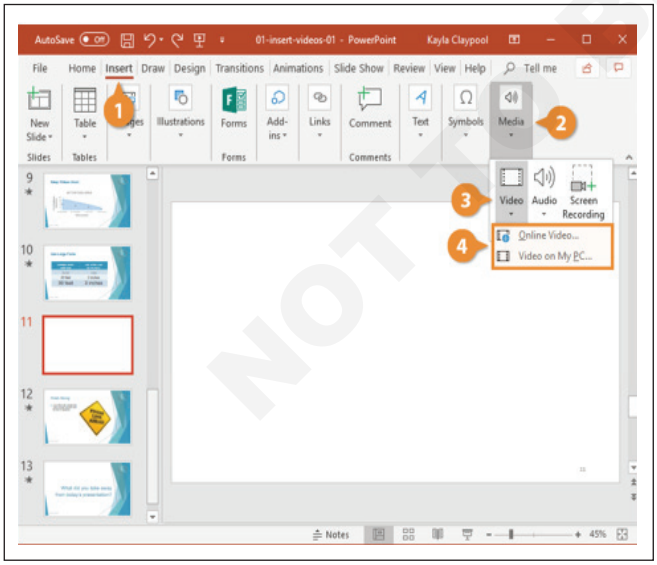
1 Click the Insert tab on the ribbon.

2 Click to expand the Media group.

3 Click Video.

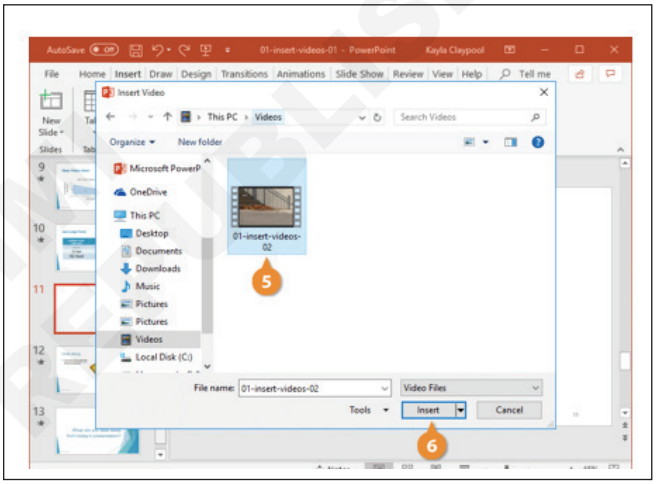
4 Select Video on My PC.

If you don't have a video saved to your computer, you can also choose Online Video to add a video from YouTube or use an embed code.



5 Navigate to and select the video.

6 Click Insert.

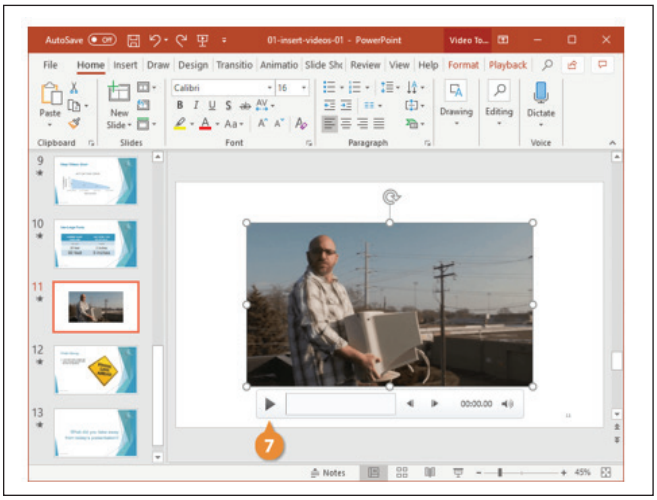


The video is inserted into the slide.

Just like with other objects, you can click and drag to resize or move the video.

7 Click Play to preview your video.

To delete a video, select the video and press the Delete key on your keyboard.



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TASK 2: **Resize video to fit slide**

Video Size

If the video isn't quite the right size, you can change that too, just like you would a picture.

1 Drag the size handles or adjust the value in the size field.

TASK 3: **Configure video playback options**

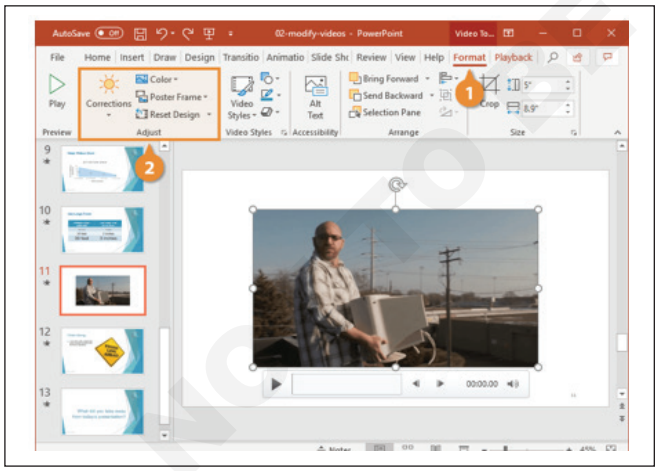
Video Appearance Options

The Adjust group of the Format tab contains all the options you'll need to modify the video's appearance.

1 Click the Video Tools Format tab.

2 Select an adjustment option.

- **Corrections:** Modify the brightness or contrast of the video.
- **Color:** Apply a style effect, such as a color or grayscale.
- **Poster Frame:** Set the video's preview image.
- **Reset Design:** Discard all formatting changes applied to the video.

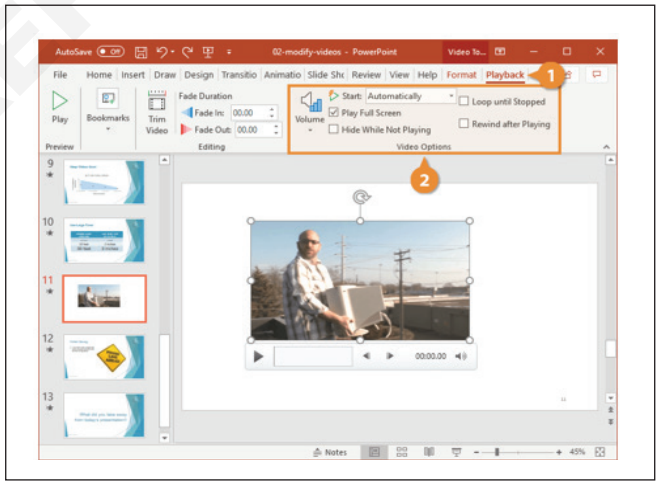


Video Playback Options

1 Click the Playback tab.

2 Adjust the settings in the Video Options group.

- **Volume:** Adjusts the volume for the video clip's audio.
- **Start:** Determines when the video clip will play. The default setting is "On Click", but you can adjust the setting so the video starts automatically.
- **Play Full Screen:** Expands the video to play full screen while the presentation is running.
- **Hide While Not Playing:** Hides the video frame when it is not playing.
- **Loop until Stopped:** Repeats the video until it is manually paused or the presentation moves on to the next slide.
- **Rewind after Playing:** Returns the video clip to the starting position after playback ends.



Set Video Start and End Point

The Trim Video option allows you to cut off portions of the beginning or end of a video to make it shorter.

1 Click the Trim Video button.

2 Adjust the start and end points.

You can either type specific values into the Start Time and End Time fields or click and drag the start and end handles in the timeline below the video.

3 Click OK.

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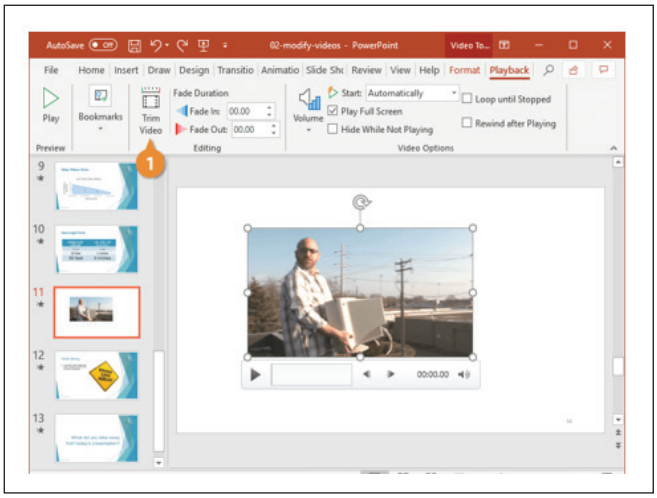

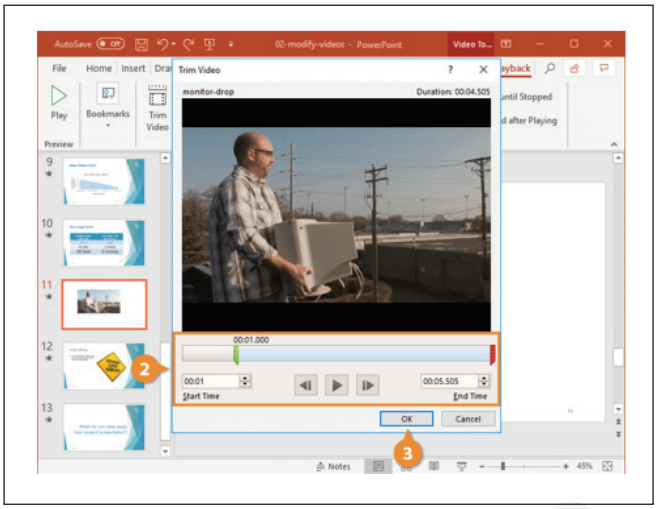

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Add slide transitions

Objectives: At the end of this exercise you shall be able to
- **add same slide transition for all slides**
- **set transition effect duration**
- **configure transition start and finish options**
- **customize select slide transitions**

Requirements

Tools/Equipment/Machines

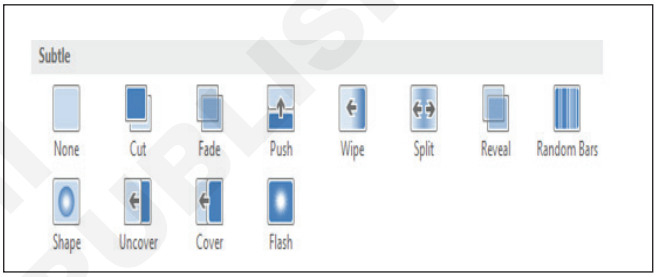
- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

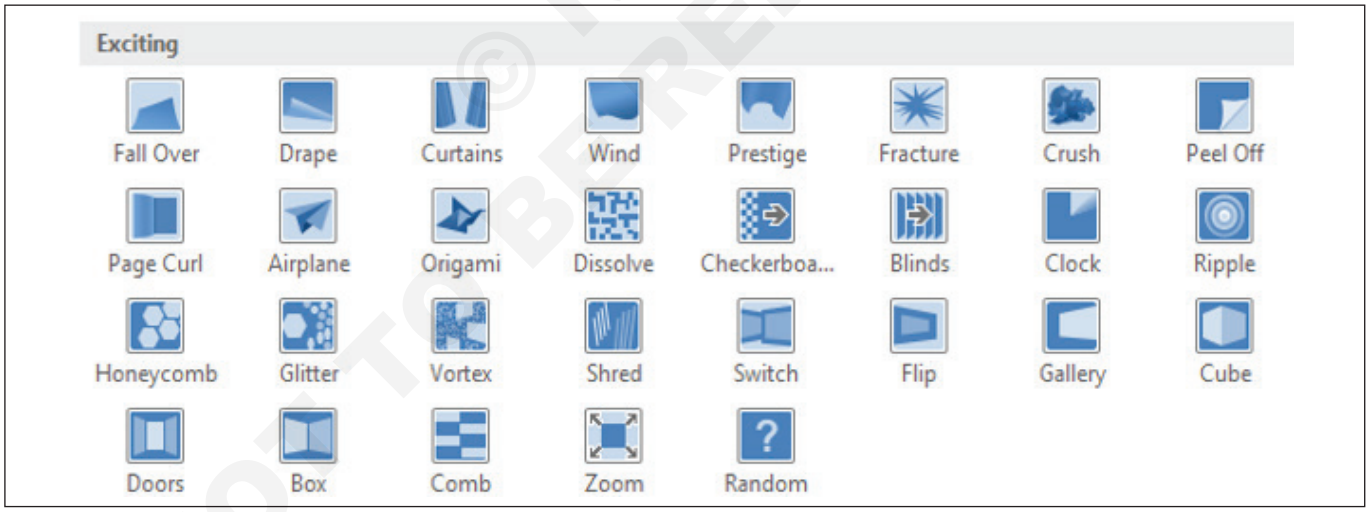
TASK 1: **Add same slide transition for all slides**

About transitions

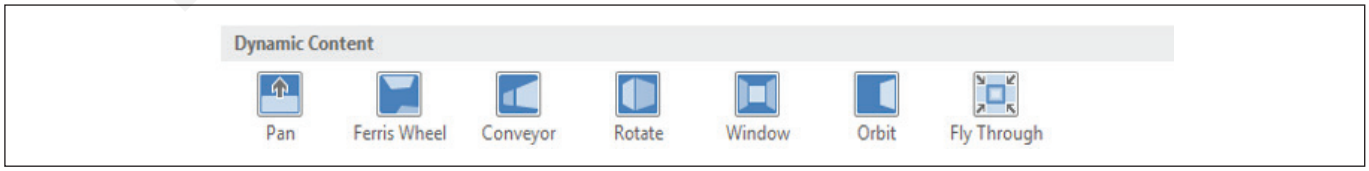
There are three categories of unique transitions to choose from, all of which can be found on the Transitions tab.



- **Subtle:** These are the most basic types of transitions. They use simple animations to move between slides.
- **Exciting:** These use more complex animations to transition between slides.



- **Dynamic Content:** If you're transitioning between two slides that use similar slide layouts, dynamic transitions will move only the placeholders, not the slides themselves..



Transitions are best used in moderation. Adding too many transitions can make your presentation look a little silly and can even be distracting to your audience. Consider using mostly subtle transitions, or not using transitions at all.

Apply a Transition

1 Select the slide that you want to apply a transition to.

To select multiple slides, hold down Ctrl as you select each slide.

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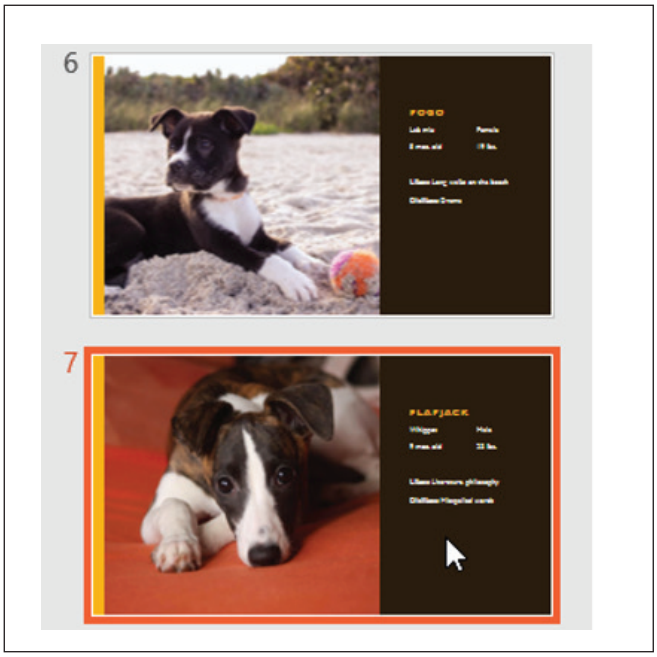
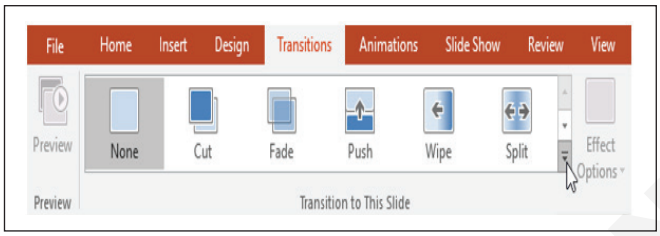
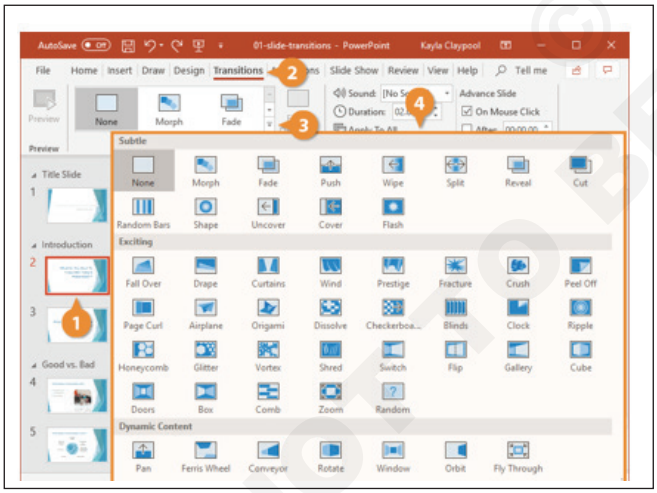


2 Click the Transitions tab.

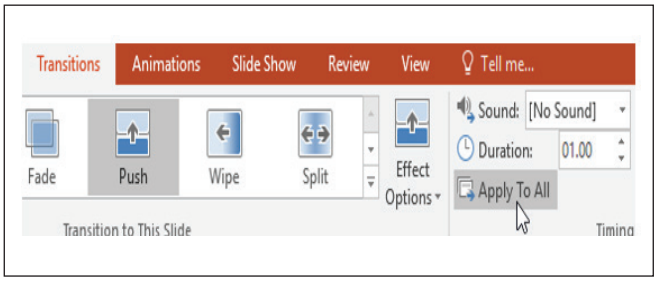
3 Click the Slide Transitions More button.



4 Select the transition you want to use.

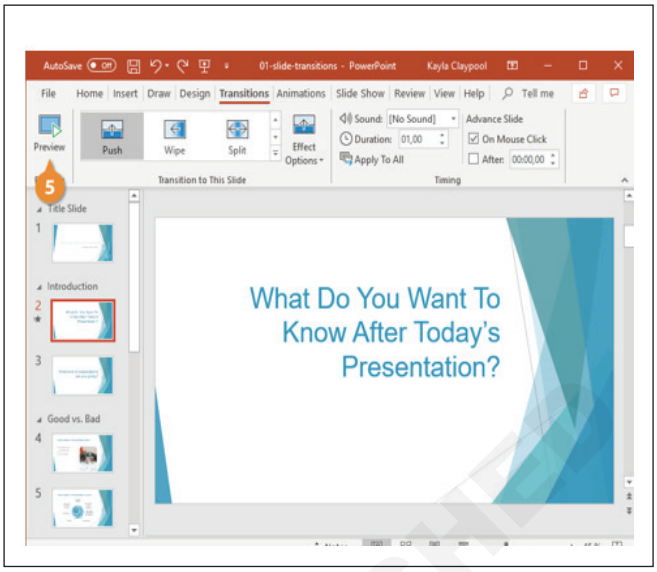


The transition is applied to just the selected slide. To apply the transition to all slides in the presentation, click the Apply to All button on the Transitions tab.



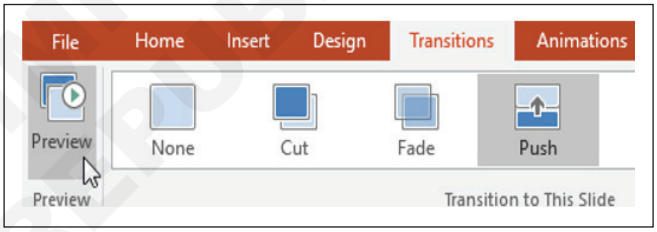
To preview a transition:

5 (Optional) To test the transition after it's applied, click the Preview button.



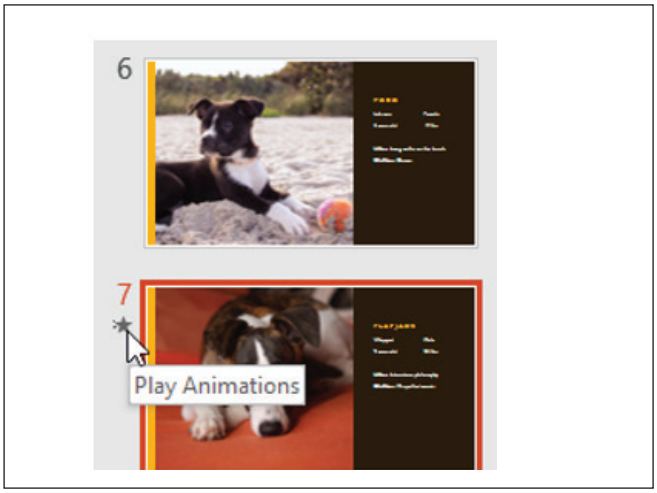
You can preview the transition for a selected slide at any time using one of these two methods:

- Click the Preview command on the Transitions tab.



- Click the Play Animations command in the Slide Navigation pane.

6 To remove a transition, select None in the Slide Transitions gallery.



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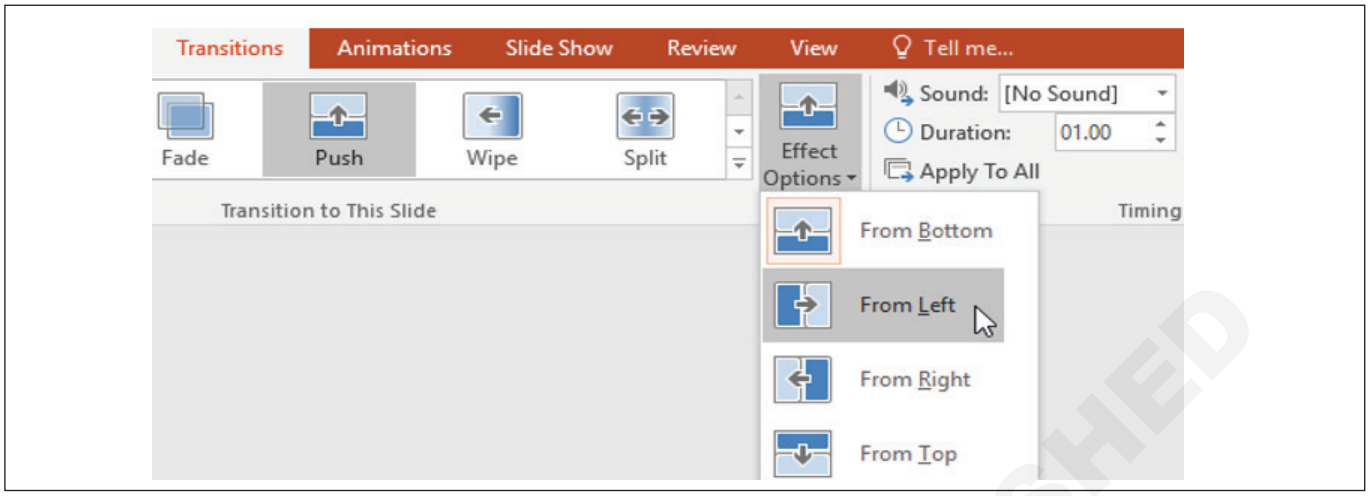
TASK 2: **Set transition effect duration**

To Set the transition effect:

You can quickly customize the look of a transition by changing its direction.

1 Select the slide with the transition you want to modify.



2 Click the Effect Options command and choose the desired option. These options will vary depending on the selected transition.

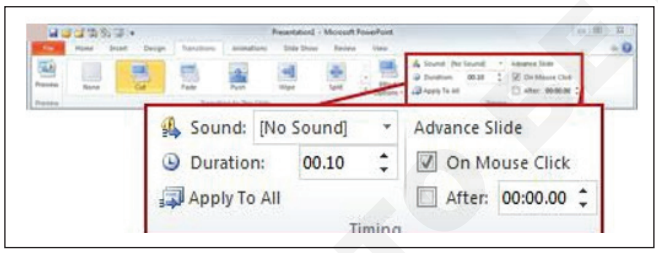
3 The transition will be modified, and a preview of the transition will appear.

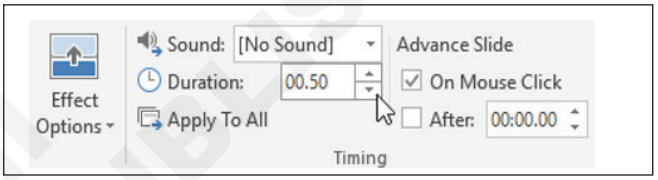
Some transitions do not allow you to modify the direction.

To modify the transition duration:

1 Select the slide with the transition you want to modify.

2 On the Transitions tab, in the Timing group, In the Duration field in the Timing group, enter the desired time for the transition. In this example, we'll decrease the time to half a second—or 00.50—to make the transition faster.

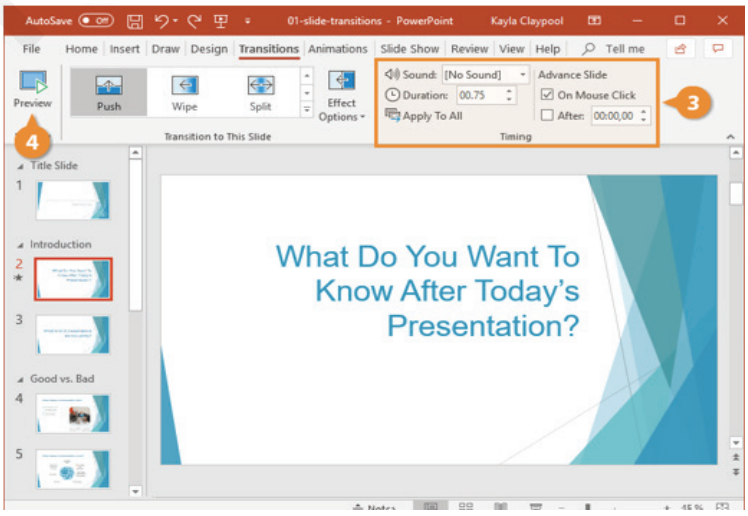




3 Select additional modification options in the Timing group:

- **Sound:** Pick a sound to play in unison with the slide transition.
- **Duration:** Specify the length of the transition.
- **Apply To All:** Apply the current slide's transition, effects, and timing settings to the entire presentation.
- **On Mouse Click:** Select this option to have the slide advance when the mouse is clicked.
- **After:** Select this option to have the slide advance after the amount of time you specify.

4 Click Preview to see how your transition looks with the modifications applied.



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TASK 3: **Configure transition start and finish options**

Advancing slides

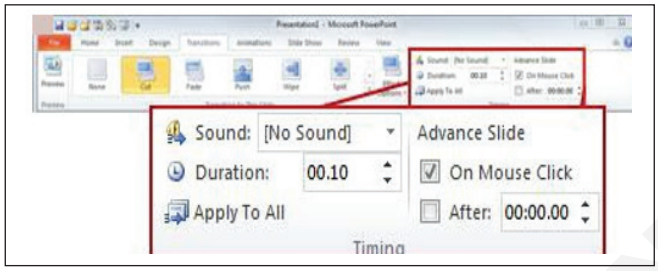
Normally, in Slide Show view you would advance to the next slide by clicking your mouse or by pressing the spacebar or arrow keys on your keyboard. The Advance Slides setting in the Timing group allows the presentation to advance on its own and display each slide for a specific amount of time. This feature is especially useful for unattended presentations, such as those at a trade show booth.

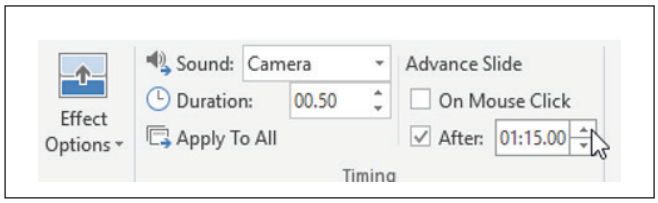
To advance slides automatically:

1 Select the slide you want to modify.

2 Locate the Timing group on the Transitions tab. Under Advance Slide, uncheck the box next to On Mouse Click.

3 In the After field, enter the amount of time you want to display the slide. In this example, we will advance the slide automatically after 1 minute and 15 seconds, or 01:15:00.





- To make the slide advance to the next slide when you click the mouse, select the On Mouse Click check box.
- To make the slide advance automatically, select the After check box, and then enter the number of minutes or seconds that you want. The timer starts when the final animation or other effect on the slide finishes.
- To enable both the mouse and automatic advance, select both the On Mouse Click check box and the After check box. Then, at After, enter the number of minutes or seconds that you want. The slide will advance automatically, but you can advance it more quickly by clicking the mouse.

Select another slide and repeat the process until all slides have the desired timing. You can also click the Apply to All command to apply the same timing to all slides.

TASK 4: **Customize select slide transitions**

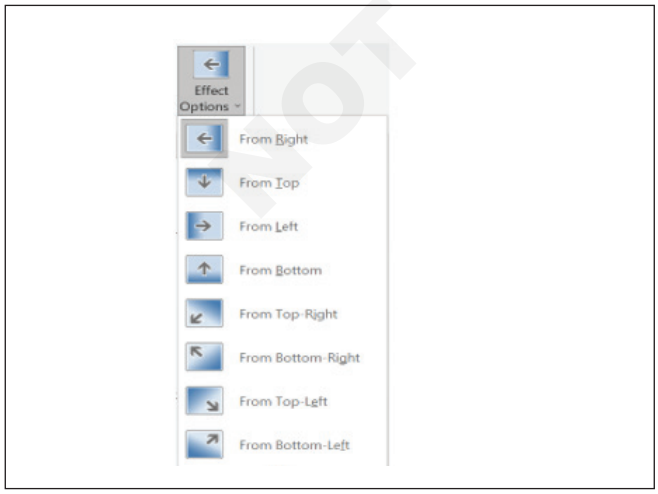
Customize a Transition

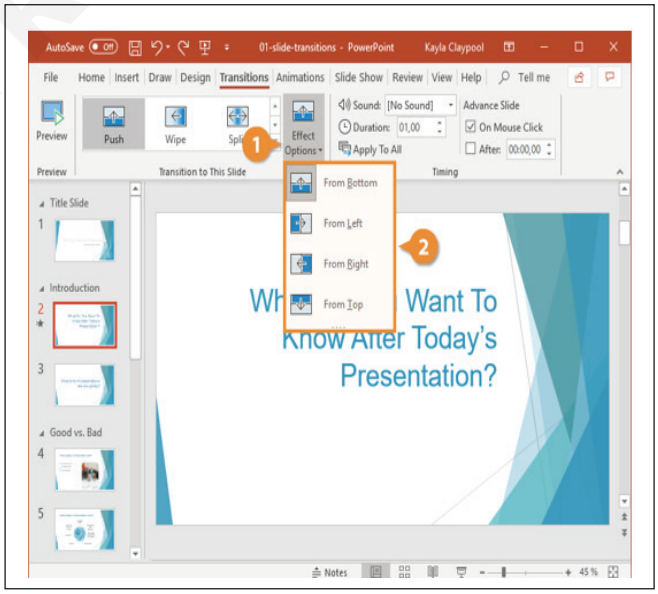
You can customize a transition effect to meet your needs, including adjusting its speed or duration and adding sound.

1 Click the Effect Options button.

The options available here will change based on which transition you've applied.

2 Select an effect option.





3 Select additional modification options in the Timing group:

- **Sound:** Pick a sound to play in unison with the slide transition.
- **Duration:** Specify the length of the transition.
- **Apply To All:** Apply the current slide's transition, effects, and timing settings to the entire presentation.

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- **On Mouse Click:** Select this option to have the slide advance when the mouse is clicked.
- **After:** Select this option to have the slide advance after the amount of time you specify.

To add sound:

1 Select the slide with the transition you want to modify.

2 Click the Sound drop-down menu in the Timing group.

3 Click a sound to apply it to the selected slide, then preview the transition to hear the sound.

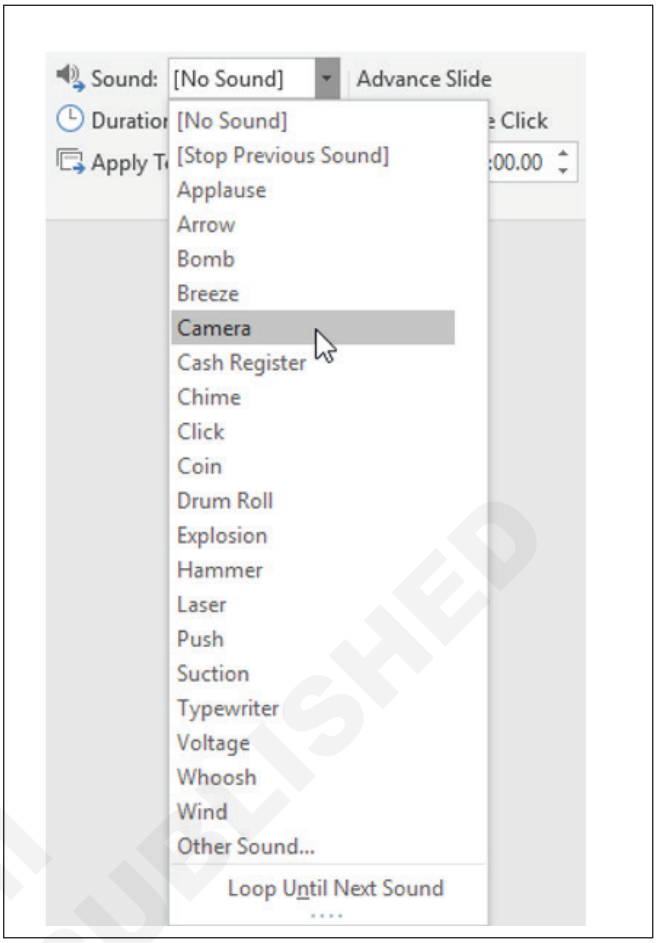
Sounds are best used in moderation. Applying a sound between every slide could become overwhelming or even annoying to an audience when presenting your slide show.

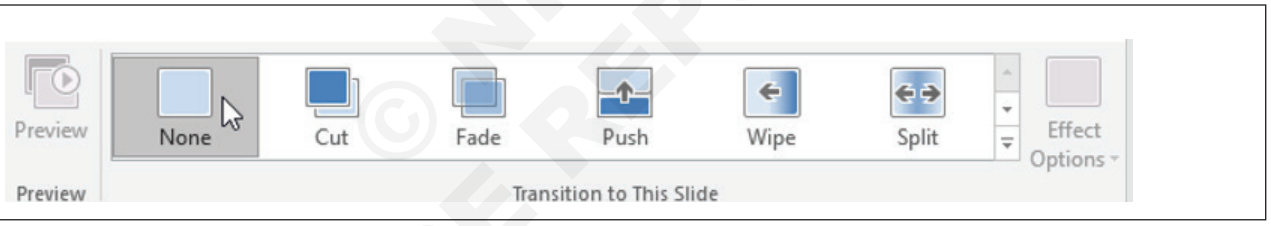
To remove a transition:

1 Select the slide with the transition you want to remove.

2 Choose None from the Transition to This Slide group. The transition will be removed.

To remove transitions from all slides, apply the None transition to a slide, then click the Apply to All command.





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Add Animations

Objectives: At the end of this exercise you shall be able to

- **animate text and graphic elements**
- **order shapes, images, and text boxes**
- **group shapes, images, and text boxes**
- **configure animation effects**
- **configure animation paths**
- **reorder animations on a slide**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

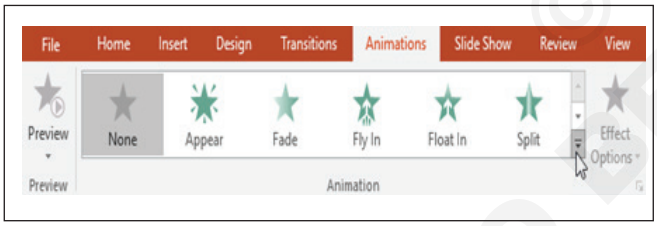
TASK 1: **Animate text and graphic elements**

Animate Text or Object:

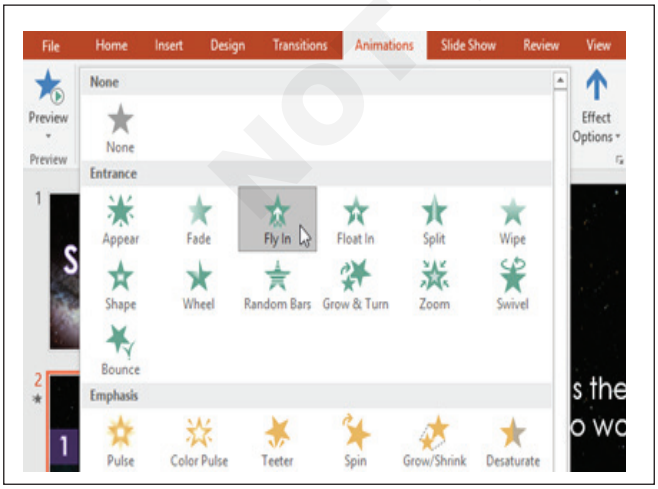
Note: Animating objects on a slide is really no different than animating text. However, you'll notice the available effect options will differ depending on what's being animated.

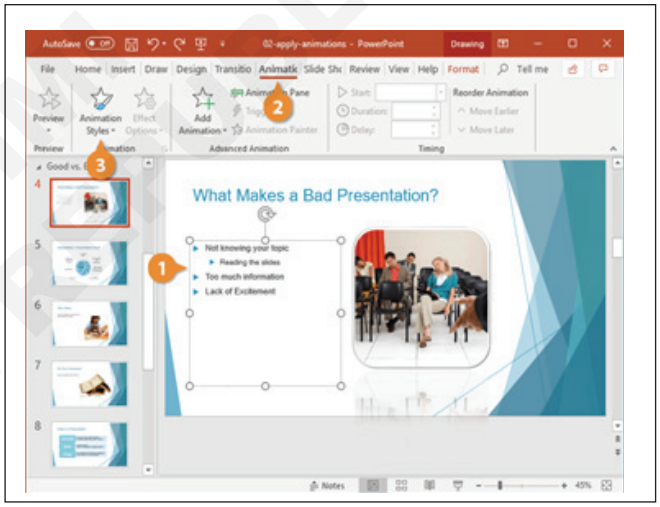
1 Select the text or Object you want to animate.

2 Click the Animations tab.



3 Click the Animation Styles button in the Animation group. A drop-down menu of animation effects will appear. Select the desired effect.





4 From here, you can see all the available animations They're grouped by Entrance, Exit, and Emphasis effects.

- **Entrance:** These control how the object enters the slide.

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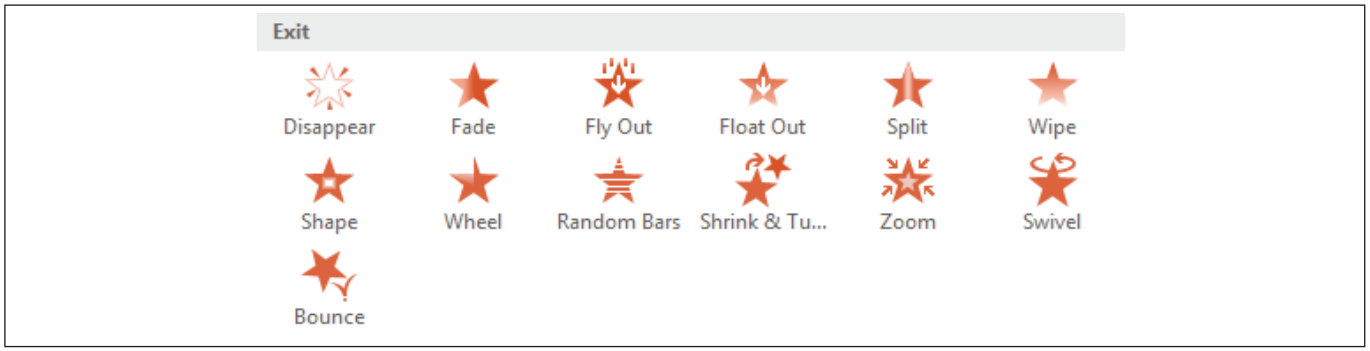
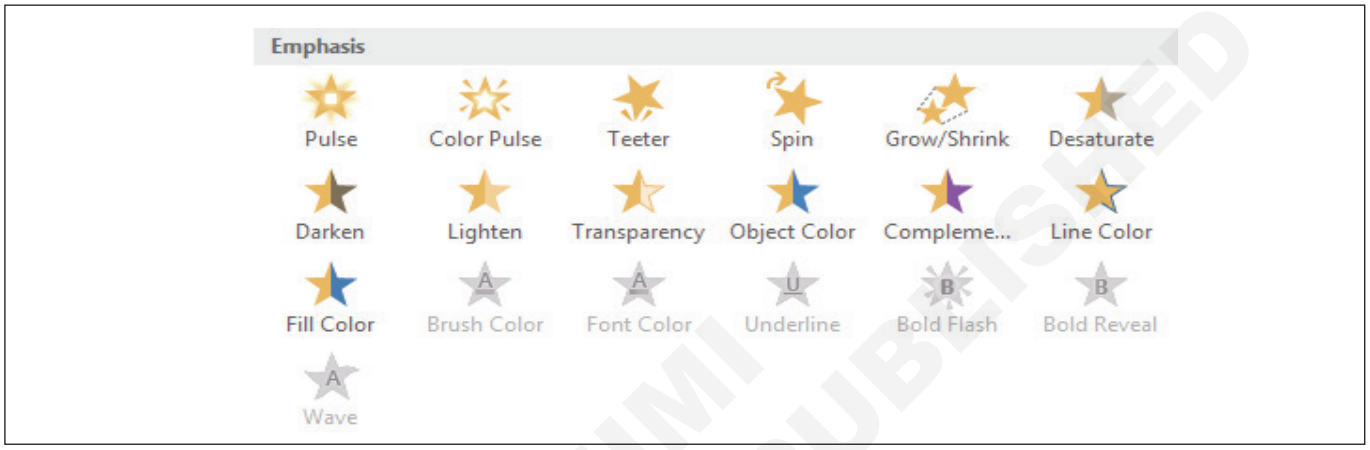
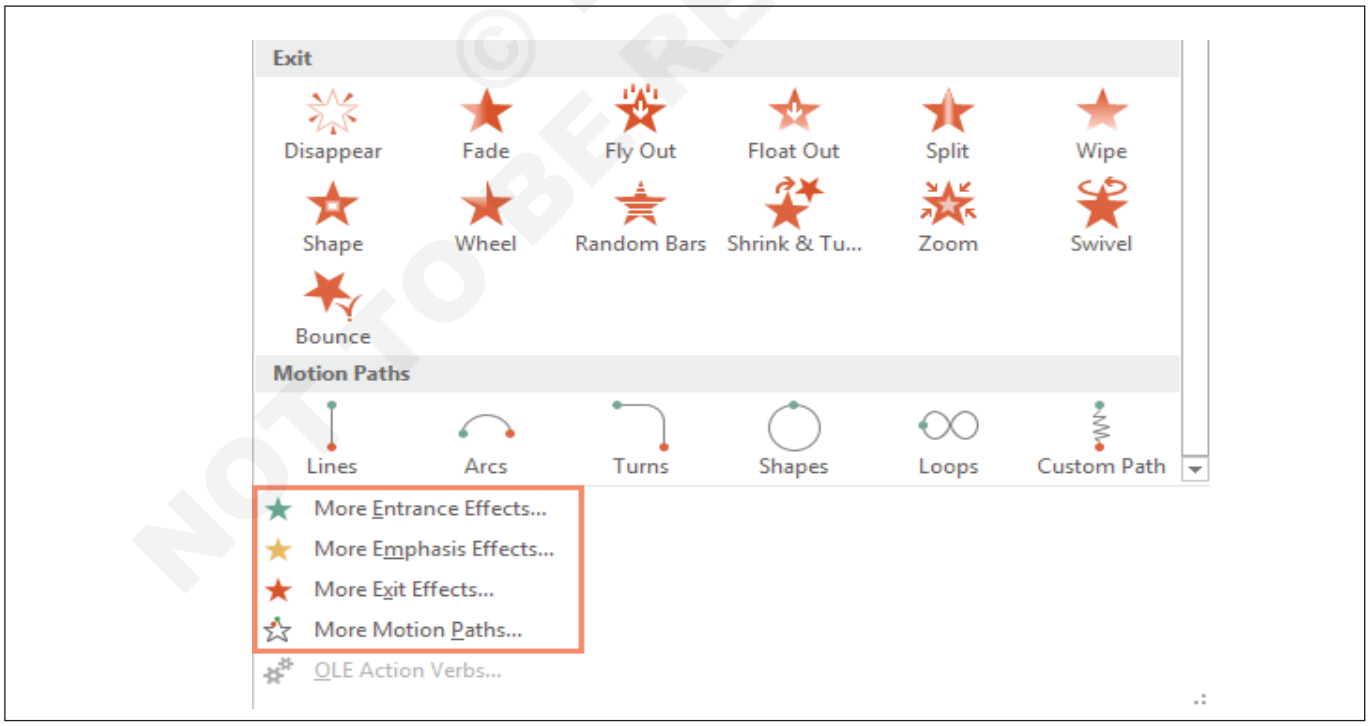
- **Exit:** These control how the object exits the slide.



- **Emphasis:** These animations occur while the object is on the slide, often triggered by a mouse click.



5 At the bottom of the menu, you can access additional effects.



Don't get too crazy with your animations. Animation effects should be used to call attention to the main points of your slide. Too many effects can detract from your presentation.

The preset animation is applied to the text or object and a preview of the effect is displayed. A number appears next to the object showing the order in which the animation will be displayed.

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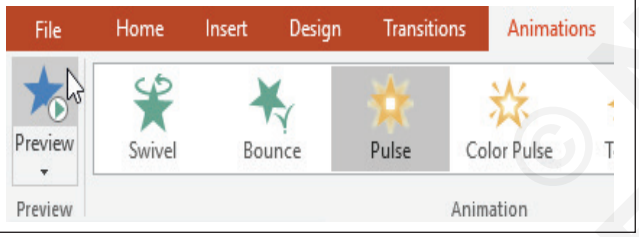
6 The effect will apply to the object. The object will have a small number next to it to show that it has an animation. In the Slide pane, a star symbol also will appear next to the slide.

To preview animations:

Any animation effects you have applied will show up when you play the slide show. However, you can also quickly preview the animations for the current slide without viewing the slide show.

1 Navigate to the slide you want to preview.

2 From the Animations tab, click the Preview command. The animations for the current slide will play.



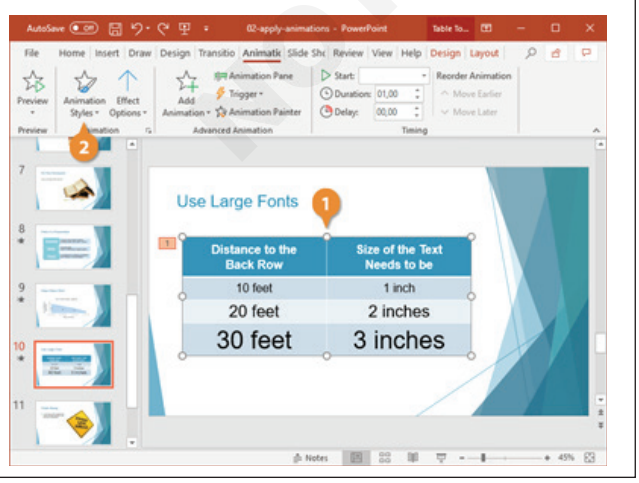
Remove an Animation Effect

An animation effect can quickly be removed if you decide you don't like it.

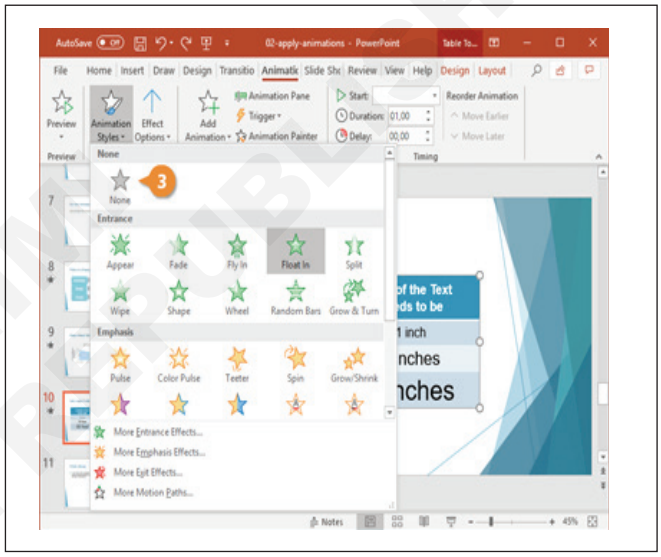
Option1:

1 Select the text or object with the animation you want to remove.

2 Click the Animation Styles button.



3 Select None.



The animation effect is removed from the text or object.

Option2:

To remove an animation:

1 Select the small number located next to the animated object.

2 Press the Delete key. The animation will be deleted.

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TASK 2: **Order shapes, images, and text boxes**

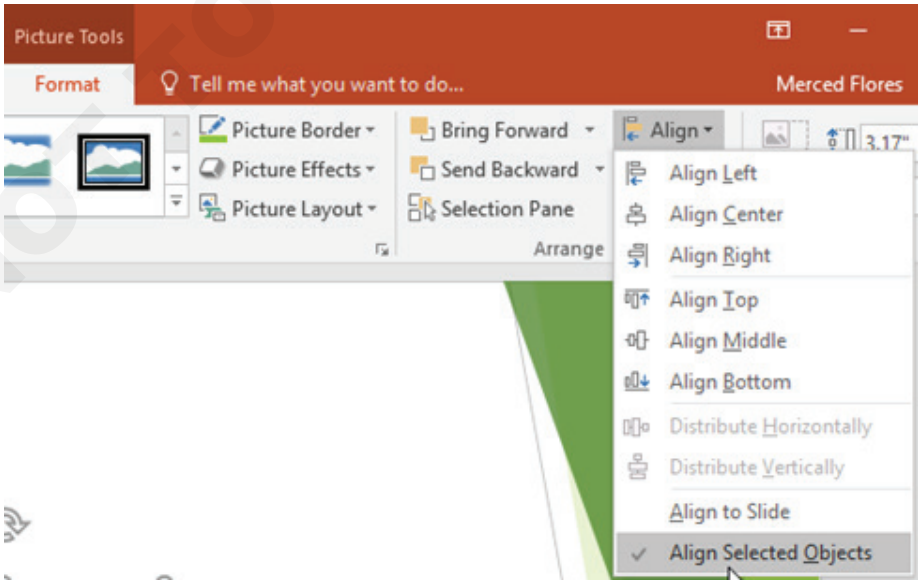
Aligning objects

When you move objects in PowerPoint, alignment guides and spacing guides will appear as dashed orange lines and arrows around the objects to help you align them. However, if you have several objects on a slide, it may be difficult and time consuming to get them perfectly aligned. Luckily, PowerPoint has several alignment commands that allow you to easily arrange and position objects.

To align two or more objects:

1 Select the objects you want to align. To select multiple objects at once, hold the Shift key while you click. The Format tab will appear.

2 From the Format tab, click the Align command, then select Align Selected Objects.



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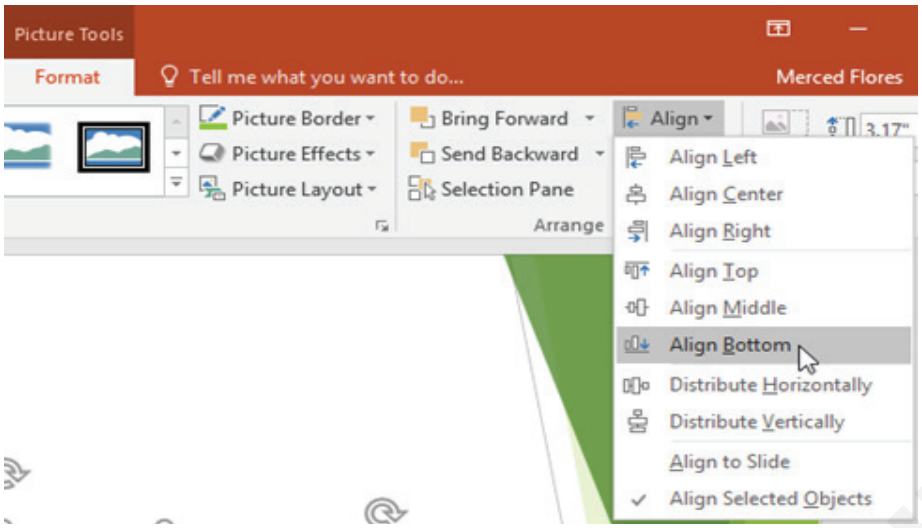
3 Click the Align command again, then select one of the six alignment options.

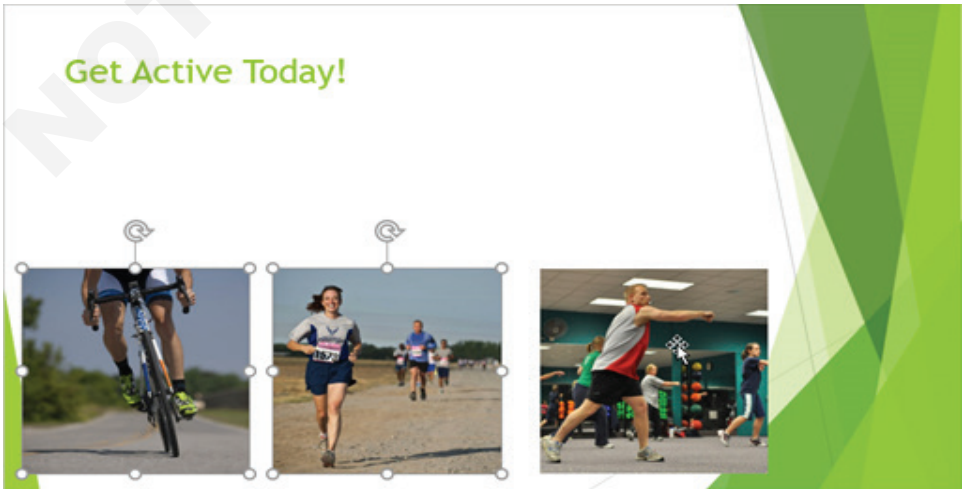


4 The objects will align based on the option you selected.

To align objects to the slide:

Sometimes you may want to align one or more objects to a specific location within the slide, such as at the top or bottom. You can do this by selecting the Align to Slide option before aligning the objects.

1 Select the objects you want to align. To select multiple objects at once, hold the Shift key while you click.



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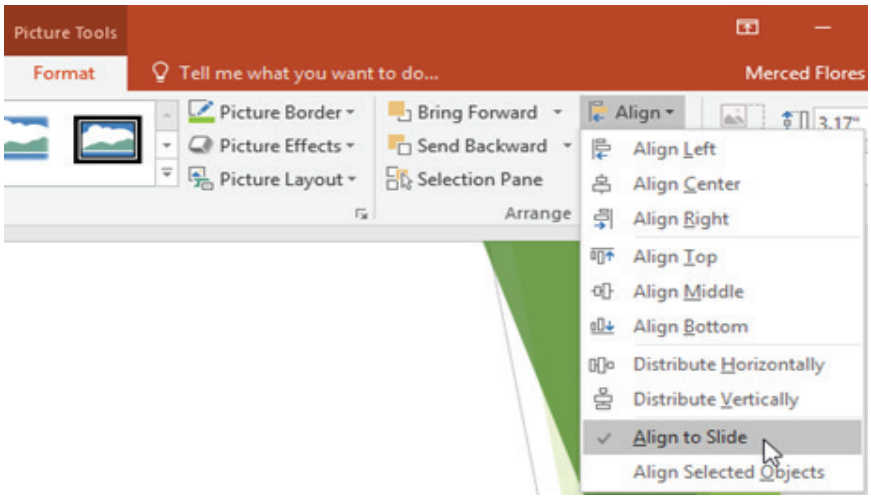
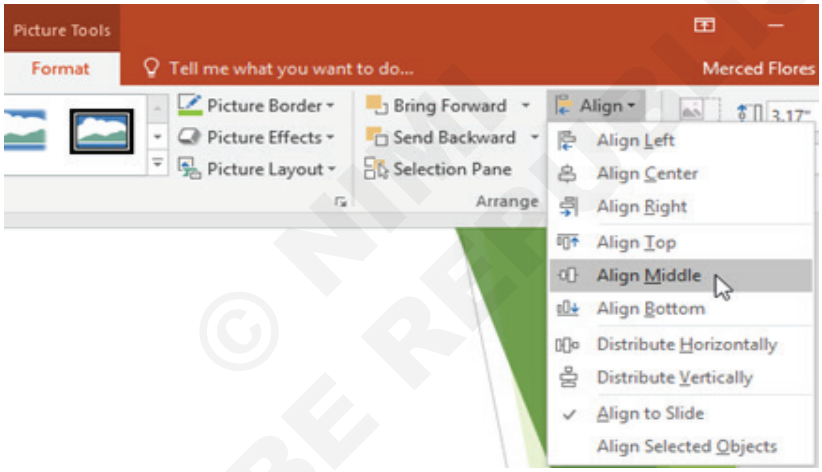
2 From the Format tab, click the Align command, then select Align to Slide.



3 Click the Align command again, then select one of the six alignment options.



4 The objects will align based on the option you selected.

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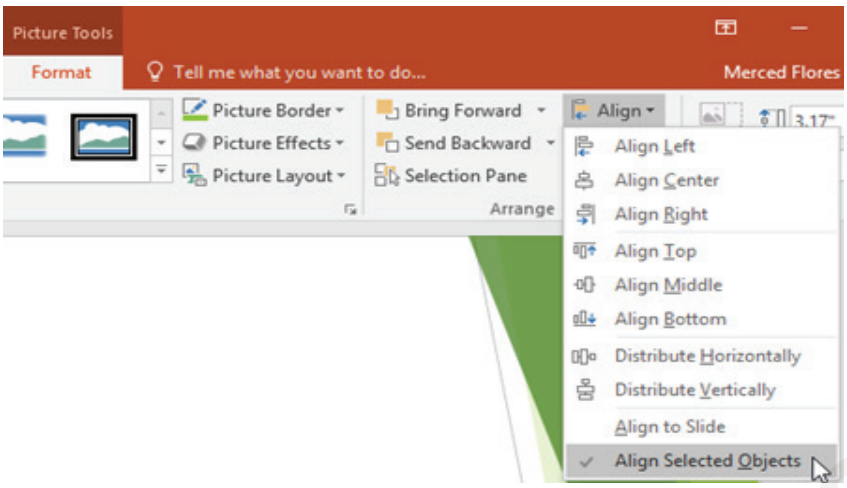
To distribute objects evenly:

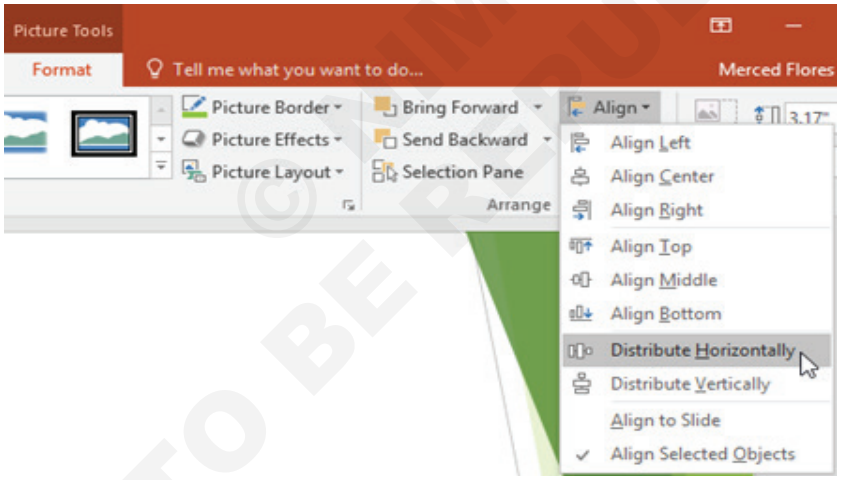
If you have arranged objects in a row or column, you may want them to be an equal distance from one another for a neater appearance. You can do this by distributing the objects horizontally or vertically.

1 Select the objects you want to align. To select multiple objects at once, hold the Shift key while you click.

2 From the Format tab, click the Align command, then select Align to Slide or Align Selected Objects.



3 Click the Align command again, then select Distribute Horizontally or Distribute Vertically from the drop-down menu that appears.



4 The objects will distribute evenly.

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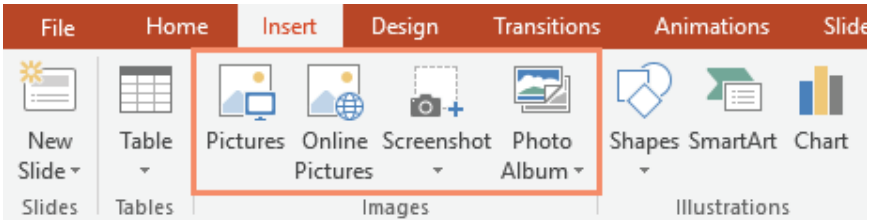
TASK 3: **Group shapes, images, and text boxes**

Grouping objects

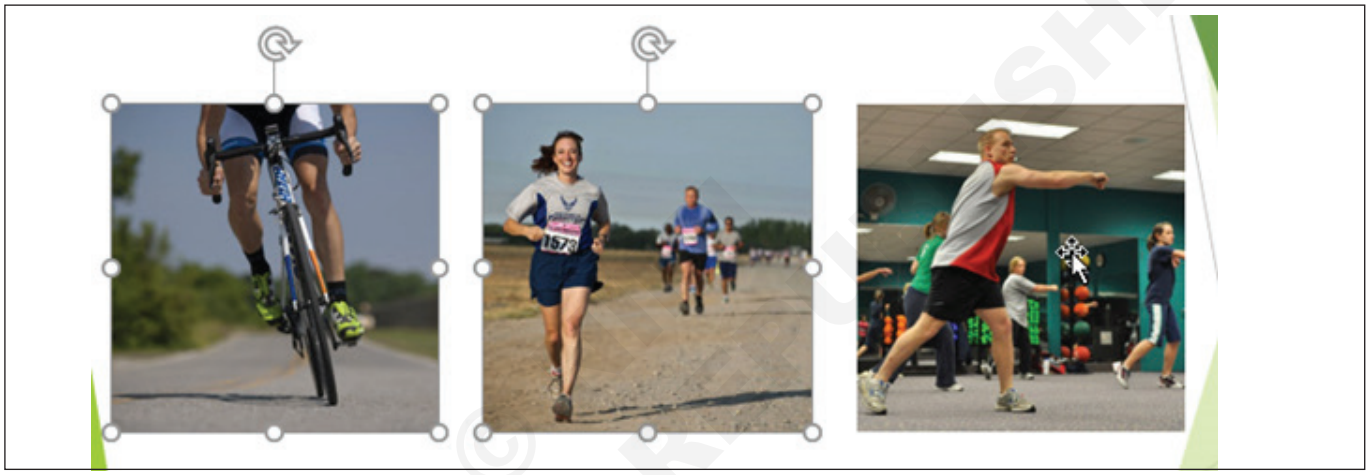
You may want to group multiple objects into one object so they will stay together if they are moved or resized. This is often easier than selecting all of the objects each time you want to move them.

Pictures, shapes, clip art, and text boxes can all be grouped; however, placeholders cannot be grouped. If you will be grouping pictures, use one of the commands in the Images group on the Insert tab to insert pictures instead of the picture icon inside the placeholder.

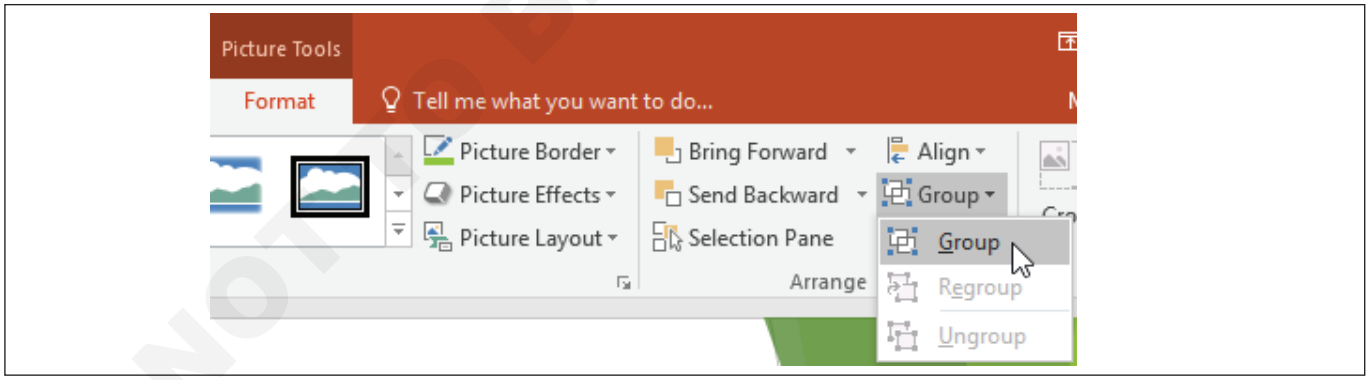


To group objects:

1 Select the objects you want to align. To select multiple objects at once, hold the Shift key while you click. The Format tab will appear.



2 From the Format tab, click the Group command, then select Group.



3 The selected objects will now be grouped. There will be a single box with sizing handles around the entire group to show that they are one group. You can now move or resize all of the objects at once.

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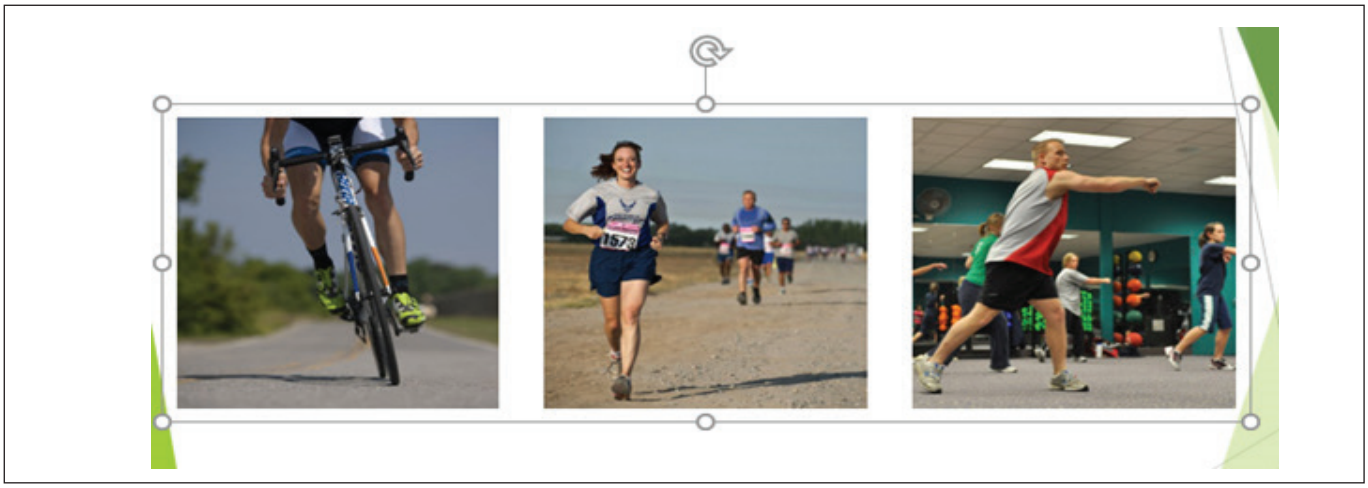
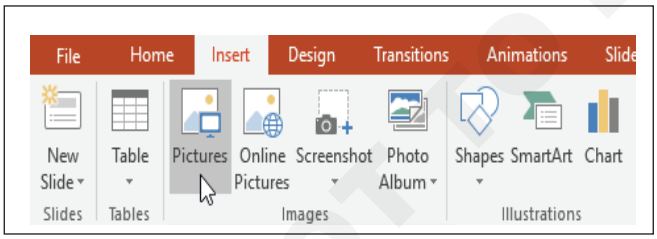


If you want to edit or move one of the objects in the group, double-click to select the object. You can then edit it or move it to the desired location.

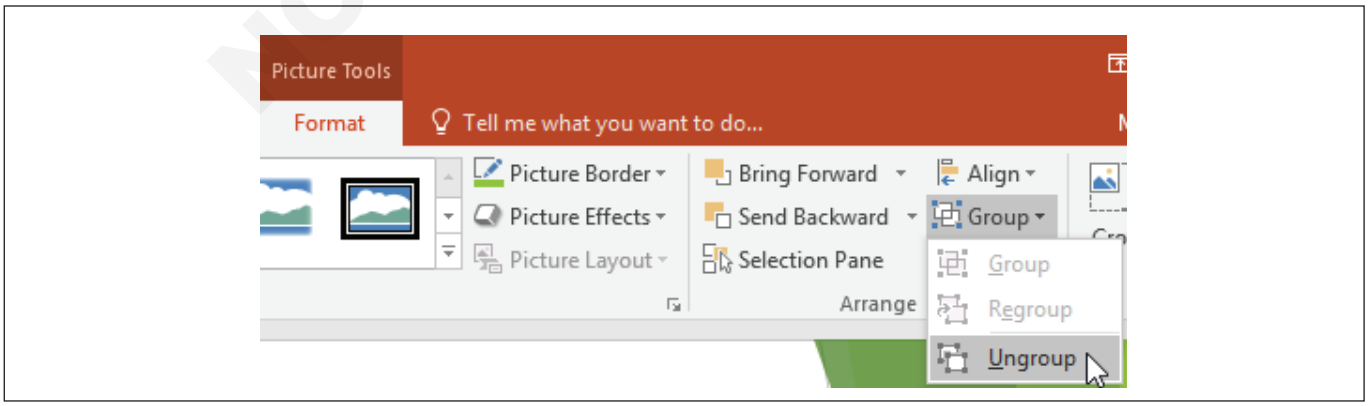
If you select the objects and the Group command is disabled, it may be because one of the objects is inside a placeholder. If this happens, try reinserting the images by using the Pictures command on the Insert tab.



To ungroup objects:

1 Select the object group you want to ungroup.

2 From the Format tab, click the Group command, then select Ungroup.



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3 The objects will be ungrouped.

Ordering objects

In addition to aligning objects, PowerPoint gives you the ability to arrange objects in a specific order. The ordering is important when two or more objects overlap because it will determine which objects are in the front or the back.

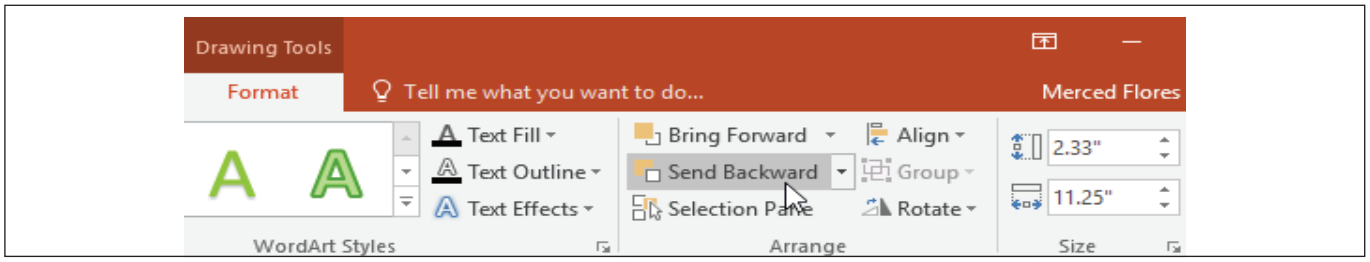
Understanding levels

When objects are inserted into a slide, they are placed on levels according to the order in which they were inserted into the slide. In our example, we've drawn an arrow on the top level, but we can change the level to put it behind the other objects.

To change the ordering by one level:

1 Select an object. The Format tab will appear.

2 From the Format tab, click the Bring Forward or Send Backward command to change the object's ordering by one level. If there are multiple objects on the slide, you may need to click the command several times to achieve the desired ordering.



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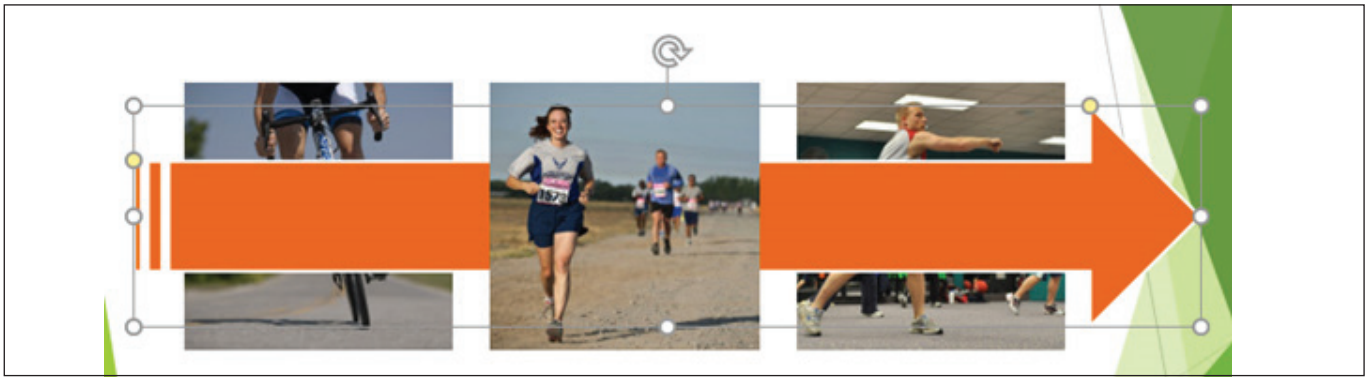
3 The objects will reorder.

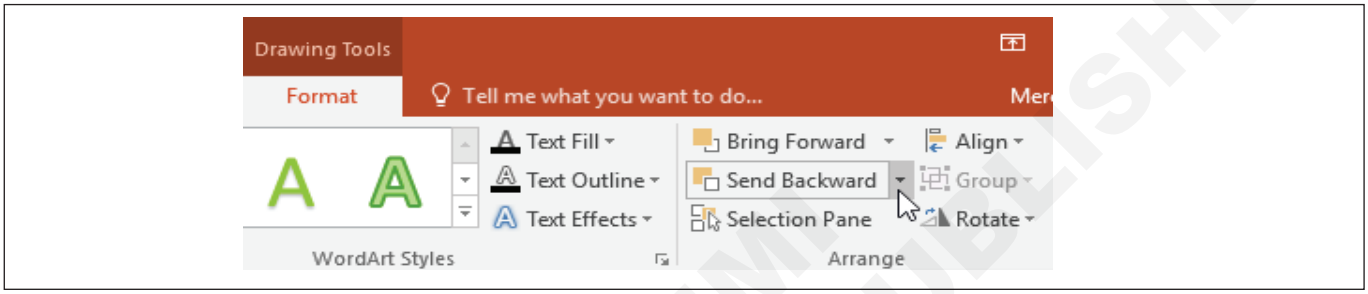


To bring an object to the front or back:

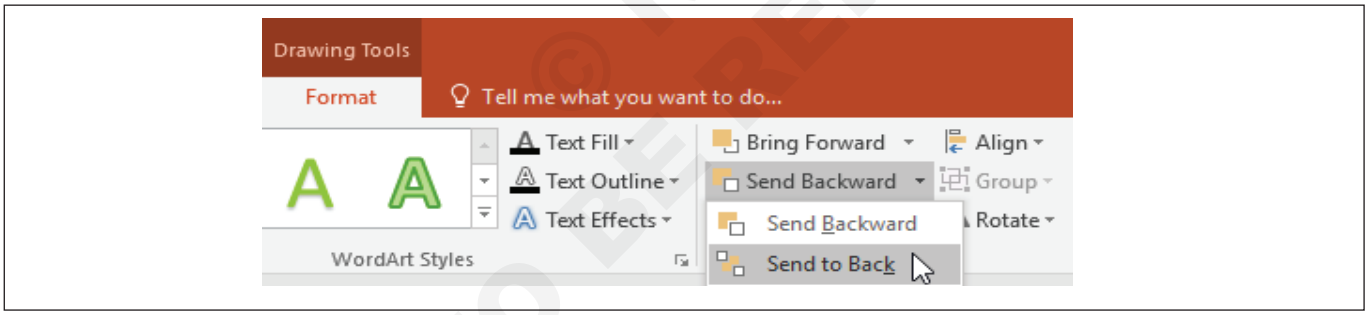
If you want to move an object behind or in front of several objects, it's usually faster to bring it to front or send it to back instead of clicking the ordering commands multiple times.

1 Select an object.

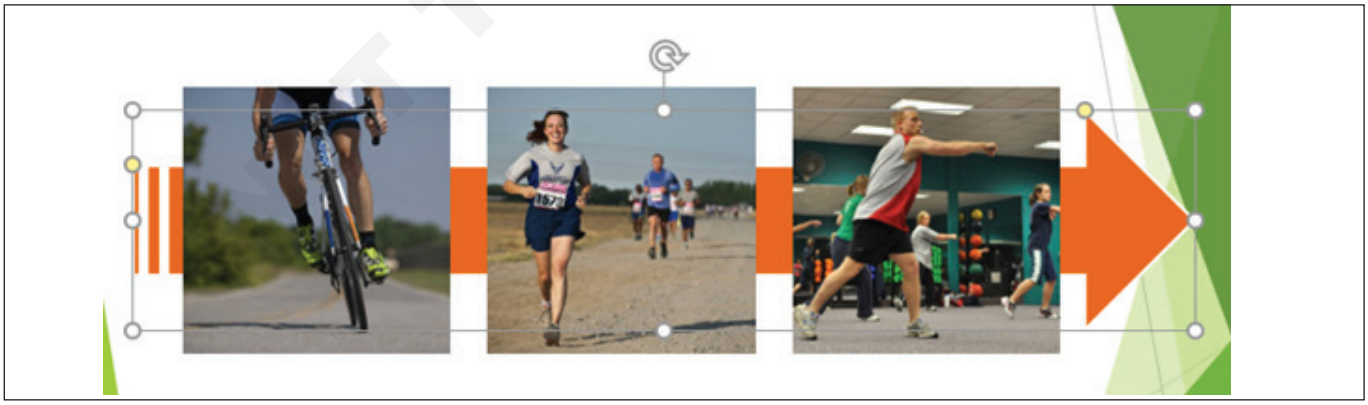
2 From the Format tab, click the Bring Forward or Send Backward drop-down arrow.



3 From the drop-down menu, select Bring to Front or Send to Back.



4 The objects will reorder.



If you have several objects placed on top of each other, it may be difficult to select an individual object. The Selection pane allows you to easily drag an object to a new location. To access the Selection pane, click Selection Pane on the Format Tab.

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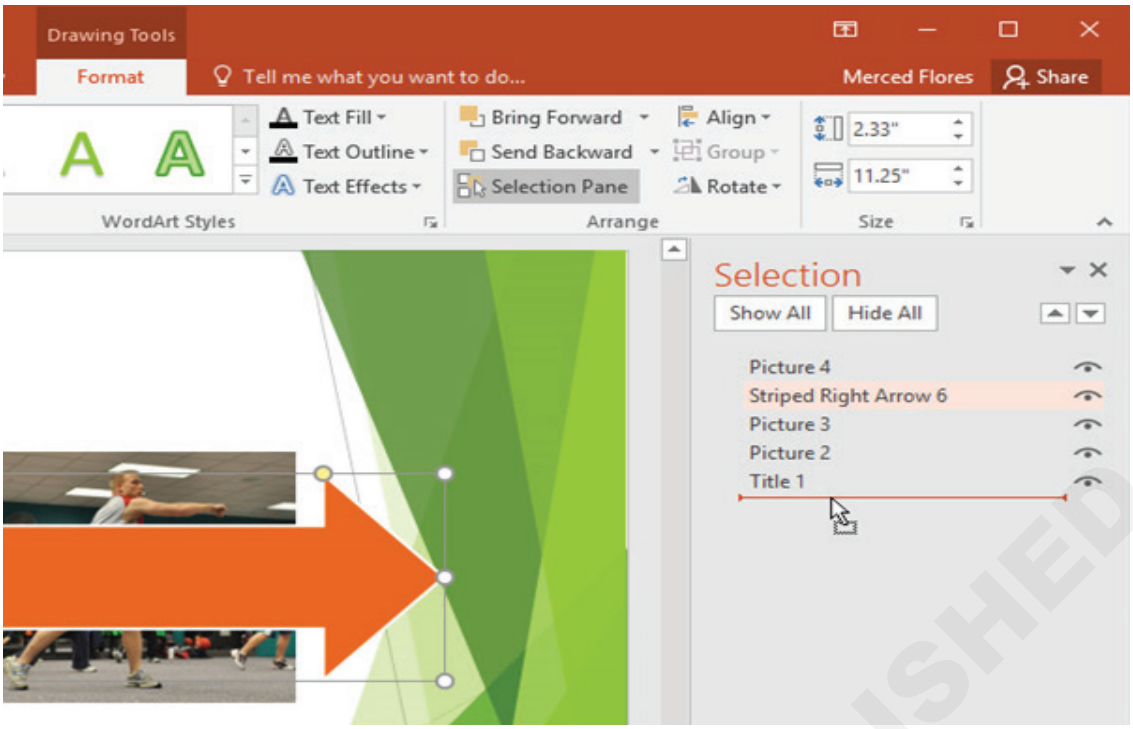


Rotating objects

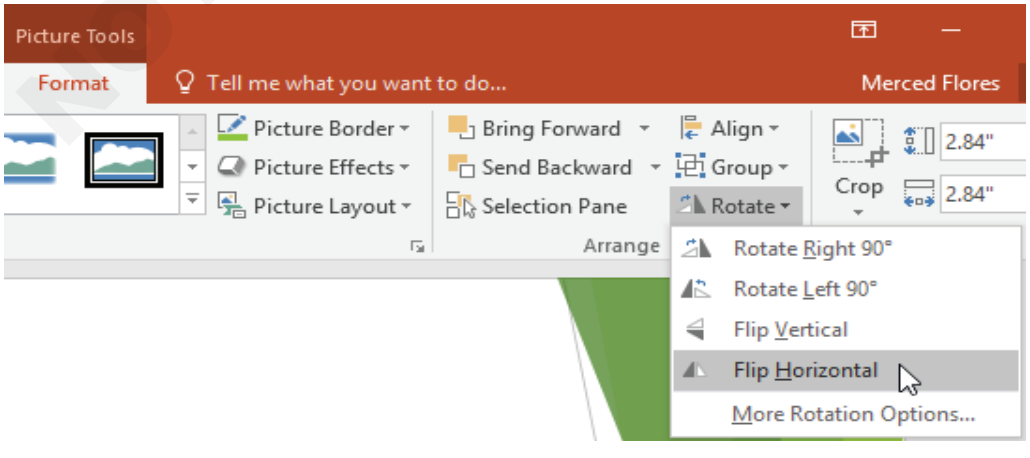
If you need to turn an object so it faces a different direction, you can rotate it to the left or right or flip it horizontally or vertically.

To rotate an object:

1 Select an object. The Format tab will appear.

2 From the Format tab, click the Rotate command. A drop-down menu will appear.

3 Select the desired rotation option.



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4 The object will rotate.

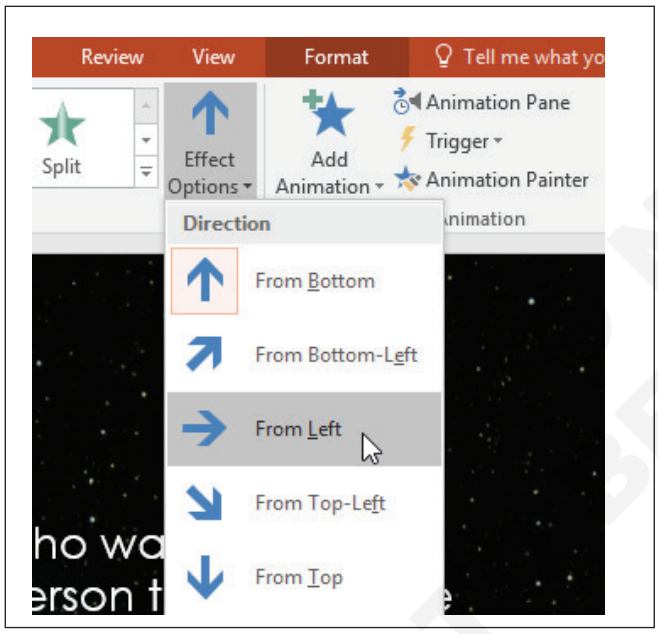
TASK 4: **Configure animation effects**

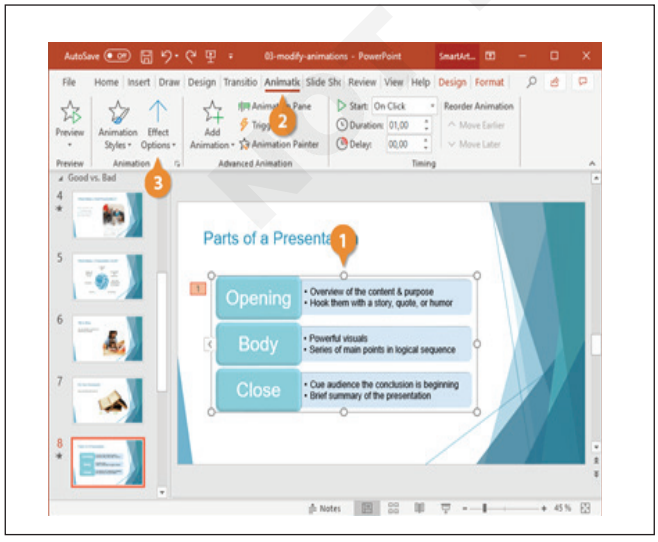
Customize an Animation

1 Select an object with an animation applied.

2 Click the Animations tab.

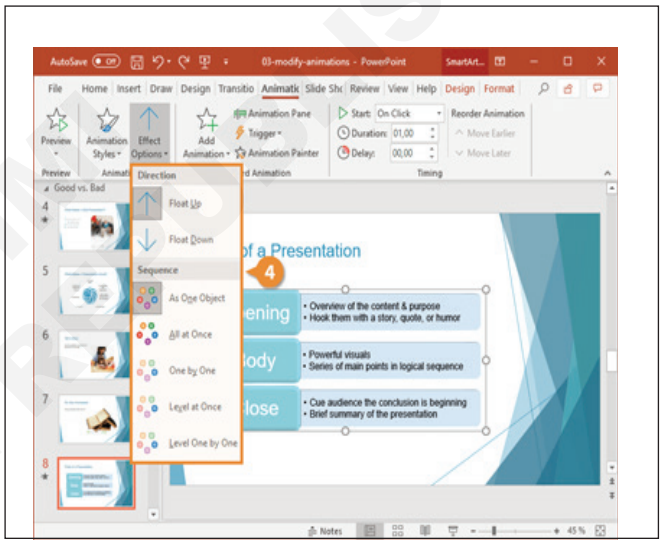
3 Click the Effect Options button.





The options available in the menu will vary based on the animation you're using and the object you're animating.

4 Select an effect option.



To copy animations with the Animation Painter:

In some cases, you may want to apply the same effects to more than one object. You can do this by copying the effects from one object to another using the Animation Painter. In our example, we want to copy an animation from one slide to another because they have similar layouts.

1 Click the object that has the effects you want to copy. In our example, we'll click our answer text.

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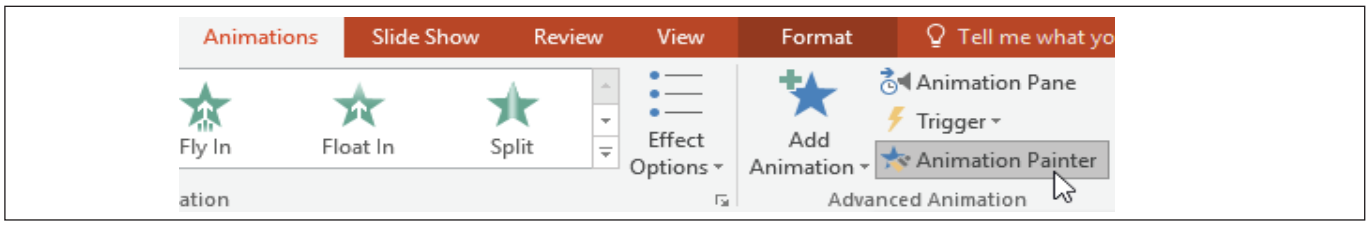
2 From the Animations tab, click the Animation Painter command.



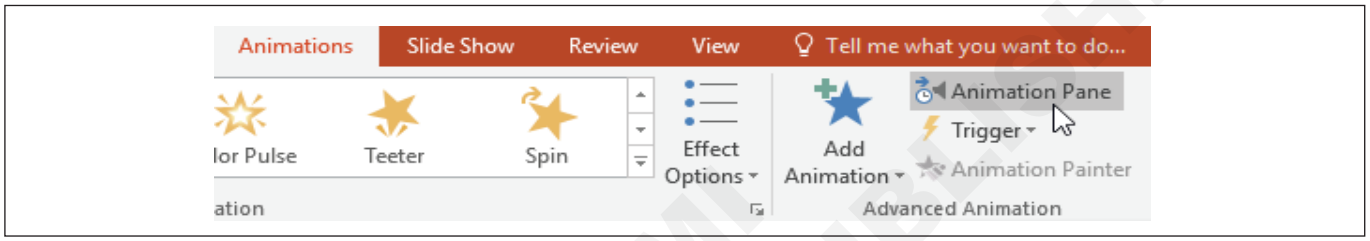
3 Click the object you want to copy the effects to. In our example, we'll click the answer text on the next slide. Both objects now have the same effect.

The Animation Pane

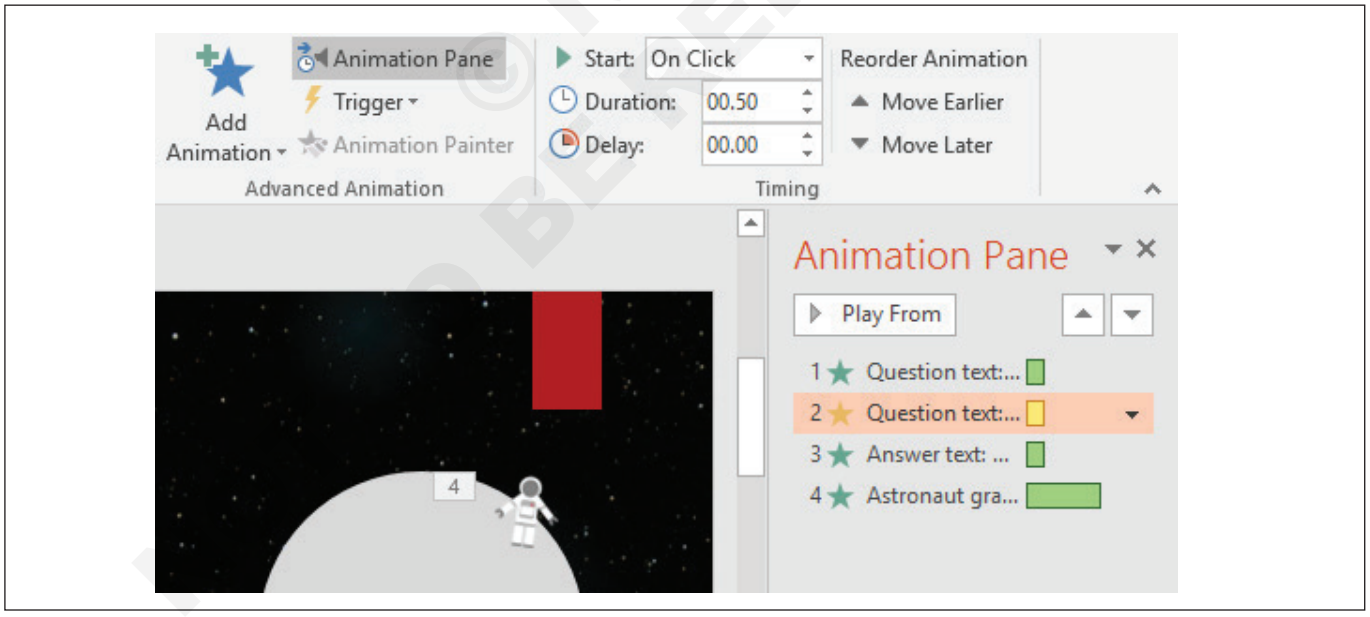
The Animation Pane allows you to view and manage all of the effects that are on the current slide. You can modify and reorder effects directly from the Animation Pane, which is especially useful when you have several effects.

To open the Animation Pane:

1 From the Animations tab, click the Animation Pane command.



2. The Animation Pane will open on the right side of the window. It will show all of the effects for the current slide in the order in which they will appear.



If you have several animated objects, it may help to rename them before reordering them in the Animation Pane. You can rename them in the Selection pane.

To open the Selection Pane, click an object, then from the Format tab click Selection pane. Double-click the name of an object to rename it.

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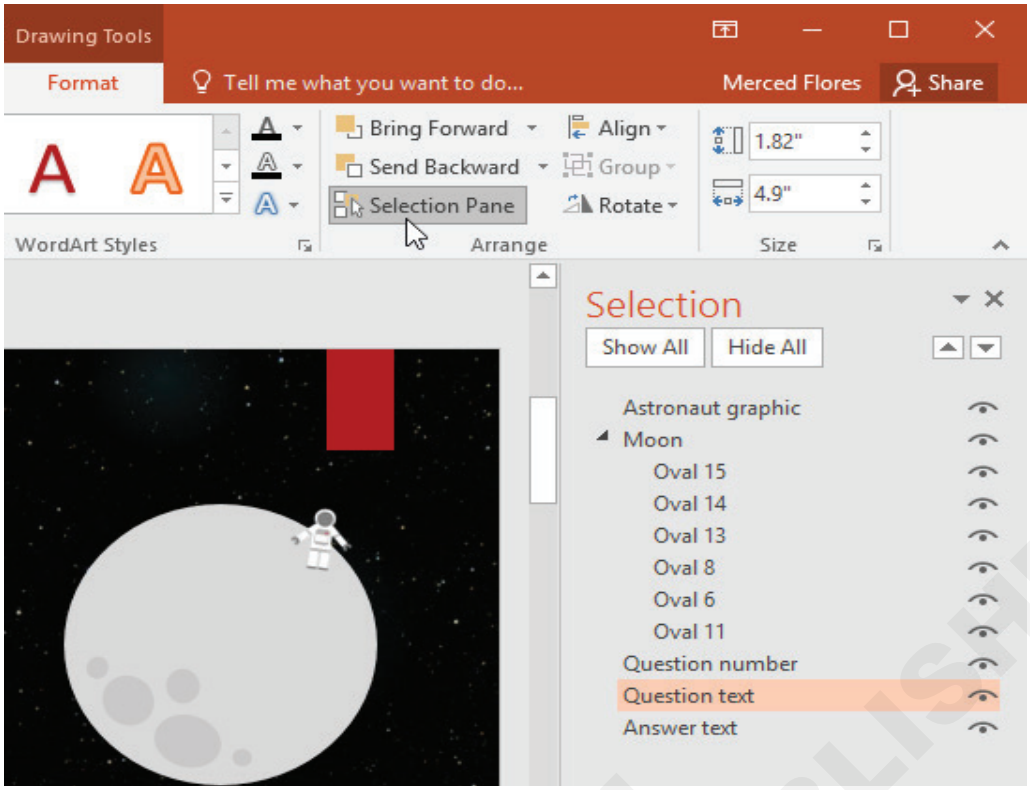
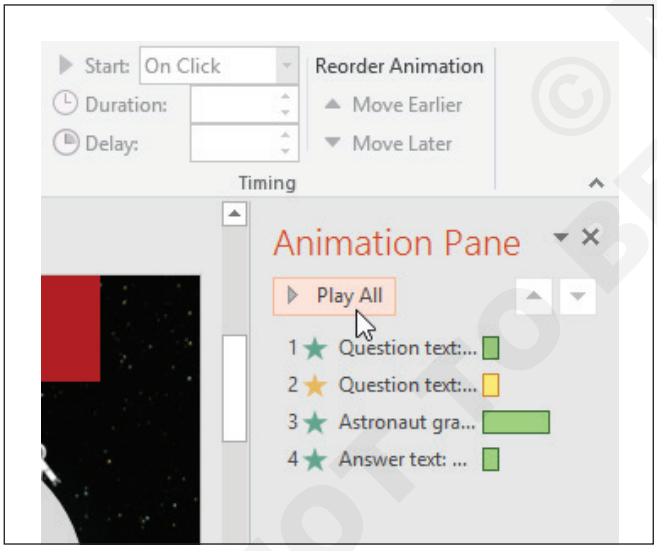
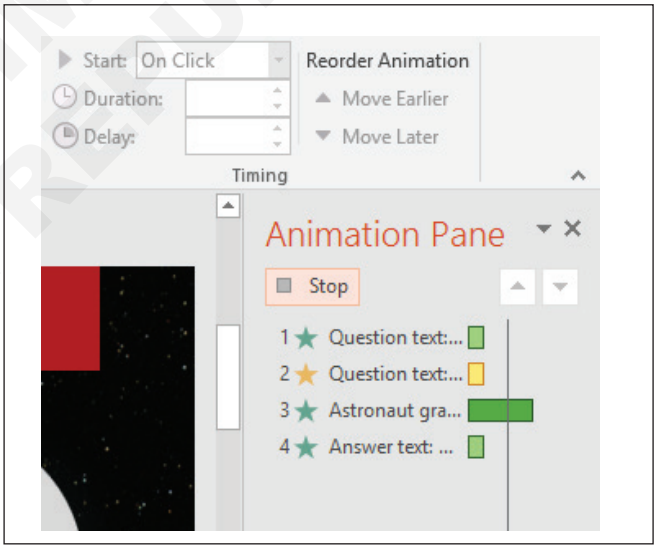


To preview effects from the Animation Pane:

1 From the Animation Pane, click the Play button.



2 The effects for the current slide will play. On the right side of the Animation Pane, you will be able to see a timeline that shows the progress through each effect.



If the timeline is not visible, click the drop-down arrow for an effect, then select Show Advanced Timeline.

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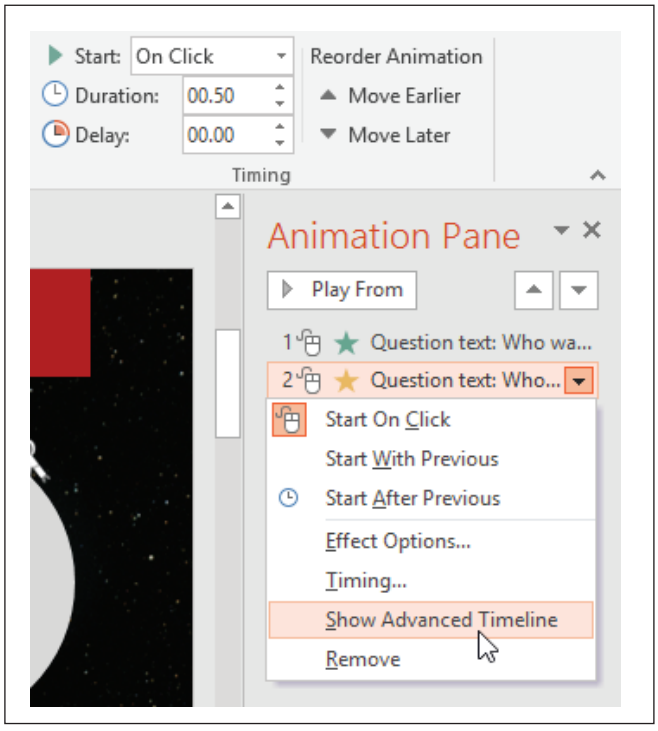
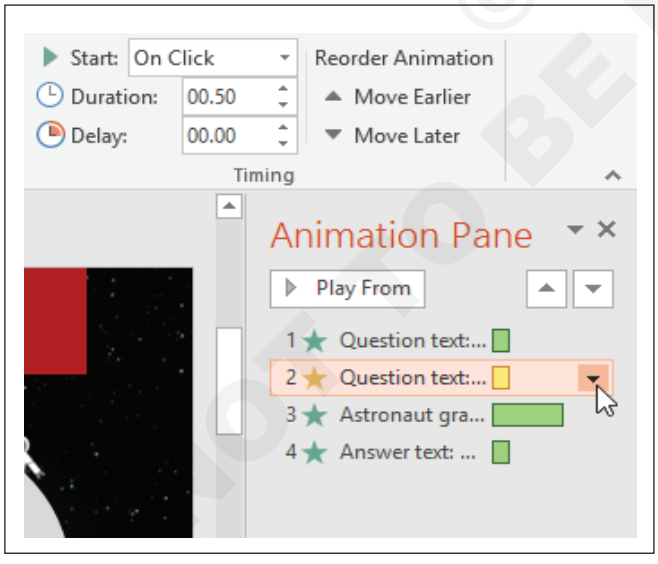


To change an effect's start option:

By default, an effect starts playing when you click the mouse during a slide show. If you have multiple effects, you will need to click multiple times to start each effect individually. However, by changing the start option for each effect, you can have effects that automatically play at the same time or one after the other.

1 From the Animation Pane, select an effect. A drop-down arrow will appear next to the effect.

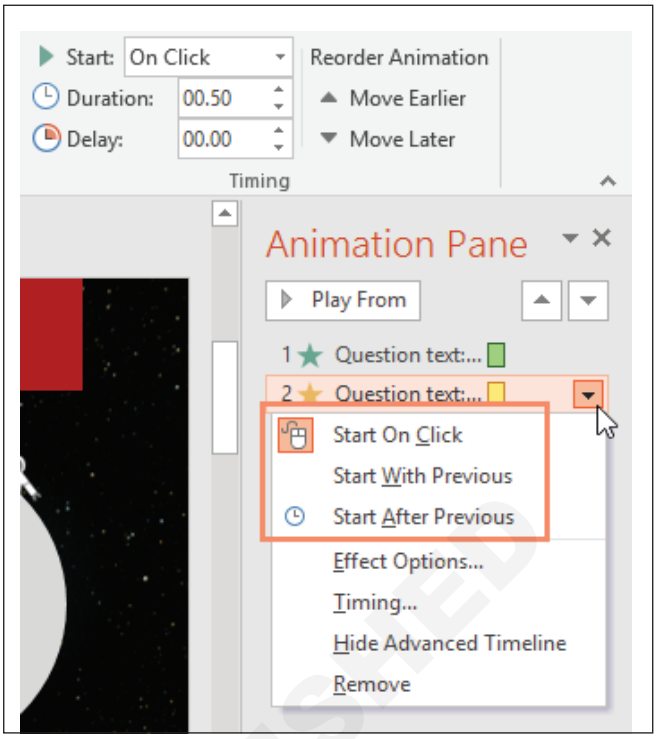


2 Click the drop-down arrow and select one of the three desired start options.

a Start on Click will start the effect when the mouse is clicked,

b Start With Previous will start the effect at the same time as the previous effect, and

c Start After Previous will start the effect when the previous effect ends.



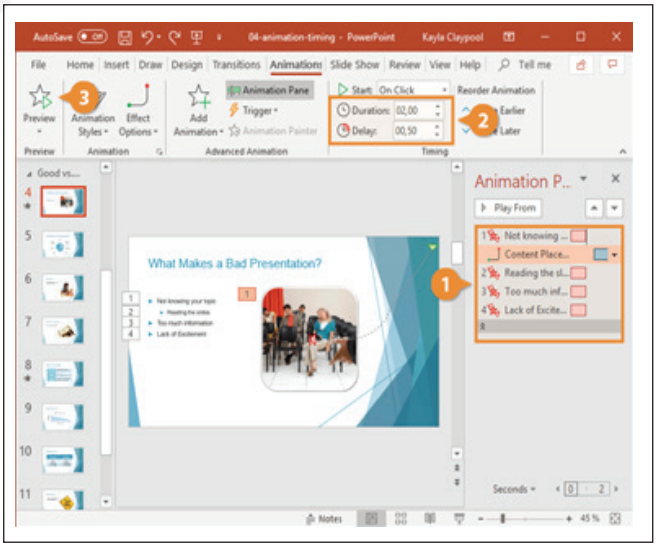
When you preview the animations, all of the effects will play through automatically. To test effects that are set to Start on Click, you will need to play the slide show.

Change the Duration and Delay of an Animation

1 Select the animation you want to modify.

2 Click the Up and Down arrows in the Duration and Delay fields to adjust the timing.

3 Click Preview.



The Effect Options dialog box : From the Animation Pane, you can access the Effect Options dialog box, which contains more advanced options you can use to adjust your animations.

To open the Effect Options dialog box:

1 From the Animation Pane, select an effect. A drop-down arrow will appear next to the effect.

2 Click the drop-down arrow, then select Effect Options...

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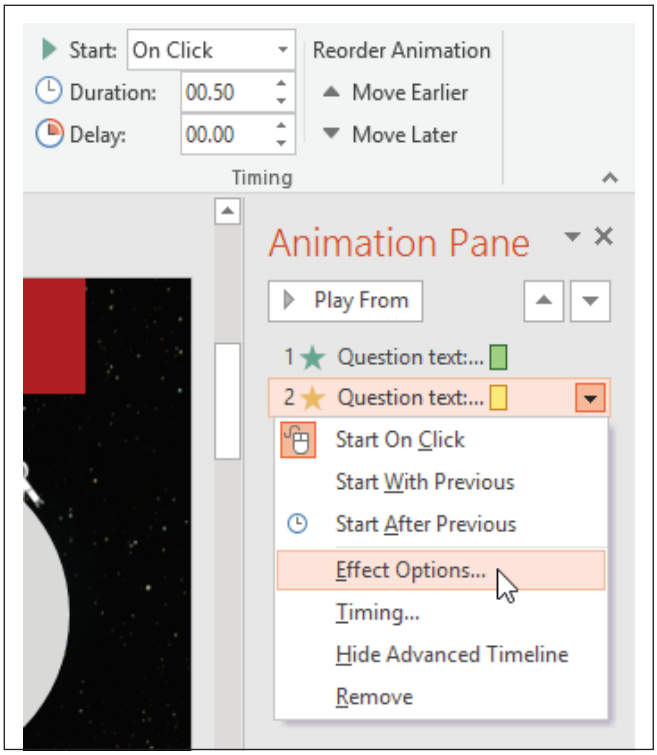
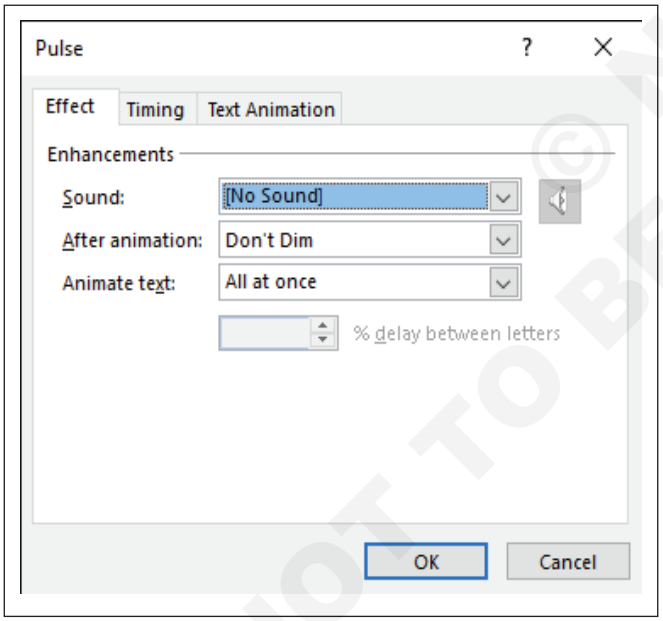


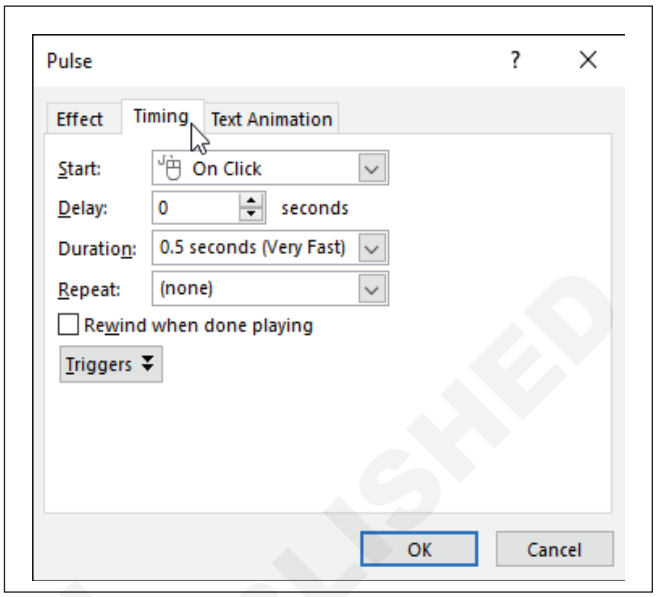
3 The Effect Options dialog box will appear. Click the drop-down menus and select the desired enhancement. You can add a sound to the animation, add an effect after the animation is over, or animate text in a different sequence.



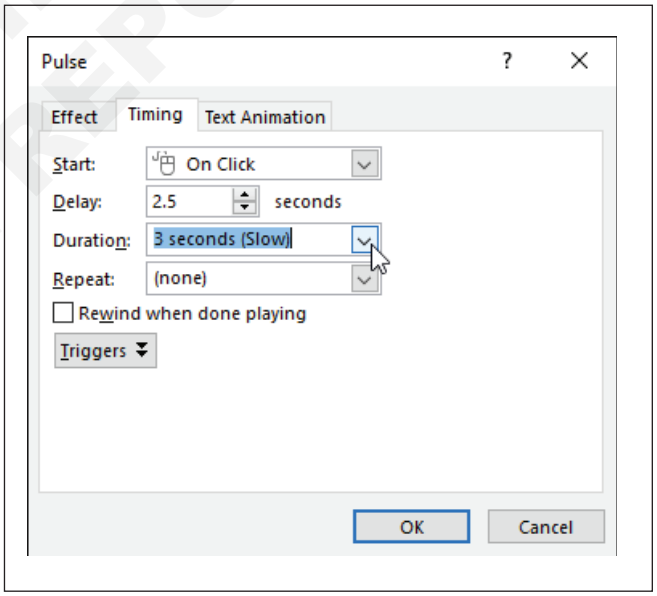
Some effects have additional options you can change. These will vary depending on which effect you have selected.

To change the effect timing:

1 From the Effect Options dialog box, select the Timing tab.



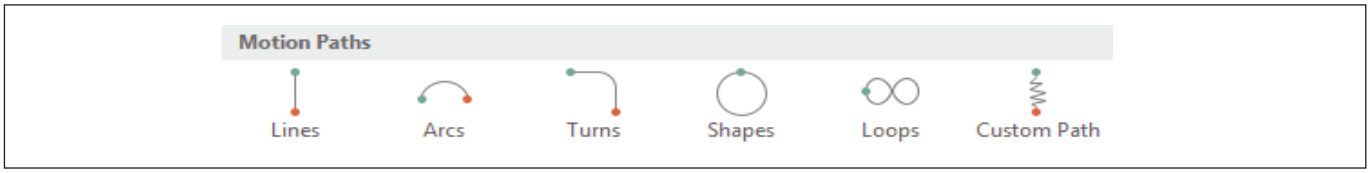
2 From here, you can add a delay before the effect starts, change the duration of the effect, and control whether the effect repeats.



TASK 5: **Configure animation paths**

Motion Paths

a Motion Path: These are similar to Emphasis effects, except the object moves within the slide along a predetermined path, like a circle.



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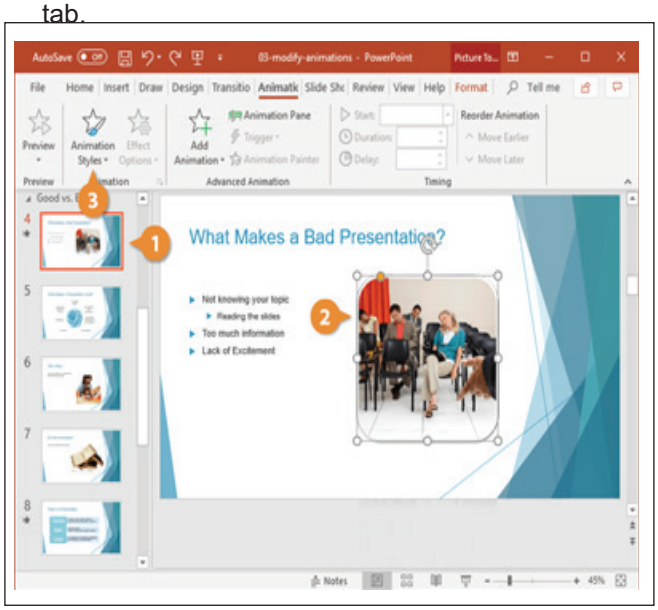
If you don't like the standard animations PowerPoint has, you can create and customize your own motion path instead.

1 Select the slide with the object you want to animate.

2 Select the object you want to animate.

3 Click the Animation Styles button on the Animations tab.

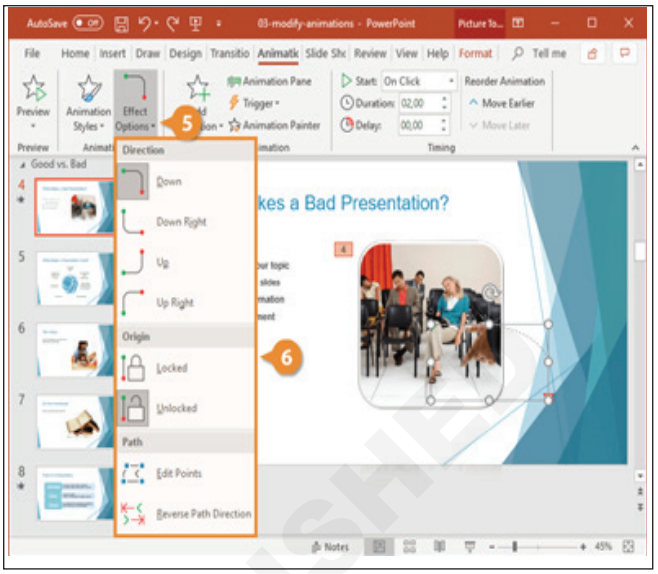


4 Select a motion path.

5 Click the Effect Options button.

6 Select an effect option.

7 Customize the effect as needed.



TASK 6: **Reorder animations on a slide**

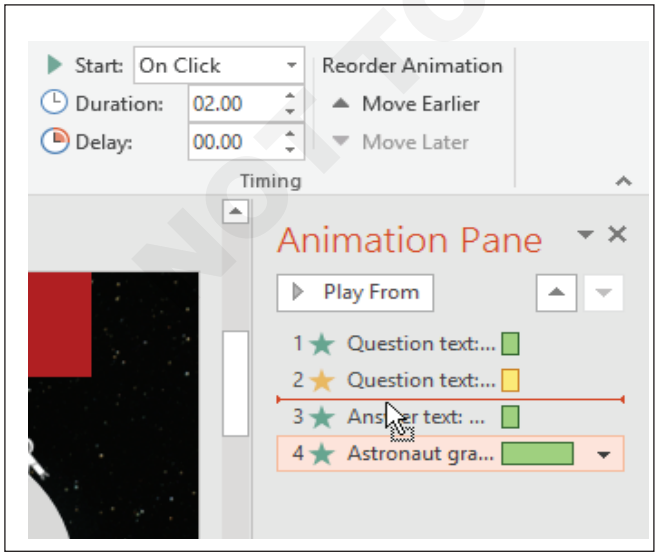
Reorder Animations

If you want to adjust the order in which animation effects play, you can simply resequence them. You'll notice that each animation is numbered, both on the slide and in the Animation pane. This is the order that they'll animate.

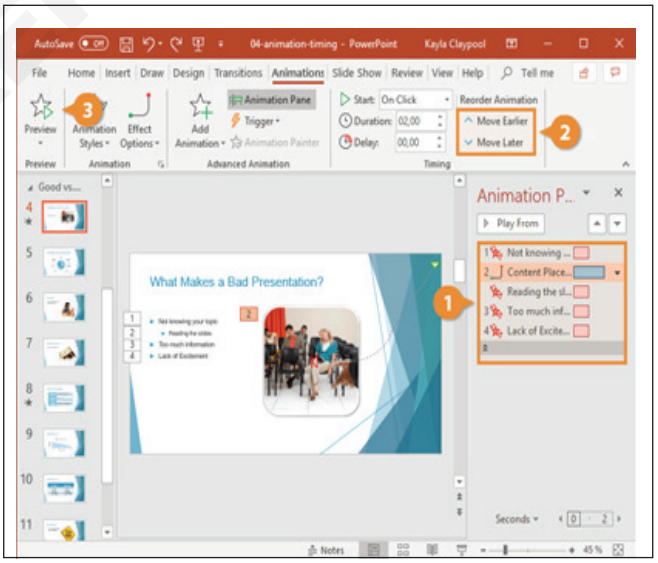
1 Select the animation you want to reorder.

2 Click Move Earlier or Move Later in the Timing group.

You can also reorder animations by clicking and dragging them in the Animation pane.



3 Click Preview.



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Add and manage comments

Objectives: At the end of this exercise you shall be able to
- **add comments**
- **review and reply to comments**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

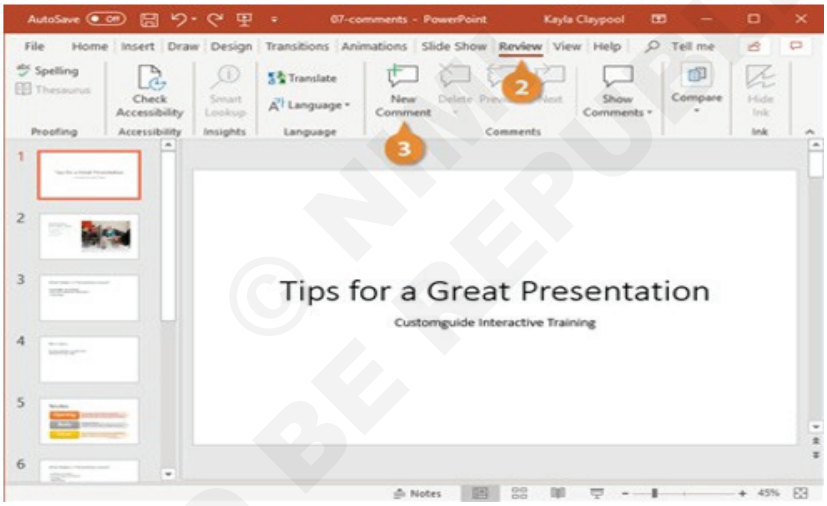
TASK 1: **Add comments**

Insert a Comment

1 Click where you want to attach your comment.

2 Click the Review tab.

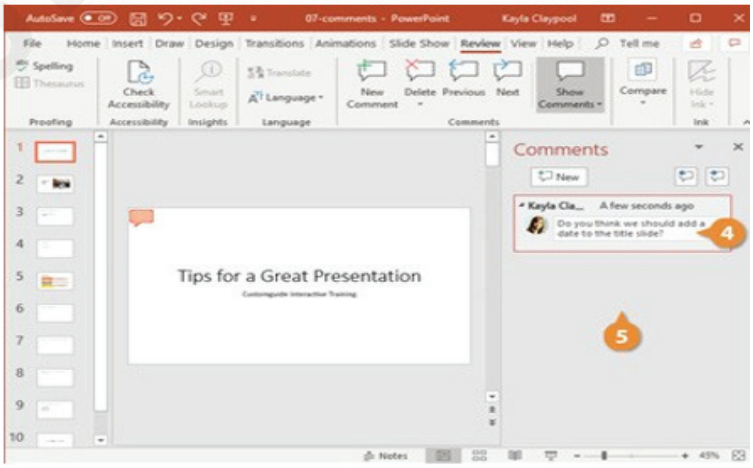
3 Click New Comment.



The Comments pane appears at the right with a new empty comment ready for you to type in.

4 Type your comment.

5 Click outside the comment to save it.



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To edit a comment, simply click in the comment balloon and edit the text.

To jump between comments, use the Next and Previous buttons in the Comments group on the ribbon or in the Comments pane.

TASK 2: **Review and reply to comments**

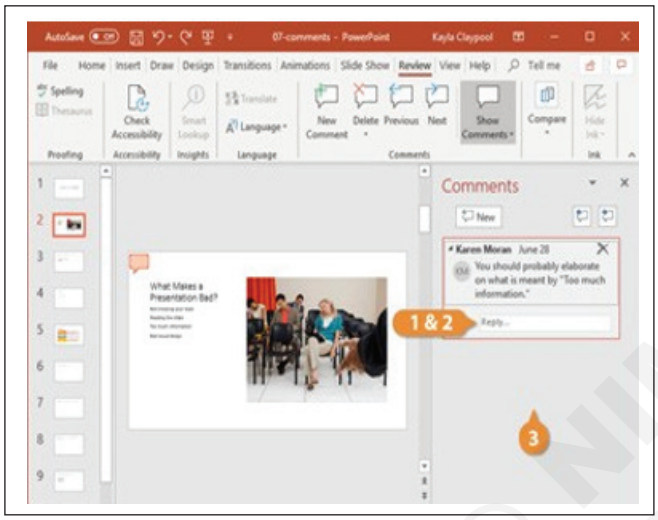
Reply to a Comment

In addition to making your own comments, you can have a conversation by replying to comments made by other people.

1 Click in the Reply field for the comment you are replying to.

2 Type your response.

3 Click outside the reply to save it.



Delete a Comment

If you no longer need a comment, delete it from the presentation.

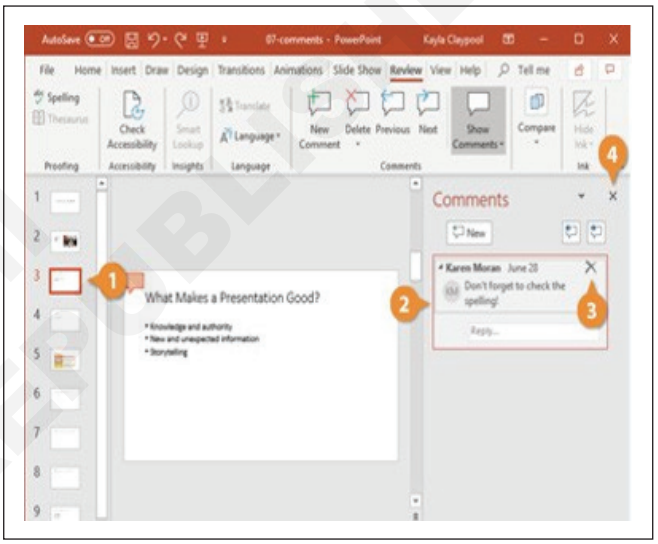
1 Navigate to a slide with a comment to delete.

2 Select a comment.

3 Click the Delete button.

4 Click the Close button on the Comments pane.

To delete all comments, click the Delete button list arrow on the Review tab and select Delete All Comments and Ink in This Presentation.



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Installation of MySQL

Objectives: At the end of this exercise you shall be able to
- **install MySQL server, to create and use database.**
- **create, design and modifying a table in MySQL also data integrity rules in MySQL.**
- **creation data base and use data base**
- **creating a table**
- **altering a table**
- **add value to table.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad)
  & Browser, MySQL server Connection - 1 No.

PROCEDURE

TASK 1: **Install MySQL**

Step 1: Open browser and google google.com.

Step 2: Login toyours google account.

Step 3: Download the MySQL Installer from dev.mysql.com. (Fig 1)

NOTE: The two download options are a web-community version and a full version. The full installer will download the server and all the recommended additional applications. (It asked to create a user account, but we skip this part by scrolling down to the bottom and clicking "No thanks, just start my download"

Fig 1

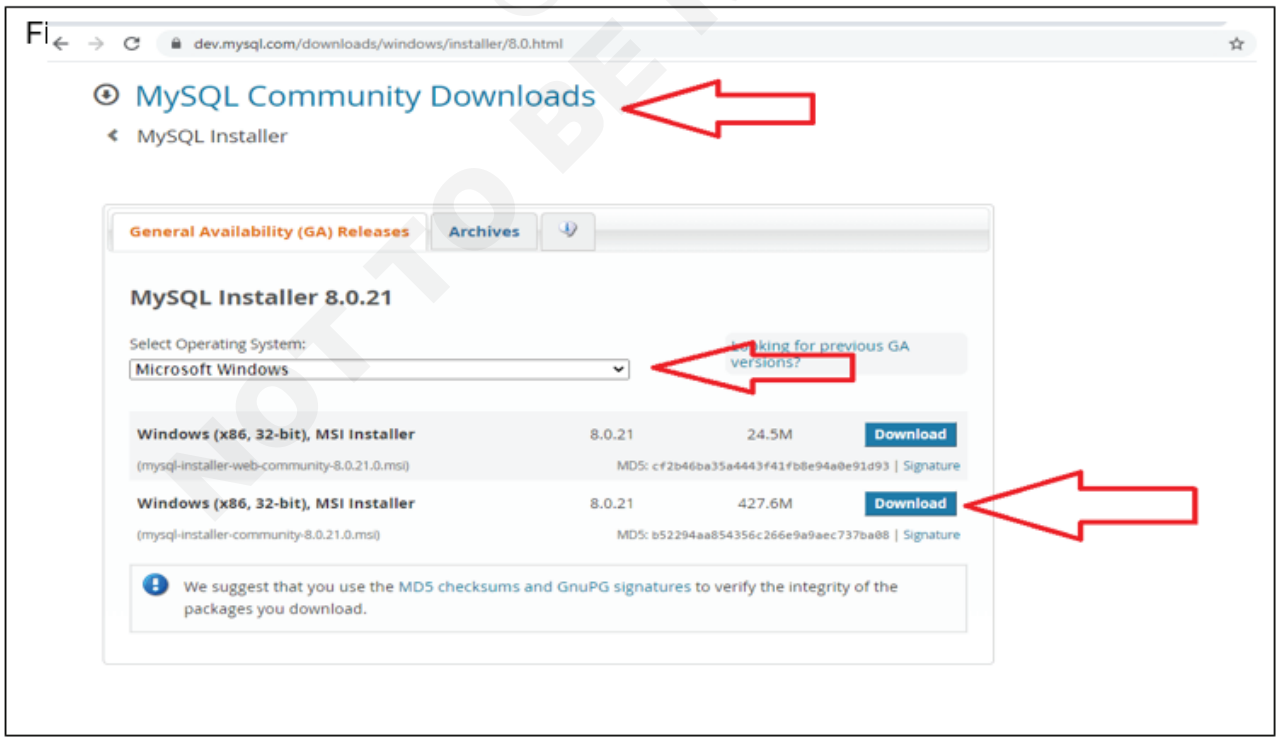

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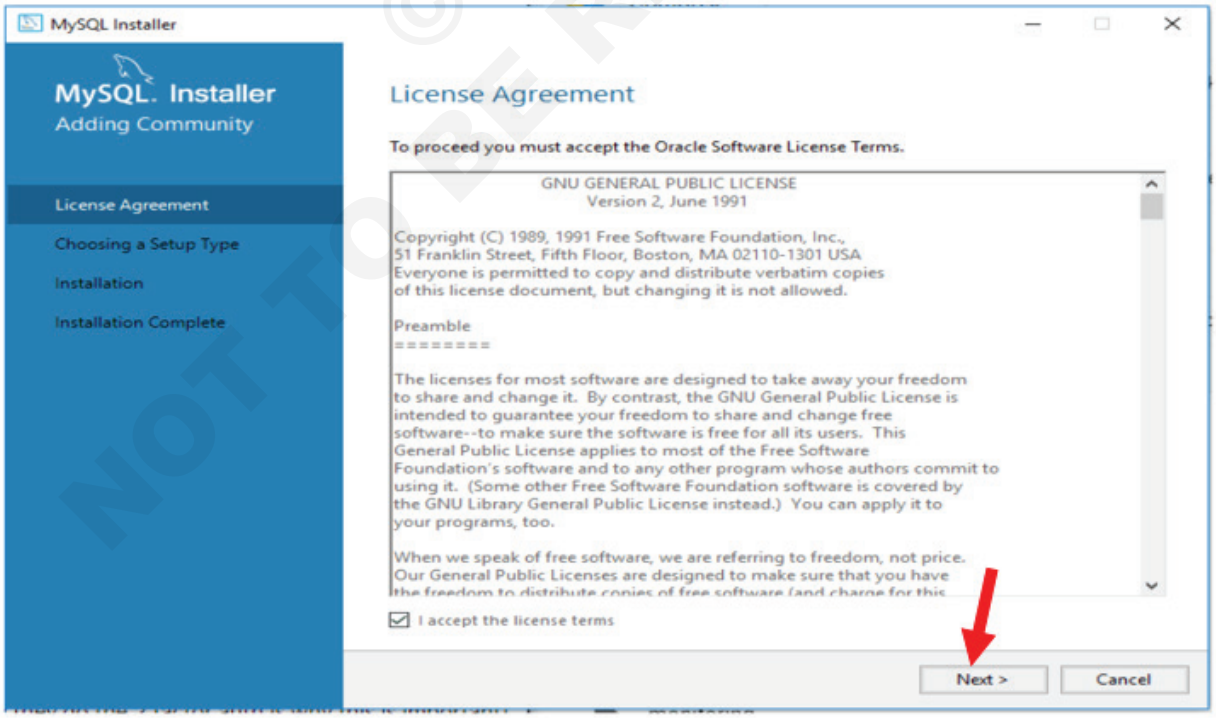
Fig 2

Step 4: Then run the installer that you downloaded from its location on your server, generally by double-clicking. Then clicked to NEXT. (Fig 3)

Step 5: Next choose the Developer Default and click next to move forward the process. (Fig 4)

Fig 3



Step 6: Next go to Installation Complete tab and clicked on FINISH. (Fig 5)

Finally, its ready to work. (Fig 6)

Open MySQL command Prompt

METHOD 1: Click on START menu button then search MySQL Command Line Client.

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Fig 4

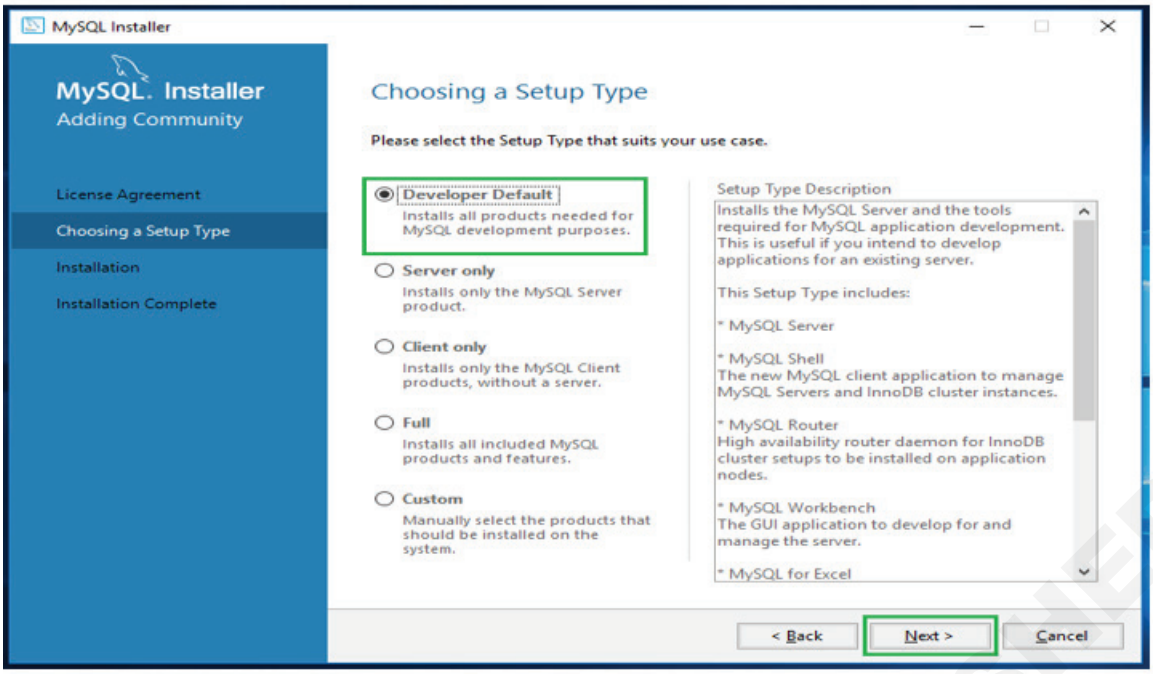

Fig 5

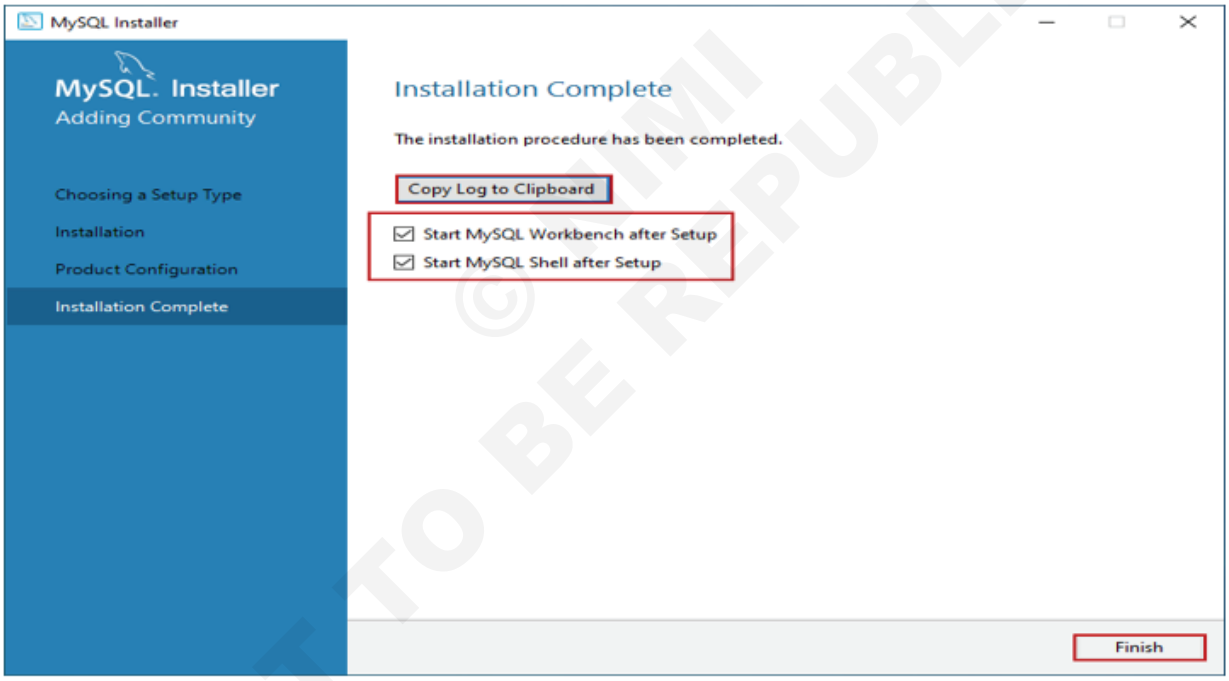

Fig 6

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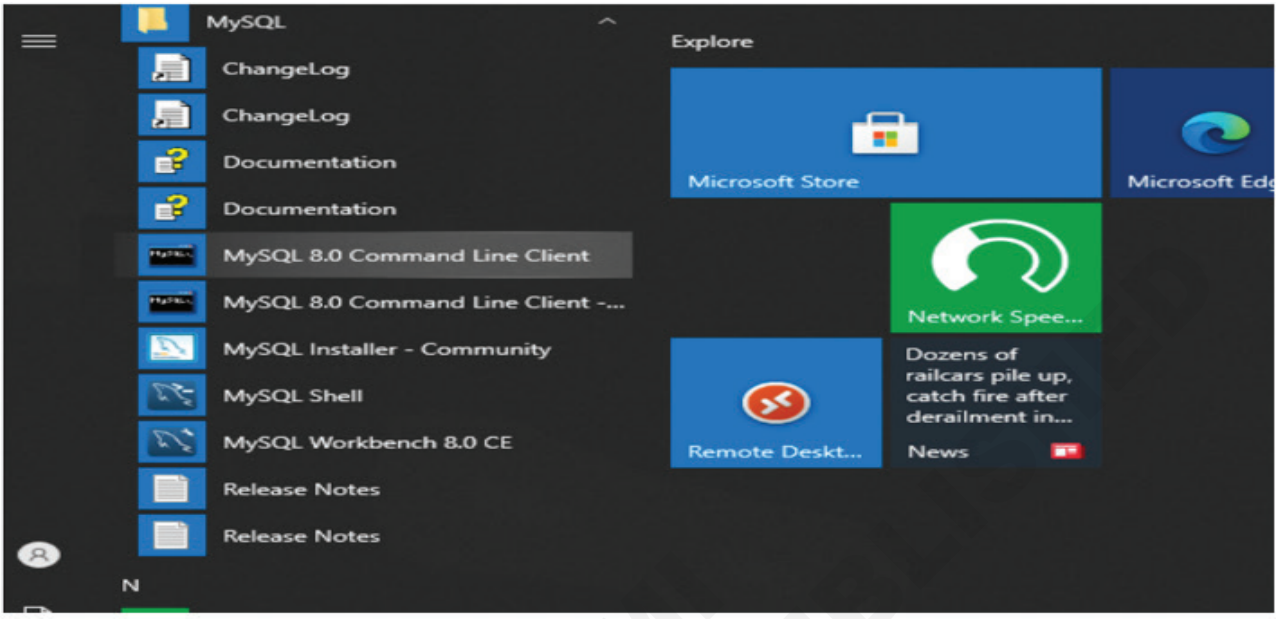
NOTE: It is usually comes with MySQL Server installation pack. It is installed in two versions – with the support for UTF-8 and without it. You can run the console client right from the START menu.

Step 1: To create a new MySQL database first run the client**. (Fig 7)**

Step 2: Then enter the password, if there is no password simply press the Enter key.

Fig 7



METHOD - 2:

Step 1: Click on START menu button then search Command prompt and then open the Command Prompt. (Fig 8)

Step 2: Change the directory to MySQL where MySQL is installed.(Fig 9)

Step 3: Run the command mysql –u <username> -p <password>.(Fig 10)

NOTE:Here the default username is root and if there is no password then leave it blank and simply click Enter.

Fig 8

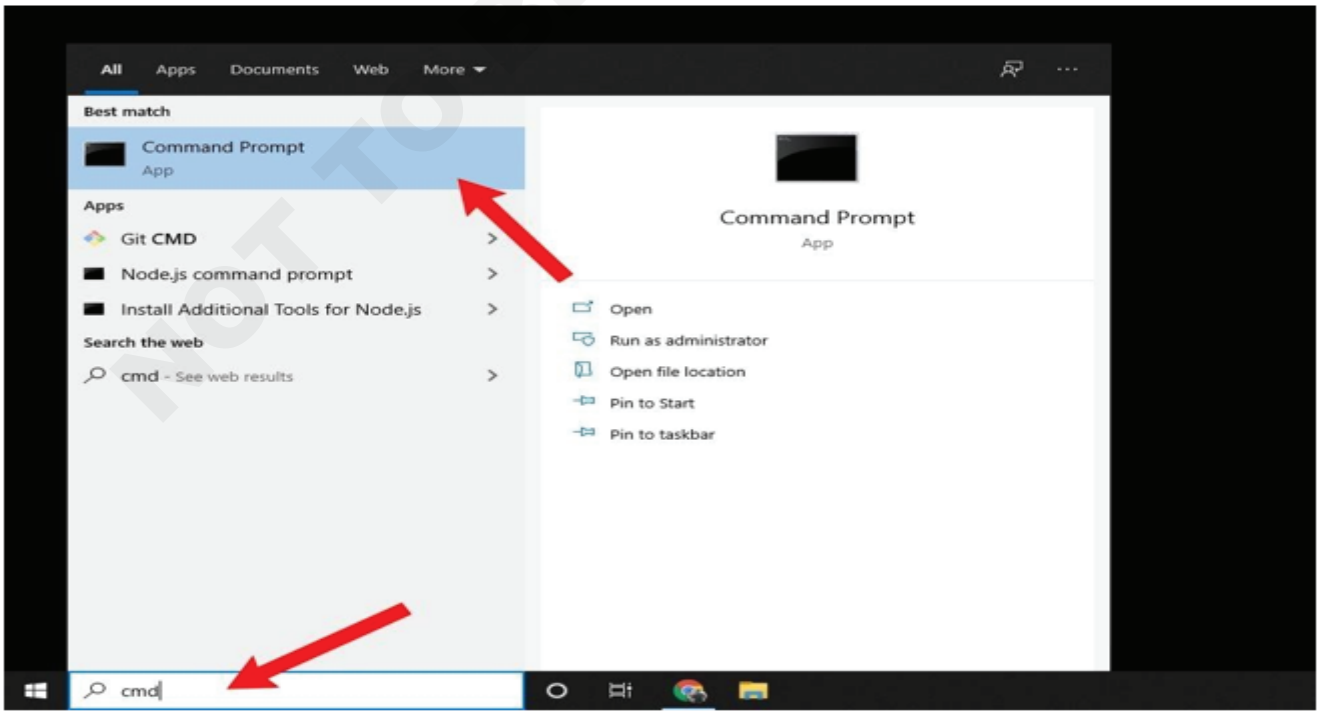


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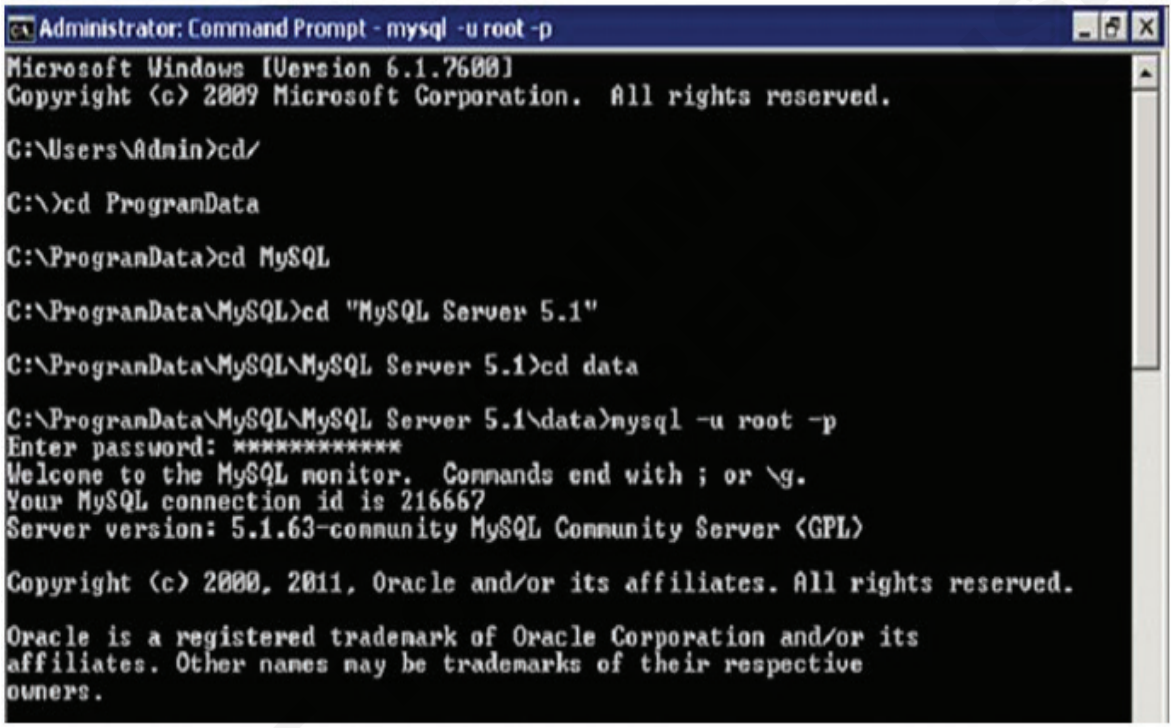
Fig 9

Fig 10



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Troubleshooting basic installation issues

Objectives: At the end of this exercise you shall be able to
- **troubleshooting basic installation issues.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad) & Browser, MySQL server Connection - 1 No.

PROCEDURE

TASK 1: **Troubleshooting basic installation issues**

MySQL installation failure

1 The MySQL installer for MySQL 5.6.20 may not always work on Windows installations, usually due to the installer erroneously attempting to grab a different version of the application than the installer can handle.

2 In this case, we recommend the following procedure to address the issue and obtain a working installation.

3 If at any time you have questions or difficulty with this process, please feel free to stop by the TechDeck for assistance.

Remove MySQL Components

1 Uninstall all present MySQL components on the system via the Control Panel's Programs and Features menu.

2 If you are on Windows 10, go to the Start menu and start typing "Control Panel" to access this menu.

Download another version of MySQL

1 After removing the failed installation of MySQL 5.6.20, please download another version – we recommend either 5.6.19, or 5.6.21.

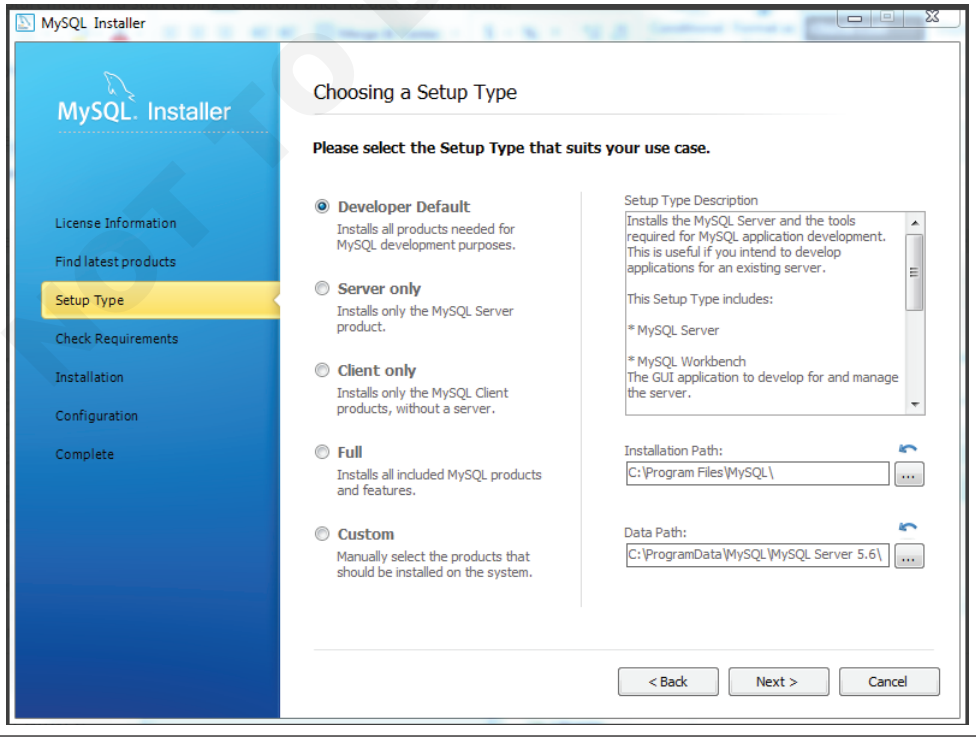
2 When downloading from Oracle's website, you will want to choose the larger of the two files, which should be over 200MB in size.

Run the Installer

1 You will need to run the installer after download. While installing, follow the instructions provided by your instructor, which should recommend using the Developer Default.

You can skip the check for updates while doing the initial installation. (Fig 1)

Fig 1



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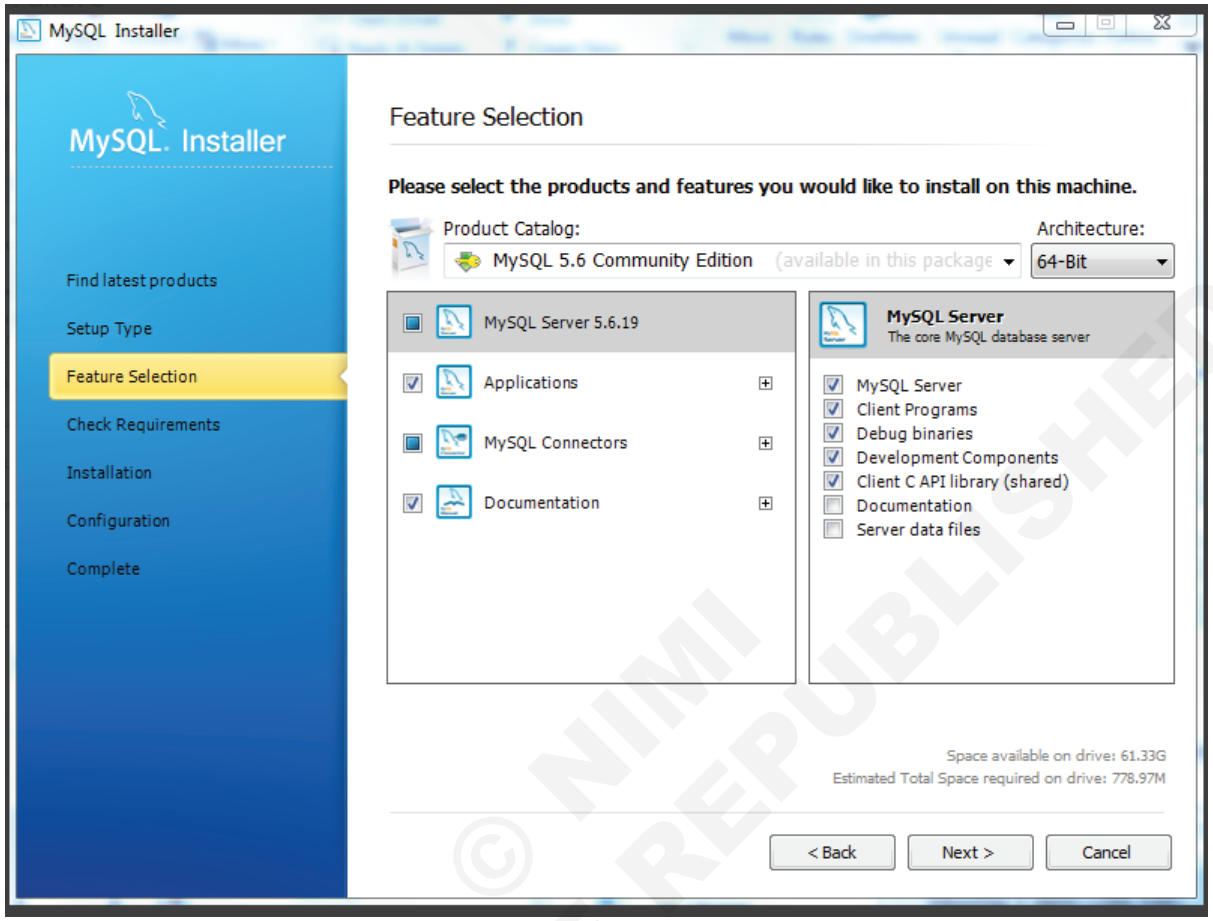
Re-run Installer From Start Menu

1 Once the installer has completed, if the original attempt to install MySQL has failed, go to your Start Menu and look for an application called “MySQL installer”. (Fig 2)

When you run the Application, you may be able to choose your configuration. If not, cancel the installer and proceed to the next step.

Fig 2



Obtain MySQL files

1 For whichever version of MySQL you installed, you’ll need to obtain the zip file from Oracle.

2 Unzip the files, and copy them to C:\Program Files\MySQL\MySQL Server 5.6\

If the directory exists, just overwrite the existing files with what is in the zip file. If it does not exist, create a folder called “MySQL Server 5.6”, and place the files into it.

Register MySQL as a Service

1 Open the command prompt as an administrator. Run the following command (quotation marks are necessary):

“C:\Program Files\MySQL\MySQL Server 5.6\bin\mysqld.exe” --install

This should install the service, allowing MySQL to automatically start.

2 Go to the start menu, type services.msc and hit enter. The window that comes up with should show a list of services. Look for the MySQL56 service and start it.

3 Once it starts, open the MySQL Workbench and connect to the local database server. If it shows the service as online, you’re good to go!

ODBC Installation Failures

Occasionally, the installation for the ODBC driver will fail. While this is not necessary for the server to run, it may be necessary to connect to some components of Microsoft Office through MySQL.

To resolve this, you’ll need to download the Visual Studio 2010 C++ Runtime, as well as the ODBC Driver from Oracle directly.

4 After downloaded, you can install. This may prompt for administrator credentials.

After installation, please reboot your PC.

5 **ODBC Driver :** Download the appropriate MSI file for your system. If, for some reason, this fails to install after the C++ Package has been installed, please stop by the TechDeck for assistance.

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.Net Framework 4.0 Installation Hang

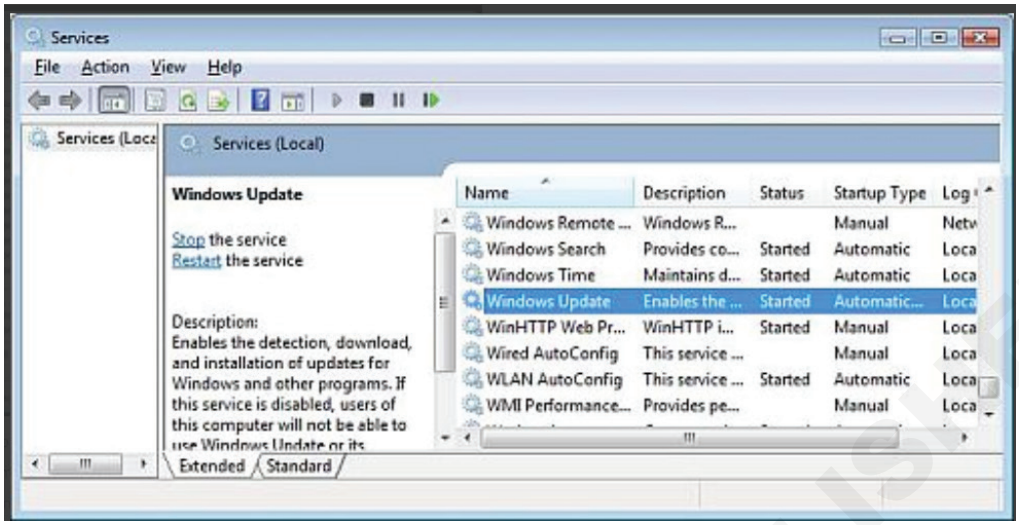
1 Occasionally the .Net Framework redistributable hangs during installation.

2 To solve this problem you need to disable the Windows Update Service and kill the WUSA.exe process.

3 Start the service manager by typing “services.msc” and pressing Enter at the Start menu.

4 Locate Windows Update (Fig 3)

Fig 3



5 Right Click and choose Properties

6 Set the Startup Type to Disabled and Stop the service (Fig 4).

7 Setting the startup type

8 Now launch the Windows Task Manager

9 Ensure you show processes for all users (Fig 5)

10 Windows task manager processes

11 Select the WUSA.exe process and End Process

12 Perform the .NET Framework Install

13 When completed, reenable the Windows Update Service

Fig 4

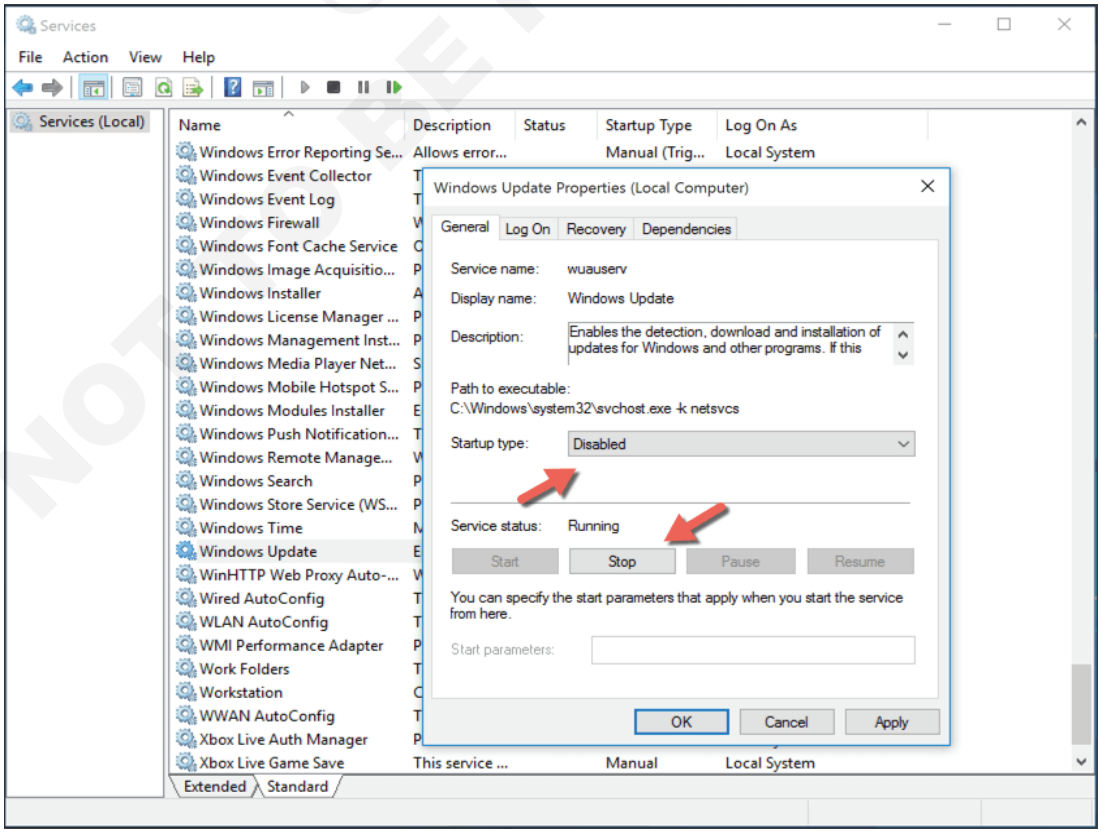


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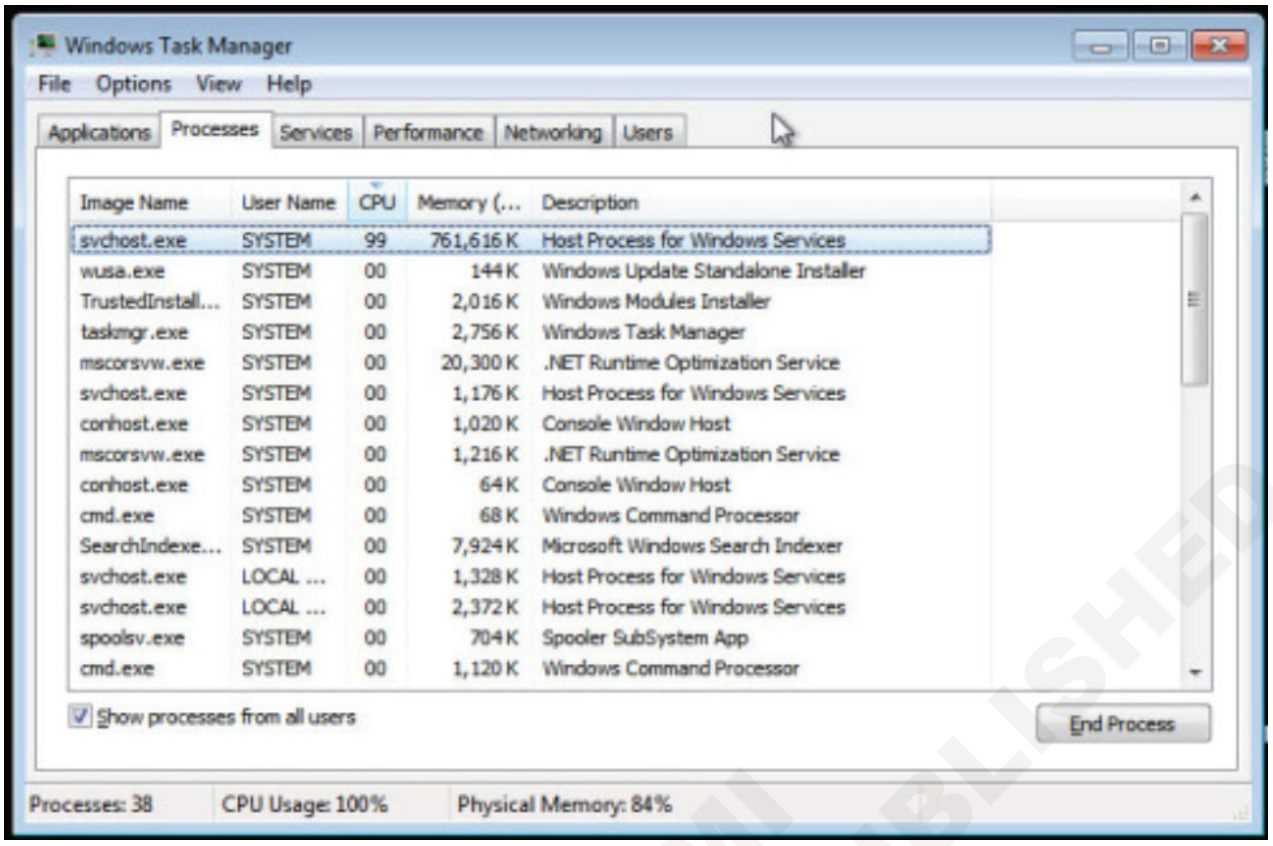
Fig 5



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Creation and uses of MySQL

Objectives: At the end of this exercise you shall be able to
- **creating a database**
- **using database.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad) & Browser, MySQL server Connection - 1 No.

PROCEDURE

TASK 1: **Creation and uses of MySQL**

Step 1: Use create database <database-name>; command.(Fig 1)

Step 2: To use created database, giveuse <database name>; command.(Fig 2)

Fig 1

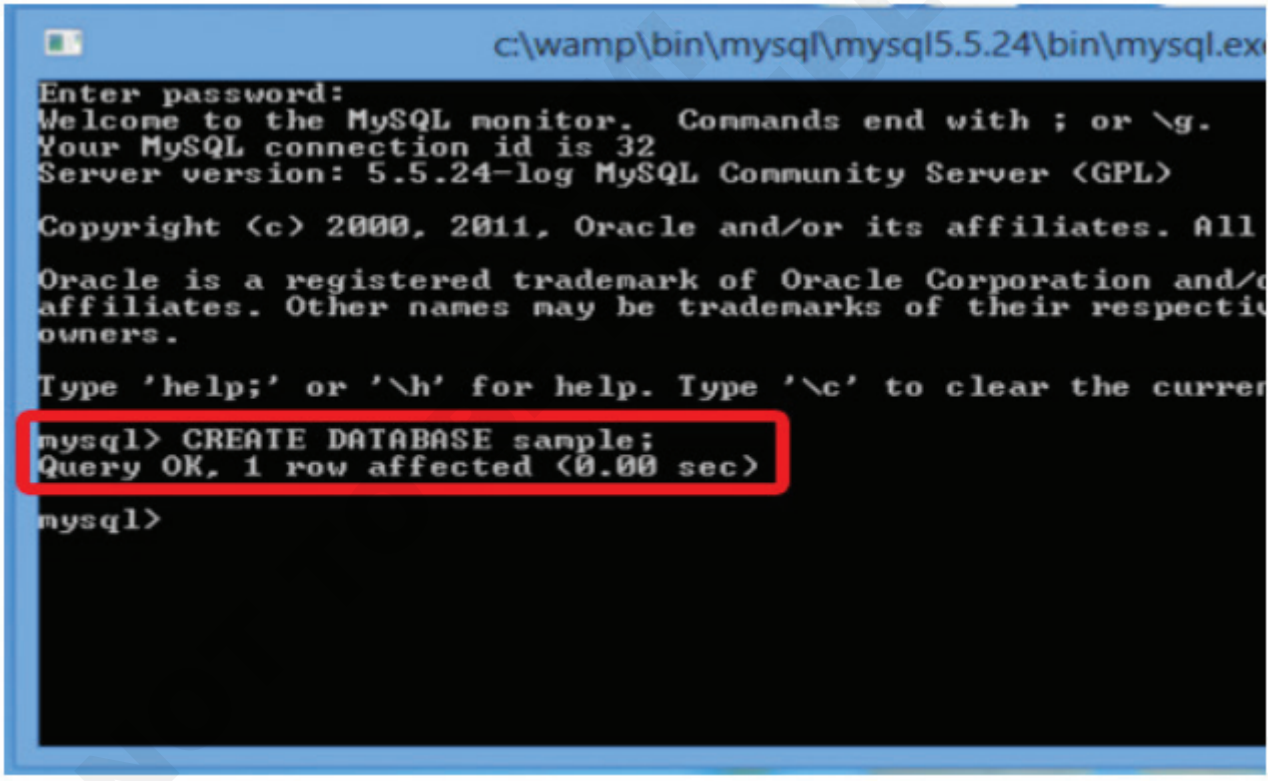
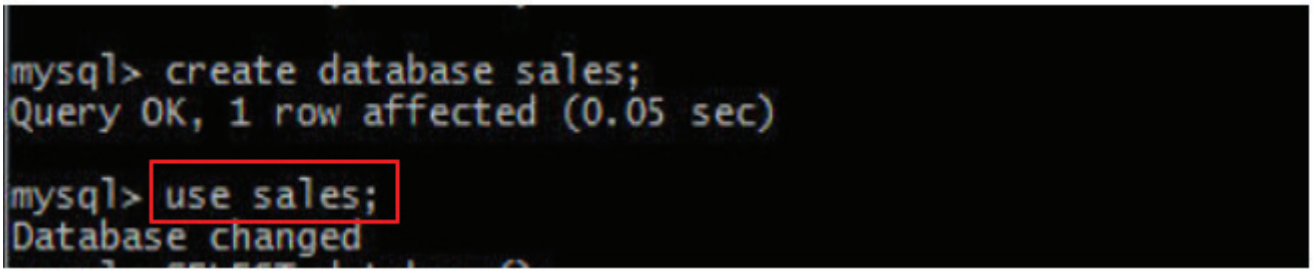


Fig 2



Designing of tables

Objectives: At the end of this exercise you shall be able to
- **creating a table**
- **altering a table**
- **add value to table.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad) & Browser, MySQL server Connection - 1 No.

PROCEDURE

TASK 1: **Creating, altering and adding value to a table**

Creating table

To use create table, run **create table<table-name>; command.** (Fig 1)

NOTE: Here we are using a primary key as detailed. If we want to access the two or more tables this primary key is used and it act as a foreign key of another table.The primary key value is always not null and it should be an auto increment value.

Alter table

Syntax:

alter table **table_namecolumn_name; (Fig 2)**

Add value to table

Syntax:

Insert into table_name(fieldname) values (field_ value) ; (Fig 3)

If field value is string it means use ‘ ” ’ or digit means use ‘ ‘ ‘;

Example: “tommy” is a string value so we used “ ” and ‘3’ is a digit so we used ‘ ‘;

Fig 1

```
mysql> use Pet;
Database changed
mysql> create table tbldetail(
    -> detailid int not null auto_increment,
    -> petname varchar(100) null,
    -> pettype varchar(100) null,
    -> petage int null,
    -> primary key (detailid) );
Query OK, 0 rows affected (0.20 sec)

mysql> _
```

choose a databse which one is you want to create a table

Fig 2

```
mysql> alter table tbldetail add ownername varchar(100);
Query OK, 0 rows affected (0.22 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> show columns from tbldetail;
+-----------+-------------+------+-----+---------+----------------+
| Field     | Type        | Null | Key | Default | Extra          |
+-----------+-------------+------+-----+---------+----------------+
| detailid  | int(11)     | NO   | PRI | NULL    | auto_increment |
| petname   | varchar(100)| YES  |     | NULL    |                |
| pettype   | varchar(100)| YES  |     | NULL    |                |
| petage    | int(11)     | YES  |     | NULL    |                |
| ownername | varchar(100)| YES  |     | NULL    |                |
+-----------+-------------+------+-----+---------+----------------+
5 rows in set (0.00 sec)

mysql> _
```

to show the column values in tbldetil

Fig 3

```
mysql> insert into tbldetail(petname, pettype, petage, ownername)
    -> values
    -> ("tommy","puppydog",'3',"John");
Query OK, 1 row affected (0.05 sec)

mysql> select * from tbldetail;
+----------+---------+----------+---------+-----------+
| detailid | petname | pettype  | petage  | ownername |
+----------+---------+----------+---------+-----------+
|        1 | tommy   | puppydog |       3 | John      |
|        2 | tommy   | puppydog |       3 | John      |
+----------+---------+----------+---------+-----------+
2 rows in set (0.00 sec)

mysql> _
```

Applying data integrity rules

Objectives: At the end of this exercise you shall be able to
- **learning to apply data integrity rules.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad) & Browser, MySQL server Connection - 1 No.

PROCEDURE

TASK 1: **Applying data integrity rules**

Data Integrity rules

- MySQL CONSTRAINT is used to define rules to allow or restrict what values can be stored in columns. The purpose of inducing constraints is to enforce the integrity of a database.
- MySQL CONSTRAINTS are used to limit the type of data that can be inserted into a table.
- MySQL CONSTRAINTS can be classified into two types - column level and table level.

MySQL CONSTRAINTs are:

- NOT NULL
- UNIQUE
- PRIMARY KEY
- FOREIGN KEY
- CHECK
- DEFAULT

MySQL CREATE TABLE with NULL CONSTRAINT

- Here we want to create a table 'newauthor' where no columns are allowed to store NULL VALUES, to do that we are using following statement. (Fig 1)

Fig 1

```
CREATE TABLE IF NOT EXISTS newauthor
(aut_id varchar(8) NOT NULL,
aut_name varchar(50) NOT NULL,
country varchar(25) NOT NULL,
home_city varchar(25) NOT NULL );
```

Here in the above statement the constraint 'NOT NULL' have been used to exclude the NULL VALUE.

The following picture shows that the columns will not accept the NULL values. (Fig 2)

Fig 2

	Field	Type	Collation	Attributes	Null	Default	Extra
☐	aut_id	varchar(8)	latin1_swedish_ci		No	None	
☐	aut_name	varchar(50)	latin1_swedish_ci		No	None	
☐	country	varchar(25)	latin1_swedish_ci		No	None	
☐	home_city	varchar(25)	latin1_swedish_ci		No	None	

MySQL UNIQUE CONSTRAINT

The MySQL statement stated below will create a table 'newauthor' with a column 'aut_id' which will store unique values only since UNIQUE (aut_id) is used. (Fig 3)

The picture below shows the structure of the table (Fig 4)

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Fig 3

```
CREATE TABLE IF NOT EXISTS
newauthor(aut_id varchar(8) NOT NULL ,
aut_name varchar(50)
NOT NULL,
country varchar(25) NOT NULL,
home_city varchar(25)
NOT NULL,
UNIQUE (aut_id));
```

Fig 4

	Field	Type	Collation	Attributes	Null	Default	Extra				Acti
☐	aut_id	varchar(8)	latin1_swedish_ci		No	None					
☐	aut_name	varchar(50)	latin1_swedish_ci		No	None					
☐	country	varchar(25)	latin1_swedish_ci		No	None					
☐	home_city	varchar(25)	latin1_swedish_ci		No	None					

Indexes:

Action		Keyname	Type	Unique	Packed	Field	Cardinality	Collation	Null	Comment
		aut_id	BTREE	Yes	No	aut_id	0	A		

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Using DDL, DCL and DML statements

Objectives: At the end of this exercise you shall be able to
- **learn to use and difference between DDL, DML & DCL statements.**

Requirements

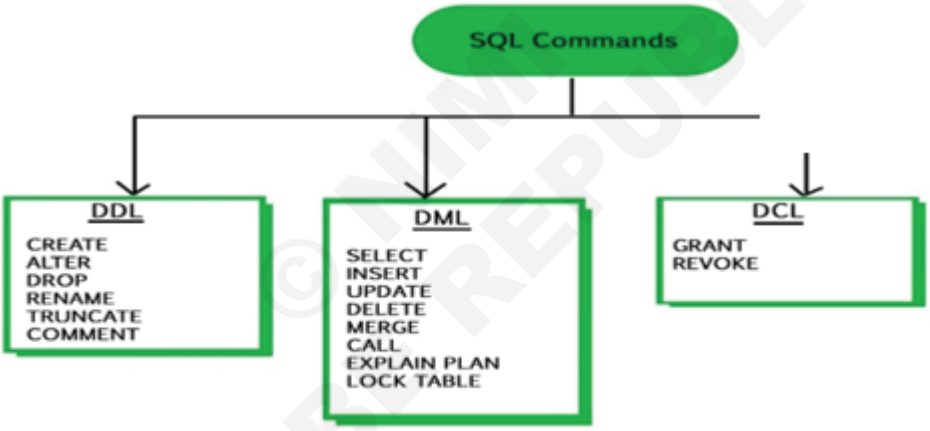
Tools/Equipment/Machines

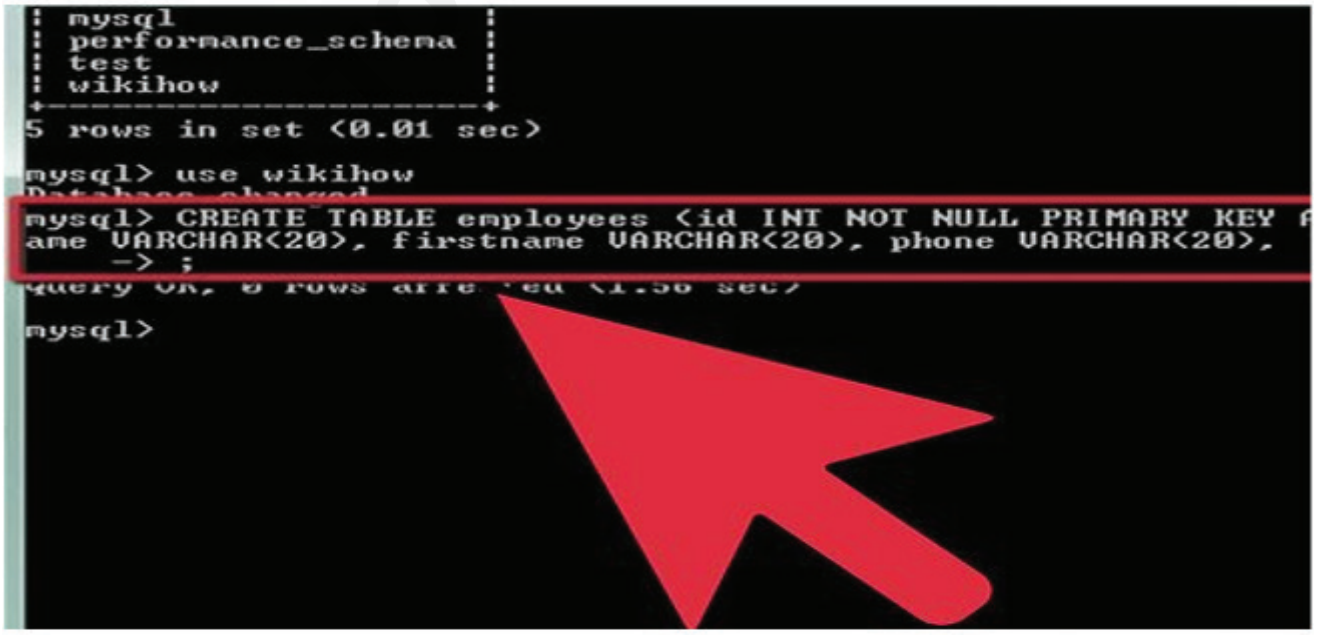
- A working PC with Text Editor (Notepad)
  & Browser, MySQL server Connection - 1 No.

PROCEDURE

TASK 1: **Using DDL, DCL and DML statements**

Using DDL statements (create, drop, rename etc.)
(Figs 1 & 2)





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Drop database

To drop a database use **drop database <database-name>**; command. (Fig 3)

```
mysql> CREATE DATABASE deleteme;
Query OK, 1 row affected (0.00 sec)

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| auth               |
| cdcol              |
| deleteme           |
| example            |
| lr                 |
| malex              |
| mysql              |
| performance_schema |
| phpa               |
| phpmyadmin         |
| social             |
| webauth            |
| website            |
+--------------------+
14 rows in set (0.00 sec)

mysql> DROP DATABASE deleteme;
Query OK, 0 rows affected (0.01 sec)
```

Drop table

To drop a table use drop table <table-name>; command.

Rename table

Use alter table <old-table-name> rename <new-table-name>; command. (Fig 4)

Using DML statements (select, insert, delete, update etc.)

Select

- Select command is used to fetch data from the MySQL database.
- To do that we used the select * from <table-name>; command.(Fig 5)

Insert

- The INSERT INTO statement is used to insert new records in a table.
- To insert values in a table here we use this **INSERT INTO <table-name> (column1, column2, column3, ...)VALUES (value1, value2, value3, ...);** command.(Fig 6)

Using DCL statements (grant, revoke etc.)

Grant

Syntax: GRANT <privileges_names> ON <object> TO user; (Fig 7)

```
mysql> use phpdirector;
Database changed
mysql> show tables;
+------------------------+
| Tables_in_phpdirector  |
+------------------------+
| pp_categories          |
| pp_config              |
| pp_config_new          |
| pp_files               |
| pp_rating              |
+------------------------+
5 rows in set (0.00 sec)

mysql> ALTER TABLE pp_config_new rename pp_config_BACKUP;
Query OK, 0 rows affected (0.20 sec)

mysql> show tables;
+------------------------+
| Tables_in_phpdirector  |
+------------------------+
| pp_categories          |
| pp_config              |
| pp_config_BACKUP       |
| pp_files               |
| pp_rating              |
+------------------------+
5 rows in set (0.00 sec)

mysql>
```

```
mysql> SELECT * FROM weather;
+-----------+---------+-------------+----------+---------------------+
| windspeed | maxwind | temperature | humidity | stamp               |
+-----------+---------+-------------+----------+---------------------+
| 0         | 0       | 72.14       | 51.7     | 2015-10-16 17:07:26 |
| 0         | 7.89    | 73.4        | 50.5     | 2015-10-16 17:17:31 |
| 0         | 0       | 73.22       | 50.4     | 2015-10-16 17:27:37 |
| 0         | 0       | 73.22       | 50.4     | 2015-10-16 17:37:44 |
| 0         | 4.82    | 69.8        | 52.5     | 2015-10-16 23:12:21 |
+-----------+---------+-------------+----------+---------------------+
5 rows in set (0.00 sec)
```

```
mysql> insert into tbldetail(petname, pettype, petage, ownername)
    -> values
    -> ("tommy","puppydog" ,'3',"John");
Query OK, 1 row affected (0.03 sec)

mysql> select * from tbldetail;
+----------+---------+----------+---------+------------+
| detailid | petname | pettype  | petage  | ownername  |
+----------+---------+----------+---------+------------+
|        1 | tommy   | puppydog |       3 | John       |
|        2 | tommy   | puppydog |       3 | John       |
+----------+---------+----------+---------+------------+
2 rows in set (0.00 sec)

mysql> _
```

```
MySQL 8.0 Command Line Client
mysql> GRANT ALL ON mystudentdb.* TO john@localhost;
Query OK, 0 rows affected (0.19 sec)

mysql> SHOW GRANTS FOR john@localhost;
+-----------------------------------------------------------+
| Grants for john@localhost                                 |
+-----------------------------------------------------------+
| GRANT USAGE ON *.* TO `john`@`localhost`                  |
| GRANT ALL PRIVILEGES ON `mystudentdb`.* TO `john`@`localhost` |
+-----------------------------------------------------------+
```

Enforcing constraints, primary key and foreign key

Objectives: At the end of this exercise you shall be able to
- **learning to use enforcing constraints, primary key amd foreign key.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad)
  & Browser, MySQL server Connection - 1 No.

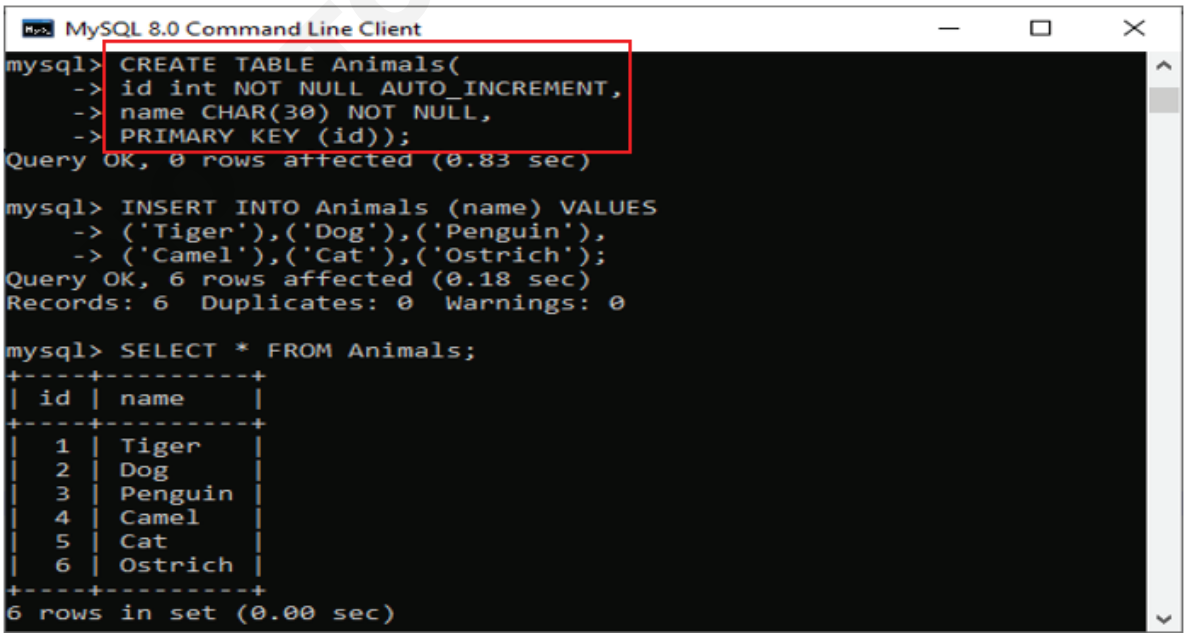
PROCEDURE

TASK 1: **Enforcing constraints, primary key amd foreign key**

Enforcing constraints, primary key

- Constraints are the rules enforced on the data columns of a table. These are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the database.
- Constraints could be either on a column level or a table level. The column level constraints are applied only to one column, whereas the table level constraints are applied to the whole table.
- Constraints can be specified when a table is created with the CREATE TABLE statement or you can use the ALTER TABLE statement to create constraints even after the table is created.
- NOT NULL Constraint − Ensures that a column cannot have NULL value.
- DEFAULT Constraint − Provides a default value for a column when none is specified.
- UNIQUE Constraint − Ensures that all values in a column are different.
- PRIMARY Key − Uniquely identifies each row/record in a database table.
- FOREIGN Key − Uniquely identifies a row/record in any of the given database table.
- CHECK Constraint − The CHECK constraint ensures that all the values in a column satisfies certain conditions.
- INDEX − Used to create and retrieve data from the database very quickly.

Use NOT NULL and PRIMARY KEY constrains for the id in table animals, which make the id unique and that id column cannot have null value. See the bellow figure. (Fig 1)



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Foreign key

The FOREIGN KEY constraint is use to prevent actions that would destroy links between tables.A FOREIGN KEY is a field (or collection of fields) in one table, that refers to the PRIMARY KEY in another table. (Fig 2)

Notice that the “PersonID” column in the “Orders” table points to the “PersonID” column in the “Persons” table.

The “PersonID” column in the “Persons” table is the PRIMARY KEY in the “Persons” table.

The “PersonID” column in the “Orders” table is a FOREIGN KEY in the “Orders” table.

- In the bellow picture, first, createtable “Persons”, give PRIMARY KEY constrain to “PersonsID” column
- Next, create a second table “Orders”, make the “PersonsID” column of table “Persons” to foreign key in table “Orders”

SYNTAX: (Fig 3)

Persons Table

PersonID	LastName	FirstName	Age
1	Hansen	Ola	30
2	Svendson	Tove	23
3	Pettersen	Kari	20

Orders Table

OrderID	OrderNumber	PersonID
1	77895	3
2	44678	3
3	22456	2
4	24562	1

```
CREATE TABLE Orders (
    OrderID int NOT NULL,
    OrderNumber int NOT NULL,
    PersonID int,
    PRIMARY KEY (OrderID),
    FOREIGN KEY (PersonID) REFERENCES Persons(PersonID)
);
```

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Adding indices to tables

Objectives: At the end of this exercise you shall be able to
- **learn how to add index in a table, using SELECT statement, add new values in a table.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad) & Browser, MySQL server Connection - 1 No.

PROCEDURE

TASK 1: **Adding indices to Tables**

Adding indices to Tables

Indexing makes columns faster to query by creating pointers to where data is stored within a database. (Fig 1)

To create index use the below command:-

```
CREATETABLE friends (id INTPRIMARYKEY, name VARCHAR, city VARCHAR);
```

NOTE: The clustered index will be automatically created when the primary key is defined.

NOTE: The created table, "friends", will have a clustered index automatically created, organized around the Primary Key "id" called "friends_pkay". (Fig 2)

```
SELECT * FROM friends WHERE name = 'Zack';
```

	friends		
	id	**name**	**city**
	1	Matt	San Francisco
	2	Dave	Oakland
	3	Andrew	Blacksburg
	4	Todd	Chicago
	5	Blake	Atlanta
	6	Evan	Detroit
	7	Nick	New York City
Zack	8	Zack	Seattle

friends_pkey	Friends		
id	**id**	**name**	**city**
1	1	Matt	San Francisco
2	2	Dave	Oakland
3	3	Andrew	Blacksburg
4	4	Todd	Chicago
5	5	Blake	Atlanta
6	6	Evan	Detroit
7	7	Nick	New York City
8	8	Zack	Seattle

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COPA - Demonstrate on queries

Simple select queries

Objectives: At the end of this exercise you shall be able to
- **explain about simple select queries.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad) & Browser, MySQL server Connection - 1 No.

PROCEDURE

TASK 1: **Simple select queries**

Demonstrate on Simple select queries

- The SELECT statement is used to select data from a database. The data returned is stored in a result table, called the result-set.

SYNTAX :

SELECT column1, column2, ...

FROM table_name;

Here, column1, column2, ... are the field names of the table you want to select data from. If you want to select all the fields available in the table, use the following syntax:

SYNTAX :

SELECT * FROM table_name;

This will show the whole table data. (Fig 1)

Here with the help of SELECT statement we are fetching the whole data of “customer” table.

Fig 1

```
mysql> DELETE FROM customer WHERE Adress='Bhopal';
Query OK, 1 row affected (0.15 sec)

mysql> SELECT * FROM customer;
+------+----------------+------+------------+----------+
| ID   | Name           | Age  | Adress     | Salary   |
+------+----------------+------+------------+----------+
|    1 | Himani Gupta   |   21 | Meerut     | 22000.00 |
|    3 | Ajeet Bhardwaj |   45 | Modinagar  | 65000.00 |
|    4 | Rahul          |   21 | Muradnagar | 26000.00 |
|    5 | Aashutosh      |   23 | Modinagar  | 36000.00 |
|    6 | Pratima        |   23 | Noida      | 32000.00 |
|    7 | Bhanu          |   21 | Muradnagar | 62000.00 |
+------+----------------+------+------------+----------+
6 rows in set (0.00 sec)

mysql>
```

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Insert and delete queries update queries

Objectives: At the end of this exercise you shall be able to
- **explain about insert queries**
- **explain about delete queries**
- **explain about update queries.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad) & Browser, MySQL server Connection - 1 No.

PROCEDURE

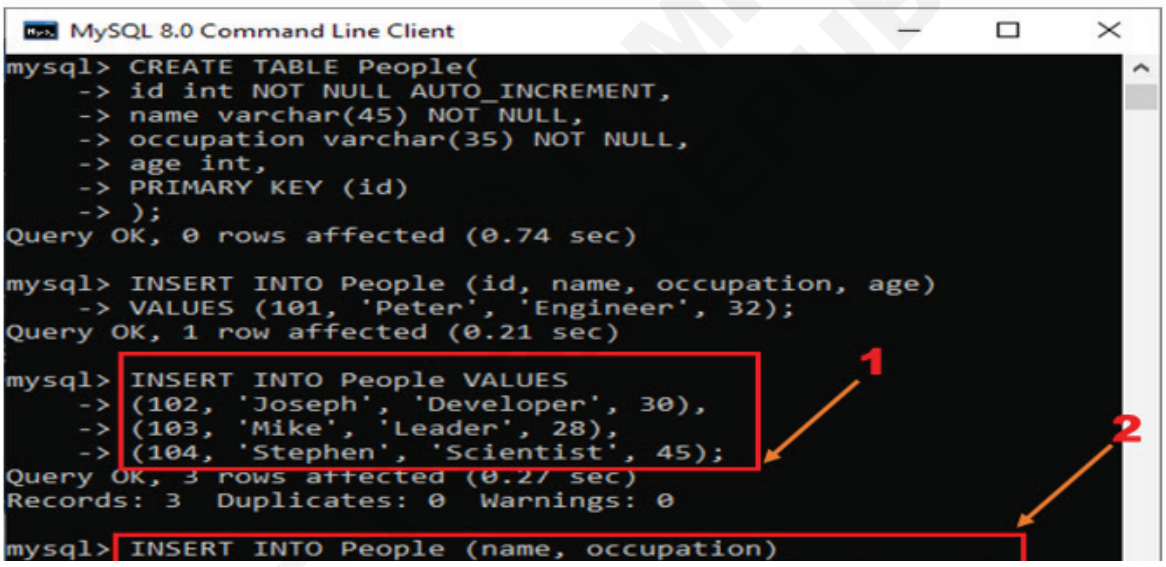
TASK 1: **Insert queries**

Insert queries

The INSERT INTO statement is used to insert new records in a table. (Fig 1)

- As per the above image, there aretwo ways to use insert query. First one, will add values for all column of the table, that's why no need to specifying column names.

Fig 1



- In the second way, that query will add value for "name" and "occupation" columns only.

Delete queries

1 To delete the database, useDROP DATABSE <database-name> (Fig 2)

2 To delete a table, use DROP TABLE <table-name> (Fig 3)

Update queries

There may be a requirement where the existing data in a MySQL table needs to be modified. You can do so by using the SQL UPDATE command. This will modify any field value of any MySQL table.

Syntax:

UPDATE table_name SET field1 = new-value1, field2 = new-value2

[WHERE Clause]

- You can update one or more field altogether.
- You can specify any condition using the WHERE clause.
- You can update the values in a single table at a time.
- The WHERE clause is very useful when you want to update the selected rows in a table. (Fig 4)

Fig 2

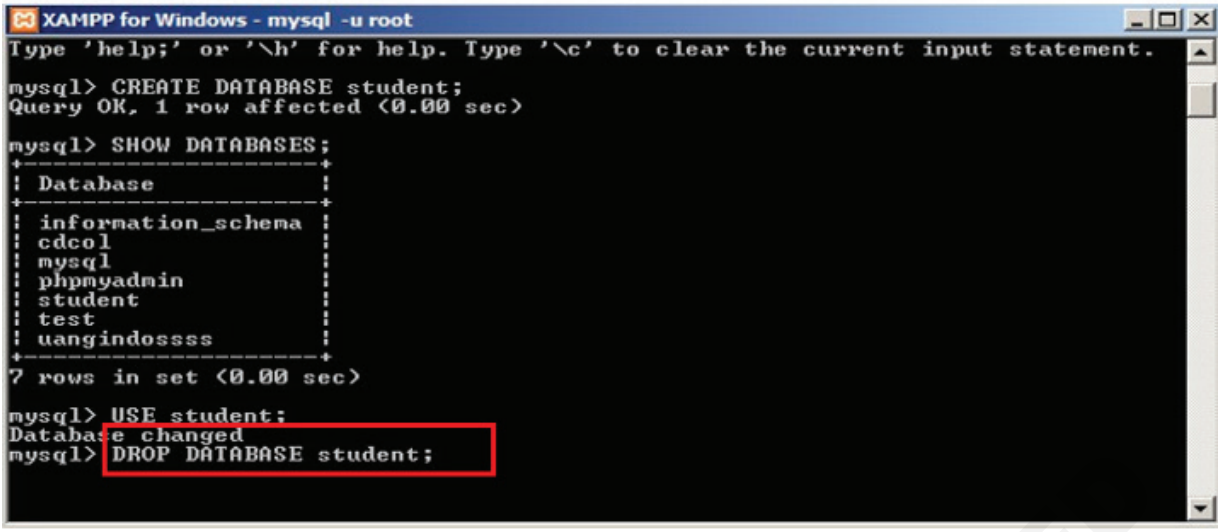


Fig 3

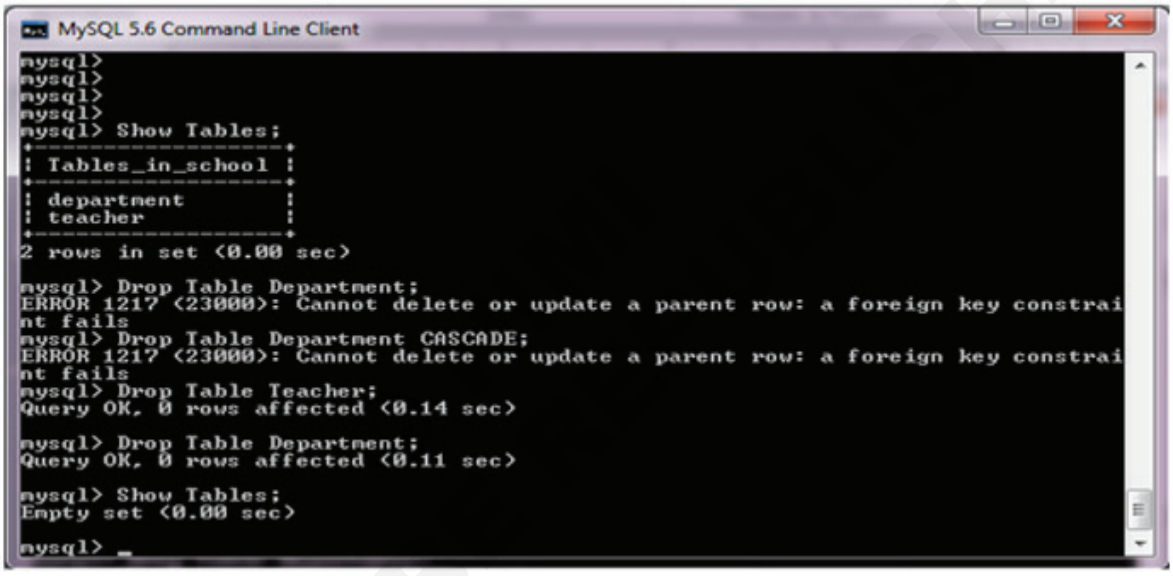
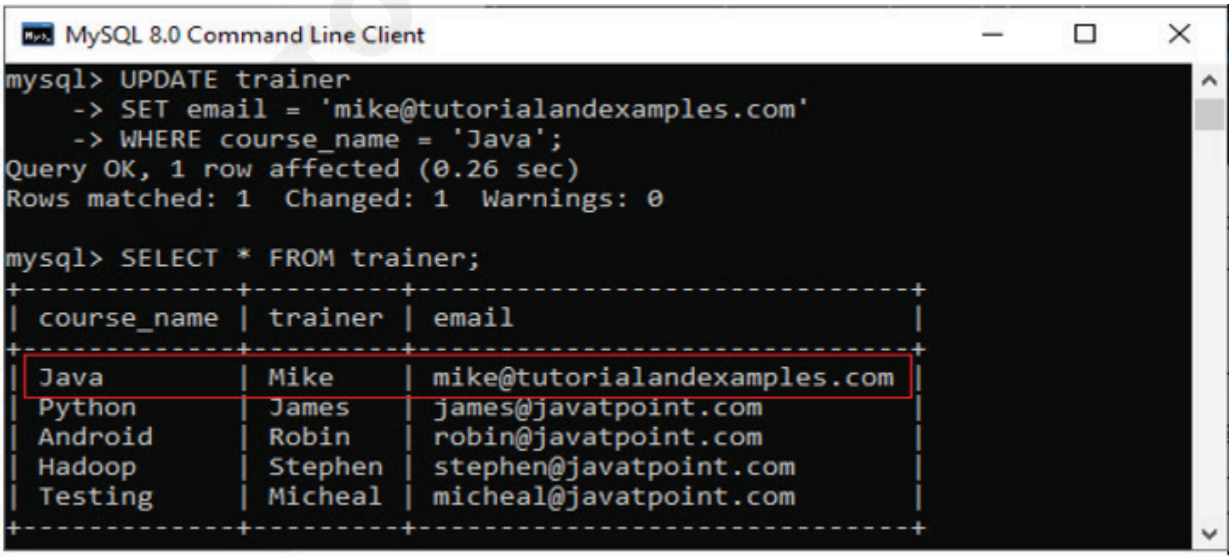


Fig 4



Using the Number, Date and Character functions, Joins and Functions

Objectives: At the end of this exercise you shall be able to
- **explain about number, date and character functions.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad) & Browser, MySQL server Connection - 1 No.

PROCEDURE

TASK 1: **Using the Number, Date and Character functions, Joins and Functions**

Number function

ABS(x)

To check absolute value, use this function. (Fig 1)

Fig 1

```
SQL> SELECT ABS(2);
+-------------------------
| ABS(2)
+-------------------------
| 2
+-------------------------
1 row in set (0.00 sec)
```

ACOS(x)

This function returns the arccosine of X. The value of X must range between -1 and 1 or NULL will be returned (Fig 2)

Fig 2

```
SQL> SELECT ACOS(1);
+-------------------------
| ACOS(1)
+-------------------------
| 0.000000
+-------------------------
1 row in set (0.00 sec)
```

Some other functions

SIN() Return the sine of numeric expression given in radians.
SQRT() Returns the non-negative square root of numeric expression.
STD() Returns the standard deviation of the numeric expression.
STDDEV() Returns the standard deviation of the numeric expression.
TAN() Return the tangent of numeric expression expressed in radians.
TRUNCATE() Return numeric exp1 truncated to exp2 decimal places. If exp2 is 0, then the result will have no decimal point.
DEGREES() Returns numeric expression converted from radians degrees.
EXP() Returns the base of the natural logarithm (e) raised to the power of passed numeric expression.
FLOOR() Returns the largest integer value that is not greater that is not greater than passed numeric expression.

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GREATEST() Returns the largest value of the input expressions.
INTERVAL() Take multiple expressions exp1 ,exp2,and exp3 so on.. and returns o if exp1 is less than exp2, returns 1 if exp 1 is less than exp3 and so on.
LEAST() Returns the minimum-valued input when given two or more
LOG() Returns the natural logarithm of the passed numeric expression.

character function

Functions	Description
lower()	The SQUL LOWER() function is used to convert all characters of string to lower case.
upper()	The SQL UPPER() function is used to covert all characters of a string to upper case.
trim()	The SQL TRIM() removes leading and trailing characters(or both) from a character string.
Translate()	The SQL TRANSLATE() function replaces a sequence of character in a string with another sequence of character. The function replaces a single character at a time.

Date function

Date functions	Desc	Return value Data Type	None
Day (date or datetime)	Return the day of the week for a given date	Integer like 1 -32	
Month (date or datetime)	Return the month of a given date	Integer like 1 - 12	
YEAR (date or datetime)	Return the year of a given date	Integer for year like 2021	
DATEPART(date part, date or datetime)	Return the date part specified in int format	Integer like 1 -12 for month, 1 – 31 for day, or year like 2021	
DATENAME (Date part, date or datetime	Return the date part specified character format	Character like April, May, '1', '2', '2020' ,2021,	
EOMONTH (date months to add)	Returns the last do of the month with an optional parameter to add months (+ or -)	01/31/2021	Introduced in SQL Server 2012
DATEDIFF (date part, units, date or datetime)	Return date math results	datetime	
DATEDIFF(date part, units, date or datetime)	Give the difference between 2 dates in units specified by date part	Integer of date part units	
DATEDIFF-BIG	Give the difference between 2 dates in units specified by date part	Big integer of date part units	
CONVERT (date type,value ,style	Used to convert date output to a specified mask	Typically, a character datetype is specified when coverinting dates.	*To convert a valid date char string to date no function is needed! Implicit convert!
FORMAT (value,format, culture	Used to convert date output to a specified mask	Returns a date formatted string based on the mask specified.	

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Joins, Group by, Having, Sub query

Objectives: At the end of this exercise you shall be able to

- **learn how to join two table in different ways, also able to use group by and having clause in MySQL, create index for a table and optimizing those queries**
- **create procedure and also how to use stored procedures.**

Requirements

Tools/Equipment/Machines

- A working PC with Text Editor (Notepad) & Browser, MySQL server Connection - 1 No.

PROCEDURE

TASK 1: **Learning to Joins, Group by, Having, Sub query**

Joins

- MySQL JOINS are used with SELECT statement. It is used to retrieve data from multiple tables. It is performed whenever you need to fetch records from two or more tables.There are three types of MySQL joins: (Fig 1)
  - MySQL INNER JOIN (or sometimes called simple join)
  - MySQL LEFT OUTER JOIN (or sometimes called LEFT JOIN)
  - MySQL RIGHT OUTER JOIN (or sometimes called RIGHT JOIN)

MySQL Inner JOIN (Simple Join)

Syntax:

SELECT columns
FROM table1
INNER JOIN table2
ON table1.column = table2.column;

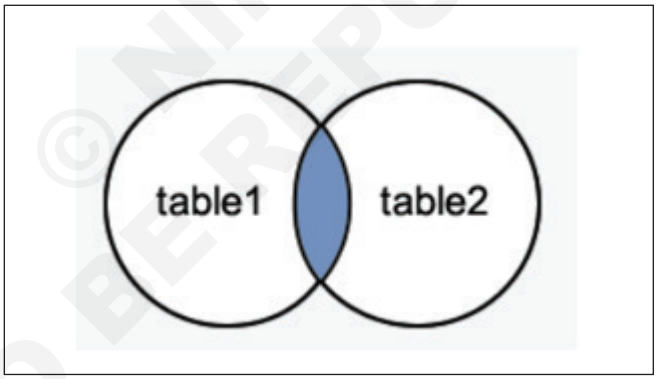
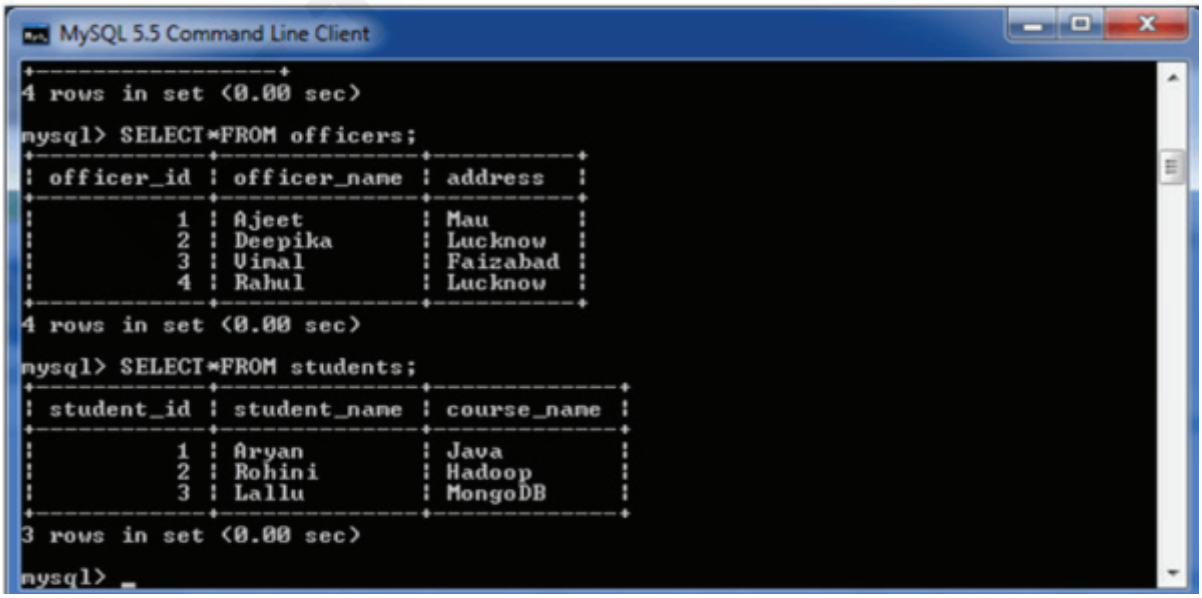


Fig 1



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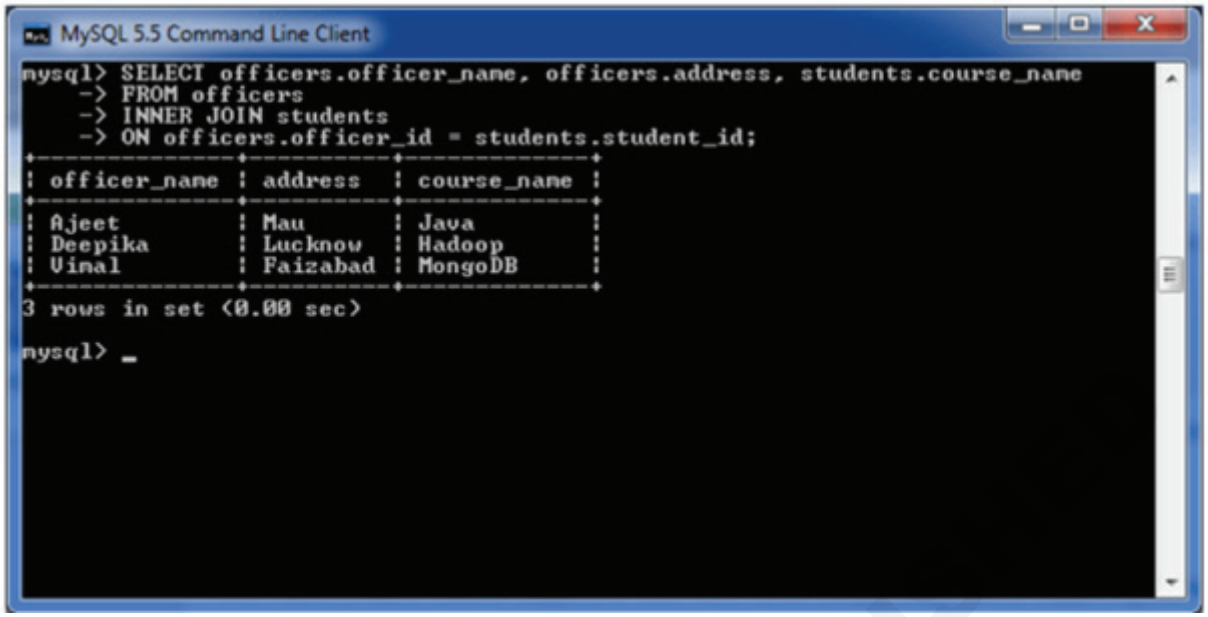
Consider two tables “officers” and “students”, having the following data.

Consider two tables “officers” and “students”, having the following data. (Fig 2)

Fig 2



MySQL Left Outer Join

- The LEFT OUTER JOIN returns all rows from the left hand table specified in the ON condition and only those rows from the other table where the join condition is fulfilled. (Fig 3)

Syntax:

SELECT columns

FROM table1

LEFT [OUTER] JOIN table2

ON table1.**column** = table2.column;

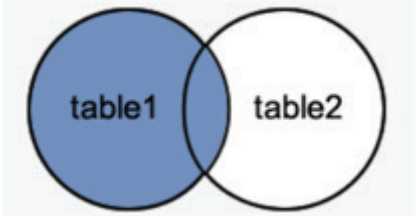
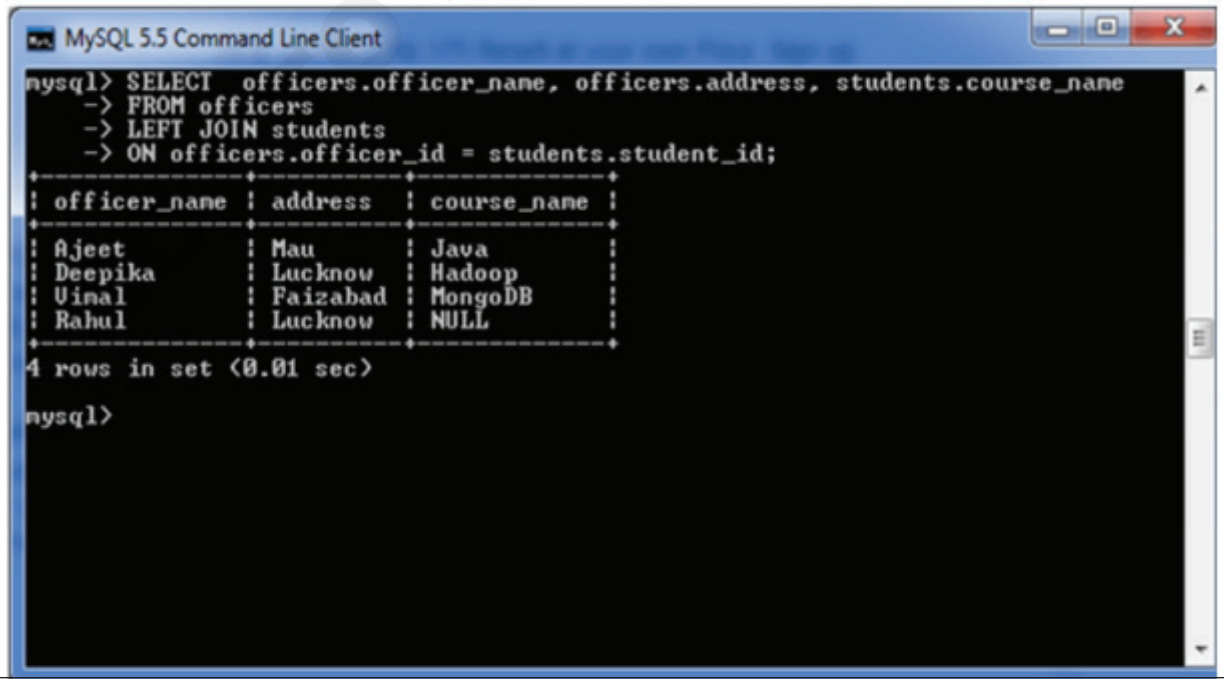


Fig 3



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MySQL Right Outer Join

- The MySQL Right Outer Join returns all rows from the RIGHT-hand table specified in the ON condition and only those rows from the other table where he join condition is fulfilled. (Fig 4)

Syntax:

SELECT columns

FROM table1

RIGHT [OUTER] JOIN table2

ON table1.**column** = table2.**column;**

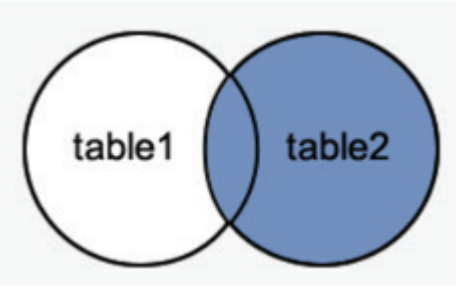
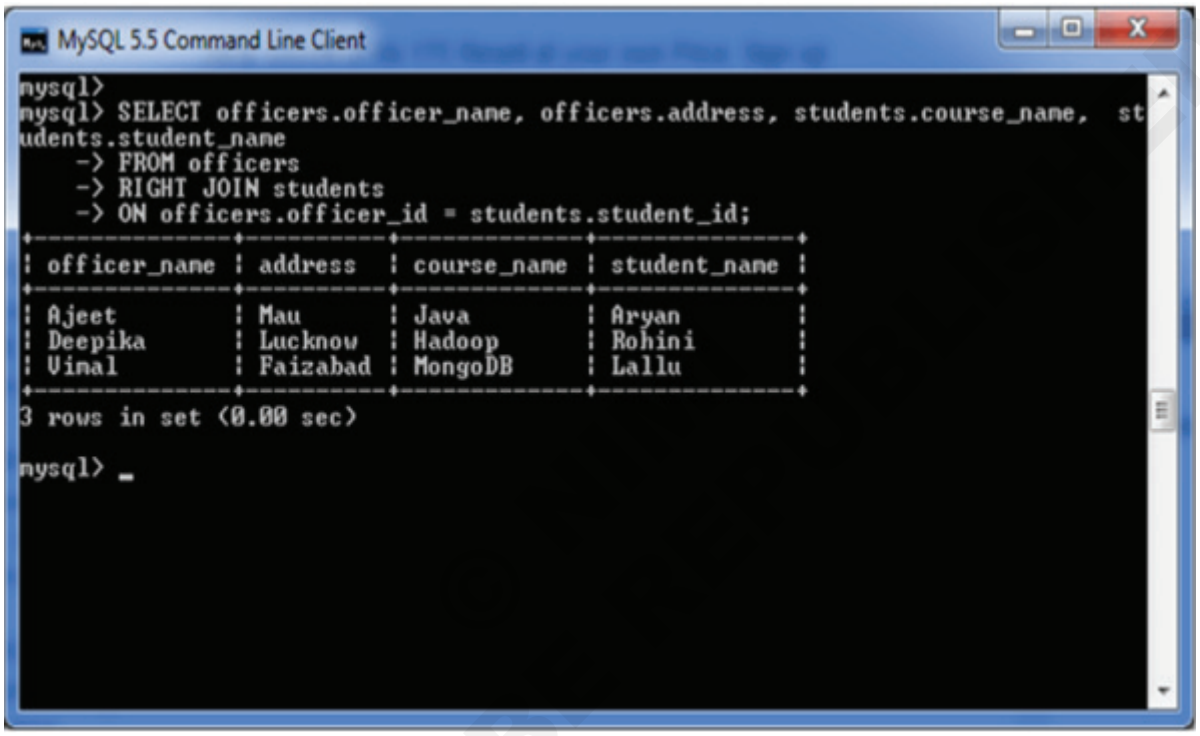


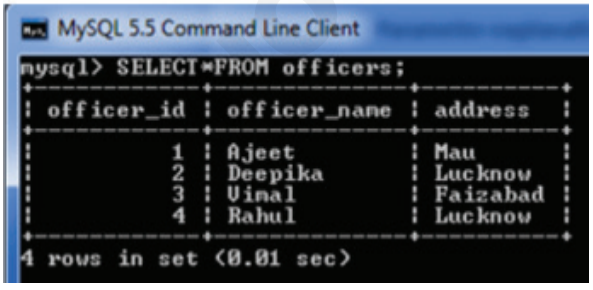
Fig 4



Group By

- The MYSQL GROUP BY Clause is used to collect data from multiple records and group the result by one or more column. It is generally used in a SELECT statement.(Fig 5)

Fig 5



- We can also use some aggregate functions like COUNT, SUM, MIN, MAX, AVG etc. on the grouped column.

Syntax:

SELECT expression1, expression2, ... expression_n,

aggregate_function (expression)

FROM tables

[WHERE conditions]

GROUP BY expression1, expression2, ... expression_n;

MySQL GROUP BY Clause with COUNT function

Consider a table named “officers” table, having the following records. (Fig 6)

Having

MySQL HAVING Clause is used with GROUP BY clause. It always returns the rows where condition is TRUE. (Fig 7)

Fig 6

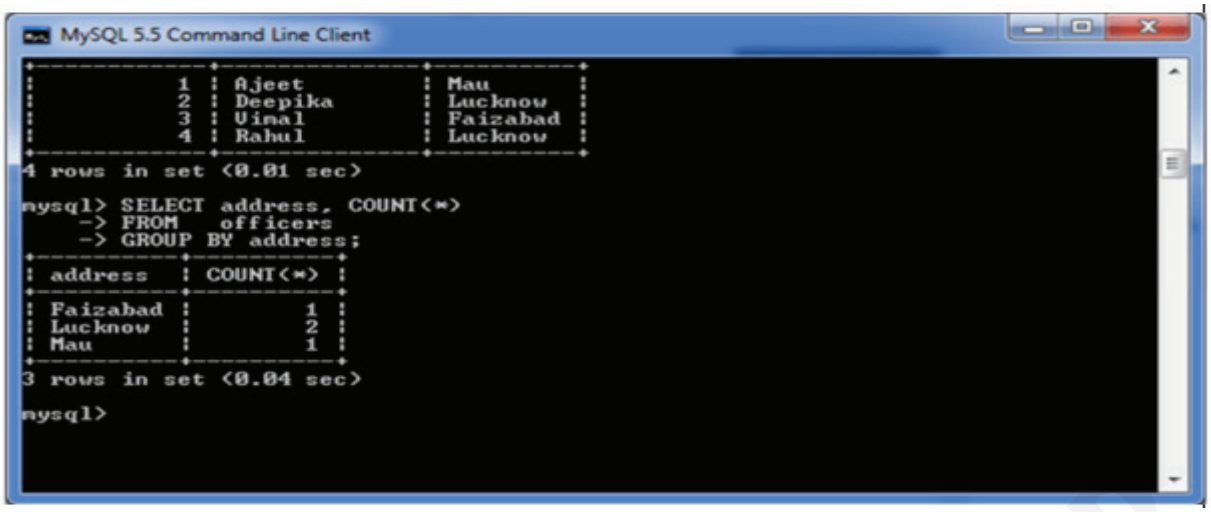
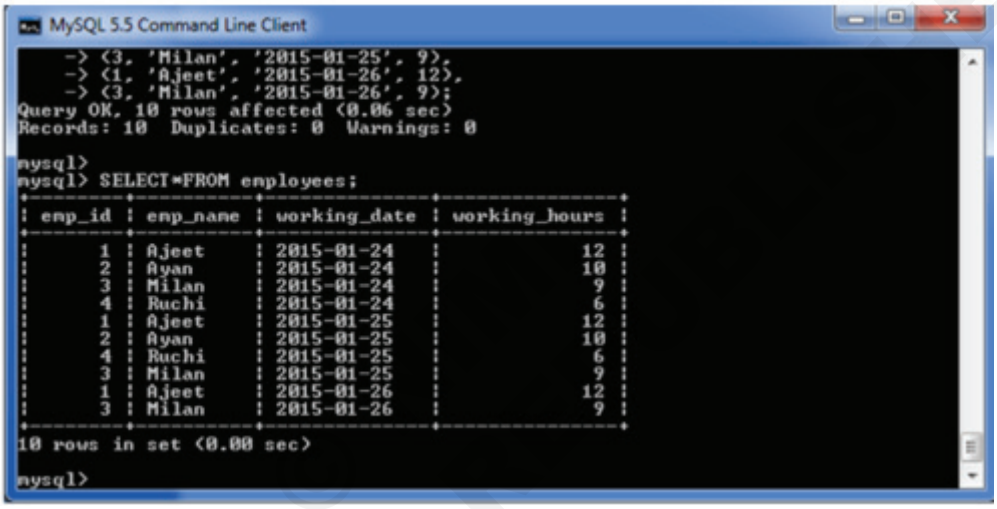


Fig 7



Syntax:

SELECT expression1, expression2, ...expression_n,

aggregate_function (expression)

FROM tables

[WHERE conditions]

GROUP BY expression1, expression2,

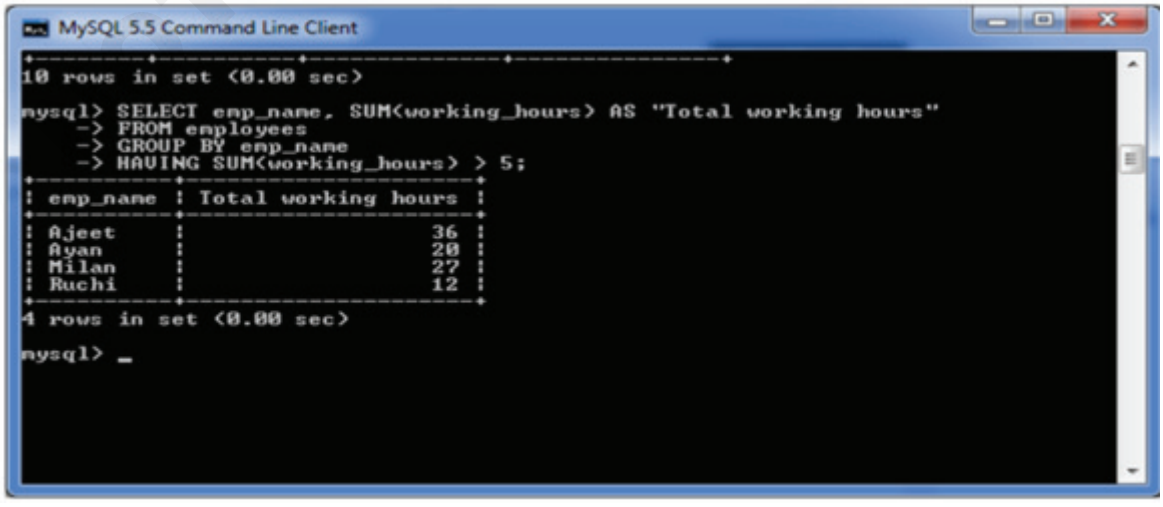
... expression_n;

HAVING condition;

MySQL HAVING Clause with SUM function

Here, we use the SUM function with the HAVING Clause to return the emp_name and sum of their working hours. (Fig 8)

Fig 8



Subqueries

- A subquery is a SQL query nested inside a larger query.
- A subquery may occur in:
  - A SELECT clause
  - A FROM clause
  - A WHERE clause
- In MySQL subquery can be nested inside a SELECT, INSERT, UPDATE, DELETE, SET, or DO statement or inside another subquery.
- A subquery is usually added within the WHERE Clause of another SQL SELECT statement.
- You can use the comparison operators, such as >, <, or =. The comparison operator can also be a multiple-row operator, such as IN, ANY, SOME, or ALL.
- A subquery can be treated as an inner query, which is a SQL query placed as a part of another query called as outer query.
- The inner query executes first before its parent query so that the results of the inner query can be passed to the outer query.

Subquery Syntax :

```
Select    select_list
From      table
Where     expr operator
                ( Select    select_list
                  From      table );
```

The subquery (inner query) executes once before the main query (outer query) executes.

The main query (outer query) use the subquery result.

Subquery syntax as specified by the SQL standard and supported in MySQL

```
DELETE FROM t1
  WHERE s11 > ANY
  (SELECT COUNT(*) /* no hint */ FROM t2
    WHERE NOT EXISTS
     (SELECT * FROM t3
       WHERE ROW(5*t2.s1,77)=
        (SELECT 50,11*s1 FROM t4 UNION SELECT
          50,77 FROM
          (SELECT * FROM t5) AS t5)));
```

A subquery can return a scalar (a single value), a single row, a single column, or a table (one or more rows of one or more columns). These are called scalar, column, row, and table subqueries.

MySQL Subquery Example:

Using a subquery, list the name of the employees, paid more than 'Alexander' from emp_details . (Fig 9)

Fig 9

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY	COMMISSION_PCT	MAN
100	Steven	King	SKING	515.123.4567	17-Jun-87	AD_PRES	24000		
101	Neena	Kochhar	NKOCHHAR	515.123.4568	21-Sep-89	AD_VP	17000		100
102	Lex	De Haan	LDEHAAN	515.123.4569	13-Jan-93	AD_VP	17000		100
103	Alexander	Hunold	AHUNOLD	590.423.4567	3-Jan-90	IT_PROG	9000		102
104	Bruce	Ernst	BERNST	590.423.4568	21-May-91	IT_PROG	6000		103
105	David	Austin	DAUSTIN	590.423.4569	25-Jun-97	IT_PROG	4800		103

```
Select    first_name, last_name, salary
From      employees          9000
Where     salary >
                ( Select    salary
                  From      employees
                  Where     first_name='Alexander' );
```

```
mysql> SELECT first_name,last_name, salary FROM em
       WHERE salary >(SELECT salary FROM emp_detai
                      WHERE first_name='Alexander'
+------------+-----------+----------+
| first_name | last_name | salary   |
+------------+-----------+----------+
| Steven     | King      | 24000.00 |
| Neena      | Kochhar   | 17000.00 |
| Lex        | De Haan   | 17000.00 |
| RABI       | CHANDRA   | 15000.00 |
| Ana        | King      | 17000.00 |
+------------+-----------+----------+
5 rows in set (0.00 sec)
```

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COMPUTER OPERATOR AND PROGRAMMING ASSISTANT

NSQF LEVEL - 3

Volume II of II

TRADE PRACTICAL

SECTOR: IT & ITES

(As per revised syllabus July 2022 - 1200 hrs)

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Directorate General of Training

DIRECTORATE GENERAL OF TRAINING
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
GOVERNMENT OF INDIA

NATIONAL INSTRUCTIONAL MEDIA INSTITUTE, CHENNAI

Post Box No. 3142, CTI Campus, Guindy, Chennai - 600 032

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FOREWORD

The Government of India has set an ambitious target of imparting skills to 30 crores people, one out of every four Indians, by 2020 to help them secure jobs as part of the National Skills Development Policy. Industrial Training Institutes (ITIs) play a vital role in this process especially in terms of providing skilled manpower. Keeping this in mind, and for providing the current industry relevant skill training to Trainees, ITI syllabus has been recently updated with the help of Mentor Councils comprising various stakeholder's viz. Industries, Entrepreneurs, Academicians and representatives from ITIs.

The National Instructional Media Institute (NIMI), Chennai has now come up with instructional material to suit the revised curriculum for **COPA Volume II of II Trade Practical NSQF Level - 3 (Revised 2022) in IT & ITES Sector.** The NSQF Level - 3 (Revised 2022) Trade Practical will help the trainees to get an international equivalency standard where their skill proficiency and competency will be duly recognized across the globe and this will also increase the scope of recognition of prior learning. NSQF Level - 3 (Revised 2022) trainees will also get the opportunities to promote life long learning and skill development. I have no doubt that NSQF Level - 3 (Revised 2022) the trainers and trainees of ITIs, and all stakeholders will derive maximum benefits from these IMPs and that NIMI's effort will go a long way in improving the quality of Vocational training in the country.

The Executive Director & Staff of NIMI and members of Media Development Committee deserve appreciation for their contribution in bringing out this publication.

Jai Hind

Addl. Secretary/Director General (Training)
Ministry of Skill Development & Entrepreneurship,
Government of India.

New Delhi - 110 001

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PREFACE

The National Instructional Media Institute (NIMI) was established in 1986 at Chennai by then Directorate General of Employment and Training (D.G.E & T), Ministry of Labour and Employment, (now under Ministry of Skill Development and Entrepreneurship) Government of India, with technical assistance from the Govt. of the Federal Republic of Germany. The prime objective of this institute is to develop and provide instructional materials for various trades as per the prescribed syllabi (NSQF LEVEL - 4) under the Craftsman and Apprenticeship Training Schemes.

The instructional materials are created keeping in mind, the main objective of Vocational Training under NCVT/NAC in India, which is to help an individual to master skills to do a job. The instructional materials are generated in the form of Instructional Media Packages (IMPs). An IMP consists of Theory book, Practical book, Test and Assignment book, Instructor Guide, Audio Visual Aid (Wall charts and Transparencies) and other support materials.

The trade practical book consists of series of exercises to be completed by the trainees in the workshop. These exercises are designed to ensure that all the skills in the prescribed syllabus are covered. The trade theory book provides related theoretical knowledge required to enable the trainee to do a job. The test and assignments will enable the instructor to give assignments for the evaluation of the performance of a trainee. The wall charts and transparencies are unique, as they not only help the instructor to effectively present a topic but also help him to assess the trainee's understanding. The instructor guide enables the instructor to plan his schedule of instruction, plan the raw material requirements, day to day lessons and demonstrations.

In order to perform the skills in a productive manner instructional videos are embedded in QR code of the exercise in this instructional material so as to integrate the skill learning with the procedural practical steps given in the exercise. The instructional videos will improve the quality of standard on practical training and will motivate the trainees to focus and perform the skill seamlessly.

IMPs also deals with the complex skills required to be developed for effective team work. Necessary care has also been taken to include important skill areas of allied trades as prescribed in the syllabus.

The availability of a complete Instructional Media Package in an institute helps both the trainer and management to impart effective training.

The IMPs are the outcome of collective efforts of the staff members of NIMI and the members of the Media Development Committees specially drawn from Public and Private sector industries, various training institutes under the Directorate General of Training (DGT), Government and Private ITIs.

NIMI would like to take this opportunity to convey sincere thanks to the Directors of Employment & Training of various State Governments, Training Departments of Industries both in the Public and Private sectors, Officers of DGT and DGT field institutes, proof readers, individual media developers and coordinators, but for whose active support NIMI would not have been able to bring out this materials.

Chennai - 600 032 **EXECUTIVE DIRECTOR**

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ACKNOWLEDGEMENT

National Instructional Media Institute (NIMI) sincerely acknowledges with thanks for the co-operation and contribution extended by the following Media Developers and their sponsoring organisations to bring out this Instructional Material **(Trade Practical)** for the trade of **COPA Volume II of II** (NSQF LEVEL - 3) (Revised 2022) under **IT & ITES** Sector for ITIs.

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Shri.G. Michael Johny	_	Manager, NIMI, Chennai - 32.

NIMI records its appreciation for the Data Entry, CAD, DTP operators for their excellent and devoted services in the process of development of this Instructional Material.

NIMI also acknowledges with thanks the invaluable efforts rendered by all other NIMI staff who have contributed towards the development of this Instructional Material.

NIMI is also grateful to everyone who has directly or indirectly helped in developing this Instructional Material.

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INTRODUCTION

TRADE PRACTICAL

The trade practical manual is intented to be used in workshop . It consists of a series of practical exercises to be completed by the trainees during the course of the **COPA Vol II of II** Trade supplemented and supported by instructions/ informations to assist in performing the exercises. These exercises are designed to ensure that all the skills in compliance with NSQF LEVEL - 3 (Revised 2022)

Module 30 - Set-up & Configure a Computer Network
Module 31 - Create Simple Static Web Pages using HTML Tags
Module 32 - JavaScript Embed JavaScript in HTML Pages
Module 33 - Data Visualization or Analysis using Excel
Module 34 - Browse E-Commerce Sites to Identify Products & Services
Module 35 - Protect Information, Computers and Networks from Viruses, Spyware and other Malicious Code
Module 36 - Cloud Computing
Module 37 - Develop an application and perform the Application Development Life Cycle
Module 38 to 42 - Elective Module I Programming in Python
Module 38 to 42 - Elective Module II Programming in JAVA

The skill training in the shop floor is planned through a series of practical exercises centred around some practical project. However, there are few instances where the individual exercise does not form a part of project.

While developing the practical manual a sincere effort was made to prepare each exercise which will be easy to understand and carry out even by below average trainee. However the development team accept that there is a scope for further improvement. NIMI, looks forward to the suggestions from the experienced training faculty for improving the manual.

TRADE THEORY

The manual of trade theory consists of theoretical information for the course of the **COPA** Trade. The contents are sequenced according to the practical exercise contained in the manual on Trade practical. Attempt has been made to relate the theortical aspects with the skill covered in each exercise to the extent possible. This co-relation is maintained to help the trainees to develop the perceptional capabilities for performing the skills.

The Trade theory has to be taught and learnt along with the corresponding exercise contained in the manual on trade practical. The indicating about the corresponding practical exercise are given in every sheet of this manual.

It will be preferable to teach/learn the trade theory connected to each exercise atleast one class before performing the related skills in the shop floor. The trade theory is to be treated as an integrated part of each exercise.

The material is not the purpose of self learning and should be considered as supplementary to class room instruction.

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CONTENTS

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
	Module 30: Set-up & Configure a Computer Network		
1.30.101	View network connections	6	1
1.30.102	Connect a computer to a network and share Devices i.e. Printers, files, folders and drives		3
1.30.103	Work with various Network devices, connectors and cables. Create straight and cross cable and punch a UTP cable in the patch socket and test the connectivity		7
1.30.104	Practice IP Addressing and Subnet masking for IPV4/ IPV6 and pinging to test networks		11
1.30.105	Configuring HUB & switch		14
1.30.106	Setup and configure wired and wireless LAN in a Computer Lab within at least three computers		15
1.30.107	Use patch panel & I/O Box for wired LAN and installing & configuring Internet connection in a single PC and in a LAN		16
1.30.108	Set up a proxy server/ DHCP Server with firewall		20
1.30.109	Setting up video conferencing using open-source software		22
1.30.110	Use various tools (by open source /free) for network troubleshooting, maintenance and security for both Wired and Wireless		23
1.30.111	Set up Internet access & communication		25
1.30.112	Use the Internet		27
	Module 31: Create Simple Static Web Pages using HTML Tags		
1.31.113	Practice with Basic HTML elements, tags and attributes	7	35
1.31.114	Create simple static web pages using CSS		51
	Module 32: JavaScript Embed JavaScript in HTML Pages		
1.32.115	Practicing the JavaScript in creating dynamic HTML pages		64
1.32.116	Embed JavaScript in HTML to Display Information in Web pages	8	66
1.32.117	Use error handling techniques in JavaScript		68
1.32.118	Use objects and classes in JavaScript		72
1.32.119	Describe Animation and Multimedia using JavaScript		75
1.32.120	Develop dynamic HTML pages using JavaScript		78
1.32.121	Deploy web project using IIS		82
	Module 33: Data Visualization or Analysis using Excel		
1.33.122	Create and modify simple macros	9	95
1.33.123	Perform form controls and create simple data entry form with macros		96
1.33.124	Look up data by using functions		107
1.33.125	Use advanced date functions		109
1.33.126	Create and modify advanced charts		126
1.33.127	Create and modify PivotTables		131

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Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.33.128	Create a Power Query, Power Query Function. Invoking the Power Query function and combining queries. Organize the workbook queries		134
1.33.129	Use Power BI for simple data visualizations		146
	Module 34: Browse E-Commerce Sites to Identify Products & Services		
1.34.130	Demonstrate E-Commerce sites		158
1.34.131	List features of e-commerce sites		159
1.34.132	Use e-commerce sites to source an item		163
1.34.133	Undertake transactions on an e-commerce site	10	169
1.34.134	Add product to an e-commerce website		170
1.34.135&136	Practice order & payment processing		172
1.34.137	Identify common security issues		174
	Module 35: Protect Information, Computers and Networks from Viruses, Spyware and other Malicious Code		
1.35.138	Provide firewall security for internet connection and network system	11	175
1.35.139	Explain compliance with IT Act		184
	Module 36: Cloud Computing		
1.36.140	Practice with IaaS using free cloud services		186
1.36.141	Practice with PaaS using free cloud services	12	193
1.36.142	Practice with SaaS using free cloud services		195
1.36.143	Host a website in a free cloud		197
	Module 37: Develop an application and perform the Application Development Life Cycle		
1.37.144	Identify Phases of the Application Development Life Cycle	12	204
1.37.145	Describe Roles in each of the phases of Application Development Life Cycle		205
	Module 38 to 42 : Elective Module I Programming in Python		
1.38.01	Install, set up the environment & run Python		207
1.38.02	Use Command Line and IDE to create and execute a python program		210
1.39.03	Write and test a python program to demonstrate print statement, comments, different types of variables		213
1.39.04	Write and test a python program to perform data and data type operations,string operations, date, input and output, output formatting and operators	13	215
1.39.05	Determine the sequence of execution based on operator precedence		219
1.40.06	Construct and analyze code segments that use branching statements		222
1.40.07	Construct and analyze code segments that perform iteration		224
1.41.08	Document code segments using comments and documentation strings		228
1.41.09	Construct and analyze code segments that include list comprehensions, tuple, set and dictionary comprehensions		230
1.42.10	Perform basic operations using built-in modules		232

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Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.42.11	Solve complex computing problems by using built-in modules		235
	Module 38 to 42: Elective Module II Programming in JAVA		
1.38.01	Installing JAVA		237
1.38.02	Setting the Class path		239
1.38.03	Writing and Executing a simple JAVA Program to display “Hello”		242
1.39.04	Use of various data types in JAVA		243
1.39.05	Use various operators in JAVA		244
1.39.06	Create and use of local, Instance and class variables		245
1.39.07	Read text from the keyboard using scanner class read text from keyboard using console class		247
1.40.08	Use if tge if and if ... else statement		248
1.40.09&12	Use of the Switch Statements & Break and continue keywords		250
1.40.10	Use of the Do ... While and while - do loops		252
1.40.11	Use of the For Loop		253
1.40.13	Use of the JAVA Character Class Methods	14	254
1.40.14	Character class methods in JAVA		256
1.40.15	String class methods in JAVA		257
1.40.16	Create and use array		258
1.41.17	Create and use of simple classes, objects and methods in JAVA		260
1.40.18&19	Passing and returning data and objects to method		261
1.41.20	Use constructors in JAVA		262
1.41.21	Create and use overloaded methods in JAVA		264
1.41.22	Override methods in JAVA		265
1.41.23	Create and use of Super class, Sub class in JAVA		266
1.42.24&25	Virtual methods, abstract class in JAVA		267
1.42.26	Create interfaces in JAVA		269
1.42.27	Override method in JAVA		270
1.42.28	Create and implement interfaces in JAVA		271
1.42.29	Extend interfaces in Java		272
1.42.30	Create and use a package in JAVA		273

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LEARNING / ASSESSABLE OUTCOME

On completion of this book you shall be able to

S.No.	Learning Outcome	Ref. Ex.No.
6	Install, setup/configure, troubleshoot, and secure computer network including Internet. (Mapped NOS: SSC/N3022)	1.30.101 - 1.30.112
7	Develop web pages using HTML and CSS. (Mapped NOS: SSC/N0503, SSC/N0501)	1.31.113 - 1.31.114
8	Develop web pages using JavaScript. (Mapped NOS: SSC/N0503, SSC/N0501)	1.32.115 - 1.32.121
9	Create workbooks with advanced formulas, macros, charts, pivot tables and demonstrate ability to use Power tools. (NOS: SSC/N9402)	1.33.122 - 1.33.129
10	Browse, select, and transact using E- commerce websites (NOS: SSC/N9403)	1.34.130 - 1.34.137
11	Secure information from Internet by using cyber security concept. (NOS: SSC/N9404)	1.35.138 - 1.35.139
12	Explain Cloud concepts &services and Describe Application Development Life Cycle. (NOS: SSC/N9405)	1.36.140 - 1.37.145
13	Write programs using Python language. (NOS: SSC/N9406)	1.38.01 - 1.42.11
14	Writing programs using JAVA. (SSC/N9407)	1.38.01 - 1.42.30

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View network connections

Objectives: At the end of this exercise you shall be able to
- **view the status of Network connection available on your computer.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- Network Connectivity (Wired / Wireless) - 1 No.
- Network Switch - 1 No.

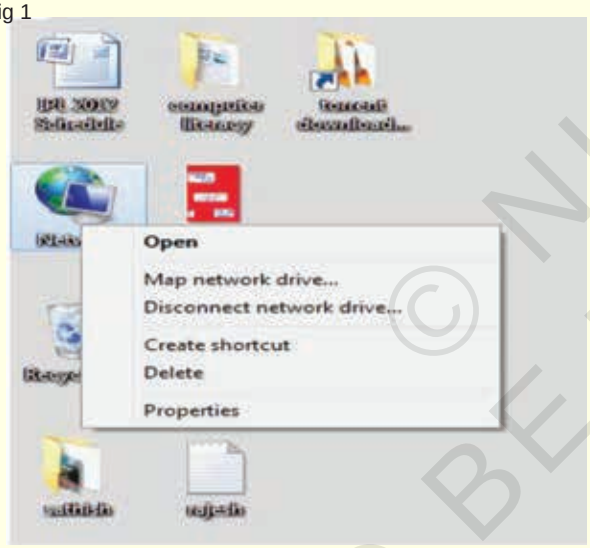
PROCEDURE

TASK 1: **View and change the IP address of your computer**

1 Choose the network icon and right click from the desktop.

Note : A menu displayed on the screen as on Fig 1.

Fig 1



2 Choose “Properties”

Note: A “View your basic network information and setup connection” window appears as on Fig 2.

3 Click “Change adapter setting” option as shown in Fig 2.

Note : A menu gets displayed on the screen

4 Here you could identify the available Network Connections (Wired – Ethernet / Wireless – WiFi) then Choose any “Local area connection” and right click it. (Fig 3)

5 Click **“ Status”** – where you could see the status of Network Connection (Connected / Disconnected) and other details (Fig 3)

6 Click **“ Details”** to get the IP address of the Network Connection. (Fig 4 & 5)

Fig 2

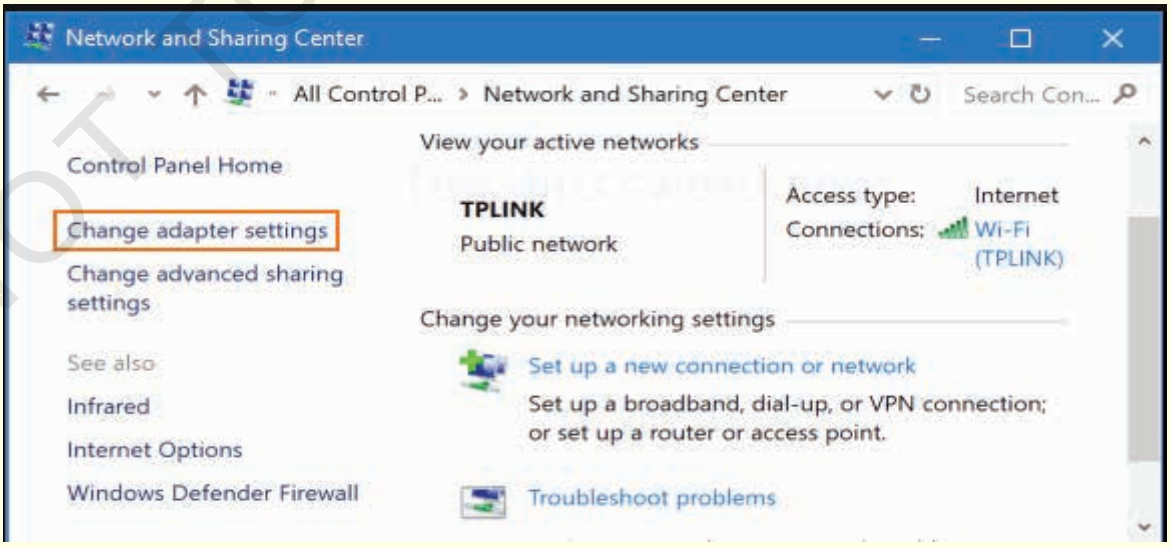


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Fig 3

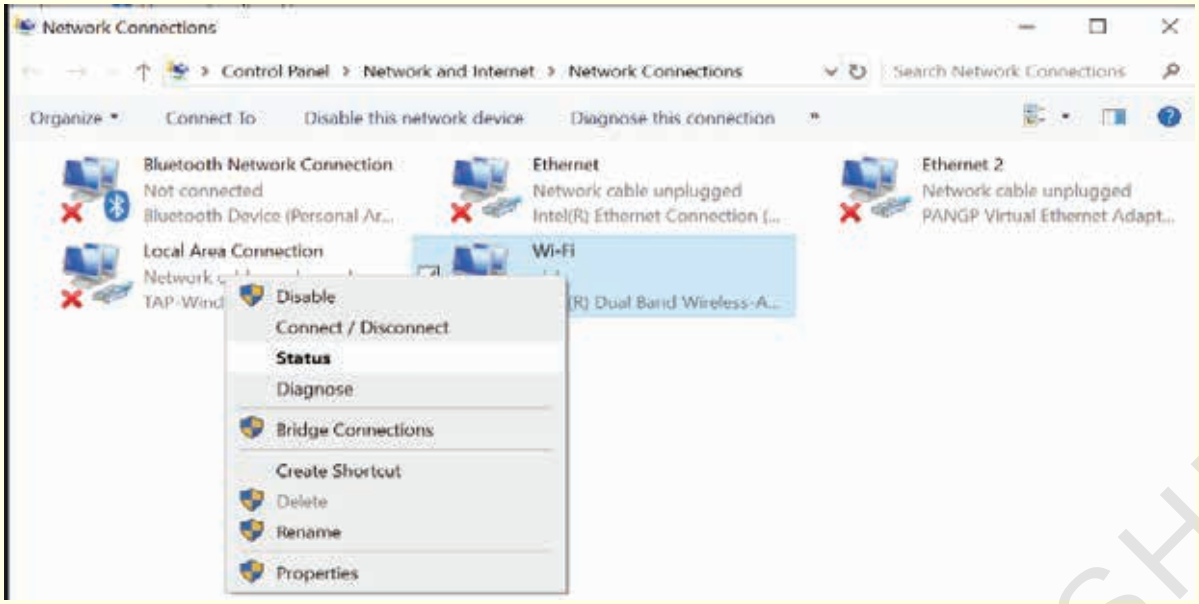


Fig 4

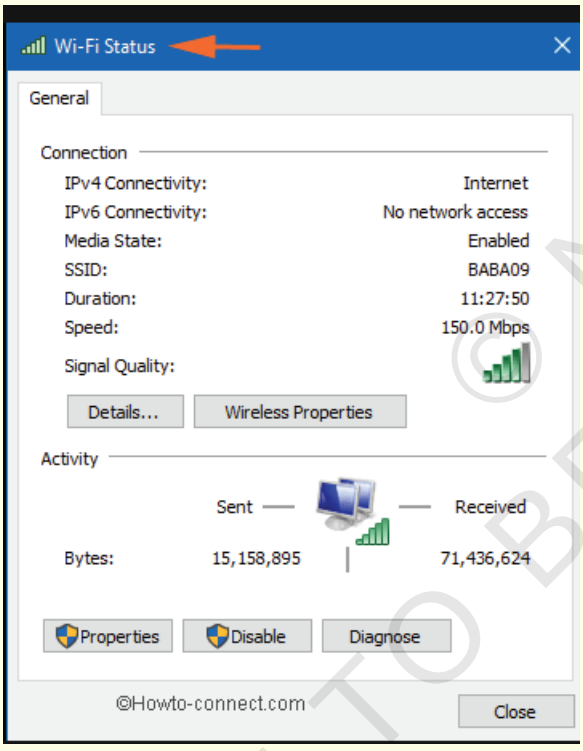
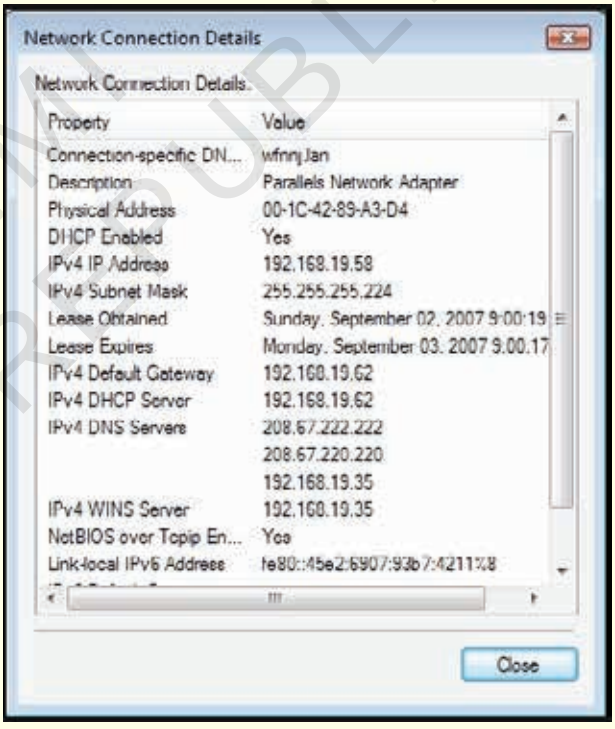


Fig 5



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Connect a computer to a network and share Devices i.e. Printers, files, folders and drives

Objectives: At the end of this exercise you shall be able to
- **share the printer, folder and drives with the network**
- **share the specific files or folders in local network**
- **how to connect Shared Printer or Folders**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- Network Connectivity (Wired / Wireless) - 1 No.
- Network Switch - 1 No.
- Network Printer - 1 No.

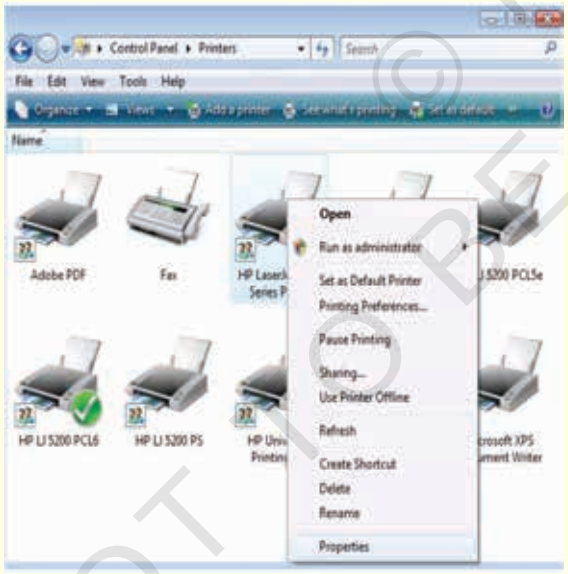
PROCEDURE

TASK 1: **Share the printer, folder and drives with the network**

1 Share the printer panel as follows :

Start ⟶ Control panel ⟶ Hardware and Sound ⟶ Devices and Printers.

Note : There you will see a list with all external devices installed on your PC as in Fig 1.

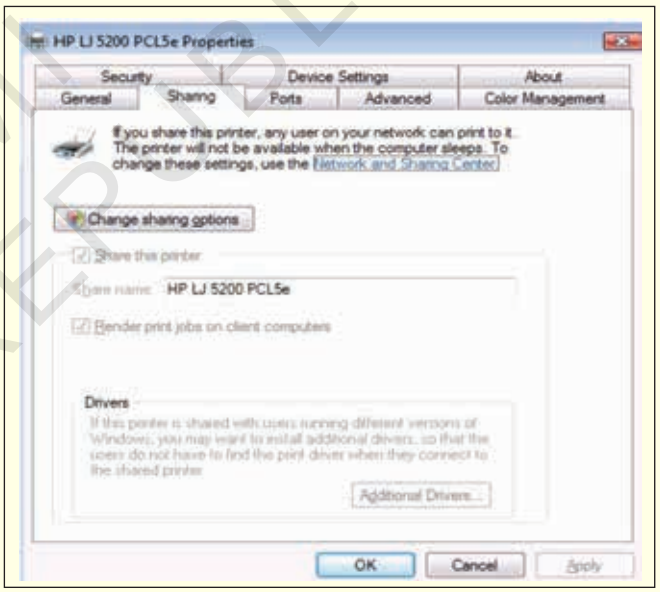


2 Select the printer you want to share, right click on it and select Printer properties.

Note : Now you will see a window with all the printer properties. Depending on the model of your printer, and its drivers, you can see different sets of options.

3 Click on the Sharing tab.

Note : There, you will have some options similar to the Fig 2.



4 Select any check box that says 'Share this printer'.

Note : Then, you can edit the printer share name which, in most cases, is by default completed by Windows with the name of your printer model. If you want to change it, type the name you want to use.

Note : "Render all print jobs on the client computers" can help keep performance levels up on the computer where the printer is plugged in, especially when big printing jobs are ordered. When this option is checked, all the print jobs are rendered on the computers which order the print job, not on the computer on which the printer is plugged.

5 Click on OK

Note : Now the printer will be shared with the computers on your network.

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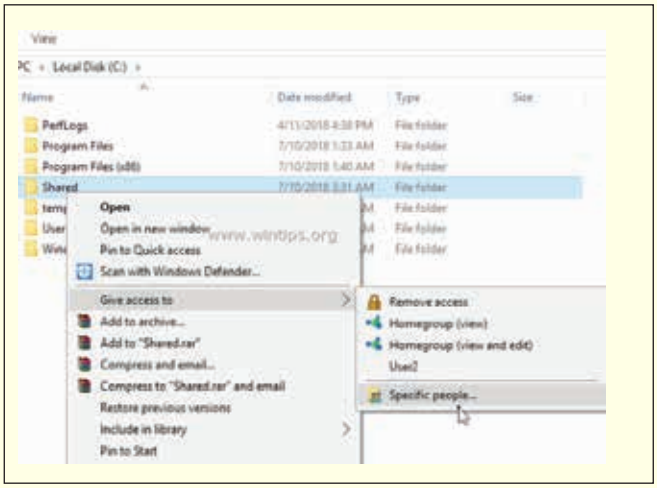
TASK 2 : **Share the specific files or folders in local network**

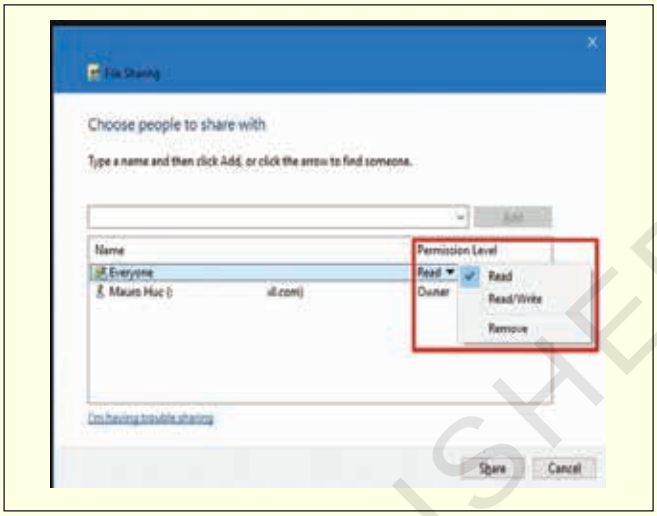
1 In windows, search for and open File Explore.

2 Browse to the folder or file you want to share.



3 Right-click on the file/folder which you want to share then Choose Give Access to Or Right-click the foldeí, and select the Properties option. Click on the Sharing tab and choose the Share button.

4 In the file sharing window select the user accounts (Everyone) with whom you want to share file with Permission of (Read / Read Write) and click on Share button.



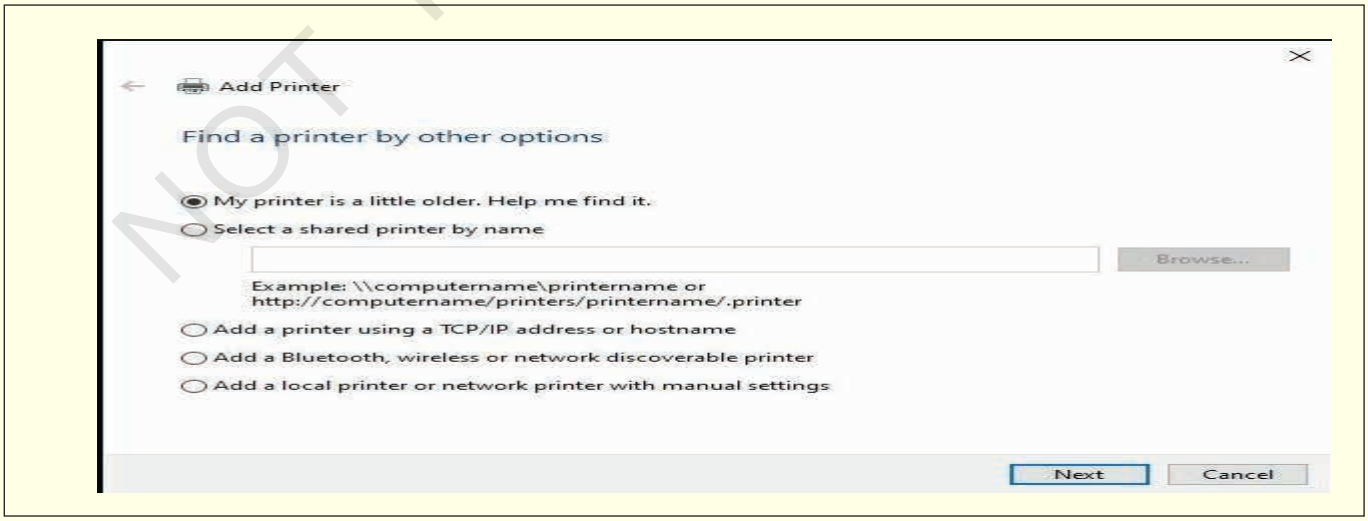
5 Confirm the folder's network path that other users need to access the network's content and click the Done button.

TASK 3 : **How to connect Shared Printer**

After setting up your shared printer, you can connect to it multiple ways. This method is from within Devices and Printer.

Open control panel ⟶ Devices & Printers

1 Click the Add Printer button, then click the link, The printer that I want isn't listed. Choose the Select a shared printer by name radio box, browse to the printer on your network, and click open.



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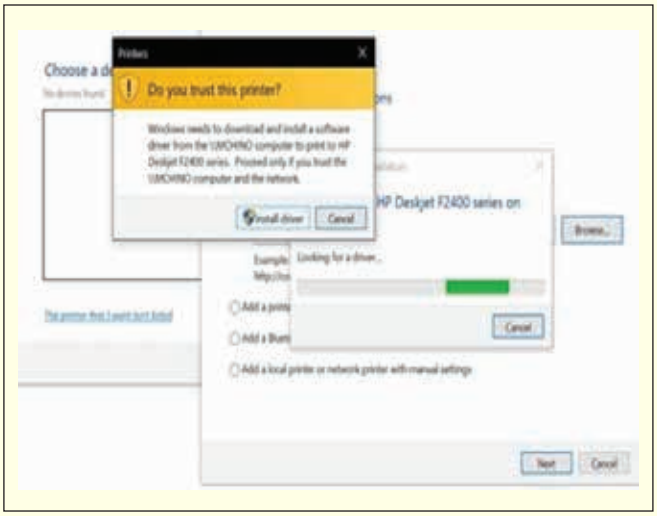
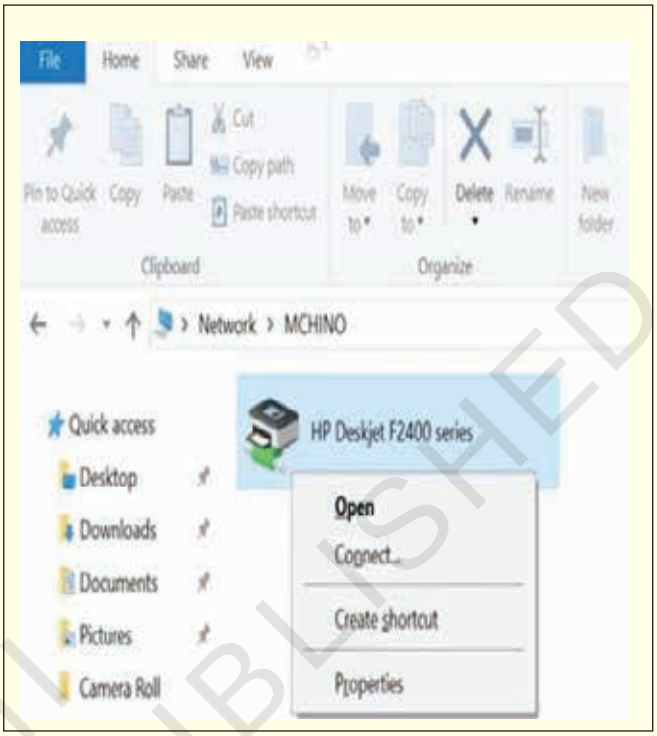
2 You will be prompted to install the driver. Click Next to complete the installation of the printer.



3 The printer will now show up in Devices and printers as a local device.

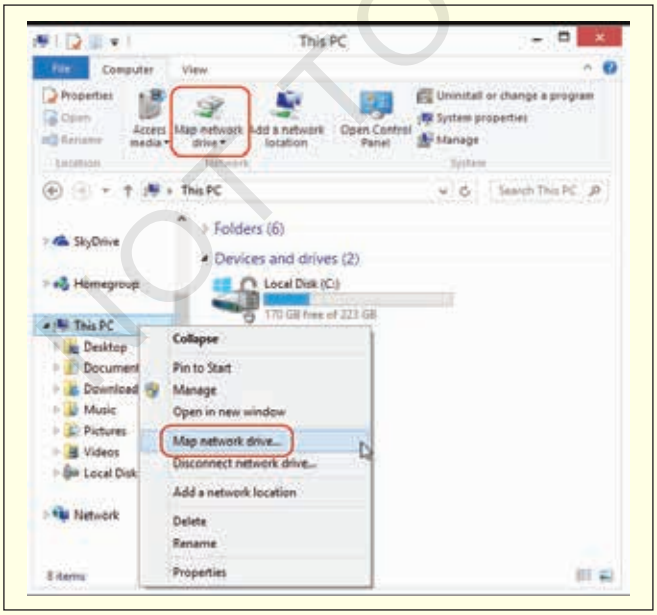
4 Another way you can connect to a shared network printer is from within File Explorer. Open the Network folder, browse the shared printer's computer, right-click it, then click Connect



TASK 4 : **How to connect Shared Folders**

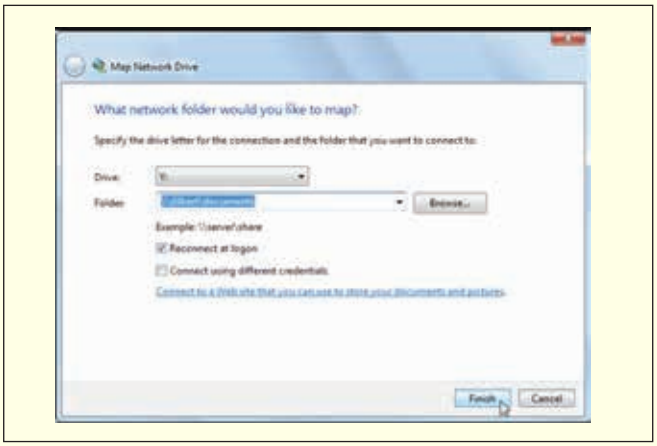
1 Open File Explorer from the taskbar or the Start menu, or press the Windows logo key + E.

2 Select This PC from the left pane. Then, on the Computer tab, select Map network drive.



3 In the Drive list, select a drive letter. (Any available letter will do.)

4 In the Folder box, type the path of the folder or computer, or select Browse to find the folder or computer. To connect every time you sign in to your PC, select Reconnect at sign-in.



5 Select Finish.

6 Connected Shared Folder available in This PC as Network Drive in Network Locations

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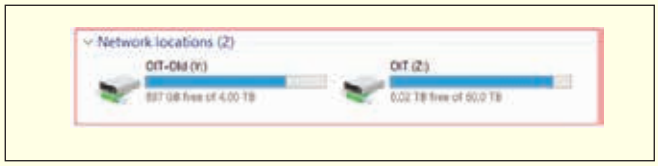
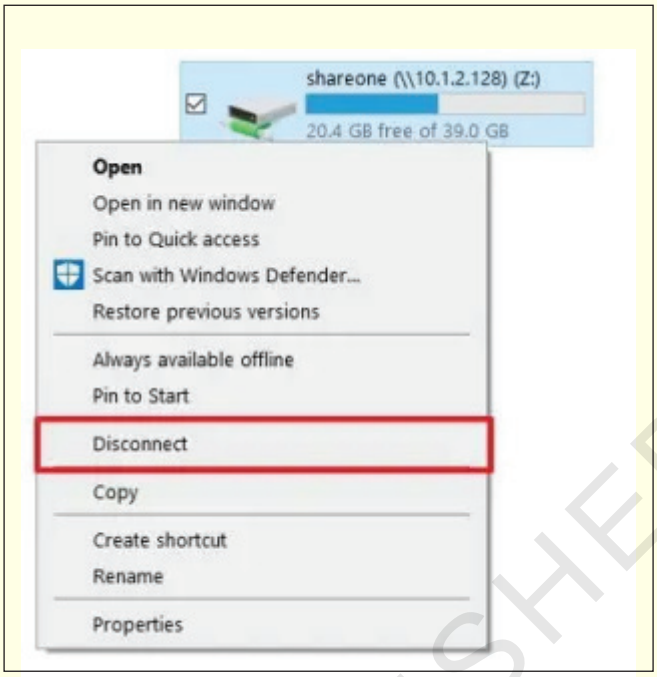


7 To disconnect shared folder, just right-click the drive in File Explorer and choose “Disconnect.”



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Work with various Network devices, connectors and cables. Create straight and cross cable and punch a UTP cable in the patch socket and test the connectivity

Objectives: At the end of this exercise you shall be able to
- **identify various network devices, cables and connectors used in networking**
- **create straight and cross cable and punch a UTP cable in the patch socket**
- **testing the cable connectivity with the LAN tester**
- **create workgroup and check the network connections**
- **create a home group on a local network**

Requirements

Materials/components

- UTP cable (CAT6 /6e) - as reqd.
- RJ45 jack - as reqd.
- Thin coaxial cable RG48 - as reqd.
- BNC connector - 1 No.
- T connector - 1 No.
- Terminator - 1 No.

Tools/Equipment/Instruments

- All the Available Network Devices - 1 No.
- Crimping Tool - 1 No.
- Cable Cutter - 1 No.

PROCEDURE

TASK 1: **: Identify Network Devices / cables and connectors**

1 Identify a labelled component referring to Table 1 and record the details in the Record sheet.

2 Get the work checked by your instructor.

Record sheet - Table 1

Network Devices	No.of Ports Available	Name the Ports
Hub		
Switch		
Modem		
Firewall		
Gateway		
Board Band Modem		
Fiber Modem		

Record sheet - Table 2

Cable/ connector	Label	Brief application
UTP cable No.of pins color code Printed mark		
Coaxial cable		
RJ 45 connector No.of pins		
T connector		
Terminator Resistance between inner and outer core		

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TASK 2 : **Create straight and cross cable and punch a UTP cable in the patch socket**

Note to instructor : Instructor must arrange the required length of cross cable, the tool for crimping and two computer for making connection as shown in Fig 1.

Fig 1

1 Use crimping tool (as shown in Fig 2) to cut through a cable and strip the cable jacket/insulation using cable stripper/ crimping.

Fig 2

Note : Crimp tools have two blades. One designed to cut the cable and other to strip the jacket. While stripping the cable care should be taken not to cut the internal wires. Remove the jacket insulation about an inch. When the jacket insulation removed you will find eight wires twisted in to four pair (for CAT 5 cable as in Fig 3) and a separator inside the CAT 6 cable as shown in Fig 3a.

Fig 3a

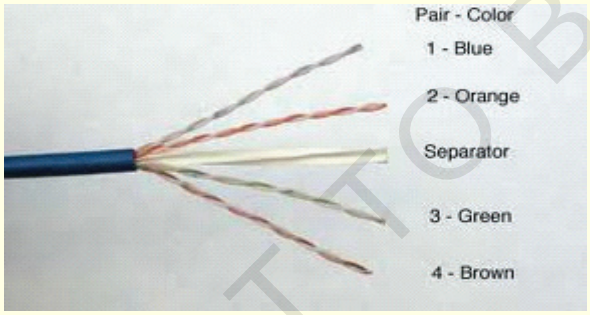
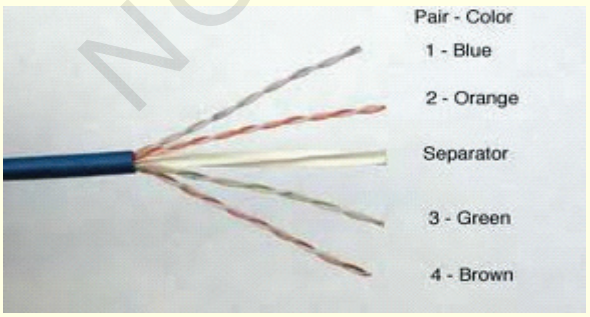


Fig 3a



2 Cut the separator off and untwist the wires back to within one-eighth inch of the jacket

3 Arrange the wires from left to right in the order they are to be crimped. The normal crimping order for cross cable is shown in Fig 4 & Fig 4a

Fig 4

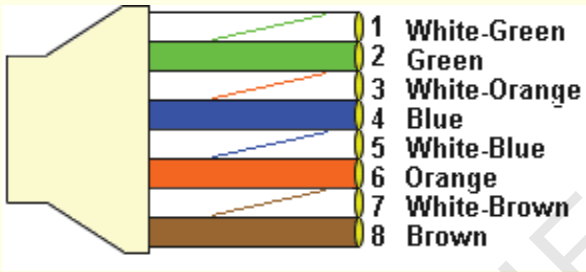
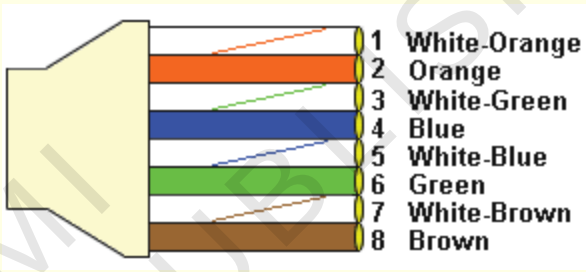


Fig 4a



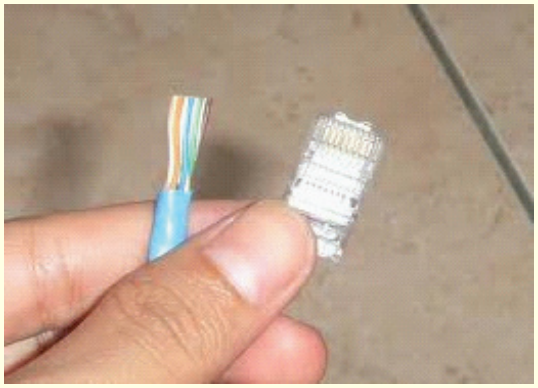
Note : The color code wiring order is different for both ends in cross cable

- Cross over cable
- One end (Fig 4)
- Other end (Fig 4a)

4 Grasp the wires firmly between your fingers and flatten them to remove the curliness.

Note : The wires must lay flat and together aligned as closely as possible in order. When finished the cable should look like as shown in Fig 5

Fig 5



5 Cut a few mm while holding them firmly, so they are all of the same length as shown in Fig 6.

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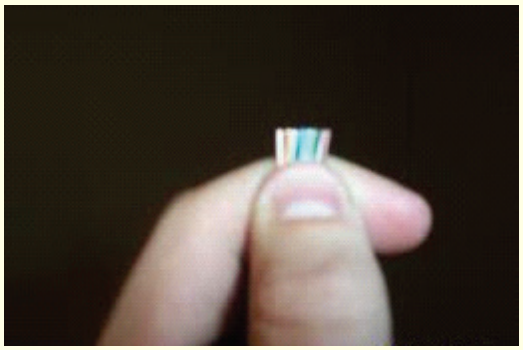
Fig 6



6 Slide the RJ45 connector on to the wires making sure the wires stay lined up.

Note : Try to make each wire fits in the slot of the connector and make each wire reach the end of its slot. The cable jacket/insulation should reach just beyond the end of the crimp point as shown in Fig 7.

Fig 7

7 Verify all the wires are in the correct order, and insert the connector in to the crimping tool and press to crimp as shown in Fig 8.

Fig 8

Note : Now half of the work done. The cable should look like as shown in the Fig 9 .The process must be repeated for the other end of the cable. However the color code wiring order changes for cross cable as shown in Fig 10.

Fig 9

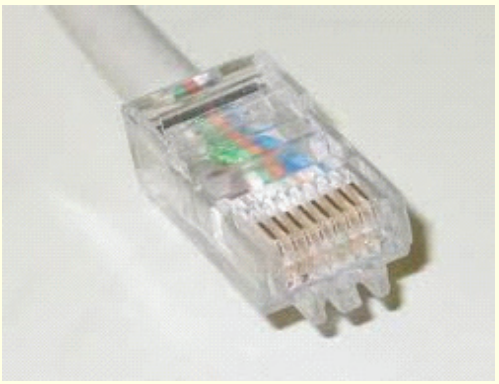
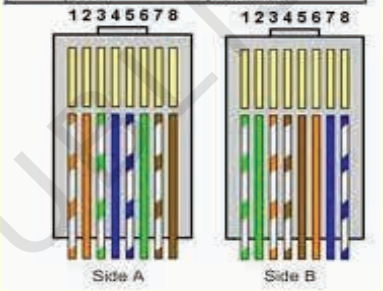


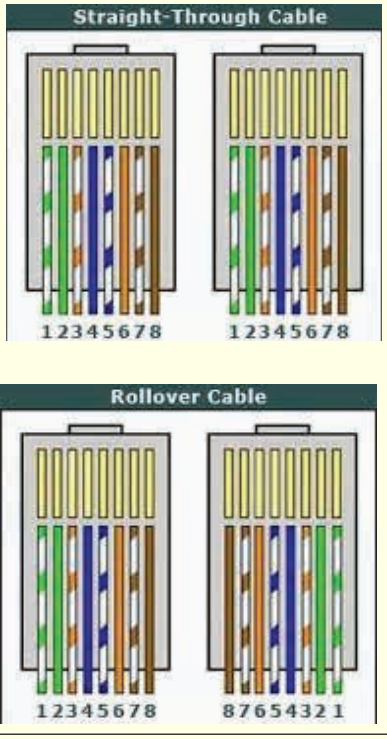
Fig 10

Pin ID	side A	side B
1	Orange-white	green-white
2	Orange	green
3	green-white	orange-white
4	blue	brown-white
5	blue-white	Brown
6	green	orange
7	brown-white	Blue
8	brown	blue-white



Note : Similarly straight through cable and roll over cable can be prepared with the help of the instructor. The color code wiring order is shown in Fig 11.

Fig 11



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1 Green White
2 Green
3 Orange White
4 Blue
5 Blue White
6 Orange
7 Brown White
8 Brown

Note : Cross over cable is used to connect be- tween two hosts(PC's). Straight-through cable is used in a network when connecting a host to a switch. A rollover cable is used in a net- working environment where a outer/ switch is to be configured from a computer. One end is wired one way but on the other it is reversed. You would typically use one end into a serial port on a PC and the other into the console port of the switch/router.

TASK 3 : **Testing the cable with the LAN tester**

1 Insert one end of the cross cable (prepared in Task 1)in to one socket and other end in another plugged in socket of the LAN tester as shown in Fig 12.

Fig 12

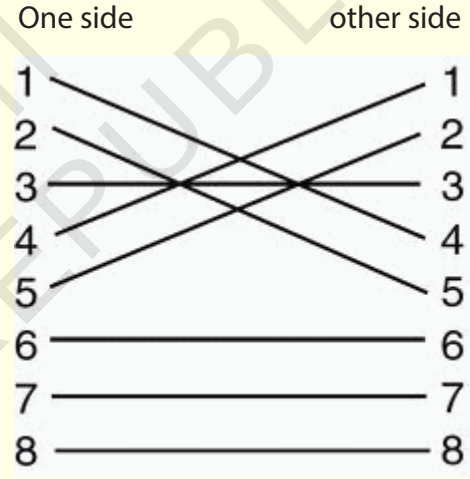
Note : Check for the batteries loaded in cable tester.

2 Switch 'ON' the LAN tester.

3 Note the order in which LED's glowing in both the panelof the LAN tester should correspond to the order shownin Fig 13.

If the LED's doesn't glow , then there is a break in the cable.

Fig 13



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Practice IP Addressing and Subnet masking for IPV4/ IPV6 and pinging to test networks

Objectives: At the end of this exercise you shall be able to
- **configure IPV4/IPV6 address and subnet mask**
- **ping to test network.**

Requirements

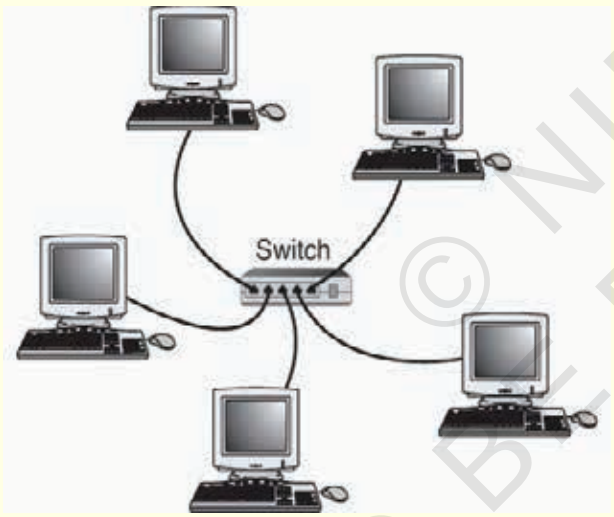
Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- Network Connectivity (Wired / Wireless) - 1 No.
- Network Switch - 1 No.

PROCEDURE

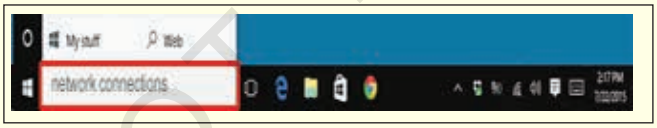
TASK 1: **Assign different classes of IPv4 addressing**

1 Connect PCs with switch using RJ45 cable as shown Fig 1.

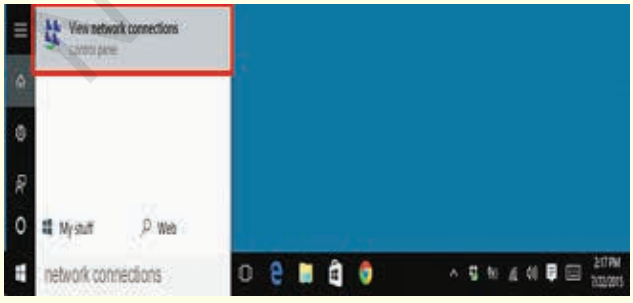


2 Power on the PCs and network switch.

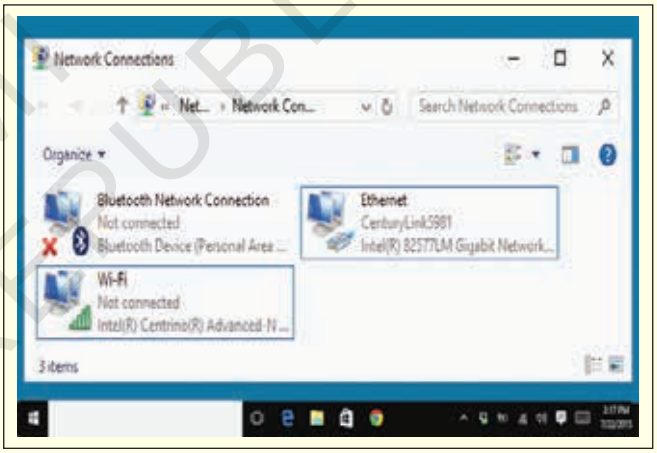
3 Type network connections in the search in PC1. (Fig 2)



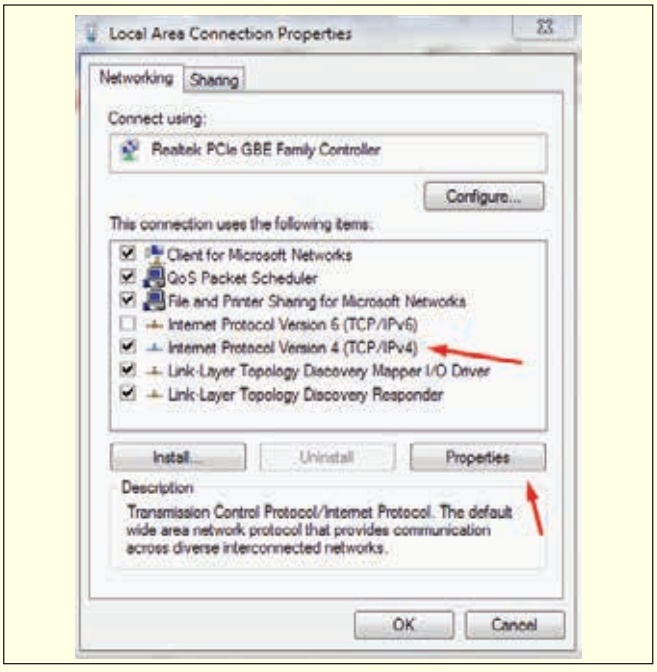
4 Select “View network connections”. (Fig 3)



5 Right click on Ethernet and select properties. (Fig 4)



6 Select Internet protocol version 4 (TCP/IPv4) and click properties as shown Fig 5.



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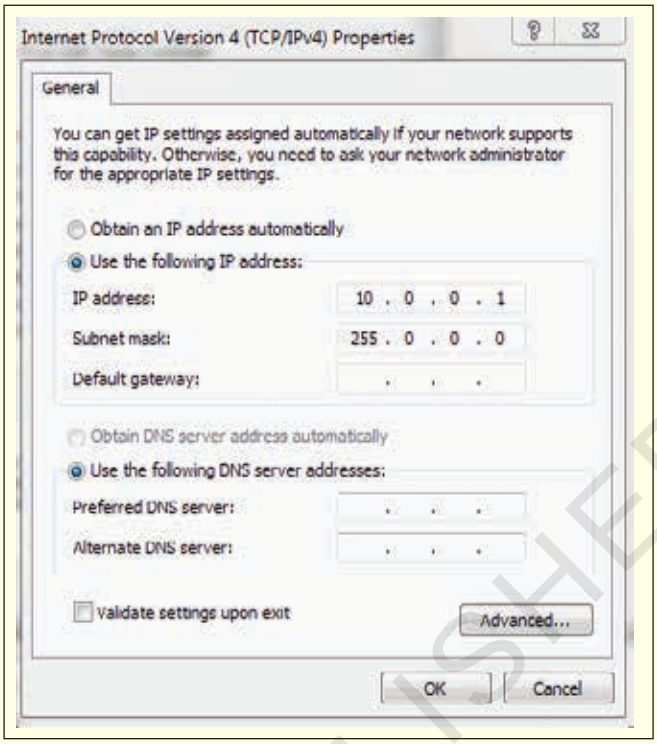
7 Select use the following IP address and assign IPV4

For example : Class A IP address - 10.0.0.1 and subnet mask 255.0.0.0 (Fig 6)

8 Assign IP address to other PCs 10.0.0.2, 10.0.0.3 and 10.0.0.4 etc.

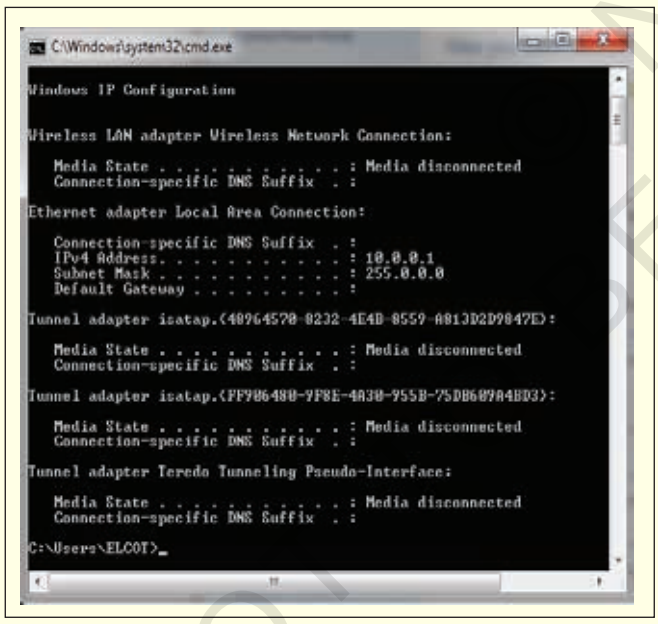
9 Assign the same subnet mask to all PCs.



TASK 2: **Test connectivity between computers**

1 For testing connectivity between computers using basic network commands.

2 Open command prompt and Check IP configuration using the command ipconfig. (Fig 7)



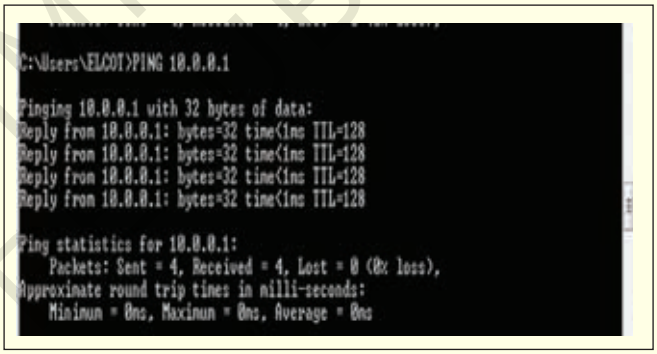
3 Note the systems IP configuration.

4 Then check connectivity between system using ping command

5 First self test to ping own IP.

Ex: ping 10.0.01 and note the result. (Fig 8)

6 Check the connectivity to other systems using their IP address and note the result.



7 Change IP address and subnet mask of a**ll PCs to class-B.**

8 Example: **172.16.0.1 to 172.16.0.2 and so on etc. with** subnet mask 255.255.0.0 to all PCs.

9 Repeat the steps 2 to 6 to test the network.

10 Change IP address and subnet mask of **all PCs to class-C.**

11 Example: **192.168.0.1 to 192.168.0.2 and so on etc. with** subnet mask 255.255.255.0 to all PCs.

12 Repeat the steps 2 and 6 to test the network.

13 Change the IP address of PC1 to class B and keep all other systems in Class A.

14 Check the connectivity from PC1 to other system using Ping command.

15 Note the result.

16 Repeat the steps 13 to 15 by changing IP addresses to different classes.

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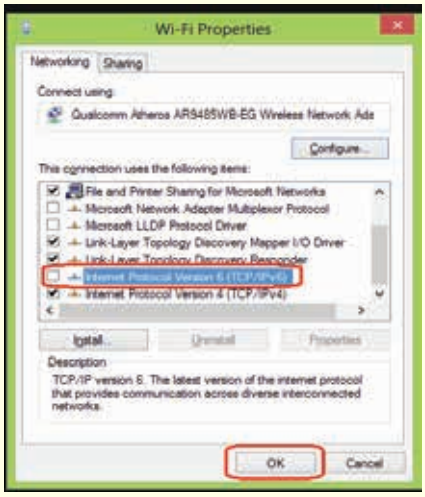
TASK 3: **Configure IPV6 Address and Test**

1 Open Control Panel and Navigate Network and Internet → Network Connections

2 Select “View network connections”.

3 Right click on Ethernet and select properties.

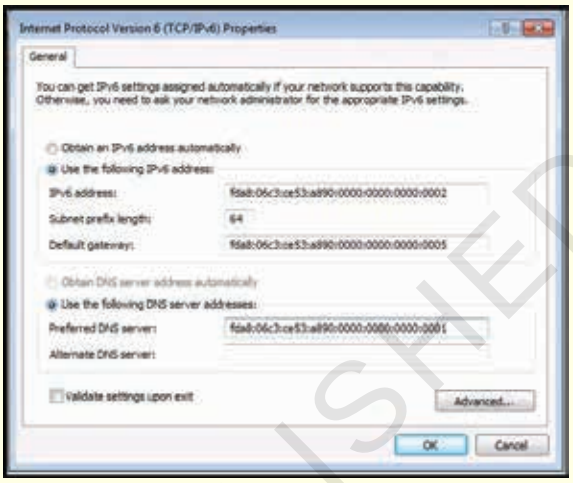
4 Select Internet protocol version 6 (TCP/IPv6) and click properties as shown Fig 9.



5 Select Obtain an IPV6 Address Automatically as assign from DCHP or Use the following IPV6 address as Static assign Manually.

6 Assign IP address to all PCs 2001:DB8:ABCD:12::1, 2001:DB8:ABCD:12::2 and 2001:DB8:ABCD:12::3 etc.

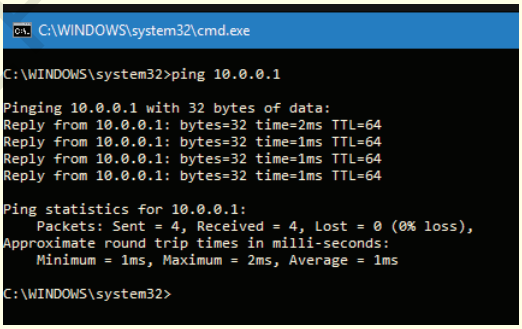
7 Subnet Prefix Length: 64 and assign the same to all PCs.



8 Click OK to save Static IPV6 Address.

9 To check the connectivity, use the PING command in CMD Prompt.

Ping 2001:DB8:ABCD:12::1



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Configuring HUB & switch

Objectives: At the end of this exercise you shall be able to
- **install and configure HUB and switch.**

Requirements

Tools/Equipment/Machines

- Switch Rack - 1 No.
- Patch Panel - 1 No.
- Network Switch / Hub - 1 No.
- UTP Cat6 / 6e Cable - as reqd.
- Krone Punching Tool - 1 No.

PROCEDURE

TASK 1: **Configure hub and switch**

1 Select the HUB / Switch.

2 Select Switch Rack.

3 Fit the HUB/ Switch in the Switch rack by screws.

4 Insert all the LAN cables into the Switch rack.

5 Punch the LAN cables in patch panel ports by Punching tools according to color code

6 Connect all the connected ports of Patch Panel to the HUB/ Switch ports by patch cables.

7 Connect the power source of HUB/ Switch.

8 Now it is ready to use.

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Setup and configure wired and wireless LAN in a Computer Lab within at least three computers

Objectives: At the end of this exercise you shall be able to
- **setup wired Ethernet network**
- **setup wireless network for LAN.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Setup wired Ethernet Network**

1 Make sure that all computers are plugged into a powered electrical outlet and turned on.

2 Make sure that the router, hub or switch is plugged into a powered electrical outlet and turned on.

Most routers, hubs, and switches have Power lights that indicate they are working.

3 Make sure that your Ethernet RJ45 Jack Patch cable is plugged into the Ethernet Port on your computer.

4 Make sure that the other end is plugged into a router, hub or switch.

5 Make sure that all computers on your network have the same workgroup or Domain name.

6 Make sure that all computers are assigned IP address by DHCP or Static.

7 Make sure that all computers have unique IP addresses with same subnet mask.

8 Check the connectivity using PING command.

9 If connectivity established then all set to Work.

For home networks, IP addresses should be 192.168.N.N where N is a number you assign between 0 and 254. The first N should be the same for all computers on your network and the second N should be different for all computers on your network.

The computer does not recognize an add-in Ethernet card

1 Shut down and restart your computer.

2 Make sure that you have installed the required software.

3 Reset the card

— — — — — —

TASK 2: **Setup Wireless Network**

1 Make sure that all computers are plugged into a powered electrical outlet and turned on.

2 Make sure that the Wifi router or Access Point is plugged into a powered electrical outlet and turned on.

Most Wifi routers and Access Points have Power lights that indicate they are working.

3 Make sure that Wifi router or Access Point has configured SSID name with Secure Encrypted Password.

4 Make sure that Wifi is ON or enabled in your computer.

5 Make sure that your computer successfully connected to same SSID with Encrypted Password

6 Make sure that all computers on your network have the same workgroup or Domain name.

7 Make sure that all computers are assigned IP address by DHCP or Static.

8 Make sure that all computers have unique IP addresses with same subnet mask.

9 Check the connectivity using PING command.

10 If connectivity established then all set to Work.

For more details refer Ex.no. 1. 4.19 Task 2.

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Use patch panel & I/O Box for wired LAN and installing & configuring Internet connection in a single PC and in a LAN

Objectives: At the end of this exercise you shall be able to
- **how to Install and Configure Networking Using Patch Panel**
- **how to Terminate and Install Cat5e / Cat6 cable in IO Box.**

Requirements

Tools/Equipment/Machines

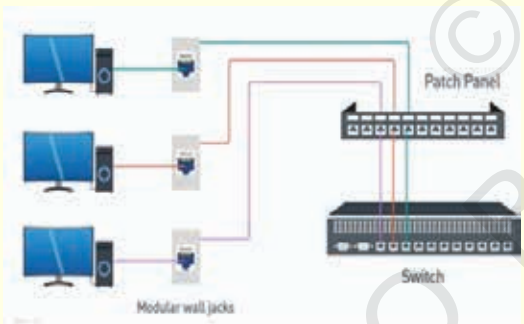
• Any size Mountable rack	- 1 No.	• UTP Cable Cutter	- 1 No.
• Patching Panel 24 Port	- 1 No.	• Lan tester	- 1 No.
• Cat6 / Cat 6e UTP cable	- as reqd.	• IO Port	- 1 No.
• 24 Port L2 Switch	- 1 No.	• IO Back Panel	- 1 No.
• Patch Cable	- as reqd.	• IO front Panel	- 1 No.
• Punching Tool	- 1 No.		

PROCEDURE

TASK 1: **How to Install and Configure Networking Using Patch Panel**

1 Determine where the patch panel and switch should be installed

Evaluate the operating environment, a place where the equipment and components can be maintained well and accessed easily. Unobstructed airflow and vents are crucial.



2 Build or purchase pre-terminated patch cords

Determine patch cord lengths as well as the quantity needed for the installation. If improper lengths are chosen, cables with excessive slack will not only increase material and installation cost but also hinder cable management.

3 Map out the ports

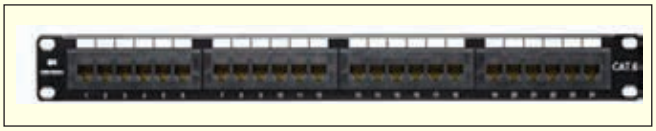
Determine which switch port is connecting to which patch panel port, by doing this can reduce installation time.

4 Mount the patch panel and switch

Ensure the server rack accommodates the size of your components (EIA standard 19” width is most common).

- Choose the size of wall mounting Rack or Stand Rack to fix the Patch Panel

- Fix patch panel into Rack using screw at right and left sides.



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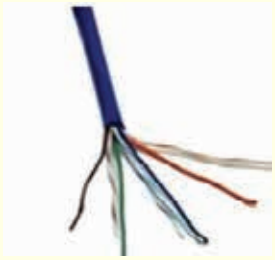
- Examine the 110-style punch down connectors on the back of the Cat6e patch panel.
- Remove the outer jacket from the end of each cable.

- Spread out the cable wires.

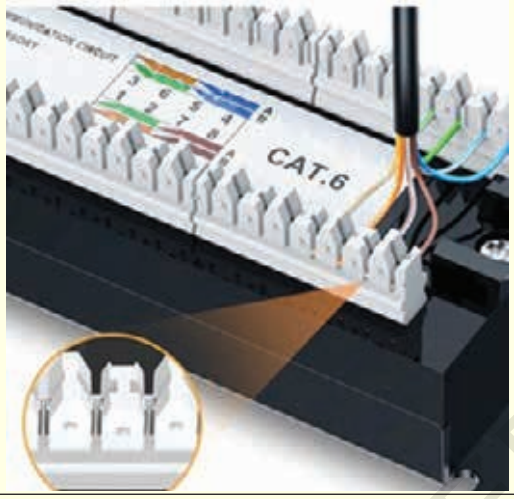


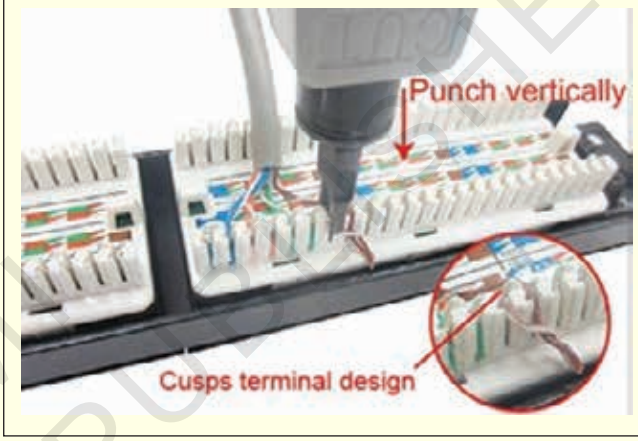
- Set the wires into the patch panel connectors. There are two color patterns T568A and T568B. Make sure to terminate both sides of the cable on the same pattern used, Preparable T568B.
- Begin terminating each wire using Punching Tool

5 Connect the patch panel to the switch

With the prepared patch cords, follow the port mapping created in step 3 and patch the cables.

6 Install cable management





Using horizontal and vertical cable management and cable ties to organize cables can help make future changes and upgrades easy.

7 Label cable

Tag both ends of each cable the same; this can assist in troubleshooting your end-to-end connectivity between the patch panel and the switch.

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TASK 2: **How to Terminate and Install Cat5e / Cat6 cable in IO Box**

Step 1

Insert the cable into the stripping tool to the required strip length. Strip off only as much cable jacket needed to properly terminate the pairs (1 to 1.5 inches should be sufficient to terminate pairs).

Holding the cable near the tool, rotate the tool around the cable several times. Slightly bend the outer jacket and manually remove the cut piece or slide the cut outer jacket with the stripper.

Step 2

Bend each pair in one direction to expose the ripcord, binder, or cross-web filler on the cable.

Remove the ripcord, binder, or cross-web filler if they are present on the cable, leaving only the twisted pairs of wire.

Step 3

Preserve the wire pair twists as close as possible to the point of termination. When connecting jacks and plugs, do not untwist the cable more than 0.5 inches for Cat5e, Cat6, and Cat6a cable.

Terminate all four pairs in the T568B wiring scheme for example.

Step 4

Make sure the punch-down tool is straight before punching down on the connector.

Make sure the cut-side of the tool is facing outward. Inspect the connector to verify that the wires are fully engaged in the IDC terminals and they are cut properly.

Place a dust cover on the jack for protection.

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Ready to insert into a wall plate or keystone jack patch panel

Step 5

Mount the IO Back panel on wall and Fix the Punched IO Krone into Face plate then screw face into wall mounted back panel.

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Set up a proxy server/ DHCP Server with firewall

Objectives: At the end of this exercise you shall be able to
- **setup a proxy server**
- **configure a DHCP server with Sophos Firewall.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- MS Office 2019 / Latest - 1 No.

PROCEDURE

TASK 1: **Setup a proxy server**

Setup Proxy Server in Windows 10

To set a proxy using an automatic configuration script, follow these steps:

1 Open settings.

2 Click network & internet.

3 Click proxy.

4 In the automatic proxy setup section, set the use setup script switch to ON.

5 Enter the script address as it was given to you; then click save.

6 Close Settings.

7 Setting up an automatic proxy configuration script.

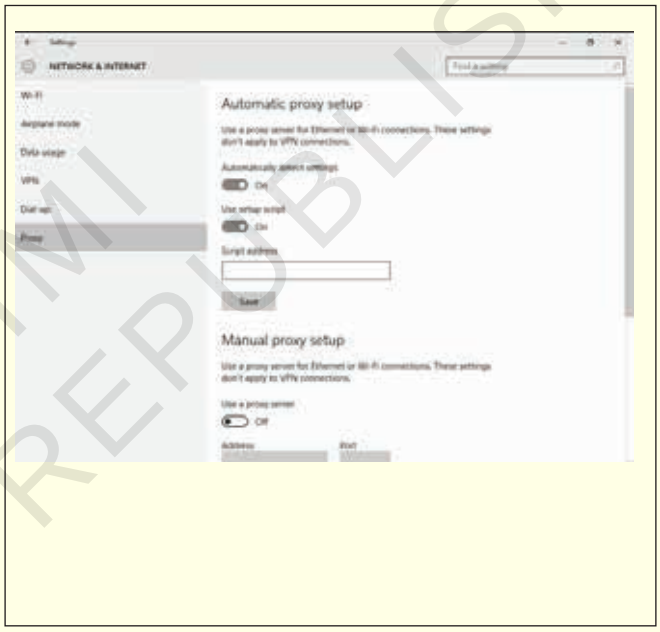
Set up a proxy manually (Fig 1)

8 Open Settings.

9 Click Network & Internet.

The list of network- and Internet-related settings appears.

10 Click Proxy.



The list of available proxy settings appears.

11 In the Manual Proxy Setup section, set the Use a Proxy Server switch to On.

12 In the Address field, type the IP address. 13 In the Port field, type the port.

14 Click Save; then close the Settings window.

— — — — — —

TASK 2: **Configure a DHCP server with Sophos Firewall**

When you configure Sophos Firewall as the DHCP server, it provides IP addresses and network parameters, such as the default gateway, subnet mask, DNS servers, and WINS servers to DHCP clients.

Introduction

In this scenario, we configure Sophos Firewall as the DHCP server to lease IP addresses to clients within the server's subnet. Do as follows:

- Specify the DHCP server settings.
- Add static IP addresses if required.
- Start the DHCP server if required.
- Check the IP addresses leased by the server.

Specify the DHCP server settings

Configure Sophos Firewall as the DHCP server to lease dynamic IP addresses directly to endpoint devices and a static IP address to a test server within the server's network.

1 Go to Network > DHCP.

2 Under Server, click Add.

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3 The following settings are an example. You must specify your network's settings

Name	Setting
Interface	Port2 - 192.168.1.1 Interface on which Sophos Firewall listens to DHCP requests.
Dynamic IP lease	192.168.1.2 to 192.168.1.25
Static IP MAC mapping	**Hostname**: TestServer **MAC address**: 2C:0E:3D:9C:CB:E4 **IP address**: 192.168.1.26
Gateway	Interface IP address as the gateway for the clients.
Use device's DNS settings	DNS servers for the clients to contact.

4 Click Save.

Here's an example:

Start the DHCP server

1 Go to System services > Services.

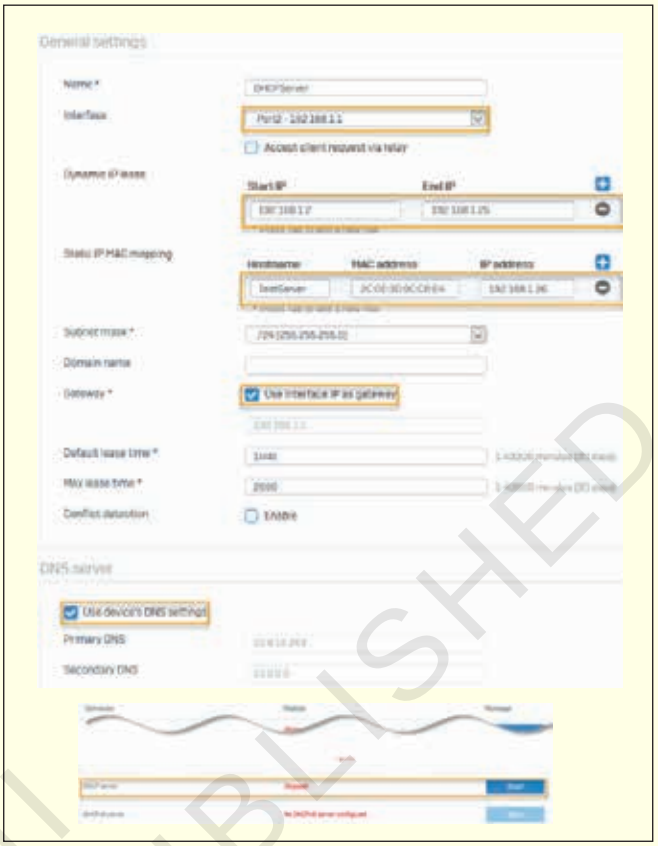
2 For DHCP server, click Start if required.

Here's an example:

Manage leased IP addresses

You can see the start and end times for IP addresses leased by the DHCP server. You can also see the client's MAC address and hostname.

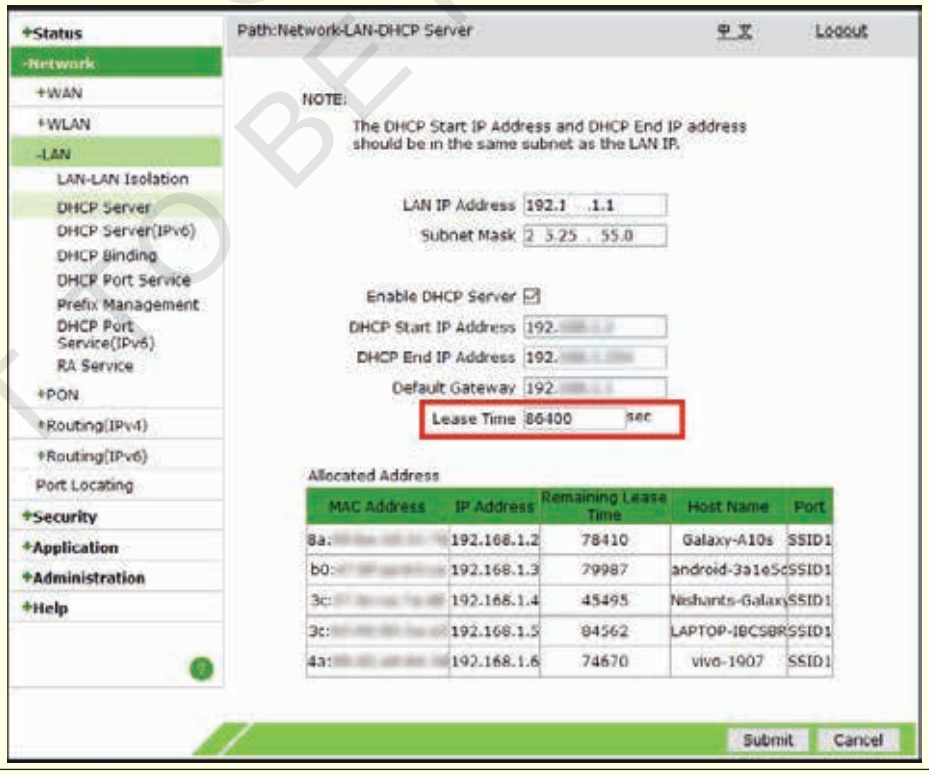
1 To see the list of leased IP addresses, go to Network > DHCP.



2 See the listed IP address ranges under IPv4 lease and IPv6 lease.

Here's an example:

Note : All the DSC broad band routers has DHCP option to enable. The Same configuration can be performed.



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Setting up video conferencing using open-source software

Objectives: At the end of this exercise you shall be able to
- **set Video Conferencing using Skype.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- Skype Software - 1 No.
- Web Camera - 1 No.
- Microphone or Headset - 1 No.
- Internet Connection - 1 No.

PROCEDURE

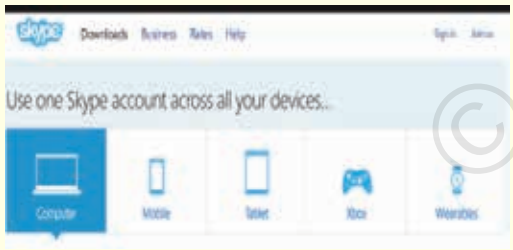
NOTE: Instructor should connect Web Cam and Microphone before starting this Practical to the Computer with good Graphic Adapter and high speed internet connection.

TASK 1: **Set Video Conferencing using Skype**

1 Open Skype.com

2 Select Download Skype .

3 Select device e.g. Computer where you want to install it.(refer Fig 1)



4 After download install it.

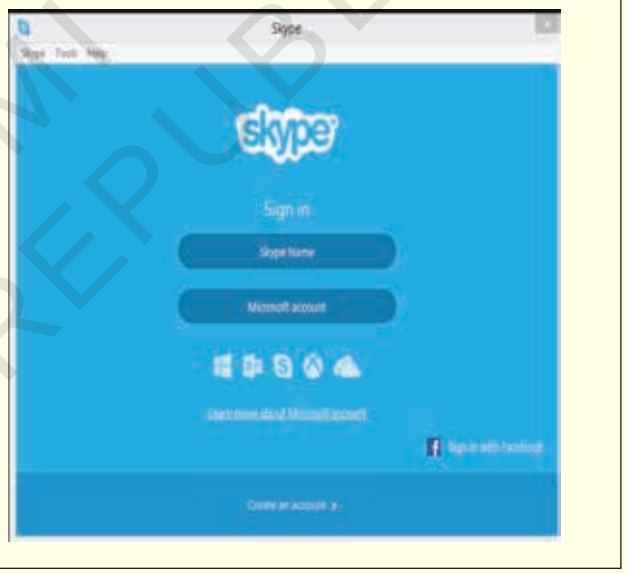
5 Now run it. (Fig 2)

6 Sign in to your account/ create your account.

7 If creating account fill up the form and submit.

8 Now log in to skype.

9 Add contacts by selecting “Add a Contact” from the upper right of your contacts list and entering a Skype username.



10 Select an online contact from your contact list 11 Select “Video Call” to initiate a video call.

12 Click the “+” sign then click “Add people” to add more Skype contacts to the video conference.

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Use various tools (by open source /free) for network troubleshooting, maintenance and security for both Wired and Wireless

Objectives: At the end of this exercise you shall be able to
- **explain the network troubleshooting tools.**

Requirements

Tools/Equipment/Machines

- A Working PC with Windows 10 OS - 1 No.
- Network Monitor software - 1 No.
- Internet connection - 1 No.

PROCEDURE

Network Troubleshooting Tools

1 Download Free 3 device Network Monitor software from below link: https://www.manageengine.com/network-monitoring/download-free.html

2. Install the software - ManageEngine_OpManager_Free_64bit.exe

ManageEngine OpManager - a powerful network troubleshooting software with in-built workflow automation

Here are some the network troubleshooting tools available in OpManager:

1 Ping (ICMP/ SNMP/ Proxy)

2 Tracert/ Traceroute

3 Browse

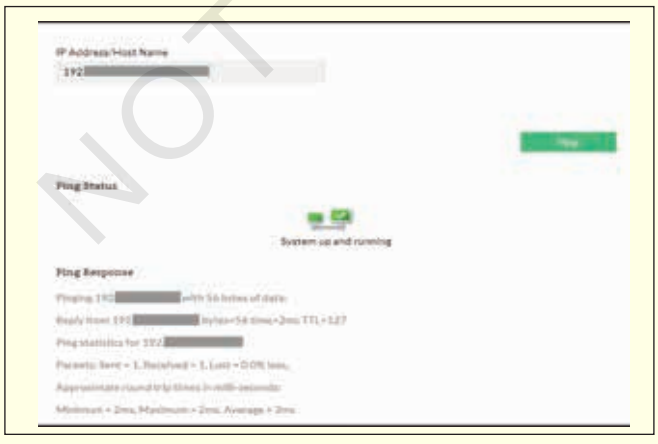
4 Telnet/ SSH

5 Remote Desktop

6 Terminal

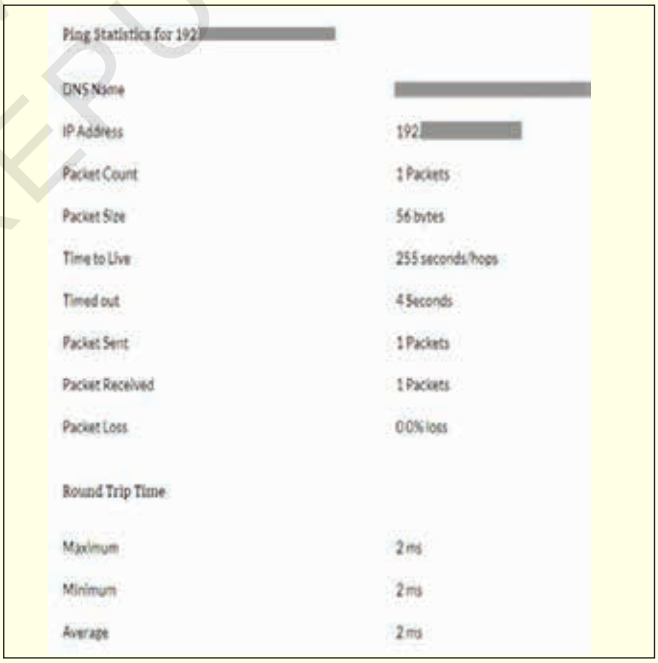
1 Ping Tools

The ICMP ping tool is a basic network troubleshooting tool that lets you assess if a device is reachable on the network. It reports on errors such as packet loss, round-trip-time, etc.



The usual ping requests are based on the ICMP echo request protocol. There are other variations of ping requests such as SNMP ping and proxy ping.

SNMP ping: It is used to check if the simple network management protocol (SNMP) is enabled in a network device. If SNMP is enabled, the device responds with a set of basic information such as DNS name, system name, location, system type, system description, etc.



Proxy ping: This is used to ping a destination device behind a proxy. Basically, the pinging device sends an SNMP SET command to the proxy router to send an ICMP echo request to the destination device. The response is collected by the proxy device. This response is fetched using the SNMP GET command. This ping also requires SNMP to be enabled in the proxy device with the write community string enabled.

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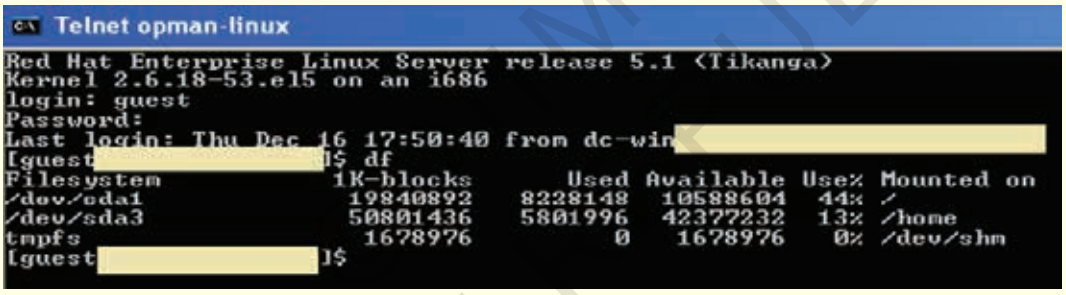
These ping commands are useful to diagnose IP problems and network connectivity issues that could be due to faulty interfaces, LAN issues, unavailable ports, configuration issues, etc., and are mostly used in combination with the traceroute network troubleshooting utility.

2 **Tracert / Trace Route :** Tracert (Windows) or traceroute (Linux) is a network diagnostic and troubleshooting tool to view the route and measure transit delays of data packets in a network. It displays the number of hops between the source and destination devices based on the hop limit concept, modifying the Time To Live (TTL) values.

A traceroute tool is useful to identify response delays (high latency), routing loops and points of failure or packet loss in a network.

3 **Browse :** Browse allows you to connect to the built-in GUI of most network devices using a 'http/ https' request. This allows you to access the device settings or configuration to troubleshoot network issues with ease.

4 **Telnet/ SSH :** Telnet or Secure Shell (SSH) utility allows you to troubleshoot issues by establishing a CLI session with Linux/Unix devices.



It is a simple yet effective network troubleshooting tool that enables you to act on any alert by executing CLI commands to remediate L1/L2 network problems.

5 **Remote Desktop :** The remote desktop utility allows you authenticate and access the desktop environment of any remote Windows devices in the network, from OpManager's user interface (UI). This allows for quick network troubleshooting like in the case of Telnet/ SSH for Linux/Unix based devices.

6 **Terminal :** The terminal allows you to establish a secure and encrypted connection with the remote device to execute various commands, diagnose and troubleshoot network problems.

In the terminal, a network administrator can manually execute all supported commands, widely interpreted as basic network troubleshooting tools, such as ping, tracert/ trace route, ipconfig/ ifconfig, netstat, nslookup, pathping/MTR, route, etc., to analyze and troubleshoot network problems. Apart from troubleshooting issues, it is important to perform network optimization.

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Set up Internet access & communication

Objectives: At the end of this exercise you shall be able to
- **set-up internet connectivity**
- **set-up digital communication**

Requirements

Tools/Equipment/Machines

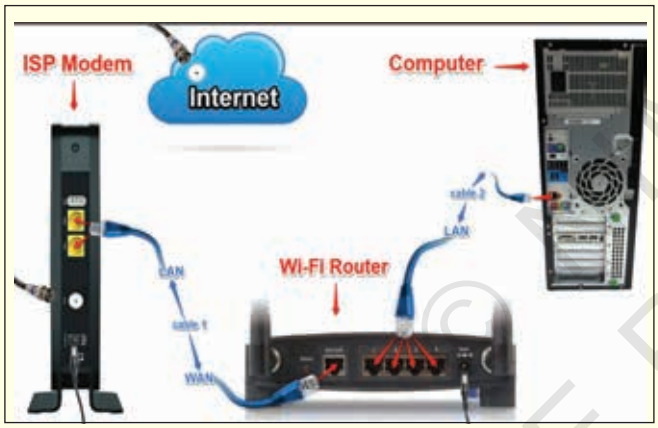
- A Working PC with Windows 10 OS - 1 No.
- Network Connectivity (Wired / Wireless) - 1 No.
- FTTH Router / DSL Modem - 1 No.
- Patch Cable - 1 No.

PROCEDURE

TASK 1: **Set-up internet connectivity**

Connect a wireless router

To create your own Wi-Fi network, you'll need a wireless router.



1 Connect it to your existing Internet modem.

2 Connect an Ethernet cable from your modem to the wireless router (there is usually a short Ethernet cable included with your wireless router for this purpose).

3 Plug in the power cable for the wireless router.

4 Wait at least 30 to 60 seconds, and make sure the lights on your router are working correctly.

Configure your router

Next, you'll need to use your computer to configure your router's default settings.

1 Using your web browser, enter the router's default IP address into the address bar, then press Enter. Your router's has the most common addresses include 192.168.0.1, 192.168.1.1, and 192.168.2.1.

2 The router's sign-in page will appear. most routers use a standard user name and password combination, such as **admin** and **password**.

3 Choose router's settings and select the Network Setting, then enter a SSIB network name.

4 Select Network Password setting, and choose an Encryption option. Recommend WPA2, which is generally considered to be the most secure.

5 Enter your desired password. Make sure to use a strong password to help ensure no one else can access your network.

6 Locate and select the Save button to save your settings.

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Connect!

That's it! Now you're ready to connect to your Wi-Fi network and make sure it's working.

1 Locate your computer's network settings, and search for nearby Wi-Fi networks.

2 Select your network, and enter your password.

3 If the connection is successful, open your web browser and try navigating to a webpage like www.google.com. If the page loads, it means your Wi-Fi connection is working correctly.

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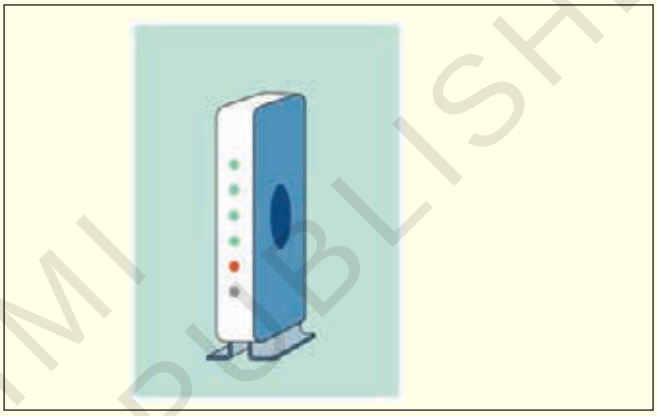
TASK 2: **Set-up digital communication**

Types of Internet service : The type of Internet service you choose will largely depend on which Internet service providers (ISPs) serve your area, along with the types of service they offer. Here are some common types of Internet service.

- Dial-up: Dial-up Internet uses your phone line
- DSL: DSL service uses a broadband connection, which makes it much faster than dial-up
- Cable: Cable service connects to the Internet via cable TV
- Satellite: A satellite connection uses broadband but does not require cable or phone lines; it connects to the Internet through satellites orbiting the Earth.
- 3G and 4G: 3G and 4G service is most commonly used with mobile phones, and it connects wirelessly through your ISP's network.

Hardware needed

Modem : The type of Internet access you choose will determine the type of modem you need. Dial-up access uses a telephone modem, DSL service uses a DSL modem, cable access uses a cable modem, and satellite service uses a satellite adapter.



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Use the Internet

Objectives: At the end of this exercise you shall be able to
- **browse a website through web browser, e-mail, social media**
- **use the phone for online activities.**

Requirements

Tools/Equipment/Machines

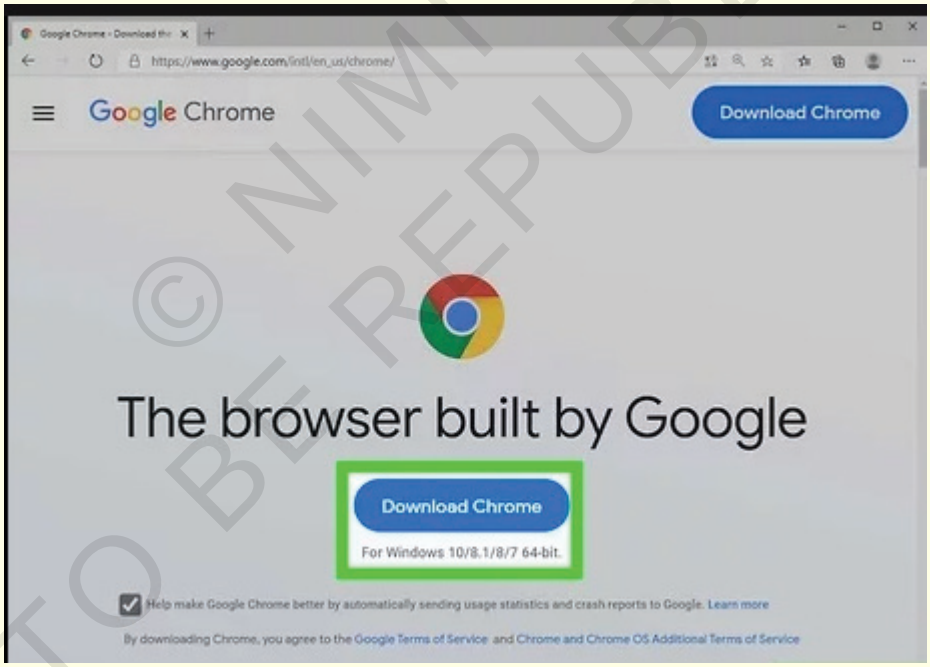
- A Working PC with Windows 10 OS - 1 No.
- Network Connectivity (Wired / Wireless) - 1 No.
- Internet Connection - 1 No.

PROCEDURE

TASK 1: **Browse a website through Web browser**

First way to open

1 Choose edge or chrome browser and open it.



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TASK 2 : **Use an Email Account**

1 Choose any browser and Click to open it.

2 Click “Gmail” on the “Google” home page.

Note:Create your own personal email accout at any of free Email accout service. (Ex.Gmail, yahoo, Outlook, hotmail etc..)

3 Click “CREATE AN ACCOUNT“

4 Type your name details in first and last name box.

5 Choose your username as you will keep secure.

6 Password and retype the same in “confirm your password”

Note : While typing the password the password box has to denote strong.

7 Choose personal details in mobile number in mobile number, and alternative email id if you have.

8 Type the given quote “Prove your not an robot” box

9 Select the location as “India”

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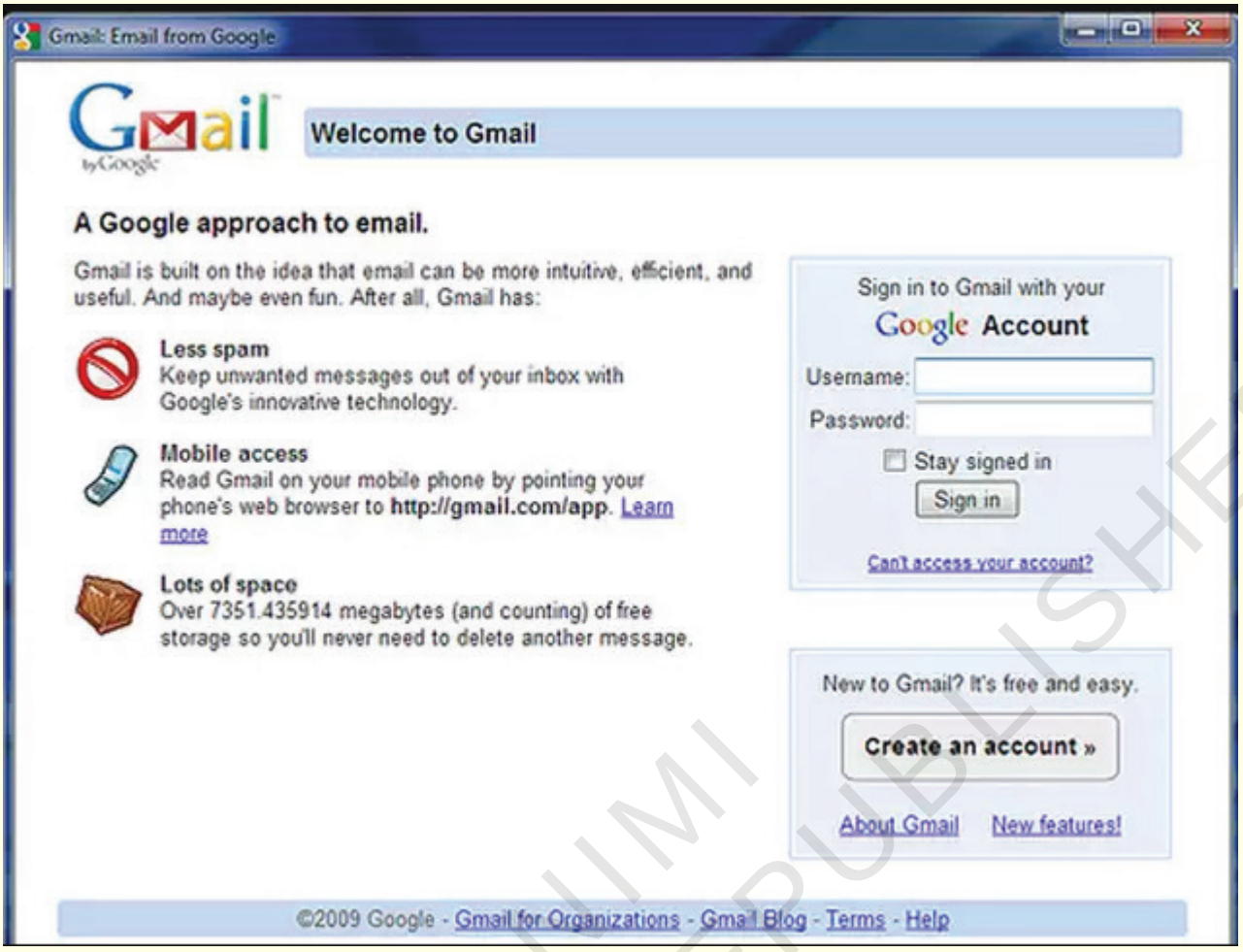

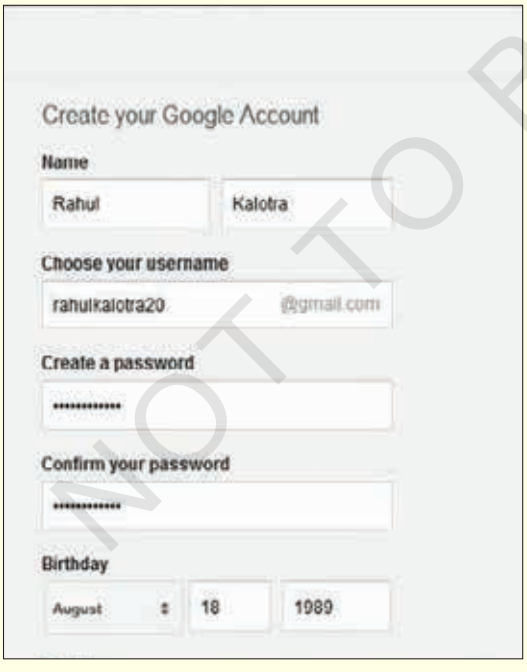

10 Click a the box “I agree to Google” and About personalization box” as shown in Fig 5.

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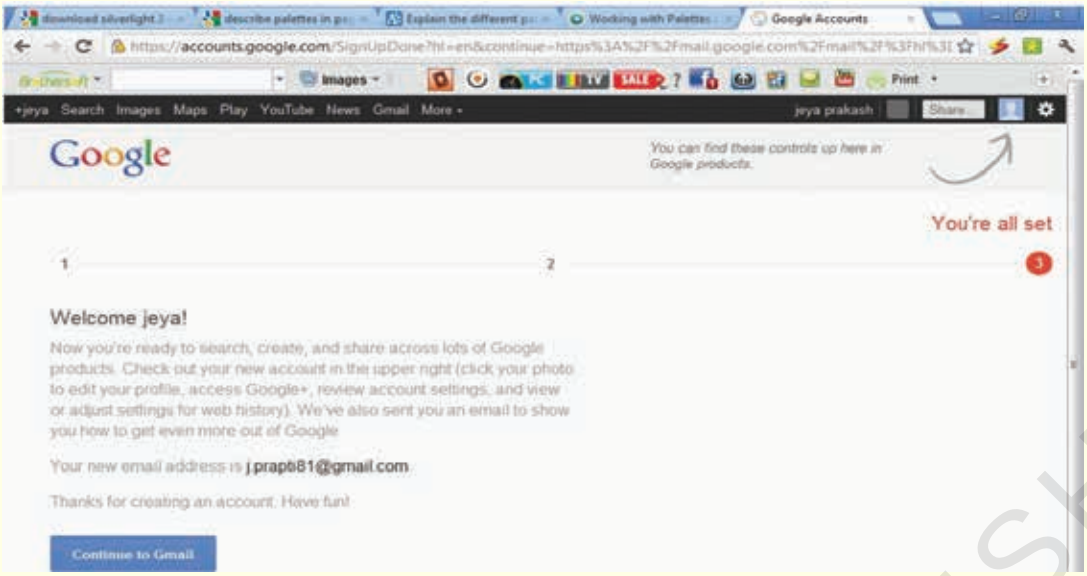
11 Click “Next Step”

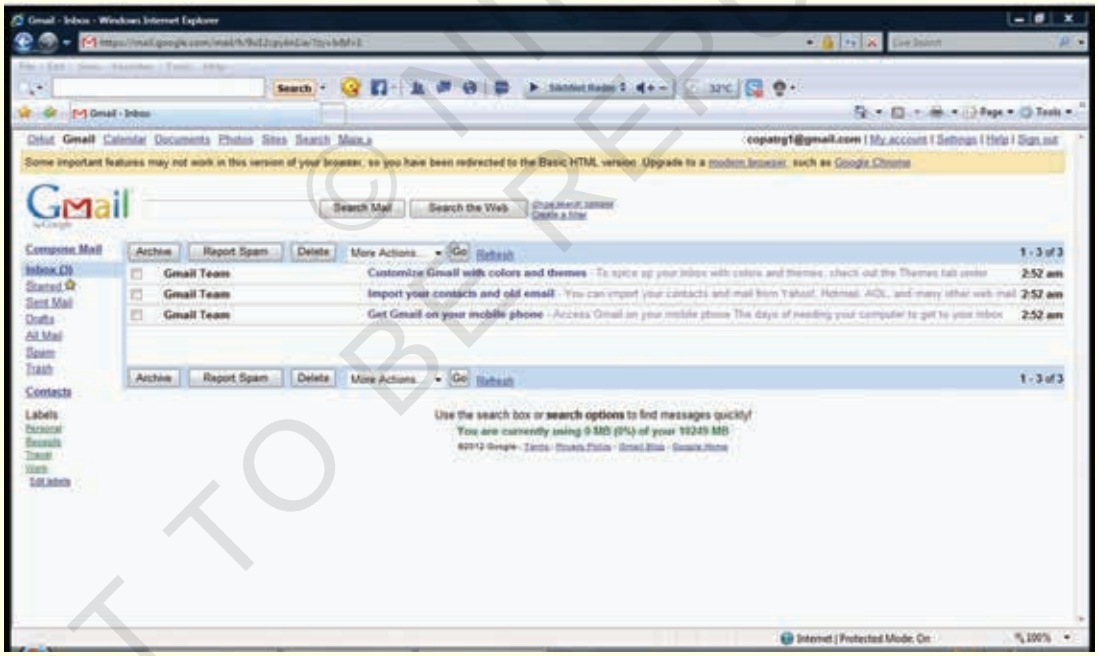
Note: Account create successfully!.



12 Click “ Continue to Gmail”

Note : A new Gmail account mail window appears on the screen with three mails of Google team appears.

Try to compose Email and sent to others and also receive from others.



— — — — — —

TASK 3: **Use social network sites**

1 Open Brower.
2 Enter address www.facebook.com
3 Enter your gmail Id and Password to login.
4 In case no login Id , Fill the form and Sign Up.
5 Add friends.
6 Send friend request.
7 Click ok.
8 Now post some message with a picture.
9 Open friends list.
10 Select some friend from the list by clicking.
11 Post something in friends facebook.
12 Click logout.

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TASK 4: **Use the phone for online activities**

Install Chrome

1 On your Android phone or tablet, go to PlayStore and Search Google Chrome.

2 Tap Install.

3 Tap Accept.

4 To start browsing, go to the Home or All Apps page. Tap the Chrome app .

Uninstall and reinstall Chrome to fix most problems with your search engine, pop-ups, or Chrome updates.

Setup Gmail for mobile devices

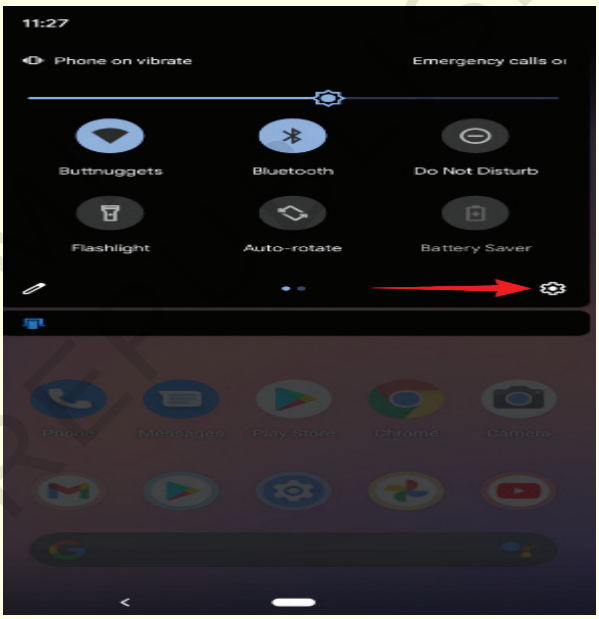
If you have a mobile device, there are two main ways to access your Gmail account:

- **Option 1:** The native email app on your device
- **Option 2:** The official Gmail mobile app, available for iOS and Android.

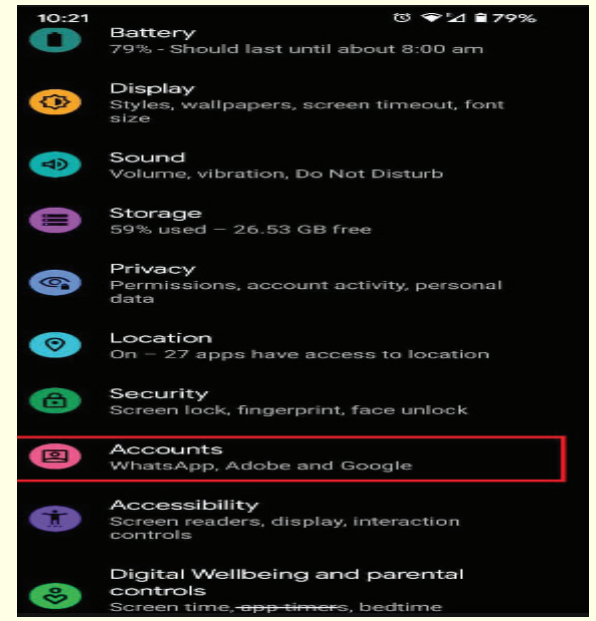
To set up Gmail with the native email app:

Stock Android 11

Step 1: Drag a finger down from the top to fully expand the Notification Shade, and then tap the Cog icon. This opens the Android settings panel.



Step 2: Scroll down and tap Accounts.



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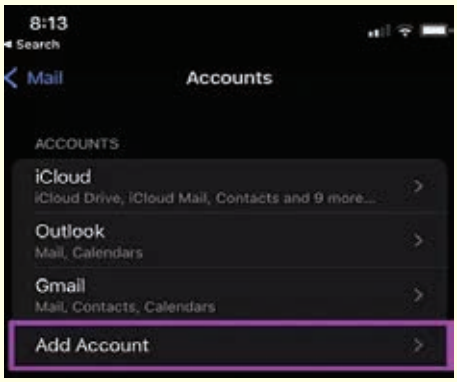
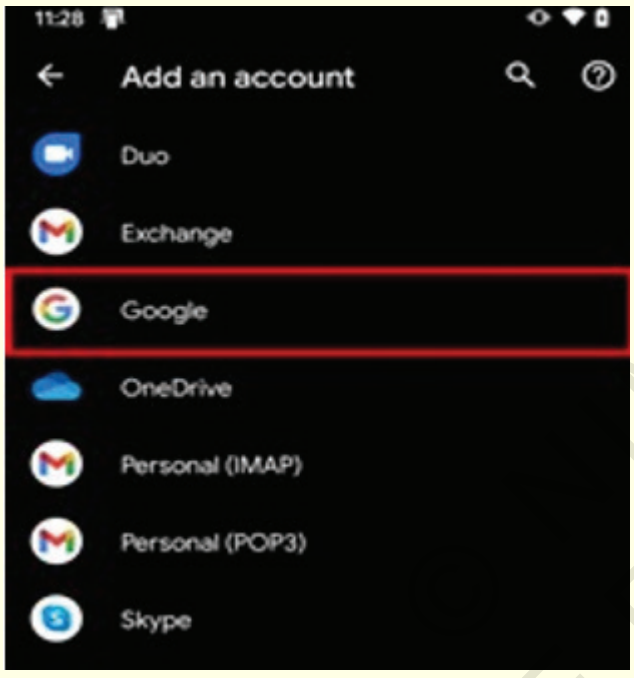
Step 3: Tap Add Account on the following screen.



Step 4: Tap Google.

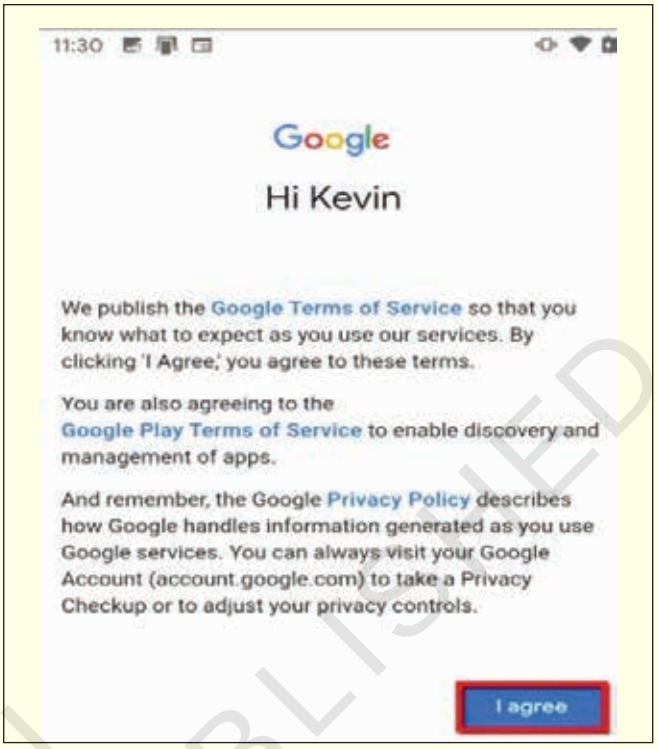


Step 5: Verify your identity by using your face, finger, or PIN.

Step 6: Enter your Google account address and then tap Next.

Step 7: Enter your Google account password and then tap Next.

Step 8: Tap I Agree on the Google Terms of Service screen.



Step 9: If prompted, add a credit card for purchases or tap No Thanks.

Once finished, you will be returned to Accounts in Settings. If you want to see the accounts that you have added or want to delete any, just tap Google.

Write an email

1 On your Android phone or tablet, open the Gmail app .

2 At the bottom right, tap Compose.

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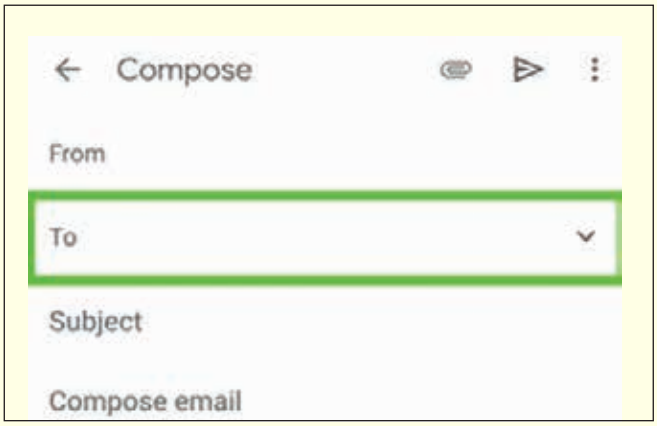
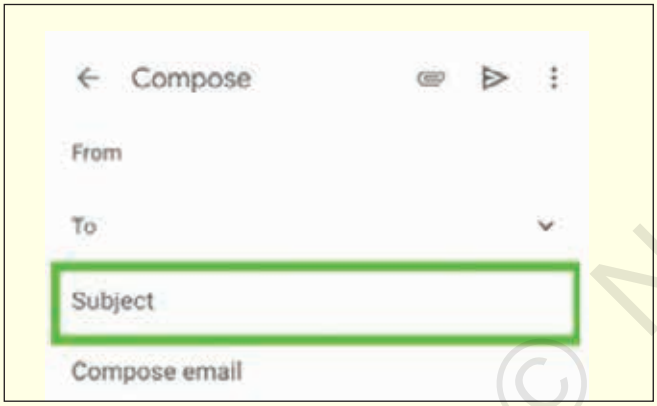
3 In the “To” field, add recipients. You can also add recipients:

- In the “Cc” and “Bcc” fields.
- When you compose a message, with a “+ sign” or “@mention” and the contact’s name in the text field.



4 Add a subject.



5 Write your message.

6 At the top of the page, tap Send ➤ .

Tip: To add formatting, like bolding or changing the text color, select the text you want to format, then tap .

Personal Email Account Setup:

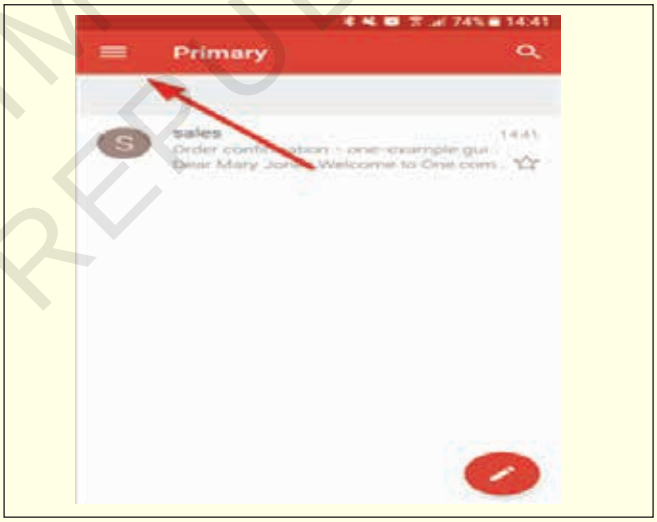
Step 1 - Open the Gmail app

Open the Gmail app on your Android device.

Step 2 - Go to Settings

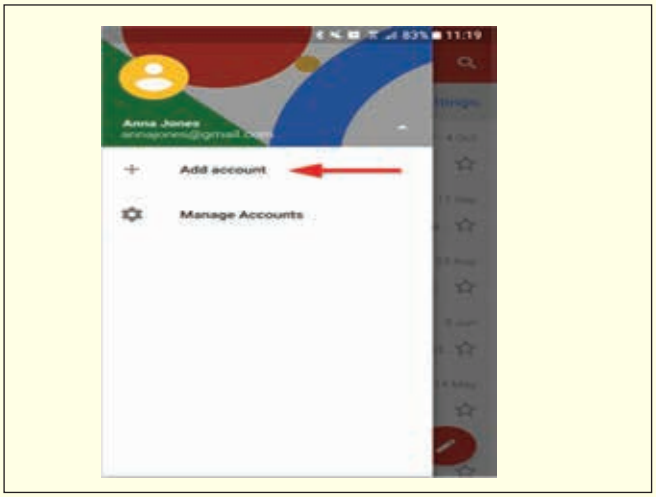
1 Click the menu in the top left corner to open Settings.

2 Tap Settings at the bottom of the menu that opens.



Step 3 - Click Add account

Click Add account to start setup.



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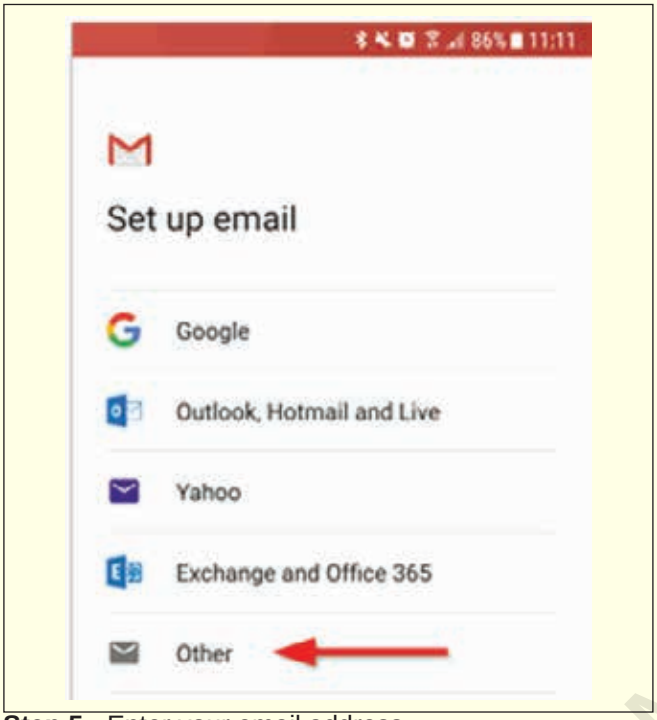
Step 4 - Click Other

Select Other as the account you want to set up.

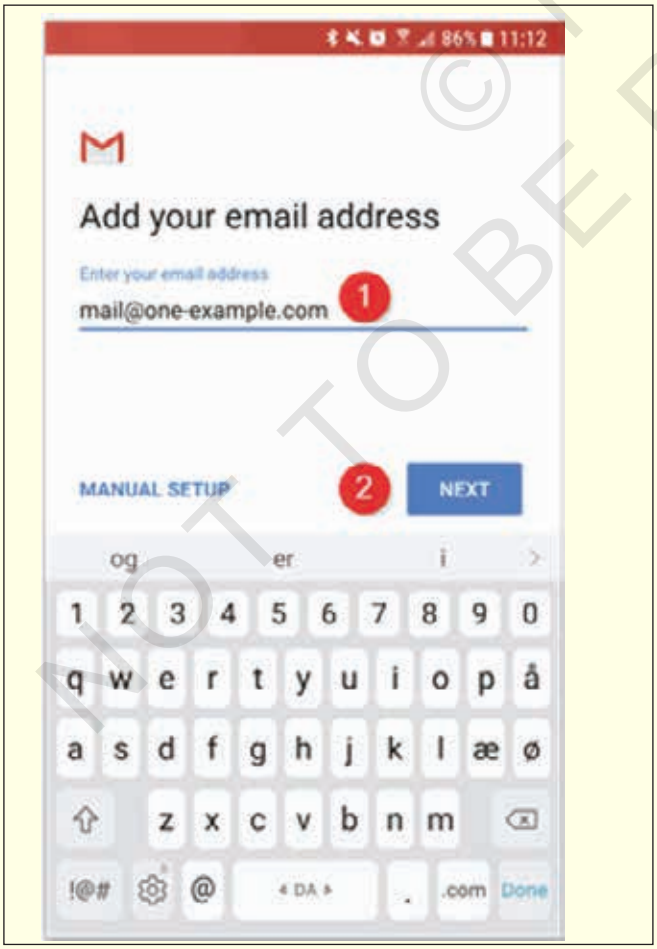
Tip: If you want to set up your email with Mobile Sync, choose Exchange instead.



Step 5 - Enter your email address

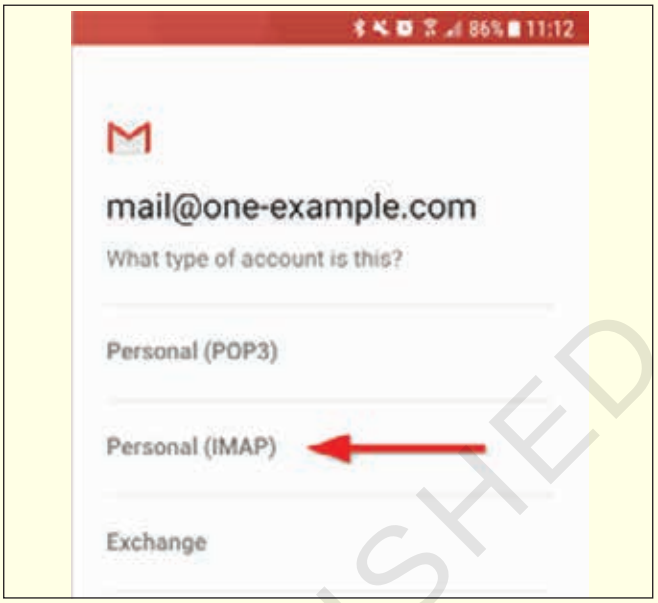
1 Type in the email address you want to set up.

2 Click Next.



Step 6 - Select IMAP

Select IMAP as the account type.



Step 7 - Enter your password

1 Type in your email password, the one you use to log in to Webmail.

2 Click Next.

Step 8 - Enter imap.one.com for incoming server

1 Type in imap.one.com as the incoming server.

2 Click Next.

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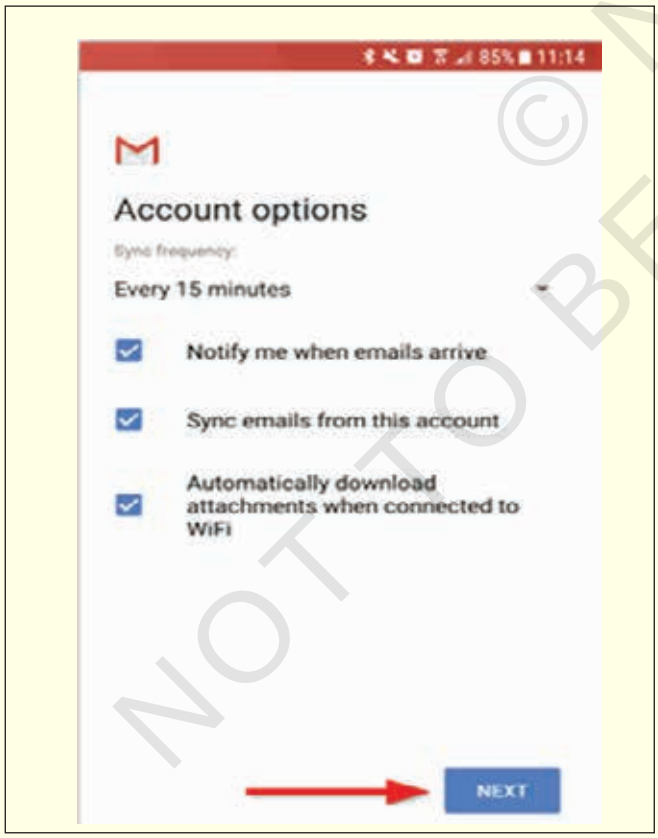
Step 9 - Enter send.one.com for outgoing server

1 Type in send.one.com as the outgoing server.

2 Click Next.

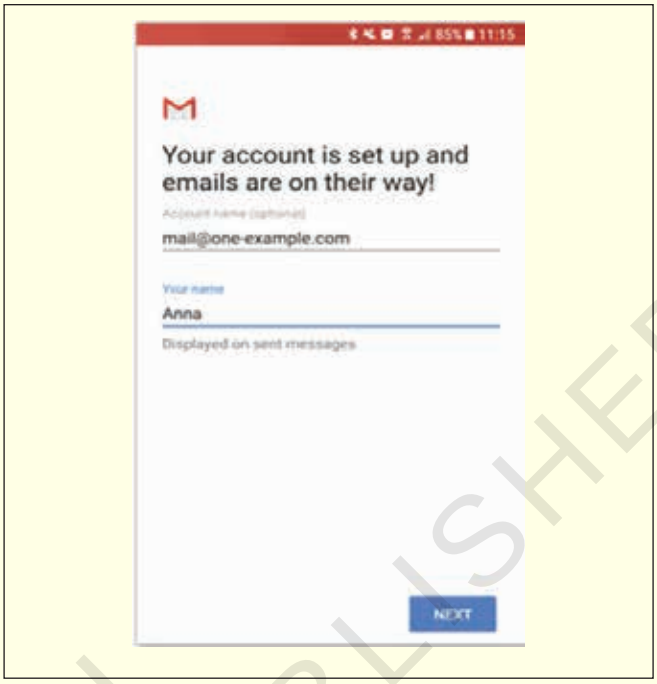
Step 10 - Select account options

Here you set how often Gmail should look for new emails, when you get notifications and more. Uncheck any options you don't want and click Next to continue.



Step 11 - Done!

Your account is now set up and ready to go!



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COPA - Create Simple Static Web Pages using HTML Tags

Practice HTML

Objectives: At the end of this exercise you shall be able to
- **display a text message using HTML program.**

Requirements

Tools/Equipment/Machines

- A Working PC with windows OS - 1 No.
- Notepad - 1 No.
- Browser - 1 No.

PROCEDURE

TASK 1: **Display text message using HTML program**

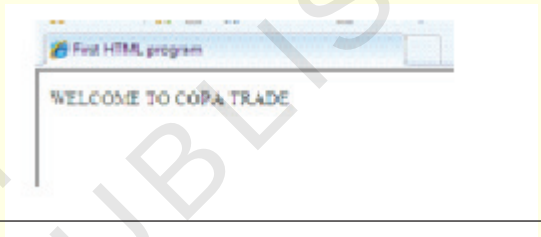
1 Type the following program in a Notepad file.

```
<html>
<head>
<title>First HTML program</title>
</head>
<body>
WELCOME TO COPA TRADE
</body>
</html>
```

2 Save it as

3 Open the browser 'Internet Explorer' and open the file

4 The output will be as follows. (Fig 1)



- If correct output is not displayed, do the following
- Press Ctrl G to open the console window to view the errors in the HTML program.
- Note the errors
- Open program in Notepad to correct the errors and save it.
- Go to browser and press F5 to refresh the page or open the saved filed in browser.

5 Get the output verified by the instructor.

TASK 2: **Design simple web page with text, paragraph and line break and using HTML Tags**

Program

```
<HTML>
<HEAD>
<TITLE> HEADING TAGS </TITLE>
</HEAD>
<BODY>
<h1>This is heading 1</h1>
<h2>This is heading 2</h2>
<h3>This is heading 3</h3>
<h4>This is heading 4</h4>
<h5>This is heading 5</h5>
<h6>This is heading 6</h6>
</BODY>
</HTML>
```

Output

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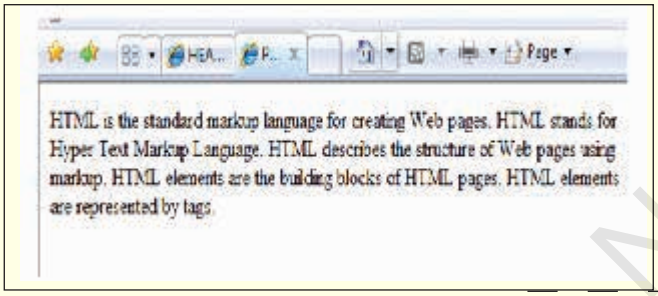
Program

```
<HTML>
<HEAD>
<TITLE> PARAGRAPH TAG </TITLE>
</HEAD>
<BODY>
<P>
HTML is the standard markup language for creating Web pages.
HTML stands for Hyper Text Markup Language. HTML describes the structure of Web pages using markup.
HTML elements are the building blocks of HTML pages.
HTML elements are represented by tags.
</P>
</BODY>
</HTML>
```

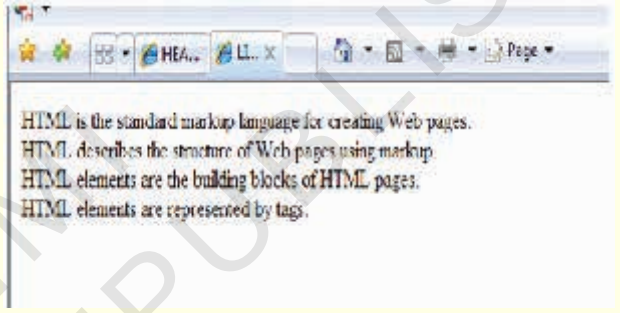
Output



Program

```
<HTML>
<HEAD>
<TITLE> LINE BREAK </TITLE>
</HEAD>
<BODY>
<P>
HTML is the standard markup language for
creating Web pages.<br>HTML describes the structure of Web pages using markup.<br>HTML elements are the building blocks of HTML pages.<br> HTML elements are represented by tags.
</P>
</BODY>
</HTML>
```

Output

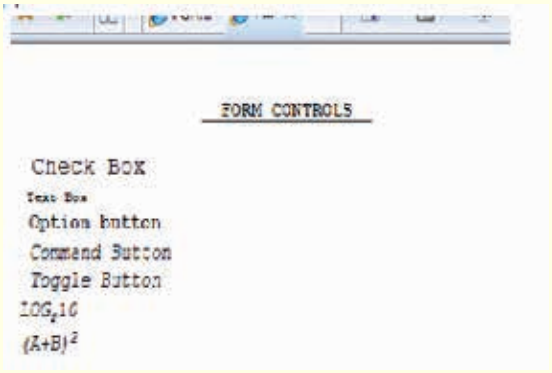


TASK 3: **Format text, change ground colour and inset pictures in web page**

Program

```
HTML>
<HEAD>
<TITLE> FORMATTING TEXT</TITLE>
</HEAD>
<BODY>
<PRE>
<CENTER> <U> <B> FORM CONTROLS </ B> </ U> </CENTER>
<BIG> Check Box </BIG>
<SMALL> Text Box</SMALL>
<STRONG> Option button </STRONG>
<I> Command Button <I>
<EM> Toggle Button <EM> LOG<SUB>2</SUB>10 (A+B)<SUP>2</SUP>
</PRE>
</BODY>
</HTML>
```

Output



Note

** - center text**
<u> - underline text
<b> - Bold text
** - Important text**
<i> - Italic text
** - Emphasized text**
<big> - <big text>
<small> - Small text
<sub> - Subscript text
<sup> - Superscript text

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Program

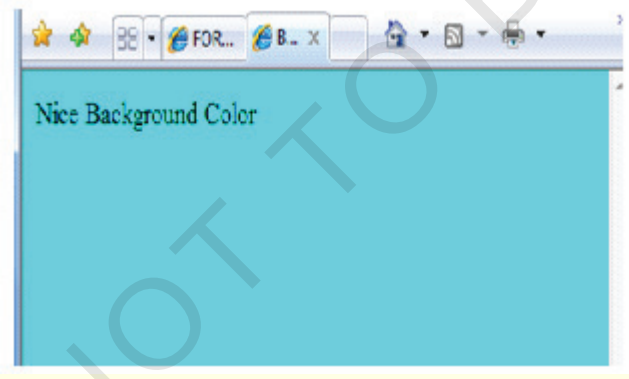
```
<HTML>
<HEAD>
<TITLE> FONTTAG</TITLE>
</HEAD>
<BODY>
<FONT COLOR=”BLUE” SIZE=”20” FACE = “ALGERIAN”>
World Wide Web
</FONT>
</BODY>
</HTML>
```

Output

Program

```
<HTML>
<HEAD>
<TITLE> BACKGROUND TAG </TITLE>
</HEAD>
<BODY BGCOLOR = “AQUA”>
<BIG> Nice Background Color </BIG>
</BODY>
</HTML>
```

Output



Program

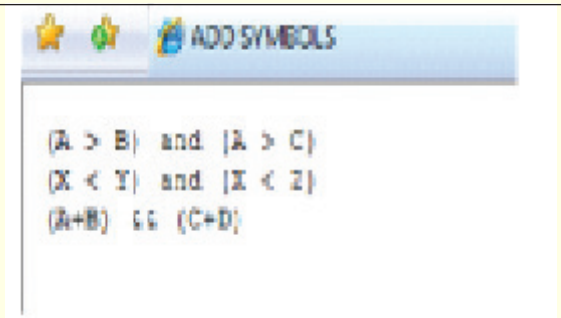
```
<HTML>
<HEAD>
<TITLE> INSERT IMAGE </TITLE>
</HEAD>
<BODY>
<IMG SRC=”C:\Users\Public\Documents\iti-logo-1.JPG” ALT = “ITI SYMBOL”>
</BODY>
</HTML>
```

Output

Program

```
<HTML>
<HEAD>
<TITLE> ADD SYMBOLS </TITLE>
</HEAD>
<BODY>
<PRE>
(A &gt B) and (A &gt C) (X &lt Y) and (X &lt Z) (A+B) &AMP&AMP (C+D)
</PRE>
</BODY>
</HTML>
```

Output



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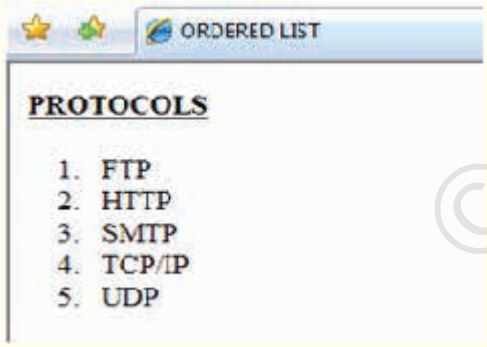
TASK 4: **Design simple webpage with tables and lists**

Program

```
HTML>
<HEAD>
<TITLE> ORDERED LIST </TITLE>
</HEAD>
<BODY>
<B><U> PROTOCOLS </U></B>
<OL TYPE = “1”>
<LI> FTP </LI>
<LI> HTTP </LI>
<LI> SMTP </LI>
<LI> TCP/IP </LI>
<LI> UDP </LI>
</OL>
</BODY>
</HTML>
```

Output



Note: The type attribute of the <OL> tag, defines the type of the list item marker:

type=”A” - The list items will be numbered with A,B,C,…

type=”a” - The list items will be numbered with a,b,c,…

type=”I” - The list items will be numbered with I,II,III,IV,…

type=”i” - The list items will be numbered with i,ii,iii,iv,….

Program

```
<HTML>
<HEAD>
<TITLE> UNORDERED LIST </TITLE>
</HEAD>
<BODY>
<B><U> CABLES USED FOR NETWORKING </
U></ B>
<UL TYPE = “square”>
<LI> Sheilded Twisted Pair Cable </LI>
<LI> Unsheilded Twisted Pair Cable </LI>
<LI> Fibre Optic Cable </LI>
</UL>
</BODY>
</HTML>
```

Output

Note: The type attribute of the <UL> tag, defines the type of the list item marker:

type=”disc”- Sets the list item marker to a bullet (default)

type=”circle “ - Sets the list item marker to a circle

Program

```
<HTML>
<HEAD>
<TITLE> DESCRIPTION LIST </TITLE>
</HEAD>
<BODY>
<B><U> MS OFFICE </U></B>
<dl>
<dt>MSWORD</dt>
<dd>- Microsoft Word or MS-WORD (often called Word) is a graphical word processing program that users can type with. It is made by the computer company Microsoft. Its purpose is to allow users to type and save documents. Similar to other word processors, it has helpful tools to make documents.<dd>
<dt>MSEXCEL</dt>
<dd>- Microsoft Excel is a spreadsheet developed by Microsoft for Windows, macOS, Android and iOS. It features calculation, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications.</dd>
<dt>MSACCESS</dt>
```

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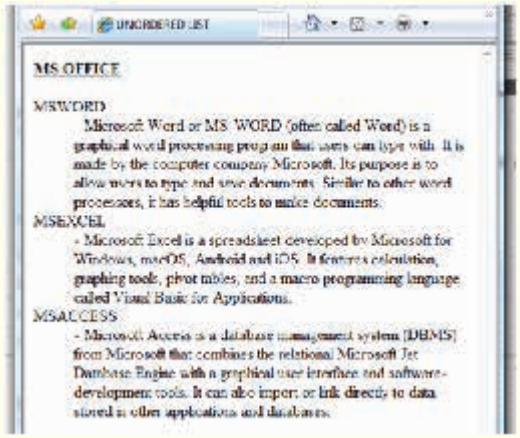
```
<dd>- Microsoft Access is a database management system (DBMS) from Microsoft that combines the relational Microsoft Jet Database Engine with a graphical user interface and software-development tools. It can also import or link directly to data stored in other applications and databases.</dd>
</dl>
</BODY>
</HTML>
```

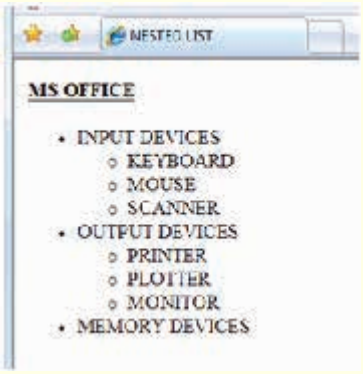
Output



Program

```
<HTML>
<HEAD>
<TITLE> NESTED LIST </TITLE>
</HEAD>
<BODY>
<B><U> MS OFFICE </U></B>
<ul>
<li>INPUT DEVICES
<ul>
<li>KEYBOARD</li>
<li>MOUSE</li>
<li>SCANNER</li>
</ul>
<li>OUTPUT DEVICES
<ul>
<li>PRINTER</li>
<li>PLOTTER</li>
<li>MONITOR</li>
</ul>
<li>MEMORY DEVICES</li>
</ul>
</BODY>
</HTML>
```

Output



Program

```
<HTML>
<HEAD>
<TITLE> TABLE 1 </TITLE>
</HEAD>
<BODY>
<B> PARTICULARS OF GOVERNMENT ITI (WOMEN) </B> <BR> <BR>
<table BORDER=”5” CELLPADDING=”5” CELLSPACING=”10”>
<tr>
<th>SNO</th>
<th>NAME OF THE TRAINEE</th>
<th>TRADE</th>
<th>SEMESTER</th>
</tr>
<tr>
<td>1.</td>
<td>ANITHA.C</td>
<td>COPA</td>
<td>II</td>
</tr>
<tr>
<td>2.</td>
<td>VENI.T</td>
<td>IT</td>
<td>II</td>
</tr>
<tr>
<td>3.</td>
<td>PRIYA.S</td>
<td>ICTSM</td>
<td>II</td>
</tr>
</table>
</BODY>
</HTML>
```

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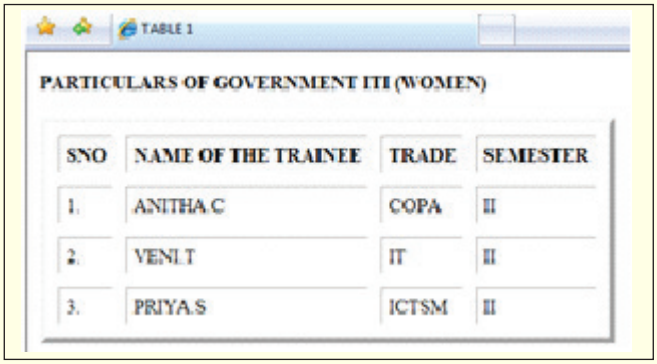
Output

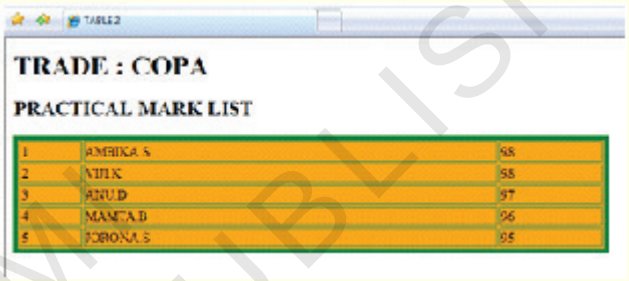


Program

```
<HTML>
<HEAD>
<TITLE> TABLE 2 </TITLE>
</HEAD>
<BODY>
<H1> TRADE : COPA </H1>
<H2> PRACTICAL MARK LIST </H2>
<TABLE BORDER="5" BORDERCOLOR="GREEN" BGCOLOR="ORANGE" WIDTH="50%">
<tr> <td>1</td> <td>AMBIKA.S</td> <td>98< td> </tr>
<tr> <td>2</td> <td>VIJI.K</td> <td>98</td>
</tr>
<tr> <td>3</td> <td>ANU.D</td> <td>97</td>
</tr>
<tr> <td>4</td> <td>MAMTA.B</td> <td>96</ td> </tr>
<tr> <td>5</td> <td>JORONA.S</td> <td>95</ td> </tr>
</TABLE>
</BODY>
</HTML>
```

Output

Note: Table's border colour in set to Green and background colour is set to orange.



TASK 5: **Use Marquees, hyperlinks and mail to link in designing webpages**

Program

```
<HTML>
<HEAD>
<TITLE>MARQUEE TAG</TITLE>
</HEAD>
<BODY>
<H1> <FONT TYPE="broadway">
<MARQUEE>
NATIONALINSTRUCTIONALMEDIAINSTITUTE, CHENNAI
</MARQUEE>
</H1> </FONT>
</BODY>
</HTML>
```

Output

The output will be "NATIONAL INSTRUCTIONAL MEDIA INSTITUTE, CHENNAI" which is scrolling towards left.

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Program

```
<HTML>
<HEAD>
<TITLE> MARQUEE WITHATTRIBUTES-1 </ TITLE>
</HEAD>
<BODY>
<FONT SIZE=”25” COLOR=”Blue”>
<MARQUEE BEHAVIOR=”scroll” DIRECTION = “right” SCROLLAMOUNT=”40”>
Directorate General of Employment & Training (DGE&T)
</MARQUEE>
</FONT>
</BODY>
</HTML>
```

Output

1 The output will be “Directorate General of Employment & Training (DGE&T)” which starts faster scrolling towards right.TASK 3: **Set the BGCOLOR and WIDTH attributes to <MARQUEE> tag.**

Program

```
<HTML>
<HEAD>
<TITLE> MARQUEE WITHATTRIBUTES-2 </ TITLE>
</HEAD>
<BODY>
<FONT SIZE=”25”>
<MARQUEE BEHAVIOR=”alternate” BGCOLOR = “yellow” WIDTH = “70%”>
National Council for Vocational Training (NCVT)
</MARQUEE>
</FONT>
</BODY>
</HTML>
```

Output

1 The output will be “National Council for Vocational Training (NCVT)” which starts scrolling towards left and bounces back and forth in 70% screen width with yellow background color.

Program

```
<HTML>
<HEAD>
<TITLE> MARQUEE WITHATTRIBUTES-3 </ TITLE>
</HEAD>
<BODY>
<FONT SIZE=”40”>
<MARQUEE DIRECTION = “UP” HEIGHT=”100%” SCROLLAMOUNT = “40%” LOOP=”-1”>
The Ministry of Labour and Employment
</MARQUEE>
</FONT>
</BODY>
```

Output

1 The output will be “The Ministry of Labour and Employment “which starts scrolling towards up 3 times (Loop).

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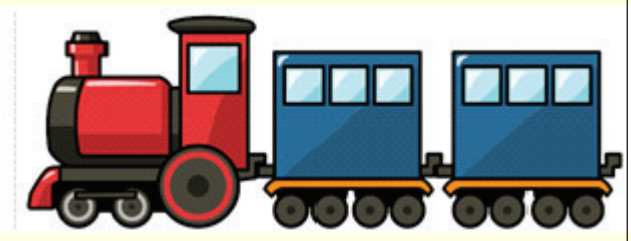
Program

```
<HTML>
<HEAD>
<TITLE> MARQUEE IMAGE </TITLE>
</HEAD>
<BODY>
<MARQUEE BEHAVIOUR=”slide” SCROLLAMOUNT=”20%”>
<IMG SRC=”TRAIN.PNG” alt=”TRAIN”>
</MARQUEE>
</FONT>
</BODY>
```

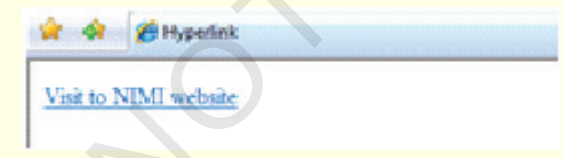
Output



Program

```
<HTML>
<HEAD>
<TITLE> Hyperlink </TITLE>
</HEAD>
<BODY>
<!— link to Home page of NIMI website —>
<A Href=”http://nimi.gov.in/”> Visit to NIMI website
</a>
</BODY>
</HTML>
```

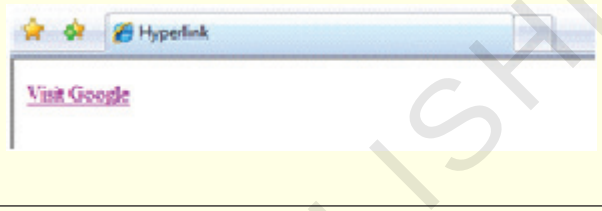
Output



Program

```
<HTML>
<HEAD>
<TITLE> Hyperlink </TITLE>
</HEAD>
<BODY>
<!— Opens the link in new window —>
<a href=”https://www.google.co.in/” TARGET = “_blank”>Visit Google</a>
</BODY>
</HTML>
```

Output



Program

```
<HTML>
<HEAD>
<TITLE> Hyperlink </TITLE>
</HEAD>
<BODY>
<p> An image as a link:</p>
< a h r e f = ” h t t p s : / / e n . w i k i p e d i a . o r g / w i k i / Brihadeeswarar_Temple#/media”>
<img src = “Brihadeswara_Temple_Landscape.jpg” height=100” width=”100”>
</a>
</BODY>
</HTML>
```

Output

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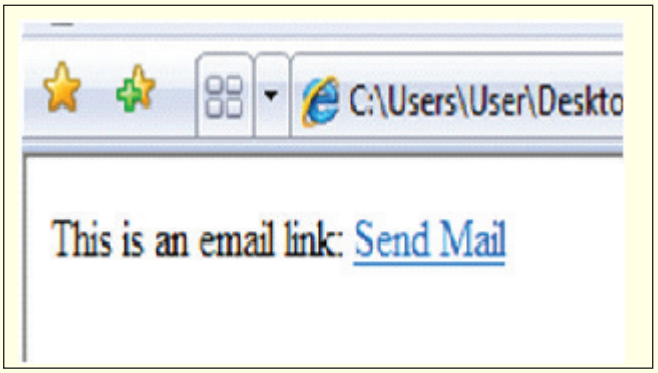
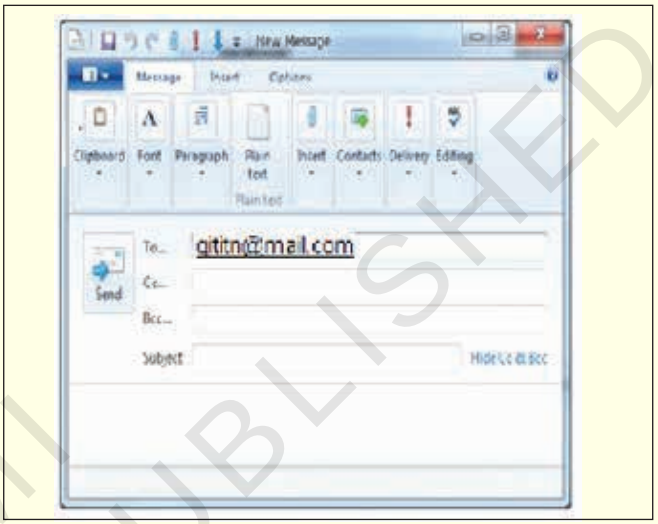
Program

```
<html>
<head>
<title> Mail to Link </title>
</head>
<body>
<p>
This is an email link:
<ahref="mailto:gititn@mail.com"target="_top">Send Mail</a>
</p>
</body>
</html>
```





Output

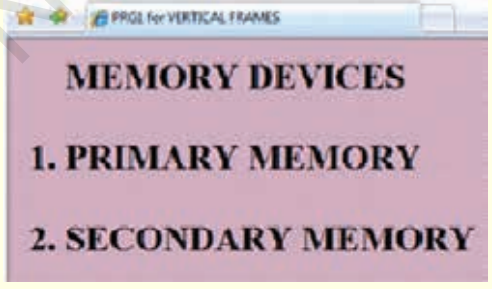
1 Mail to link is a type of HTML link that activates the default mail client on the computer for sending an e- mail. The web browser requires a default e-mail client software installed on his computer in order to activate the e-mail client. If you have Microsoft Outlook, as your default mail client, pressing the Send Mail link opens a new mail window.

TASK 6: **Create frames, and add style and Design Layout**

1 Type the following program in Notepad file and save it as PRG1.HTML

```
<HTML>
<HEAD>
<TITLE> PRG1 for VERTICAL FRAMES </TITLE>
</HEAD>
<BODY BGCOLOR = “CCAABB”>
<H1>
<OL> MEMORY DEVICES
<BR><BR>
<LI>PRIMARY MEMORY</LI>
<BR><BR>
<LI>SECONDARY MEMORY</LI>
</OL>
</BODY>
</HTML>
```

2 The output will be as follows. (Fig 1)



3 Type the following program in Notepad file and save it as PRG2.HTML

```
<HTML>
<HEAD>
<TITLE> PRG2 for VERTICAL FRAMES </TITLE>
</HEAD>
<BODY BGCOLOR = “AABBCC”>
<H1>
<OL TYPE = “A”> PRIMARY MEMORY
<BR><BR>
<LI>RANDOM ACCESS MEMORY</LI>
<BR><BR>
<LI>READ ONLY MEMORY</LI>
</OL>
</BODY>
</HTML>
```

3 The output will be as follows. (Fig 2)

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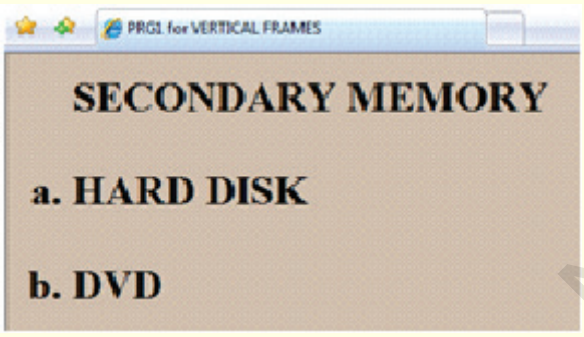
4 Type the following program in Notepad file and save it as PRG3.HTML

```
<HTML>
<HEAD>
<TITLE> PRG3 for VERTICAL FRAMES </TITLE>
</HEAD>
<BODY BGCOLOR = “CCBBAA”>
<H1>
<OL TYPE=”a”> SECONDARY MEMORY
<BR><BR>
<LI>HARD DISK</LI>
<BR><BR>
<LI>DVD</LI>
</OL>
</BODY>
</HTML>
```

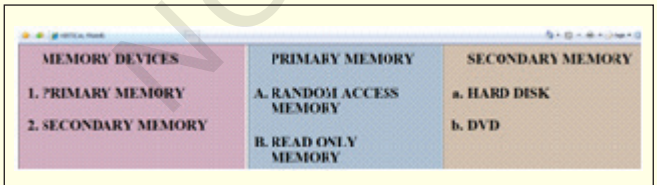
Output



5 Type the following program to create VERTICAL FRAMESET in Notepad file and save it as VERFRAME.HTML

```
<HTML>
<HEAD>
<TITLE> VERTICAL FRAMES </TITLE>
</HEAD>
<frameset cols=”35%,30%,*”>
<frame src=”PRG1.html”>
<frame src=”PRG2.html”>
<frame src=”PRG3.html”>
</frameset>
</HTML>
```

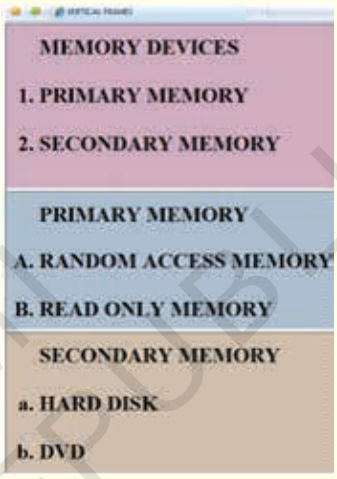
Output



1 Type the following program in a Notepad file and save it as HORFRAME.HTML

```
<HTML>
<HEAD>
<TITLE> HORIZONTAL FRAMES </TITLE>
</HEAD>
<frameset ROWS=”35%,30%,*”>
<frame src=”PRG1.html”>
<frame src=”PRG2.html”>
<frame src=”PRG3.html”>
</frameset>
</HTML>
```

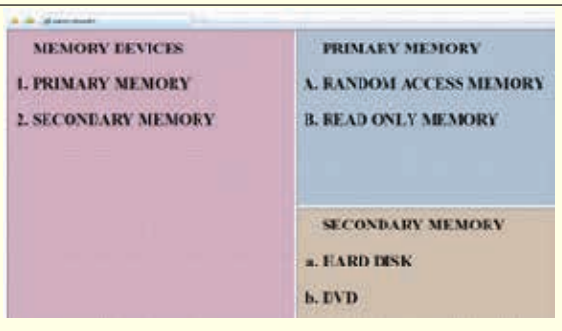
Output



1 Type the following program in a Notepad file and save it as MIXFRAME.HTML

```
<HTML>
<HEAD>
<TITLE> MIXED FRAMES </TITLE>
</HEAD>
<frameset COLS=”40%,*”>
<frame src=”PRG1.html”>
<frameset ROWS=”50%,*”>
<frame src=”PRG2.html”> frame src=”PRG3.html”>
</frameset>
</HTML>
```

Output



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1 Type the following program in a Notepad file and save it as STYLE.HTML

```
<HTML>
<HEAD>
<TITLE> STYLE </TITLE>
</HEAD>
<body style="background-color:yellow;">
<h1 style="font-size:300%;text- align:center;color:indigo;">ROUTER</h1>
<p style="color:blue;font-family:comic sans MS;">
A ROUTER IS A DEVICE THAT FORWARDS DATA PACKETS ALONG NETWORKS. A ROUTER IS CONNECTED TO
ATLEAST TWO NETWORKS, COMMONLY TWO LANS OR WANS OR A
LAN AND ITS ISP'S NETWORK. ROUTERS ARE LOCATED AT
GATEWAYS, THE PLACES WHERE TWO OR MORE NETWORKS CONNECT.
</p>
</body> </HTML>
```

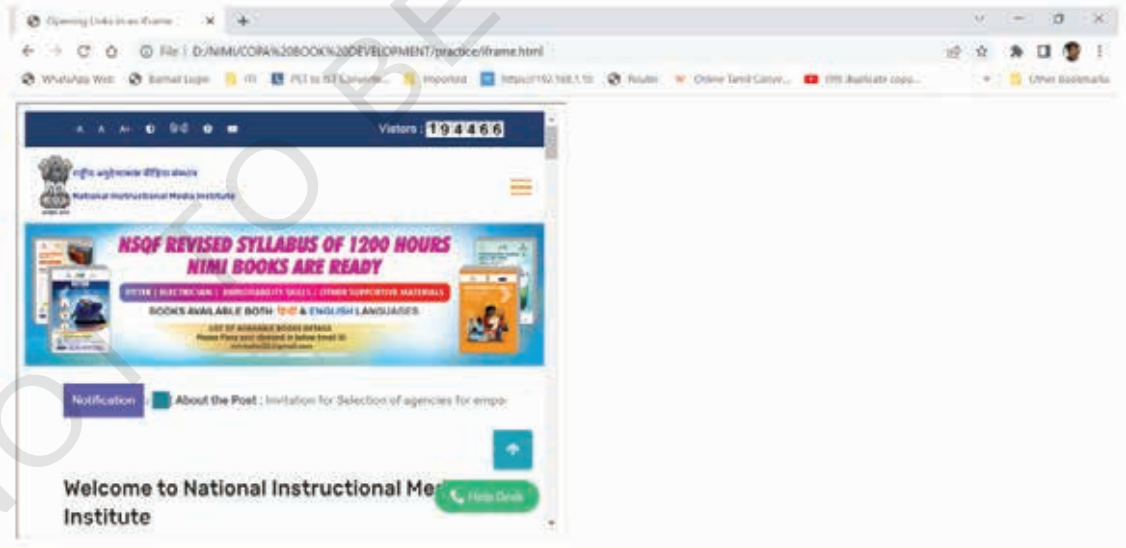
Output

TASK 7: **Display a webpage within a webpage using iframes**

Program

```
<html>
<head>
  <title>Opening Links in an iFrame</title>
   <style>
        iframe {
                width: 50%;
                height: 500px;
                }
   </style>
</head>
<body>
        <iframe src="https://nimi.gov.in/index.html" name="myFrame"></iframe>
</body>
</html>
```

Output:



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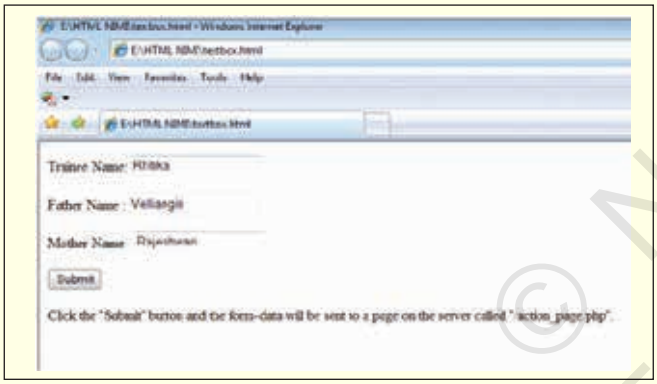
TASK 8: **Insert textbox, check box and combo box in webpage**

Program

```
<!DOCTYPE html>
<html>
<body>
<form action="/action_page.php">
Trainee Name: <input type="text" name="Trainee Name" value="Rhitika"><br><br>
Father Name : <input type="text" name="Father Name" value="Velliangiri"><br><br>
Mother Name : <input type="text" name="Mother Name" value="Rajeshwari"><br><br>
<input type="submit" value="Submit">
</form>
<p><b>Click the "Submit" button and the form-data will be sent to a page on the server called "/action_page.php".</b></p>
</body>
</html>
```

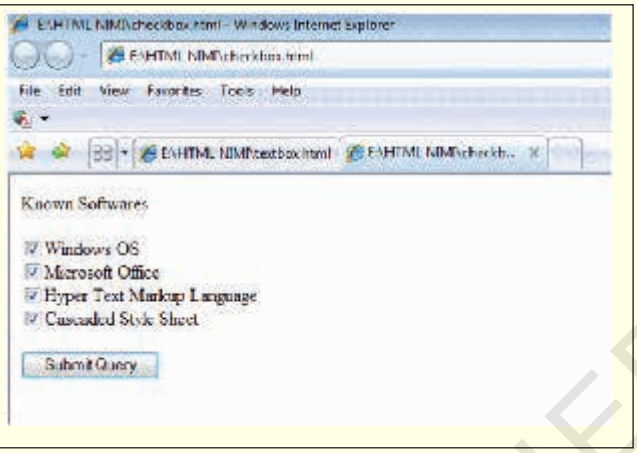
Output



Program

```
<!DOCTYPE html>
<html>
<body>
<form action="/action_page.php">
<p> Known Softwares </p>
<input type="checkbox" name="software1" value="windows">Windows OS
<br>
<input type="checkbox" name="software2" value="msoffice">Microsoft Office
<br>
<input type="checkbox" name="software3" value="html">Hyper Text Markup Language
<br>
<input type="checkbox" name="software4" value="css">Cascaded Style Sheet
<br>
<br>
<input type="submit">
</form>
</body>
</html>
```

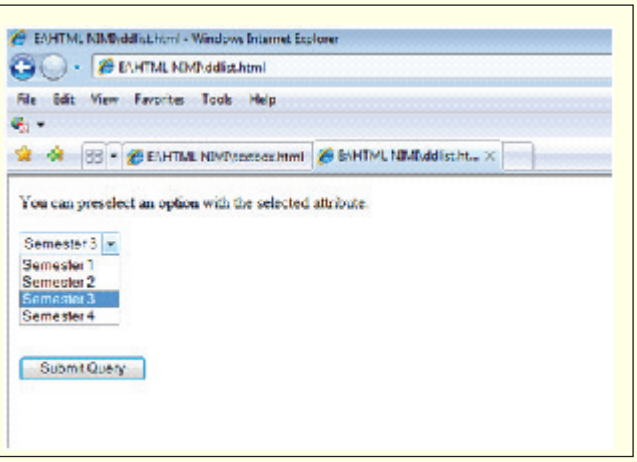
Output



Program

```
<!DOCTYPE html>
<html>
<body>
<p>You can preselect an option with the selected attribute.</p>
<form action="/action_page.php">
<select name="semester">
<option value="s1">Semester 1</option>
<option value="s2">Semester 2</option>
<option value="s3" selected>Semester 3</ option>
<option value="s4">Semester 4</option>
</select>
<br><br><br><br><br><br>
<input type="submit">
</form>
</body>
</html>
```

Output



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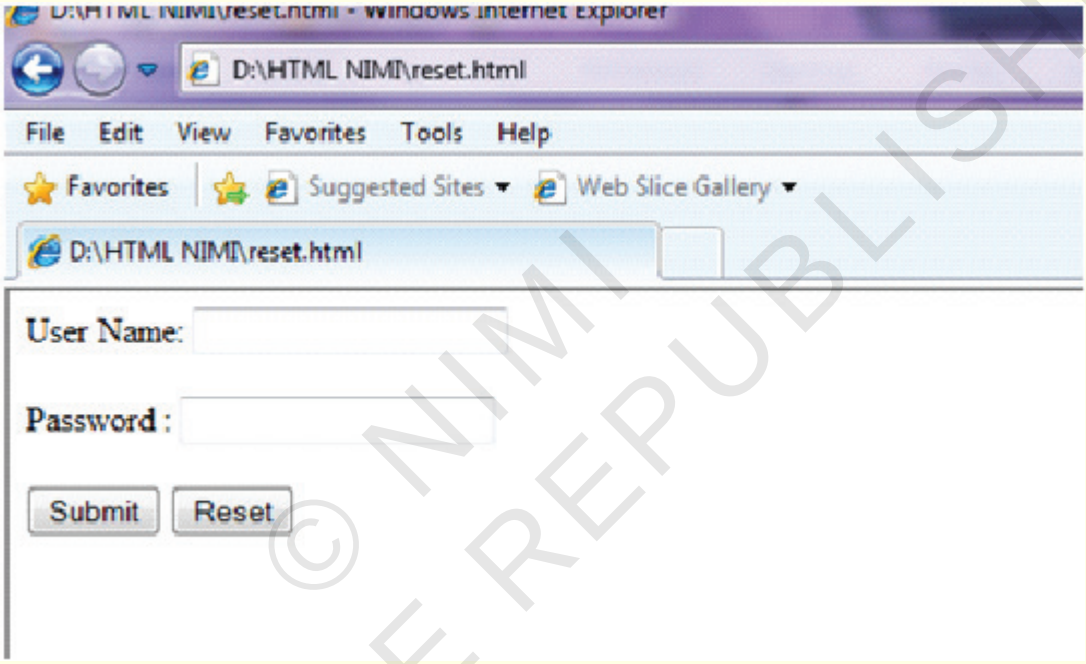
TASK 9 : **Insert Submit and Reset buttons in Web page**.

1 Type the following program in Notepad file and save it as RESET.HTML

```
<!DOCTYPE html>
<html>
<body>
<form action="/action_page.php" method="get"> User Name: <input type="text" name="userid"><br><br>
Password : <input type="password" name="psw"><br><br>
<button type="submit" value="Submit">Submit</button>
<button type="reset" value="Reset">Reset</button>
</form>
</body>
</html>
```

Output



TASK 10 : **Insert Radio button in Web page**.

1 Type the following program in Notepad file and save it as RADIOBTN.HTML

```
<!DOCTYPE html>
<html>
<body>
<form action="/action_page.php">
<input type="radio" name="gender" value="male" > Male<br>
<input type="radio" name="gender" value="female" checked> Female<br>
<input type="radio" name="gender" value="other"> Other<br><br>
<input type="submit">
</form>
</body>
</html>
```

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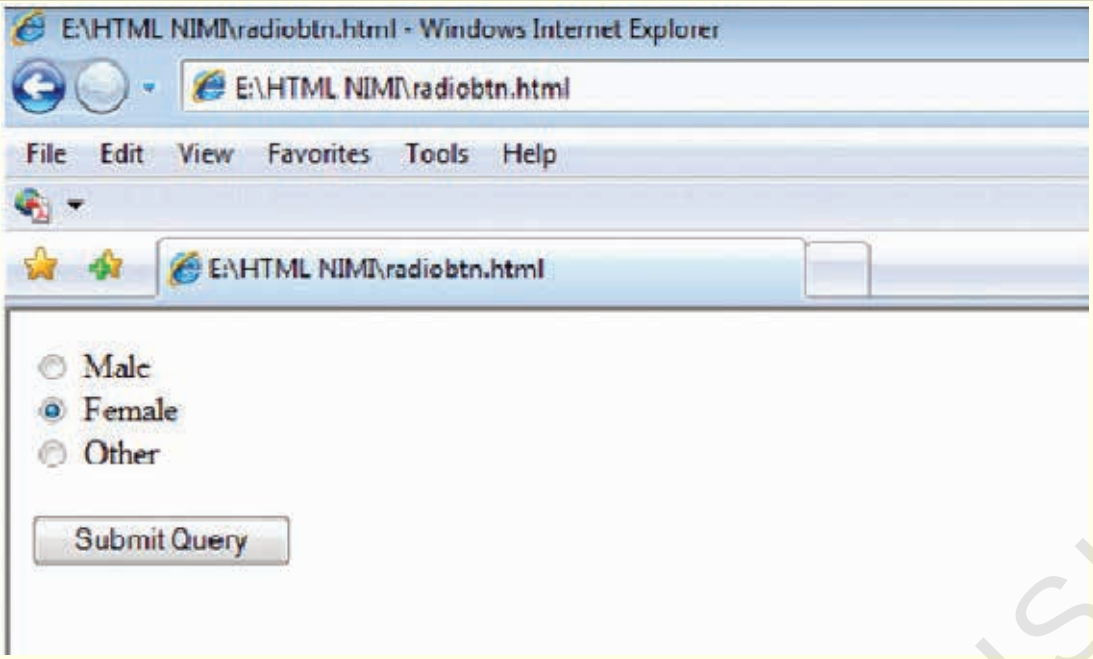
Output



— — — — — —

TASK 11: **Design a webpage adding flash file, audio and video files**

1 Type the following program in Notepad file and save it as FLASH.HTML

```
<!DOCTYPE html>
<html>
<body>
<object width="300" height="300" data="panda.swf">
</object>
</body>
</html>
```

Note: As SWF file is an animation created with Adobe Flash that can be played by Flash Player or with a web browser that has the Flash plug in installed. It may contain text, vector and raster graphics and interactive content written in Ac- tion Script.

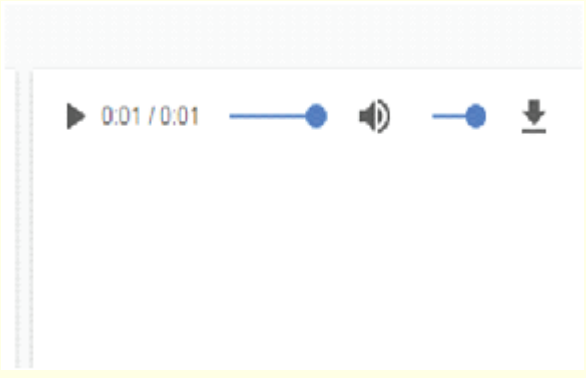
Output

Program

1 Type the following program in Notepad file and save it as AUDIO.HTML

```
<!DOCTYPE html>
<html>
<body>
<audio controls>
<source src="horse.ogg" type="audio/ogg">
<source src="horse.mp3" type="audio/mpeg">
Your browser does not support the audio element.
</audio>
</body>
</html>
```

Output



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Program

```
<!DOCTYPE html>
<html>
<body>
<video width=”320” height=”240” controls>
<source src=”C:\Users\mdc5\Downloads\Beautiful Nature.mp4” type=”video/mp4”>
<source src=”movie.ogg” type=”video/ogg”> Your browser does not support the video tag.
</video>
</body>
</html>
```

Output

Note: Currently, there are 3 supported video formats for the <video> element: MP4, WebM, and Ogg:

- **MP4 = MPEG 4 files with H264 video codec and AAC audio codec**
- **WebM = WebM files with VP8 video codec and Vorbis audio codec**
- **Ogg = Ogg files with Theora video codec and Vorbis audio codec**

Element	Chrome	IE	Firefox	Safari	Opera
<video>	4.0	9.0	10.5	4.0	10.5

— — — — — —

TASK 12: **Design webpage with forms and form controls using HTML Tags**

Program

```
<!DOCTYPE html>
<html>
<body>
<form action=”/action_page.php”>
<h1> STUDENT INFORMATION SYSTEM</H1>
<br><br>
<b>Name:</b>       <input type=”text” name=”name”><br><br>
<b>Father’s name :</b> <input type=”text” name=”fname”><br><br>
<b>Mother’s name :</b> <input type=”text” name=”mname”><br><br>
<b>Date of Birth:</b>
<input type=”date” name=”bday”><br><br>
<b>Gender:</b> <br>
    <input type=”radio” name=”gender” value=”male” > Male <br>     <input type=”radio” name=”gender” value=”female” checked> Female<br>
    <input type=”radio” name=”gender” value=”other”> Other<br><br>
<b>Communication Address:<br>
<textarea rows=”6” cols=”50”>
</textarea><br><br>
<b>TRADE :</b>  
<select name=”trade”>
<option value=”t1”>COPA</option>
<option value=”t2” selected>Information Technology</option>
<option value=”t3”>Informtion Communication Technology & System Maintenance</option>
<option value=”t4”>Computer Hardware & Network Maintenance</option>
</select>
<br><br><br><br><br><br>
<b>Languages you know:</b><BR><br>     
<SELECT NAME=”language” MULTIPLE>
<OPTION VALUE=”tamil”SELECTED>Tamil
<OPTION VALUE=”hindi”>Hindi
<OPTION VALUE=”english” SELECTED>English
<OPTION VALUE=”malayalam”>Malayalam
<OPTION VALUE=”kannada”>Kannada
</SELECT>
```

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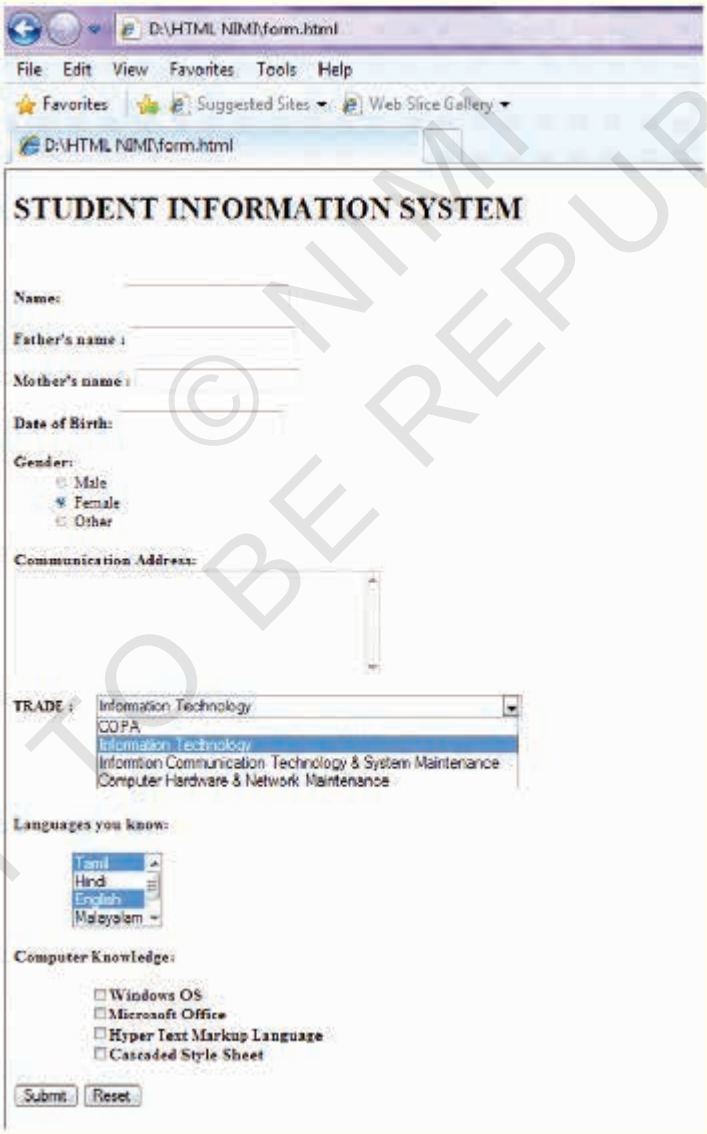
```
<br><br>
<b>Computer Knowledge:</b><br><br>        
<input type="checkbox" name="software1" value="windows">Windows OS
<br>
       
<input type="checkbox" name="software2" value="msoffice">Microsoft Office
<br>
       
<input type="checkbox" name="software3" value="html">Hyper Text Markup Language
<br>
       
<input type="checkbox" name="software4" value="css">Cascaded Style Sheet
<br>
<br>
<input type="submit" value="Submit">
<input type="reset">
</form>
</body>
</html>
```

Note: - adds a single space   - adds two spaces   - adds four spaces

Output



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Create simple static web pages using CSS

Objectives: At the end of this exercise you shall be able to
- **display a text message using HTML program**
- **display a paragraph using HTML program.**

Requirements

Tools/Equipment/Machines

- A Working PC with windows OS - 1 No.

PROCEDURE

TASK 1: **CSS syntax, Adding colors, fonts, backgrounds, images borders, text alignment, text transformation, Lists etc**

Program:

```
<!DOCTYPE html>
<html>
<head>
    <!-- Style of h1 selector for color, text-align, background and border -->
    <!-- Style of p selector for Paragraph -->
    <!-- Style of body selector for body -->
    <!-- Style of bordering selector for border image -->
    <!-- Style of div selector for text-transform -->
  <style>
   h1    {color: Orange;
          text-align: center;
          background-color:DodgerBlue;
          border: 2px solid Tomato;}
   p {background-color:Violet}
   body{  background-color: lightblue;}
   #borderimg1 {
   border: 10px solid transparent;
          padding: 15px;
   border-image: url(border.png) 50 round;}
   #borderimg2 {
          border: 10px solid transparent;
          padding: 15px;
   border-image: url(border.png) 20% round;}
   #borderimg3 {
          border: 10px solid transparent;
          padding: 15px;
          border-image: url(border.png) 30% round; }
     div.a {  text-transform: uppercase;}
     div.b {  text-transform: lowercase;}
     div.c {  text-transform: capitalize;}
    </style>
</head>
<body>
    <h1>Welcome to National Instructional Media Institute</h1>
    <p id="borderimg1"> National Instructional Media Institute (NIMI) was set up in the name of Central Instructional Media Institute (CIMI) in Chennai in December 1986 by the Government of India.</p>
    <p id="borderimg2"> It as a Subordinate Office under Directorate General of Employment and Training (DGE&T) with the assistance from Government of Germany through GTZ (German Agency for Technical Co-operation) as the executing agency. </p>
    <img id="borderimg3" src="1.jpg" alt="Mountains" width="300" height="200">
    <div class="a">Thank You </div>
    <div class="b">Thank You </div>
    <div class="c">Thank You </div>
</body>
</html>
```

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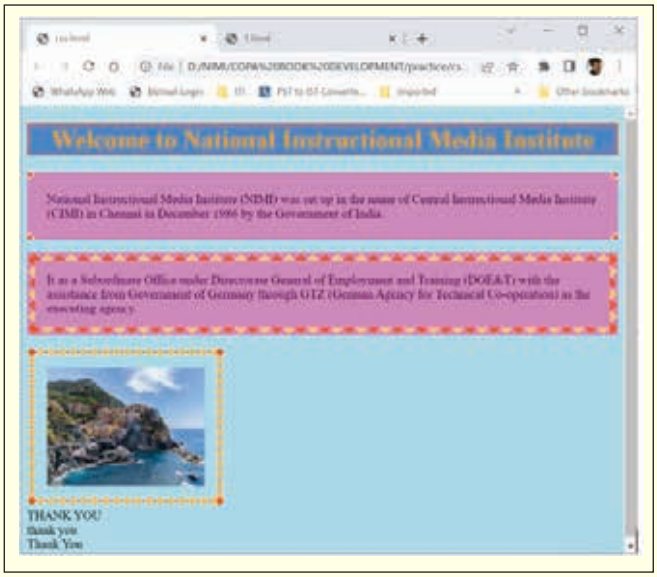
Output:



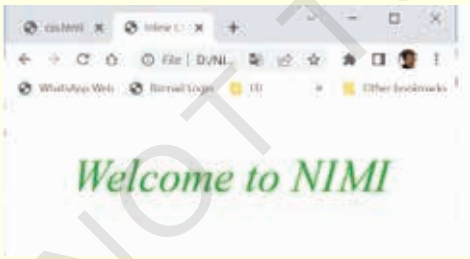
TASK 2: **3 types of CSS**

Inline CSS

Inline CSS contains the CSS property in the body section attached with element is known as inline CSS

```
<!DOCTYPE html>
<html>
  <head>
    <title>Inline CSS</title>
  </head>
  <body>
    <p style = “color:#009900; font-size:50px;
          font-style:italic; text-align:center;”>
       Welcome to NIMI
    </p>
  </body>
</html>
```

Output:



Internal or Embedded CSS

This can be used when a single HTML document must be styled uniquely. The CSS rule set should be within the HTML file in the head section.

```
<!DOCTYPE html>
<html>
   <head>
        <title>Internal CSS</title>
        <style>
                .a {
                        text-align:center;
                  }
                .b{
                        color:#009900;
                        font-size:50px;
                        font-weight:bold;
                  }
                .c {
                        font-style:bold;
                        font-size:20px;
                  }
        </style>
   </head>
   <body>
        <div class = “a”>
<div class =”b”>National Instructional Media Institute
   (NIMI) </div>
                <div class =”c”>
                        a NIMI portal for Online Books
                </div>
        </div>
   </body>
</html>
```

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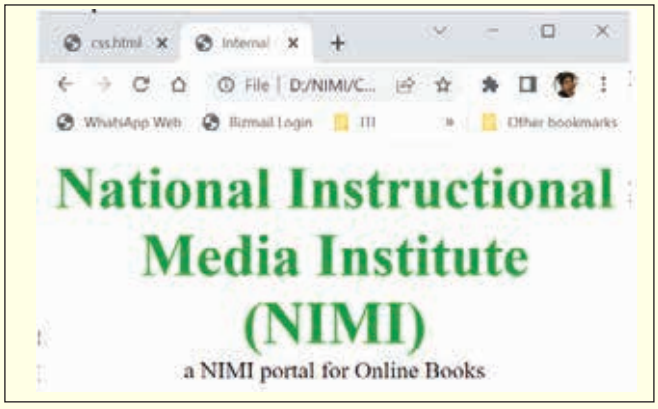
Output:



External CSS

External CSS contains separate CSS file which contains only style property with the help of tag attributes. CSS property written in a separate file with .css extension and should be linked to the HTML document using link tag. This means that for each element, style can be set only once and that will be applied across web pages.

Example: The file given below contains CSS property. This file save with .css extension. For Ex: sty.css

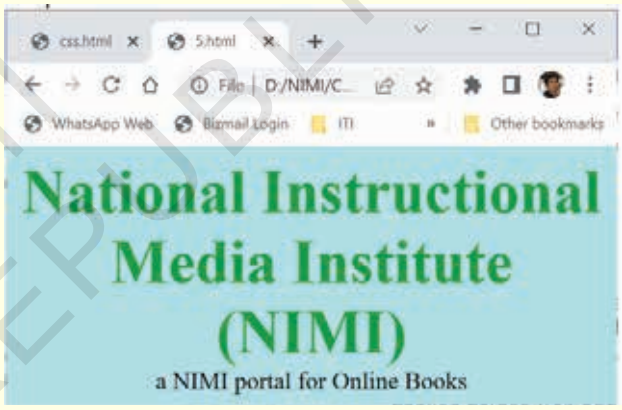
```
body {  background-color:powderblue;}
.a {    text-align:center;   }
.b {
   color:#009900;
   font-size:50px;
   font-weight:bold;}
#c {
   font-style:bold;
   font-size:20px;}
```

- link tag is used to link the external style sheet with the html webpage.
- href attribute is used to specify the location of the external style sheet file.

Main Program

```
<!DOCTYPE html>
<html>
   <head>
        <link rel=”stylesheet” href=”sty.css”/>
   </head>
   <body>
        <div class = “a”>
             <div class =”b”>National Instructional
   Media Institute (NIMI)</div>
             <div id =”c”>
                  a NIMI portal for Online Books
             </div>
        </div>
   </body>
</html>
```

Output:



TASK 3: **Adding a Navigation Bars(vertical/horizontal bars)**

Vertical Bar Menu:

```
<!DOCTYPE html>
<html>
<head>
<style>
body {
margin: 0;
}
ul {
list-style-type: none;
margin: 0;
padding: 0;
width: 25%;
background-color: #f1f1f1;
position: fixed;
height: 100%;
  overflow: auto;
}
li a {
  display: block;
  color: #000;
  padding: 8px 16px;
  text-decoration: none;
}
li a.active {
  background-color: #04AA6D;
  color: white;
}
li a:hover:not(.active) {
  background-color: #555;
  color: white;
}
```

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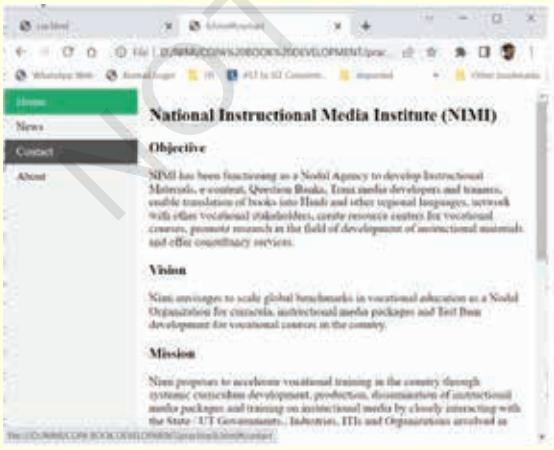
```
</style>
</head>
<body>
<ul>
 <li><a class=”active” href=”#home”>Home</a></li>
 <li><a href=”#news”>News</a></li>
 <li><a href=”#contact”>Contact</a></li>
 <li><a href=”#about”>About</a></li>
</ul>
   <div style=”margin-left:25%;padding:1px 16px;height:1000px;”>
  <h2>National Instructional Media Institute (NIMI)</h2>
 <h3>Objective</h3>
 <p>NIMI has been functioning as a Nodal Agency to develop Instructional Materials, e-content, Question Banks, Train media developers and trainers, enable translation of books into Hindi and other regional languages, network with other vocational stakeholders, create resource centers for vocational courses, promote research in the field of development of instructional materials and offer consultancy services.</p>
 <h3>Vision</h3>
  <p>Nimi envisages to scale global benchmarks in vocational education as a Nodal
        Organization for curricula, instructional media packages and Test Item development for vocational courses in the country.</p>
 <h3>Mission</h3>
 <p>Nimi proposes to accelerate vocational training in the country through systemic
   curriculum development, production, dissemination of instructional media packages and training on instructional media by closely interacting with the State / UT Governments., Industries, ITIs and Organizations involved in Vocational Training.</p>
</div>
</body>
</html>
```

Output:



horizontal bar Menu:

```
   <!DOCTYPE html>
   <html>
   <head>
   <style>
   ul {
    list-style-type: none;
    margin: 0;
   padding: 0;
   overflow: hidden;
   background-color: #333;
   }
   li {
float: left;
     border-right:1px solid #bbb;
   }
   li:last-child {
         border-right: none;
   }
   li a {
   display: block;
   color: white;
   text-align: center;
   padding: 14px 16px;
   text-decoration: none;
   }
   li a:hover:not(.active) {
   background-color: #111;
   }
   .active {
   background-color: #04AA6D;
   }
   </style>
   </head>
   <body>
   <ul>
 <li><a class=”active” href=”#home”>Home</a></li>
 <li><a href=”#news”>News</a></li>
 <li><a href=”#contact”>Contact</a></li>
  <li style=”float:right”><a href=”#about”>About</a></li>
   </ul>
<div style=”margin-left:0%;padding:1px 16px;height:1000px;”>
  <h2>National Instructional Media Institute (NIMI)</h2>
 <h3>Objective</h3>
 <p>NIMI has been functioning as a Nodal Agency to develop Instructional Materials, e-content, Question Banks, Train media developers and trainers, enable translation of books into Hindi
```

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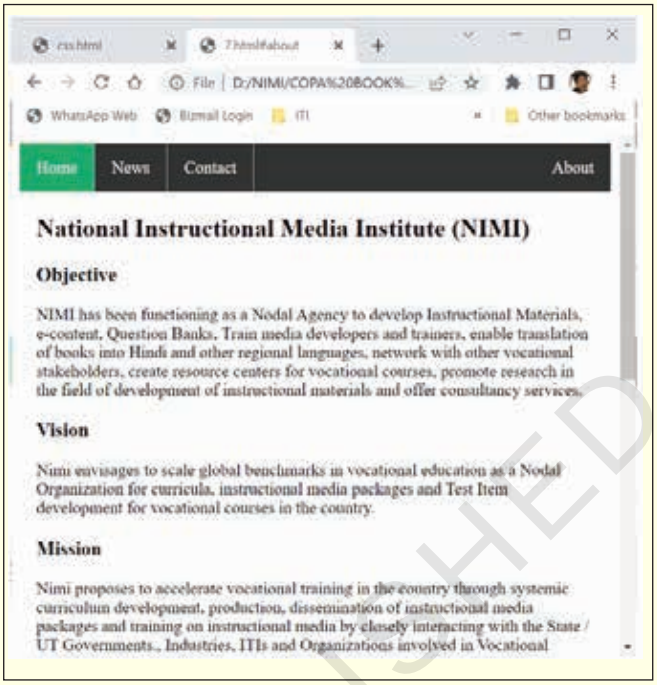
```
and other regional languages, network with other vocational stakeholders, create resource centers for vocational courses, promote research in the field of development of instructional materials and offer consultancy services.</p>
<h3>Vision</h3>
<p>Nimi envisages to scale global benchmarks in vocational education as a Nodal
Organization for curricula, instructional media packages and Test Item development for vocational courses in the country.</p>
<h3>Mission</h3>
<p>Nimi proposes to accelerate vocational training in the country through systemic
curriculum development, production, dissemination of instructional media packages and training on instructional media by closely interacting with the State / UT Governments., Industries, ITIs and Organizations involved in
Vocational Training.</p>
</div>
</body>
</html>
```

Output:



— — — — — —

TASK 4: **CSS drop downs & Forms**

From the Task3 adding drop Downs

Program:

```
<!DOCTYPE html>
<html>
<head>
<style>
ul {
list-style-type: none;
margin: 0;
padding: 0;
overflow: hidden;
background-color: #333;
}
li {
float: left;
border-right:1px solid #bbb;
}
li:last-child {
border-right: none;
}
li a {
display: block;
color: white;
text-align: center;
padding: 14px 16px;
text-decoration: none;
}
li a:hover:not(.active) {
background-color: #111;
}
.active {
background-color: #04AA6D;
}
li a:hover, .dropdown:hover .dropbtn {
background-color: green;
}
li.dropdown {
display: inline-block;
}
.dropdown-content {
display: none;
position: absolute;
background-color: #f9f9f9;
min-width: 160px;
box-shadow: 0px 8px 16px 0px rgba(0,0,0,0.2);
z-index: 1;
}
.dropdown-content a {
color: green;
padding: 12px 16px;
text-decoration: none;
display: black;
text-align: left;
}
```

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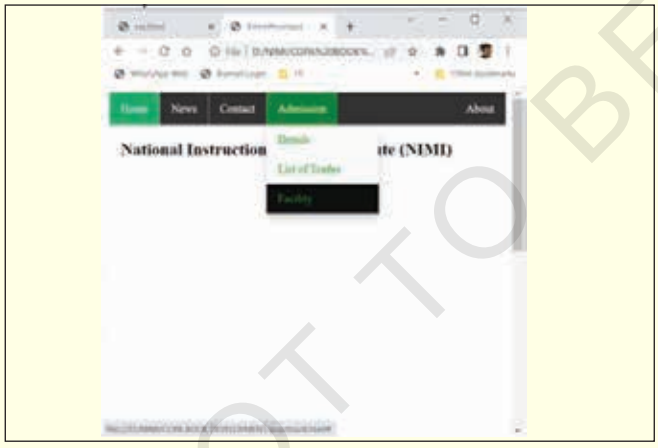
```
.dropdown-content a:hover {background-color: #f1f1f1;
}
.dropdown:hover .dropdown-content {
 display: block;
}
</style>
</head>
<body>
<ul>
 <li><a class=”active” href=”#home”>Home</a></li>
 <li><a href=”#news”>News</a></li>
 <li><a href=”#contact”>Contact</a></li>
  <li style=”float:right”><a href=”#about”>About</a></
   li>
 <li class=”dropdown”>
                          <a href=”javascript:void(0)”
   class=”dropbtn”>Admission</a>
  <div class=”dropdown-content”>
    <a href=”#”>Details</a>
    <a href=”#”>List of Trades</a>
    <a href=”#”>Facility</a>
</ul>
   <divstyle=”margin-left:0%;padding:1px
   16px;height:1000px;”>
  <h2>National Instructional Media Institute (NIMI)</
   h2>
</div>
</body>
</html>
```

Output:



CSS Form:

Program:

```
<!DOCTYPE html>
<html>
<head>
<style>
* {
  box-sizing: border-box;
}
input[type=text], select, textarea {
  width: 100%;
  padding: 12px;
  border: 1px solid #ccc;
  border-radius: 4px;
  resize: vertical;
}
label {
  padding: 12px 12px 12px 0;
  display: inline-block;
}
input[type=submit] {
  background-color: #04AA6D;
  color: white;
  padding: 12px 20px;
  border: none;
  border-radius: 4px;
  cursor: pointer;
  float: right;
}
input[type=submit]:hover {
  background-color: #45a049;
}
.container {
  border-radius: 5px;
  background-color: #f2f2f2;
  padding: 20px;
}
.col-25 {
  float: left;
  width: 25%;
  margin-top: 6px;
}
.col-75 {
  float: left;
  width: 75%;
  margin-top: 6px;
}
/* Clear floats after the columns */
.row:after {
  content: “”;
  display: table;
  clear: both;
}
/* Responsive layout - when the screen is less than
    600px wide, make the two columns stack on top of
    each other instead of next to each other */
@media screen and (max-width: 600px) {
  .col-25, .col-75, input[type=submit] {
    width: 100%;
```

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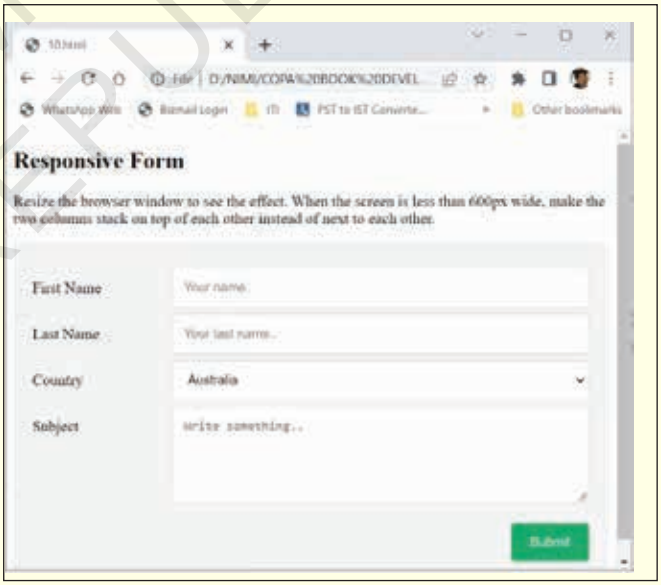
```
  margin-top: 0;
 }
}
</style>
</head>
<body>
<h2>Responsive Form</h2>
   <p>Resize the browser window to see the effect. When the screen is less than 600px wide, make the two columns stack on top of each other instead of next to each other.</p>
<div class="container">
 <form action="/action_page.php">
 <div class="row">
  <div class="col-25">
   <label for="fname">First Name</label>
  </div>
  <div class="col-75">
      <input type="text" id="fname" name="firstname" placeholder="Your name..">
  </div>
 </div>
 <div class="row">
  <div class="col-25">
   <label for="lname">Last Name</label>
  </div>
  <div class="col-75">
      <input type="text" id="lname" name="lastname" placeholder="Your last name..">
  </div>
 </div>
 <div class="row">
  <div class="col-25">
   <label for="country">Country</label>
  </div>
  <div class="col-75">
   <select id="country" name="country">
    <option value="australia">Australia</option>
    <option value="canada">Canada</option>
    <option value="usa">USA</option>
   </select>
  </div>
 </div>
 <div class="row">
  <div class="col-25">
   <label for="subject">Subject</label>
  </div>
  <div class="col-75">
      <textarea id="subject" name="subject" placeholder="Write something.." style="height:100px"></textarea>
  </div>
 </div>
 <br>
 <div class="row">
  <input type="submit" value="Submit">
 </div>
 </form>
</div>
</body>
</html>
```

Output:



TASK 5: **CSS counters and website layout, Multiple backgrounds & Putting the stylesheet in a separate file**

CSS counters

```
<!DOCTYPE html>
<html>
<head>
<style>
body {
 counter-reset: section;
}
h1 {
 counter-reset: subsection;
}
h1::before {
 counter-increment: section;
 content: "Section " counter(section) ". ";
```

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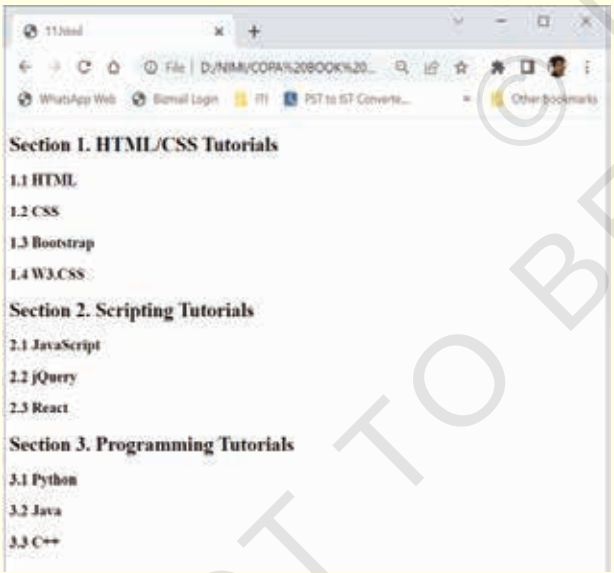
```
  }
  h2::before {
counter-increment: subsection;
content: counter(section) "." counter(subsection) " ";
  }
  </style>
  </head>
  <body>
  <h1>HTML/CSS Tutorials</h1>
  <h2>HTML</h2>
  <h2>CSS</h2>
  <h2>Bootstrap</h2>
  <h2>W3.CSS</h2>
  <h1>Scripting Tutorials</h1>
  <h2>JavaScript</h2>
  <h2>jQuery</h2>
  <h2>React</h2>
  <h1>Programming Tutorials</h1>
  <h2>Python</h2>
  <h2>Java</h2>
  <h2>C++</h2>
  </body>
  </html>
```

Output:



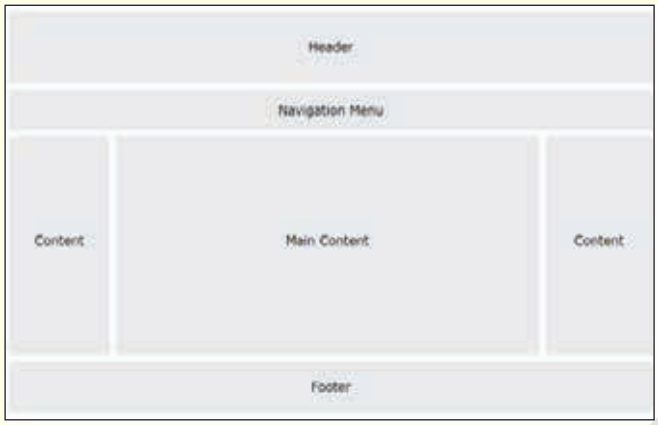
CSS website layout

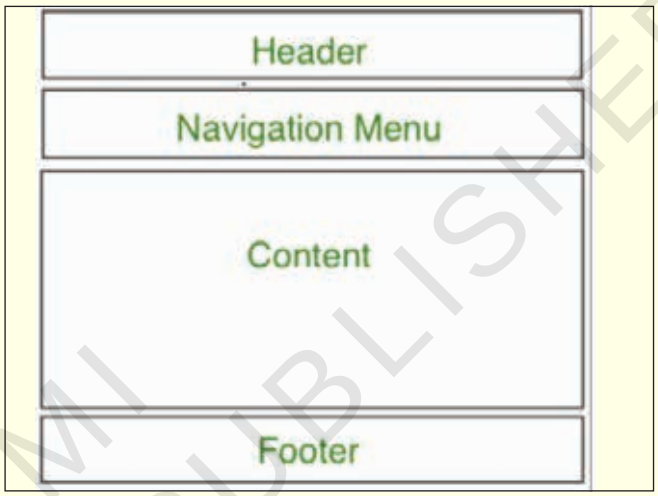
A website is often divided into headers, menus, content and a footer:

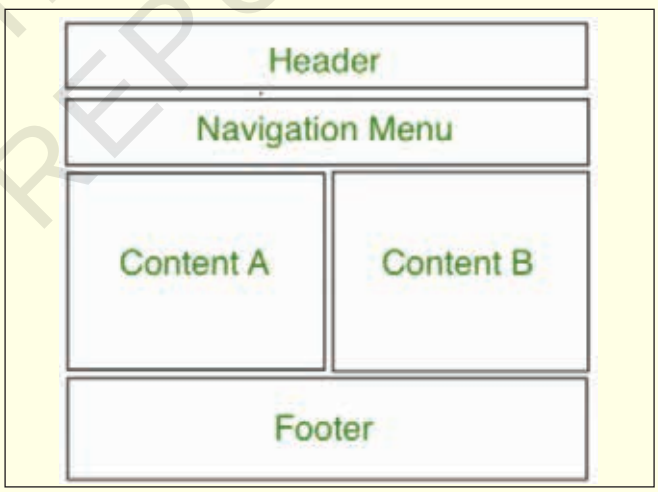
Content Section: The content section is the main body of the website. The user can divide content section in n-column layout.

The most common layouts are:

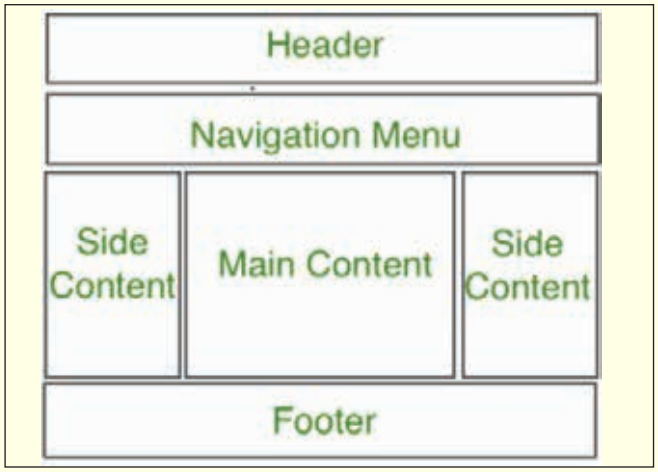
- 1-Column Layout: It is mostly used for mobile layout.
- 2-Column Layout: This website layout is mostly used for tablets or laptops.







- 3-Column Layout: This website layout is mostly used for desktops.



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The user can also create a responsive layout where the layout will get changed as per screen size. Consider the below example where if width of screen is more than 600px then there will be 3-column layout and if width of screen is between 400px to 600px then there will be 2-column layout and if screen size less than 400px then 1-column layout will display.

Program:

```
<!DOCTYPE html>
<html>
  <head>
    <title>
      Website Layout
    </title>
    <style>
      * {
        box-sizing: border-box;
      }

      /* CSS property for header section */
      .header {
        background-color: green;
        padding: 15px;
        text-align: center;
      }

      /* CSS property for navigation menu */
      .nav_menu {
        overflow: hidden;
        background-color: #333;
      }
      .nav_menu a {
        float: left;
        display: block;
        color: white;
        text-align: center;
        padding: 14px 16px;
        text-decoration: none;
      }
      .nav_menu a:hover {
        background-color: white;
        color: green;
      }
      /* CSS property for content section */
      .columnA, .columnB, .columnC {
        float: left;
        width: 31%;
        padding: 15px;
        text-align:justify;
      }
      h2 {
        color:green;
        text-align:center;
      }
      /* Media query to set website layout
      according to screen size */
      @media screen and (max-width:600px)
{
        .columnA, .columnB, .columnC
{
          width: 50%;
        }
      }
    @media screen and (max-width:400px) {
      .columnA, .columnB, .columnC {
        width: 100%;
      }
      }
    </style>
</head>
<body>
    <!-- header of website layout -->
    <div class = “header”>
      <h2 style = “color:white;font-
size:100%”>
        National Instructional Media
Institute (NIMI)
      </h2>
    </div>
    <!-- navigation menu of website layout -->
    <div class = “nav_menu”>
      <a href = “#”>Home</a>
      <a href = “#”>About</a>
      <a href = “#”>Contact</a>
    </div>
    <!-- Content section of website layout -->
    <div class = “row”>

      <div class = “columnA”>
        <h2>Column A - Objective</
h2>
<p>NIMI has been functioning as a Nodal Agency to develop Instructional Materials, e-content, Question Banks, Train media developers and trainers, enable translation of books into Hindi and other regional languages, network with other vocational stakeholders, create resource centers for vocational courses, promote research in the field of development of instructional materials and offer consultancy services.</p>
      </div>
      <div class = “columnB”>
```

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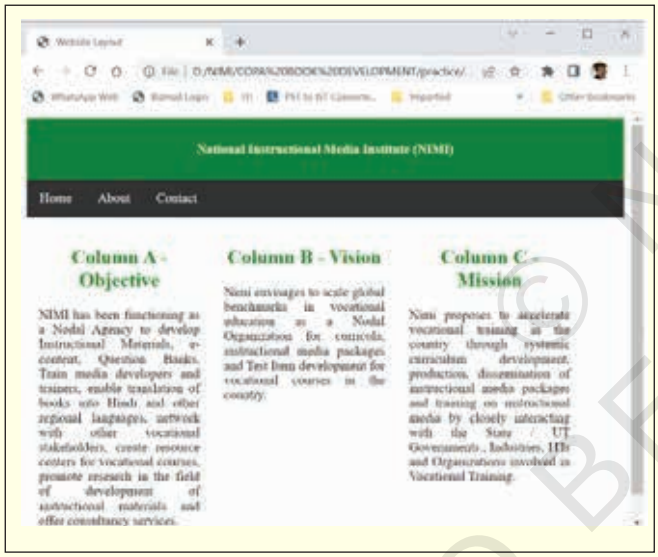
```
                <h2>Column B - Vision</h2>
                <p>Nimi envisages to scale global benchmarks in vocational education as a Nodal Organization for curricula, instructional media packages and Test Item development for vocational courses in the country.</p>
            </div>
            <div class = “columnC”>
                <h2>Column C - Mission</h2>
    <p>Nimi proposes to accelerate vocational training in the country through systemic curriculum development, production, dissemination of instructional media packages and training on instructional media by closely interacting with the State / UT Governments., Industries, ITIs and Organizations involved in Vocational Training.</p>
            </div>
        </div>
    </body>
</html>
```

Output:



Multiple backgrounds & Putting the stylesheet in a separate file

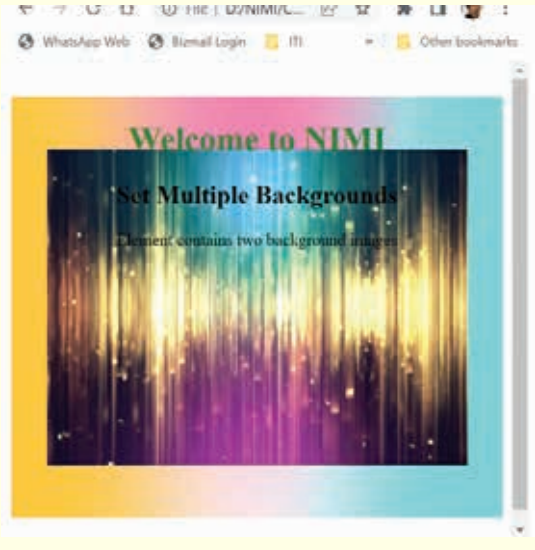
Multiple Background CSS properties created as separate file: Save the file as stys.css

```
body {
        text-align:center;
    }
    h1 {
        color: green;
    }
    #GFG {
        background-image:
        url(3.jpg),
        url(2.jpg);
        background-position: center, center;
        background-repeat: no-repeat, no-repeat;
        background-size: 400px 300px, 500px 400px;
        padding:25px;
        height:400px;
    }
```

Main Program:

```
<!DOCTYPE html>
<html>
<head>
    <link rel=”stylesheet” href=”stys.css”/>
</head>
<body>
    <div id = “GFG”>
        <h1>Welcome to NIMI</h1>
        <h2>Set Multiple Backgrounds</h2>
        <p>
        Element contains two background images
        </p>
    </div>
</body>
</html>
```

Output:



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TASK 6: **CSS Animations & CSS Buttons**

CSS Animations

Example1:

```
<!DOCTYPE html>
<html>
<head>
   <style>
   #a {
         animation-name: color;
         animation-duration: 10s;
         padding-top: 30px;
         padding-bottom: 30px;
         font-family: Times New Roman;
         }
   #a1{
         animation-name: text;
         animation-duration: 5s;
         animation-iteration-count: infinite;
   }
   #b {
         font-size: 40px;
         text-align: center;
         font-weight: bold;
         color: #090;
         padding-bottom: 5px;
   }
   #c {
         font-size: 17px;
         font-weight: bold;
         text-align: center;
   }
   @keyframes color {
         0% {
                  background-color: red;
         }
         50% {
                  background-color: orange;
         }
         100% {
                  background-color: green;
         }
   }

   @keyframes text {
         from {
         margin-top: 400px;
         }
         to {
         margin-top: 0px;
         }
   </style>
</head>

<body>
   <div id="a1">
         <div id="a">
         <div id="b">Welcome to NIMI</div>
         <div id="c">a NIMI portal for Online Books</
   div>
         </div>
   </div>
</body>
</html>
```

Output:

Example 2

```
<!DOCTYPE html>
<html>
<head>
   <style>
   .a {
         font-size: 40px;
         text-align: center;
         font-weight: bold;
         color: #090;
         padding-bottom: 5px;
         font-family: Times New Roman;
   }
   .b {
         font-size: 17px;
         font-weight: bold;
         text-align: center;
         font-family: Times New Roman;
   }
   h2 {
         width: 550px;
         animation-name: text;
         animation-duration: 4s;
         animation-iteration-count: infinite;
```

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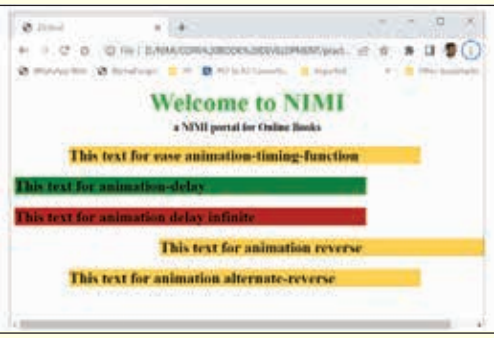
```
        background-color: rgb(255, 210, 85);
    }
    #one {
        animation-timing-function: ease;
    }
    #two {
        animation-name: color;
        animation-duration: 10s;
    }
    #three {
        animation-name: color;
        animation-duration: 2s;
        animation-iteration-count: infinite;
    }
    #four {
        animation-direction: reverse;
    }
    #five {
         animation-direction: alternate-reverse;
    }
    @keyframes text {
        from {
                margin-left: 100%;
        }
        to {
                margin-left: 0%;
        }
    }
    @keyframes color {
        from {
         background-color: red;
        }
        to {
        background-color: green;
        }
    </style>
</head>
<body>
    <div class="a">Welcome to NIMI</div>
    <div class="b">a NIMI portal for Online Books</div>
    <h2 id="one">This text for ease animation-timing-
    function</h2>
    <h2 id="two">This text for animation-delay</h2>
    <h2 id="three">This text for animation delay infinite</
    h2>
    <h2 id="four">This text for animation reverse</h2>
    <h2 id="five">This text for animation alternate-
    reverse</h2>
</body>
</html>
```

Output:



CSS Buttons

Example1:

```
<!DOCTYPE html>
<html>
<head>
    <title> button background Color </title>
    <style>
    .button {
        background-color: red;
        color: white;
        text-align: center;
        font-size: 20px;
    }
    .b1 {
        /* Set border property */
        border: none;
    }
    .b2 {
        /* Set border property */
        border: 2px black solid;
    }
    .b3 {
        /* Set border property */
        border: 2px black dashed;
    }
    .b4 {
        /* Set border property */
        border: 2px black double;
    }
    .b5 {
        /* Set border property */
        border: 2px black groove;
    }
    </style>
</head>
<body>
    <button class="button b1">None</button>
    <button class="button b2">Solid</button>
    <button class="button b3">Dashed</button>
```

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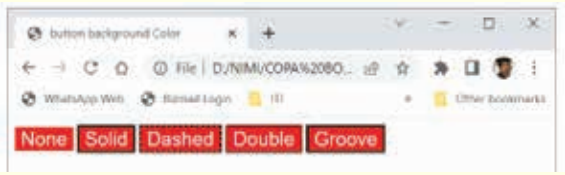
```
    <button class="button b4">Double</button>
    <button class="button b5">Groove</button>
</body>
</html>
```

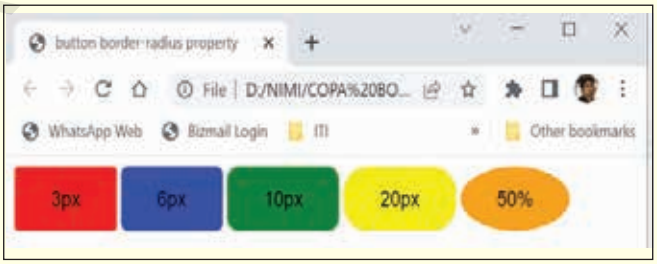
Output:



Example 2:

```
<!DOCTYPE html>
<html>
<head>
    <title> button border-radius property </title>
    <style>
    .b {
        padding: 15px 32px;
        border: none;
        font-size: 16px;
    }

    .b1 {
        background-color: red;
        border-radius: 3px;
    }

    .b2 {
        background-color: blue;
        border-radius: 6px;
    }

    .b3 {
        background-color: green;
        border-radius: 10px;
    }

    .b4 {
        background-color: yellow;
        border-radius: 20px;
    }

    .b5 {
        background-color: orange;
        border-radius: 50%;
    }
    </style>
</head>

<body>
    <button class="b b1">3px </button>
    <button class="b b2">6px</button>
    <button class="b b3">10px</button>
    <button class="b b4">20px</button>
    <button class="b b5">50%</button>
</body>
</html>
```

Output:



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Practicing the JavaScript in creating dynamic HTML pages

Objectives: At the end of this exercise you shall be able to
- **create javascript code in the <Head > section of HTML page**
- **create javascript code in the <Body > section of HTML page**
- **create javascript code in the <Head > and <Body> section of HTML page**
- **create and run sample JavaScript code.**

PROCEDURE

TASK 1 : **Create Javasscript code in the <Head > section of HTML page**

Note to instructor : To run JavaScript, any modern browser should be installed as all modern browser can run JavaScript by default.

1 Open Notepad.

2 Type the following code.

```
<html>
<head>
<script>
function myFunction() {
document.write("hello");
document.write(" world");
}
</script>
</head>
<body>
<h1>My Web Page</h1>
<button type="button" onclick="myFunction()">Try it</button>
</body>
</html>
```

3 Click Save.

4 Type filename as page1.html.

5 Select file type as All Files.

6 Select destination in Desktop or any other location. Click Save.

7 Close Notepad.

8 Now go to the file destination.

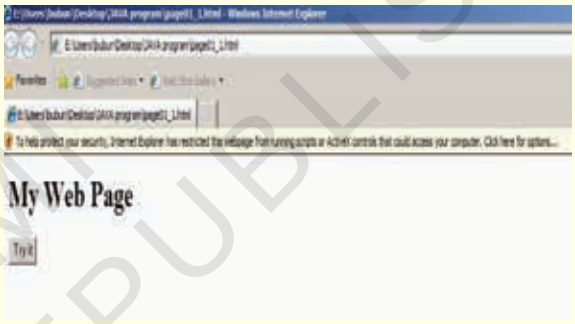
9 Double Click it to run.

10 Browser can show you a warning. (Fig 1)

11 If warning is shown, click yellow warning bar.

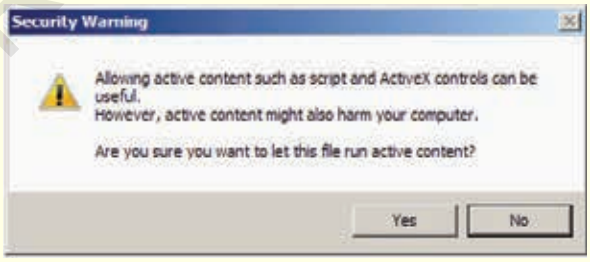
12 Select Allow Blocked Content.

Fig 1



13 A security warning can be shown (Fig 2).

Fig 2

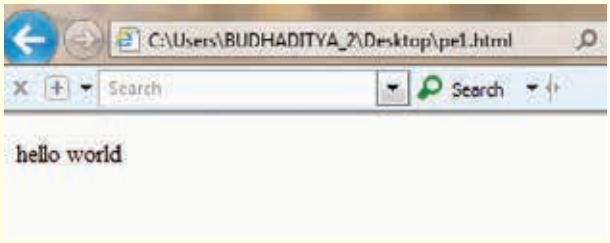


14 Click yes.

15 Now click "Try it" to run the javascript code in the page.

16 Hello World would be shown as output. (Fig 3).

Fig 3



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TASK 2 : **Create Javasscript code in the <Body > section of HTML page**

1 Write and save following code and save with access.html.

```
<html>
<body>
<p id="p1">Hello World!</p>
<script>
document.getElementById("p1").innerHTML = "New text!";
</script>
</body>
</html>
```

2 Run it by double clicking this file name.

3 It will show the following output.

New text!

— — — — — — — —

TASK 3: **Create JavaScript code in the <Head> and <Body> section of an HTML page.**

1 Create and run the following JavaScript code.

```
<!DOCTYPE html>
<head>
<title> Script in head and body section </title>
<script type = “text/javascript”>
document.writeln(“Good Morning”);
</script>
</head>
<body>
<script type = “text/javascript”>
alert(“Good Evening”);
</script>
</body>
</html>
```

2 Run the code and check the output.

— — — — — — — —

TASK 4: **Create and run sample JavaScript code.**

1 Create and run the following JavaScript code.

```
<!DOCTYPE html>
<html>
<body>
<h1 id="header">Old Header</h1>
<script>
var element = document.getElementById("header");
element.innerHTML = "New Header";
</script>
</body>
</html>
```

2 Create and run the following JavaScript code.

```
<!DOCTYPE html>
<html>
<body>
<img id="myImage" src="smiley.gif">
<script>
document.getElementById("myImage").src= "landscape.jpg";
</script>
</body>
</html>
```

3 Change the Value of an Attribute

To change the value of an HTML attribute, use this syntax:

document.getElementById(id).**attribute=new value**

— — — — — — — —

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Embed JavaScript in HTML to Display Information in Web pages

Objectives: At the end of this exercise you shall be able to
- **use external javascript files in HTML**
- **display information with javascript.**

PROCEDURE

TASK 1 : **Using external JavaScript files in HTML**

1 Open Notepad.

2 Type the following code.

```
function myFunction() {
document.write("hello");
document.write(" world");
}
```

3 Click Save.

4 Type filename as myscript.js.

5 Select file type as All Files.

6 Select destination in Desktop or any other location. Click Save.

7 Close Notepad.

8 Open Notepad again.

9 Type the following code. (Fig 2)

```
<html>
<head>
<script type="text/javascript" src=" myscript.js"> </script>
</head>
<body>
<h1>My Web Page</h1>
<button type="button" onclick="myFunction()">Try it</button>
</body>
</html>
```

10 Click Save.

11 Type filename as js2102.html

12 Select file type as All Files.

13 Select destination in Desktop or any other location. Click Save.

14 Close Notepad.

15 Now go to the file destination.

16 Double Click it to run.

17 See the output as shown in Fig 1 & Fig 2.

Fig 1

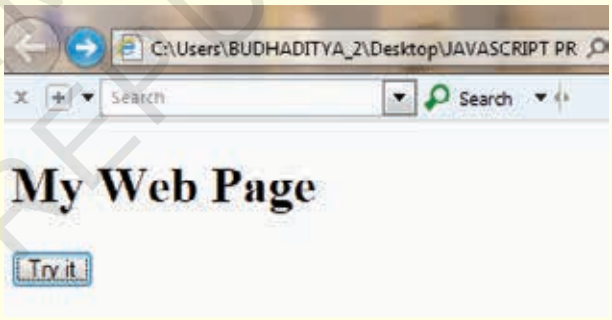
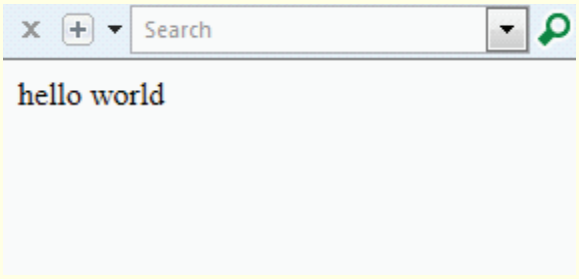


Fig 2



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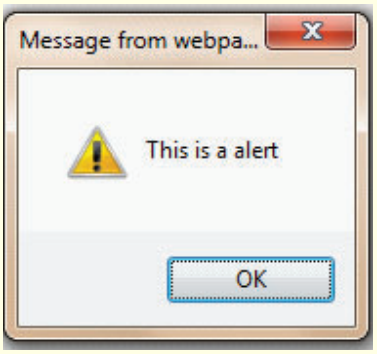
TASK 2 : **Display information with JavaScript**

1 Write the code and save it with jc21021.html.

```
<html>
<head>
<title>A Web page</title>
<script type="text/javascript">
function anotherAlert(textAlert) {
alert(textAlert);
}
anotherAlert("This is a alert");
</script>
<body>
<h1>Web Page with Alert</h1>
</body>
</html>
```

Fig 3



2 Run the code and see the output.(Fig 3)

— — — — — — — —

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Use error handling techniques in JavaScript

Objectives: At the end of this exercise you shall be able to
- **use try-catch in JavaScript**
- **use finally in JavaScript**
- **use throw in JavaScript**
- **use onerror() method in JavaScript.**

PROCEDURE

TASK 1: **Use try-catch in javascript**

1 Open Notepad

2 Type the following code

```
<html>
<head>
<script type="text/javascript">
 function myFunc()
{
var a = 100;
try {
alert("Value of variable a is : " + a );
 }
catch ( e ) {
alert("Error: " + e.description );
}
}
</script>
</head>
<body>
<p>Click the following to see the result:</p>
<form>
<input type="button" value="Click Me"
onclick="myFunc();" />
</form>
</body>
</html>
```

3 Click Save

4 Type filename as ErrorHandling1.html

5 Select file type as All Files.

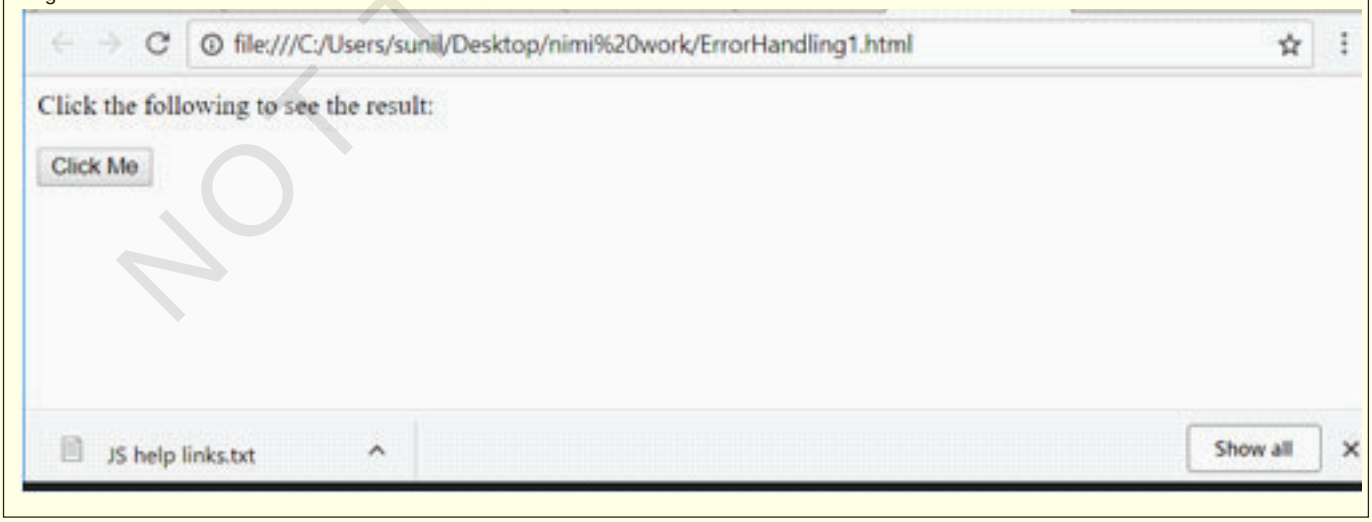
6 Select desktop or any other location. Click Save

7 Close Notepad

8 Now run the html file to see the result(fig-1)

9 Click the Click Me button(fig-2)

Fig 1



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TASK 2: **Use finally in javascript**

1 Open Notepad

2 Type the following code

```
<html>
<head>
<script type="text/javascript">
function myFunc()
{
var a = 100;
try {
alert("Value of variable a is : " + a );
}
 catch ( e ) {
alert("Error: " + e.description );
}
finally {
alert("Finally block will always execute!" );
}
}
</script>
</head>
<body>
<p>Click the following to see the result:</p>
<form>
<input type="button" value="Click Me"
onclick="myFunc();" />
</form>
</body>
 </html>
```

3 Click Save

4 Type filename as ErrorHandling2.html

5 Select file type as All Files.

6 Select desktop or any other location. Click Save

7 Close Notepad

8 Now run the html file to see the result (Fig-3)

9 Click on Click Me button (Fig-4)

Fig 3

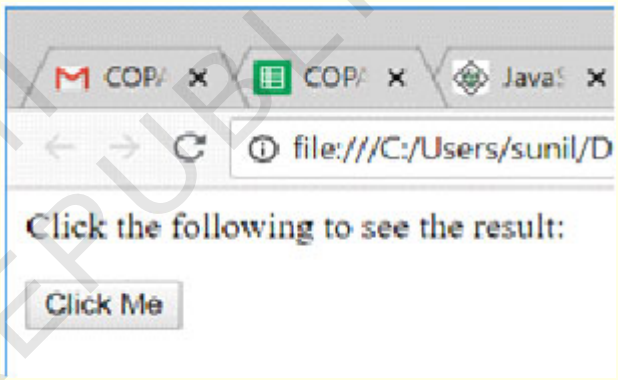
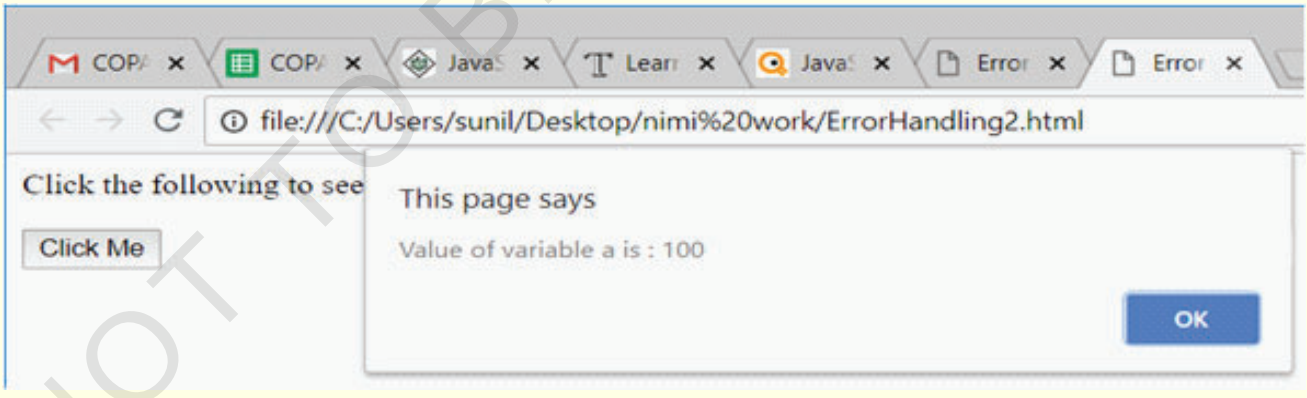


Fig 4



— — — — — — — —

TASK 3: Use throw in javascript

1 Open Notepad

2 Type the following code

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```
<html>
<head>
<script type=”text/javascript”>
 function myFunc()
{
var a = 100;
var b = 0;
try{
if ( b == 0 )
{
throw( “Divide by zero error.” );
}
else
{
 var c = a / b;
}
}
catch ( e ) {
alert(“Error: “ + e );
}
}
```

```
</script>
</head>
<body>
<p>Click the following to see the result:</p>
<form>
<input type=”button” value=”Click Me”
onclick=”myFunc();” />
</form>
</body>
</html>
```

3 Click Save

4 Type filename as ErrorHandling3.html

5 Select file type as All Files.

6 Select desktop or any other location. Click Save

7 Close Notepad

8 Now run the html file to see the result (Fig-5)

9 Click the Click Me button (Fig-6)

Fig 5

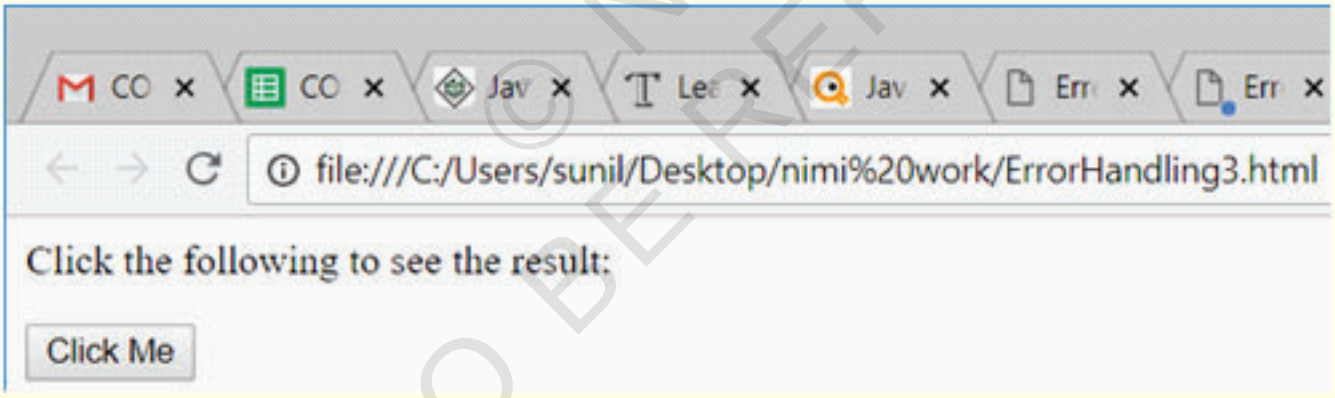
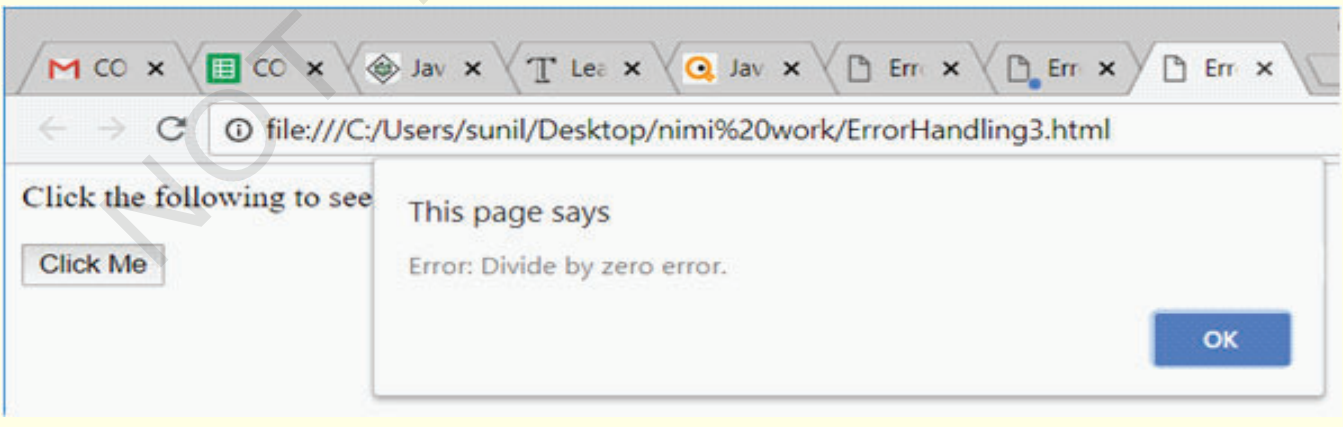


Fig 6



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TASK 4: **Use onerror() Method in javascript**

1 Open Notepad

2 Type the following code

```
<html>
 <head>
 <script type="text/javascript">
  window.onerror = function () {
alert("An error occurred.");
}
</script>
</head>
 <body>
<p>Click the following to see the result:</p>
<form>
<input type="button" value="Click Me"
onclick="myFunc();" />
</form>
</body>
</html>
```

3 Click Save

4 Type filename as ErrorHandling4.html

5 Select file type as All Files.

6 Select desktop or any other location. Click Save

7 Close Notepad

8 Now run the html file to see the result (Fig-7)

9 Click the Click Me button (Fig-8)

Fig 7

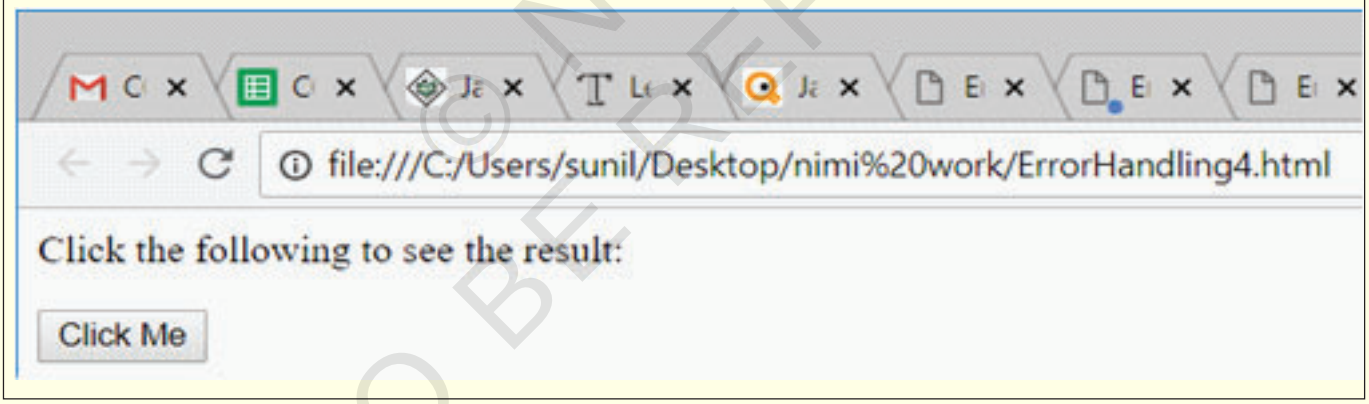
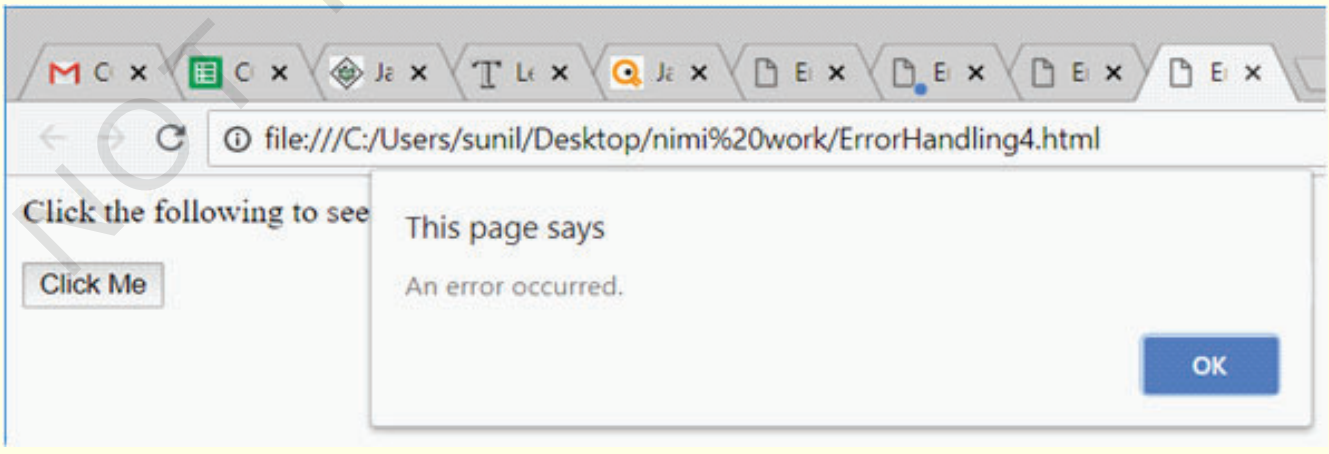


Fig 8



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Use objects and classes in JavaScript

Objectives: At the end of this exercise you shall be able to
- **display add two numbers using function**
- **take input using prompt function**
- **take confirmation using confirm method**
- **using global variable.**

PROCEDURE

TASK 1 : **Display add two numbers using function**

1 Open Notepad.

2 Type the following code.

```
<html>
<head>
<title>Adder</title>
<script>
var a=4;
var b=6;
var c=add(a,b);
alert(c);
function add(a,b) {
return a+b;
}
</script>
</head>
<body>
</body>
</html>
```

3 Click Save.

4 Type filename as add1.html

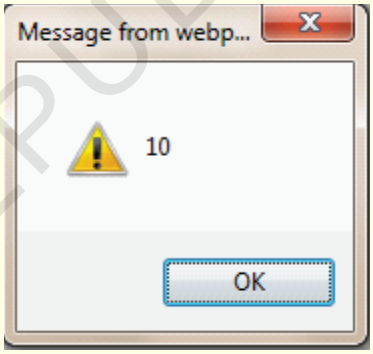
5 Select file type as All Files.

6 Select destination in Desktop or any other location. Click Save.

7 Close Notepad.

8 Now run the html file to see the result. (See Fig 1)

Fig 1



TASK 2: **Take input using prompt function**

1 Open Notepad.

2 Type the following code.

```
<html>
<head>
<title>Prompt</title>
<script>
var a=prompt("Enter a Number:");
var b=prompt("Enter another Number:");
var ch=+prompt("1->Add 2->Sub 3->Mul 4->Div Enter Choice:");
var r=0,fl=0;
switch(ch) {
case 1:
r=add(a,b);
break;
case 2:
r=sub(a,b);
break;
case 3:
r=mul(a,b);
break;
case 4:
r=div(a,b);
break;
```

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```
default:
fl=1;
}
if(fl)
document.write("Invalid choice");
else
document.write("Result is "+r);
function add(a,b) {
return a+b;
}
function sub(a,b) {
return a-b;
}
function mul(a,b) {
return a*b;
}
function div(a,b) {
return a/b;
}
</script>
</head>
<body>
</body>
</html>
```

3 Click Save.

4 Type filename as calcul1.html

5 Select file type as All Files.

6 Select destination in Desktop or any other location. Click Save.

7 Close Notepad.

8 Now run the html file to see the result. (Fig 2 to Fig 5)

Fig 2

Fig 3

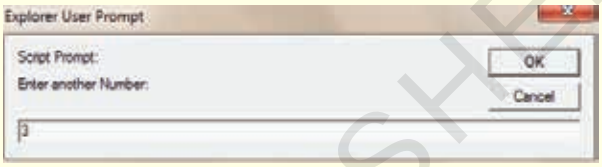


Fig 4

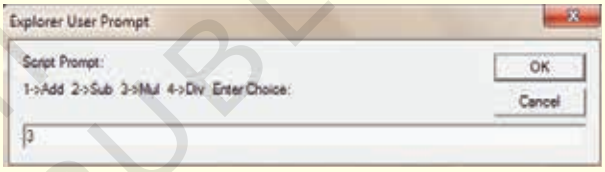
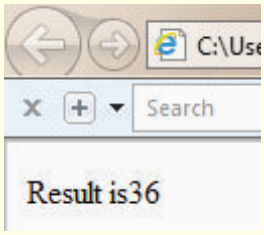


Fig 5



TASK 3 : **Take confirmation using confirm method**

1 Open Notepad.

2 Type the following code.

```
<html>
<head>
<title>Confirm</title>
<script>
var a=confirm("Want to play a game?");
if(a)
document.write("We will play a game now!");
else
document.write("May be next time");
</script>
</head>
<body>
</body>
</html>
```

3 Click Save.

4 Type filename as conf1.html

5 Select file type as All Files.

6 Select destination in Desktop or any other location. Click Save.

7 Close Notepad.

8 Now run the html file to see the result. (Fig 6 to Fig 8)

If Ok is selected.

If cancel is selected

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Fig 6

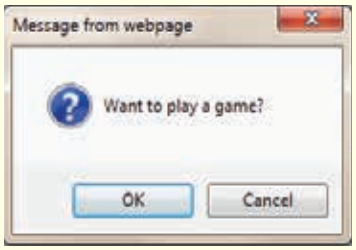


Fig 7

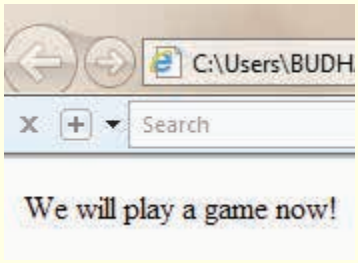
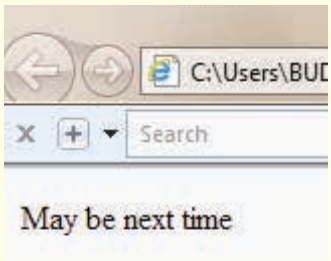


Fig 8



TASK 4 : **Using global variable**

1 Open Notepad.

2 Type the following code.

```
<html>
<body>
<script>
function m()
{
window.value=100;//declaring global variable by window object
}
function n(){
alert(value);//accessing global variable from other function
}
m();
n();
</script>
</body>
</html>
```

3 Click Save.

4 Type filename as vari1.html

5 Select file type as All Files.

6 Select destination in Desktop or any other location. Click Save.

7 Close Notepad.

8 Now run the html file to see the result. (Fig 9)

Fig 9

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Describe Animation and Multimedia using JavaScript

Objectives: At the end of this exercise you shall be able to
- **manual Animation**
- **automated Animation**
- **rollover with a Mouse Event.**

PROCEDURE

TASK 1 : **Manual Animation**

1 Open notepad.

2 Type the following code

```
<html>
  <head>
    <title>JavaScript Animation</title>
    <script type = "text/javascript">
      <!--
        var imgObj = null;

        function init() {
          imgObj = document.getElementById('myImage');
          imgObj.style.position= 'relative';
          imgObj.style.left = '0px';
        }
        function moveRight() {
          imgObj.style.left = parseInt(imgObj.style.left) + 10 + 'px';
        }

        window.onload = init;
      //-->
    </script>
  </head>

  <body>
    <form>
      <img id = "myImage" src = "/images/html.gif" />
      <p>Click button below to move the image to right</p>
      <input type = "button" value = "Click Me" onclick = "moveRight();" />
    </form>
  </body>
</html>
```

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3 Click save

4 Type filename as animation1.html

5 Select file type as all files

6 Select destination in desktop or other location. Click save

7 Close Notepad

8 Now run the html file to see the result (see Fig 1)

Output

Fig 1

TASK 2: **Automated Animation**

1 Open notepad.

2 Type the following code

```
<html>
  <head>
    <title>JavaScript Animation</title>
    <script type = "text/javascript">
      <!--
        var imgObj = null;
        var animate ;

        function init() {
          imgObj = document.getElementById('myImage');
          imgObj.style.position= 'relative';
          imgObj.style.left = '0px';
        }
        function moveRight() {
          imgObj.style.left = parseInt(imgObj.style.left) + 10 + 'px';
          animate = setTimeout(moveRight,20);    // call moveRight in 20msec
        }
        function stop() {
          clearTimeout(animate);
          imgObj.style.left = '0px';
        }

        window.onload = init;
      //-->
    </script>
  </head>

  <body>
    <form>
      <img id = "myImage" src = "/images/html.gif" />
      <p>Click the buttons below to handle animation</p>
      <input type = "button" value = "Start" onclick = "moveRight();" />
      <input type = "button" value = "Stop" onclick = "stop();" />
    </form>
  </body>

</html>
```

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3 Click save

4 Type filename as animation2.html

5 Select file type as all files

6 Select destination in desktop or other location. Click save

7 Close Notepad

8 Now run the html file to see the result (see Fig 2)

Output

Fig 2

TASK 3: **Rollover with a Mouse Event**

1 Open notepad.

2 Type the following code

```
<html>

  <head>
    <title>Rollover with a Mouse Events</title>

    <script type = "text/javascript">
      <!--
        if(document.images) {
          var image1 = new Image();      // Preload an image
          image1.src = "/images/html.gif";
          var image2 = new Image();      // Preload second image
          image2.src = "/images/http.gif";
        }
      //-->
    </script>
  </head>

  <body>
    <p>Move your mouse over the image to see the result</p>

    <a href = "#" onMouseOver = "document.myImage.src = image2.src;"
      onMouseOut = "document.myImage.src = image1.src;">
      <img name = "myImage" src = "/images/html.gif" />
    </a>
  </body>
</html>
```

3 Click save

4 Type filename as animation3.html

5 Select file type as all files

6 Select destination in desktop or other location. Click save

7 Close Notepad

8 Now run the html file to see the result (see Fig:3)

Output

Fig 3

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Develop dynamic HTML pages using JavaScript

Objectives: At the end of this exercise you shall be able to
- **learn how to develop dynamic HTML Pages using JavaScript.**

Requirements

Tools/Equipment/Machines

- A working PC with Windows O.S., Text Editor (Notepad) & Browser - 1 No./batch.

PROCEDURE

TASK 1: **HTML Java script**

1 Open Notepad.

2 Type the following code.

```
<HTML>
<head>
<title>
Method of a JavaScript
</title>
</head>
<body>
<script type="text/javascript">
document.write("JavaTpoint");
</script>
</body>
</html>
```

3 Click Save.

4 Type filename as page1.html.

5 Select file type as All Files.

6 Select destination in Desktop or any other location. Click Save.

7 Close Notepad.

8 Now go to the file destination.

9 Double Click it to run.

10 Browser can show you a warning.

11 If warning is shown, click yellow warning bar.

12 Select Allow Blocked Content.

13 A security warning can be shown.

14 Click yes.

15 Now click "Try it" to run the javascript code in the page.

16 Hello World would be shown as output.

Output:

— — — — — — — —

TASK 2: **JavaScript and HTML event**

Ref Steps 1 to 16 - Task 1

```
<html>
<head>
<title>
DHTML with JavaScript
</title>
<script type="text/javascript">
function dateandtime()
{
```

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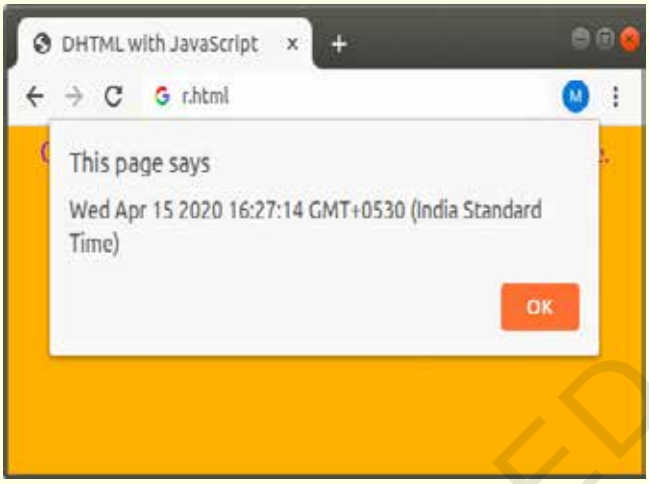
```
alert(Date());
}
</script>
</head>
<body bgcolor="orange">
<font size="4" color="blue">
<center> <p>
Click here # <a href="#" onClick="dateandtime();">
Date and Time </a>
# to check the today's date and time.
</p> </center>
</font>
</body>
</html>
```

Output:

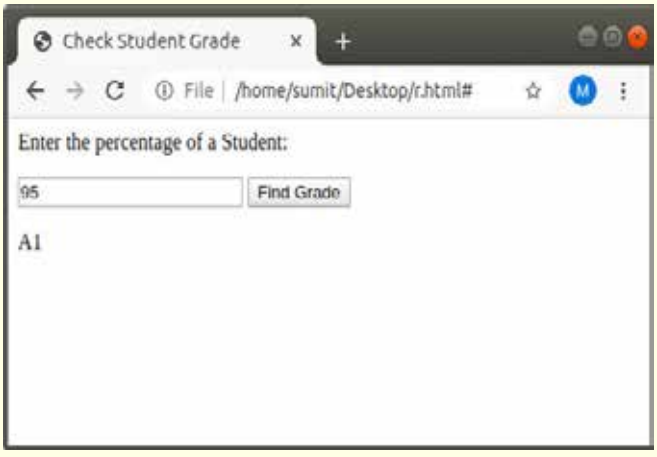


TASK 3: **JavaScript and HTML DOM**

Ref Steps 1 to 16 - Task 1

```
<html>
<head>
<title> Check Student Grade
</title>
</head>

<body>
<p>Enter the percentage of a Student:</p>
<input type="text" id="percentage">
<button type="button" onclick="checkGrade()">
Find Grade
</button>
<p id="demo"></p>
<script type="text/javascript">
function checkGrade() {
var x,p, text;
p = document.getElementById("percentage").value;

x=parseInt(p);



 if (x>90 && x <= 100) {
 document.getElementById("demo").innerHTML =
"A1";
 } else if (x>80 && x <= 90) {
 document.getElementById("demo").innerHTML =
"A2";
 } else if (x>70 && x <= 80) {
 document.getElementById("demo").innerHTML =
"A3";
 }
          }
 </script>
 </body>
 </html>
```

Output:



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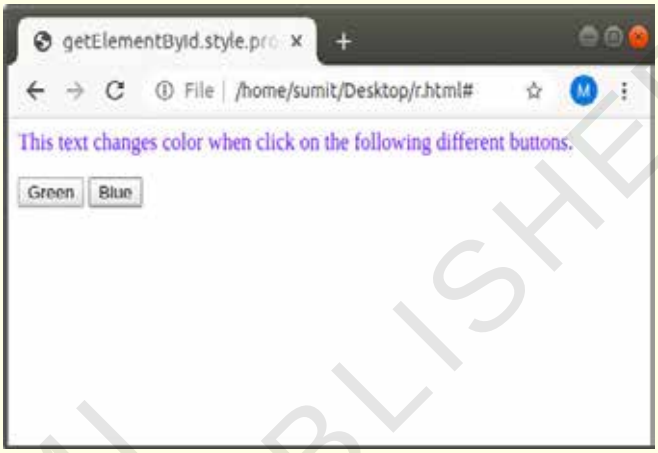
TASK 4: **CSS with JavaScript in DHTML**

Ref Steps 1 to 16 - Task 1

```
<html>
<head>
<title>
getElementById.style.property example
</title>
</head>
<body>
<p id="demo"> This text changes color when click on the following different buttons. </p>
<button onclick="change_Color('green');"> Green </button>
<button onclick="change_Color('blue');"> Blue </button>
<script type="text/javascript">


function change_Color(newColor) {
var element = document.get ElementById ('demo').style.color = newColor;
}
</script>
</body>
</html>
```

Output:



— — — — — — — —

TASK 5: **DHTML CSS**

Ref Steps 1 to 16 - Task 1

```
<html>
<head>
<title>
Changes current HTML element
</title>
</head>
<body>
<center>
<h1 onclick="this.style.color='blue'"> This is a JavaTpoint Site </h1>
<center>
</body>
</html>
```

Output:

— — — — — — — —

TASK 6: **DHTML Events**

Ref Steps 1 to 16 - Task 1

```
<html>
<head>
<title>
Example of onclick event
</title>
<script type="text/javascript">
function ChangeText(ctext)
{
ctext.innerHTML=" Hi JavaTpoint! ";
}
```

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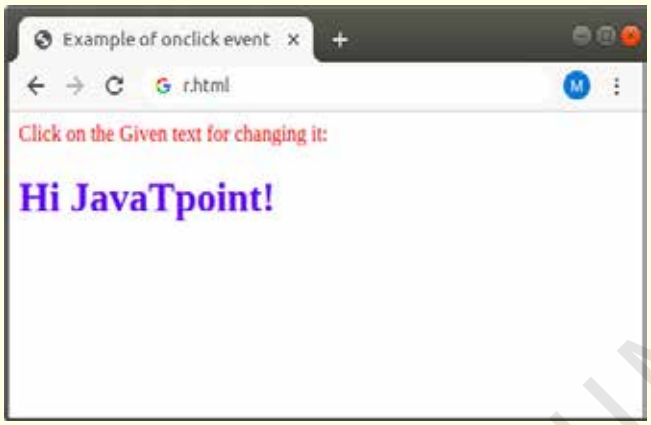
```
</script>
</head>
<body>
<font color="red"> Click on the Given text for changing it: <br>
</font>
<font color="blue">
<h1 onclick="ChangeText(this)"> Hello World! </h1>
</font>
</body>
</html>
```

Output:




```
<html>
<head>
<title>
Example of onsubmit event
</title>
</head>
<body>
<form onsubmit="Submit_Form()">
<label> Enter your name: </label>
<input type="text">
<label> Enter your Roll no: </label>
<input type="Number">
<input type="submit" value="submit">
</form>
<script type="text/javascript">
function Submit_Form()
{
alert(" Your form is submitted");
}
</script>
</body>
</html>
```

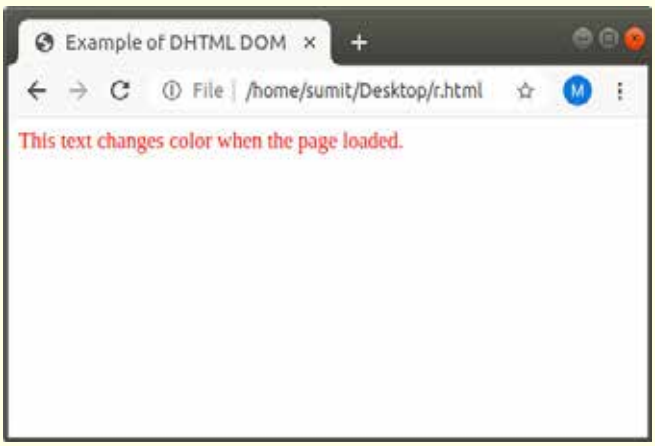
Output:

TASK 7: **DHTML DOM**

Ref Steps 1 to 16 - Task 1

```
<html>
<head>
<title>
Example of DHTML DOM
</title>
</head>
<body>
<font color = "blue">
<p id="demo"> This text changes color when the page loaded. </p>
</font>
<script type="text/javascript">
document.getElementById('demo').style.color = "red";
</script>
</body>
</html>
```

Output:



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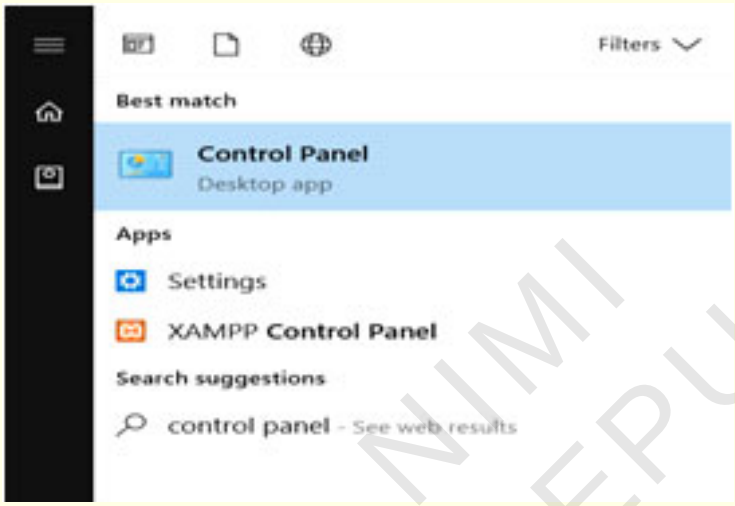
Deploy web project using IIS

Objectives: At the end of this exercise you shall be able to
- **configure IIS in Windows 10 Operating System**
- **publish website on IIS locally**
- **publish Web site in IIS.**

PROCEDURE

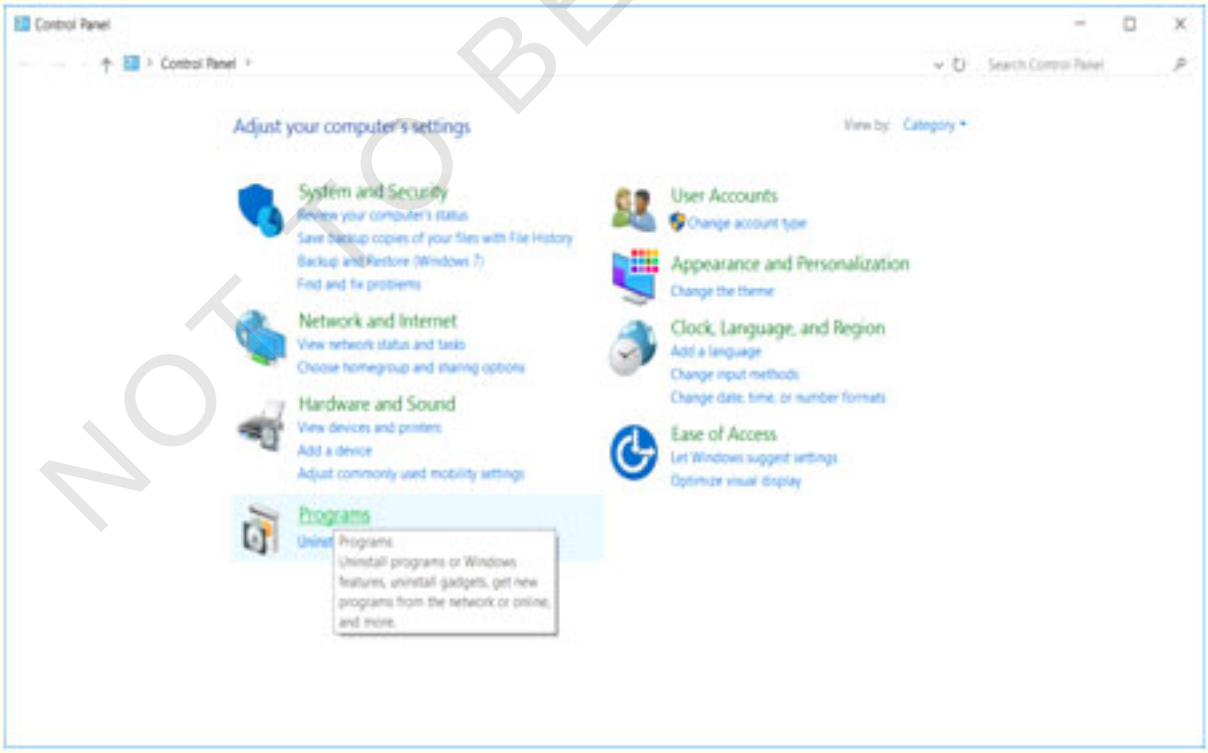
TASK 1 : **Configure IIS in Windows 10 Operating System**

Fig 1



1 Click Programs (Fig 2)

Fig 2



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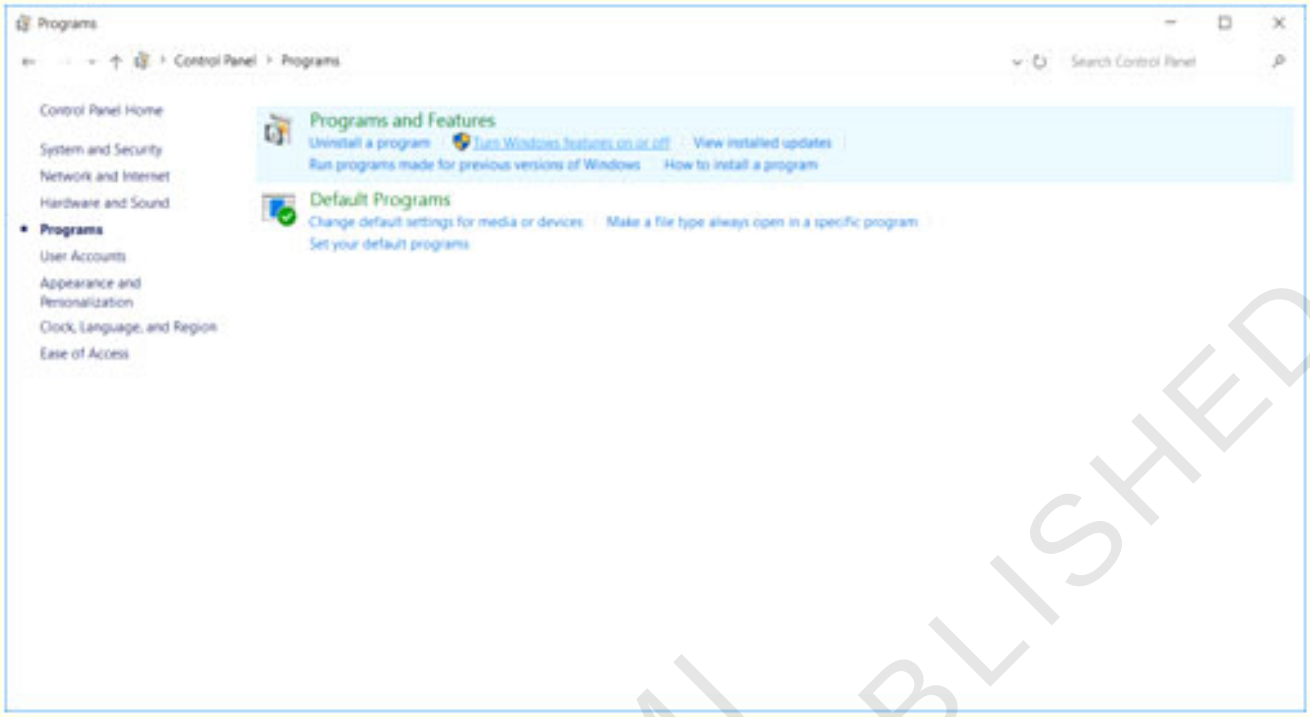
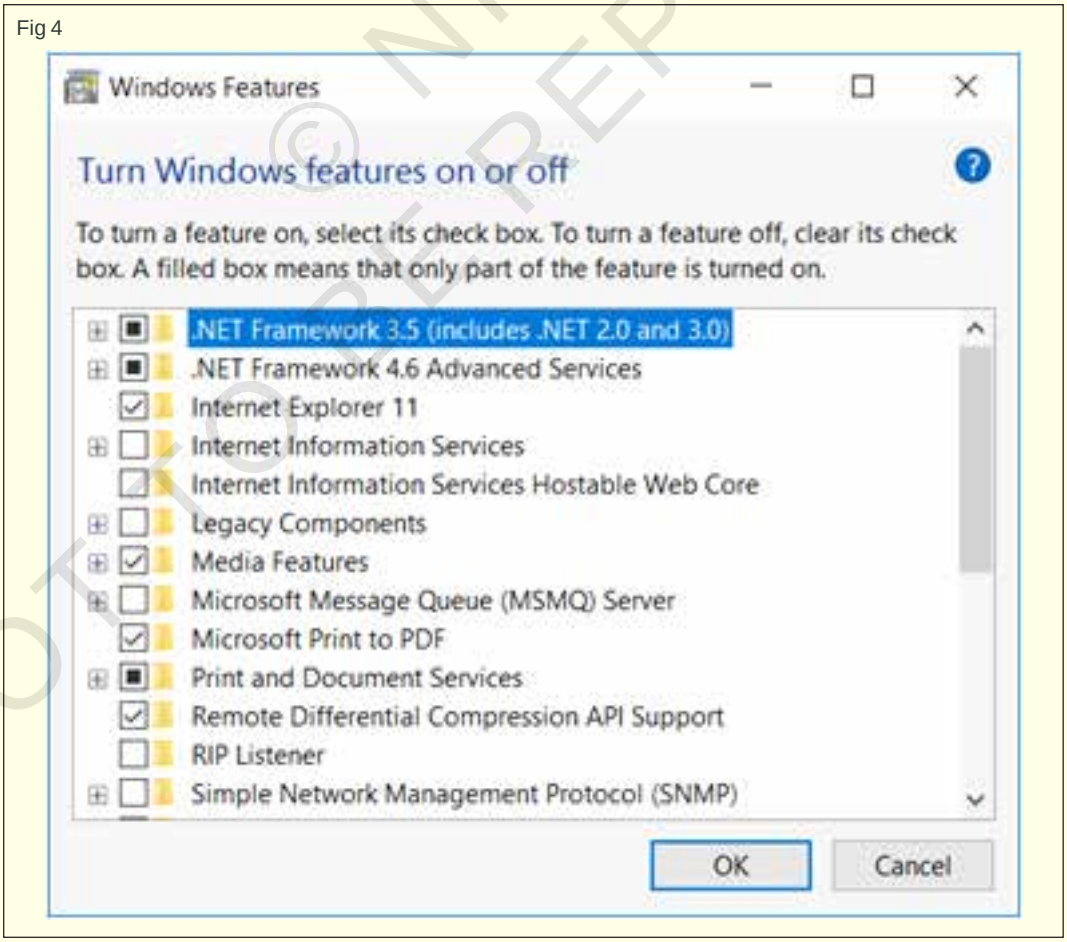
2 Click Turn Window features on or off (Fig 3)

Fig 3



3 Check the Internet Information Services and its related features in the New popup window(Fig 4)

Fig 4



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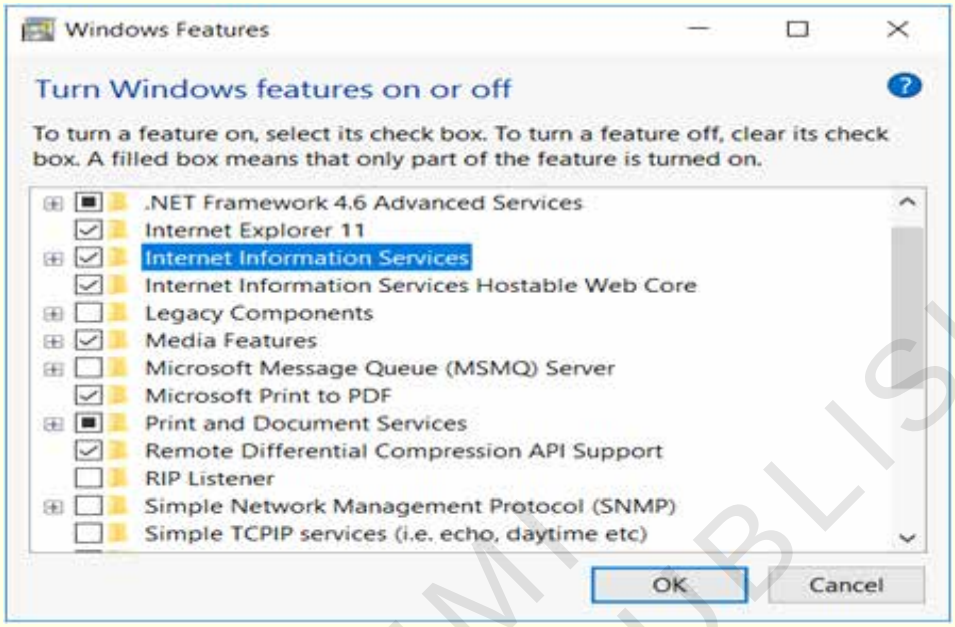
Under Internet Information Services check the following folders:(Fig 5)

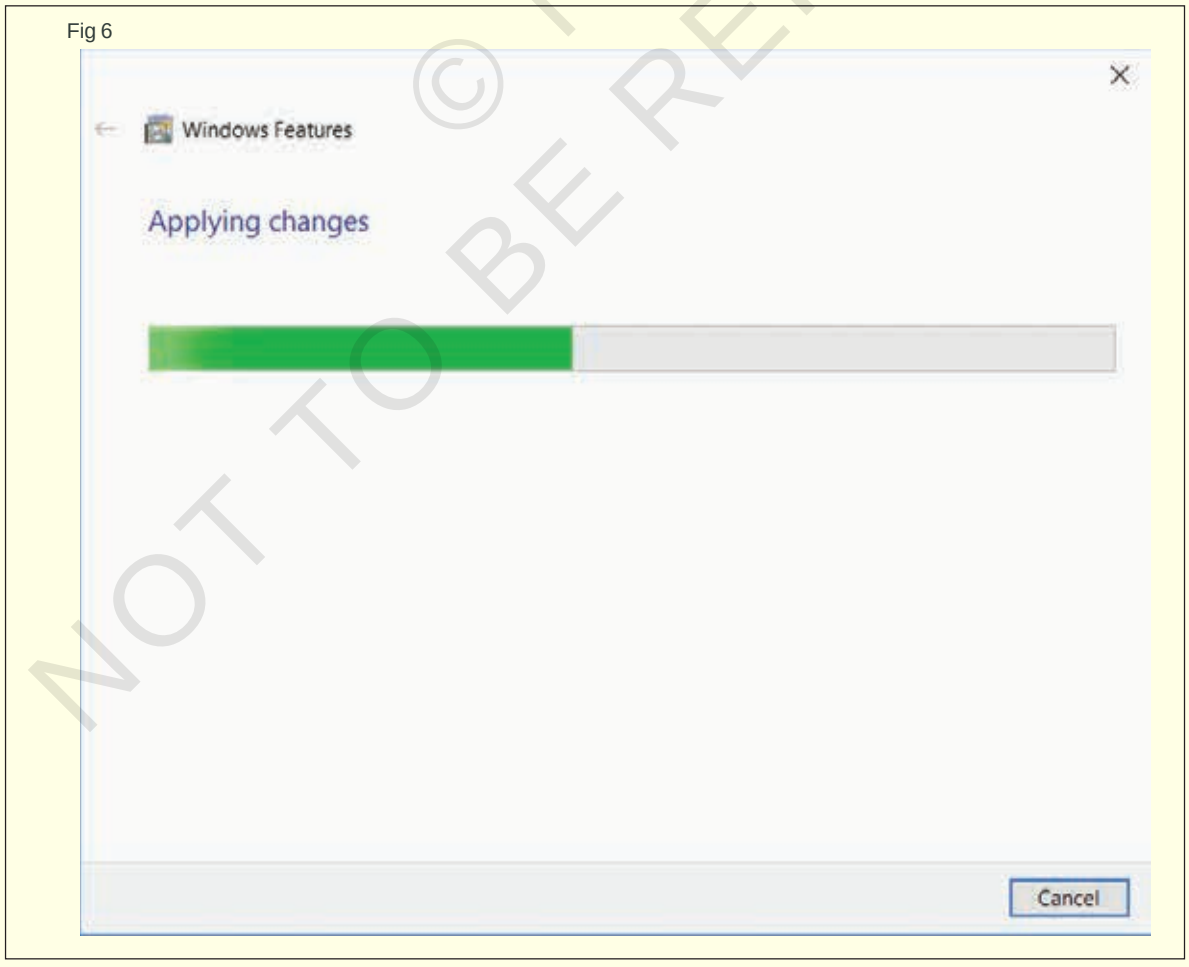
- FTP Server
- Web Management Tools
- World wide web services
- Application development features
- Common HTTP Feature
- Health and Diagnostics
- Perfomance Feature
- Security

Fig 5



4 Then click OK to complete the installation of new features.

Fig 6



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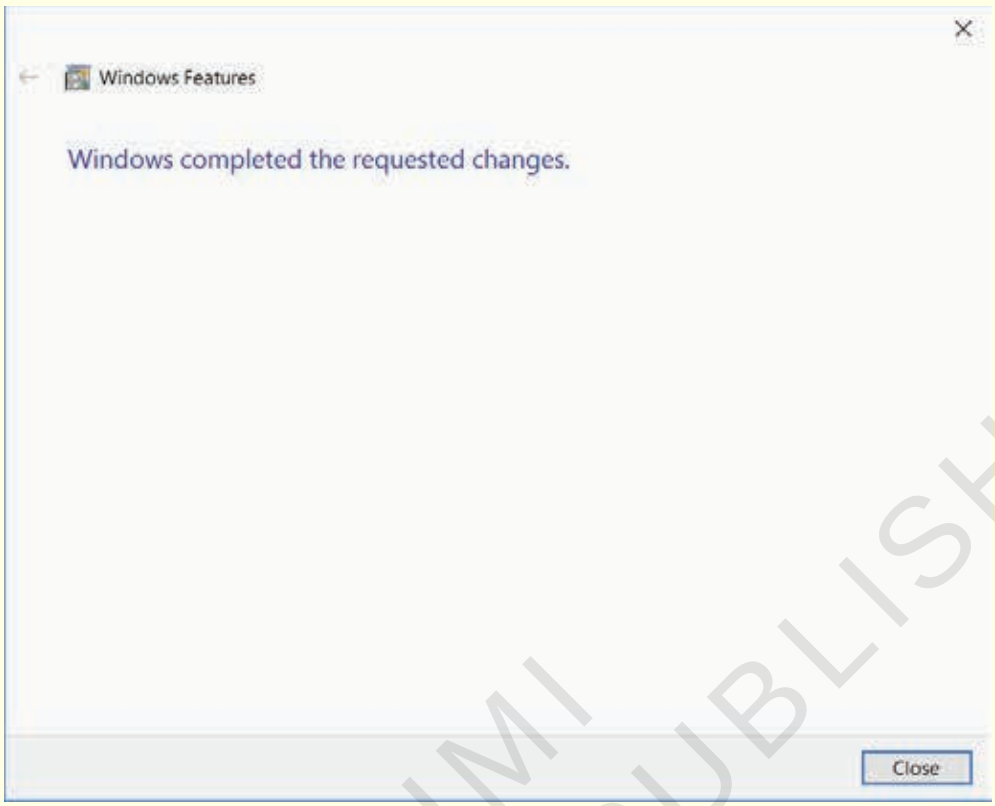
5 Click Close to complete the IIS feature installation.

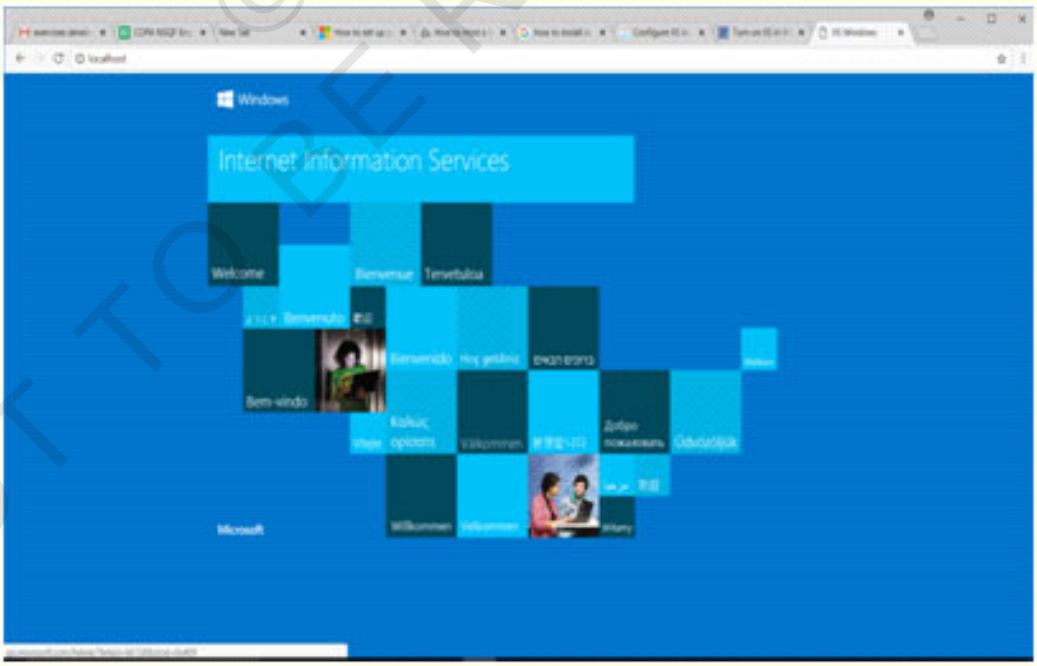
Fig 7



6 Open the browser, type url http://localhost

7 Internet Information Services (IIS) successfully configured (Fig 8)

Fig 8



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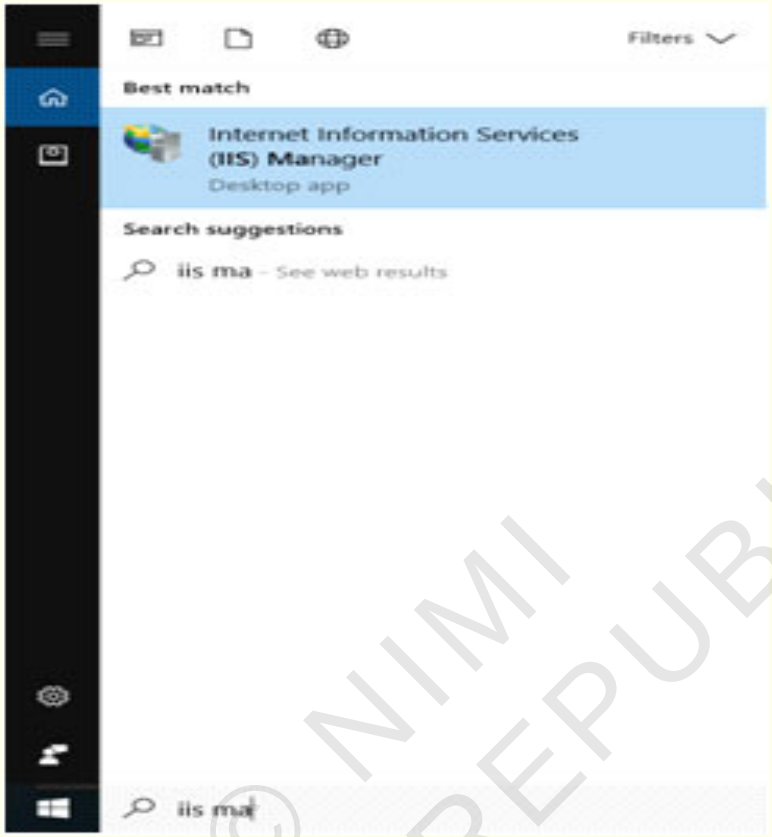
TASK 2 : **Publish website on IIS web server locally**

1 Create a home page for the website using any web page design tool

2 Copy the home page in to inetpub/wwwroot the Web publishing directory of IIS

3 Type the user's computer name or the computer'snumerical IP address followed by the home page name in the browser's address bar to reach user's site.

Fig 9

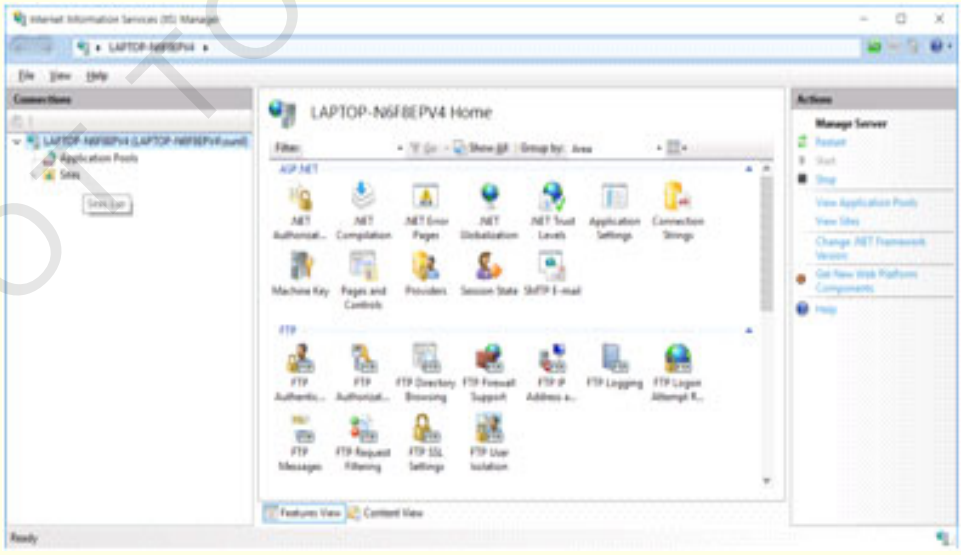


TASK 3 : **Publish a new Web site in IIS**

1 Type IIS Manger in Cortana search

2 Open IIS Manager by clicking on Internet Information Services(IIS) Manager. (Fig,10)

Fig 10



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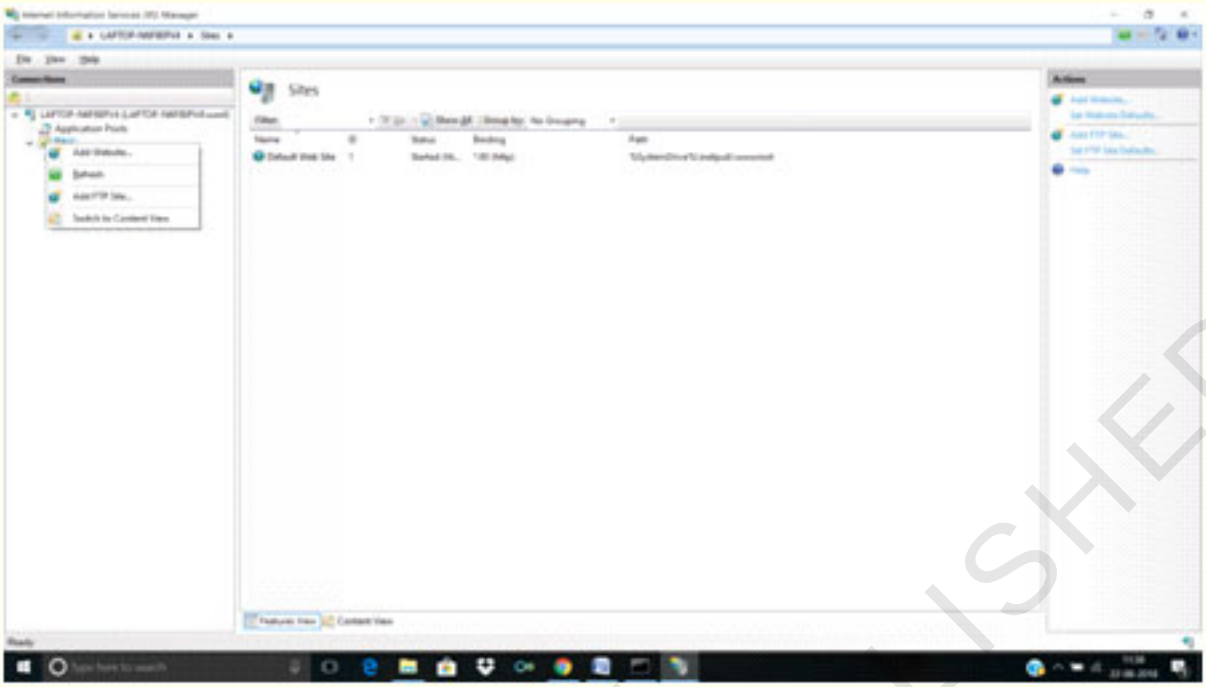
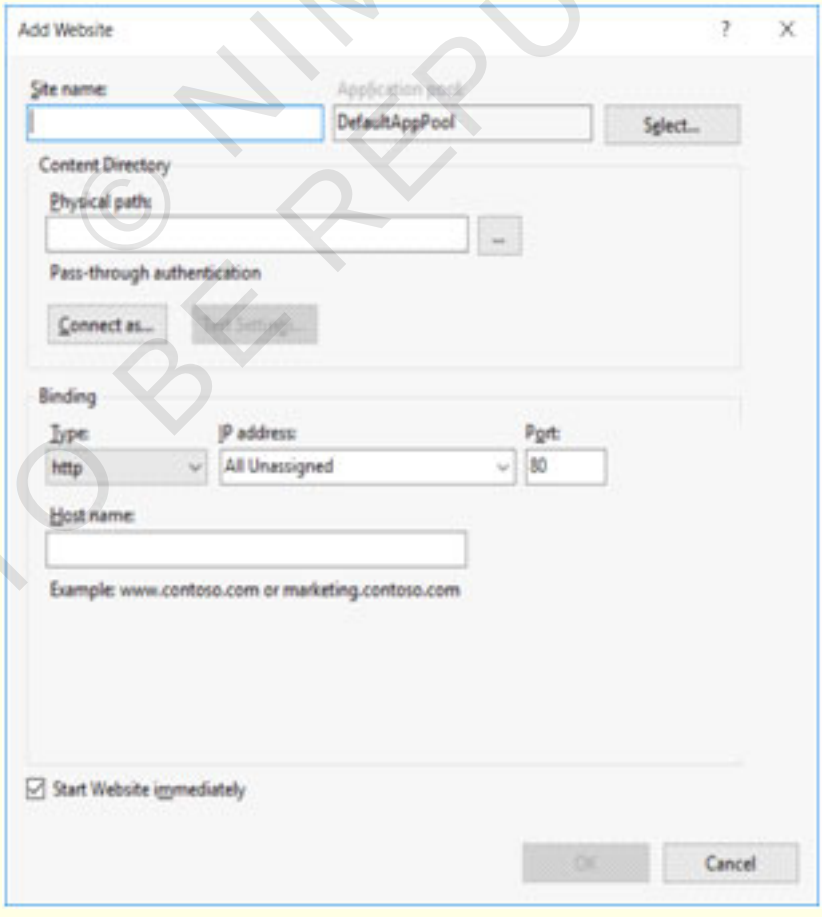
3 Right click on Sites and click on Add Website. (Fig11)

Fig 11



4 Opens Add website dialog. (Fig 12)

Fig 12



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5 Fill in required details and select folder where compiled code is located. (Fig 13)

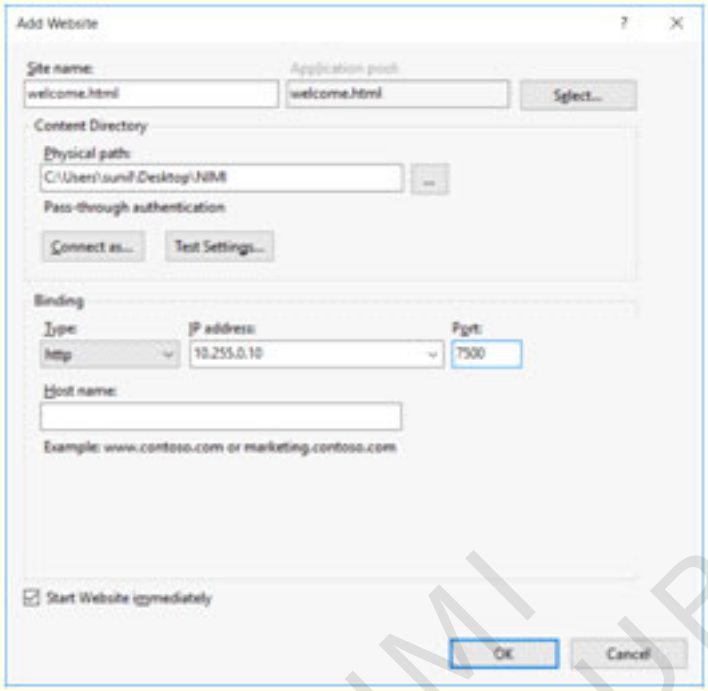
Eg: C:\Nigel\Publish

6 Select required port .(Fig 13)

7 Enter host name details

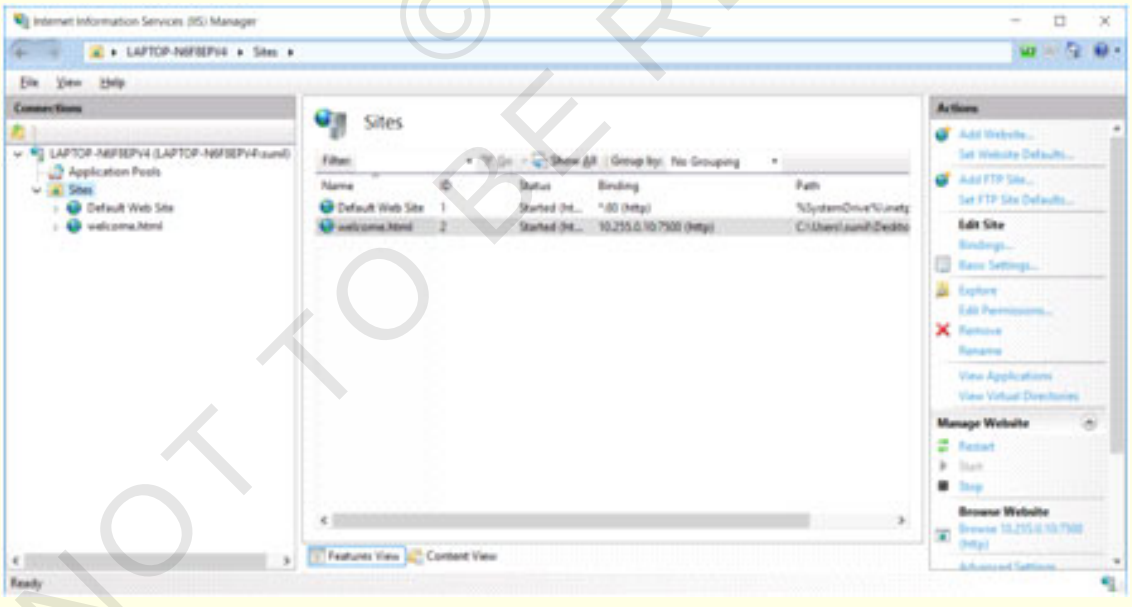
(Do not enter host name details if you are testing or using on LAN).

Fig 13



8 Click ok, website gets created and it will show under Sites(Fig 14)

Fig 14



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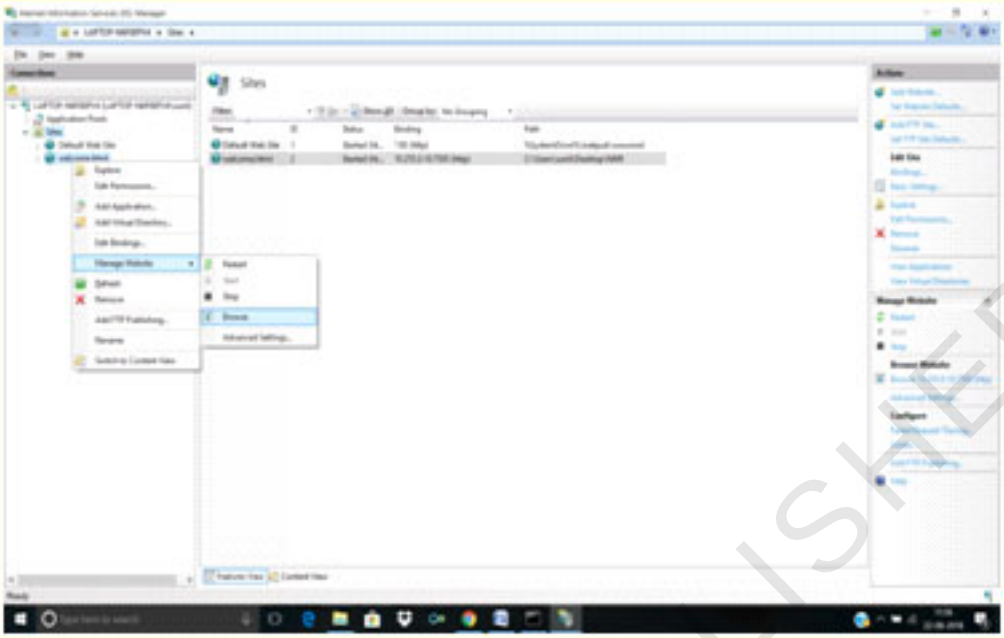
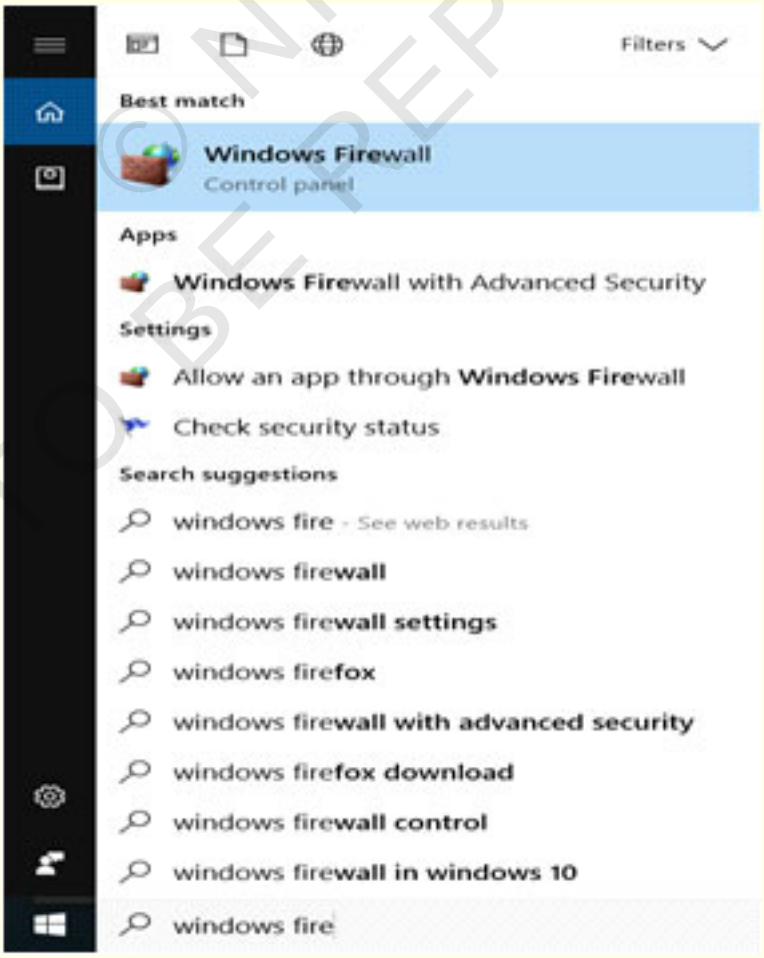
9 Right click on website name then Manage websiteand then click browse. (Fig 15)

Fig 15



10 Type firewall In Cortana search for change in Firewall Rules.(Fig16)

Fig 16



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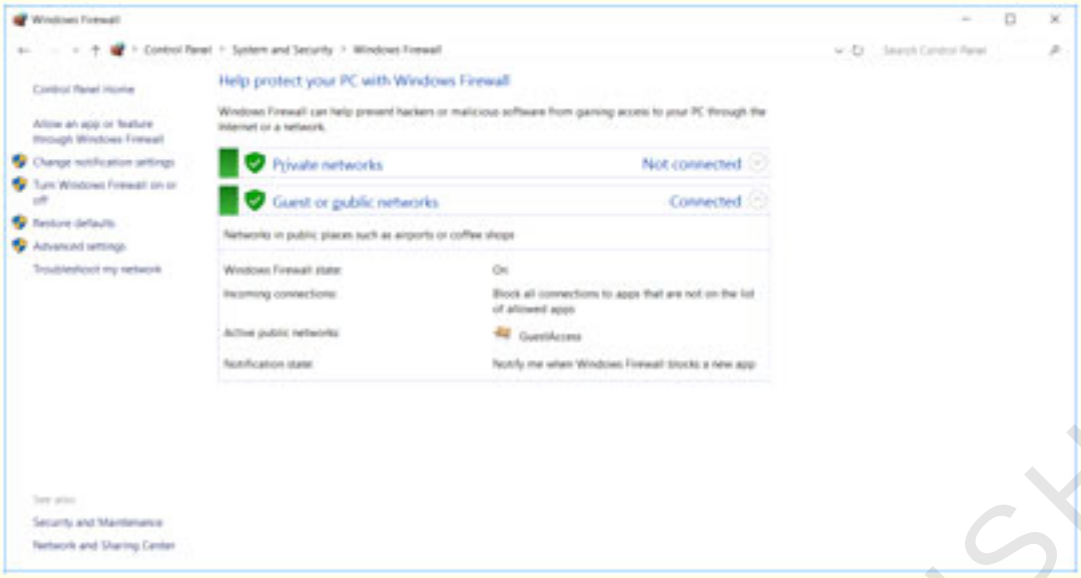
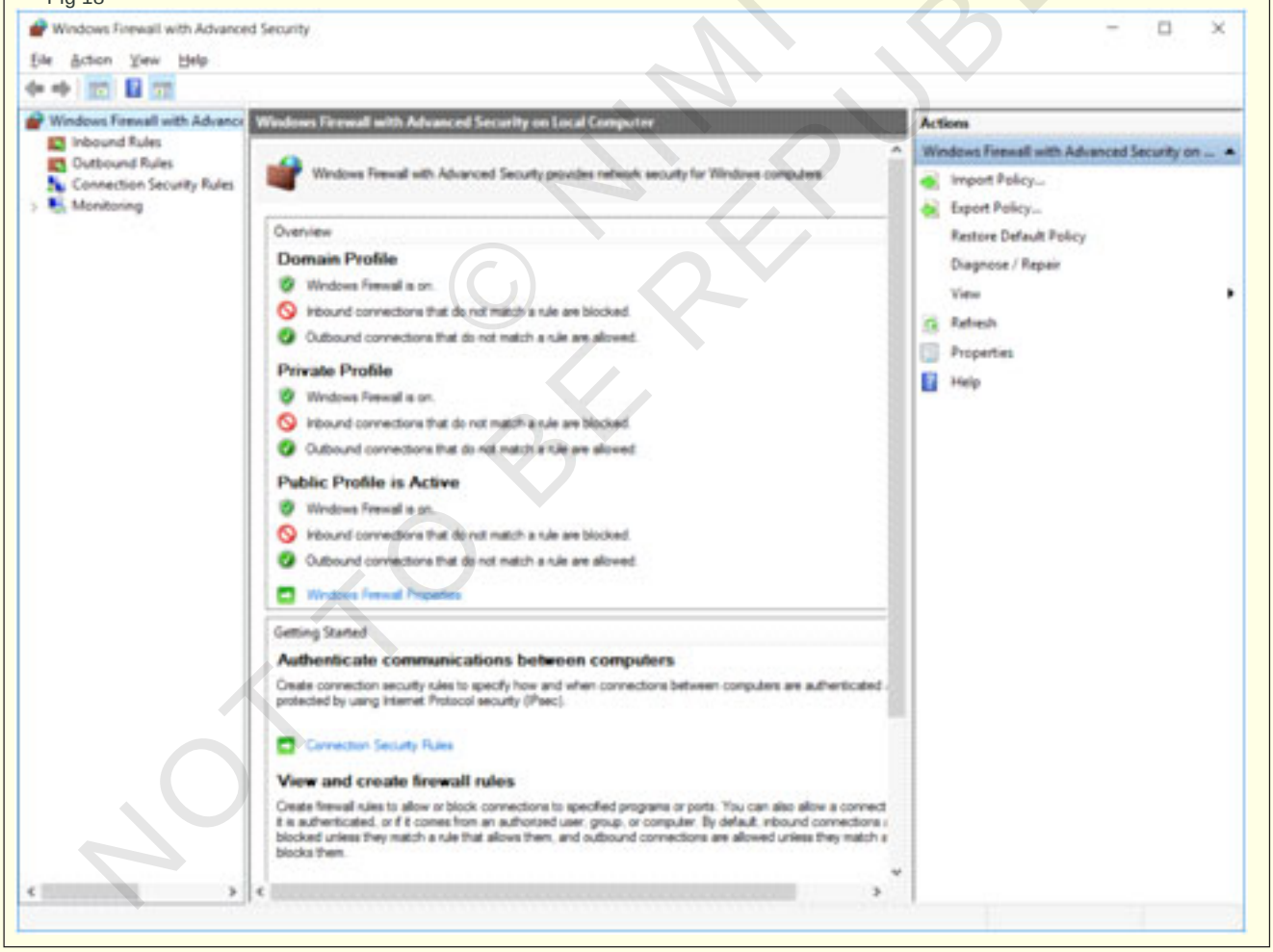
11 Click on Windows firewall (Fig 17)

Fig 17



12 Click advanced settings.(Fig 18)

Fig 18



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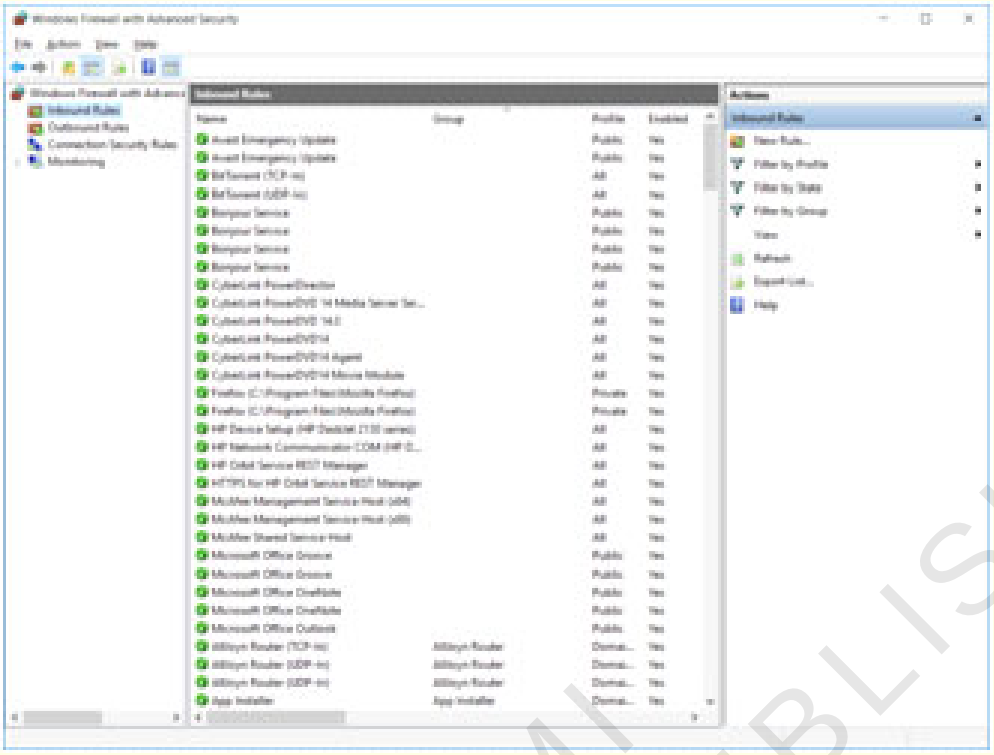
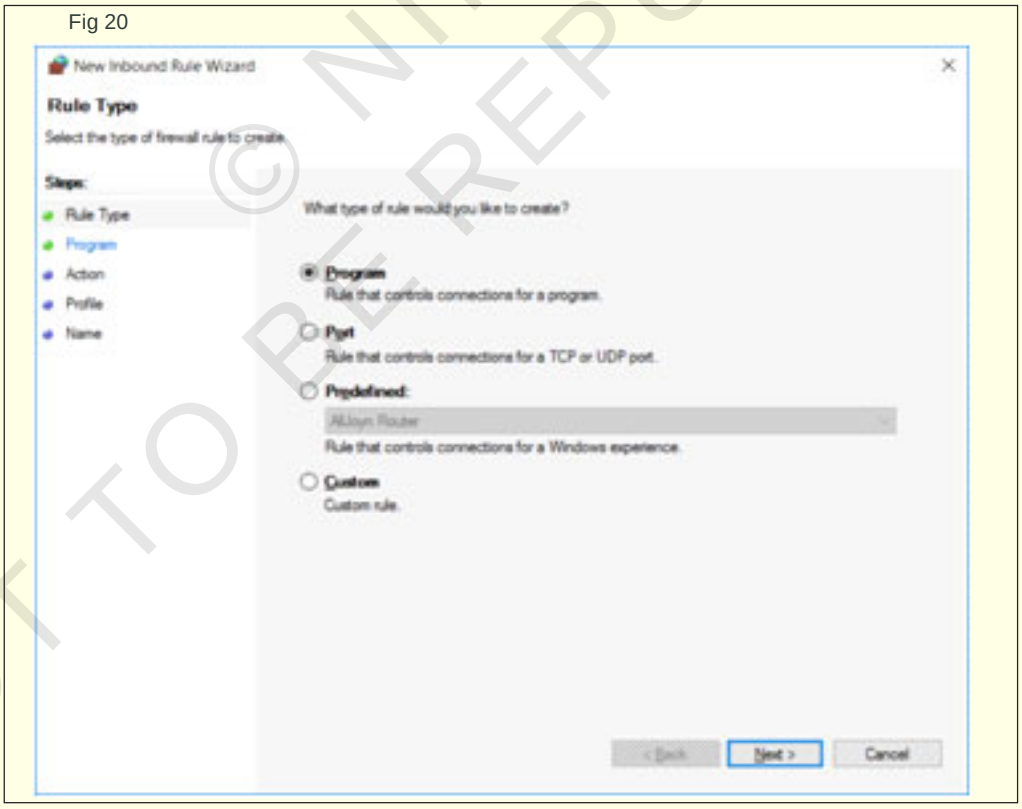
13 Click on Inbound rules on the left. (Fig 19)

Fig 19



14 Click new Rule in the right side menu.(Fig 20)

Fig 20



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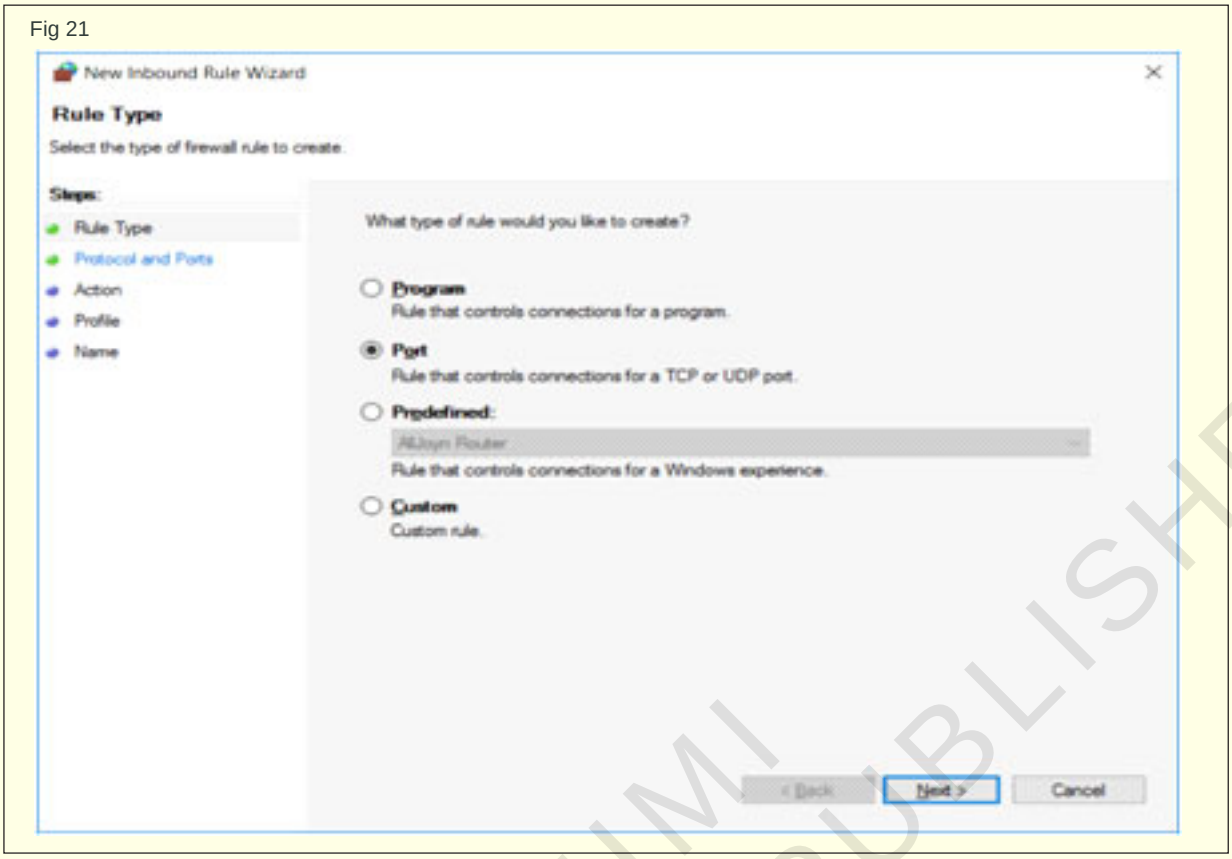
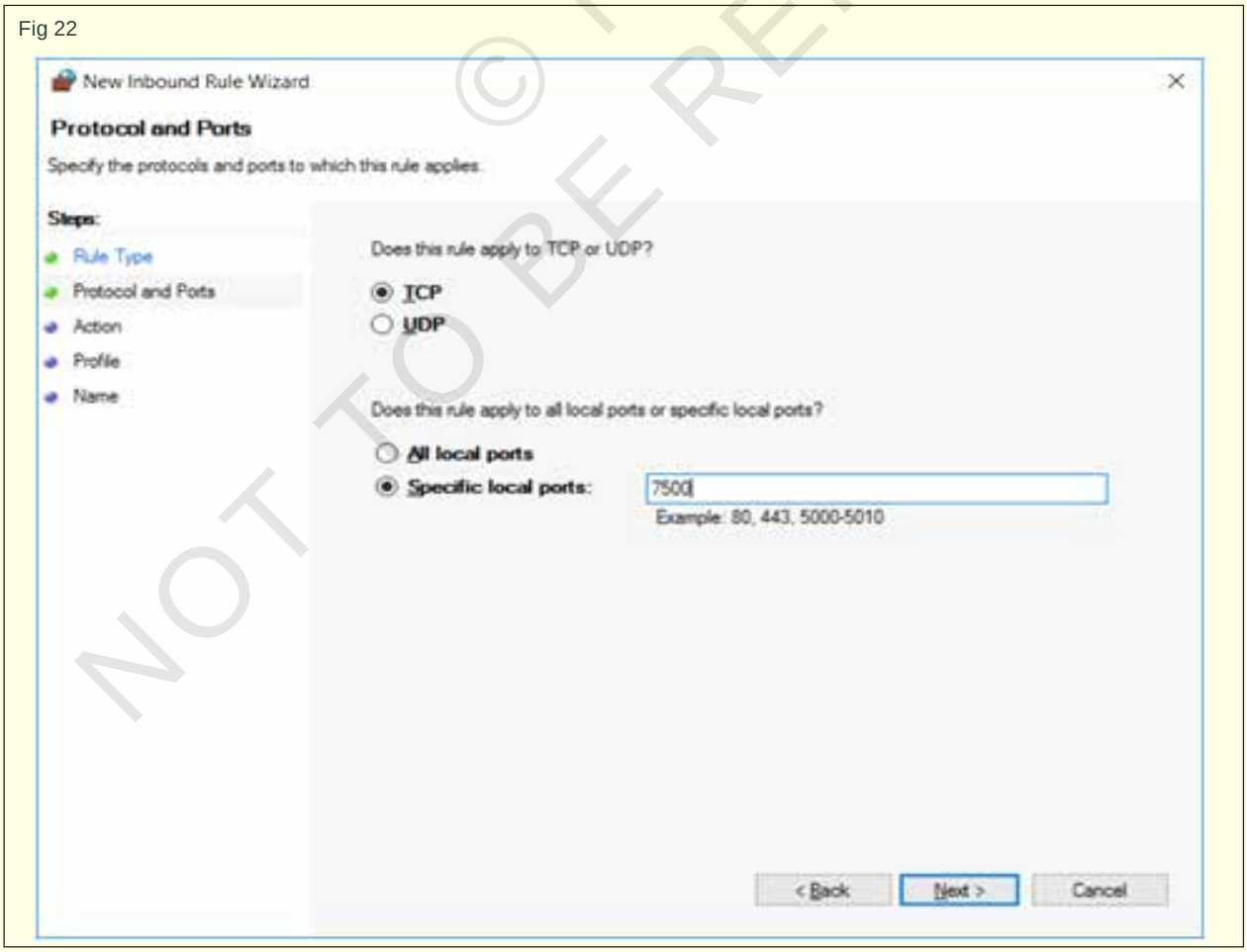
15 Select Port in the New inbound rule wizard and click Next .(Fig 21)

Fig 21



16 Enter port number in specific local ports textbox, Then click Next (Fig 22)

Fig 22



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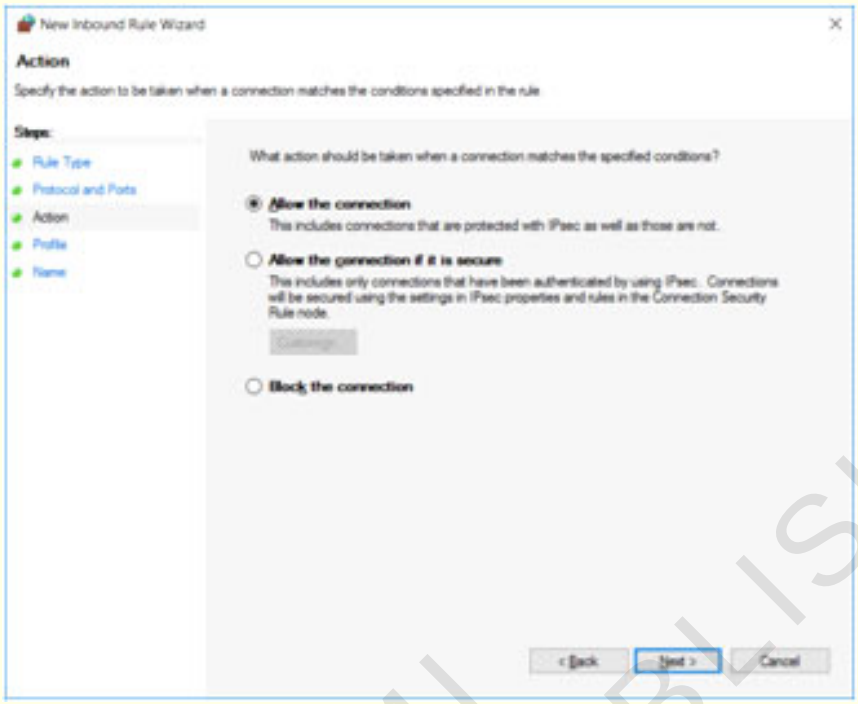
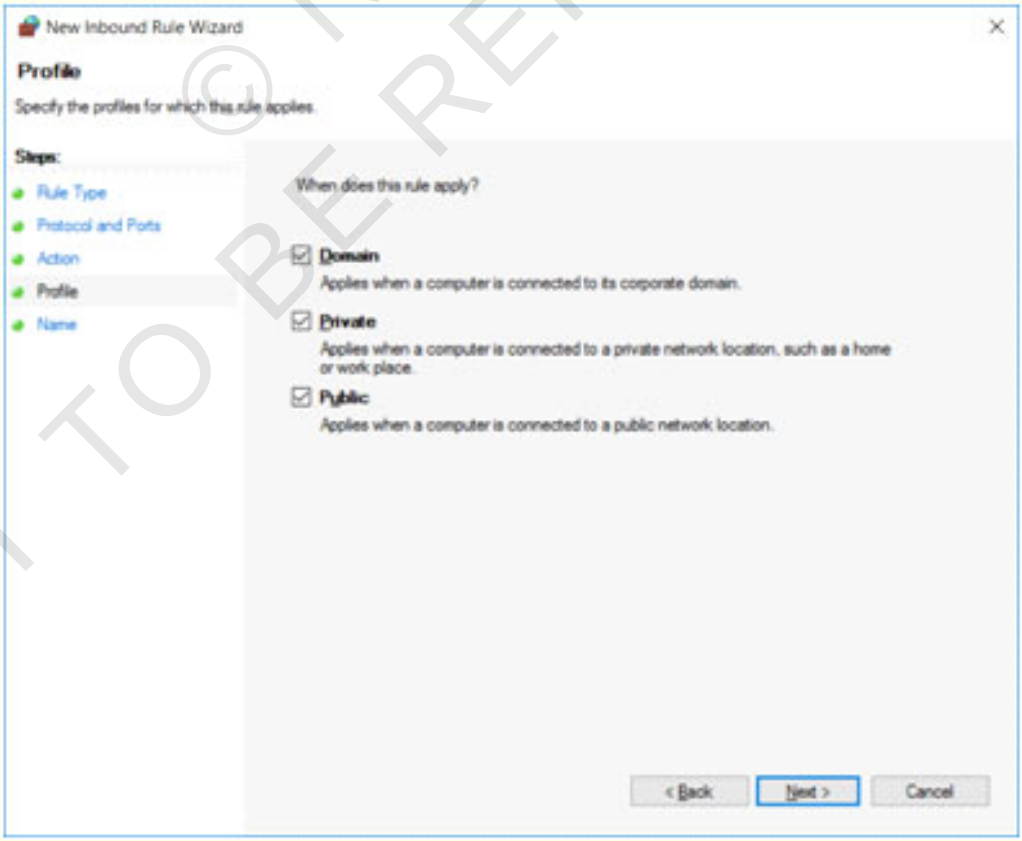
17 Select Allow the connection in the opened Action form and click Next .(Fig 23)

Fig 23



18 Select required ones in the profile form and Click Next. (Fig 24)

Fig 24



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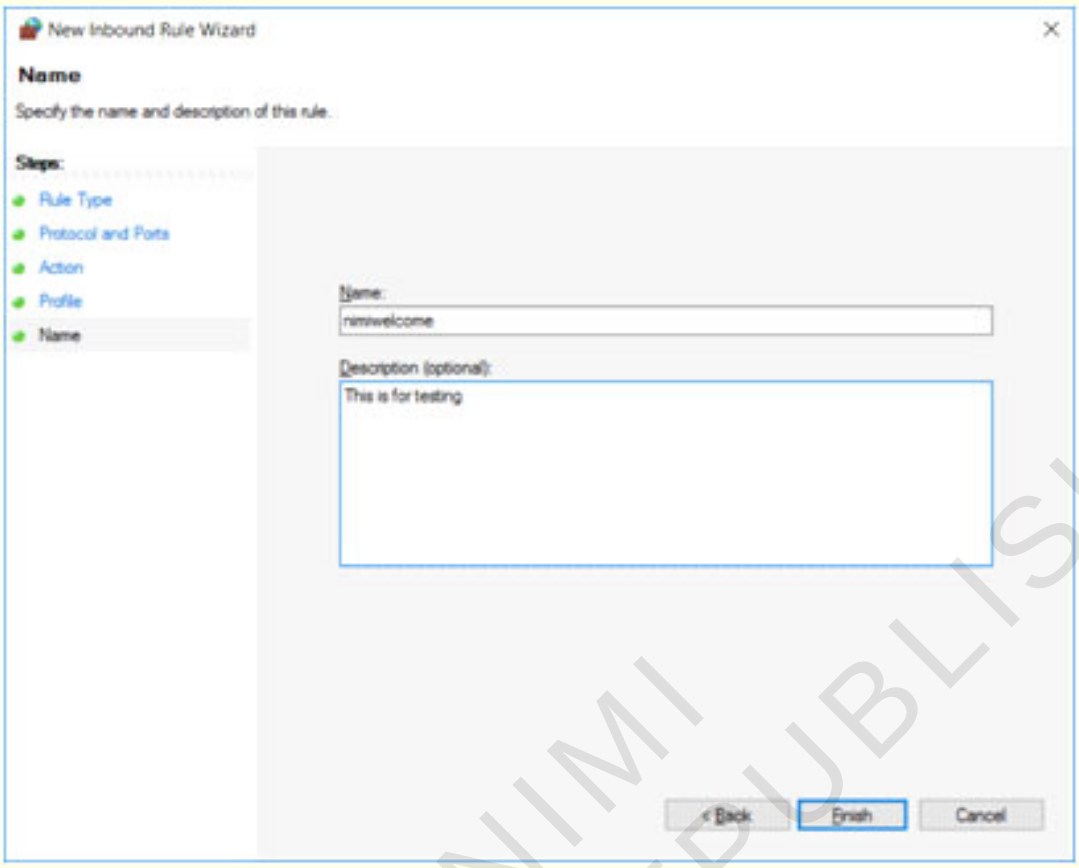
19 Give firewall rule Name and Description, Then click finish. (Fig 25)

Fig 25



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TASK 3: Publish Content on IIS web server locally

1 Create a home page for the website using any web page design tool

2 Copy the home page in to inetpub/wwwroot the Web publishing directory of IIS

3 Type the user's computer name or the computer's numerical IP address followed by the home pagename in the browser's address bar to reach user's site.

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Create and modify simple macros

Objectives: At the end of this exercise you shall be able to
- **state create macro**
- **state modify a macro**

Requirements

Tools/Equipment/Machines

- A working PC with MS-OFFICE - 1 No.

PROCEDURE

TASK 1: **Create a macro**

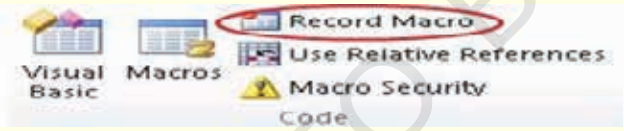
Before you record a macro

Macros and VBA tools can be found on the Developer tab, which is hidden by default, so the first step is to enable it. For more information, see Show the Developer tab.

Record a macro

1 In the Code group on the Developer tab, click Record Macro.

2 Optionally, enter a name for the macro in the Macro name box, enter a shortcut key in the Shortcut key box, and a description in the Description box, and then click OK to start recording.



3 Perform the actions you want to automate, such as entering boilerplate text or filling down a column of data.

4 On the Developer tab, click Stop Recording.

Take a closer look at the macro

You can learn a little about the Visual Basic programming language by editing a macro.

To edit a macro, in the Code group on the Developer tab, click Macros, select the name of the macro, and click Edit. This starts the Visual Basic Editor.

See how the actions that you recorded appear as code. Some of the code will probably be clear to you, and some of it may be a little mysterious.

Experiment with the code, close the Visual Basic Editor, and run your macro again. This time, see if anything different happens!

— — — — — —

TASK 2: **Modify a macro**

1 On the Developer tab, in the Code group, click Macros.

2 In the Macro name box, click the macro that you want to edit.

3 Click Edit. The Visual Basic Editor appears.

Tip: To get help while you are working in the Visual Basic Editor, on the Help menu, click Microsoft Visual Basic Help, or press F1.

— — — — — —

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Perform form controls and create simple data entry form with macros

Objectives: At the end of this exercise you shall be able to
- **details form controls**
- **create simple data entry form.**

Requirements

Tools/Equipment/Machines

- A working PC with MS-OFFICE - 1 No.

PROCEDURE

TASK 1: **Form Controls**

In a new worksheet, type the following items in the range H1:H20:

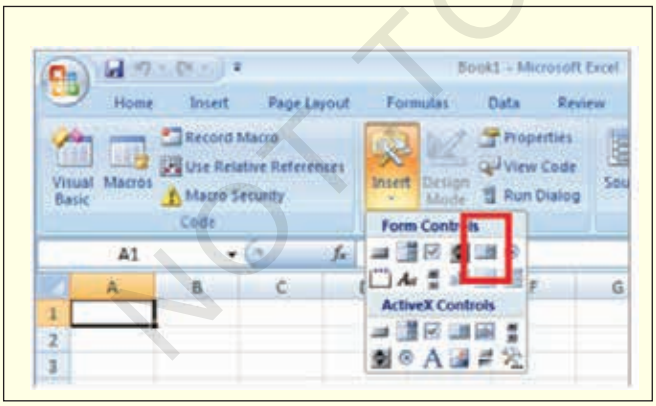
H1 : Roller Skates	H2 : VCR	H3 : Desk
H4 : Mug	H5 : Car	H6 : Washing Machine
H7 : Rocket Launcher	H8 : Bike	H9 : Phone
H10: Candle	H11: Candy	H12: Speakers
H13: Dress	H14: Blanket	H15: Dryer
H16: Guitar	H17: Dryer	H18: Tool Set
H19: VCR	H20: Hard Disk	

1 In cell A1, type the following formula:

=INDEX(H1:H20,G1,0)

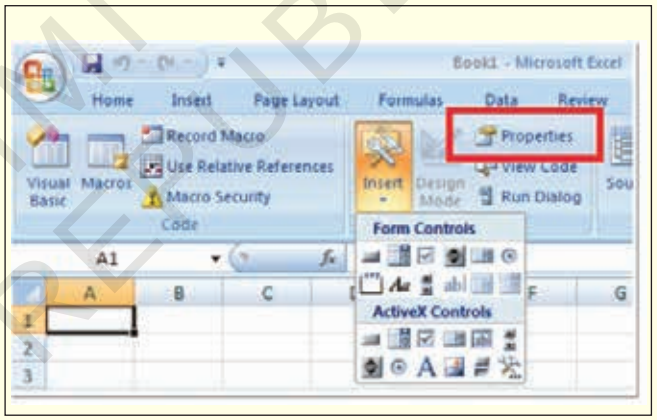
List box example

1 To add a list box in Excel 2007 and later versions, click the Developer tab, click Insert in the Controls group, and then click List Box Form (Control) under Form Controls.



2 To add a list box in Excel 2003 and in earlier versions of Excel, click the List Box button on the Forms toolbar. If the Forms toolbar is not visible, point to Toolbars on the View menu, and then click Forms.

3 Click the worksheet location where you want the upper-left corner of the list box to appear, and then drag the list box to where you want the lower-right corner of the list box to be. In this example, create a list box that covers cells B2:E10.



4 In the Controls group, click Properties.

5 In the Format Object window, type the following information, and then click OK.

a To specify the range for the list, type H1:H20 in the Input range box.

b To put a number value in cell G1 (depending on which item is selected in the list), type G1 in the Cell link box.

Note: The INDEX() formula uses the value in G1 to return the correct list item.

c Under Selection type, make sure that the Single option is selected.

Note: The Multi and Extend options are only useful when you are using a Microsoft Visual Basic for Applications procedure to return the values of the list. Note also that the 3-D shading check box adds a three-dimensional look to the list box.

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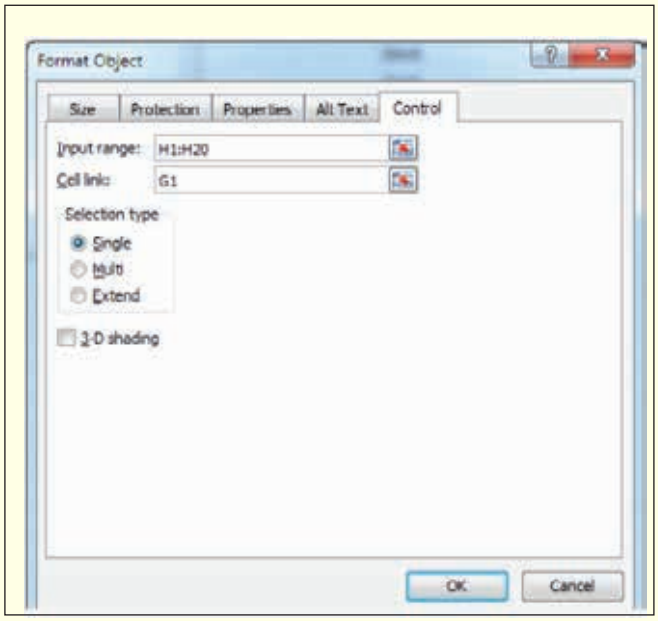
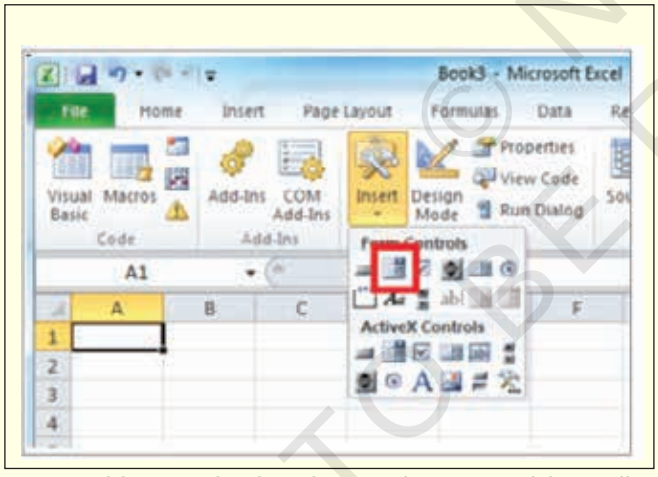


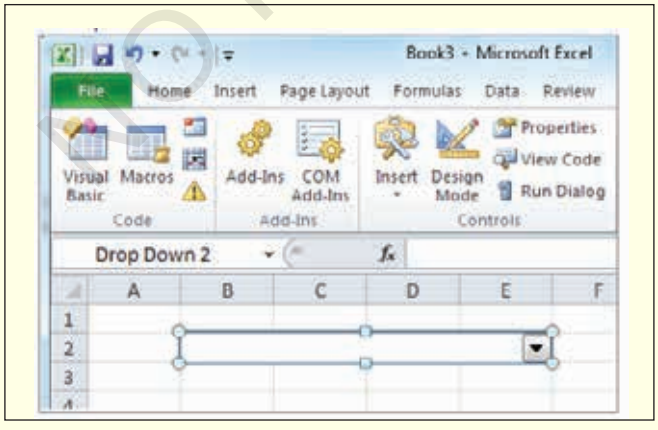
6 The list box should display the list of items. To use the list box, click any cell so that the list box is not selected. If you click an item in the list, cell G1 is updated to a number that indicates the position of the item that is selected in the list. The INDEX formula in cell A1 uses this number to display the item's name.

Combo box example

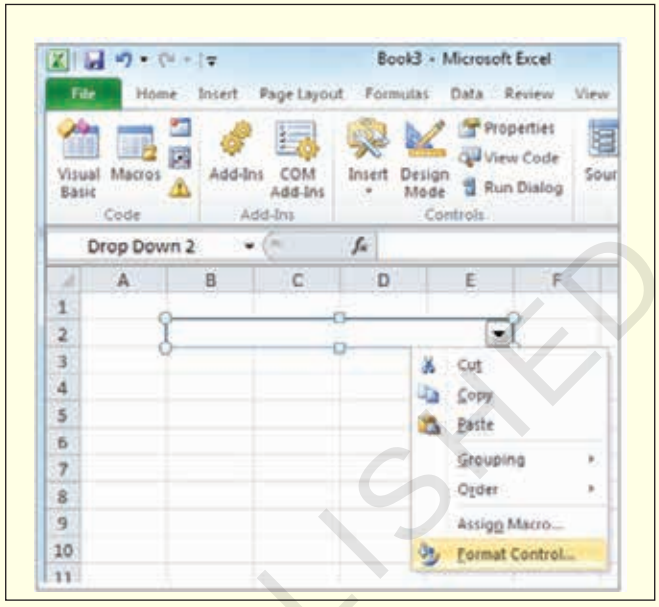
1 To add a combo box in Excel 2007 and later versions, click the Developer tab, click Insert, and then click Combo Box under Form Controls.



2 To add a combo box in Excel 2003 and in earlier versions of Excel, click the Combo Box button on the Forms toolbar.



3 Click the worksheet location where you want the upper-left corner of the combo box to appear, and then drag the combo box to where you want the lower-right corner of the list box to be. In this example, create a combo box that covers cells B2:E2.



4 Right-click the combo box, and then click Format Control.

5 Type the following information, and then click OK:

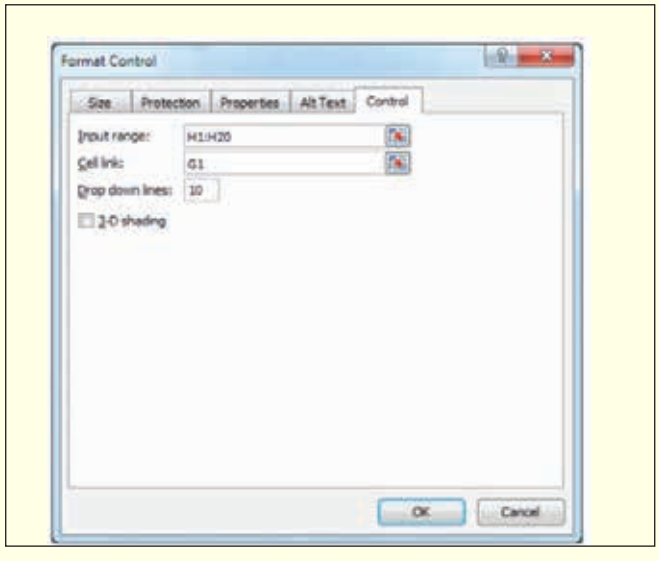
a To specify the range for the list, type H1:H20 in the Input range box.

b To put a number value in cell G1 (depending on which item is selected in the list), type G1 in the Cell link box.

Note: The INDEX formula uses the value in G1 to return the correct list item.

c In the Drop down lines box, type 10. This entry determines how many items will be displayed before you have to use a scroll bar to view the other items.

Note: The 3-D shading check box is optional. It adds a three-dimensional look to the drop-down or combo box.



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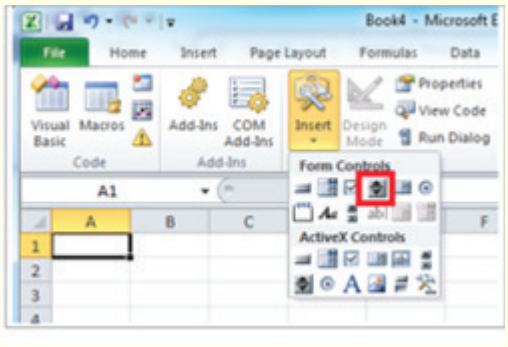
6 The drop-down box or combo box should display the list of items. To use the drop-down box or combo box, click any cell so that the object is not selected. When you click an item in the drop-down box or combo box, cell G1 is updated to a number that indicates the position in the list of the item selected. The INDEX formula in cell A1 uses this number to display the item's name.

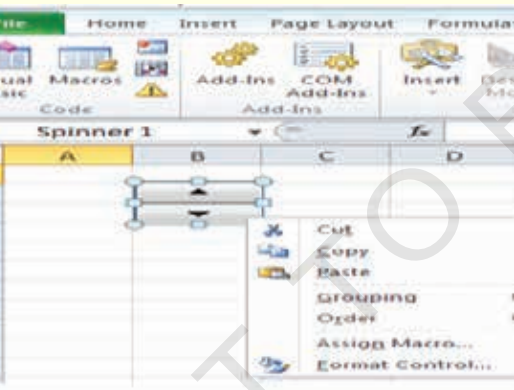
Spin button example

1 To add a spin button in Excel 2007 and later versions, click the Developer tab, click Insert, and then click Spin Button under Form Controls.



To add a spinner in Excel 2003 and in earlier versions of Excel, click the Spinner button on the Forms toolbar.

2 Click the worksheet location where you want the upper-left corner of the spin button to appear, and then drag the spin button to where you want the lower-right corner of the spin button to be. In this example, create a spin button that covers cells B2: B3.



3 Right-click the spin button, and then click Format Control.

4 Type the following information, and then click OK:

a In the Current value box, type 1.

This value initializes the spin button so that the INDEX formula will point to the first item in the list.

b In the Minimum value box, type 1.

This value restricts the top of the spin button to the first item in the list.

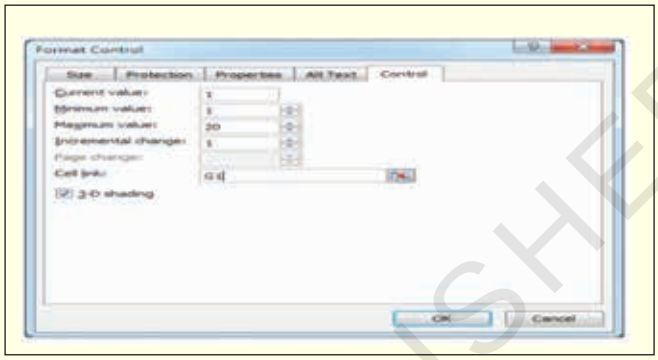
c In the Maximum value box, type 20.

This number specifies the maximum number of entries in the list.

d In the Incremental change box, type 1.

This value controls how much the spin button control increments the current value.

e To put a number value in cell G1 (depending on which item is selected in the list), type G1 in the Cell link box.

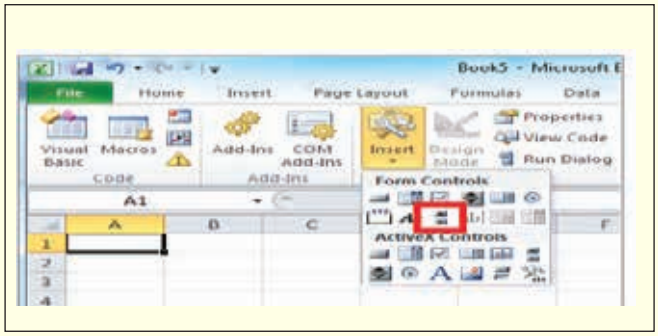


5 Click any cell so that the spin button is not selected. When you click the up control or down control on the spin button, cell G1 is updated to a number that indicates the current value of the spin button plus or minus the incremental change of the spin button. This number then updates the INDEX formula in cell A1 to show the next or previous item.

The spin button value will not change if the current value is 1 and you click the down control, or if the current value is 20 and you click the up control.

Scroll bar example

1 To add a scroll bar in Excel 2007 and later versions, click the Developer tab, click Insert, and then click Scroll Bar under Form Controls.



To add a scroll bar in Excel 2003 and in earlier versions of Excel, click the Scroll Bar button on the Forms toolbar.

2 Click the worksheet location where you want the upper-left corner of the scroll bar to appear, and then drag the scroll bar to where you want the lower-right corner of the scroll bar to be. In this example, create a scroll bar that covers cells B2:B6 in height and is about one-fourth of the width of the column.

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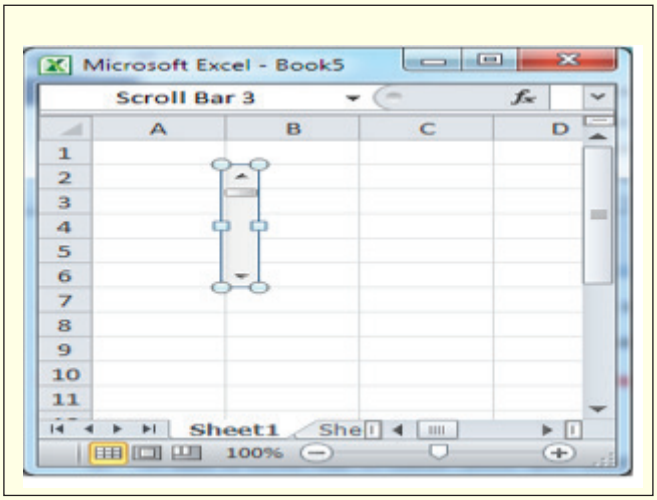
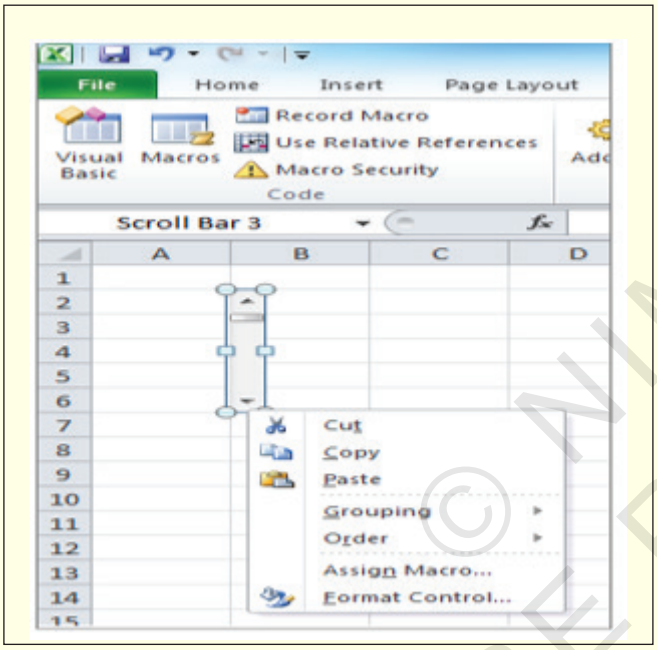


3 Right-click the scroll bar, and then click Format Control.



4 Type the following information, and then click OK:

a In the Current value box, type 1.

This value initializes the scroll bar so that the INDEX formula will point to the first item in the list.

b In the Minimum value box, type 1.

This value restricts the top of the scroll bar to the first item in the list.

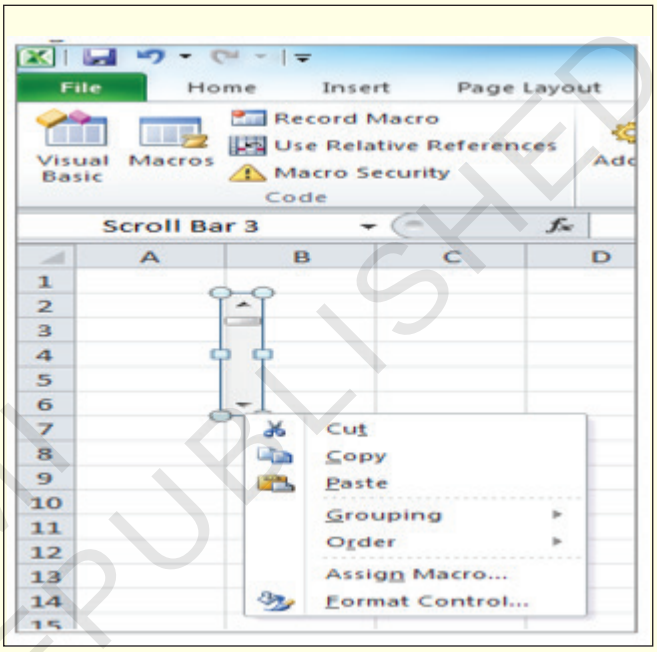
c In the Maximum value box, type 20. This number specifies the maximum number of entries in the list.

d In the Incremental change box, type 1.

This value controls how many numbers the scroll bar control increments the current value.

e In the Page change box, type 5. This value controls how much the current value will be incremented if you click inside the scroll bar on either side of the scroll box).

f To put a number value in cell G1 (depending on which item is selected in the list), type G1 in the Cell link box.



Note: The 3-D shading check box is optional. It adds a three-dimensional look to the scroll bar.

5 Click any cell so that the scroll bar is not selected. When you click the up or down control on the scroll bar, cell G1 is updated to a number that indicates the current value of the scroll bar plus or minus the incremental change of the scroll bar. This number is used in the INDEX formula in cell A1 to show the item next to or before the current item. You can also drag the scroll box to change the value or click in the scroll bar on either side of the scroll box to increment it by 5 (the Page change value). The scroll bar will not change if the current value is 1 and you click the down control, or if the current value is 20 and you click the up control.

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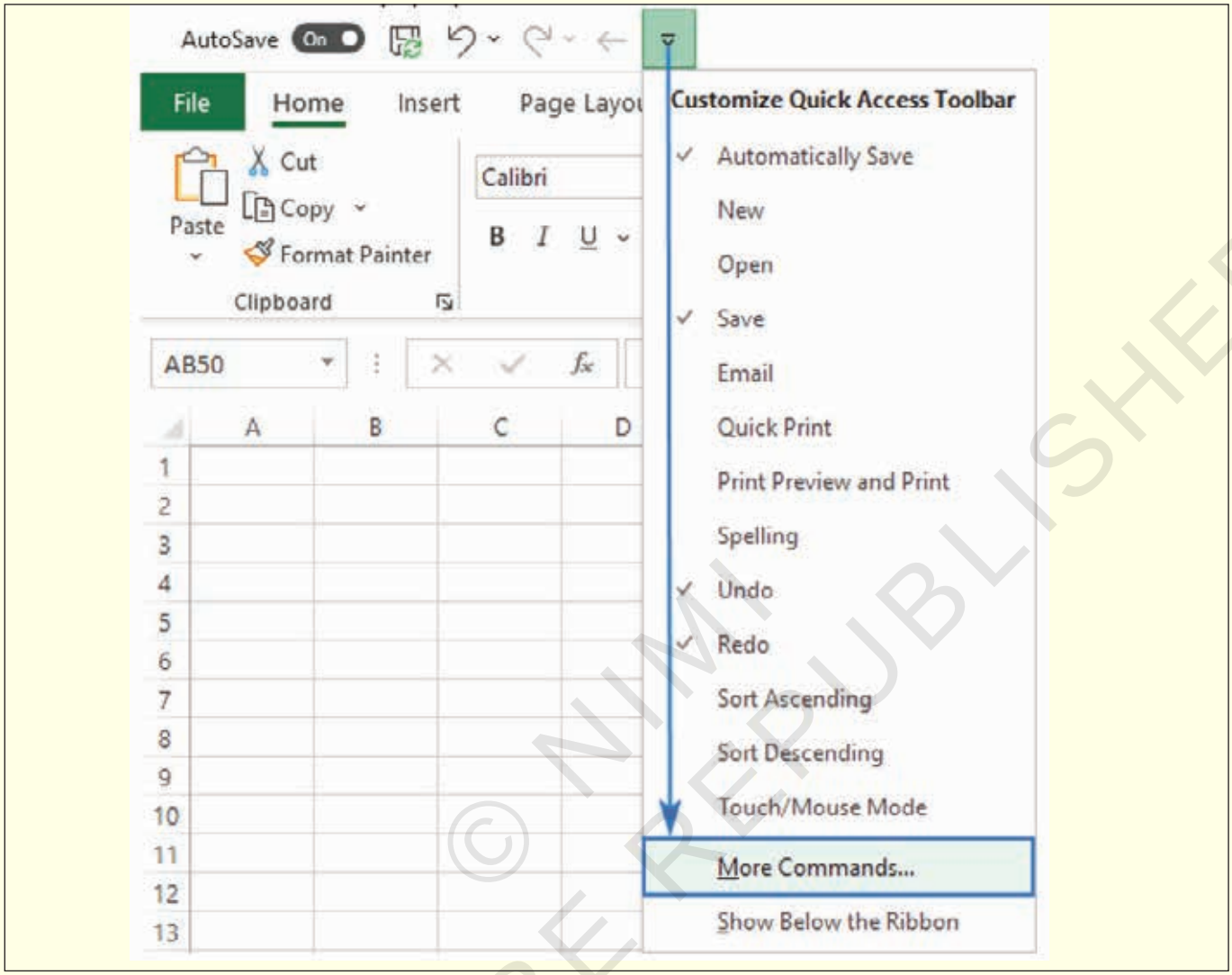
TASK 2: **Create simple Data entry form with Macros**

1 Click the small down arrow at the far-right of the QAT, and then choose More Commands in the pop-up menu.



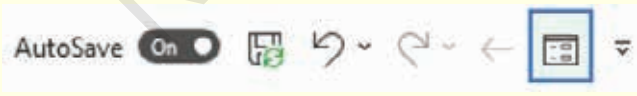
2 In the Excel Options dialog box that opens, under Choose commands from, select All Commands or Commands Not in the Ribbon.

3 Scroll down the list of command on the left until you see Form… and click on it.

4 Click the Add button in the middle to move the Form to the list of QAT commands on the right.

5 Click OK to save the changes and close the dialog.

The Form icon will immediately appear in your Quick Access Tollbar and will be available in all your workbooks.



Believe it or not, you've successfully coped with the main challenge. Once the Form tool is in your Excel, creating a data entry form for any table (a new or existing one) takes just a single button click.

Tip: In a similar fashion, you can place the Form tool on the ribbon. For the detailed instructions, please see **How to add a button to Excel ribbon.**

How to make data entry form in Excel

A data entry form is only available for a fully functional Excel table. To get the form, you just need to put your data in a table and the click the Form button. The detailed steps follow below:

1 In your worksheet, type the column headings in the topmost row as usual. If you want an input form for an existing data set, skip this step.

2 Select any cell in your dataset and click the Ctrl + T keys simultaneously. This will select all the data and convert it to a table.

3 Place the cursor anywhere within the table and click the Form button. Done!

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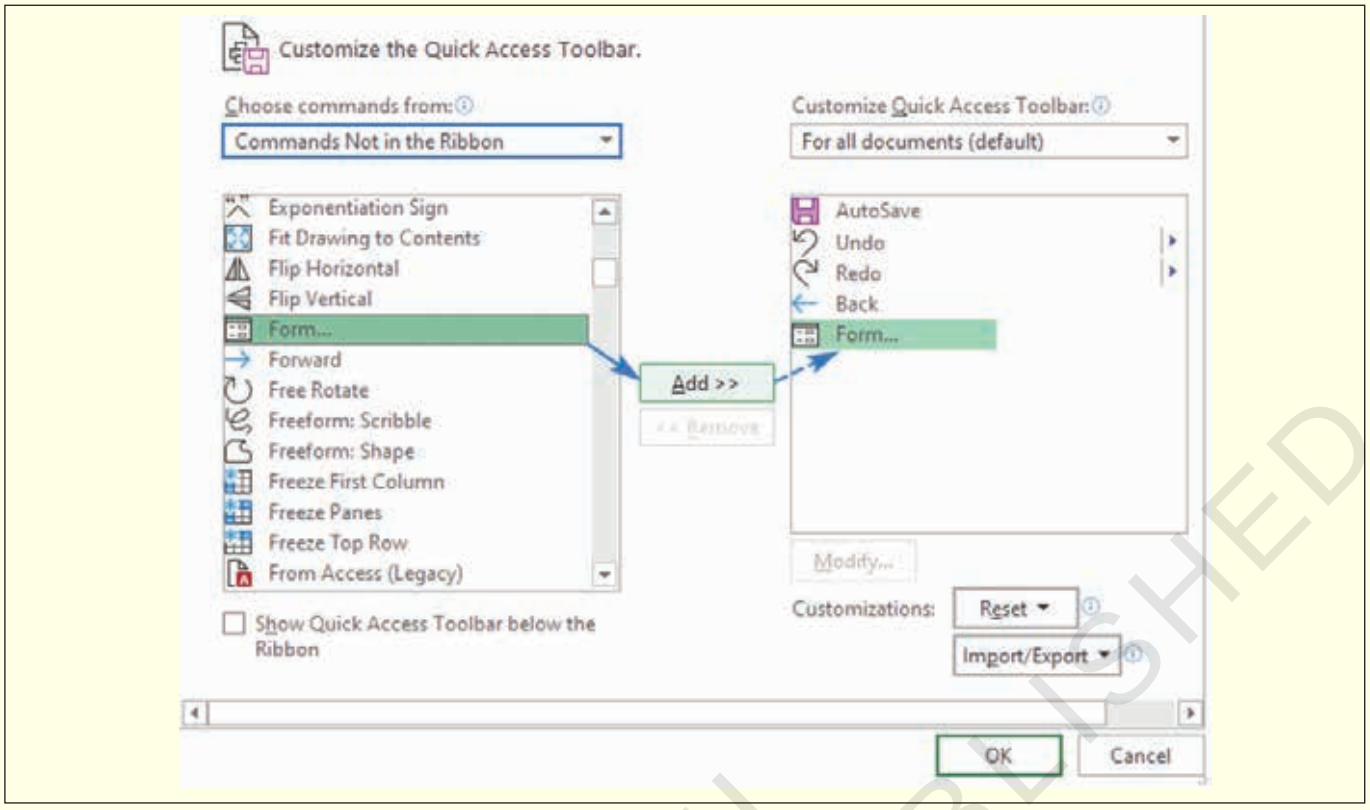
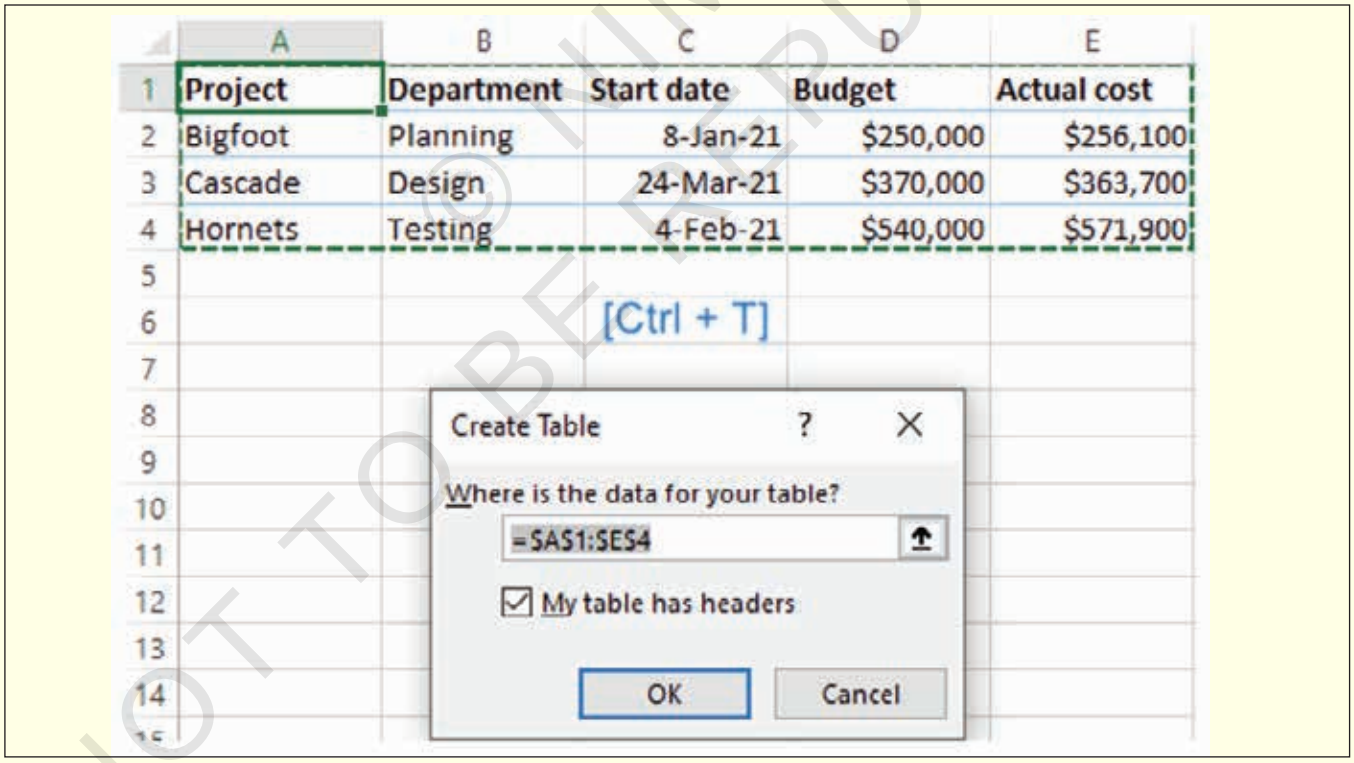


To keep things simple, let's make this small table as an example:



Clicking the Form button automatically creates a data entry form for your table with fields corresponding to the column headings:

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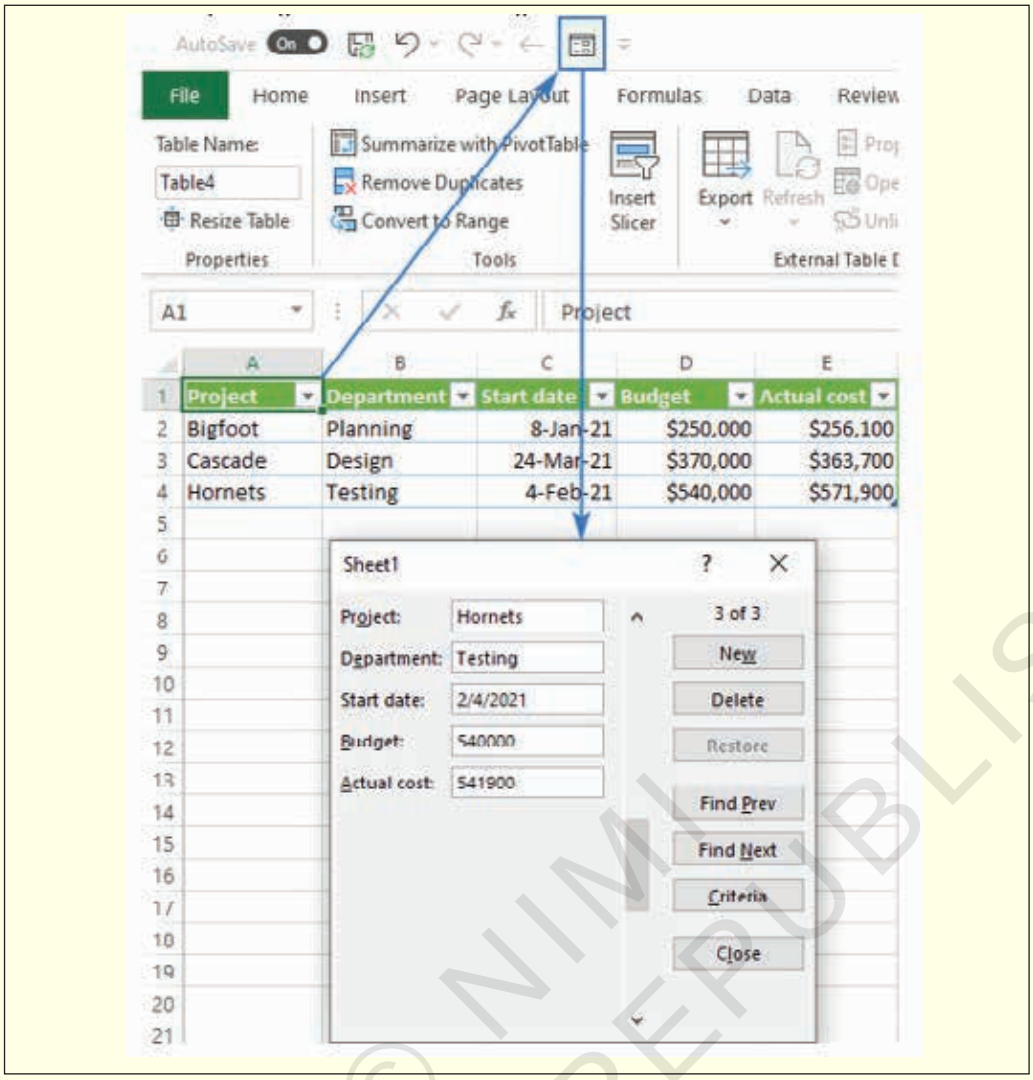
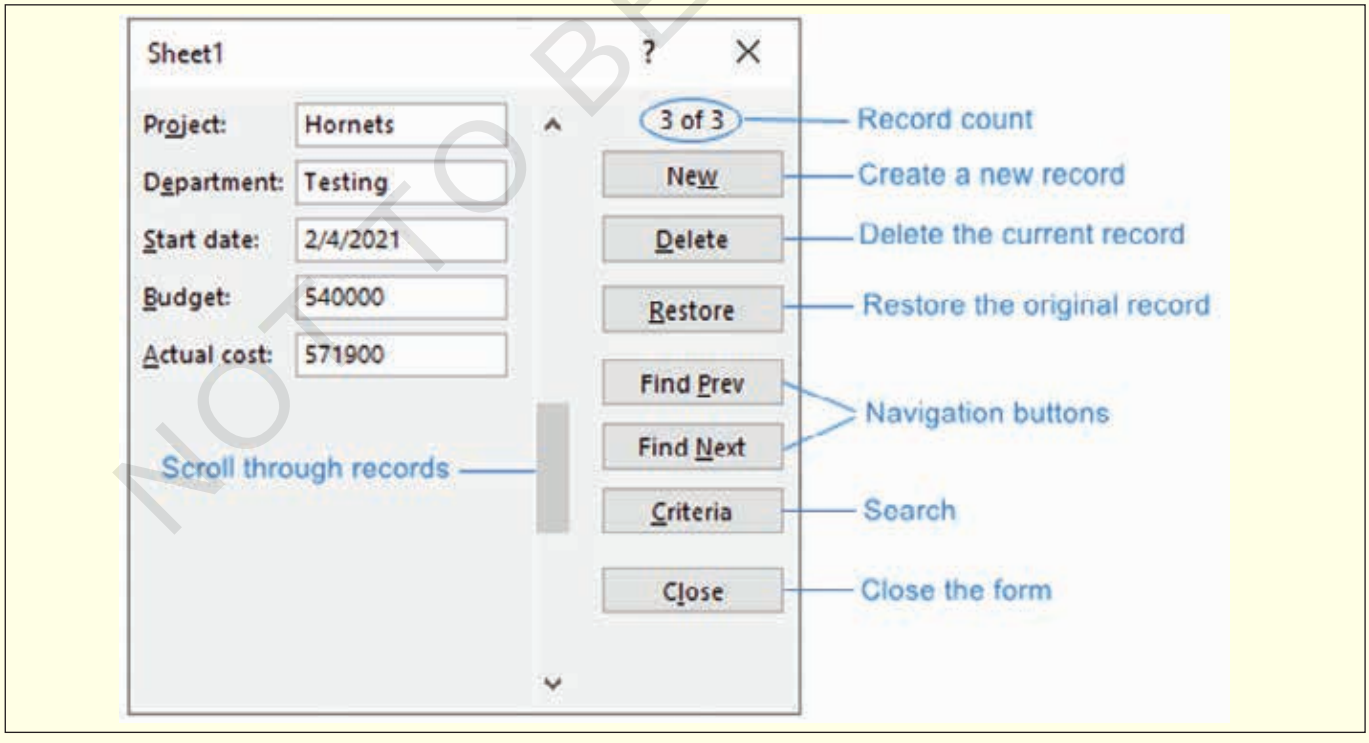


As you can see, the Excel input form has a handful of different buttons. Here's a brief explanation of what each button does:



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Aside from the buttons, you can use the following keys for navigation:

- Tab - get to the next field.
- Shift + Tab - get to the previous field.
- Enter - save the current record and start a new one.

How to add a new record

To add a new record to your table using the data entry form, perform these steps:

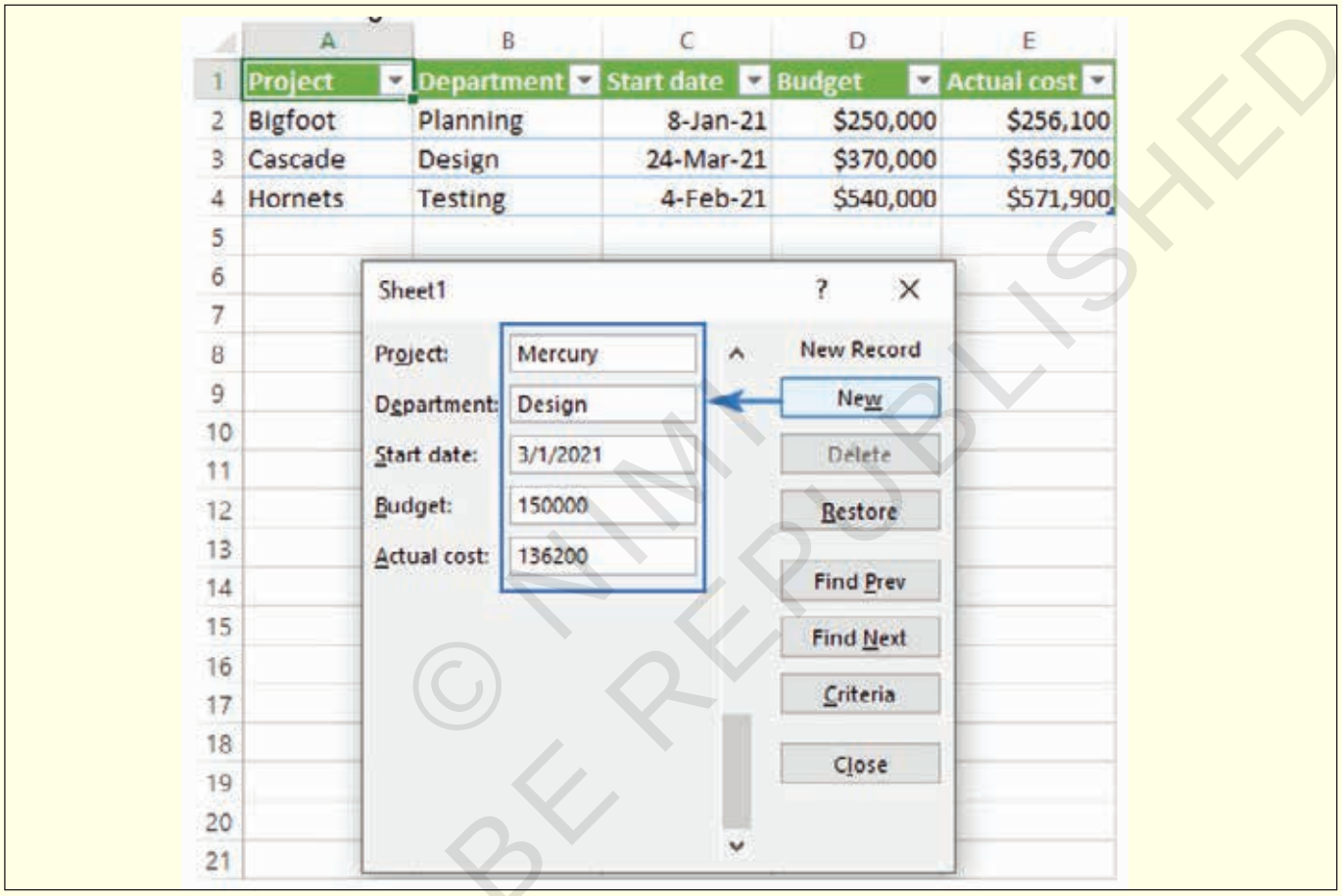
1 Select any cell in your table.

2 Click on the Form button on the Quick Access Toolbar or on the ribbon.

3 In the input form, click the New button.

4 Type the information in the appropriate fields.

5 When done, hit the Enter key or click the New button again. This will add the record to the table and get a blank form for the next record.



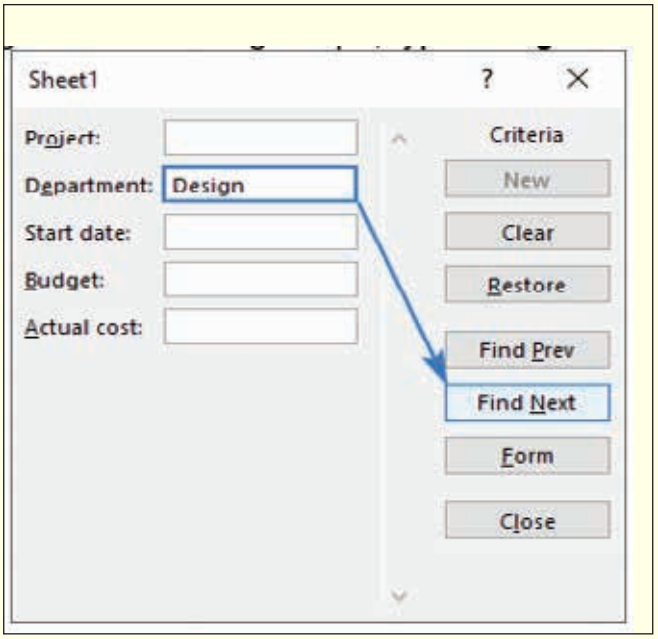
Tip: To quickly enter specific information, you can use the same shortcuts that you use in your worksheets. For example:

- Press Ctrl + ; to insert today's date.
- Press Ctrl + Shift + ; to enter the current time.

How to search for records

To go through the records one by one, you can use the Find Prev and Find Next buttons or the vertical scroll bar. To find records that meet certain conditions, use the Criteria button.

For example, to locate all the projects assigned to the Design dept., type Design in the Department field, and press Find Next:



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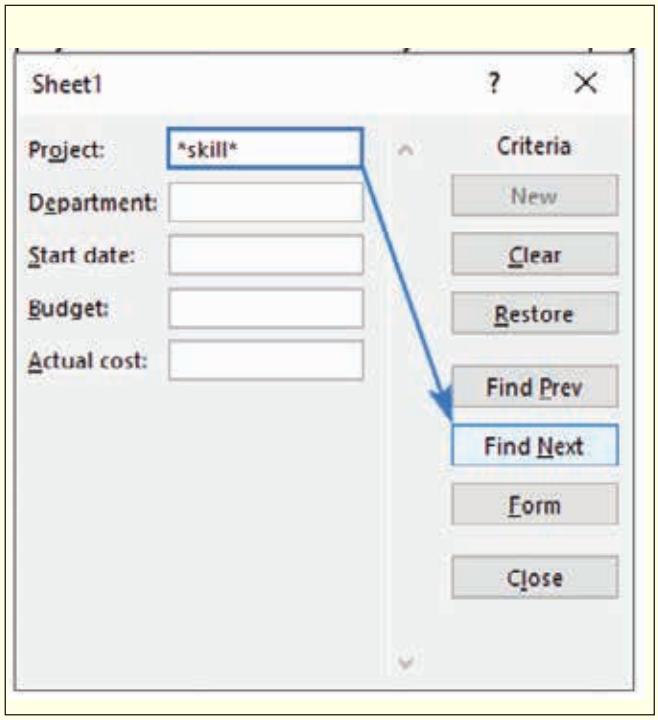
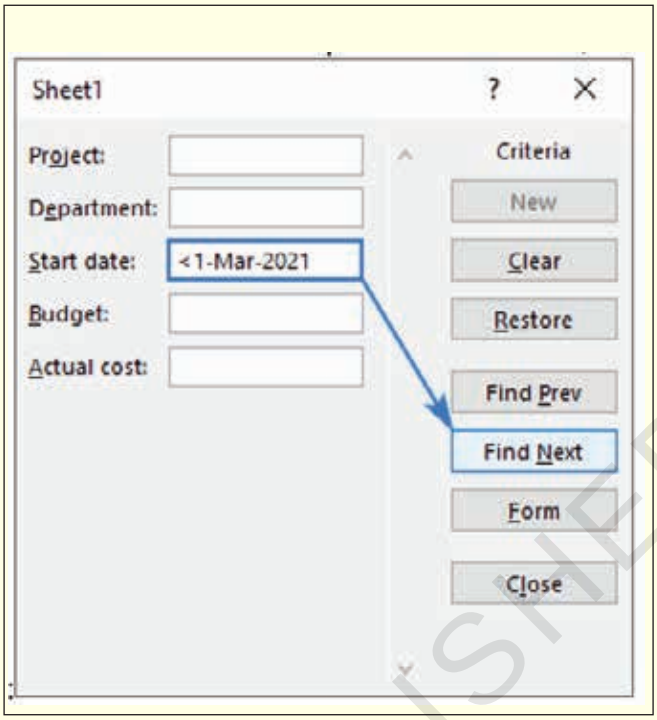
The wildcard characters can help you broaden the search. For instance, to discover the projects that contain “skill” anywhere in the project name, type *skill* in the Project field.



When dealing with numbers and dates, the logical operators such as greater than (>), less than (<), equal to (=), not equal to (<>) and others come in handy. For example, to view the records where the start date is prior to 1-Mar-2021, use “<1-Mar-2021” or “<3/1/2021” for the criteria:

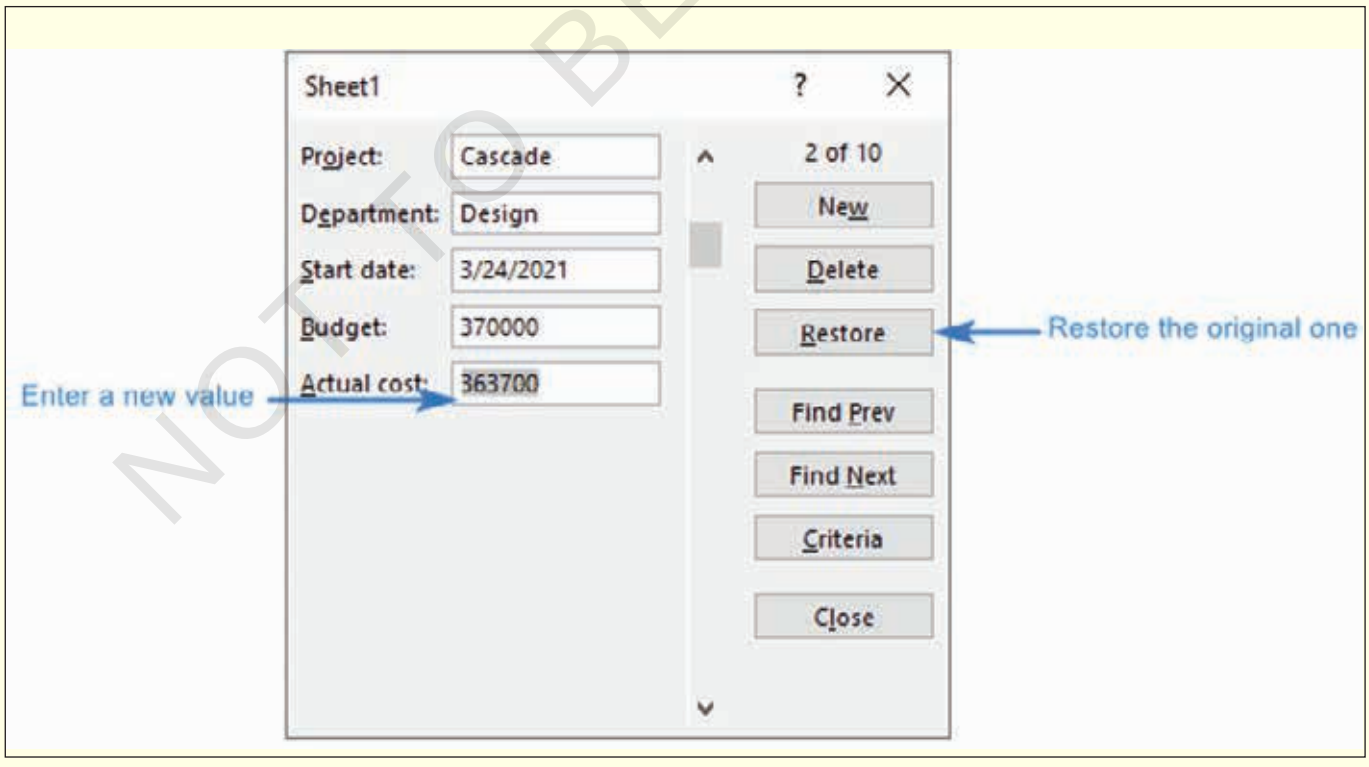
Note: Criteria on a data form are not case sensitive. Say, when searching for the Design dept., “DESIGN” and “design” will also be found.



How to update and restore records

If some entry is outdated or contains wrong information, you can use the Criteria or navigation buttons to get to the record, update the incorrect field, and press Enter to commit the updated data to the table.

If you made some accidental changes but have not pressed the Enter key yet, you can revert to the original record by clicking the Restore button. If you’ve already hit Enter and the changes were passed over to the table, press **Ctrl + Z** to undo.



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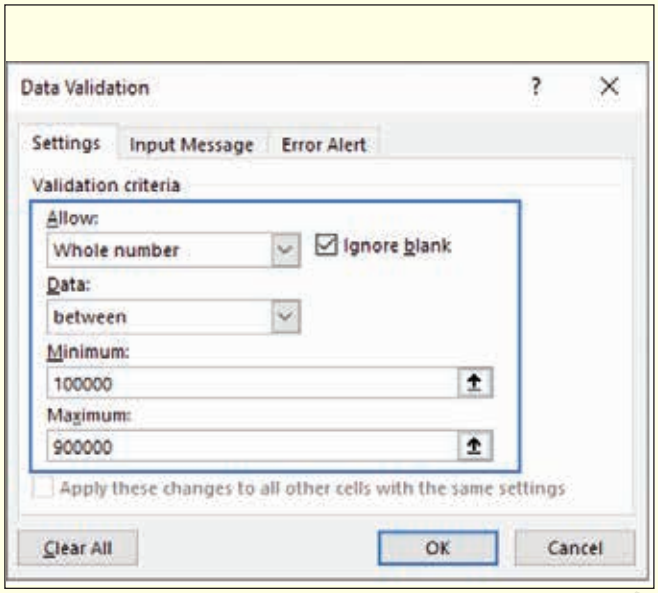
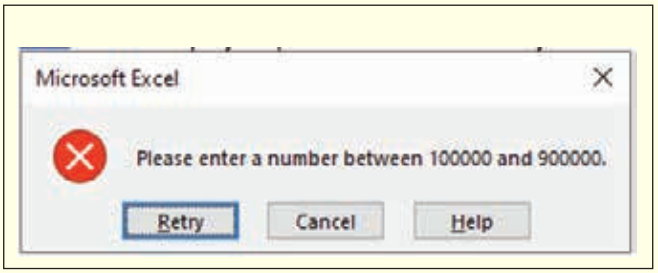
How to use Data Validation with data entry form

To restrict user input to a specific data type, you can set up a data validation rule for one or more columns in your table, and your rules will be automatically carried over to the data entry form.

For example, to limit the Budget to numbers in a given range, we create this rule:

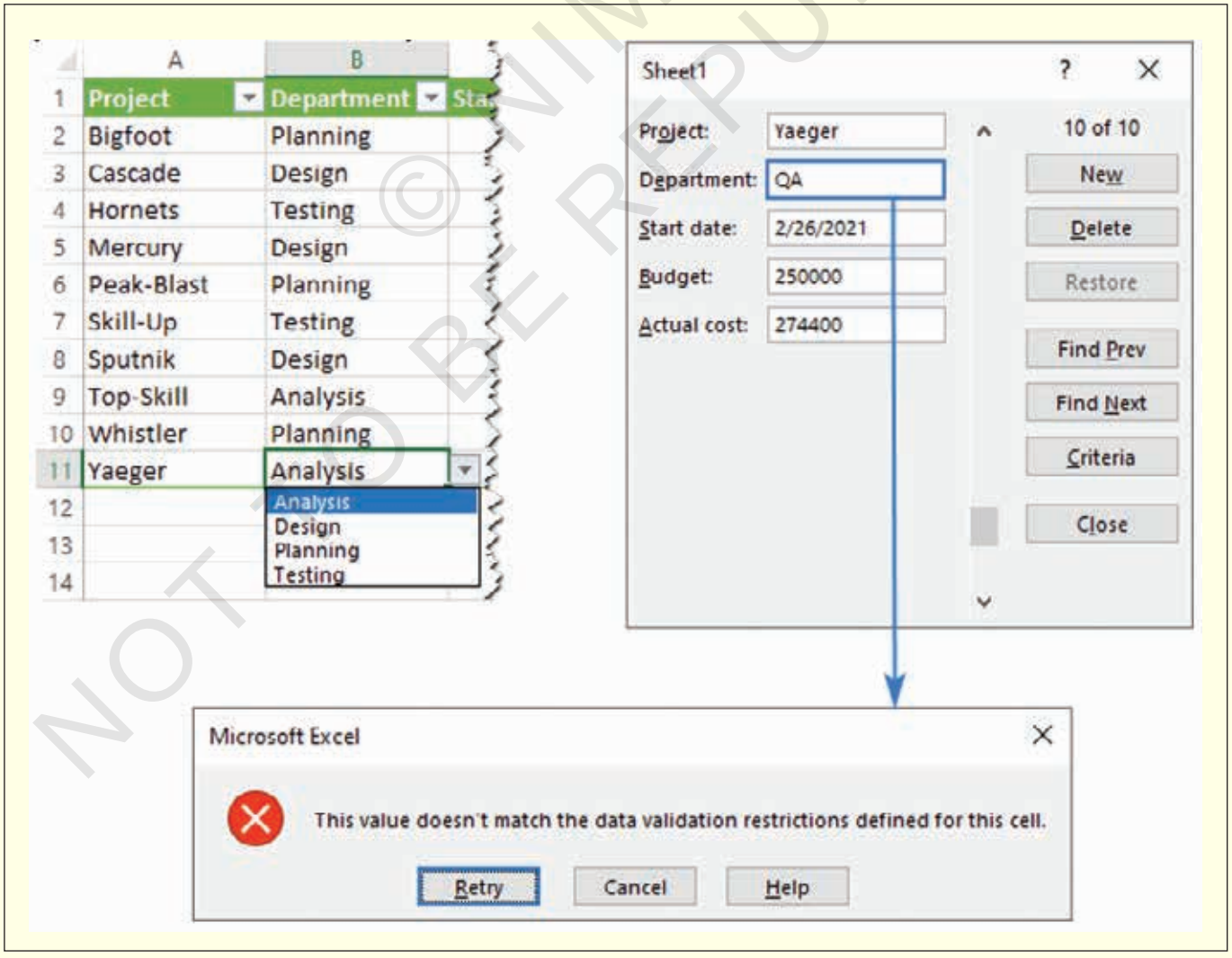


If someone tries to enter a value that does not conform to the rule you've set, an error alert will be displayed (either the standard or your custom one):



Limitation: drop down lists are unavailable on a form

The use of data validation with input forms has one limitation - drop down lists do not appear in data entry fields. But even though a drop-down list does not show up inside the form, its restrictions are still in effect. If you enter a value that is not in the list, the form will reject it just as Data Validation normally would.



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Formulas in data entry forms

In case one or more columns in your table are calculated by formulas, you won't be able to alter those formulas using the form because the formula result appears as text, not as an editable field. Although that may sound like another limitation, in fact it is done for a reason. When you change a table formula in one cell, the formulas in all other cells in the same column change automatically. To avoid messing up your data, formula editing on the input form is blocked.

For example, you could use the following formula to find out if the actual cost is under, over or within the budget based on the 5% threshold:

=IF(ABS([@[Actual cost]]/ [@Budget] - 1)<=5%, "Within budget", IF([@[Actual cost]]/ [@Budget]- 1>5%, "Over budget", IF([@[Actual cost]]/ [@Budget]- 1<5%, "Under budget", "")))

If you are using a Microsoft 365 subscription and signed up for Beta Channel (Office Insider), then you could wrap the above formula in the LET function like shown below. This will make your formula more compact, easier-to-understand and faster-to-calculate:

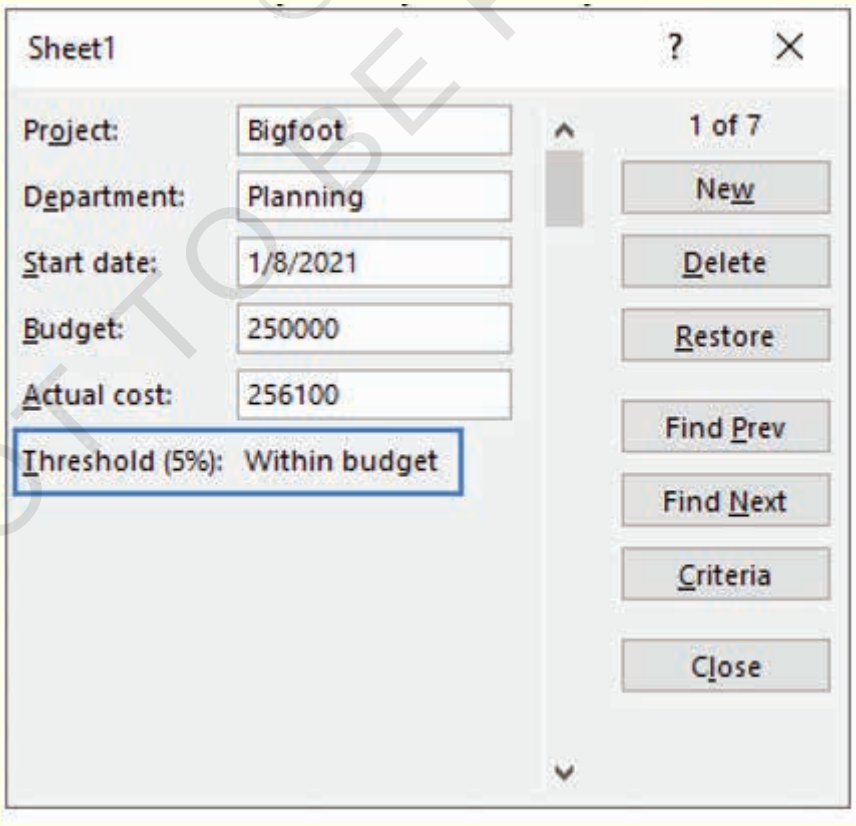
=LET(dif, E2/D2-1, IF(ABS(dif)<=5%, "Within budget", IF(dif>5%, "Over budget", IF(dif<5%, "Under budget", ""))))

F3

```
=IF(ABS([@[Actual cost]]/ [@Budget] - 1) <=5%, "Within budget",
IF([@[Actual cost]]/ [@Budget] - 1 >5%, "Over budget",
IF([@[Actual cost]]/ [@Budget] - 1<5%, "Under budget", "")))
```

	A	B	C	D	E	F
1	Project	Department	Start date	Budget	Actual cost	Threshold (5%)
2	Bigfoot	Planning	8-Jan-21	$250,000	$256,100	Within budget
3	Cascade	Design	24-Mar-21	$370,000	$363,700	Within budget
4	Hornets	Testing	4-Feb-21	$540,000	$571,900	Over budget
5	Mercury	Design	1-Mar-21	$150,000	$136,200	Under budget
6	Peak-Blast	Planning	20-Jan-21	$710,000	$736,400	Within budget
7	Skill-Up	Testing	18-Jan-21	$400,000	$373,500	Under budget
8	Sputnik	Design	20-Jan-21	$530,000	$538,200	Within budget

On the data entry form, you will only see a non-editable calculated result, not the formula:



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Look up data by using functions

Objectives: At the end of this exercise you shall be able to
- **state look up data.**

Requirements

Tools/Equipment/Machines

- A working PC with MS-OFFICE - 1 No.

PROCEDURE

Look up data

Use LOOKUP, one of the lookup and reference functions, when you need to look in a single row or column and find a value from the same position in a second row or column.

For example, let's say you know the part number for an auto part, but you don't know the price. You can use the LOOKUP function to return the price in cell H2 when you enter the auto part number in cell H1.

	B	C	D	E	F	G	H
1	**Part Number**	**Part Name**	**Part Price**	**Status**		**Part Number**	
2	A001	water pump	$68.39	In stock		**Part Price**	<enter the LOOKUP forumula here>
3	A002	alternator	$380.73	In stock			
4	A003	air filter	$15.49	In stock			
5	A004	wheel bearing	$35.16	In stock			

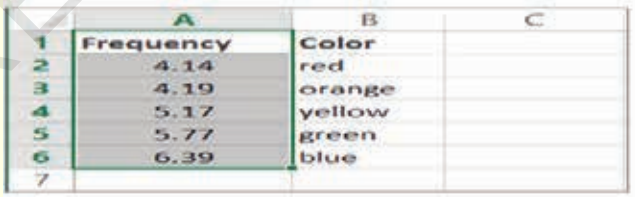
Use the LOOKUP function to search one row or one column. In the above example, we're searching prices in column D.

Tips: Consider one of the newer lookup functions, depending on which version you are using.

- Use VLOOKUP to search one row or column, or to search multiple rows and columns (like a table). It's a much improved version of LOOKUP. Watch this video about how to use VLOOKUP.
- If you are using Microsoft 365, use XLOOKUP - it's not only faster, it also lets you search in any direction (up, down, left, right).

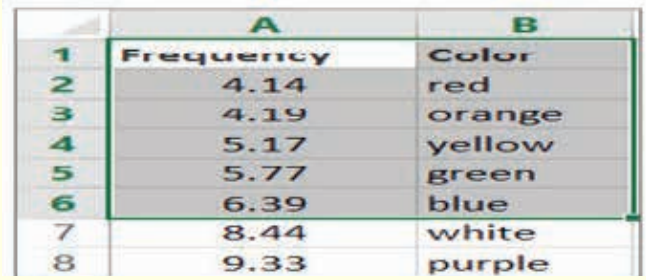
There are two ways to use LOOKUP: Vector form and Array form

- **Vector form:** Use this form of LOOKUP to search one row or one column for a value. Use the vector form when you want to specify the range that contains the values that you want to match. For example, if you want to search for a value in column A, down to row 6.
- **Array form:** We strongly recommend using VLOOKUP or HLOOKUP instead of the array form. Watch this video about using VLOOKUP. The array form is provided for compatibility with other spreadsheet programs, but it's functionality is limited.



	A	B	C
1	Frequency	Color	
2	4.14	red	
3	4.19	orange	
4	5.17	yellow	
5	5.77	green	
6	6.39	blue	
7			

An array is a collection of values in rows and columns (like a table) that you want to search. For example, if you want to search columns A and B, down to row 6. LOOKUP will return the nearest match. To use the array form, your data must be sorted.



	A	B
1	Frequency	Color
2	4.14	red
3	4.19	orange
4	5.17	yellow
5	5.77	green
6	6.39	blue
7	8.44	white
8	9.33	purple

Vector form

The vector form of LOOKUP looks in a one-row or one-column range (known as a vector) for a value and returns a value from the same position in a second one-row or one-column range.

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Syntax

LOOKUP(lookup_value, lookup_vector, [result_vector])

The LOOKUP function vector form syntax has the following arguments:

- lookup_value Required. A value that LOOKUP searches for in the first vector. Lookup_value can be a number, text, a logical value, or a name or reference that refers to a value.
- lookup_vector Required. A range that contains only one row or one column. The values in lookup_vector can be text, numbers, or logical values.

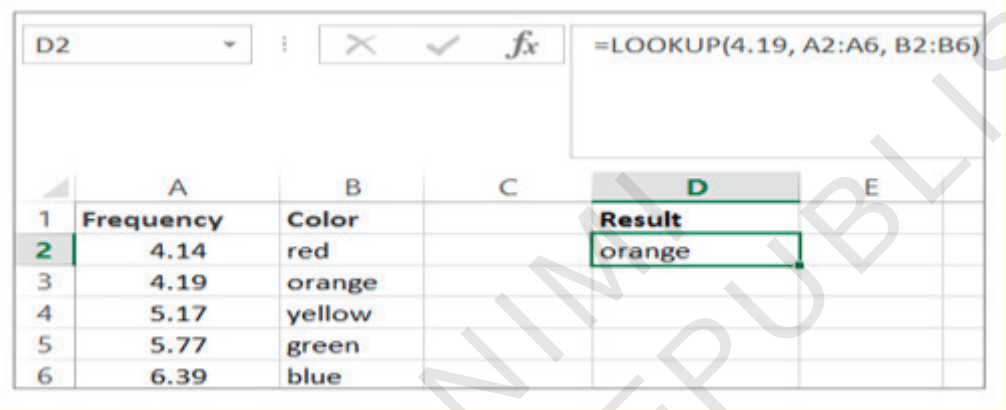
  Important: The values in lookup_vector must be placed in ascending order: ..., -2, -1, 0, 1, 2, ..., A-Z, FALSE, TRUE; otherwise, LOOKUP might not return the correct value. Uppercase and lowercase text are equivalent.
- result_vector Optional. A range that contains only one row or column. The result_vector argument must be the same size as lookup_vector. It has to be the same size.

Remarks

- If the LOOKUP function can't find the lookup_value, the function matches the largest value in lookup_vector that is less than or equal to lookup_value.
- If lookup_value is smaller than the smallest value in lookup_vector, LOOKUP returns the #N/A error value.

Vector examples

You can try out these examples in your own Excel worksheet to learn how the LOOKUP function works. In the first example, you're going to end up with a spreadsheet that looks similar to this one:



Array form

Tip: We strongly recommend using VLOOKUP or HLOOKUP instead of the array form. See this video about VLOOKUP; it provides examples. The array form of LOOKUP is provided for compatibility with other spreadsheet programs, but its functionality is limited.

The array form of LOOKUP looks in the first row or column of an array for the specified value and returns a value from the same position in the last row or column of the array. Use this form of LOOKUP when the values that you want to match are in the first row or column of the array.

Syntax

LOOKUP(lookup_value, array)

The LOOKUP function array form syntax has these arguments:

- lookup_value Required. A value that LOOKUP searches for in an array. The lookup_value argument can be a number, text, a logical value, or a name or reference that refers to a value.
- If LOOKUP can't find the value of lookup_value, it uses the largest value in the array that is less than or equal to lookup_value.
- If the value of lookup_value is smaller than the smallest value in the first row or column (depending on the array dimensions), LOOKUP returns the #N/A error value.
- array Required. A range of cells that contains text, numbers, or logical values that you want to compare with lookup_value.

  The array form of LOOKUP is very similar to the HLOOKUP and VLOOKUP functions. The difference is that HLOOKUP searches for the value of lookup_value in the first row, VLOOKUP searches in the first column, and LOOKUP searches according to the dimensions of array.
- If array covers an area that is wider than it is tall (more columns than rows), LOOKUP searches for the value of lookup_value in the first row.
- If an array is square or is taller than it is wide (more rows than columns), LOOKUP searches in the first column.
- With the HLOOKUP and VLOOKUP functions, you can index down or across, but LOOKUP always selects the last value in the row or column.

  Important: The values in array must be placed in ascending order: ..., -2, -1, 0, 1, 2, ..., A-Z, FALSE, TRUE; otherwise, LOOKUP might not return the correct value. Uppercase and lowercase text are equivalent.

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Use advanced date functions

Objectives: At the end of this exercise you shall be able to
- **DATE,DATEIF, DATEVALUE, DAY, DAYS, DAYS360**
- **EDATE , EOMONTH, HOUR,ISOWEEKNUM, MINUTE, MONTH, NETWORKDAYS, NETWORKDAYS.INTL, NOW,SECOND, TIME,TIMEVALUE**
- **TODAY, WEEKDAY, WEEKNUM,WORKDAY, WORKDAY.INTL, YEAR, YEARFRAC.**

Requirements

Tools/Equipment/Machines

- A working PC with MS-OFFICE - 1 No.

PROCEDURE

DATE

The DATE function returns the serial number of a particular date.

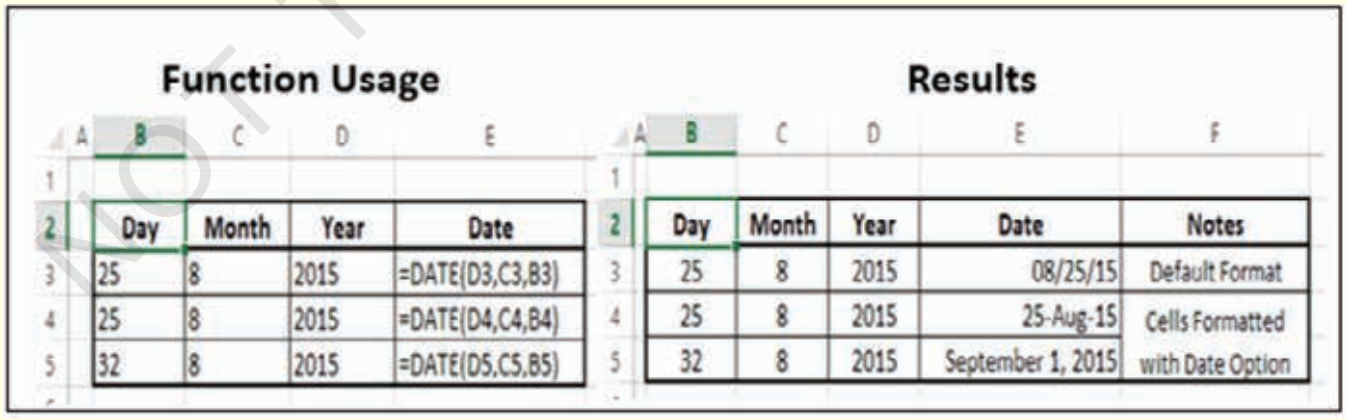
Syntax

DATE (year, month, day)

Arguments

Argument	Description	Required/ Optional
year	The value of the year argument can include one to four digits. Excel interprets the year argument according to the date system your computer is using. By default, Microsoft Excel for Windows uses the 1900 date system. See Notes below.	Required
month	A positive or negative integer representing the month of the year from 1 to 12 (January to December). See Notes below.	Required
day	A positive or negative integer representing the day of the month from 1 to 31. See Notes below.	Required

Example



Day	Month	Year	Date
25	8	2015	=DATE(D3,C3,B3)
25	8	2015	=DATE(D4,C4,B4)
32	8	2015	=DATE(D5,C5,B5)

Day	Month	Year	Date	Notes
25	8	2015	08/25/15	Default Format
25	8	2015	25-Aug-15	Cells Formatted
32	8	2015	September 1, 2015	with Date Option

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DATEIF

The DATEDIF function calculates the number of days, months, or years between two dates. This function is provided for compatibility with Lotus 1-2-3.

Syntax

DATEDIF (start_date,end_date,unit)

Arguments

Argument	Description	Required/ Optional
Start_date	A date that represents the first, or starting, date of the period. Dates may be entered as text strings within quotation marks (E.g. “2001/1/30”), as serial numbers (E.g. 36921, which represents January 30, 2001, if you are using the 1900 date system), or as the results of other formulas or functions (E.g. DATEVALUE (“2001/1/30”)).	Required
End_date	A date that represents the last, or ending, date of the period.	Required
Unit	The type of information that you want returned. Look at the Unit Table given below.	Required

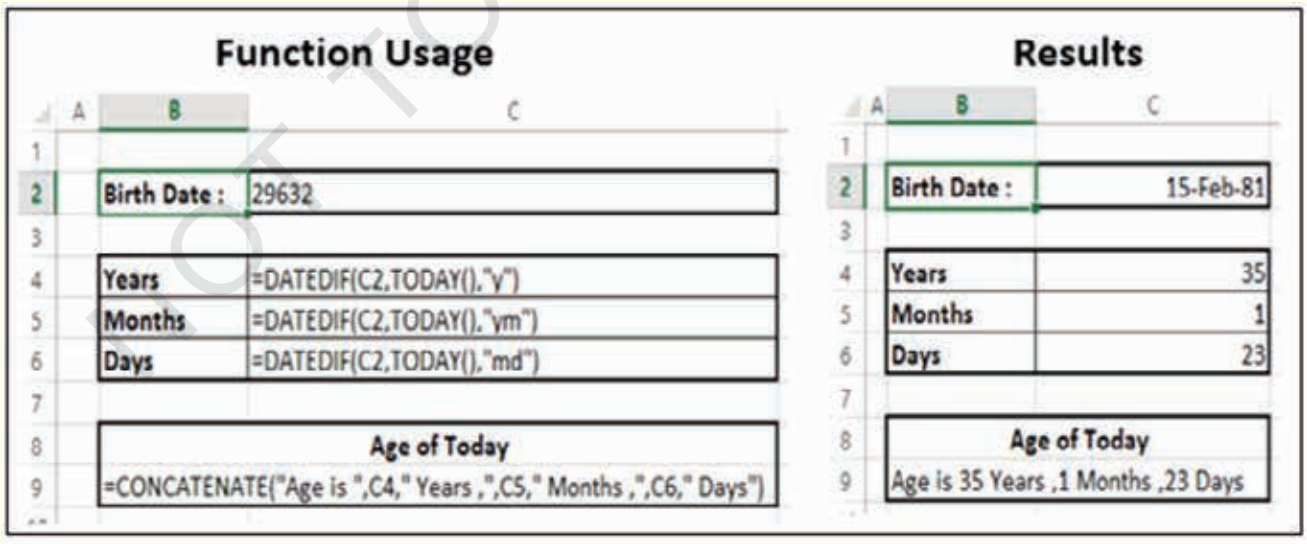
Unit Table

Unit	Returns
“Y”	The number of complete years in the period.
“M”	The number of complete months in the period.
“D”	The number of days in the period.
“MD”	The difference between the days in start_date and end_date. The months and years of the dates are ignored.
“YM”	The difference between the months in start_date and end_date. The days and years of the dates are ignored
“YD”	The difference between the days of start_date and end_date. The years of the dates are ignored.

Notes

- Excel stores dates as sequential serial numbers so that they can be used in calculations. January 1, 1900 is serial number 1, and January 1, 2008 is serial number 39448 because it is 39,447 days after January 1, 1900
- The DATEDIF function is useful in formulas where you need to calculate age.

Example



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DATEVALUE

The DATEVALUE function converts a date in the form of text to a serial number (Excel's date-time code).

The DATEVALUE function converts a date that is stored as text to a serial number that Excel recognizes as a date. For example,

=DATEVALUE ("1/1/2008")

returns 39448, the serial number of the date 1/1/2008.

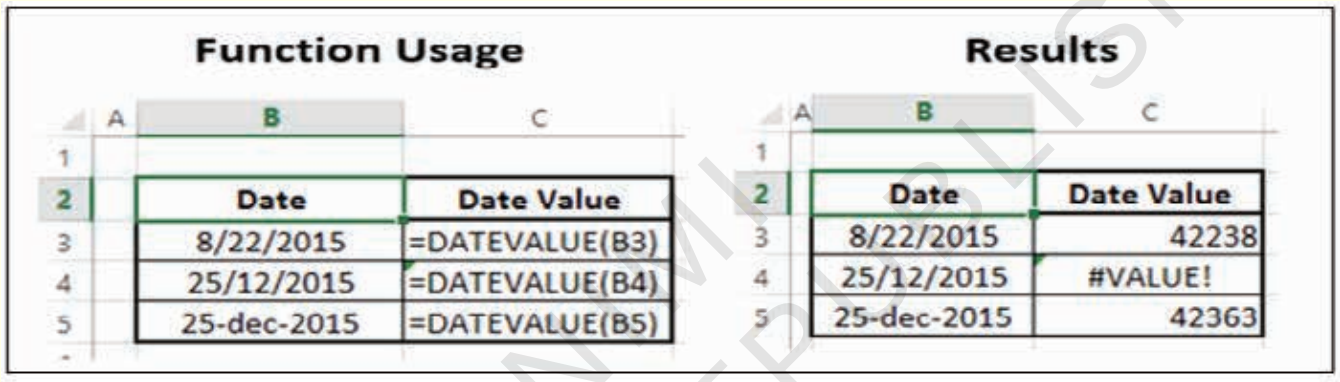
Syntax

DATEVALUE (date_text)

Arguments

Argument	Description	Required/ Optional
date_text	Text that represents a date in an Excel date format, or a reference to a cell that contains text that represents a date in an Excel date format. For example, "1/30/2008" or "30-Jan-2008" are text strings within quotation marks that represent dates. See Notes below.	Required

Example



DAY

The DAY function returns the day of a date, represented by a serial number. The day is given as an integer ranging from 1 to 31.

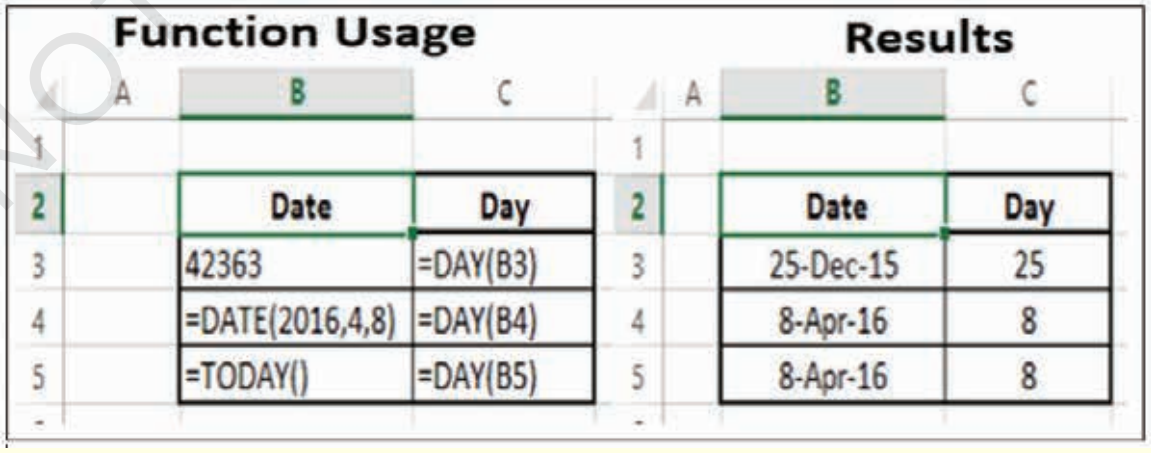
Syntax

DAY (serial number)

Arguments

Argument	Description	Required/ Optional
serial number	The date of the day you are trying to find. Dates should be entered by using the DATE function, or as results of other formulas or functions. For example, use DATE (2008,5,23) for the 23rd day of May 2008. Problems can occur if dates are entered as text.	Required

Example



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DAYS

The DAYS function returns the number of days between two dates.

Syntax

DAYS (end_date, start_date)

Arguments

Argument	Description	Required/ Optional
End_date	Start_date and End_date are the two dates between which you want to know the number of days.	Required
Start_date	Start_date and End_date are the two dates between which you want to know the number of days.	Required

Example

Function Usage

	A	B	C	D
1				
2		Start Date	End Date	Result
3		42370	42430	=DAYS(C3,B3)
4		42430	42370	=DAYS(C4,B4)
5		42370		=DAYS(C5,B5)
6			42370	=DAYS(C6,B6)
7		1 1 2016	42430	=DAYS(C7,B7)

Results

	A	B	C	D
1				
2		Start Date	End Date	Result
3		1/1/2016	3/1/2016	60
4		3/1/2016	1/1/2016	-60
5		1/1/2016		-42370
6			1/1/2016	42370
7		1 1 2016	3/1/2016	#VALUE!

DAYS360

The function DAYS360 returns the number of days between two dates based on a 360-day year (twelve 30-day months), which is used in accounting calculations.

Syntax

DAYS360 (start_date,end_date,[method])

Arguments

Argument	Description	Required/ Optional
Start_date	The two dates between which you want to know the number of days.	Required
end_date	If start_date occurs after end_date, the DAYS360 Function returns a negative number. Dates should be entered by using the DATE Function, or derived from the results of other formulas or functions. Problems can occur if dates are entered as text.	Required
Method	A logical value that specifies whether to use the U.S. or European method in the calculation. Look at the Method Table below.	Optional

Method Table

Method	Defined
FALSE or omitted	U.S. (NASD) method. If the starting date is the last day of a month, it becomes equal to the 30th day of the same month. If the ending date is the last day of a month and the starting date is earlier than the 30th day of a month, the ending date becomes equal to the 1st day of the next month; otherwise, the ending date becomes equal to the 30th day of the same month.
TRUE	European method. Starting dates and ending dates that occur on the 31st day of a month become equal to the 30th day of the same month.

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Example

Function Usage

	A	B	C	D
1				
2		StartDate	EndDate	Days Between
3		42370	42374	=DAYS360(B3,C3,FALSE)
4		42370	42374	=DAYS360(B4,C4,TRUE)
5		42374	42370	=DAYS360(B5,C5,TRUE)
6		42370	42401	=DAYS360(B6,C6,FALSE)
7		42370	42401	=DAYS360(B7,C7,TRUE)
8		42370	=DATE(2016,3,31)	=DAYS360(B8,C8,FALSE)
9		42370	=DATE(2016,3,31)	=DAYS360(B9,C9,TRUE)
10		42095	=DATE(2016,3,31)	=DAYS360(B10,C10,FALSE)
11		42095	=DATE(2016,3,31)	=DAYS360(B11,C11,TRUE)

Results

	A	B	C	D
1				
2		StartDate	EndDate	Days Between
3		1-Jan-16	5-Jan-16	4
4		1-Jan-16	5-Jan-16	4
5		5-Jan-16	1-Jan-16	-4
6		1-Jan-16	1-Feb-16	30
7		1-Jan-16	1-Feb-16	30
8		1-Jan-16	31-Mar-16	90
9		1-Jan-16	31-Mar-16	89
10		1-Apr-15	31-Mar-16	360
11		1-Apr-15	31-Mar-16	359

EDATE

The EDATE function returns the serial number that represents the date that is the indicated number of months before or after a specified date (the start_date).

Use EDATE to calculate maturity dates or due dates that fall on the same day of the month as the date of issue.

Syntax

EDATE (start_date, months)

Arguments

Argument	Description	Required/ Optional
Start_date	A date that represents the start date. Dates should be entered by using the DATE function, or as results of other formulas or functions. Problems can occur if dates are entered as text.	Required
Months	The number of months before or after start_date. A positive value for months yields a future date; a negative value yields a past date.	Required

Example

Function Usage

	A	B	C	D
1				
2		Start Date	Months	End Date
3		42370	3	=EDATE(B3,C3)
4		42371	3	=EDATE(B4,C4)
5		42371	-3	=EDATE(B5,C5)

Results

	A	B	C	D
1				
2		Start Date	Months	End Date
3		1-Jan-16	3	1-Apr-16
4		2-Jan-16	3	2-Apr-16
5		2-Jan-16	-3	2-Oct-15

EMONTH

The EOMONTH function returns the serial number for the last day of the month that is the indicated number of months before or after start_date.

Syntax

EOMONTH (start_date, months)

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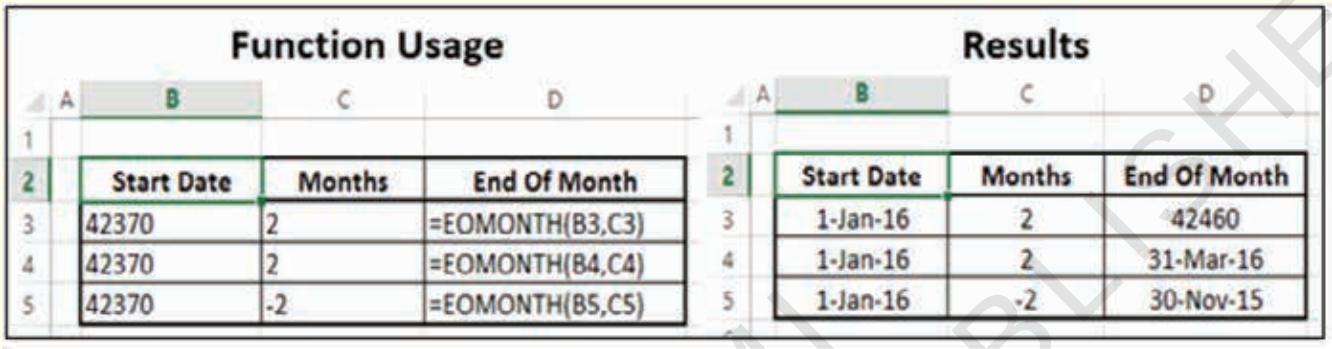
Arguments

Argument	Description	Required/ Optional
Start_date	A date that represents the starting date. Dates should be entered by using the DATE function, or as results of other formulas or functions. Problems can occur if dates are entered as text.	Required
Months	The number of months before or after start_date. A positive value for months yields a future date. A negative value yields a past date.	Required

Example



Function Usage

	A	B	C	D
1				
2		Start Date	Months	End Of Month
3		42370	2	=EOMONTH(B3,C3)
4		42370	2	=EOMONTH(B4,C4)
5		42370	-2	=EOMONTH(B5,C5)

Results

	A	B	C	D
1				
2		Start Date	Months	End Of Month
3		1-Jan-16	2	42460
4		1-Jan-16	2	31-Mar-16
5		1-Jan-16	-2	30-Nov-15

HOUR

The HOUR function returns the hour of a time value. The hour is given as an integer, ranging from 0 (12:00 A.M.) to 23 (11:00 P.M.).

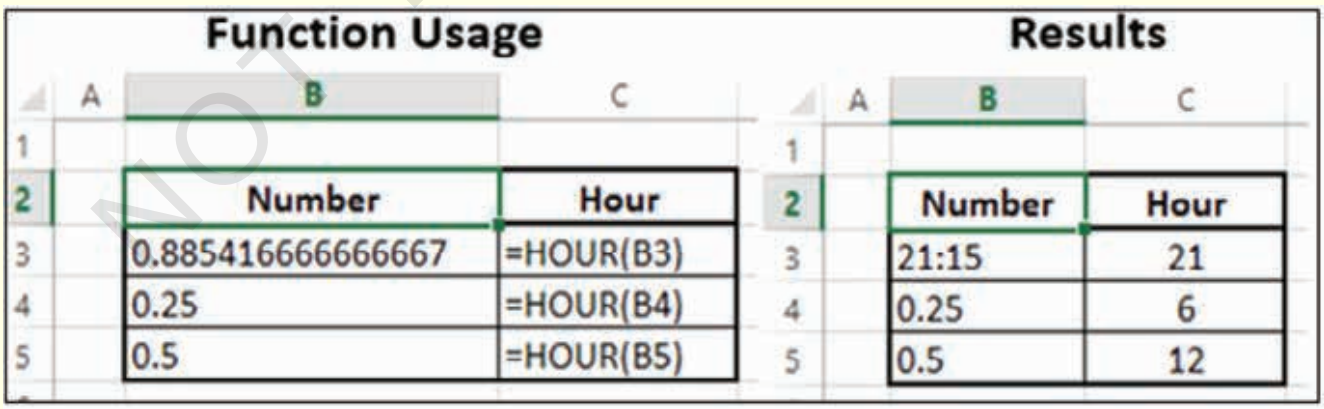
Syntax

HOUR (serial_number)

Arguments

Argument	Description	Required/ Optional
Serial_number	The time that contains the hour, you want to find. Times can be entered • as text strings within quotation marks (E.g. “6:45 PM”) • as decimal numbers (E.g. 0.78125, which represents 6:45 PM) • as results of other formulas or functions (E.g. TIME VALUE(“6:45 PM”))	Required

Example



Function Usage

	A	B	C
1			
2		Number	Hour
3		0.885416666666667	=HOUR(B3)
4		0.25	=HOUR(B4)
5		0.5	=HOUR(B5)

Results

	A	B	C
1			
2		Number	Hour
3		21:15	21
4		0.25	6
5		0.5	12

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ISOWEEKNUM

The ISOWEEKNUM function returns number of the ISO week number of the year for a given date.

Syntax

ISOWEEKNUM (date)

Arguments

Argument	Description	Required/ Optional
Date	Date is the date-time code used by Excel for date and time calculation.	Required

Example

Function Usage

	A	B	C
1			
2		Date	ISOWEEKNUM
3		42005	=ISOWEEKNUM(B3)
4		42370	=ISOWEEKNUM(B4)
5		42431	=ISOWEEKNUM(B5)
6		42463	=ISOWEEKNUM(B6)
7			

Results

	A	B	C
1			
2		Date	ISOWEEKNUM
3		1/1/2015	1
4		1/1/2016	53
5		3/2/2016	9
6		4/3/2016	13

MINUTE

The MINUTE function returns the minutes of a time value. The minute is given as an integer, ranging from 0 to 59.

Syntax

MINUTE (serial_number)

Arguments

Argument	Description	Required/ Optional
Serial_number	The time that contains the minute, you want to find. Times can be entered • as text strings within quotation marks (E.g. “6:45 PM”) • as decimal numbers (E.g. 0.78125, which represents 6:45 PM) • as results of other formulas or functions (E.g. TIMEVALUE (“6:45 PM”))	Required

Example

Function Usage

	A	B	C
1			
2		Number	Minute
3		0.885416666666667	=MINUTE(B3)
4		0.78125	=MINUTE(B4)
5		0.525	=MINUTE(B5)
6		0.677083333333333	=MINUTE(B6)
7		4:75:00 PM	=MINUTE(B7)

Results

	A	B	C
1			
2		Number	Minute
3		21:15	15
4		0.78125	45
5		0.525	36
6		4:15:00 PM	15
7		4:75:00 PM	#VALUE!

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MONTH

The MONTH function returns the month of a date represented by a serial number. The month is given as an integer, ranging from 1 (January) to 12 (December).

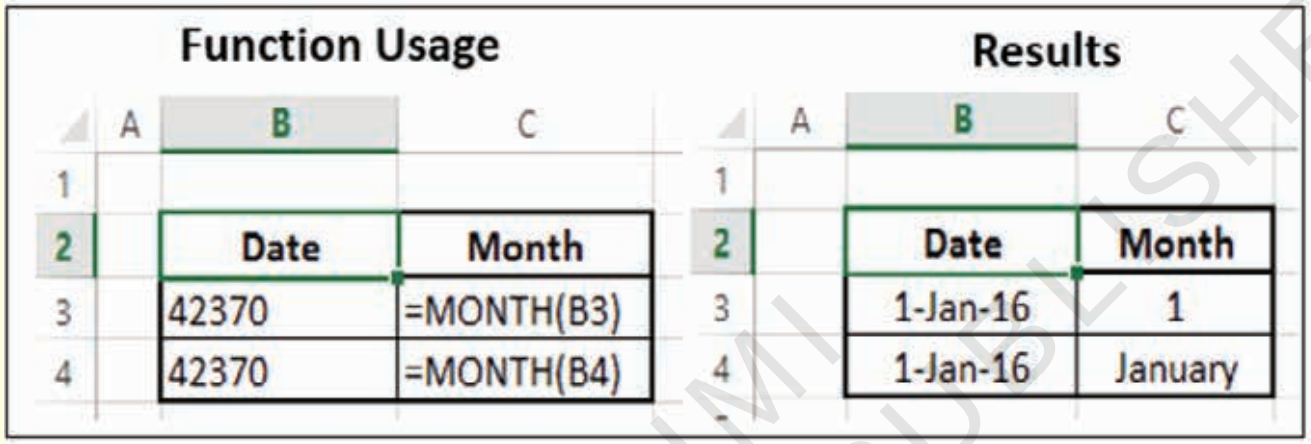
Syntax

MONTH (serial_number)

Arguments

Argument	Description	Required/ Optional
Serial_number	The date of the month you are trying to find. Dates should be entered by using the DATE Function, or as results of other formulas or functions. Problems can occur if dates are entered as text.	Required

Example



NETWORKDAYS

The NETWORKDAYS function returns the number of whole working days between start_date and end_ date. Working days exclude weekends and any dates identified in holidays.

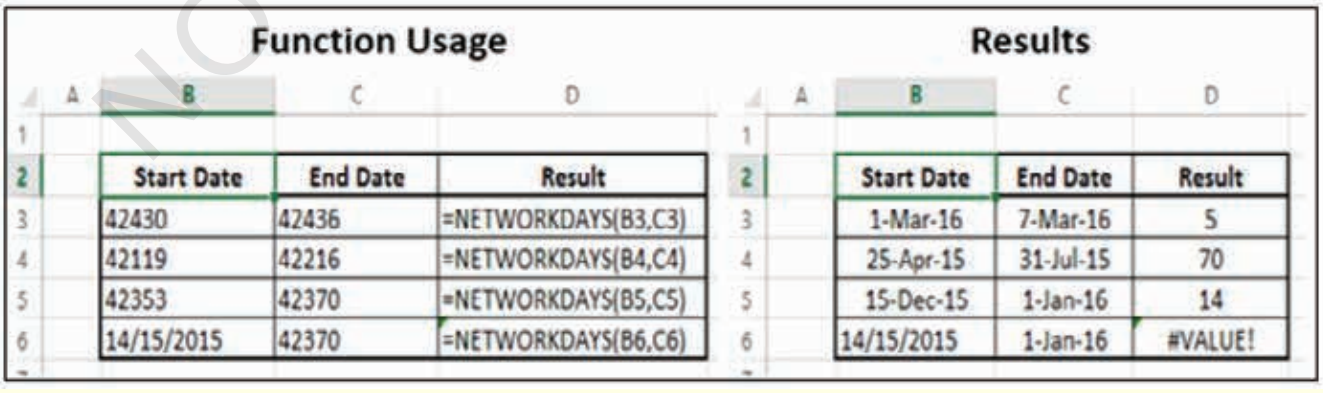
Syntax

NETWORKDAYS (start_date, end_date, [holidays])

Arguments

Argument	Description	Required/ Optional
Start_date	A date that represents the start date.	Required
End_date	A date that represents the end date.	Required
Holidays	An optional range of one or more dates to exclude from the working calendar, such as state and federal holidays and floating holidays. The list can be either a range of cells that contains the dates or an array constant of the serial numbers that represent the dates.	Optional

Example



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NETWORKDAY.INTL

The NETWORKDAY.INTL function returns the number of whole workdays between two dates using parameters to indicate which and how many days are weekend days. Weekend days and any days that are specified as holidays are not considered as workdays.

Syntax

NETWORKDAYS.INTL (start_date, end_date, [weekend], [holidays])

Arguments

Argument	Description	Required/ Optional
Start_date	The dates for which the difference is to be computed.	Required
End_date	The start_date can be earlier than, the same as, or later than the end_date.	Required
Weekend	Indicates the days of the week that are weekend days and are not included in the number of whole working days between start_date and end_date. Weekend is a weekend number or string that specifies when weekends occur. Look at Weekend Number - Weekend Days Table given below.	Optional
Holidays	An optional set of one or more dates that are to be excluded from the working day calendar. Holidays shall be • a range of cells that contain the dates • an array constant of the serial values that represent those dates The ordering of dates or serial values in holidays can be arbitrary.	Optional

Weekend Number - Weekend Days Table

Weekend Number	Weekend Days
1 or omitted	Saturday, Sunday
2	Sunday, Monday
3	Monday, Tuesday
4	Tuesday, Wednesday
5	Wednesday, Thursday
6	Thursday, Friday
7	Friday, Saturday
11	Sunday only
12	Monday only
13	Tuesday only
14	Wednesday only
15	Thursday only
16	Friday only
17	Saturday only

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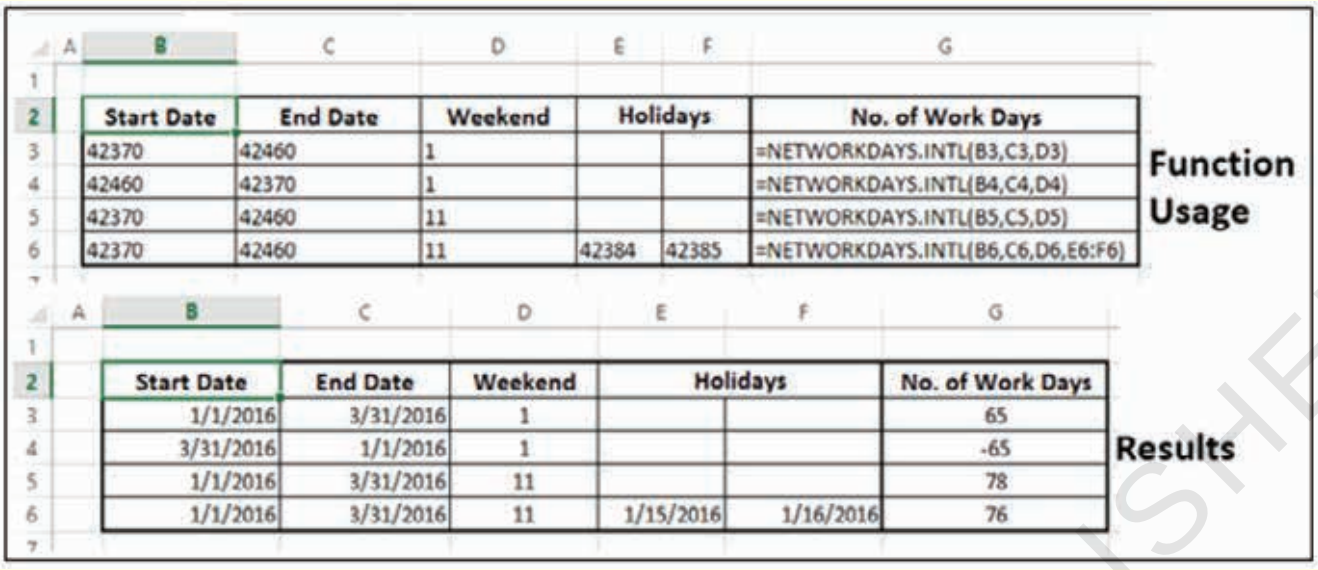
Weekend string values are seven characters long and each character in the string represents a day of the week, starting with Monday. 1 represents a non-workday and 0 represents a workday. Only the characters 1 and 0 are permitted in the string. Using 1111111 will always return 0.

Example



Start Date	End Date	Weekend	Holidays		No. of Work Days
42370	42460	1			=NETWORKDAYS.INTL(B3,C3,D3)
42460	42370	1			=NETWORKDAYS.INTL(B4,C4,D4)
42370	42460	11			=NETWORKDAYS.INTL(B5,C5,D5)
42370	42460	11	42384	42385	=NETWORKDAYS.INTL(B6,C6,D6,E6:F6)

Function Usage

Start Date	End Date	Weekend	Holidays		No. of Work Days
1/1/2016	3/31/2016	1			65
3/31/2016	1/1/2016	1			-65
1/1/2016	3/31/2016	11			78
1/1/2016	3/31/2016	11	1/15/2016	1/16/2016	76

Results

NOW

The NOW function returns the serial number of the current date and time.

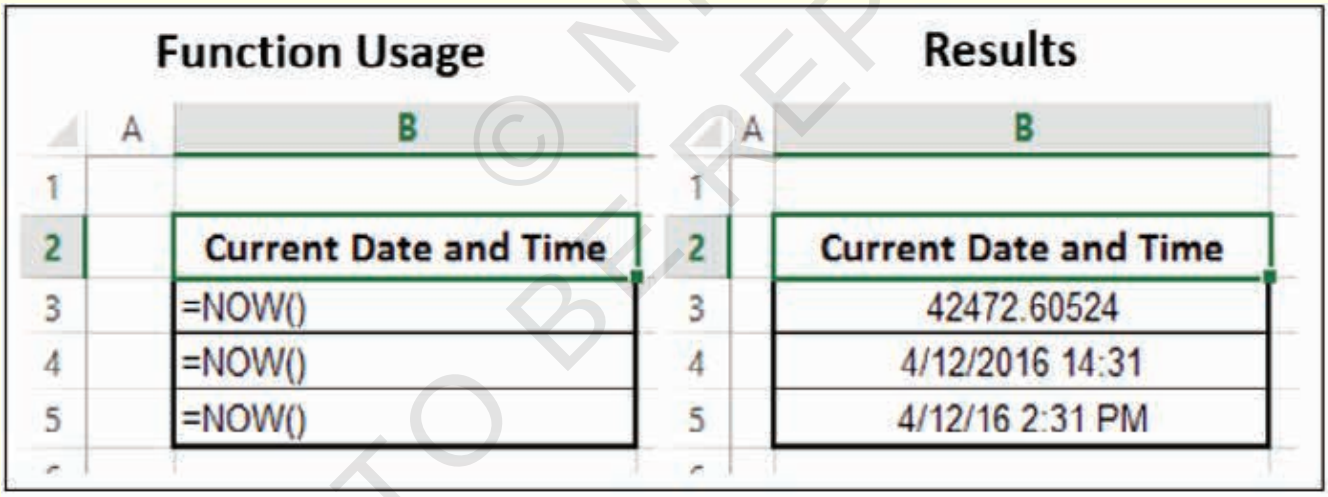
Syntax

NOW ()

Arguments

The NOW function syntax has no arguments.

Example



Function Usage

Current Date and Time
=NOW()
=NOW()
=NOW()

Results

Current Date and Time
42472.60524
4/12/2016 14:31
4/12/16 2:31 PM

SECOND

The SECOND function returns the seconds of a time value. The second is given as an integer in the range 0 (zero) to 59.

Syntax

SECOND (serial_number)

Arguments

Argument	Description	Required/ Optional
Serial_number	The time that contains the seconds, you want to find. Times can be entered as − • Text strings within quotation marks (E.g. “6:45 PM”) • Decimal numbers (E.g. 0.78125, which represents 6:45 PM) • Results of other formulas or functions (E.g. TIMEVALUE “6:45 PM”))	Required

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Example

Function Usage

	A	B	C
1			
2		Number	Second
3		=NOW()	=SECOND(B3)
4		0.5	=SECOND(B4)
5		0.5	=SECOND(B5)
6		0.51	=SECOND(B6)
7		2.51	=SECOND(B7)

Results

	A	B	C
1			
2		Number	Second
3		13/Apr/16 05:24:08	8
4		12:00:00 PM	0
5		0.50	0
6		0.51	24
7		2.51	24

TIME

The TIME function returns the decimal number for a particular time. If the cell format was General before the Function was entered, the result is formatted as a date.

The decimal number returned by TIME is a value ranging from 0 (zero) to 0.99988426, representing the times from 0:00:00 (12:00:00 AM) to 23:59:59 (11:59:59 P.M.)

Syntax

TIME (hour, minute, second)

Arguments

Argument	Description	Required/ Optional
Hour	A number from 0 (zero) to 32767 representing the hour. Any value greater than 23 will be divided by 24 and the remainder will be treated as the hour value.	Required
Minute	A number from 0 to 32767 representing the minute. Any value greater than 59 will be converted to hours and minutes.	Required
Second	A number from 0 to 32767 representing the second. Any value greater than 59 will be converted to hours, minutes, and seconds.	Required

Example

Function Usage

	A	B	C	D	E
1					
2		Hour	Minute	Second	Time
3		14	30	59	=TIME(B3,C3,D3)
4		14	30	59	=TIME(B4,C4,D4)
5		14	30	59	=TIME(B5,C5,D5)
6		25	5	0	=TIME(B6,C6,D6)
7		25	5		=TIME(B7,C7,D7)
8		25	-5		=TIME(B8,C8,D8)
9		-25	-5		=TIME(B9,C9,D9)
10		-25	Five		=TIME(B10,C10,D10)

Results

	Hour	Minute	Second	Time
1				
2	Hour	Minute	Second	Time
3	14	30	59	14:30:59
4	14	30	59	2:30:59 PM
5	14	30	59	0.60485
6	25	5	0	1:05:00 AM
7	25	5		1:05:00 AM
8	25	-5		12:55:00 AM
9	-25	-5		#NUM!
10	-25	Five		#VALUE!

TIMEVALUE

The TIMEVALUE function returns the decimal number of the time represented by a text string.

The decimal number is a value ranging from 0 (zero) to 0.99988426, representing the times from 0:00:00 (12:00:00 AM) to 23:59:59 (11:59:59 P.M.).

Syntax

TIMEVALUE (time_text)

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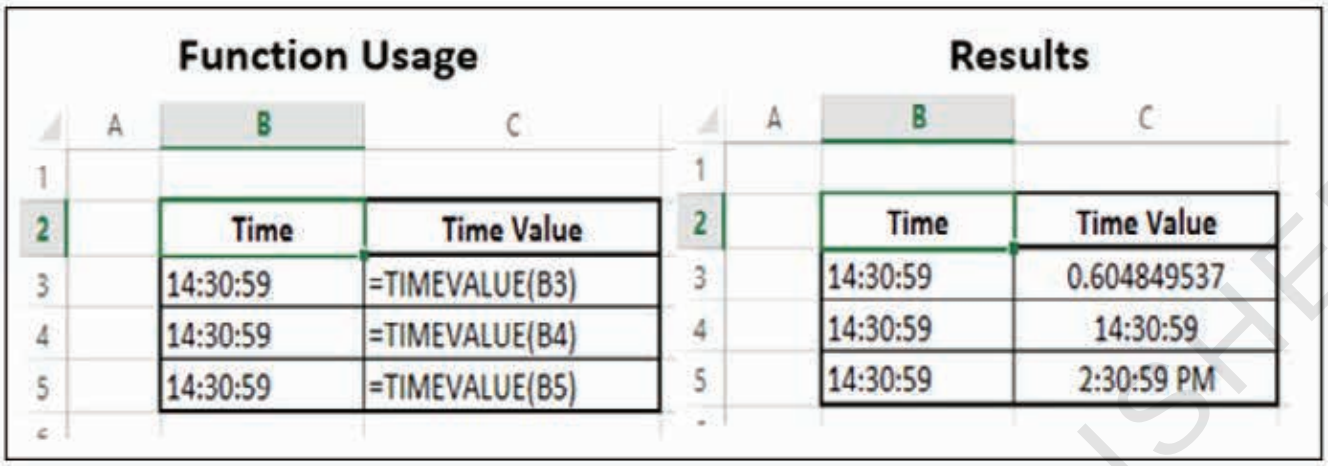
Arguments

Argument	Description	Required/ Optional
Time_text	A text string that represents a time in any one of the Microsoft Excel time formats.	Required

Example



TODAY

The TODAY function returns the serial number of the current date. The serial number is the date-time code used by Excel for date and time calculations. If the cell format was General before the function was entered, Excel changes the cell format to Date. If you want to view the serial number, you must change the cell format to General or Number.

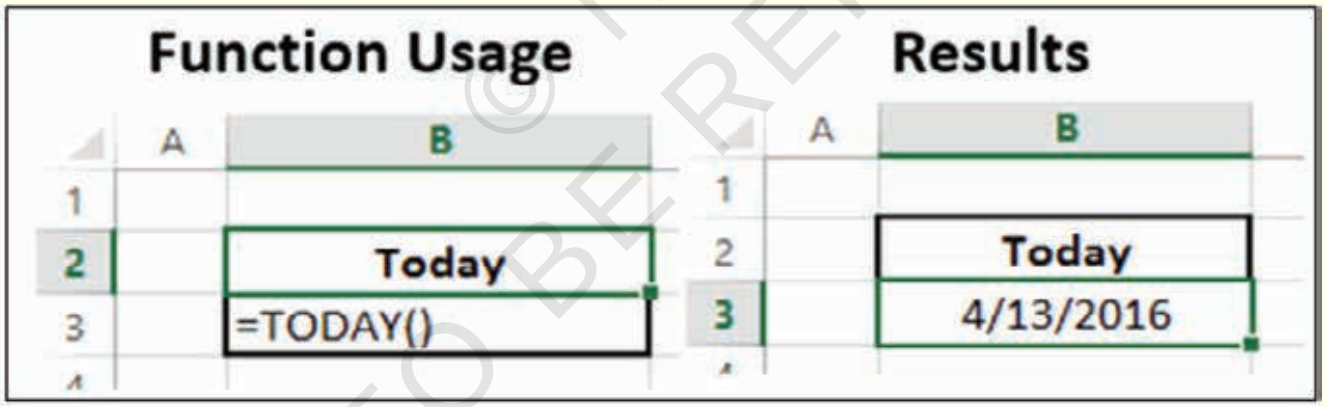
Syntax

TODAY ()

Arguments

The TODAY Function syntax has no arguments.

Example



WEEKDAY

The WEEKDAY function returns the day of the week corresponding to a date. The day is given as an integer, ranging from 1 (Sunday) to 7 (Saturday), by default

Syntax

WEEKDAY (serial_number, [return_type])

Arguments

Argument	Description	Required/ Optional
Serial_number	A sequential number that represents the date of the day you are trying to find. Dates should be entered by using the DATE function, or as results of other formulas or functions.	Required
Return_type	A number that determines the type of return value. Look at the Return Type Table given below.	Optional

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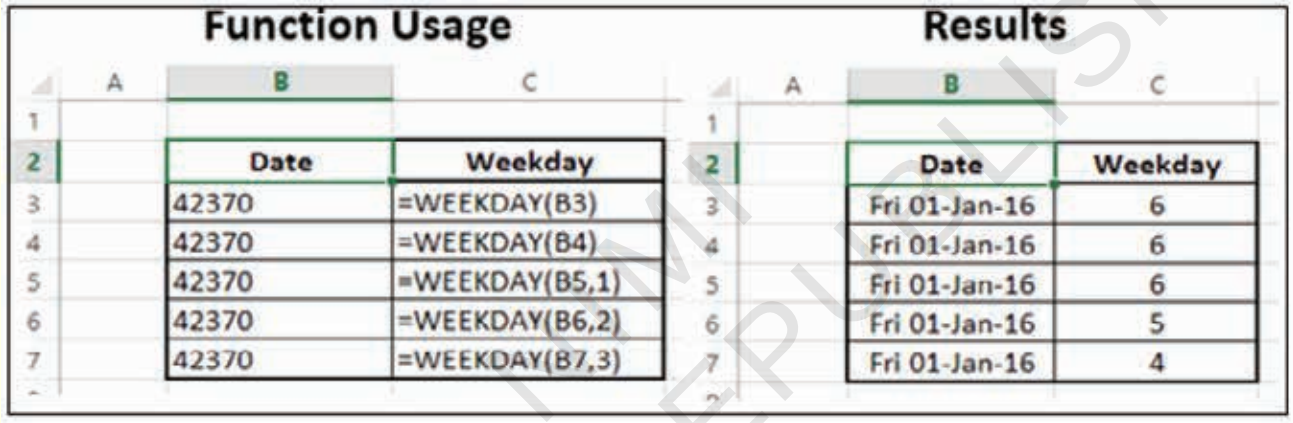
Return Type Table

Return_type	Number Returned
1 or omitted	Numbers 1 (Sunday) through 7 (Saturday). Behaves like previous versions of Microsoft Excel.
2	Numbers 1 (Monday) through 7 (Sunday).
3	Numbers 0 (Monday) through 6 (Sunday).
11	Numbers 1 (Monday) through 7 (Sunday).
12	Numbers 1 (Tuesday) through 7 (Monday).
13	Numbers 1 (Wednesday) through 7 (Tuesday).
14	Numbers 1 (Thursday) through 7 (Wednesday).
15	Numbers 1 (Friday) through 7 (Thursday).
16	Numbers 1 (Saturday) through 7 (Friday).
17	Numbers 1 (Sunday) through 7 (Saturday).

Example



WEEKNUM

The WEEKNUM function returns the week number of a specific date. The number represents where the week falls numerically within a year.

There are two systems used for this Function −

- **System 1 −** The week containing January 1 is the first week of the year, and is numbered week 1.
- **System 2 −** The week containing the first Thursday of the year is the first week of the year, and is numbered as week 1. This system is the methodology specified in ISO 8601, which is commonly known as the European week numbering system.

Syntax

WEEKNUM (serial_number, [return_type])

Arguments

Argument	Description	Required/ Optional
Serial_number	A date within the week. Dates should be entered by using the DATE function, or as results of other formulas or functions. Problems can occur if dates are entered as text.	Required
Return_type	A number that determines on which day the week begins. The default is 1. Look at the Week_beginning Day Table given below.	Optional

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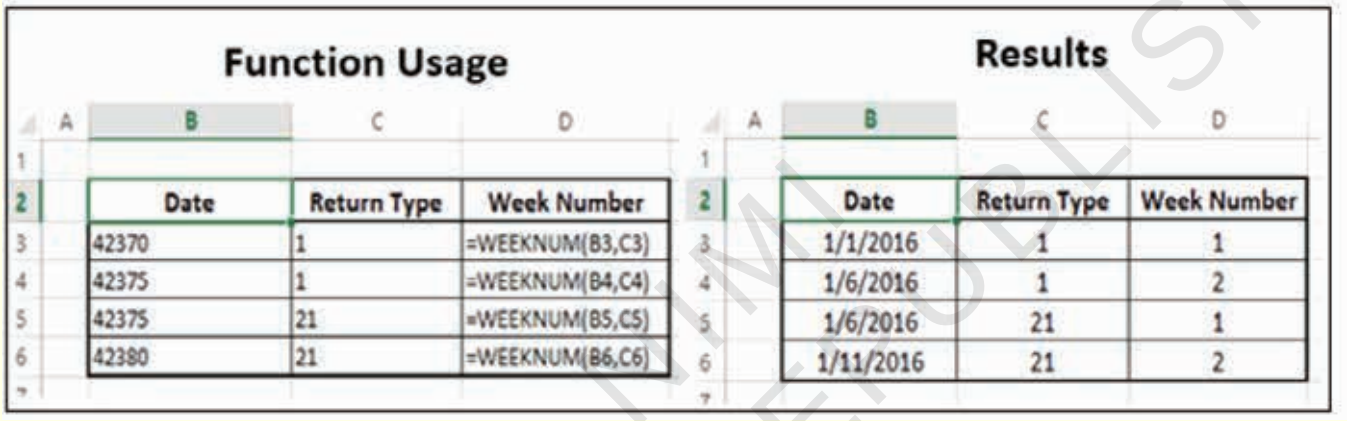
Week_beginning Day Table

Return_type	Week begins on	System
1 or omitted	Sunday	1
2	Monday	1
11	Monday	1
12	Tuesday	1
13	Wednesday	1
14	Thursday	1
15	Friday	1
16	Saturday	1
17	Sunday	1
21	Monday	2

Example



WORKDAY

The WORKDAY function returns a number that represents a date that is the indicated number of working days before or after a date (the starting date). Working days exclude weekends and any dates identified as holidays.

Use WORKDAY to exclude weekends or holidays when you calculate invoice due dates, expected delivery times, or the number of days of work performed.

Syntax

WORKDAY (start_date, days, [holidays])

Arguments

Argument	Description	Required/ Optional
Start_date	A date that represents the start date.	Required
Days	The number of nonweekend and nonholiday days before or after start_date. A positive value for days yields a future date. A negative value yields a past date.	Required
Holidays	An optional list of one or more dates to exclude from the working calendar, such as state and federal holidays and floating holidays. The list can be either a range of cells that contain the dates or an array constant of the serial numbers that represent the dates.	Optional

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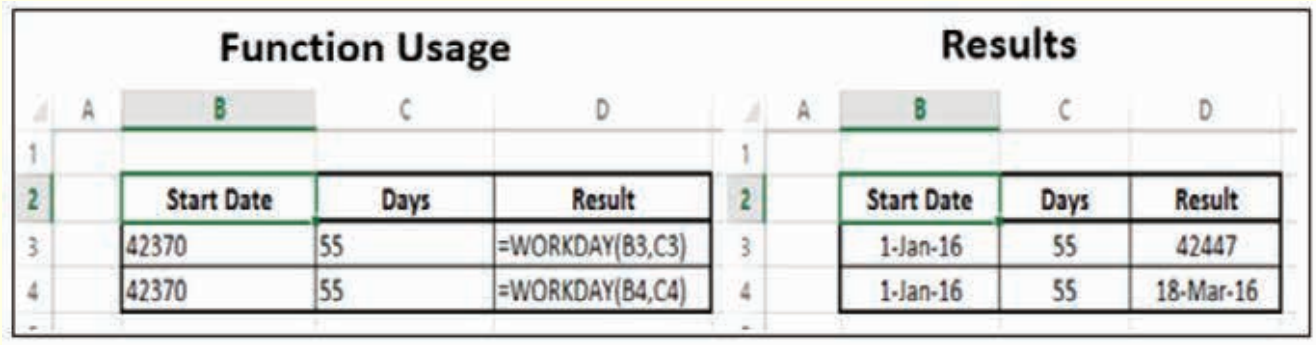
Example



Function Usage

	A	B	C	D
1				
2		Start Date	Days	Result
3		42370	55	=WORKDAY(B3,C3)
4		42370	55	=WORKDAY(B4,C4)

Results

	A	B	C	D
1				
2		Start Date	Days	Result
3		1-Jan-16	55	42447
4		1-Jan-16	55	18-Mar-16

WORKDAY.INTL

The WORKDAY.INTL function returns the serial number of the date before or after a specified number of workdays with custom weekend parameters. Weekend parameters indicate which and how many days are weekend days. Weekend days and any days that are specified as holidays are not considered as workdays.

Syntax

WORKDAY.INTL (start_date, days, [weekend], [holidays])

Arguments

Argument	Description	Required/ Optional
Start_date	The start date, truncated to integer.	Required
Days	The number of workdays before or after the start_date. • A positive value yields a future date • A negative value yields a past date • A zero value yields the start_date Day-offset is truncated to an integer.	Required
Weekend	Indicates the days of the week that are weekend days and are not considered working days. Weekend is a weekend number or string that specifies when weekends occur. Look at Weekend-Number-Days Table given below. Weekend string values are seven characters long and each character in the string represents a day of the week, starting with Monday. 1 represents a non-workday and 0 represents a workday. Only the characters 1 and 0 are permitted in the string.	Optional
Holidays	An optional set of one or more dates that are to be excluded from the working day calendar. Holidays shall be a range of cells that contain the dates, or an array constant of the serial values that represent those dates. The ordering of dates or serial values in holidays can be arbitrary.	Optional

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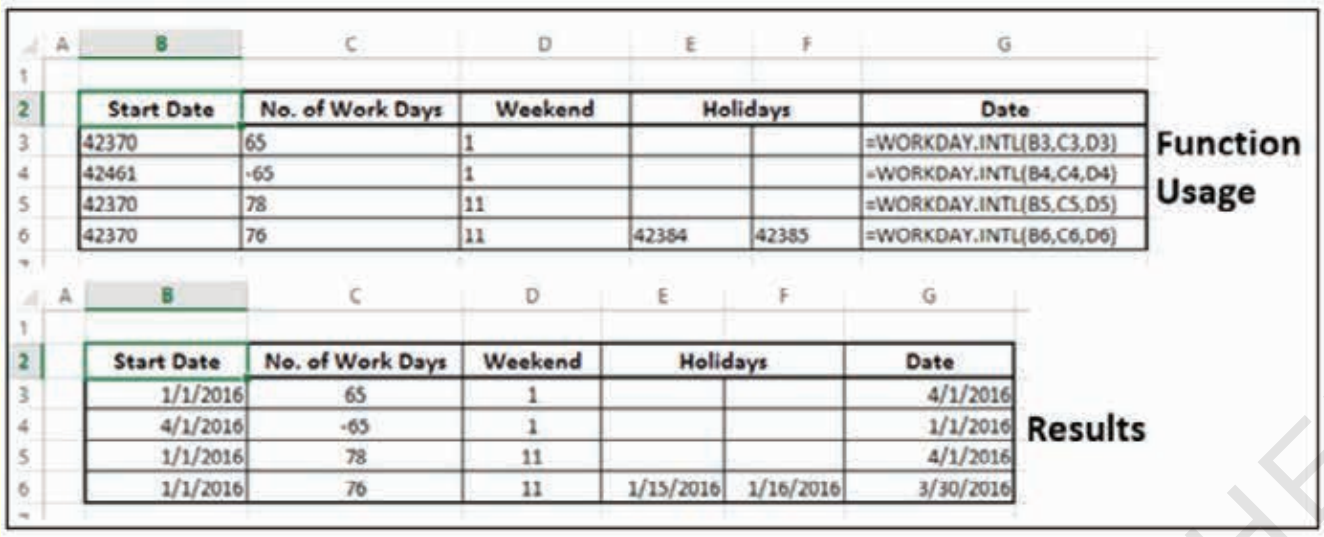
Example



Function Usage

	A	B	C	D	E	F	G
1							
2		Start Date	No. of Work Days	Weekend	Holidays		Date
3		42370	65	1			=WORKDAY.INTL(B3,C3,D3)
4		42461	-65	1			=WORKDAY.INTL(B4,C4,D4)
5		42370	78	11			=WORKDAY.INTL(B5,C5,D5)
6		42370	76	11	42384	42385	=WORKDAY.INTL(B6,C6,D6)

Results

	A	B	C	D	E	F	G
1							
2		Start Date	No. of Work Days	Weekend	Holidays		Date
3		1/1/2016	65	1			4/1/2016
4		4/1/2016	-65	1			1/1/2016
5		1/1/2016	78	11			4/1/2016
6		1/1/2016	76	11	1/15/2016	1/16/2016	3/30/2016

YEAR

The YEAR function returns the year corresponding to a date. The year is returned as an integer in the range 1900-9999.

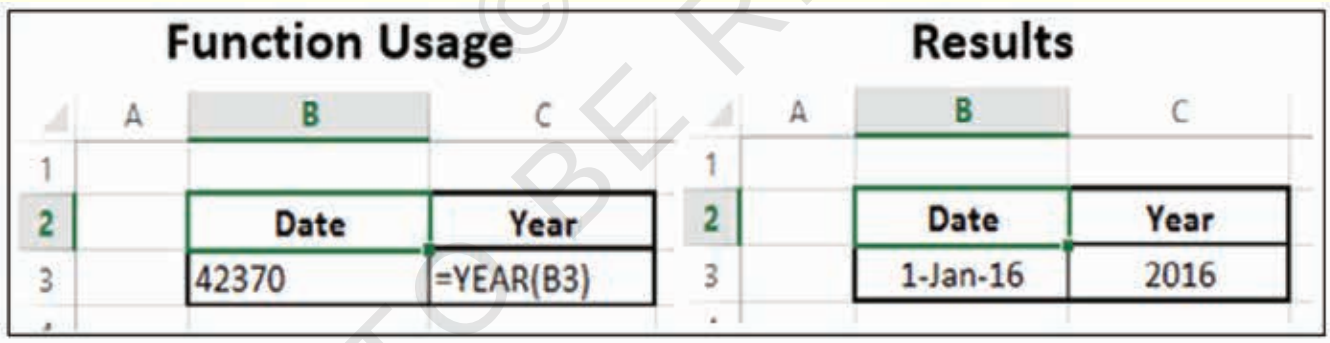
Syntax

YEAR (serial_number)

Arguments

Argument	Description	Required/ Optional
Serial_number	The date of the year you want to find. Dates should be entered by using the DATE function, or as results of other formulas or functions. Problems can occur if dates are entered as text.	Required

Example



Function Usage

	A	B	C
1			
2		Date	Year
3		42370	=YEAR(B3)

Results

	A	B	C
1			
2		Date	Year
3		1-Jan-16	2016

YEARFRAC

The YEARFRAC function calculates the fraction of the year represented by the number of whole days between two dates (the start_date and the end_date).

Use the YEARFRAC worksheet function to identify the proportion of a whole year's benefits or obligations to assign to a specific term.

Syntax

YEARFRAC (start_date, end_date, [basis])

Arguments

Argument	Description	Required/ Optional
Start_date	A date that represents the start date.	Required
End_date	A date that represents the end date.	Required
Basis	The type of day count basis to use. Look at the Day Count Basis Table given below.	Optional

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Day Count Basis Table

Basis	Day Count Basis
0 or omitted	US (NASD) 30/360
1	Actual/actual
2	Actual/360
3	Actual/365
4	European 30/360

Example

Function Usage

	A	B	C	D
1				
2		Start Date	End Date	Fraction
3		42370	42461	=YEARFRAC(B3,C3)
4		42005	42369	=YEARFRAC(B4,C4)
5		42370	42460	=YEARFRAC(B5,C5)

Results

	A	B	C	D
1				
2		Start Date	End Date	Fraction
3		1-Jan-16	1-Apr-16	0.25
4		1-Jan-15	31-Dec-15	1
5		1-Jan-16	31-Mar-16	0.25

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Create and modify advanced charts

Objectives: At the end of this exercise you shall be able to
- **state create a chart**
- **state modify a chart.**

Requirements

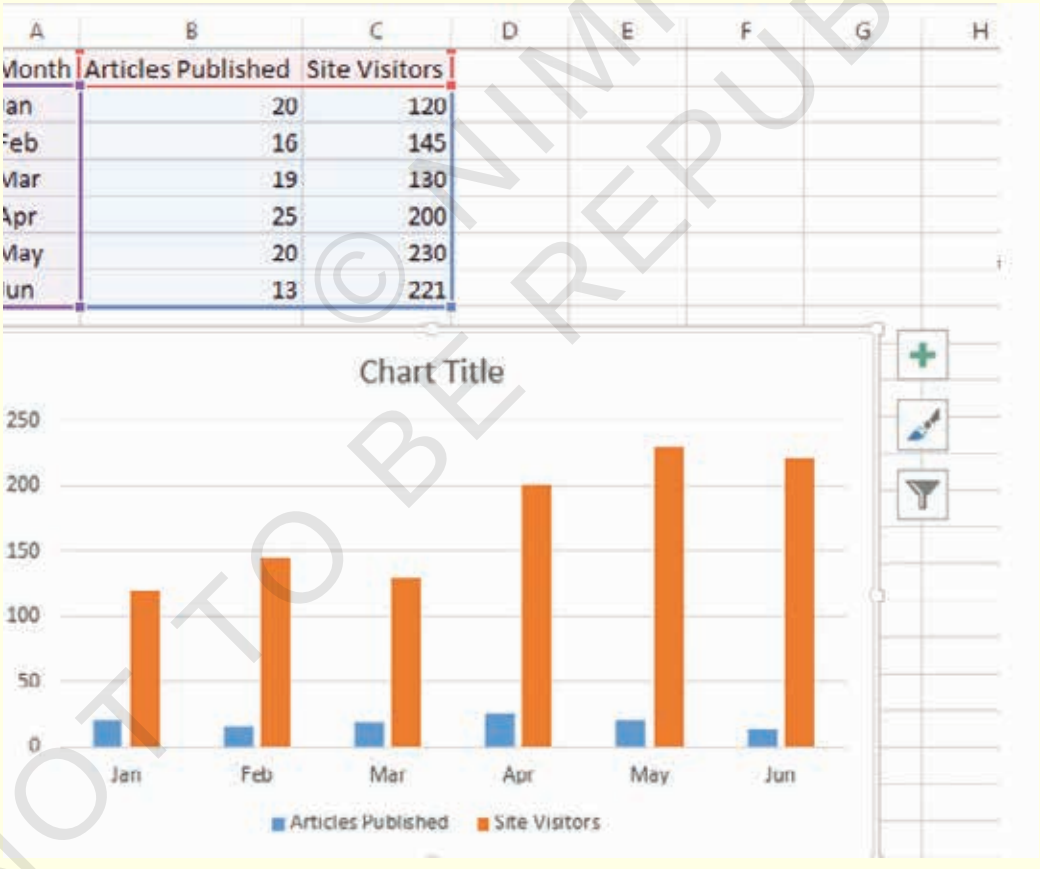
Tools/Equipment/Machines

- A working PC with MS-OFFICE - 1 No.

PROCEDURE

TASK 1: **Create a new chart in Excel**

- Enter the data shown below Fig 1.
- Create a basic column chart as shown below. If you do not know how to create a basic chart, then read the article on charts.



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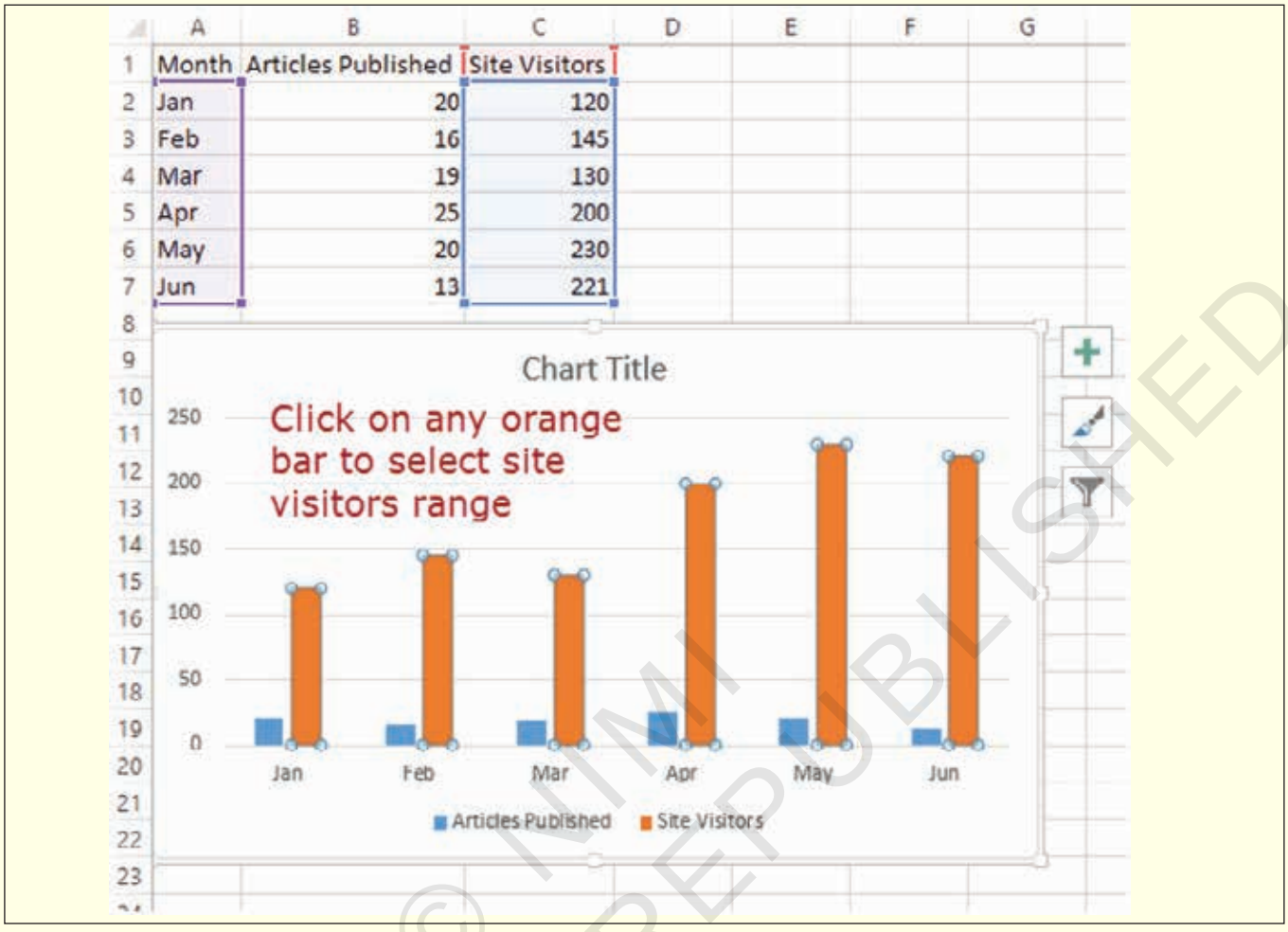
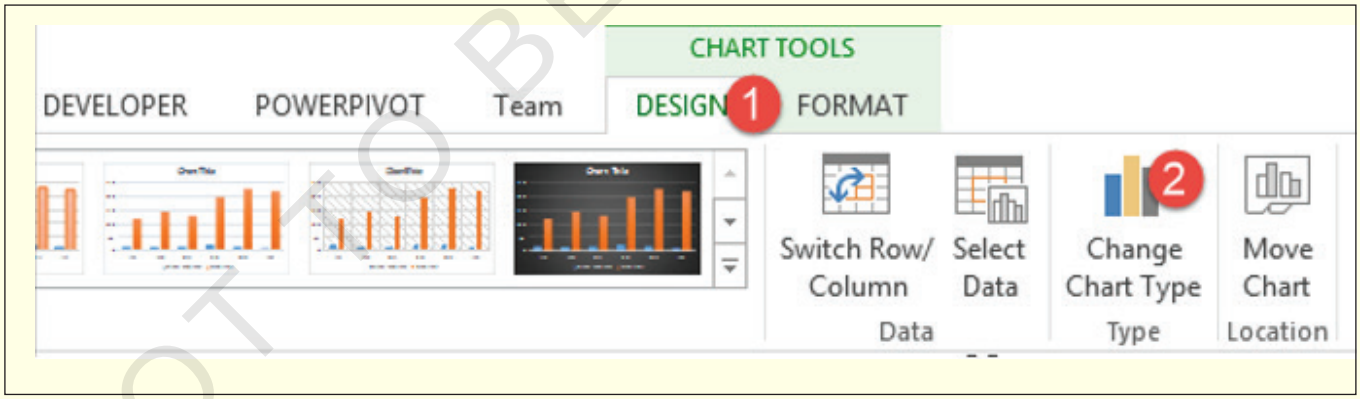
Step 2: Now, it's time for our charts and complex graphs in Excel to take beyond the basics. Select the orange bars representing traffic.



TASK 2: **Modify a chart**

Step 1: Click on change chart type as shown below



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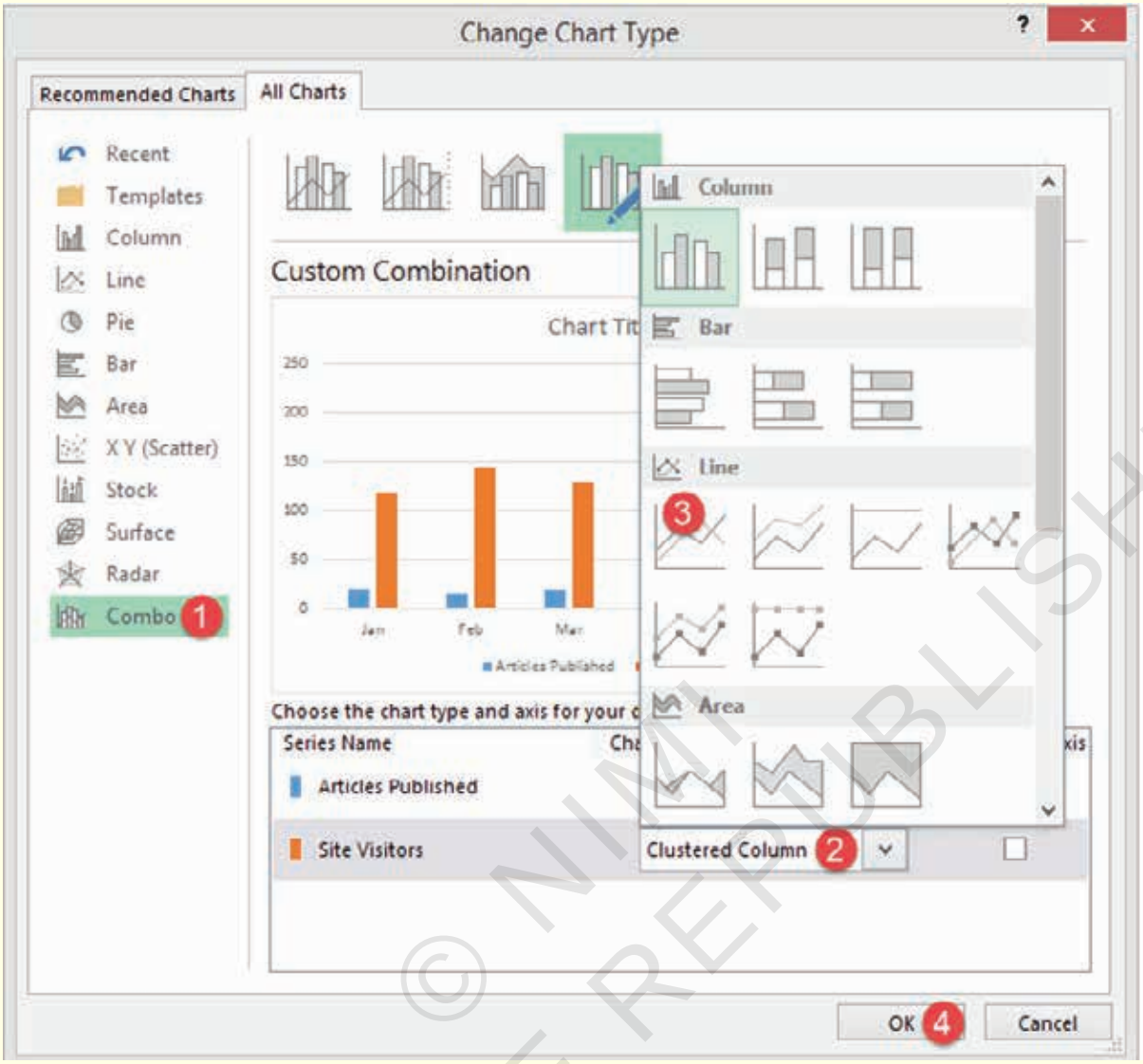
- You will get the following dialog window



Step 2: Select Combo and,

1 Click on the clustered column

2 Select Line chart

3 Click on OK button

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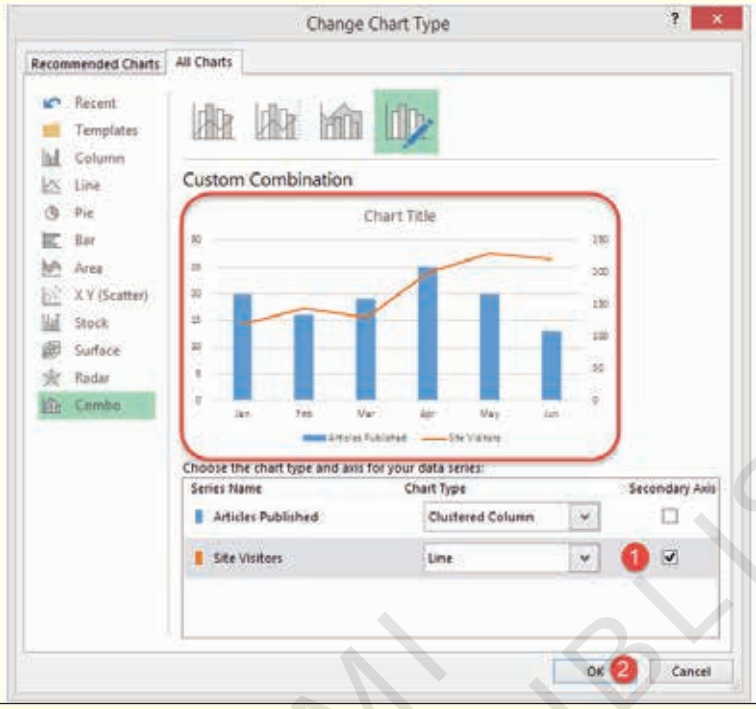
Congratulations, you just created a creative Excel chart with two types of charts in it.

Let's now add a secondary axis to our chart to make it look more presentable.

- Select the chart
- Click on Design under chart tools and select change chart type



1 Click on Secondary Axis check box under Site Visitors

2 Click on OK button

Let's now edit the chart, primary and secondary axis titles as shown below.

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1 Go to Add chart elements

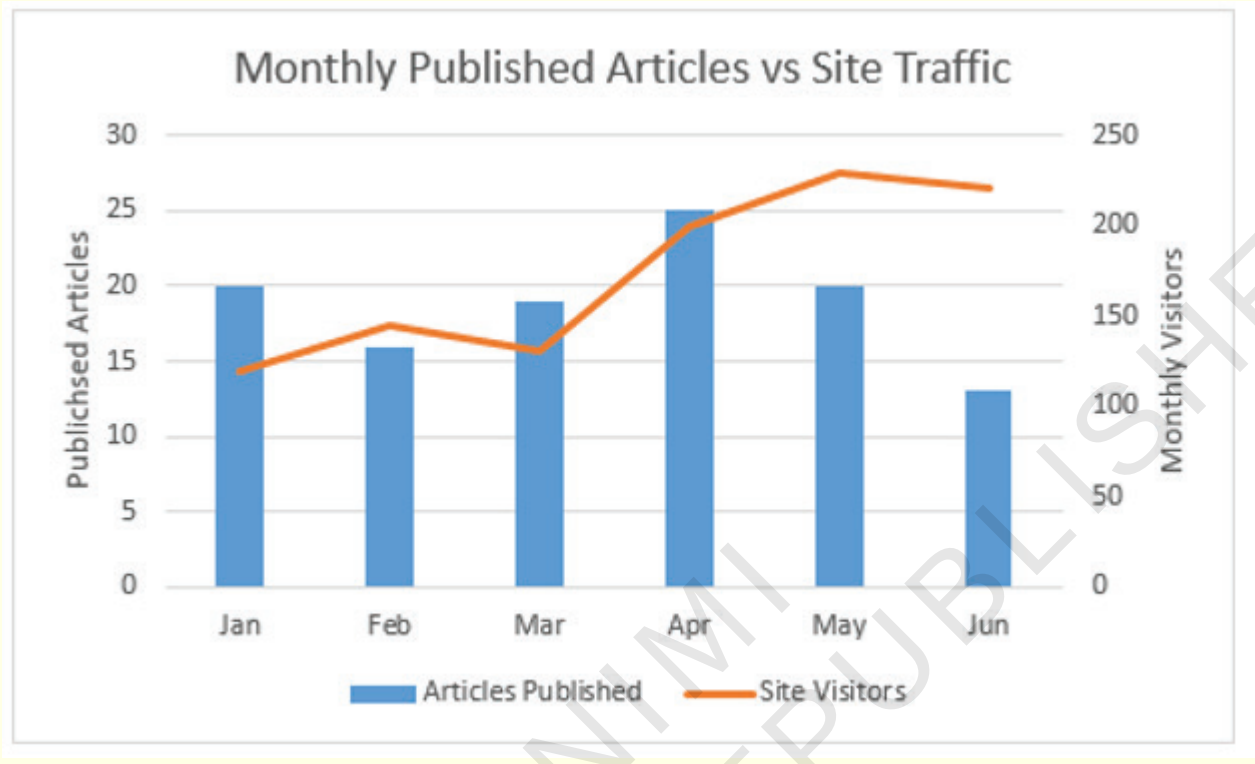
2 Click on Axis titles

3 Select primary verticals

4 Double click on the chart title and edit the title

Write Monthly Published Articles vs Site Traffic. Your complete chart should now look as follows

As you can see from the above complete chart, we have consolidated two data sets and visualized them in such a way that it easily shows the effect of one data set onto the other using Excel graphs.



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Create and modify PivotTables

Objectives: At the end of this exercise you shall be able to
- **create and modify pivot table.**

Requirements

Tools/Equipment/Machines

- A working PC with MS-OFFICE - 1 No.

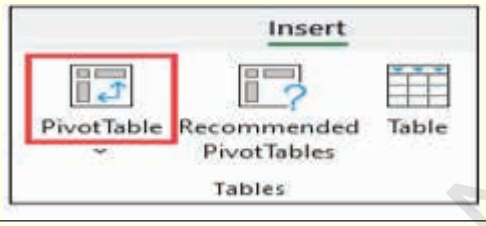
PROCEDURE

TASK 1: **Create a pivot table**

1 Select the cells you want to create a PivotTable from.

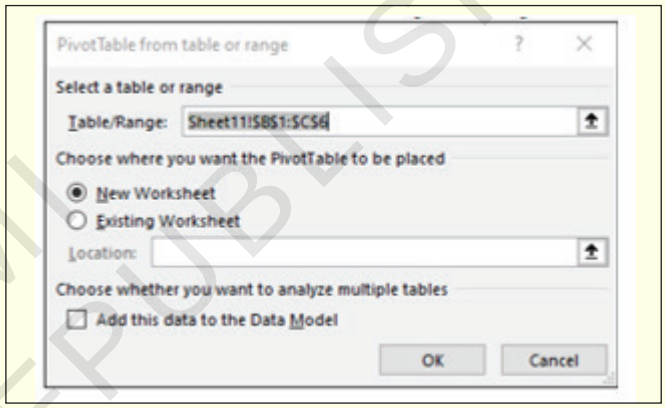
Note: Your data should be organized in columns with a single header row.

2 Select Insert > PivotTable.



3 This will create a PivotTable based on an existing table or range.

Note: Selecting Add this data to the Data Model will add the table or range being used for this PivotTable into the workbook's Data Model. Learn more.

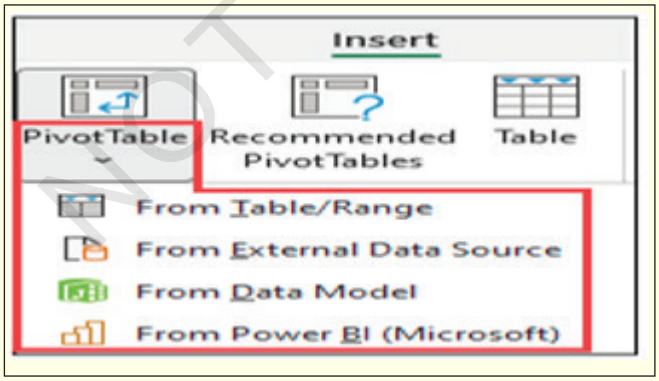


4 Choose where you want the PivotTable report to be placed. Select New Worksheet to place the PivotTable in a new worksheet or Existing Worksheet and select where you want the new PivotTable to appear.

5 Click OK.

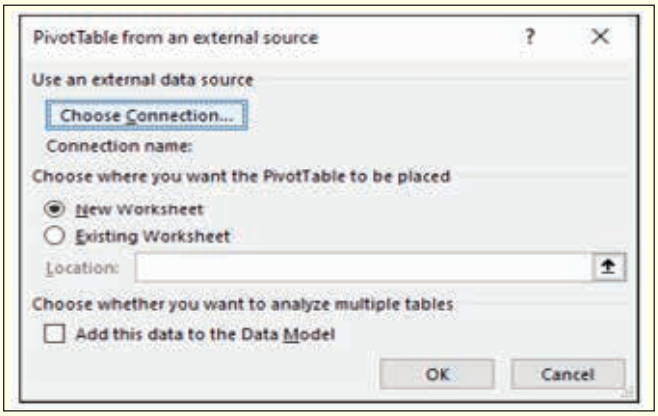
TASK 2: **PivotTables from other sources**

By clicking the down arrow on the button, you can select from other possible sources for your PivotTable. In addition to using an existing table or range, there are three other sources you can select from to populate your PivotTable.



Note: Depending on your organization's IT settings you might see your organization's name included in the button. For example, "From Power BI (Microsoft)"

Get from External Data Source



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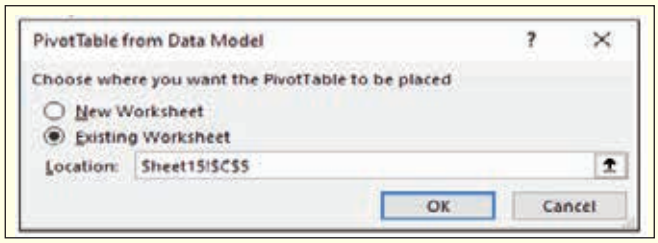
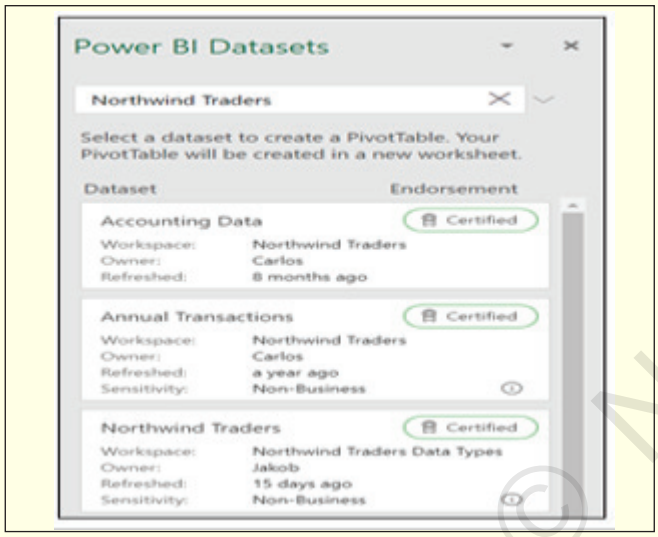
Get from Data Model

Use this option if your workbook contains a Data Model, and you want to create a PivotTable from multiple Tables, enhance the PivotTable with custom measures, or are working with very large datasets.



Get from Power BI

Use this option if your organization uses Power BI and you want to discover and connect to endorsed cloud datasets you have access to.



Building out your PivotTable

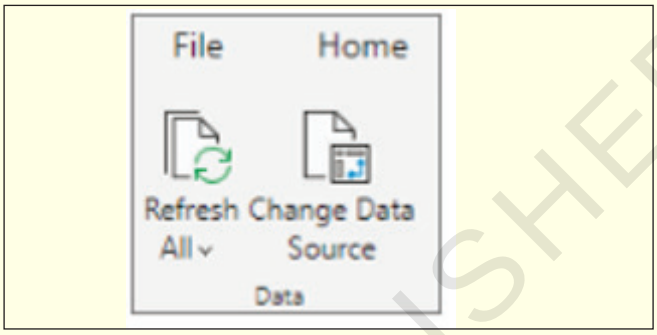
1 To add a field to your PivotTable, select the field name checkbox in the PivotTables Fields pane.

Note: Selected fields are added to their default areas: non-numeric fields are added to Rows, date and time hierarchies are added to Columns, and numeric fields are added to Values.

2 To move a field from one area to another, drag the field to the target area.

Refreshing PivotTables

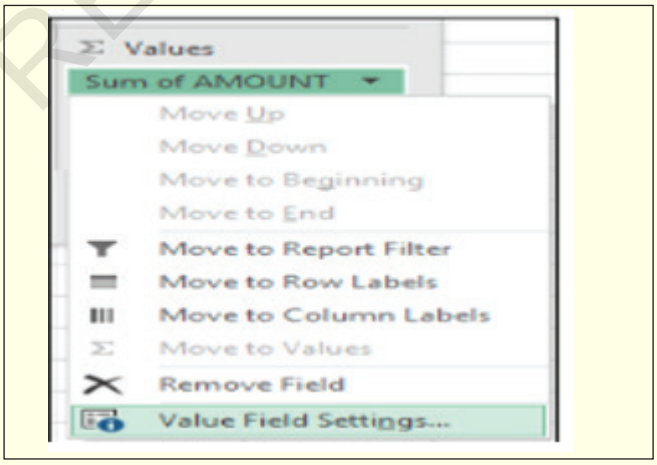
If you add new data to your PivotTable data source, any PivotTables that were built on that data source need to be refreshed. To refresh just one PivotTable you can right-click anywhere in the PivotTable range, then select Refresh. If you have multiple PivotTables, first select any cell in any PivotTable, then on the Ribbon go to PivotTable Analyze > click the arrow under the Refresh button and select Refresh All.



Working with PivotTable Values

Summarize Values By

By default, PivotTable fields that are placed in the Values area will be displayed as a SUM. If Excel interprets your data as text, it will be displayed as a COUNT. This is why it's so important to make sure you don't mix data types for value fields. You can change the default calculation by first clicking on the arrow to the right of the field name, then select the Value Field Settings option.



Next, change the calculation in the Summarize Values By section. Note that when you change the calculation method, Excel will automatically append it in the Custom Name section, like "Sum of FieldName", but you can change it. If you click the Number Format button, you can change the number format for the entire field.

Tip: Since the changing the calculation in the Summarize Values By section will change the PivotTable field name, it's best not to rename your PivotTable fields until you're done setting up your PivotTable. One trick is to use Find & Replace (Ctrl+H) >Find what > "Sum of", then Replace with > leave blank to replace everything at once instead of manually retyping.

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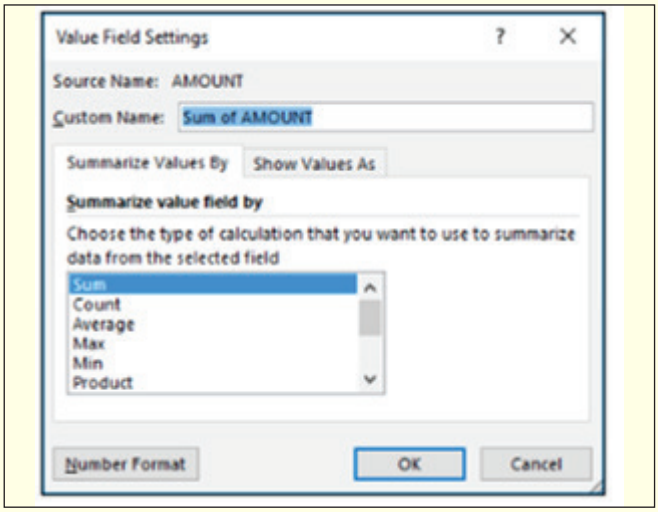

Show Values As

Instead of using a calculation to summarize the data, you can also display it as a percentage of a field. In the following example, we changed our household expense amounts to display as a % of Grand Total instead of the sum of the values.

Once you've opened the Value Field Setting dialog, you can make your selections from the Show Values As tab.

Display a value as both a calculation and percentage

Simply drag the item into the Values section twice, then set the Summarize Values By and Show Values As options for each one.

AMOUNT	MONTH			
CATEGORY	January	February	March	Grand Total
Entertainment	5.10%	6.38%	6.13%	17.61%
Grocery	12.00%	12.25%	13.27%	37.52%
Household	8.93%	11.49%	10.21%	30.63%
Transportation	3.78%	5.87%	4.59%	14.24%
Grand Total	29.81%	35.99%	34.20%	100.00%

AMOUNT	MONTH			
CATEGORY	January	February	March	Grand Total
Entertainment	5.10%	6.38%	6.13%	17.61%
Grocery	12.00%	12.25%	13.27%	37.52%
Household	8.93%	11.49%	10.21%	30.63%
Transportation	3.78%	5.87%	4.59%	14.24%
Grand Total	29.81%	35.99%	34.20%	100.00%

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Create a Power Query, Power Query Function. Invoking the Power Query function and combining queries. Organize the workbook queries

Objectives: At the end of this exercise you shall be able to
- **learn Create a Power Query, Power Query Function. Invoking the Power Query function and combining queries. Organize the workbook queries**
- **use Power BI for simple data visualizations.**

Requirements

Tools/Equipment/Machines

- A working PC with MS-OFFICE - 1 No.

PROCEDURE

The Complete Guide to Power Query

What is Power Query?

Power Query is a business intelligence tool available in Excel that allows you to import data from many different sources and then clean, transform and reshape your data as needed.

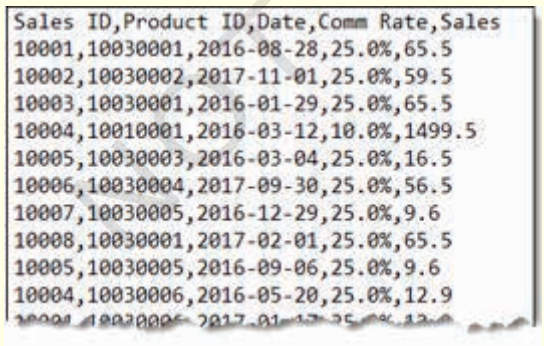
It allows you to set up a query once and then reuse it with a simple refresh. It's also pretty powerful. Power Query can import and clean millions of rows into the data model for analysis after. The user interface is intuitive and well laid out so it's really easy to pick up. It's an incredibly short learning curve when compared to other Excel tools like formulas or VBA.

The best part about it, is you don't need to learn or use any code to do any of it. The power query editor records all your transformations step by step and converts them into the M code for you, similar to how the Macro recorder with VBA.

If you want to edit or write your own M code, you certainly can, but you definitely don't need to.

Get the data used in this post to follow along.

What Can Power Query Do?



```
Sales ID,Product ID,Date,Comm Rate,Sales
10001,10030001,2016-08-28,25.0%,65.5
10002,10030002,2017-11-01,25.0%,59.5
10003,10030001,2016-01-29,25.0%,65.5
10004,10010001,2016-03-12,10.0%,1499.5
10005,10030003,2016-03-04,25.0%,16.5
10006,10030004,2017-09-30,25.0%,56.5
10007,10030005,2016-12-29,25.0%,9.6
10008,10030001,2017-02-01,25.0%,65.5
10005,10030005,2016-09-06,25.0%,9.6
10004,10030006,2016-05-20,25.0%,12.9
```

Imagine you get a sales report in a text file from your system on a monthly basis that looks like this.

Every month you need to go to the folder where the file is uploaded and open the file and copy the contents into Excel.

You then use the text to column feature to split out the data into new columns.

The system only outputs the sales person's ID, so you need to add a new column to the data and use a VLOOKUP to get the salesperson associated with each ID. Then you need to summarize the sales by salesperson and calculate the commission to pay out.

You also need to link the product ID to the product category but only the first 4 digits of the product code relate to the product category. You create another column using the LEFT function to get the first 4 digits of the product code, then use a VLOOKUP on this to get the product category. Now you can summarize the data by category.

Maybe it only takes an hour a month to do, but it's pretty mindless work that's not enjoyable and takes away from time you can actually spend analyzing the data and producing meaningful insight.

With Power Query, this can all be automated down to a click of the refresh button on a monthly basis. All you need to do is build the query once and reuse it, saving an hour of work each and every month!

Where is Power Query?

Power Query is available as an add-in to download and install for Excel 2010 and 2013 and will appear as a new tab in the ribbon labelled Power Query. In 2016 it was renamed to Get & Transform and appears in the Data tab without the need to install any add-in.

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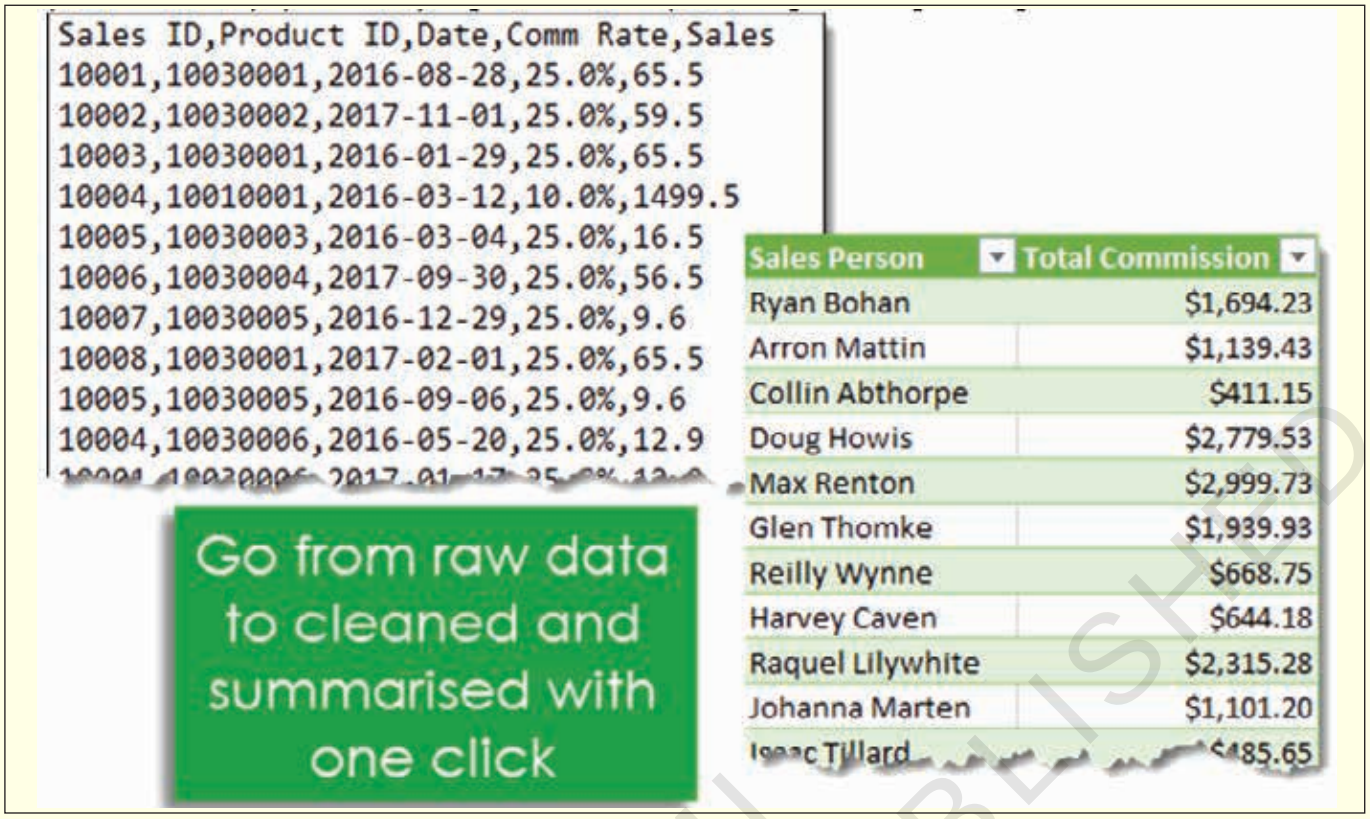
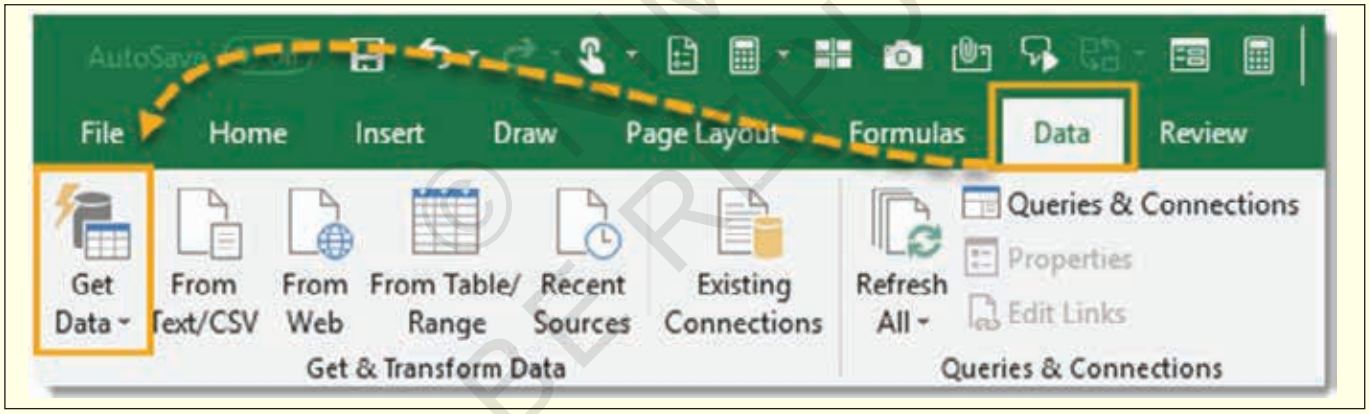


Importing Your Data with Power Query



Importing your data with Power Query is simple. Excel provides many common data connections that are accessible from the Data tab and can be found from the Get Data command.

- Get data from a single file such as an Excel workbook, Text or CSV file, XML and JSON files. You can also import multiple files from within a given folder.
- Get data from various databases such as SQL Server, Microsoft Access, Analysis Services, SQL Server Analysis Server, Oracle, IBM DB2, MySQL, PostgreSQL, Sybase, Teradata and SAP HANA databases.
- Get data from Microsoft Azure
- Get data from online services like Sharepoint, Microsoft Exchange, Dynamics 365, Facebook and Salesforce.
- Get data from other sources like a table or range inside the current workbook, from the web, a Microsoft Query, Hadoop, OData feed, ODBC and OLEDB.
- We can merge two queries together similar to joining two queries in SQL.
- We can append a query to another query similar to a union of two queries in SQL.

Note: The available data connection options will depend on your version of Excel.

There are a couple of the more common query types available in the top level of the ribbon commands found in the Get & Transform section of the Data tab. From here we can easily access the From Text/CSV, From Web and From Table/Range queries. These are just duplicated outside of the Get Data command for convenience of use, since you'll likely be using these more frequently.

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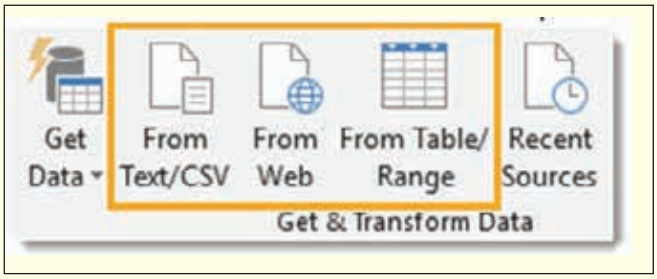
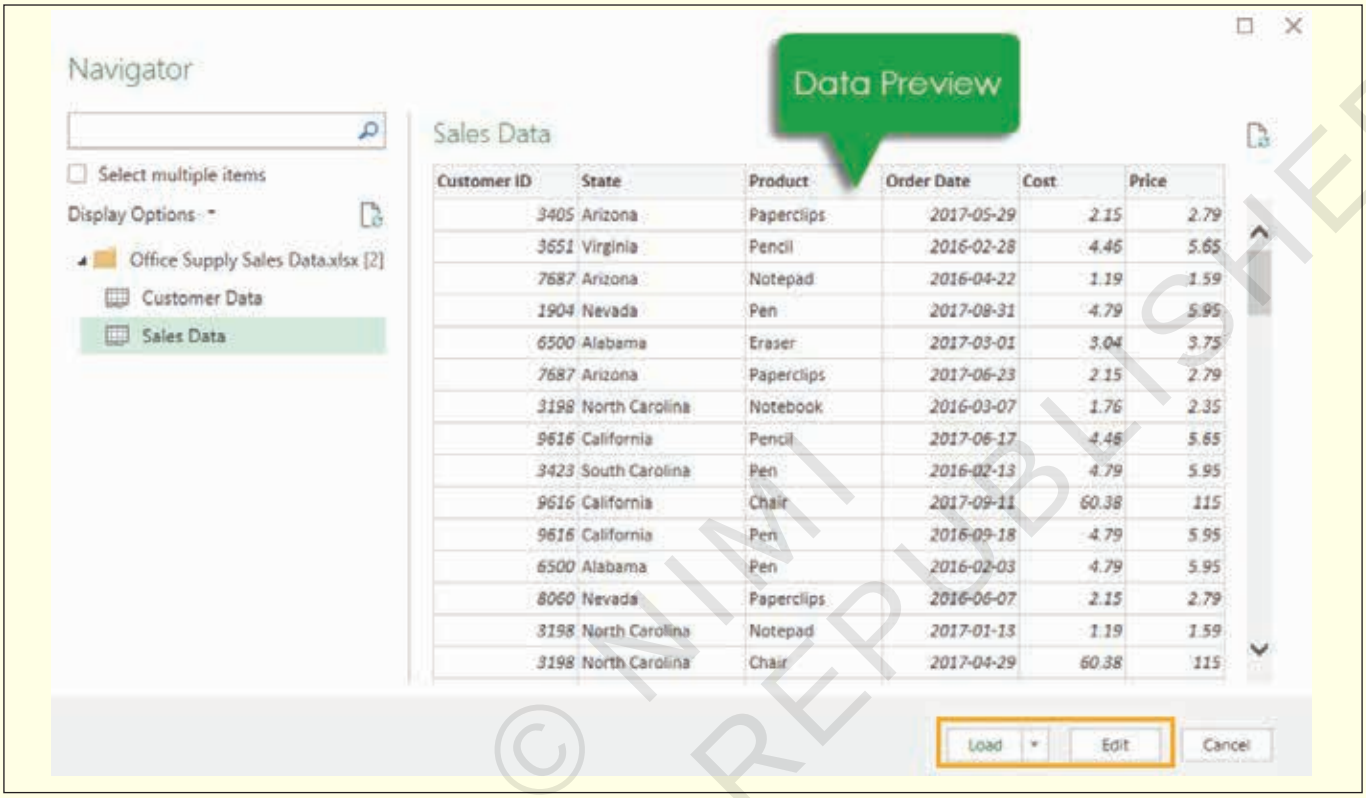


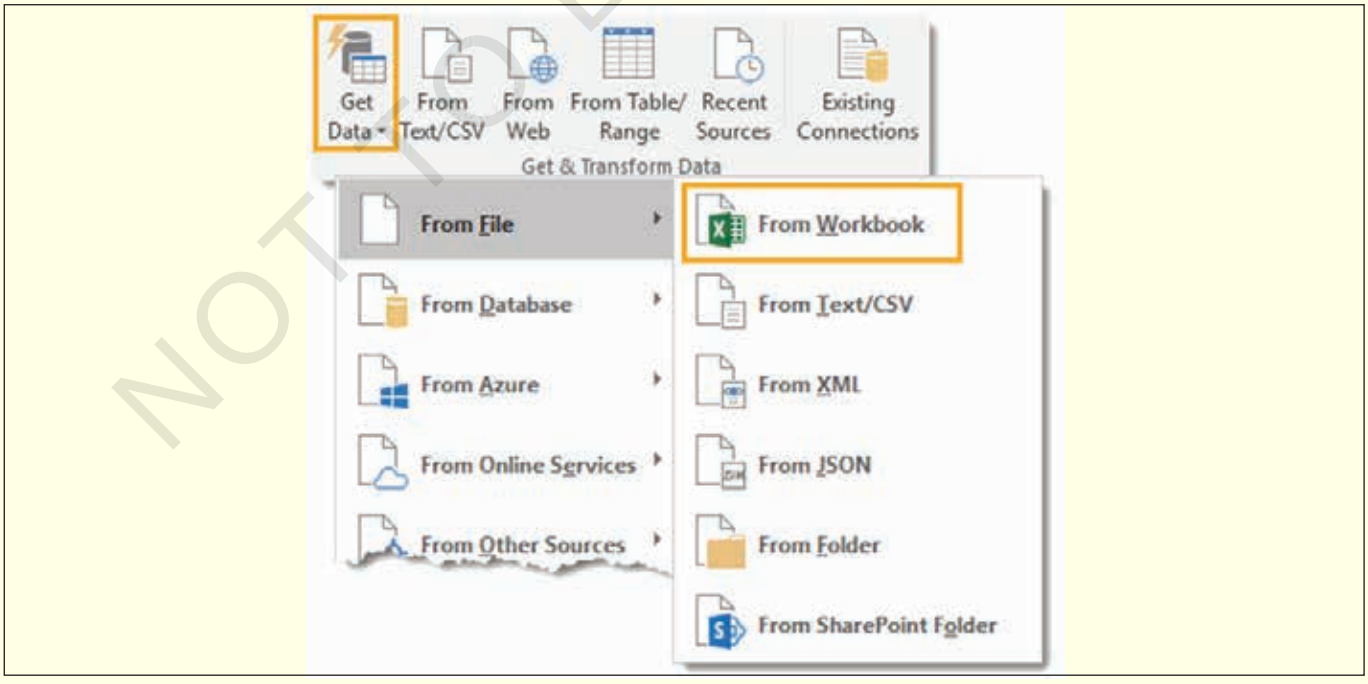
Depending on which type of data connection you choose, Excel will guide you through the connection set up and there might be several options to select during the process.

At the end of the setup process, you will come to the data preview window. You can view a preview of the data here to make sure it's what you're expecting. You can then load the data as is by pressing the Load button, or you can proceed to the query editor to apply any data transformation steps by pressing the Edit button.



A Simple Example of Importing Data in an Excel File

Let's take a look at importing some data from an Excel workbook in action. We're going to import an Excel file called Office Supply Sales Data.xlsx. It contains sales data on one sheet called Sales Data and customer data on another sheet called Customer Data. Both sheets of data start in cell A1 and the first row of the data contains column headers.



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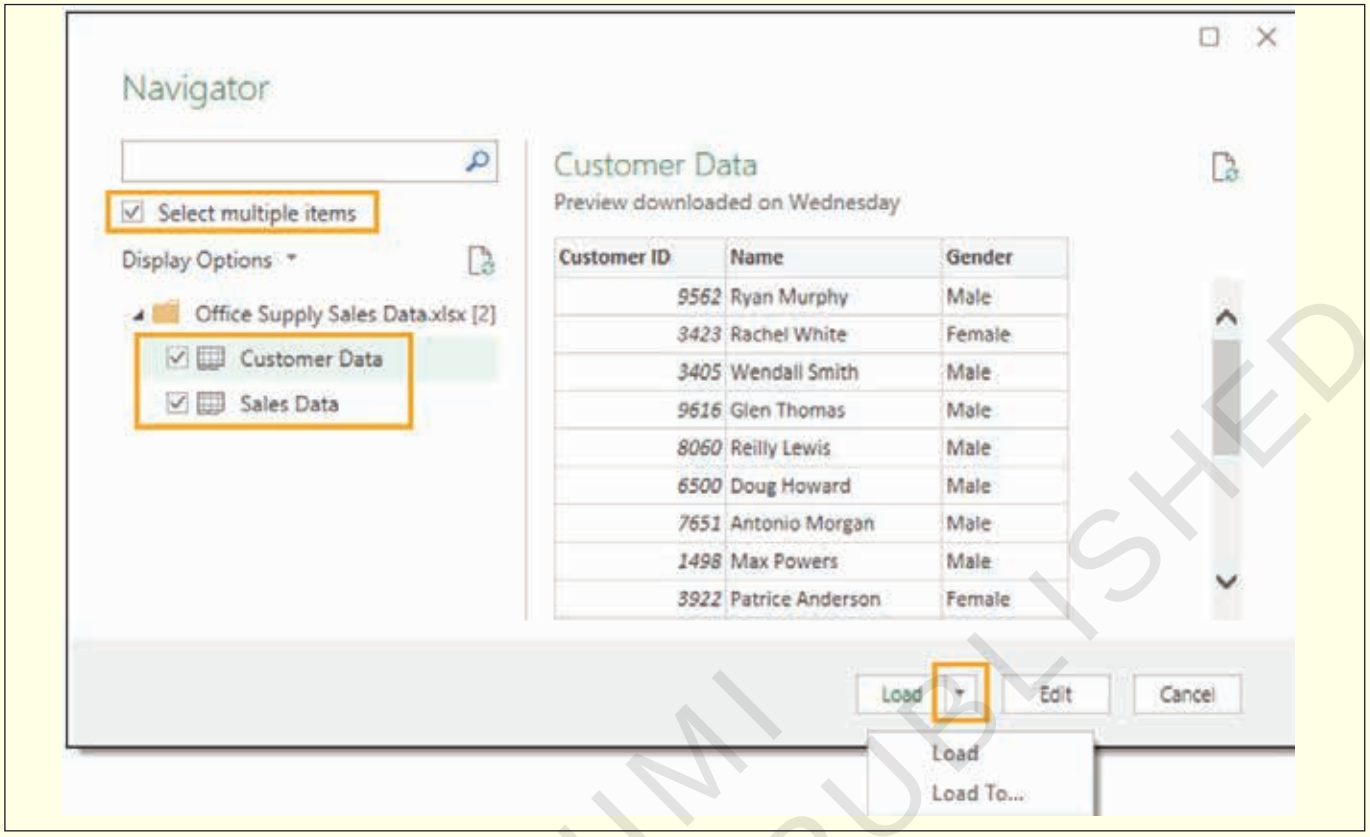
Go to the Data tab and select the Get Data command in the Get & Transform Data section. Then go to From File and choose From Workbook.

This will open a file picker menu where you can navigate to the file you want to import. Select the file and press the Import button.



After selecting the file you want to import, the data preview Navigator window will open. This will give you a list of all the objects available to import from the workbook. Check the box to Select multiple items since we will be importing data from two different sheets. Now we can check both the Customer Data and Sales Data.

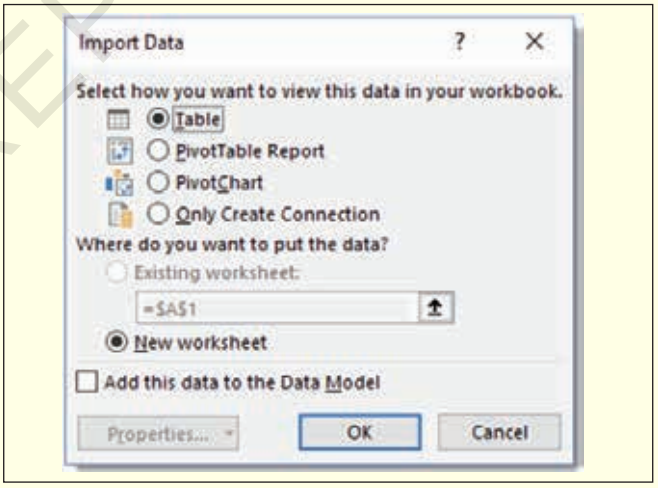
When you click on either of the objects in the workbook, you can see a preview of the data for it on the right hand side of the navigator window. This is great for a sense check to make sure you've got the correct file.

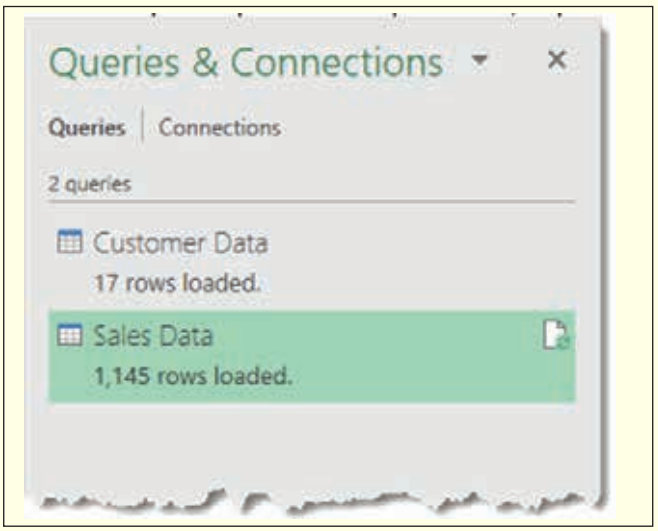
When you're satisfied that you've got everything you need from the workbook, you can either press the Edit or Load buttons. The edit button will take you to the query editor where you can transform your data before loading it. Pressing the load button will load the data into tables in new sheets in the workbook.

In this simple example, we will bypass the editor and go straight to loading the data into Excel. Press the small arrow next to the Load button to access the Load To options. This will give you a few more loading options.

We will choose to load the data into a table in a new sheet, but there are several other options. You can also load the data directly into a pivot table or pivot chart, or you can avoid loading the data and just create a connection to the data.

Now the tables are loaded into new sheets in Excel and we also have two queries which can quickly be refreshed if the data in the original workbook is ever updated.





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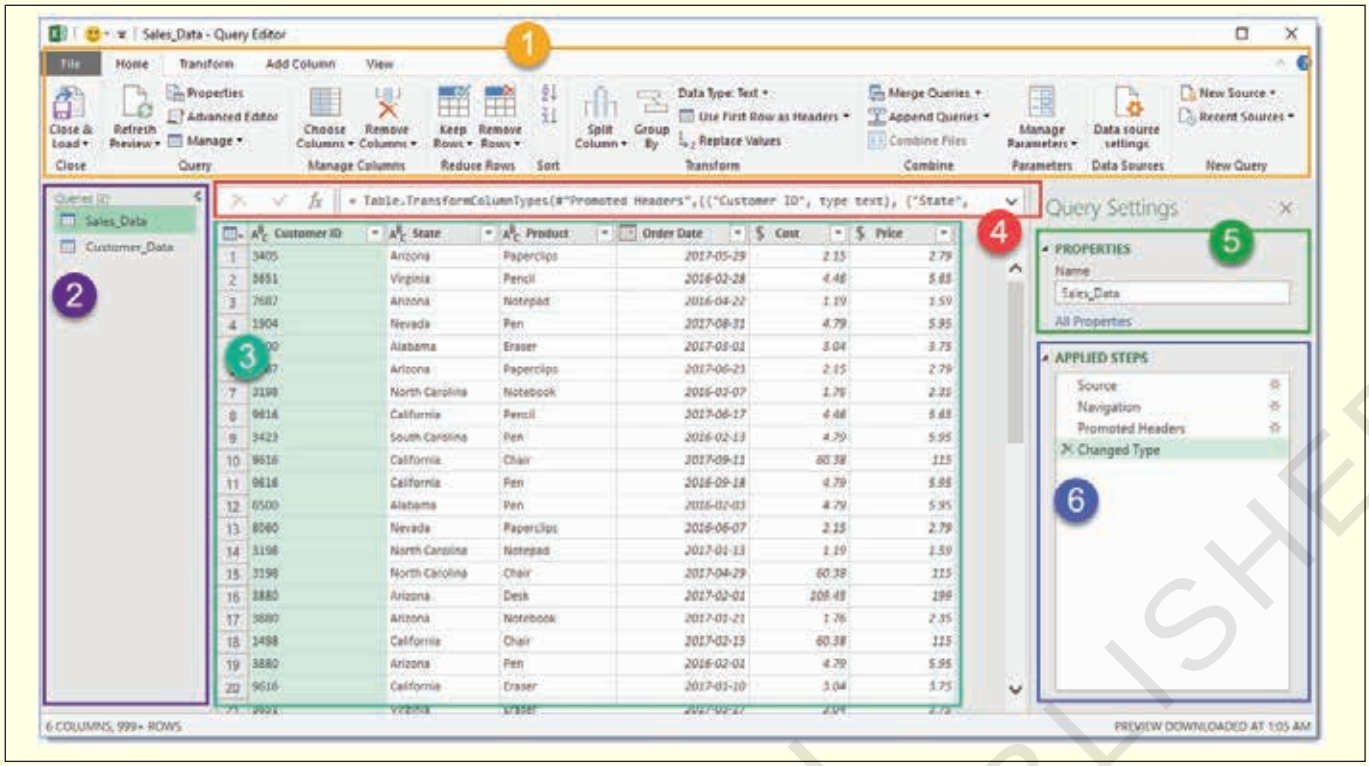
The Query Editor



After going through the guide to connecting your data and selecting the Edit option, you will be presented with the query editor. This is where any data transformation steps will be created or edited. There are 6 main area in the editor to become familiar with.

1 **The Ribbon –** The user interface for the editor is quite similar to Excel and uses a visual ribbon style command center. It organizes data transformation commands and other power query options into 5 main tabs.

2 **Query List –** This area lists all the queries in the current workbook. You can navigate to any query from this area to begin editing it.

3 **Data Preview –** This area is where you will see a preview of the data with all the transformation steps currently applied. You can also access a lot of the transformation commands here either from the filter icons in the column headings or with a right click on the column heading.

4 **Formula Bar –** This is where you can see and edit the M code of the current transformation step. Each transformation you make on your data is recorded and appears as a step in the applied steps area.

5 **Properties –** This is where you can name your query. When you close and load the query to an Excel table, power query will create a table with the same name as its source query if the table name isn't already taken. The query name is also how the M code will reference this query if we need to query it in another query.

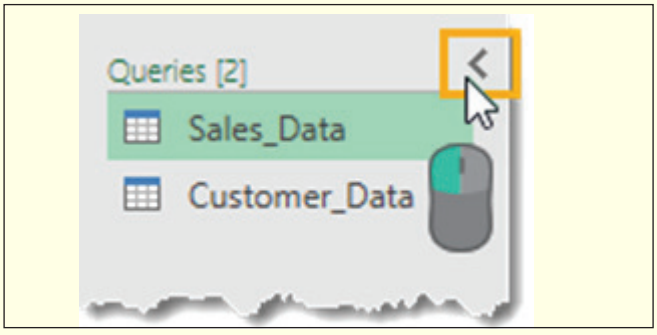
6 **Applied Steps –** This area is a chronological list of all the transformation steps that have been applied to the data. You can move through the steps here and view the changes in the data preview area. You can also delete, modify or reorder any steps in the query here.

The Query List

The Query List has other abilities other than just listing out all the current workbook's queries.

One of the primary functions of the query list is navigation. There's no need to exit the query editor to switch which query you're working on. You can left click on any query to switch. The query you're currently on will be highlighted in a light green colour.

When you do eventually exit the editor with the close and load button, changes in all the queries you edited will be saved.



You can hide the query list to create more room for the data preview. Left click on the small arrow in the upper right corner to toggle the list between hidden and visible.

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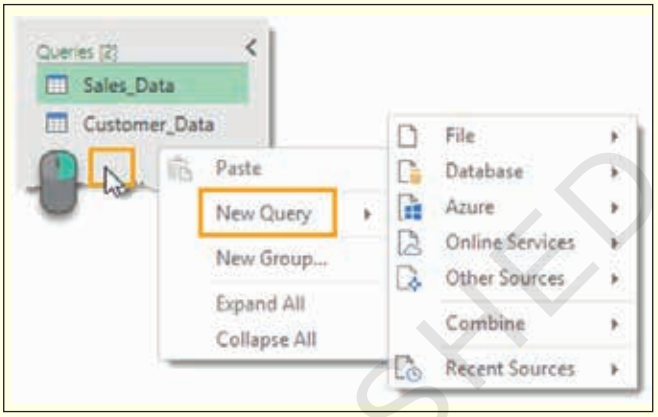
If you right click on any query in the list, there are a variety of options available.

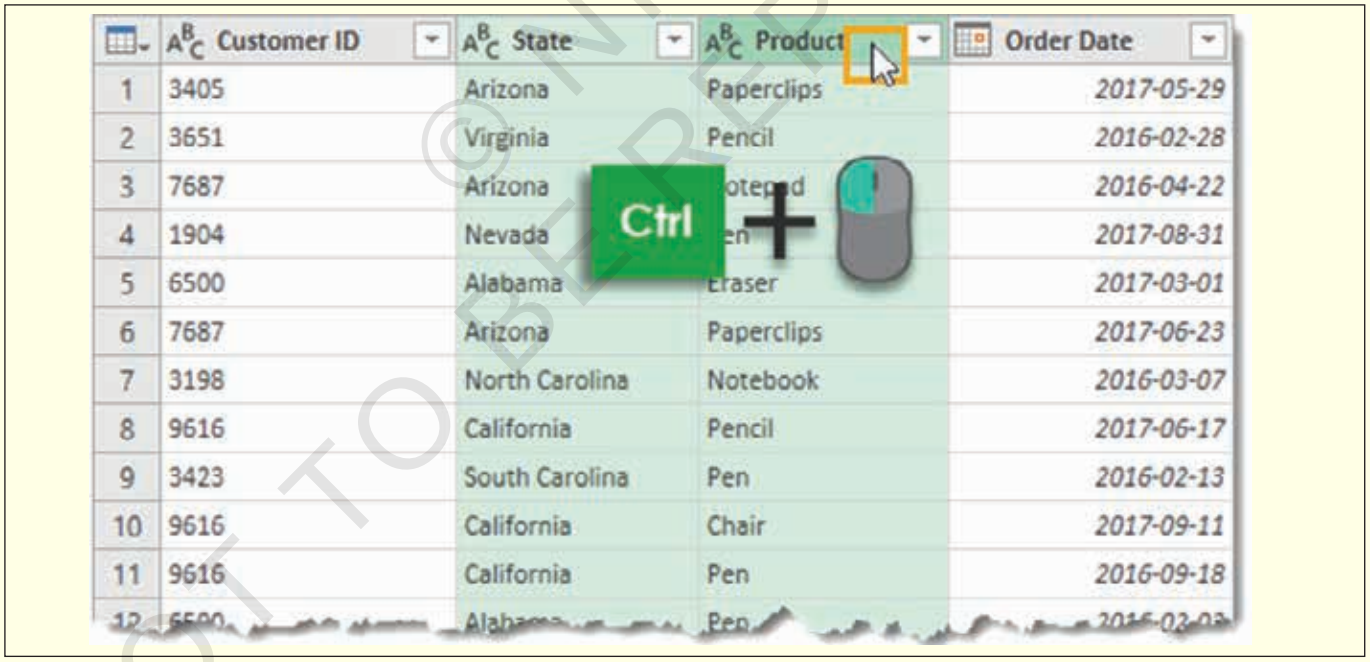
- **Copy and Paste –** Copy and paste a query to make another copy of it.
- **Delete –** Delete the query. If you accidentally delete a query, there's no undo button, but you can exit the query editor without saving via close and load to restore your query.
- **Rename –** Rename your query. This is the same as renaming it from the properties section on the left hand side of the editor.
- **Duplicate –** Make another copy of the query. This is the same as copy and paste but turns the process into one step.
- **Move To Group –** Place your queries into a folder like structure to keep them organised when the list gets large.
- **Move Up and Move Down –** Rearrange the order your queries appear in the list or within the folder groups to add to your organisational efforts. This can also be done by dragging and dropping the query to a new location.
- **Create Function –** Turn your query into a query function. They allow you to pass a parameter to the query and return results based on the parameter passed.
- **Convert To Parameter –** Allows you to convert parameters to queries or queries to parameters.
- **Advanced Editor –** Open the advanced editor to edit the M code for the query.
- **Properties –** Allows you to change the query name, add a description text and enable Fast Data Load option for the query.



If you right click any empty area in the query list, you can create a new query.

The Data Preview

The main job of the data preview area is to apply transformation steps to your data and show a preview of these steps you're applying.



In the data preview area, you can select columns with a few different methods. A column will be highlighted in a light green colour when it's selected.

- Select a single column with a left click on the column heading.
- Select multiple adjacent columns with a left click on the first column heading, then hold Shift and left click on the last column heading.
- Select multiple non-adjacent columns by holding Ctrl then left click on any column headings you want to select.

You can then apply any relevant data transformation steps on selected columns from the ribbon or certain steps can be accessed with a right click on the column heading. Commands that are not available to your selected column or columns will appear grayed out in the ribbon.

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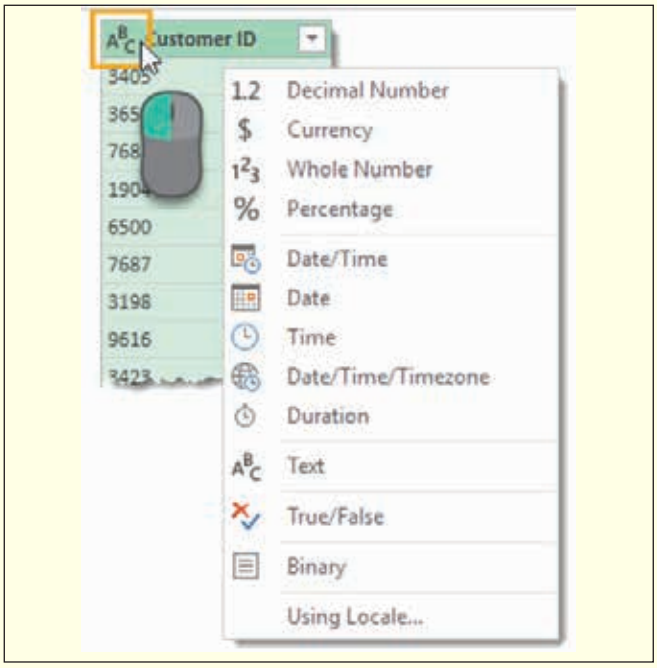
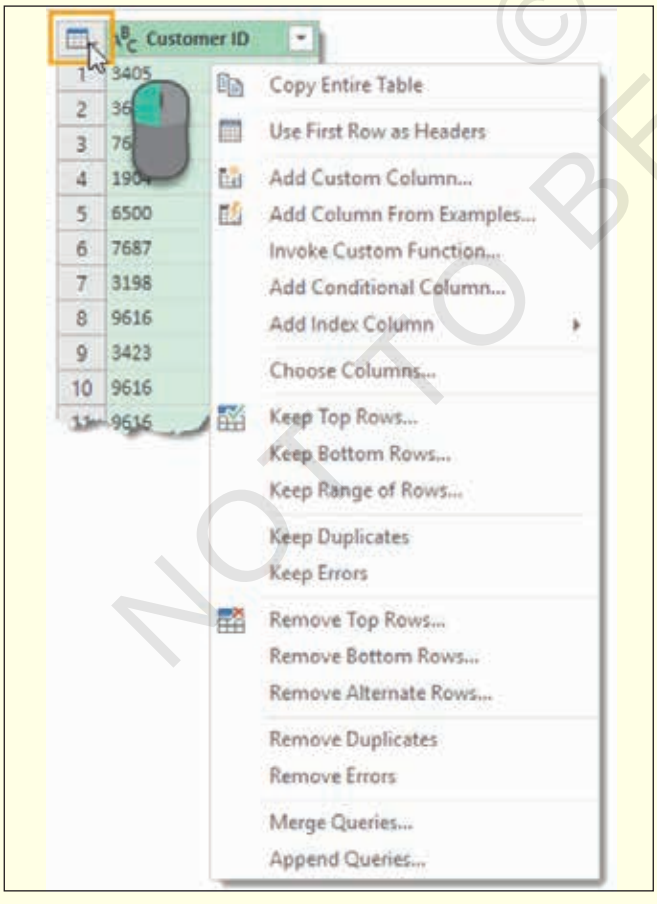


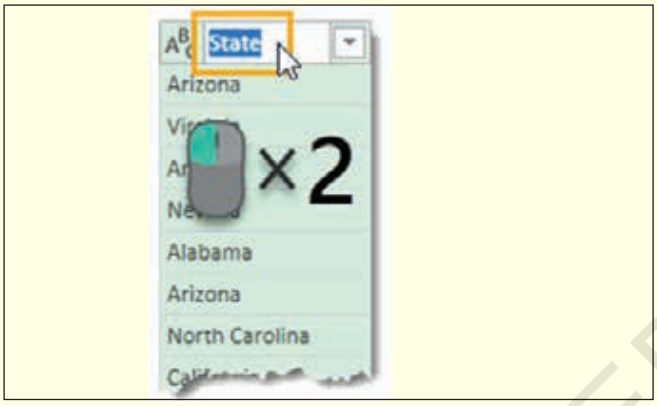
Each column has a data type icon on the left hand of the column heading. You can left click on it to change the data type of the column.

You can choose from decimal numbers, currency, whole numbers, percentages, date and time, dates, times, timezone, duration, text, Boolean, and binary.

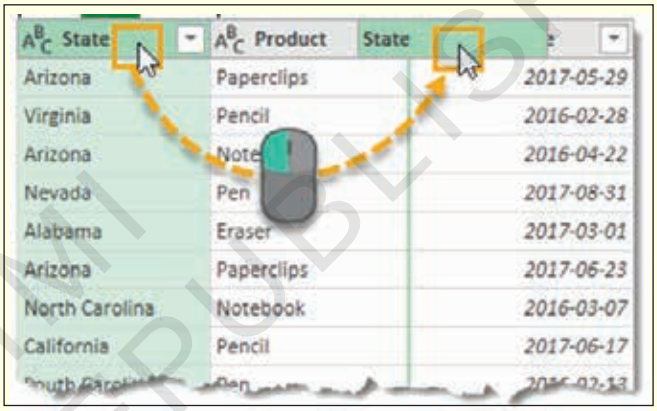
Using the Locale option allows you to set the data type format using the convention from different locations. For example, if you wanted to display the date in the American m/d/yyyy format instead of the usual dd/mm/yyyy then you could select United States as the locale.



There's a small table icon in the top left hand corner of the data preview, you can right click or left click this to access various actions that affect the whole table.



Renaming any column heading is really easy. Double left click on any column heading then type your new name and press Enter when you're done.



You can change around the order of any of the columns with a left click and drag action. The green border between two columns will become the new location of the dragged column when you release the left click.

Each column also has a filter toggle on right hand side. Left click on this to sort and filter your data. This filter menu is very similar to the filters found in a regular spreadsheet and will work the same way.

The list of items shown is based on a sample of the data so may not contain all available items in the data. You can load more by clicking on the Load more text in blue.

Many transformations found in the ribbon menu are also accessible from the data preview area using a right click on the column heading. Some of the action you select from this right click menu will replace the current column. If you want to create a new column based, use a command from the Add Column tab instead.

The Applied Steps

Any transformation you make to your data will appear as a step in the Applied Steps area. It also allows you to navigate through your query. Left click on any step and the data preview will update to show all transformations up to and including that step.

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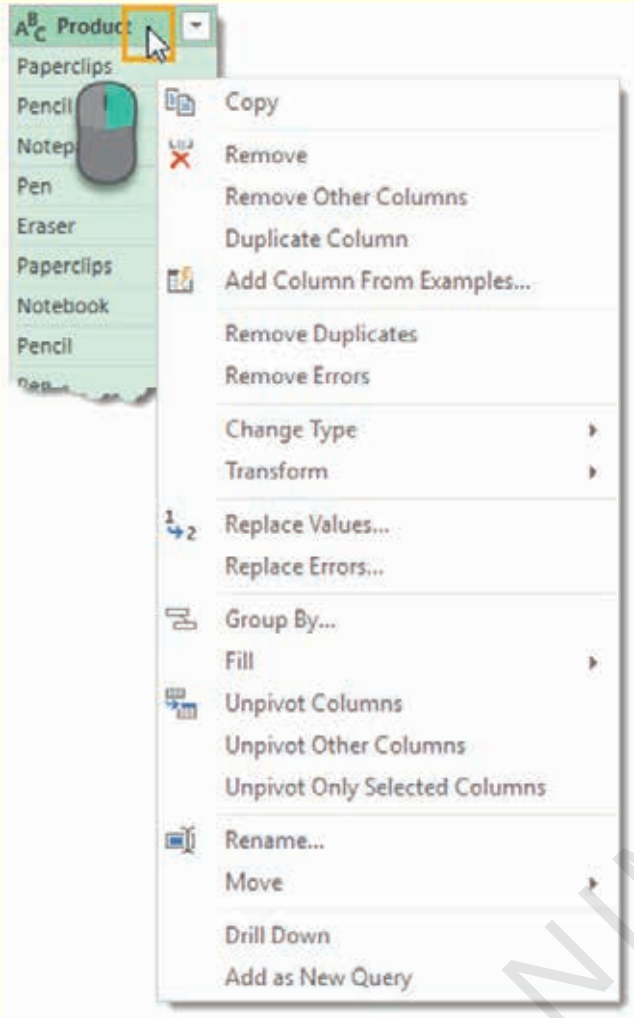
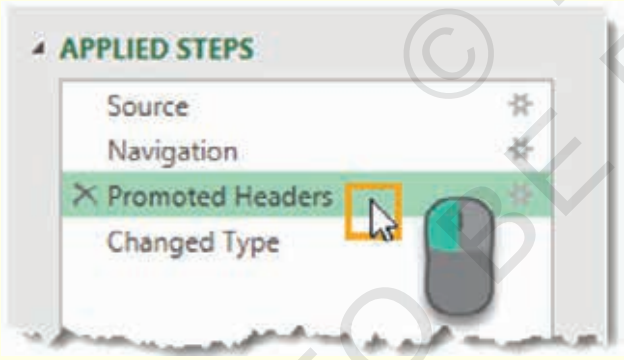
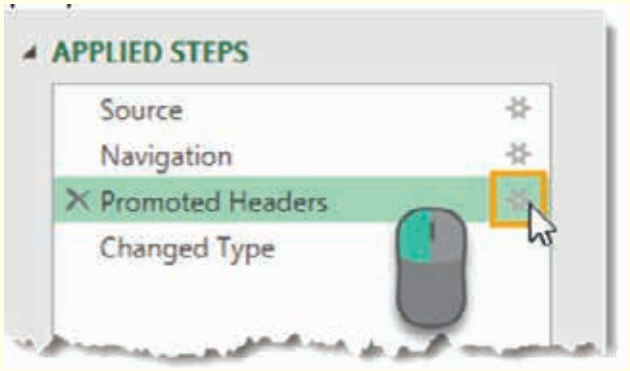




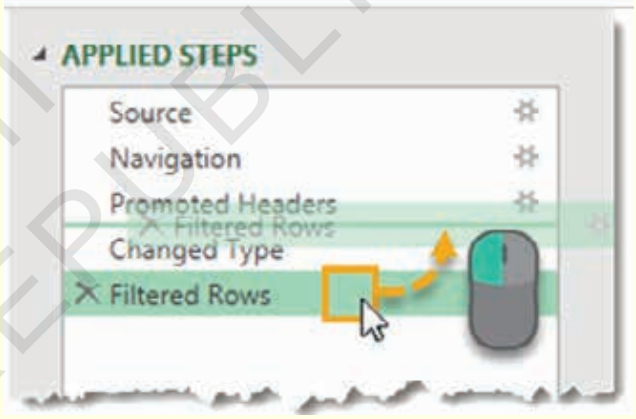
You can insert new steps into the query at any point by selecting the previous step and then creating the transformation in the data preview. Power Query will then ask if you want to insert this new step. Careful though, as this may break the following steps that refer to something you changed.

You can delete any steps that were applied using the X on the left hand side of the step name in the Applied Steps area. Caution is needed though, as if any of the following steps depend on the step you're trying delete, you will break your query. This is where Delete Until End from the right click menu can be handy.



A lot of transformation steps available in power query will have various user input parameters and other setting associated with them. If you apply a filter on the product column to show all items not starting with Pen, you might later decide you need to change this filter step to show all items not equal to Pen. You can make these edits from the Applied Step area.

Some of the steps will have a small gear icon on the right hand side. This allows you to edit the inputs and settings of that step.



You can rearrange the order the steps are performed in your query. Just left click on any step and drag it to a new location. A green line between steps will indicate the new location. This is another one you'll need to be careful with as a lot of steps will depend on previous steps, and changing ordering can create errors because of this.

Right click on any step to access a menu of options.

- **Edit Settings –** This allows you to edit the settings of the step similar to using the gear icon on the right hand side of the step.
- **Rename –** This allows you to rename the steps label. Instead of the displaying the generic name like "Filtered Rows", you could have this display something like "Filtered Product Rows on Pens" so you can easily identify what the step is doing.
- **Delete –** This deletes the current step similar to the X on the left hand side of the step.
- **Delete Until End –** This allows you to delete the current step plus all steps up until the end. Since steps can depend on previous steps, deleting all steps after a step is a good way to avoid any errors.

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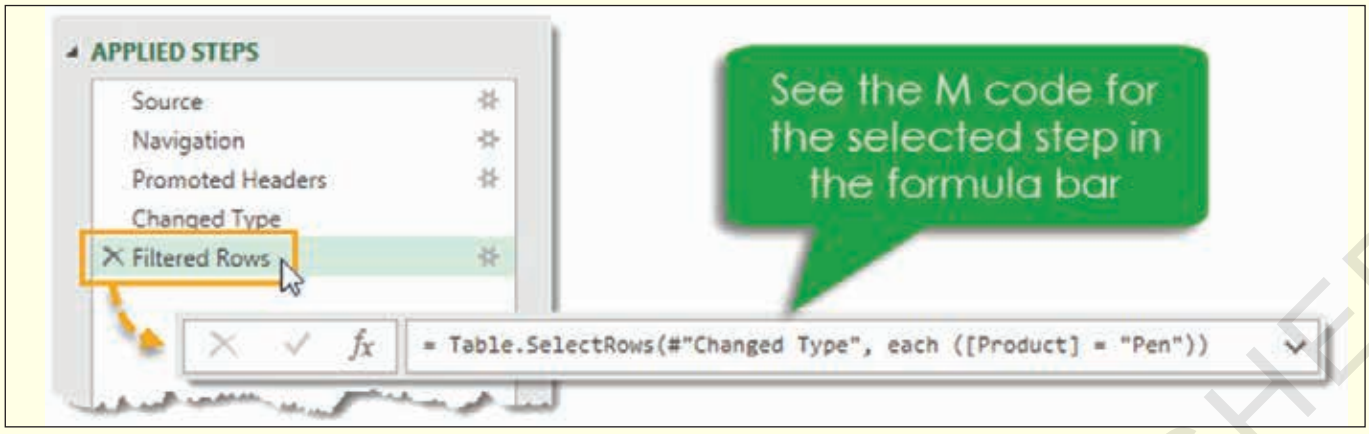
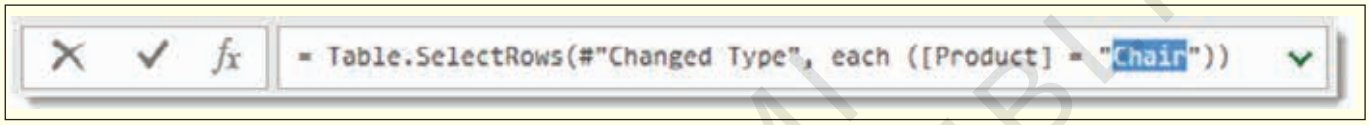
- Insert Step After – This allows you to insert a new step after the current step.
- Move Up and Move Down – This allows you to rearrange the query steps similar to the dragging and dropping method.
- Extract Previous – This can be a really useful option. It allows you to create a new copy of the query up to the selected step.

The Formula Bar

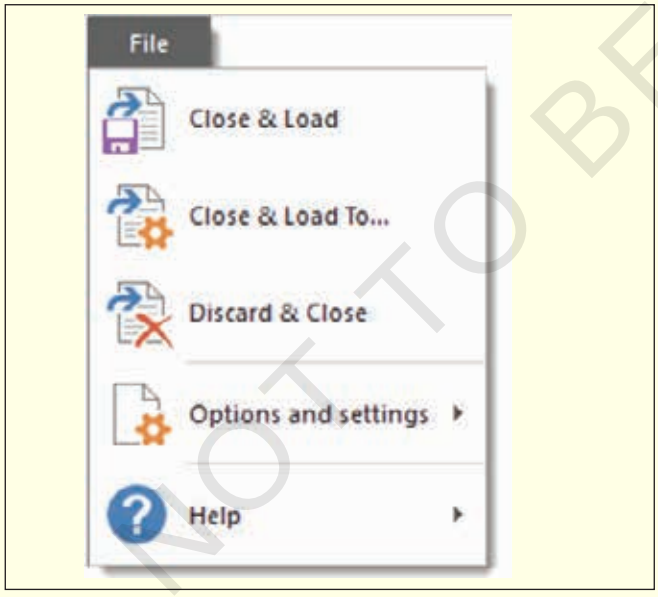


When you click on different steps of the transformation process in the Applied Steps area, the formula bar updates to show the M code that was created for that step. If the M code generated is longer than the formula bar, you can expand the formula bar using the arrow toggle on the right hand side.



You can edit the M code for a step directly from the formula bar without the need to open the advanced editor. In this example, we've changed our filter from "Pen" to "Chair" by typing in the formula bar and then pressing Enter or using the check mark on the left to confirm the change. Press Esc or use the X on the left to discard any changes.

The File Tab



The File tab contains various options for saving any changes made to your queries as well as power query options and settings.

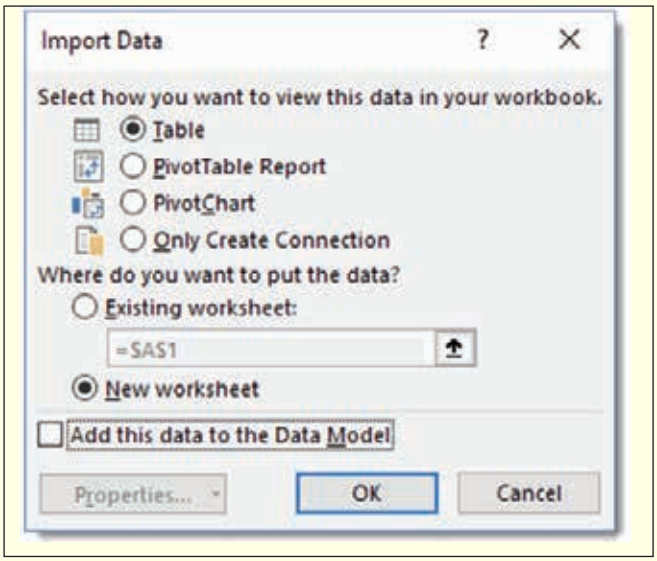
- **Close & Load –** This will save your queries and load your current query into an Excel table in the workbook.
- **Close & Load To –** This will open the Import Data menu with various data loading options to choose from.
- **Discard & Close –** This will discard any changes you made to the queries during your session in the editor and close the editor.

Note, you will still need to save the workbook in the regular way to keep any changes to queries if you close the workbook.

Close & Load and Close & Load To commands are also available from the Home tab.

Data Loading Options

When you use the Close & Load To option to exit the editor, this will open the Import Data menu.



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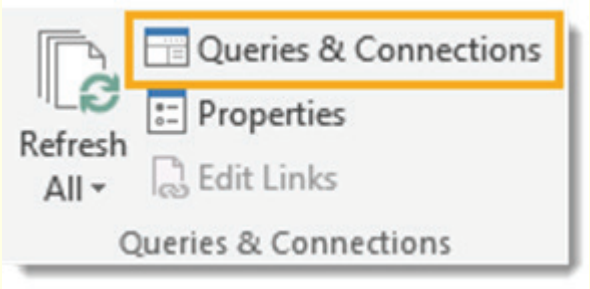
You can choose to load the query to a table, pivot table, pivot chart or only create a connection for the query. The connection only option will mean there is no data output to the workbook, but you can still use this query in other queries. This is a good option if the query is an intermediate step in a data transformation process.

You'll also be able to select the location to load to in your workbook if you selected either a table, pivot table or pivot chart in the previous section. You can choose a cell in an existing worksheet or load it to a new sheet that Excel will create for you automatically.

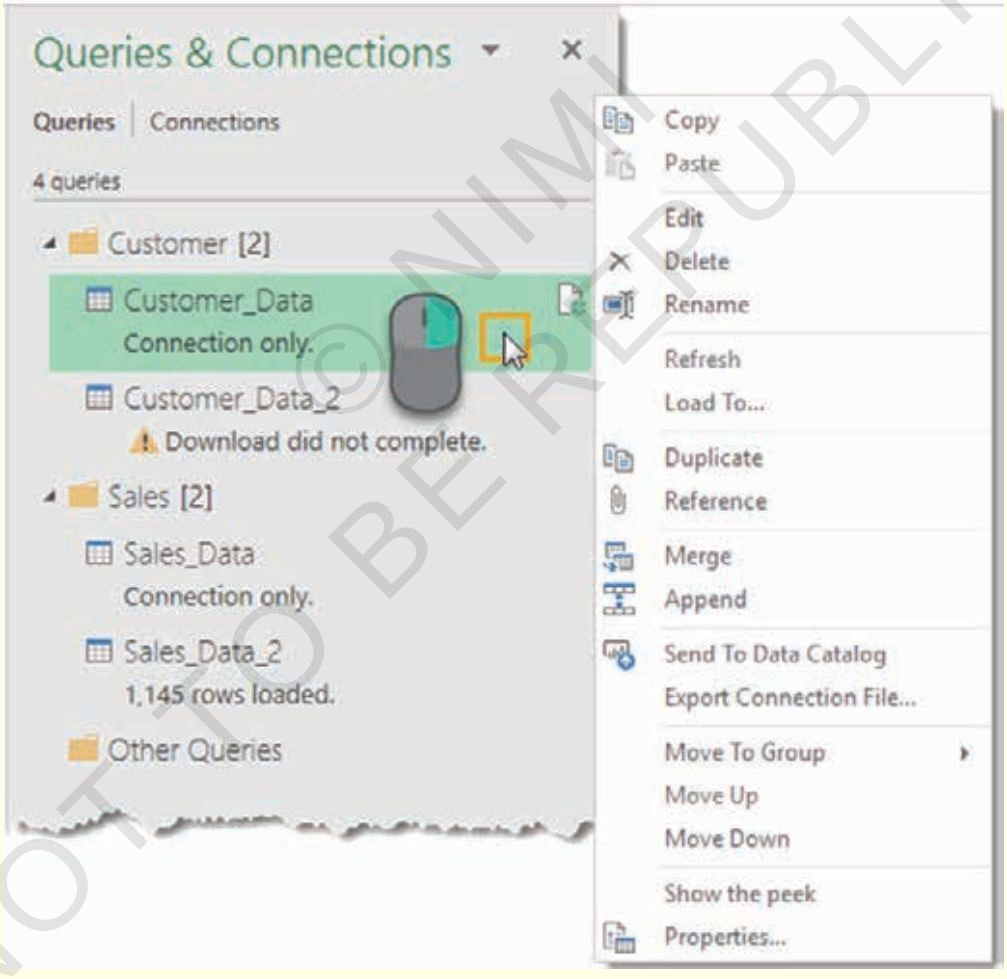
The other option you get is the Add this data to the Data Model. This will allow you to use the data output in Power Pivot and use other Data Model functionality like building relationships between tables. The Data Model Excel's new efficient way of storing and using large amounts of data.

The Queries & Connections Window



When you're working outside of the power query editor, you can see and interact with all the queries in the workbook through the Queries & Connections window. To open this, go to the Data tab in the regular Excel ribbon, then press the Queries & Connections command button found in the Queries & Connections section.

When opened it will be docked to the right hand side of the workbook. You can undock it by left clicking on the title and dragging it. You can drag it to the left hand side and dock it there or leave it floating. You can also resize the window by left clicking and dragging the edges.



This is very similar to the query list in the editor and you can perform a lot of the same actions with a right click on any query.

One option worth noting that's not in the query list right click menu, is the Load To option. This will allow you to change the loading option for any query, so you can change any Connection only queries to load to an Excel table in the workbook.

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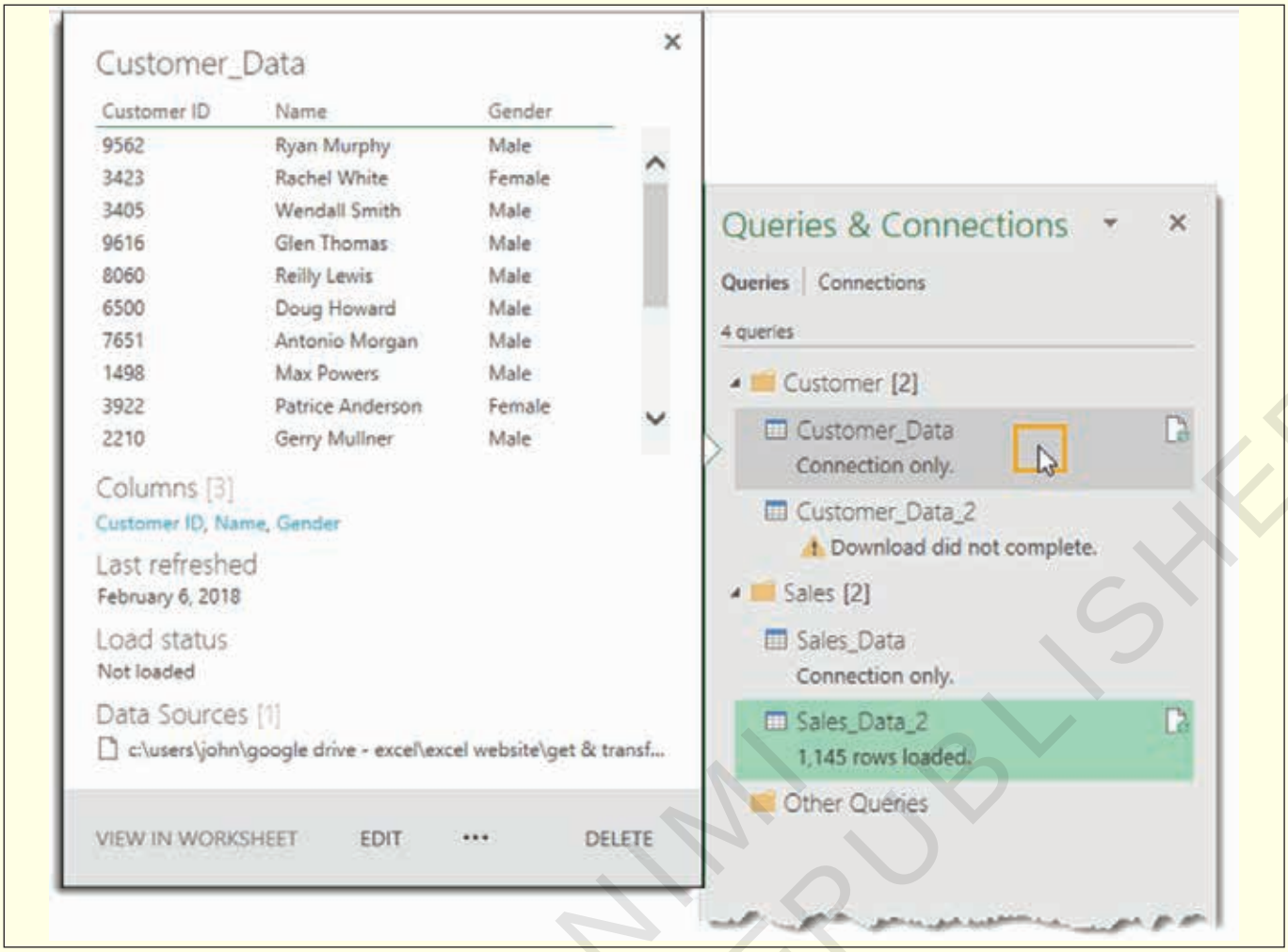
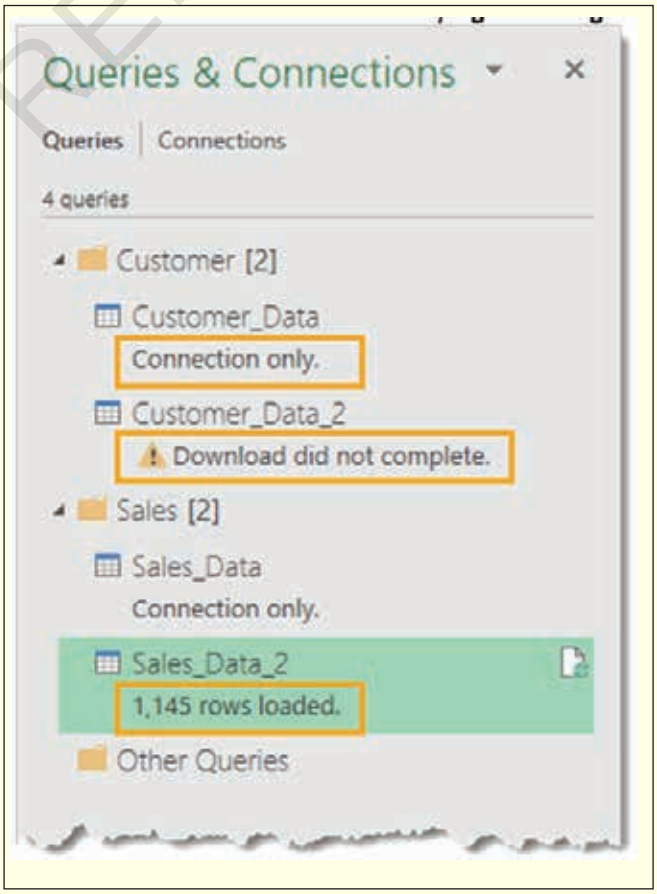


Another thing worth noting is when you hover over a query with the mouse cursor, Excel will generate a Peek Data Preview. This will show you some basic information about the query.

- **Data Preview –** This is a live preview of the data similar to when first setting up a query.
- **Columns –** This will give you a list of all the columns contained in the final results of the query along with a count of how many columns there are. Clicking on any of them will highlight the column in the data preview.
- **Last Refreshed –** This will tell you when the data was last refreshed.
- **Load Status –** This displays whether the data is loaded to a table, pivot table, pivot chart or is a connection only.
- **Data Sources –** This will show you the source of the data along with a count of the number of files if you're it's a from folder query.
- **View in Worksheet –** Clicking on this will take you to the output table if the query is loaded to a table, pivot table or pivot chart.

You can also access this Peek view by right clicking on the query and selecting Show the peek.



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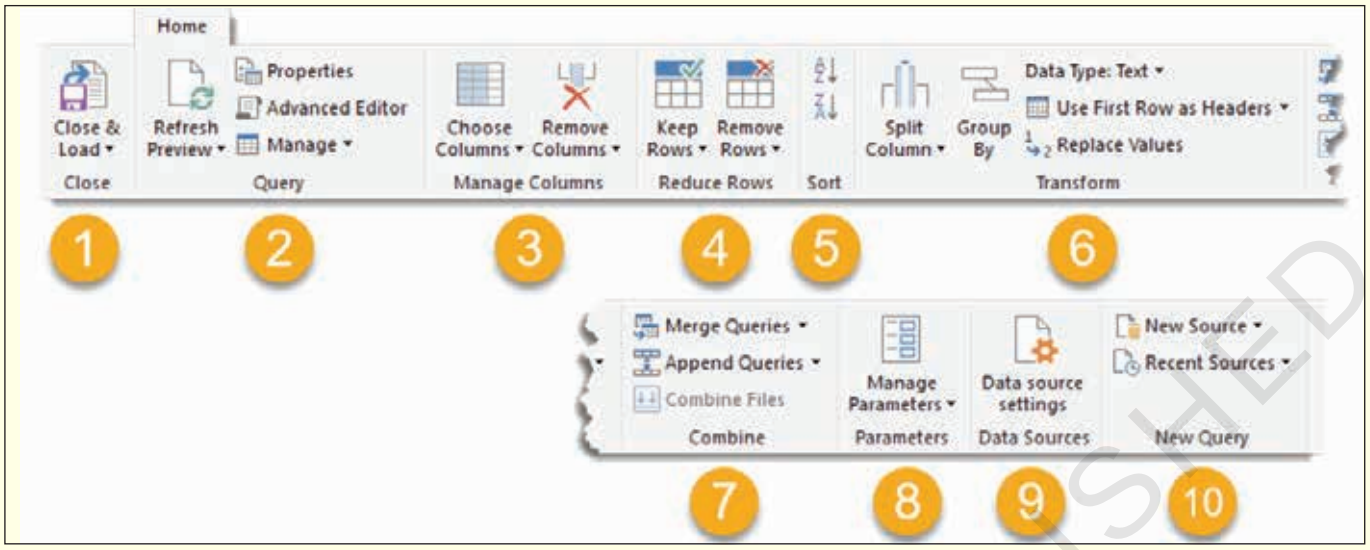
There are also some useful messages displayed in the Queries & Connections window for each query. It will show you if the query is a connection only, if there were any errors when the query last ran, or how many rows loaded.

The Home Tab

The Home tab contains all the actions, transformations, and settings that will affect the whole table.



1 **Close –** You can access the Close & Load and Close & Load To options from here. These are also available in the File tab menu.

2 **Query –** You can refresh the data preview for the current query or all query connections. You can also open the properties settings and the advanced editor for the current query and there are options under the Manage button to delete, duplicate or reference the current query.

3 **Manage Columns –** You can navigate to specific columns and choose to keep or remove columns.

4 Reduce Rows – You can manage the rows of data from this section. There are lots of options to either keep certain rows or remove certain rows. Keep or remove the top N rows, the bottom N rows, a particular range of rows, alternating rows, duplicate rows or rows with errors. One option only available for removing rows is to remove blank rows.

5 **Sort –** You can sort any column in either ascending or descending order.

6 **Transform –** This section contains a mix of useful transformation options.

- **Split Columns –** This allows you to split the data in a column based on a delimiter or character length.
- **Group By –** This allows you to group and summarize your data similar to a Group By in SQL.
- **Data Type –** This allows you to change the data type of any column.
- **Use First Row as Headers –** This allows you to promote the first row of data to column headings or demote the column headings to a row of data.
- **Replace Values –** This allows you to find and replace any value from a column.

7 **Combine –** This sections contains all the commands for joining your query to with other queries. You can merge, append queries or combine files when working with a from folder query.

8 **Parameters –** Power Query allows you to create parameters for your queries. For example when setting up a from folder query, you may want the folder path to be a parameter as so you can easily change the location. You can create and manage existing parameters from this section.

9 **Data Sources –** This section contains the data source settings including permissions management for any data sources that require passwords to access.

10 **New Query –** You can create new queries from new data sources or previously used data sources from this section.

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Use Power BI for simple data visualizations

Objectives: At the end of this exercise you shall be able to
- **details power BI for simple data visualizations.**

Requirements

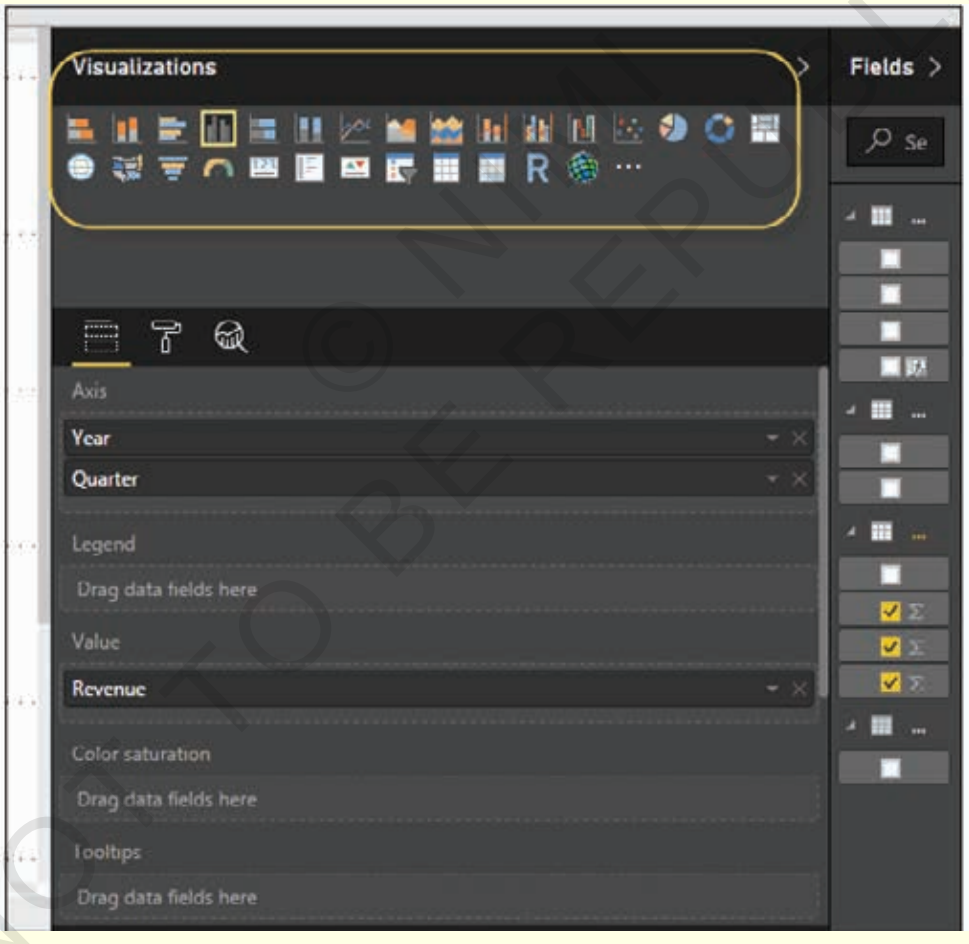
Tools/Equipment/Machines

- A working PC with MS-OFFICE - 1 No.

PROCEDURE

Use power BI for simple data visualizations

Visualizations are used to effectively present your data and are the basic building blocks of any Business Intelligence tool. Power BI contains various default data visualization components that include simple bar charts to pie charts to maps, and also complex models such as waterfalls, funnels, gauges, and many other components.



In Power BI, you can create visualization in two ways. First is by adding from the right side pane to Report Canvas. By default, it is the table type visualization, which is selected in Power BI. Another way is to drag the fields from right side bar to the axis and value axis under Visualization. You can add multiple fields to each axis as per the requirement.

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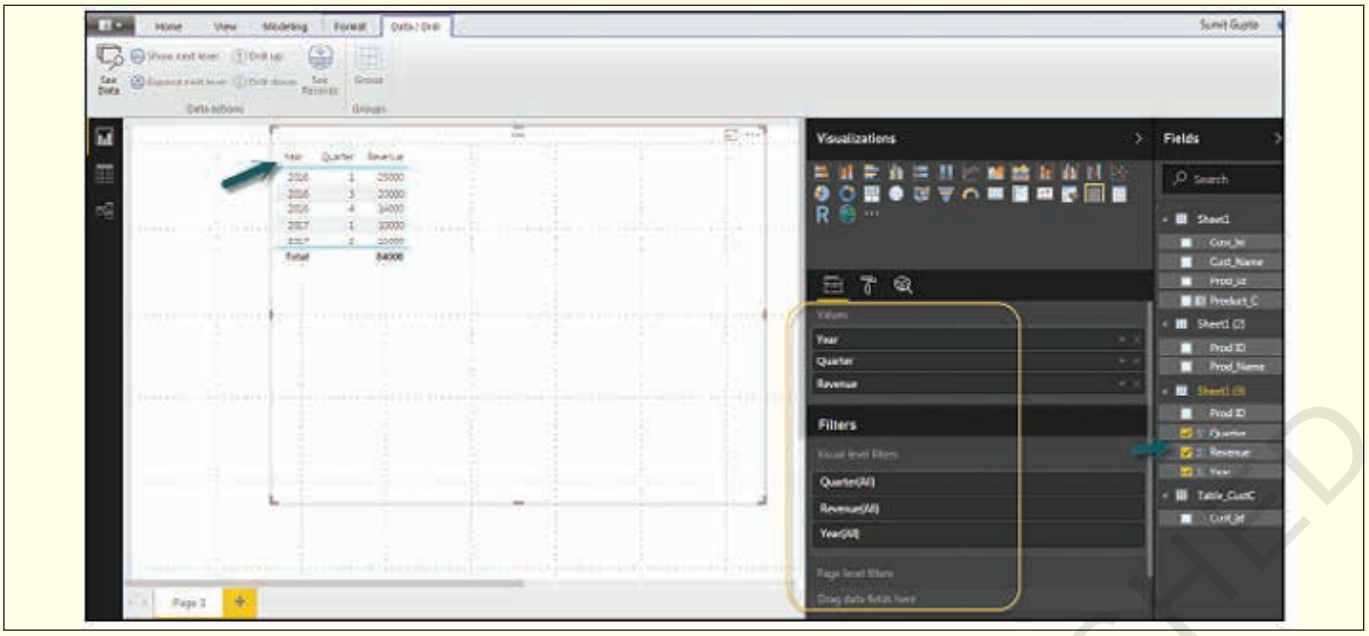
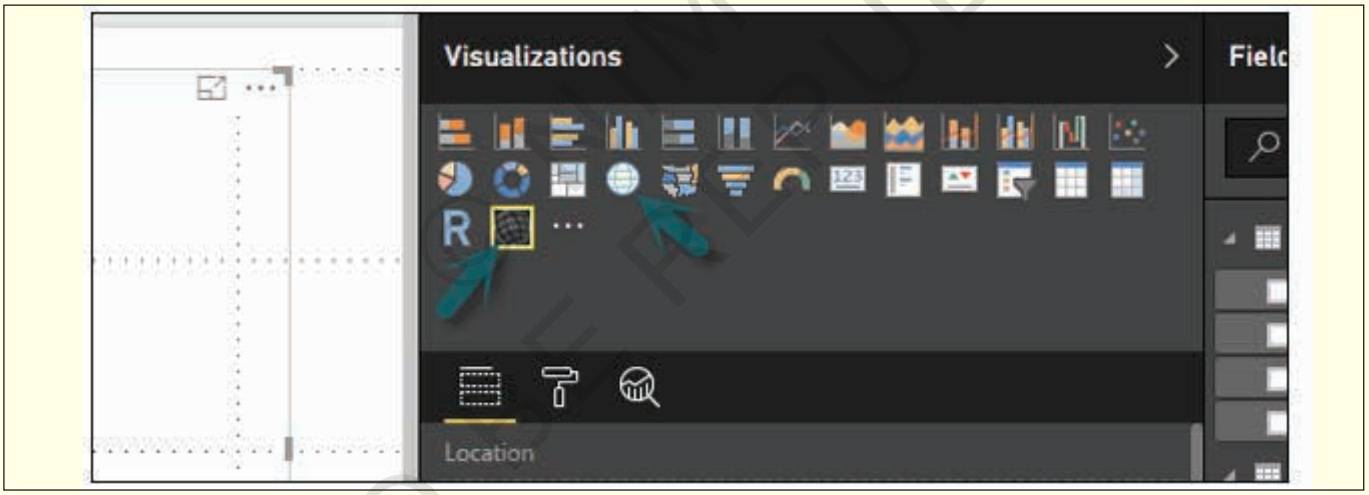


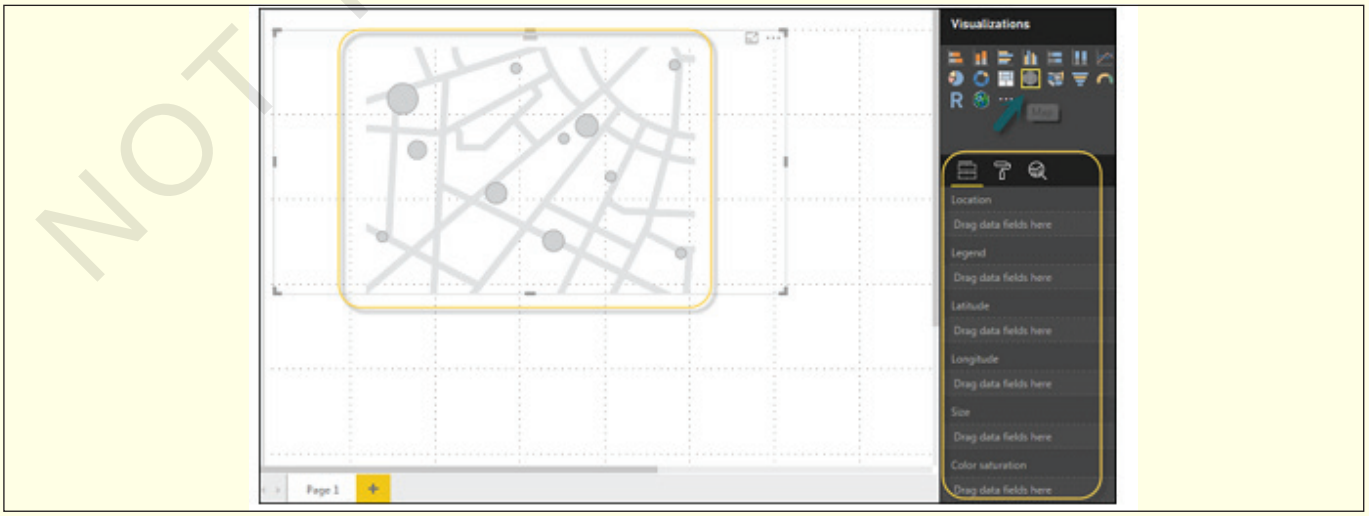
In Power BI, it is also possible to move your visualization on the reporting canvas by clicking and then dragging it. You can also switch between different type of charts and visualizations from the Visualization pane. Power BI attempts to convert your selected fields to the new visual type as closely as possible.

Creating Map Visualizations

In Power BI, we have two types of map visualization - bubble maps and shape maps. If you want to create a bubble map, select the map option from the visualization pane.



To use a bubble map, drag the map from Visualizations to the Report Canvas. To display values, you have to add any location object to the axis.



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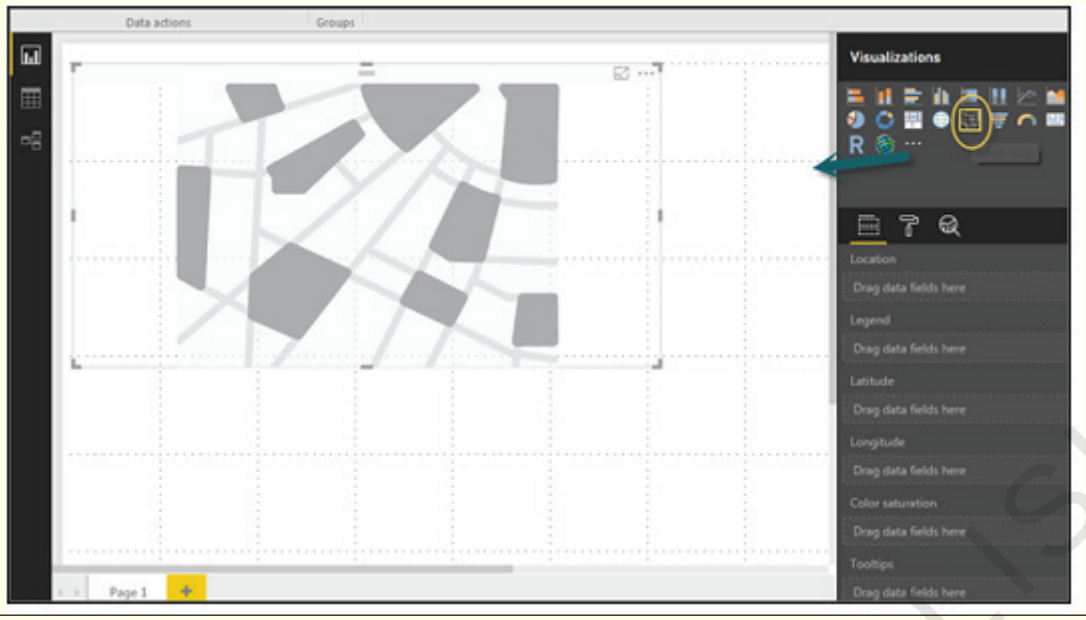
In the value fields, you can see that it accepts values axis such as City and State and or you can also add longitude and latitude values. To change the bubble size, you need to add a field to the value axis.

You can also use a filled map in data visualization, just by dragging the filled map to the Report Canvas.

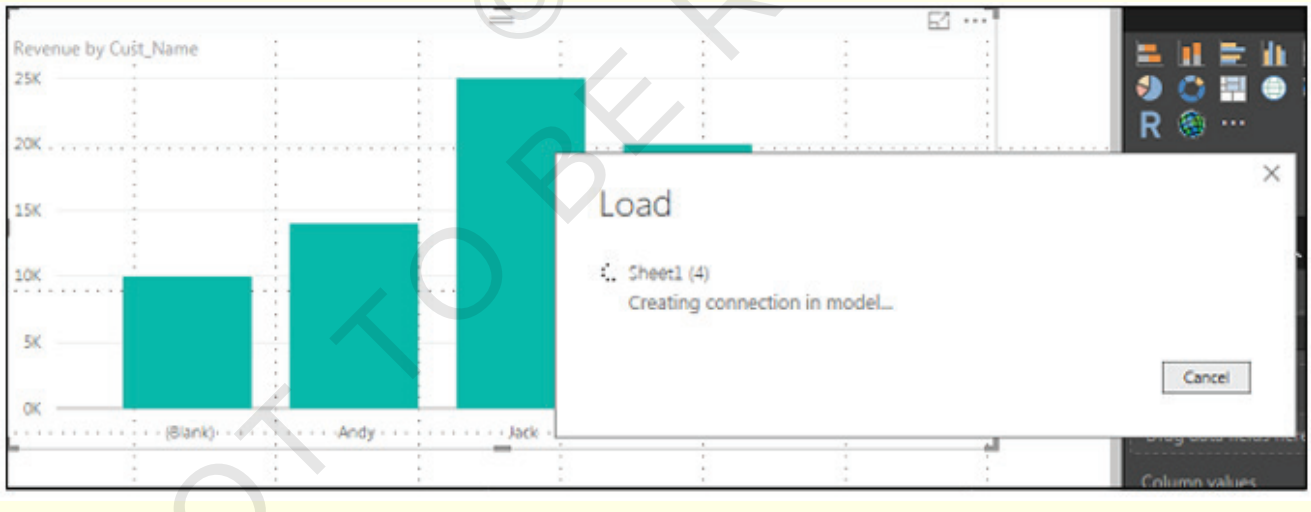


Note – If you see a warning symbol on top of your map visualization, it means that you need to add more locations to your map chart.

Using Combination Charts

In data visualization, it is also required to plot multiple measures in a single chart. Power BI supports various combination chart types to plot measure values. Let us say you want to plot revenue and unit_solds in one chart. Combination charts are the most suitable option for these kind of requirement.

One of the most common Combination chart in Power BI is Line and Stacked column charts. Let us say we have a revenue field and we have added a new data source that contains customer-wise unit quantity and we want to plot this in our visualization.



Once you add a data source, it will be added to the list of fields on the right side. You can add units to the column axis as shown in the following screenshot.

You have other type of combine chart that you can use in Power BI - Line and Clustered Column.

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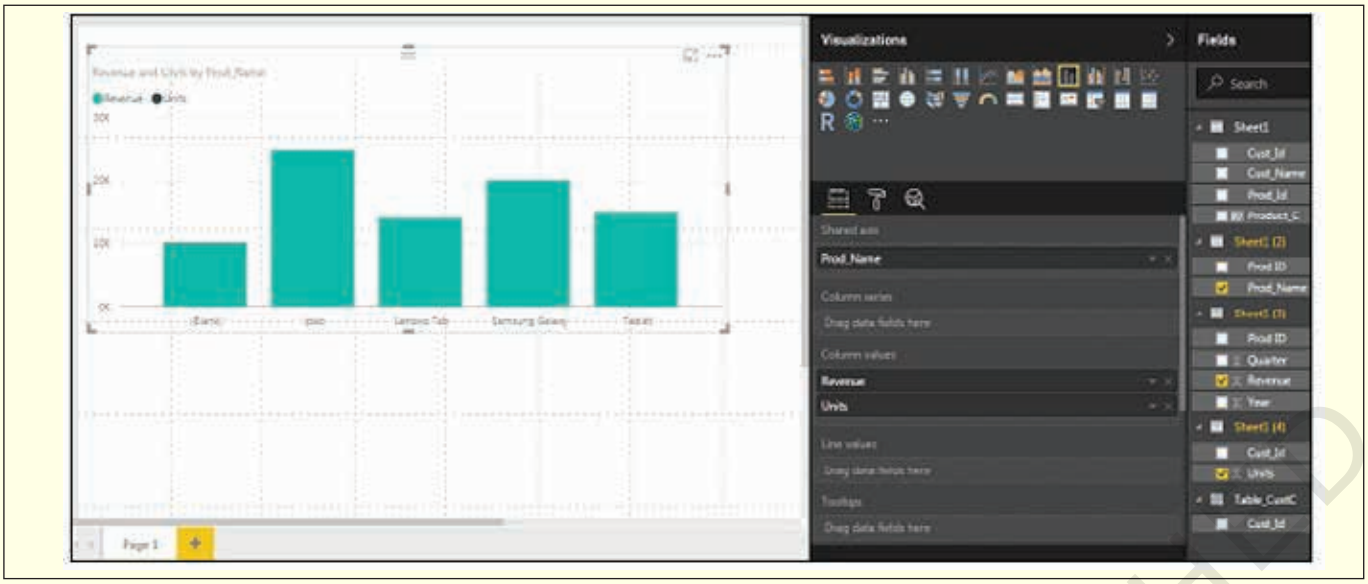
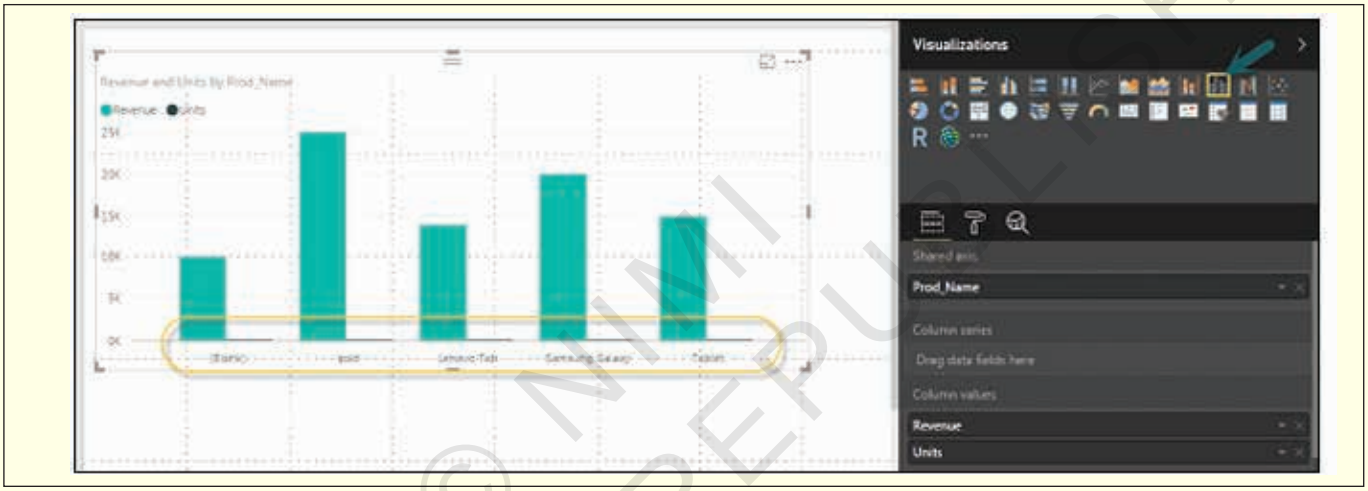
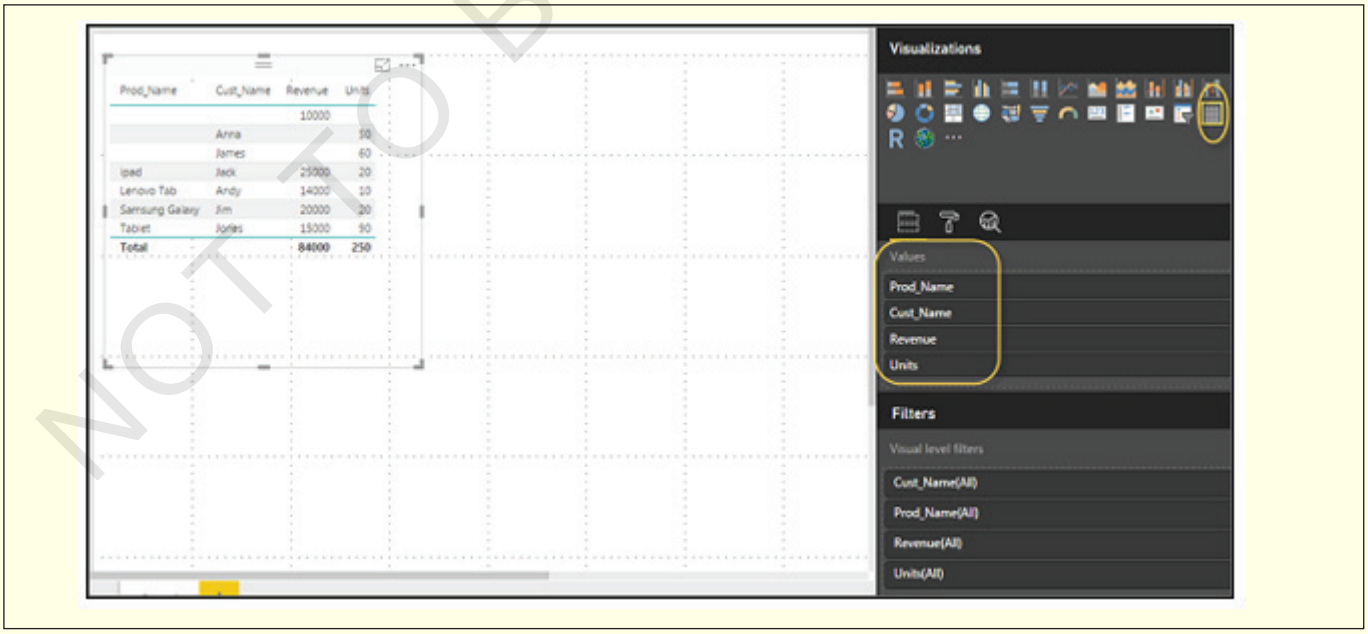




Using Tables

In Power BI, when you add a dataset to your visualization, it adds a table chart to the Report canvas. You can drag the fields that you want to add to the report. You can also select the checkbox in front of each field to add those to the Report area.

With the numerical values in a table, you can see a sum of values at the bottom.



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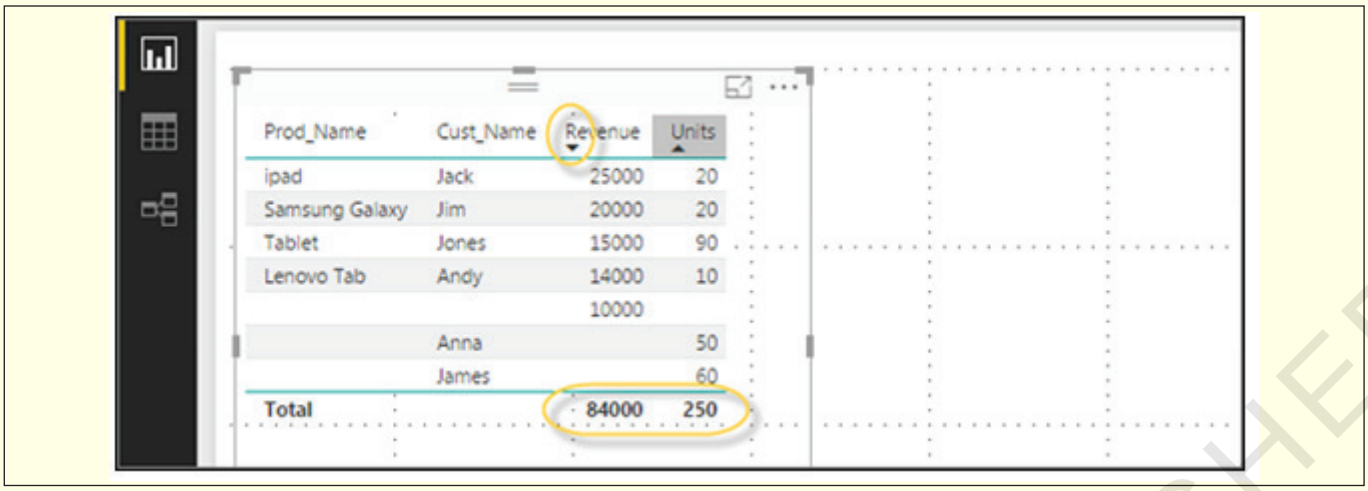
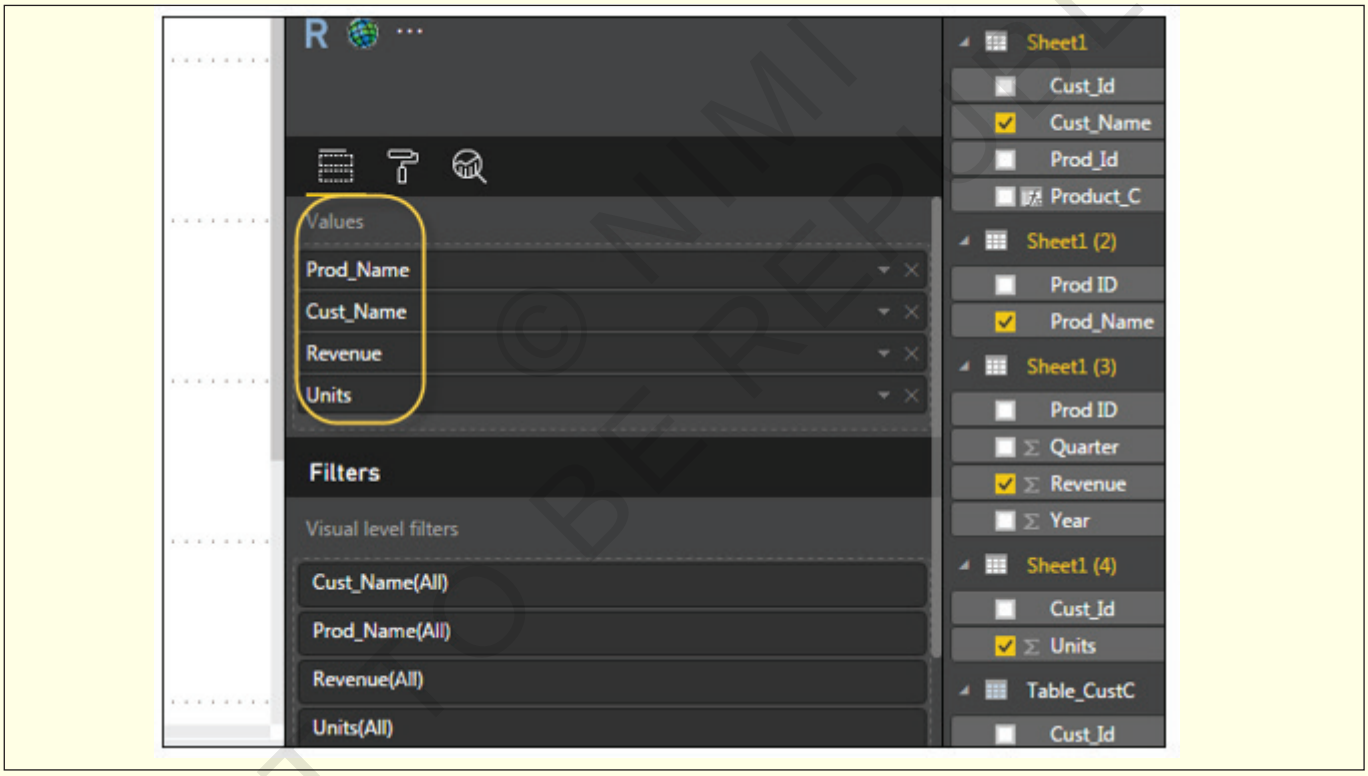
You can also perform a sort in the table using an arrow key at the top of the column. To perform ascending/ descending sort, just click the arrow mark, and the values in the column will be sorted.



The order of the columns in a table is determined by the order in the value bucket on the right side. If you want to change the order, you can delete any column and add the other one.



You can also undo summarize or apply different aggregate function on numerical values in the table. To change the aggregation type, click the arrow in the value bucket in front of the measure and you will see a list of formulas that can be used.

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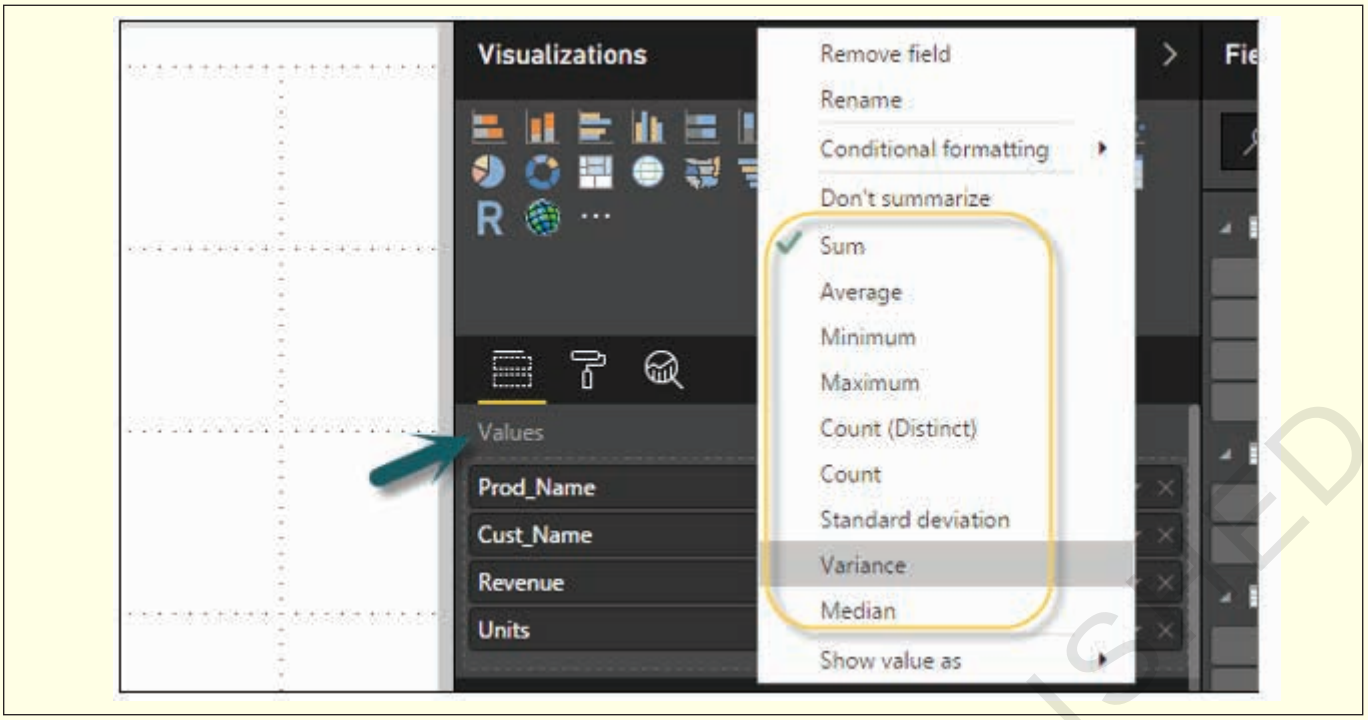

Another table type in Power BI is the matrix table that provides a lot of features such as auto sizing, column tables, and setting colors, etc.

Prod_Name	Units	Revenue
Tablet	90	15000
Samsung Gal...	20	20000
Lenovo Tab	10	14000
ipad	20	25000
	110	10000
Total	**250**	**84000**

Modify Colors in Charts

In Power BI, you can also modify the colors in the chart. When you select any visualization, it has an option to change the color. Following options are available under the Format tab −

- Legend
- Data Colors
- Detail Label
- Title
- Background
- Lock Aspect
- Border
- General

To open these options, go to the Format tab as shown in the following screenshot. Once you click, you can see all the options available.

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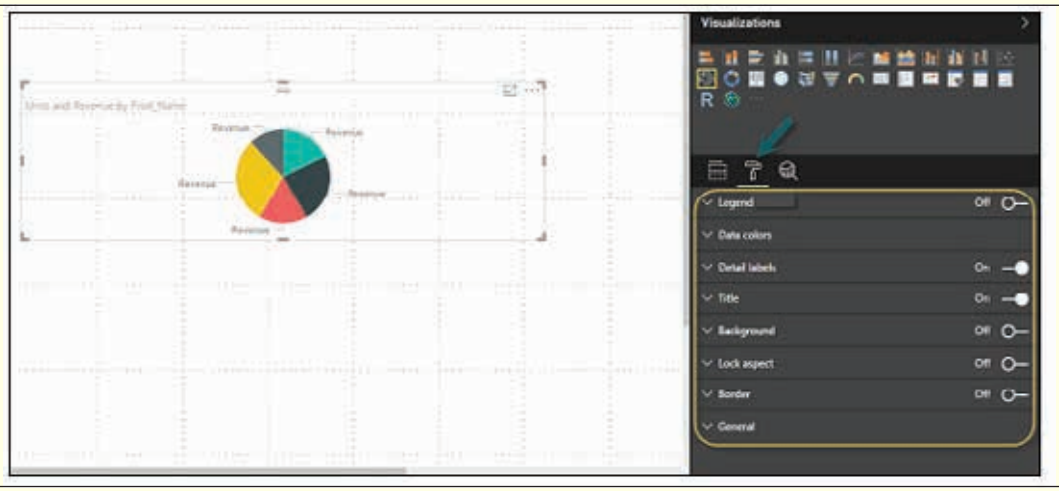
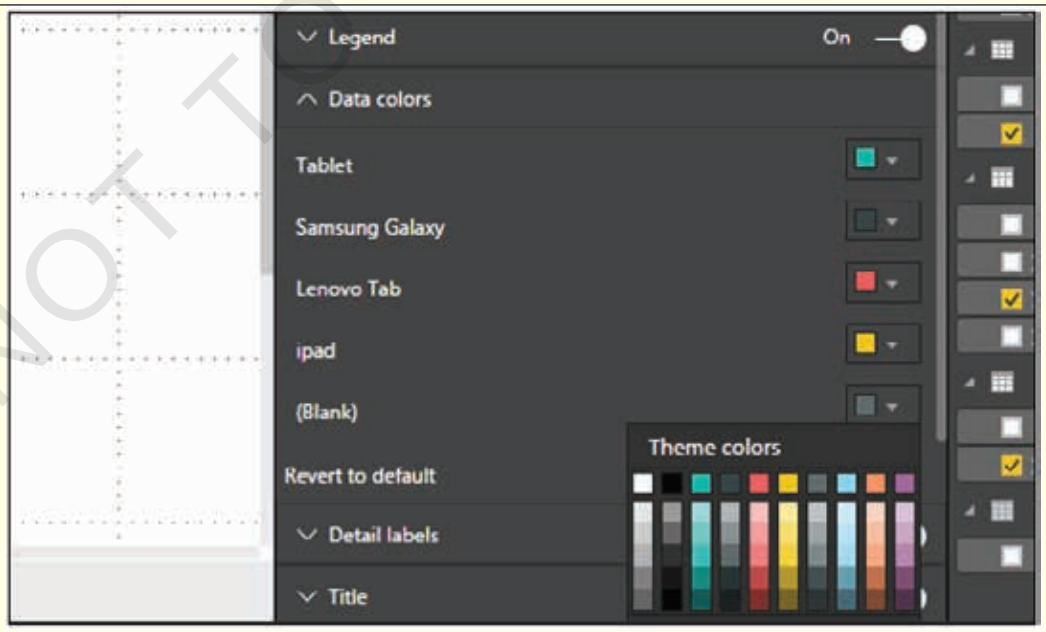


When you expand the Legend field, you have an option where you want to display the legend. You can select −

- Position
- Title
- Legend Name
- Color
- Text Size
- Font Family

Similarly, you have data colors. In case, you want to change the color of any data field, you can use this option. It shows all objects and their corresponding colors in the chart.



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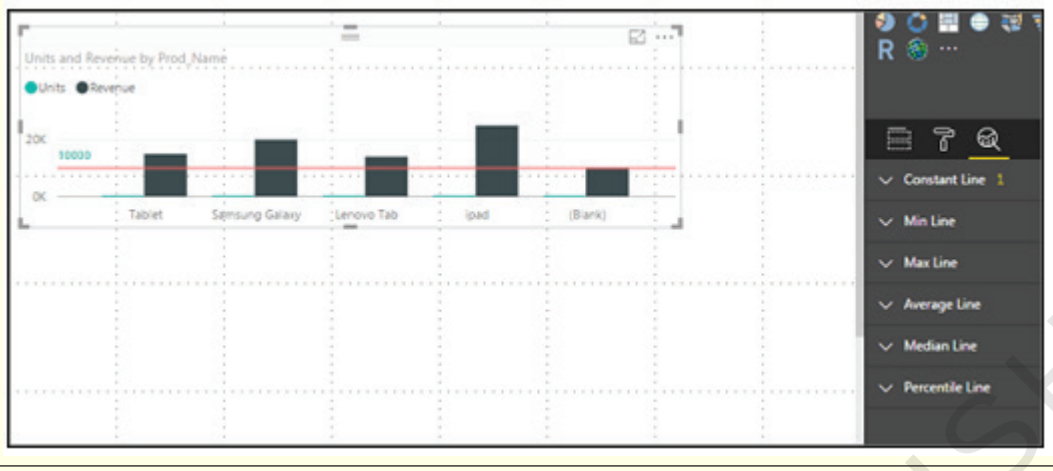
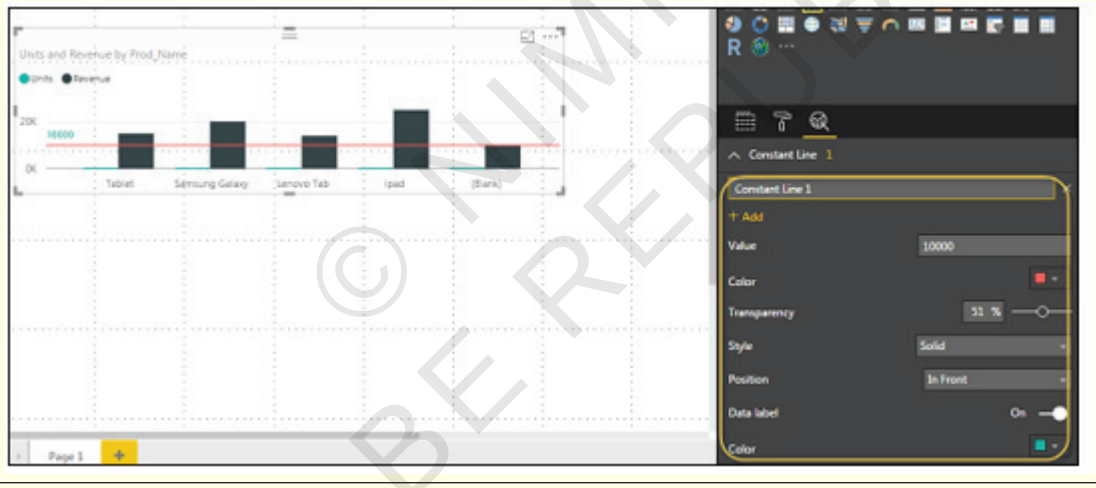
You also have Analytics feature in the tool, where you can draw lines as per requirement in data visualization. You have the following line types in data visualization −

- Constant Line
- Min Line
- Max Line
- Average Line
- Median Line
- Percentile Line



You can opt for a dashed, dotted, or a solid line. You can select Transparency level, color, and position of the line. You can also switch on/off data label for this line.

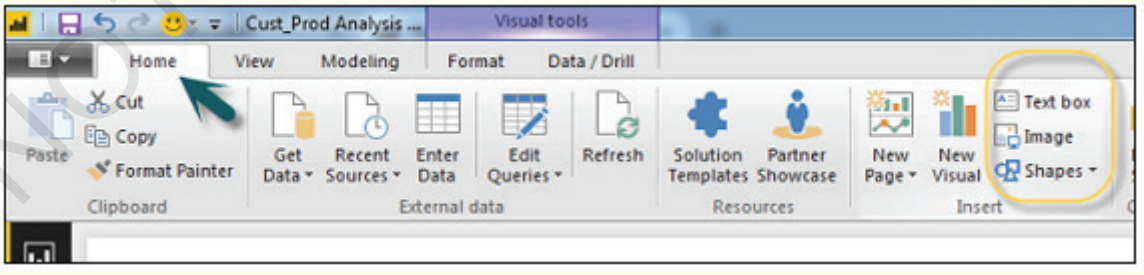


Adding Shapes, Images and Text box

Sometimes it is required that you need to add static text, images, or shapes to your visualization. In case you want to add header/footer or any static signatures, messages to data visualization this option can be used.

You can also add URLs in the text box and Power BI uses those link to make it live.

To add shapes, images and text box, navigate to the Home tab and at the top you will find an option to add images.



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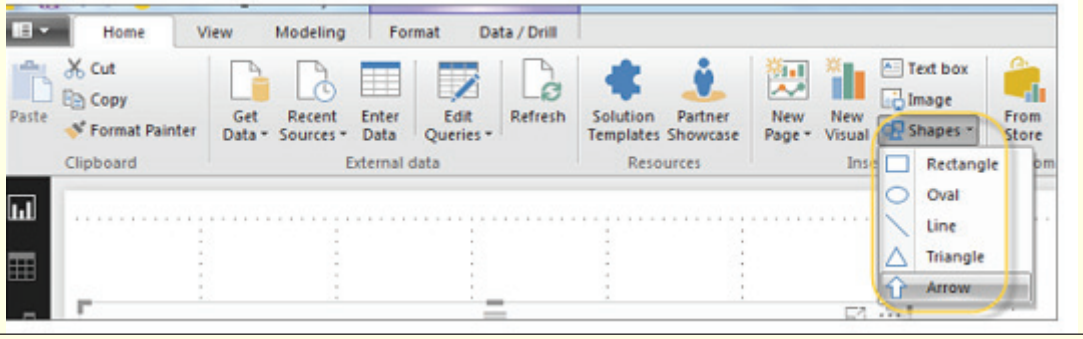
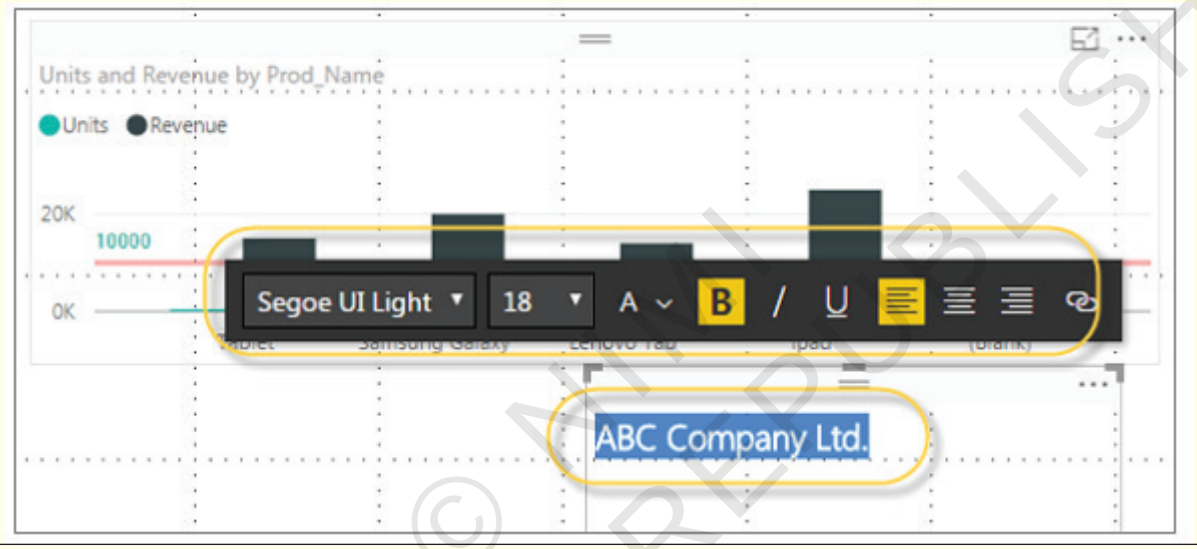
You can insert different shapes in data visualization. To see the available shapes, click the arrow next to the Shapes button.

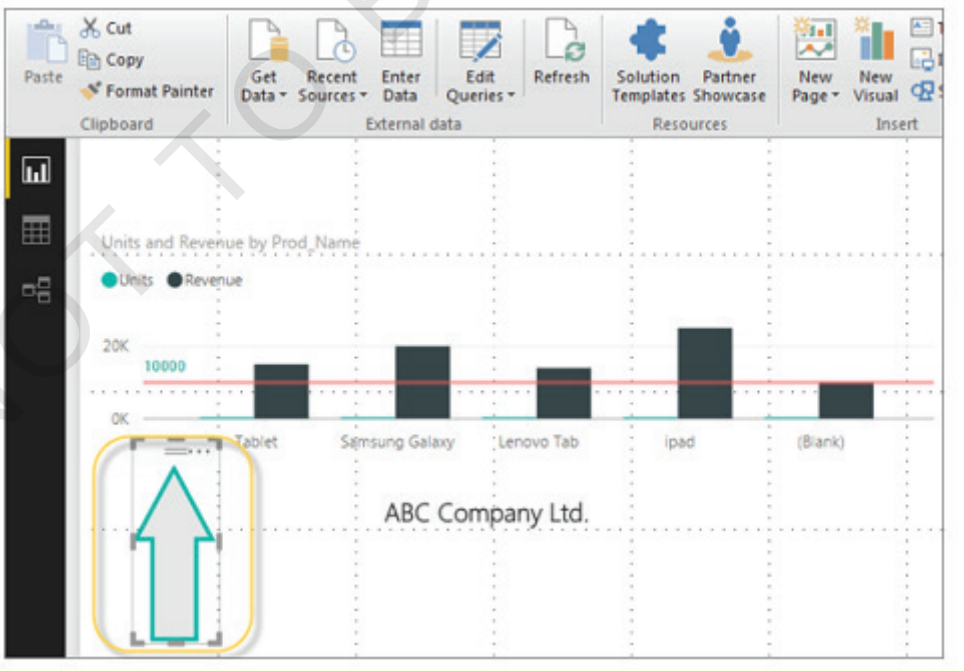


When you click on the text box, it adds a text box in your Report canvas. You can enter any text in the text box and use the rich text editor to make formatting changes.



Similarly, images can be added to data visualization to add logos or other images to data visualization. When you click the Image option, it asks for a path to pass the image file.

You can add shapes by selecting any shape from the dropdown list. You can also resize it using different options.



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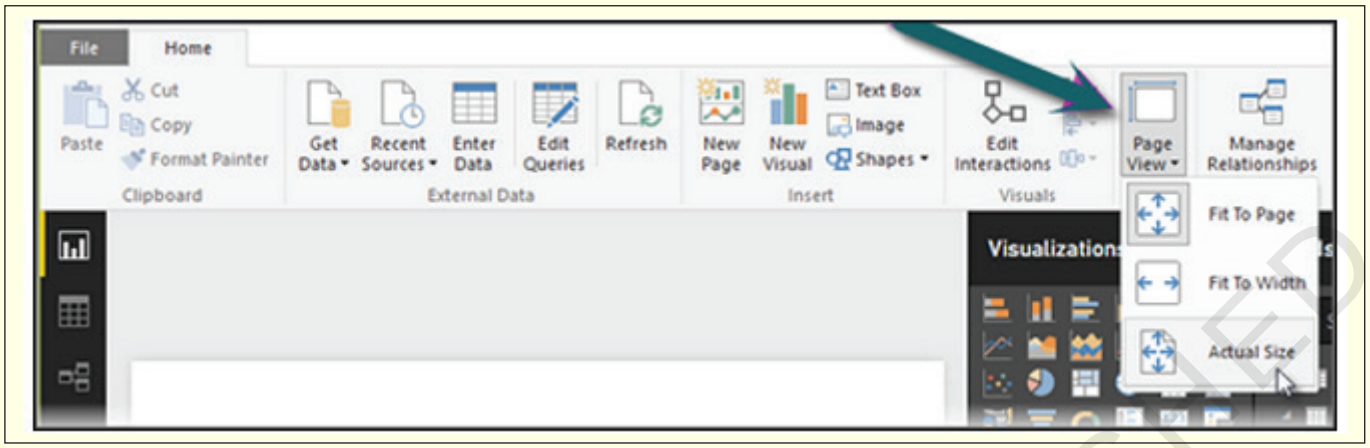
Styling Reports

In Power BI, you have flexible options to adjust the page layout and formatting such as orientation and page size of your report. Navigate to Page View menu from the Home tab and the following options are provided.

- Fit to Page
- Fit to Width
- Actual Size



By default, the page size in a report is 16:9; however, it is also possible to change the page size of the report. To change the page size, navigate to the Visualization pane and select Paint brush.

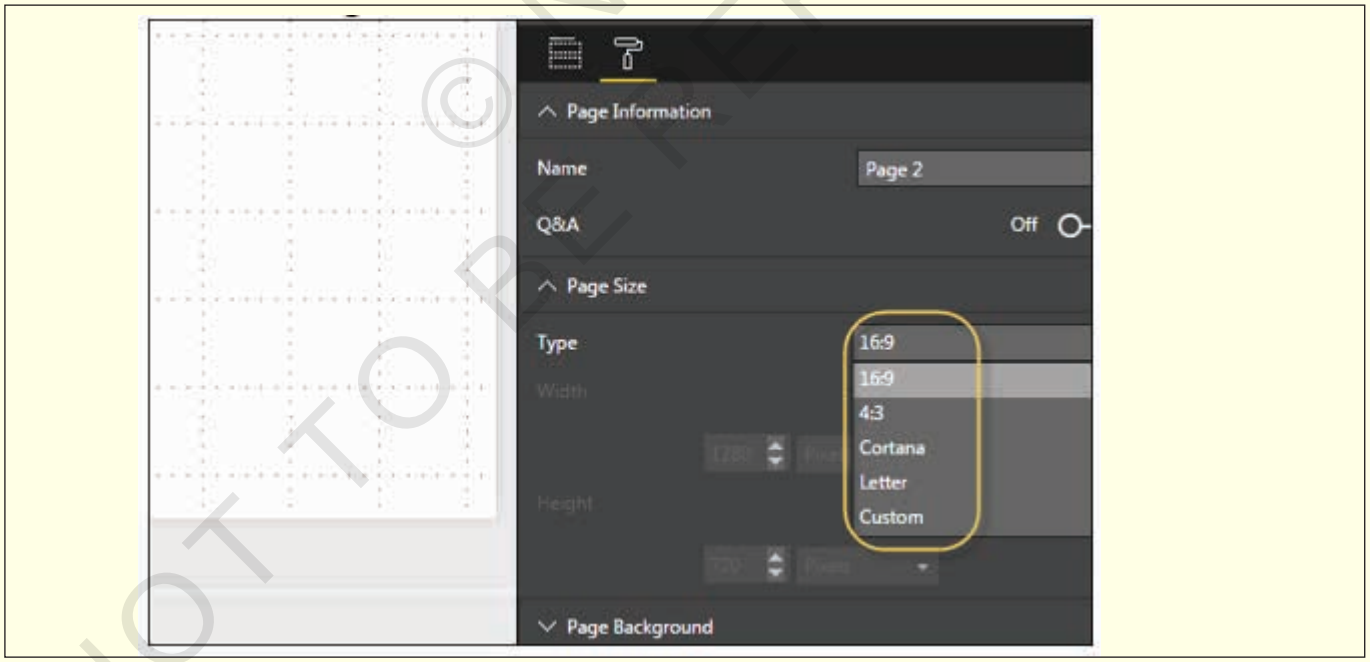
Note – To change page size, no visualization should be added to the Report canvas. You have the following options available under Page layout −

- Page Information
- Page Size
- Page Background

Under Page Information, you have Name and Q&A.

Under Page Size, you can select from the following options −

- Type
- Width
- Height



Under Page Background, you can select from the following options:

- Color
- Transparency
- Add Image

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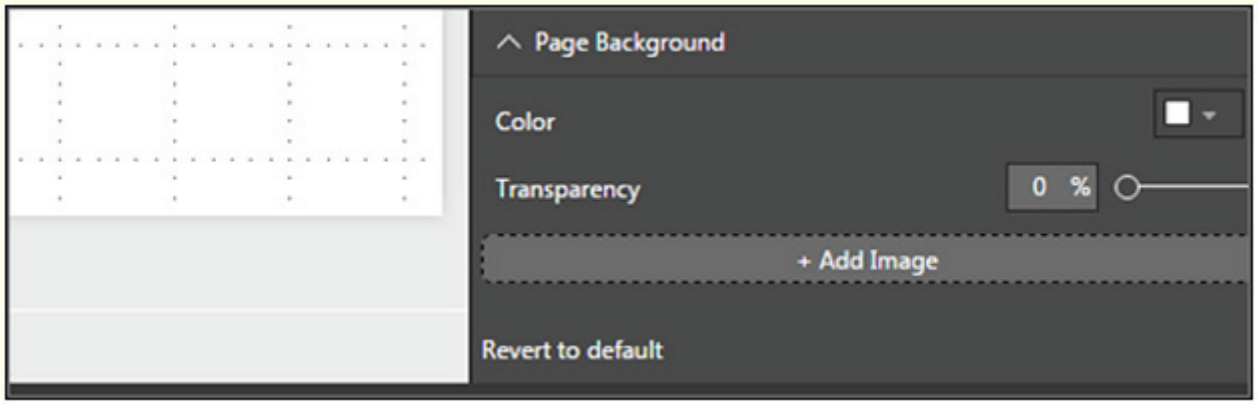

Duplicating Reports

In some scenarios, you may want to use the same layout and visuals for different pages. Power BI provides an option to create a copy of the page. When you use Duplicate Page option, a new page is added with similar layout and visuals.

To duplicate a page, right-click the Page and select Duplicate Page option. This will create a copy of the same page with the name - Duplicate of Page1.

Now, if you want to rename an existing page or delete a page, you can use other options as shown in the above screenshot.

For those who are new to dashboards, it would be ideal to get an understanding of the dashboards first. In this chapter, you will get to know the definition of dashboard, how it got its name, how they became popular in IT, key metrics, benefits of dashboards, types of dashboards, dashboard data and formats and live data on dashboards.

In information technology, a dashboard is an easy to read, often single page, real-time user interface, showing a graphical presentation of the current status (snapshot) and historical trends of an organization's or department's key performance indicators to enable instantaneous and informed.

Decisions to be made at a glance

Dashboards take their name from automobile dashboards. Under the hood of your vehicle, there may be hundreds of processes that impact the performance of your vehicle. Your dashboard summarizes these events using visualizations so that you have the peace of mind to concentrate on safely operating your vehicle. In a similar way, business dashboards are used to view and/or monitor the organization's performance with ease.

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The idea of digital dashboards emerged from the study of decision support systems in the 1970s. Business dashboards were first developed in the 1980s, but due to the problems with data refreshing and handling, they were put on the shelf. In the 1990s, the information age quickened pace and data warehousing, and online analytical processing (OLAP) allowed dashboards to function adequately. However, the use of dashboards did not become popular until the rise of key performance indicators (KPIs), and the introduction of Robert S. Kaplan and David P. Norton's Balanced Scorecard. Today, the use of dashboards forms an important part of decision making.

In today's business environment, the tendency is towards Big Data. Managing and extracting real value from all that data is the key for modern business success. A well-designed dashboard is a remarkable information management tool.

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Demonstrate E-Commerce sites

Objectives: At the end of this exercise you shall be able to
- **demonstrate the e-commerce sites.**

PROCEDURE

Browser the following e-Commerce sites to identify products & services in different sectors

1 Product Buying & Selling
- https://www.amazon.in/
- https://www.flipkart.com/
- https://www.olx.in/
- https://www.cars24.com/

2 Transports
- https://www.irctc.co.in/nget/train-search
- https://www.uber.com/in/en/ride/
- https://www.olacabs.com/

3 Entertainment
- https://in.bookmyshow.com/
- https://www.ticketnew.com/

4 Food
- https://www.swiggy.com/
- https://www.zomato.com/

5 Travel and Tourism
- https://www.makemytrip.com/
- https://www.cleartrip.com/

6 Real Estate
- https://www.99acres.com/
- https://www.nobroker.in/

7 Job
- https://www.naukri.com/
- https://www.linkedin.com/

8 Banking
- https://www.axisbank.com/
- https://www.icicibank.com/

9 Pharmacy
- https://www.1mg.com/
- https://pharmeasy.in/

10 Local Information Search
- https://www.justdial.com/
- https://www.whitepages.com/

11 Education
- https://byjus.com/
- https://unacademy.com/

Sl.No.	Name of the site	Purpose of the site

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List features of e-commerce sites

Objectives : At the end of this exercise you shall be able to
- **browse and observe features of ebay**
- **browse and observe Amazon website**
- **browse and listout the Flipkart**
- **browse and listout the OLX**
- **browse and listout QuickR**
- **compare websites and features on the following table basis by tick marks.**

PROCEDURE

TASK 1 : **Browse and observe features of ebay**

1 Open web browser for accessing web page.

2 Type in the address bar as “http://www.ebay.in” as in Fig 1

Fig 1

3 Note down the features listed in the following table from the main window.

Items	Placement	On Click
Name of the Site / Logo		
Products Catalogue		
Offers		
User Login		
Seller Login		
Terms & Conditions		

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TASK 2 : **Browse features of Amazon**

1 Open web browser for accessing web page.

2 Type in the address bar as “http://www.amazon.in” as in Fig.2

3 Note down the features listed in the following table from the main window.

Fig 2

Items	Placement	On Click
Name of the Site / Logo		
Products Catalogue		
Offers		
User Login		
Seller Login		
Terms & Conditions		

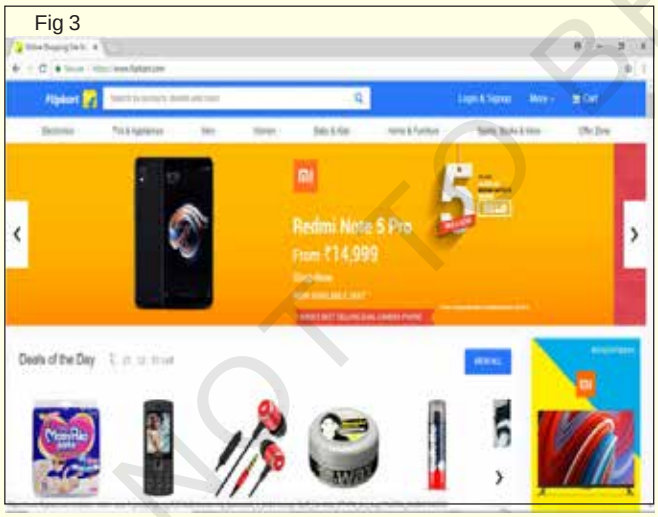
TASK 3 : **Browse features of Flipkart**

1 Open web browser for accessing web page.

2 Type in the address bar as “http://www.flipkart.com” as in Fig.3

3 Note down the features listed in the following table from the main window.

Fig 3



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Items	Placement	On Click
Name of the Site / Logo		
Products Catalogue		
Offers		
User Login		
Seller Login		
Terms & Conditions		

— — — — — — — —

TASK 4 : **Browse features of OLX**

1 Open web browser for accessing web page.

2 Type in the address bar as “http://www.olx.in” as in Fig.4

3 Note down the features listed in the following table from the main window.

Fig 4

Items	Placement	On Click
Name of the Site / Logo		
Products Catalogue		
Offers		
User Login		
Seller Login		
Terms & Conditions		

— — — — — — — —

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TASK 5 : **Browse features of QuickR**

1 Open web browser for accessing web page.

2 Type in the address bar as “http://www.quickr.com” as in Fig.5

3 Note down the features listed in the following table from the main window.

Fig 5

Items	Placement	On Click
Name of the Site / Logo		
Products Catalogue		
Offers		
User Login		
Seller Login		
Terms & Conditions		

TASK 6 : **Compare websites and features on the following table basis by tick marks**

Sl.No.	Site Name	Buy	Sell	Used Goods	Return\ Refund	COD	Feedback	Offers	Update Email
1	Ebay								
2	Amazon								
3	Flipkart								
4	OLX								
5	QuickR								

Note : This chart compares facilities available for users in various E-Commerce websites, which increases the usability of services of the particular site. More facilities, more visitors, which makes continuous sale over E-Commerce sites.

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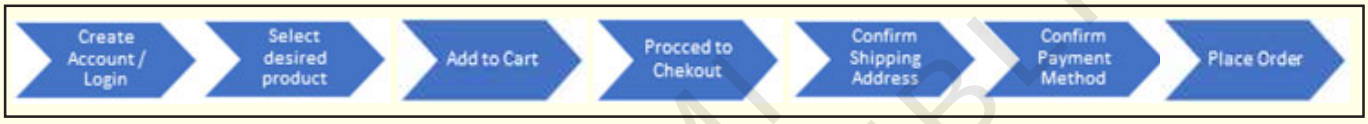
Use e-commerce sites to source an item

Objectives: At the end of this exercise you shall be able to
- **buying a Desired Product on Amazon.**

PROCEDURE

Process of Source an Items from E-Commerce Sites:

1 **Sign in to your E-Commerce Sites account.**
2 **Hover over Departments and click on a category. When you find an item you want, click on it.**
3 **Review the item, and click Add to Cart.**
4 **Click Proceed to Checkout.**
5 **Enter a shipping address and click Continue.**
6 **Choose a payment method and click Continue.**
7 **Click Place Your Order**



TASK 1: **Buying a Desired Product on Amazon**

1 Sign into your Amazon account.

Go to www.amazon.com in your web browser and log in. To do this, move your mouse over "Hello, Sign In" and click Sign In. Then click in the boxes highlighted in the right screenshot below and type in your email address and account password, respectively. Finally, click Sign In Using Our Secure Server.

2 Search through departments.

Let's you're looking for a new toaster.

Let's start by moving the mouse over Departments, then Home, Garden, and Tools, and then clicking Kitchen and Dining.

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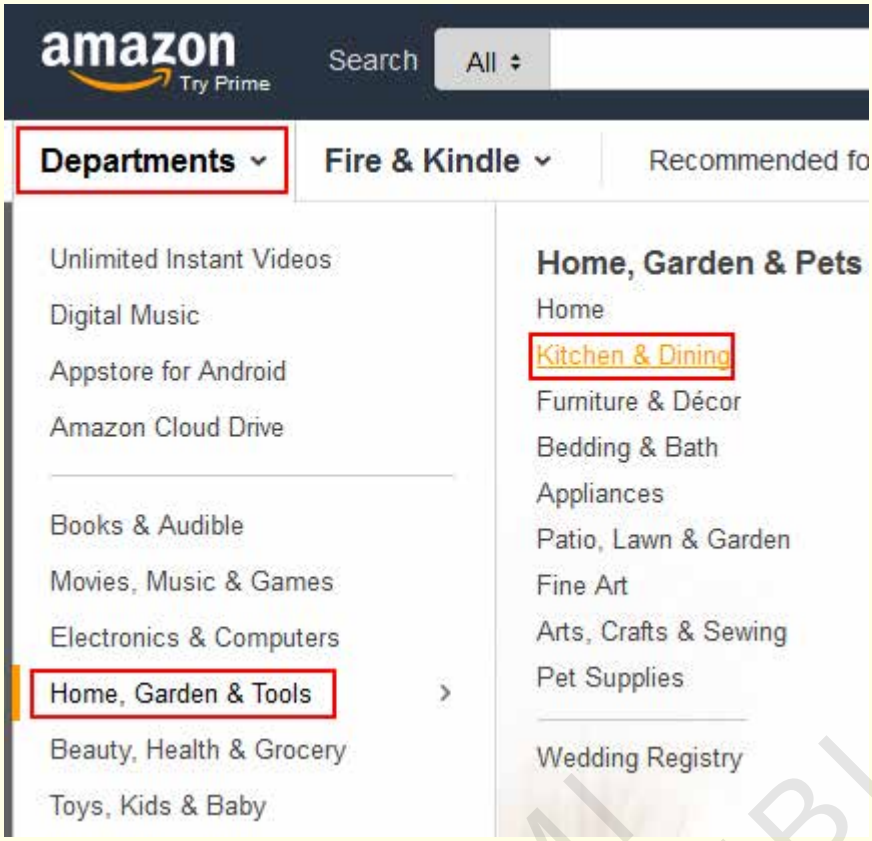

3 Find a specific category.

Now, let's click on Ovens and Toasters, and then click Toasters, just to narrow things down a bit more.

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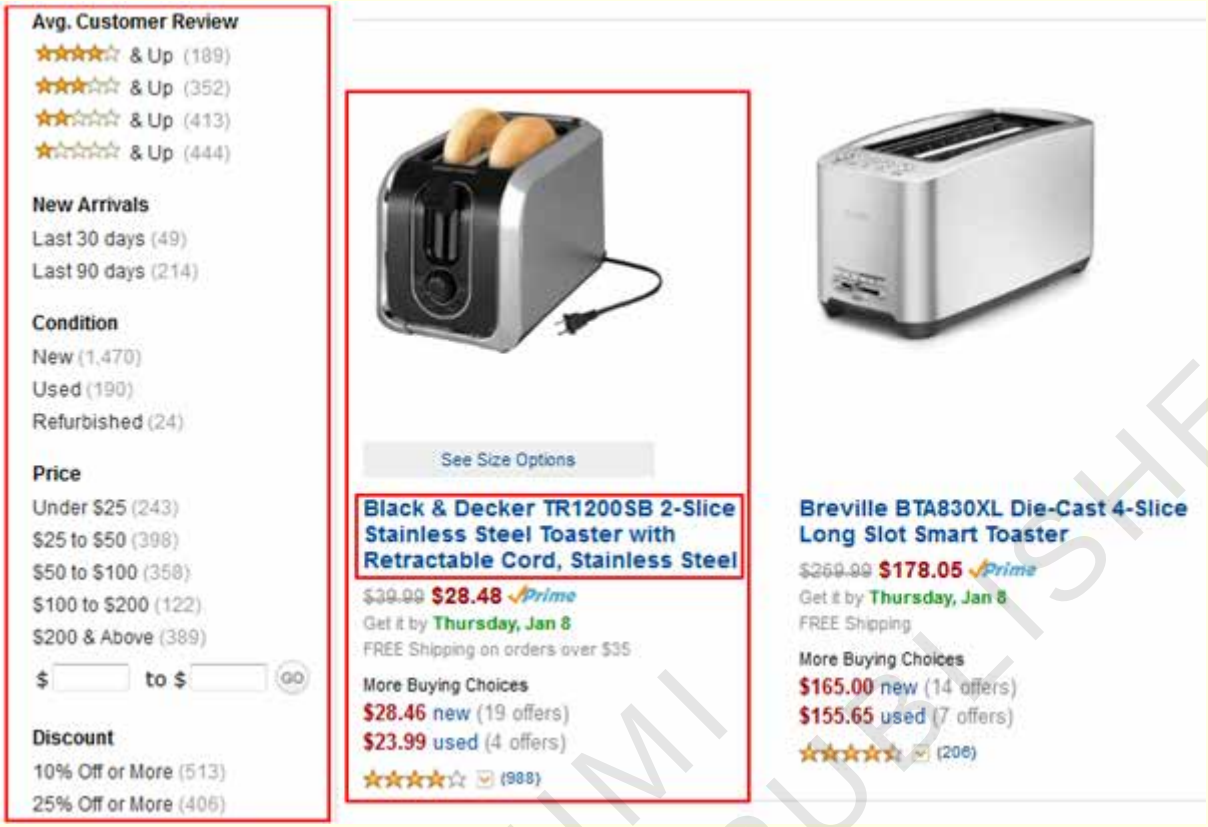
4 View and select an item.

You'll now see a list of toasters available for sale.



Across the left-hand side of the screen, you'll see a series of options that you can click to narrow down your search even more. For example, you can look for a product:

- in a certain colour
- from a certain company or brand
- based on how well it has been reviewed by Amazon customers
- within a certain price range
- based on who is selling it

The product information itself will show you, among other things:

- what the product looks like, and if there are any variations that you can look at
- what the product is called
- its price when you buy it (and if you save anything off retail price)
- when you can expect to get it, or how many are left in stock
- what other customers are saying about the product

When you find a product that you like, click on its name.

5 Add the item to your cart.

If you've decided that it's what you want, click the drop-down menu marked "QTY" to select how many of this product you want. Then click Add to Cart.

6 Proceed to the Amazon checkout.

If this is the only thing you want to buy, click Proceed to Checkout.

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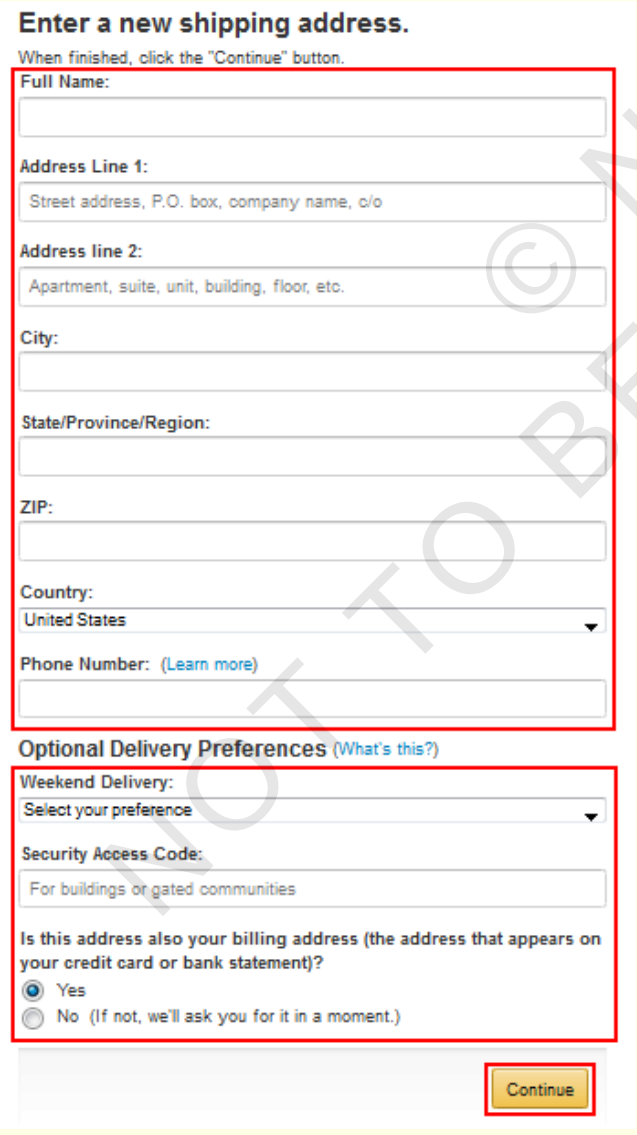
7 Enter a shipping address.

You'll now have to pick an address to send your delivery to. If you don't have one, you'll have to create a new one.



Click in each of the boxes or drop-down menus underneath "Enter A New Shipping Address" and type in or select:

- your full name
- your street address
- your unit address (if you live in an apartment, condo, etc.)
- the city in which you live
- the state, province, or region in which you live
- your mailing code (doesn't have to be a U.S. Z.I.P. code)
- the country in which you live
- your phone number

There are additional options underneath "Optional Delivery Preferences", where you can:

- choose whether or not you're available on weekends to receive delivered packages
- provide Amazon with the access code to your apartment complex or gated community (if you're allowed) so a delivery person can get in
- choose whether or not the address your items will be shipped to is the same one that you want your bill to come to

When you've entered all of your information, click Continue to move on.

8 View and confirm your order summary.

On the left, you'll see your order summary. On the right, you'll be asked to select what kind of shipping you want (if applicable). Click the button next to the type you want. Usually, the faster the shipping speed, the more it will cost you. When you're done, click Continue.

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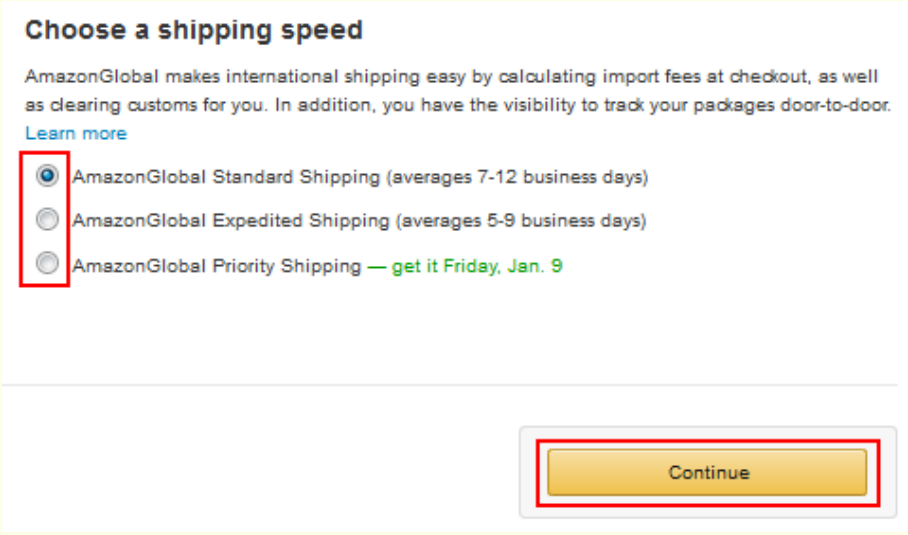
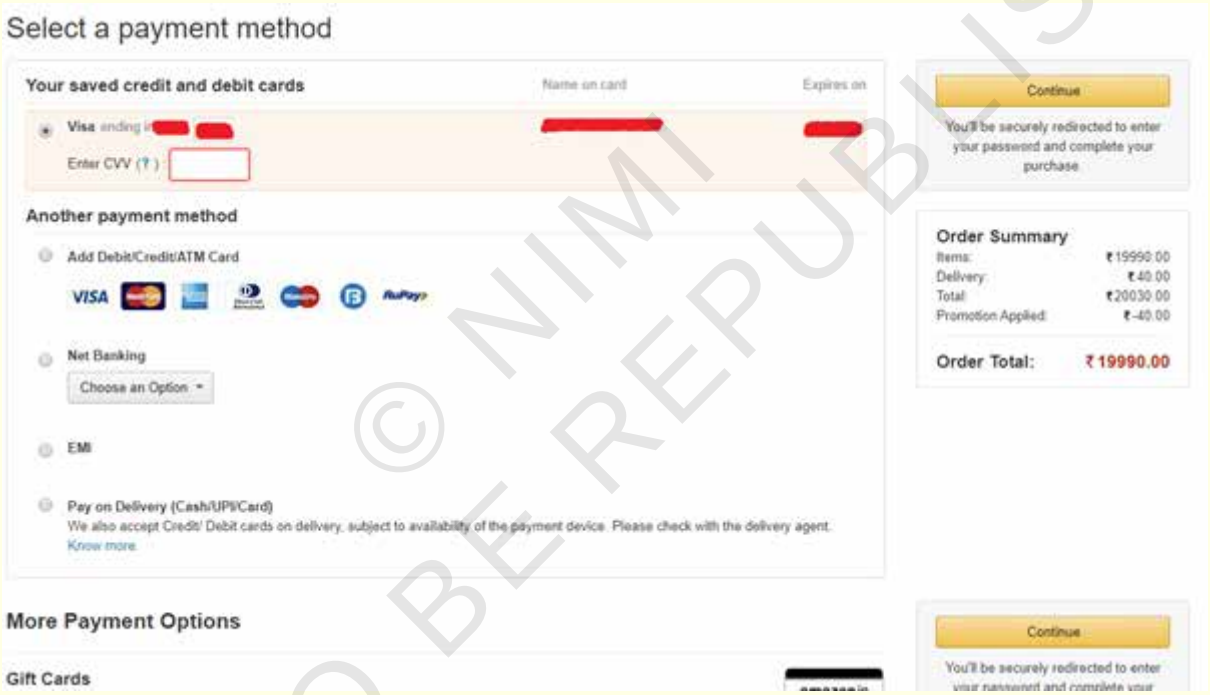
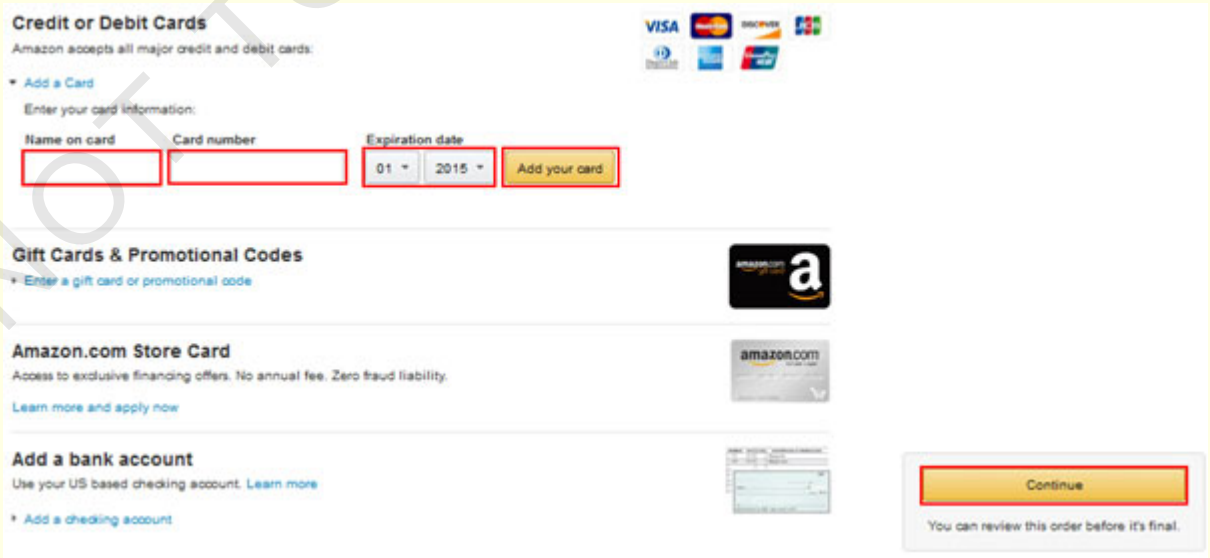


9 Choose a payment method.

You'll now have to select a method of paying for your purchase.



Add Debit / Credit Card:



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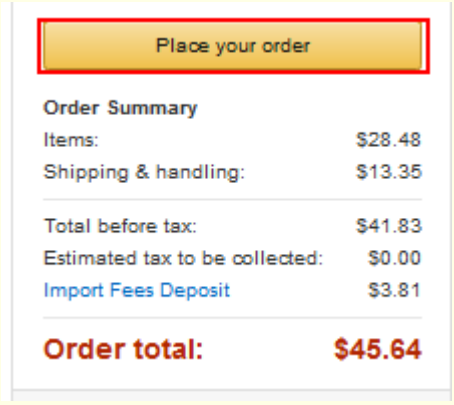
For the purposes of this tutorial, we'll assume that you want to pay by using a credit card. To add a new credit card:

- Scroll down to the section that says "Credit or Debit Cards."
- Click in the box that says "Name on Card" and type in your name as it appears on your credit card.
- Click in the box that says "Card Number" and type in your credit card number (with no spaces).
- Click the two drop-down menus labelled "Expiration Date" to select the month and year that your credit card expires.
- Click Add Your Card to add this credit card as a payment option.

When you're done, this credit card will automatically be selected as a payment option, so you can just click Continue.

10 Confirm and place your order.

On the next screen, you can review your order and make any final changes, including the type of shipping you want. If you're happy with what you have, click Place Your Order.



You'll receive a confirmation receipt via email. Now all that's left to do is to wait for your item to arrive!

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Undertake transactions on an e-commerce site

Objectives: At the end of this exercise you shall be able to
- **details the accepted payment methods.**

PROCEDURE

Accepted Payment Methods

Payments on e-commerce site can be made using certain types of credit and debit cards.

As per the new RBI guidelines, from 30th September 2022 onwards, only card networks (VISA/Mastercard etc.) and/or issuing banks can store credit/debit card details. You will not be able to see saved cards starting 1st October 2022 unless you provide consent to Amazon for card tokenization.

The following payment methods are available for you to make payment:

- Pay on delivery
- Credit/Debit card
- Net Banking
- Unified Payment Interface (UPI)
- Easy Monthly Installments (EMI).

The following cards issued in India can be used:

- Credit Cards: Visa, Mastercard, American Express, Diners Club, and RuPay
- Debit Cards: Visa, Mastercard, RuPay, and Maestro

Refer : Ex.1.34.132 Step 9. Use e-commerce sites to source an item for payment method and Option.

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Add product to an e-commerce website

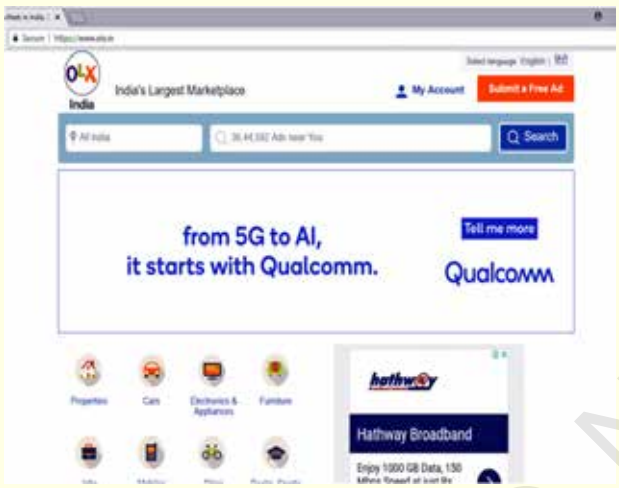
Objectives : At the end of this exercise you shall be able to
• sell a product in OLX.in website.

PROCEDURE

TASK 1 : **Sell a product in OLX.in website**

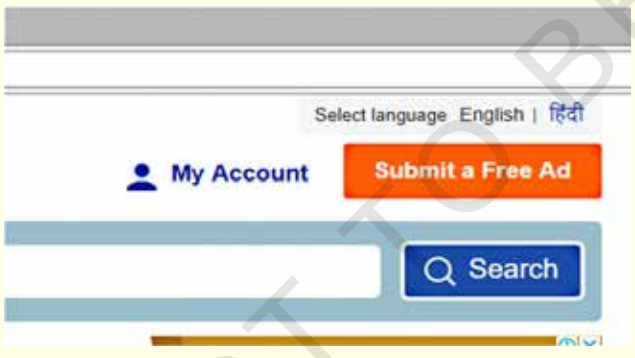
1 Open the website in a browser http://www.olx.in (Fig 1)

Fig 1



2 Click on Submit a free Ad to post a classified advertisement (Fig 2)

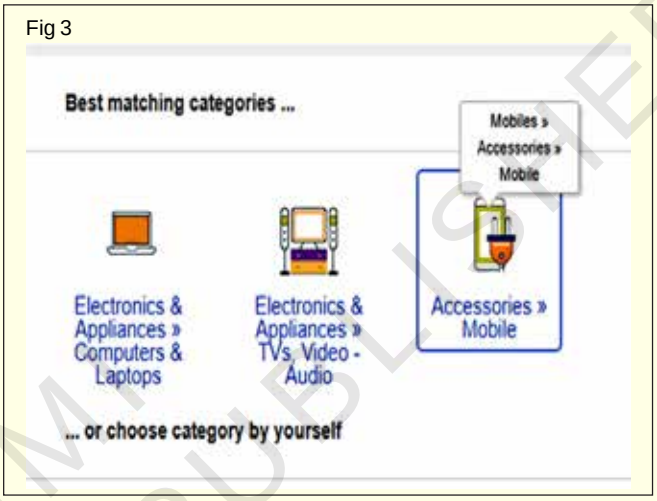
Fig 2



3 Add a title to the ad, say Laptop Headphone and select category, say 'Accessories-Mobile' as in Fig 3.

5 Put price for the product.

Fig 3



6 Write a description to match the product like 'Best sound quality with rich bass compatible with laptop and mobile' as in Fig 4.

Fig 4

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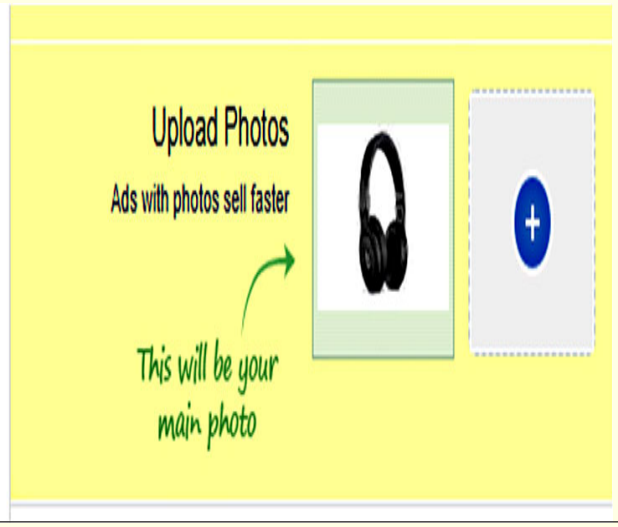
7 Upload view of product photographs (5 views of photos will attract more) (Fig 5).

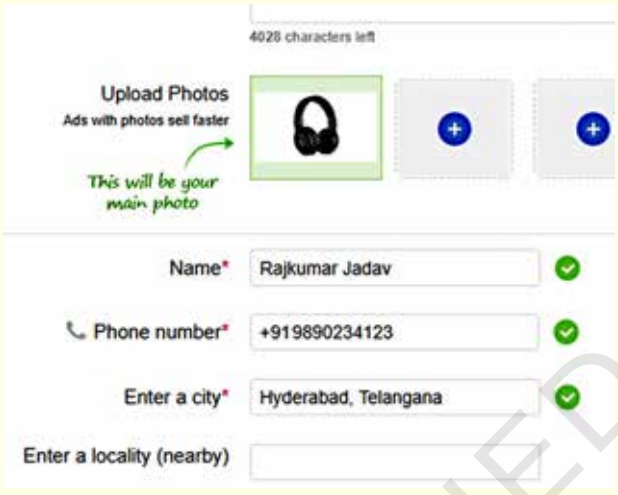
Fig 5



8 Enter seller name, Phone number and City and press Submit to complete. (Fig 6).

9 Re-enter OTP if required to activate the advertisement.

Fig 6



Note : Posted ad will be active upto a standard time frame i.e. 15 days minimum, then renewal may be required.

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Practice order & payment processing

Objectives : At the end of this exercise you shall be able to
• login and buy a desired product.

PROCEDURE

TASK 1 : **Login and buy a desired product**

1 Login to the created account as in Fig 1.

Fig 1

2 View the deals in Today's deals tab, it is matches to buy.

3 Enter the item required to buy in the "search" tab at the top of the site as in Fig 2.

Fig 2

4 Select on " Sort by " to get the order of the product list as to price low to high or new & popular, etc.

5 Select the product that matches the requirement. (Fig 3)

Fig 3

6 Click on the product desired to get detailed view of the product as in Fig 4.

Fig 4

7 Click on "Buy now" to finish selection and purchase or "Add to Cart" to continue for more items to buy. (Assume here, it is Buy Now to complete the order) (Fig 5).

8 Enter the password if asked.

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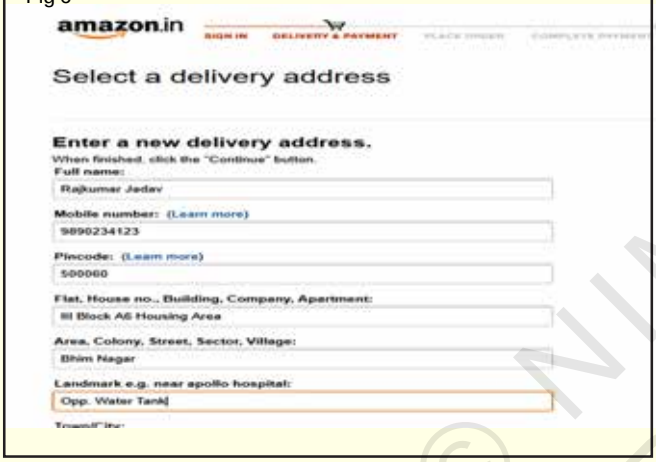
Fig 5

9 Enter details of shipping address on the page. (Fig 6).

Fig 6



10 Select the payment method from available options. (Fig 7)

Note : Use a Debit card which requires an OTP to complete payment or COD if available which allows to pay at the time of delivery

11 Complete the order and get a Track-order to know the current status of order in future.

Fig 7

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Identify common security issues

Objectives : At the end of this exercise you shall be able to
- **secure personal information sharing**
- **secure payment operations online.**

PROCEDURE

TASK 1 : **Secure personal information sharing**

The following table ensures for a secure E-commerce practice

a	Never public internet / WiFi for online purchases
b	Never forget to LOGOUT to secure the account associated
c	Never save a Debit Card / Banking details with password or PIN in any website as it can easily be hacked
d	Never use a legible / assumable password
e	Prefer Cash on Delivery option to avoid online payment threats
f	Never share personal / confidential information to Login in any website

— — — — — — — —

TASK 2 : **Secure payments operation online**

The following points make payments online to be secure.

a	Ensure the payment gateway is PCI compliant by clicking the Payment Gateway's Terms and Conditions page
b	Confirm, the payment transactions are encrypted, as encrypted data is securedof transfer time from hacking
c	Use always a transaction that requires a PIN and / or OTP to be received in mobile as without this authentication, the amount will not be transferred
d	Use E-Wallets to pay as there is no need to disclose banking or card details always and the amount in the wallet only is spent securely.

Note: Discus with instructor an list the common security uses.

Sl.No.	Security Uses	Cause

— — — — — — — —

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Provide firewall security for internet connection and network system

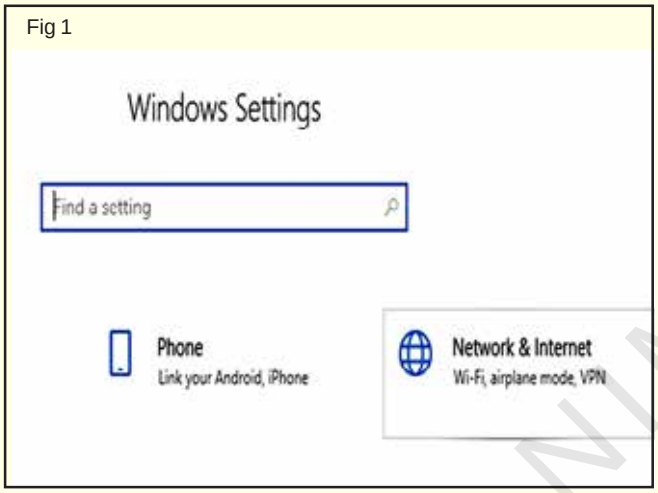
Objectives : At the end of this lesson you shall be able to
- **enable or disable firewall settings of windows 10**
- **protect system using windows defender.**

PROCEDURE

TASK 1 : **Enable or disable firewall settings of windows 10**

1 Access Windows firewall using Win Key → Settings → Network & Internet as in Fig 1.

Fig 1



2 Select Windows firewall in the available options to open Windows - Defender security center as in Fig.2

Fig 2

3 Make sure the "Firewall" is ON state for Domain Network, Private Network and Public Network as in Fig.3

Note : The (active) state defines the current available network.

4 Reset the firewall to default by clicking "Restore firewalls to default" as in Fig 4.

Fig 3

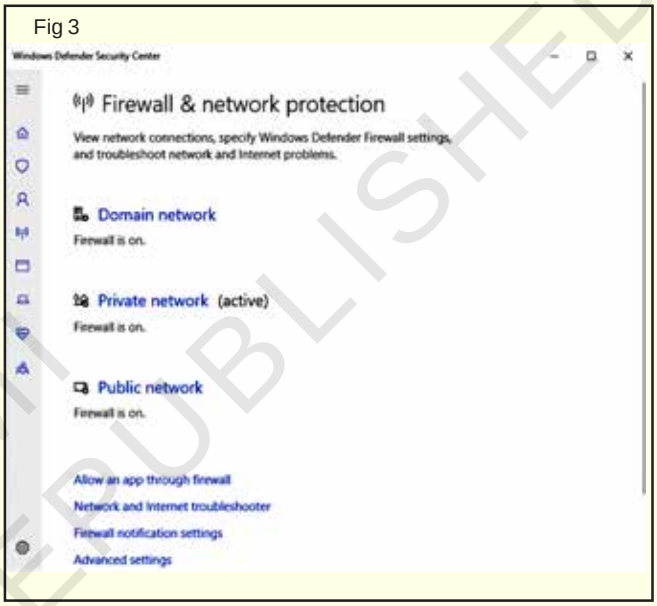
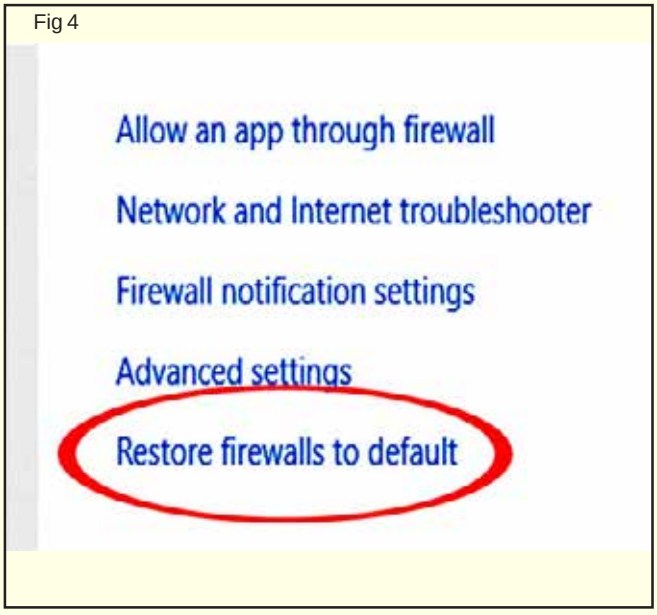


Fig 4



5 Click on any network and in the next window, set Windows Defender firewall status to OFF to disable firewall.

Note : Don't disable firewall unless it is specifically required.

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TASK 2 : **Protect system using Windows Defender**

1 Click on the Virus & Threat protection option in the left panel as in Fig 5.

Fig 5

2 Click “Scan Now” on the Threat History to scan files. Alternatively *Run a new advanced scan* runs for cleaning latest threat types as in Fig 6.

3 Run any action that is pending (or) required by settings or updates, to make the protection system up to date as in Fig 7.

Fig 6

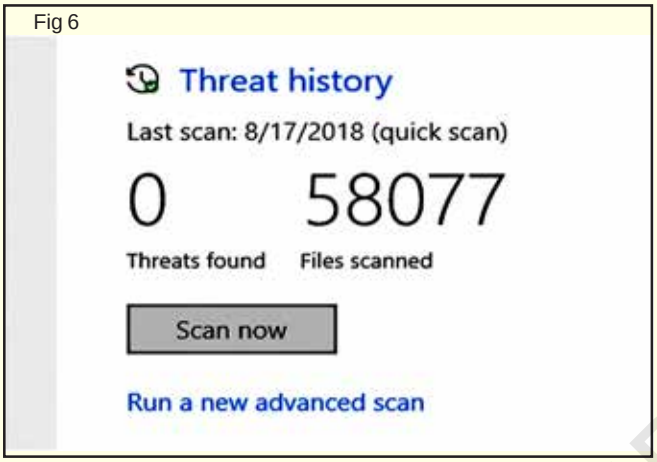

Fig 7

Protect the Computer against various Internet Threats

Objectives : At the end of this lesson you shall be able to
- **identify common internet threats**
- **secure risks protected internet systems.**

TASK 1: I**dentify common internet threats**

Threat Type	Functions
Botnet	Spam mails with virus attachments a robots in net
Hacking	Unauthorized access and steal information from system
Malware	Damage data from system and fake alert of infections
Pharming	Misleading to cloned / illegitimate websites
Phishing	Tricky gather of information from users about Credit Cards
Ransomware	Lock system / drives demand money to remove
Spam	Junk mail to get info directly from users
Spoofing	Sends spam mail and clone a legal site information
Spyware	Steal contact information, username and passwords with Popups
Trojen Horses	Delete files, hack system info and user operations
Worms	Spread unwanted files and dump the memory as well as disk space
Viruses	Delays startup time and make unwanted hidden file execution, hide files /folders

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TASK 2 : **Checklist to safeguard systems from threats**

1 Find the methods to protect systems and safe operations from the following table and choose Yes/ No to determine whether the system is protected.

Methods	Protection System	Status
Passwords	Complicated passwords reduce the method of accessing to user info easily	Created | Not Created
Anti-Virus	Software that protect system from threats	Installed | Not Installed
Firewall	Enabling this protects attacks from third party / external systems	Enabled | Not Enabled
Browser settings	Updated browser with protected plug-ins make safe browsing	Installed | Not Installed
OS Updates	Updating the Operating System makes patches to existing less secured modules to be more safe	Updated | Not updated
WiFi Security	Protect personal WiFi with SSID and passwords and avoid public WiFi for safety based transactions	Done | Not Done
Download security	Avoid unwanted downloads and ensure only the relevant files are downloaded. Allow Anti- virus/ Defender to scan for threats in downloaded files	Enabled | Not Enabled

Note : Make all the above tasks completed to protect the system from any type of threats.

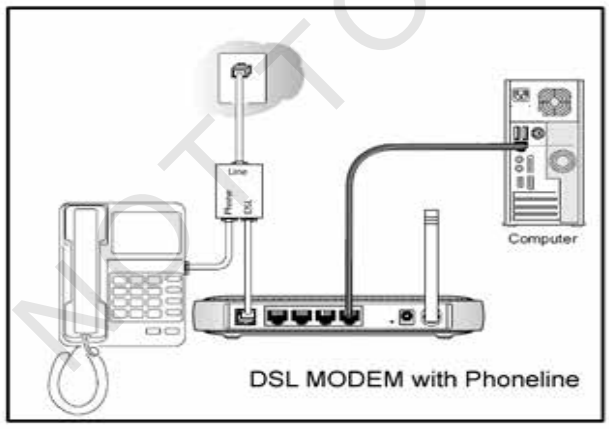
Secure WiFi networks and access controls

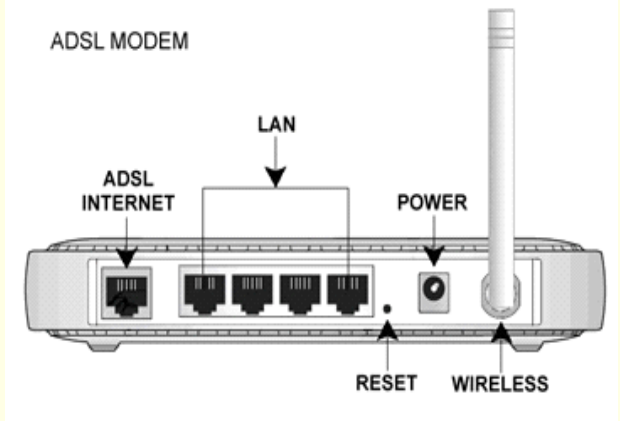
Objectives : At the end of this lesson you shall be able to
- **configure a secure WLAN**
- **filter access using MAC Address**
- **create user accounts with limited rights.**

TASK 1 : **Configure a secure WLAN**

1 Connect the internet port of the router with the incoming internet connector as in Figures 1.

Fig 1





Note : In case of leased line, it will be a RJ45 connector and in case of Broadband / DSL it will be a phoneline.

2 Connect LAN cable with port 1 of the modem and the other end to the LAN connection of the system.

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3 Run command prompt and type 'ipconfig' and press Enter, which will bring a list of available options as in Fig 2.

Fig 2

```
Wireless LAN adapter Local Area Connection* 2:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 3:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 13:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Wireless Network Connection:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::f46c:e1f2:fb9:f530%22
   IPv4 Address. . . . . . . . . . . : 10.255.0.16
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 10.255.0.1
```

4 Find the default gateway (say eg. 192.168.0.1) and access it using internet browser as in Fig 3.

Fig 3

5 Type the username and password provided with modem to login to access the configuration settings of the modem and enter into configuration settings.

6 Click Network tab and in WAN settings, select the IP mode or PPPoE mode suitable to access network and provide the given username and password for accessing (internet) as in Fig 4.

7 Select the list of Bound Ports including wireless ports and Apply.

8 Select WLAN / Wireless tab, set the following items as in Fig 5.

Fig 4

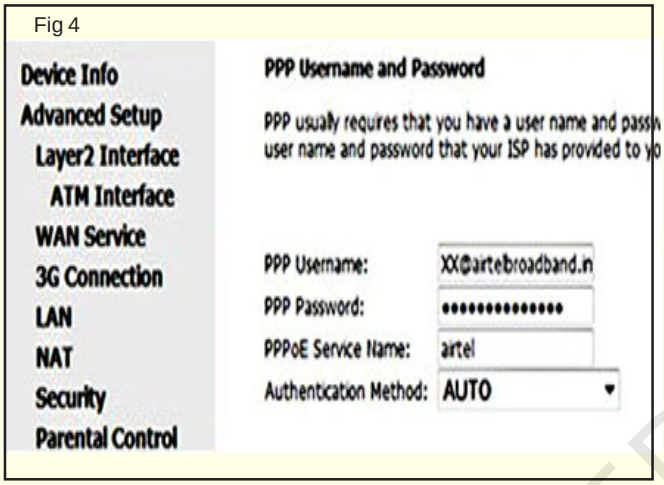
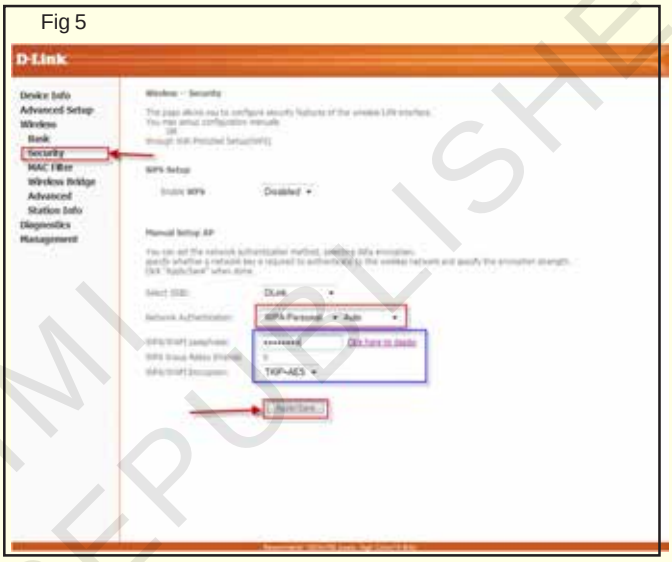


Fig 5



a SSID : <Name of the WiFi network>

Enable it for others to access.

Broadcast is enabled as it should be detected by other devices.

b In WLAN security option select the following :

Encryption Mode	: WPA-PSK; WPA2-PSK
Encryption Mode2	: TKIP-AES
WPA Preferred Key Format	: Password
WPA Pre-shared key	: <set here a password to access WiFi>

Note : The above settings make the WLAN to be accessed using the SSID and upon accessing, password to be provided to connect. Screenshots may vary according to the modem / router using for connecting but settings will be there.

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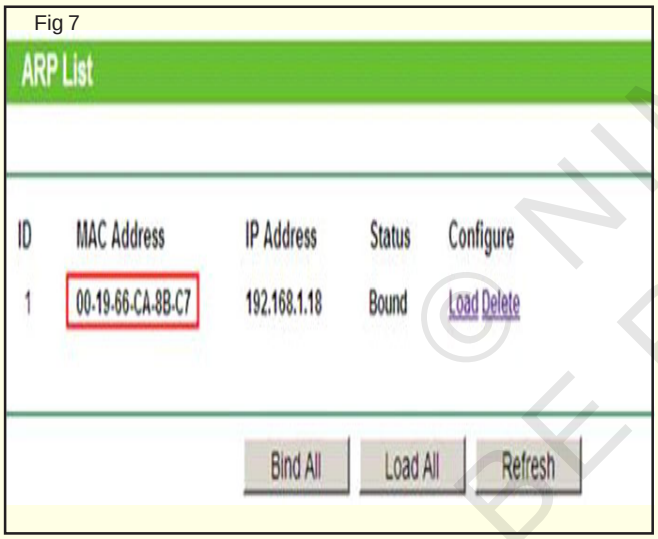
TASK 2 : **Filter access using Mac address**

1 Open the web browser and address in the address bar (default is http://192.168.0.1 or http://192.168.1.1). Press Enter as in Fig 6.

Fig 6

2 Go to IP & MAC Binding->ARP List page, find the MAC address of the all the devices which are connected to the router as in Fig 7.

Fig 7



3 Go to Wireless->Wireless MAC Filtering page, click the Add New button as in Fig 8.

4 Type in the MAC address you want to allow or deny to access the router, and give a description for this item as in Fig 9.

5 Choose Enable and Allow/Deny the Wireless MAC Filtering function about the Filtering Rules as in Fig 10.

Note : Allow enables the accessing of Mac address into this connection and Deny disallows to connect into.

Fig 8

Fig 9

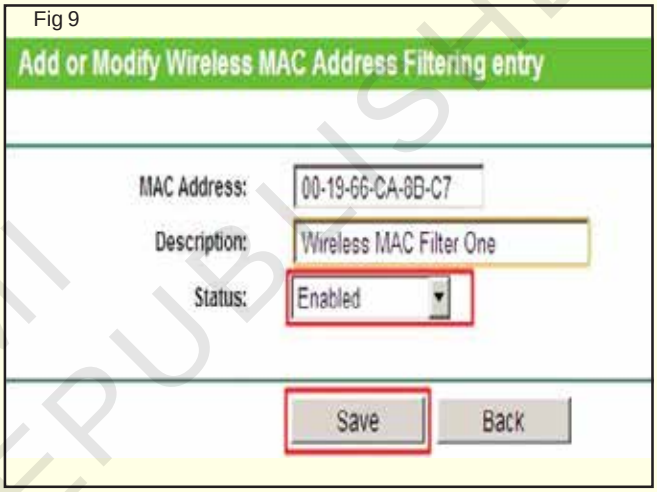
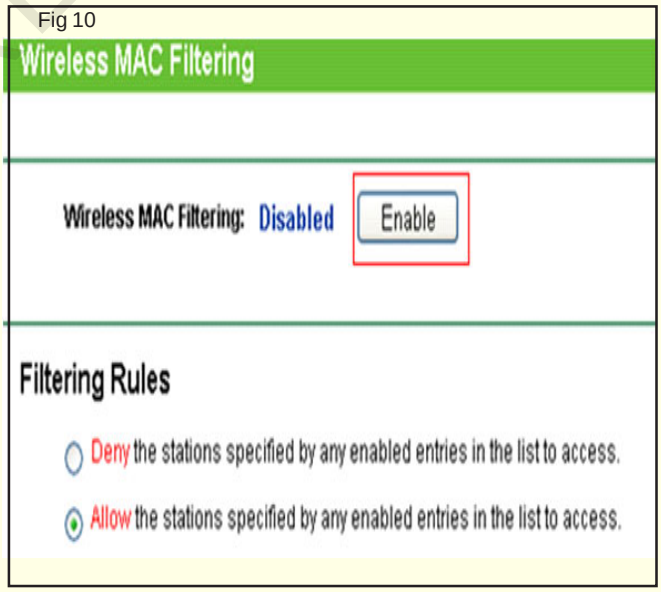


Fig 10



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TASK 3 : **Create individual user accounts**

1 Goto Control Panel and select User Accounts as in Fig 11.

Fig 11

2 Click Manage another account option to enter into Users list option as in Fig 12.

Fig 12

3 Click on Add a new user to create a new windows user as in Fig 13.

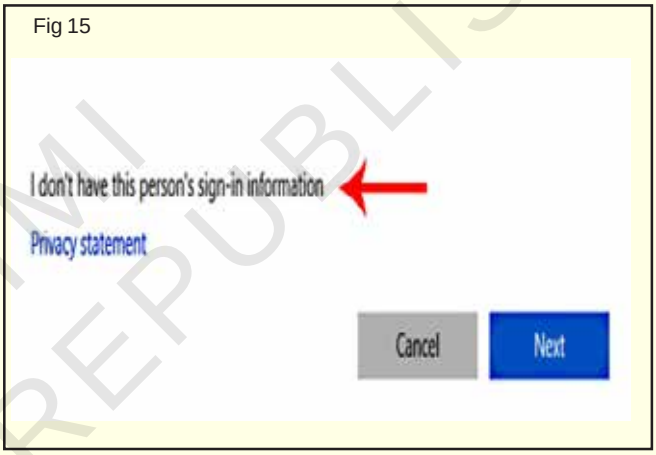
Fig 13

4 Click on Add someone else to the PC to add a new user as in Fig 14.

Fig 14

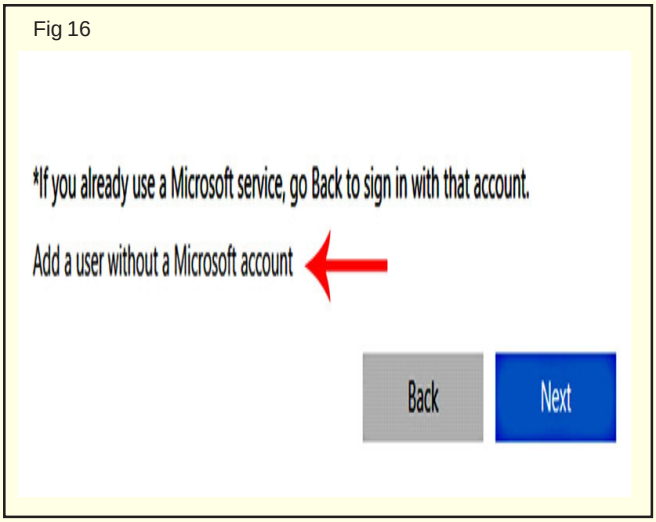
5 Skip the email option in the next window by click as in Fig 15 and click NEXT.

Fig 15



6 Click Add user without Microsoft Account to proceed a custom named user as in Fig 16.

Fig 16



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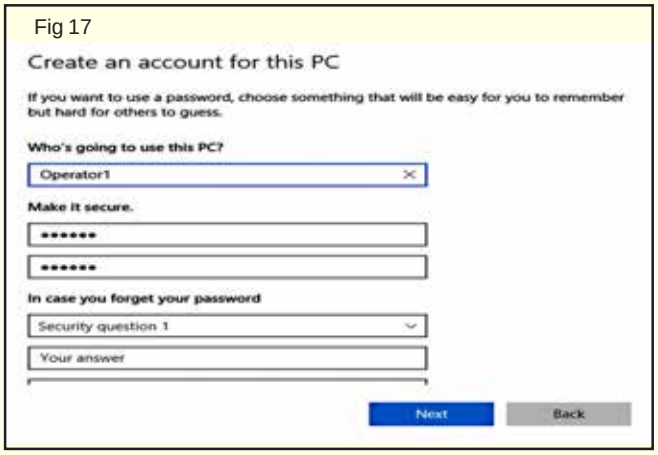
7 Type the username and password with three security questions with answer for creating a new account as in Fig 17.

Fig 17



8 Complete the user creation and the user will be available for login as in Fig 18.

Fig 18

9 Click on the user name to change user type as Local user / Administrator and for adding new users, repeat same steps and get cleared with instructor.

— — — — — — — —

Make backup copies of important file, data and information

Objectives : At the end of this lesson you shall be able to

- **take backup of files using External hard drive**
- **backup files using Google Drive**
- **make a local restoration point and restore on failure / malfunction.**

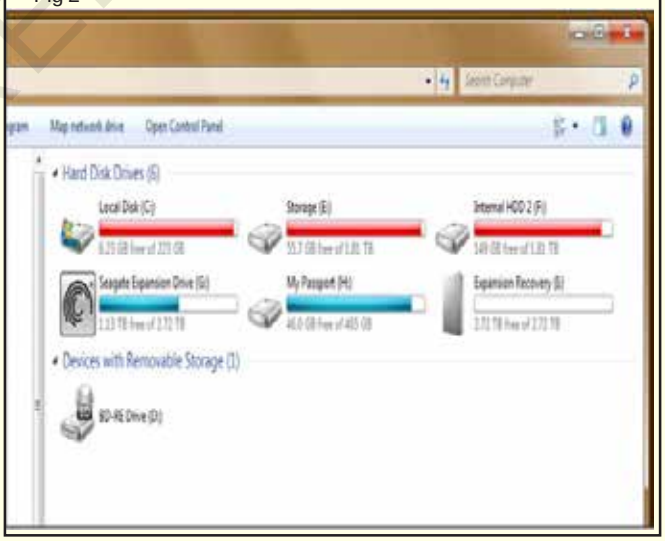
TASK 1 : **Backup of files using external hard drive**

1 Insert USB connector to access the external hard drive as in Fig.1

Fig 1

Note : Usually the plugged hard drive is shown using a new drive letter, auto assigned. Change the name of the drive to 'Backup' so as the it can be easily identified as in Fig 2.

Fig 2



2 Select the files required to be back up, copy them all and paste into the external hard drive as in Fig 3.

Note : In case, the file size is too large, it may take a long time to get pasted (Fig 4). Its better to use USB 3.0 to copy quickly. Also take the backup updated in regular intervals for safety precautions.

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Fig 3

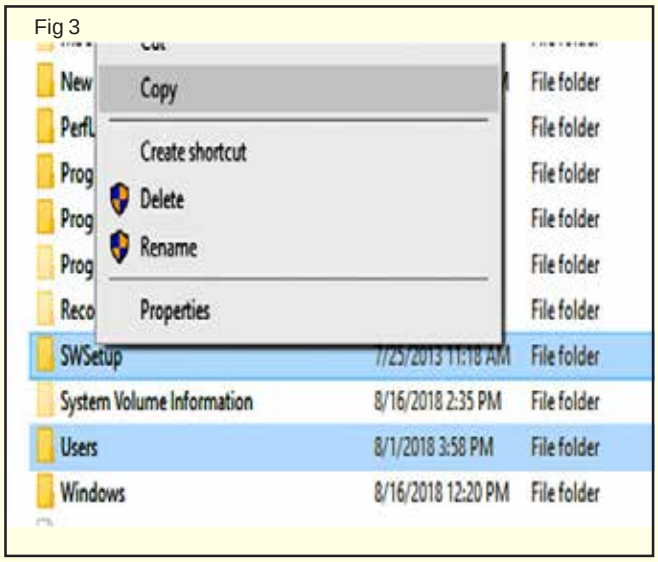
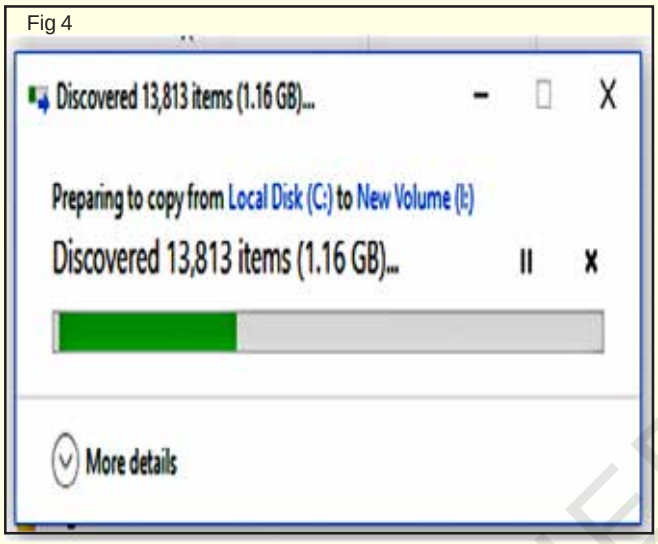


Fig 4



TASK 2 : **Backup files using Google Drive**

1 Download and install Google Drive application from "http://www.google.com/drive/download" as in Fig1.

Fig 1

2 Open the exe file downloaded to install the Google Drive into the system (will take 5 minutes and needs internet to download features) as in Fig 2.

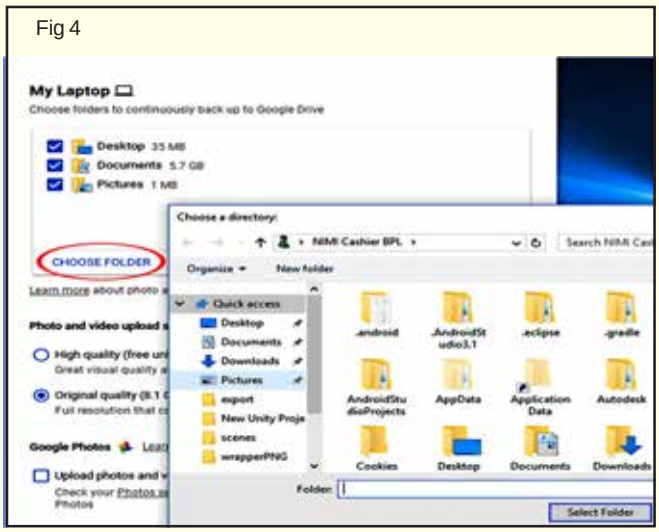
Fig 2

3 Login into Google account which is associated with backup as in Fig 3.

Fig 3

4 Fix the folders to be back up to the system before entering into backup as in Fig 4.

Fig 4



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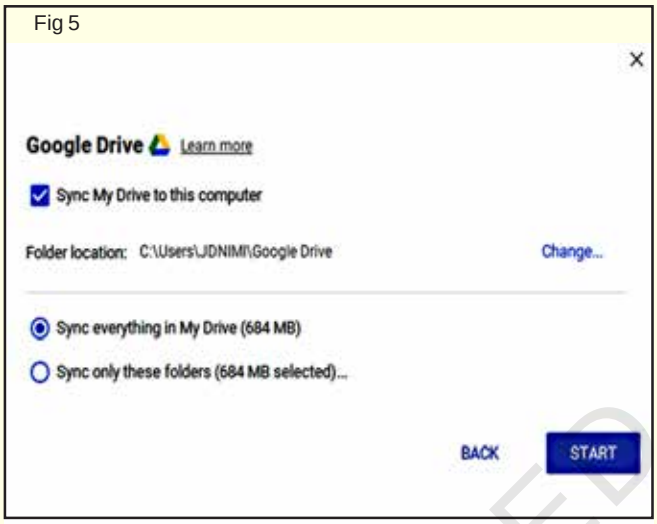
5 Add folders to drive from 'My System/Laptop' and press NEXT to proceed.

6 Press START to start back up into Drive as in Fig 5.

7 Schedule timings like daily, weekly, etc. to set periodical backup.

Fig 5

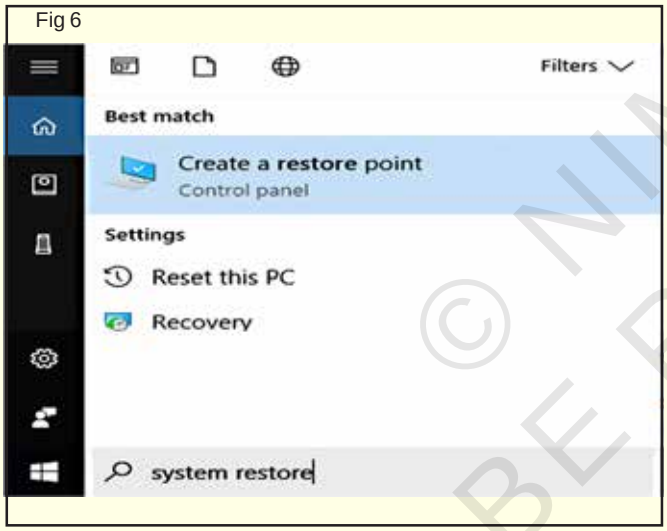


TASK 3 : **Local restoration point for failure recovery**

1 Type 'Restore Point' in Cortana to search for 'Create Restore Point'

2 Select the option to get 'Create a restore point' as in Fig 6.

Fig 6



3 Choose 'Create' option to create a Restore Point manually as in Fig 7.

4 Add description to the points identification, say 'Before Installing Wordpress'

Note : The created restore point makes a backup of applications as it is working and related files ensuring the proper working.

5 Use system restore to restore the system to working of files on the time of backup as in Fig.8

Fig 7

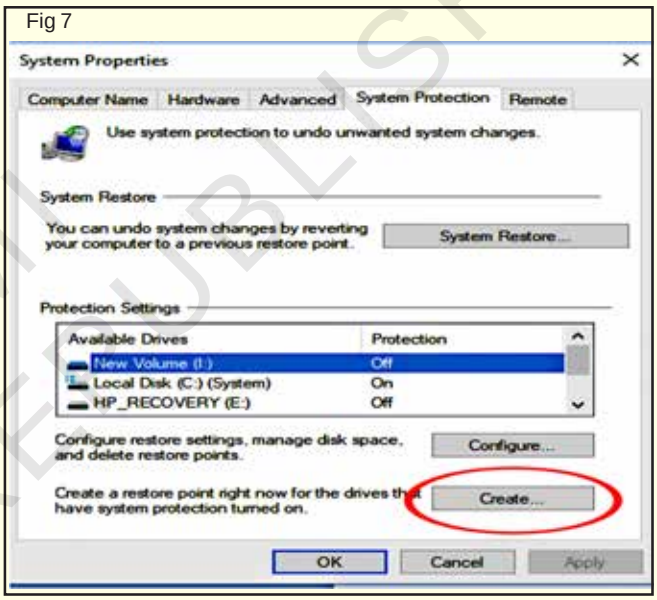
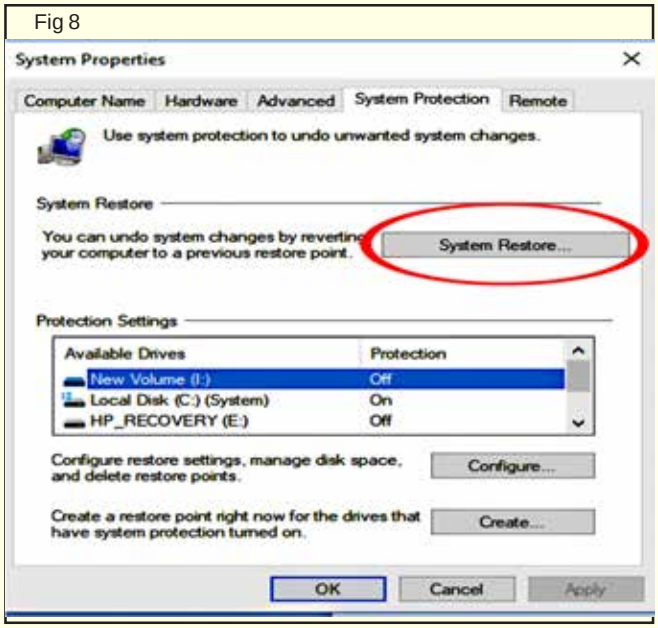


Fig 8



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Explain compliance with IT Act

Objectives : At the end of this lesson you shall be able to
- **identify steps for information privacy**
- **identify common cybercrimes and penalties applicable.**

PROCEDURE

TASK 1 : **Identify steps for information privacy**

Sensitive personal data or information (SPDI) processing. The Privacy Rules define SPDI to mean personal information relating to a person's:

- Passwords.
- Financial information, including information relating to bank accounts, credit cards, debit cards, and other payment card information.
- Physical, physiological, or mental health.
- Sexual orientation.
- Medical records and history.
- Biometric information.

List and identifying which of the information is "Sensitive Personal Information" or not.

Note: Discuss with Instructor and get the list of Sensitive Personal information as per IT Act.

S.No	Name of the Information	Type of the Information	Sensitive Status (Yes / No)

TASK 2: **Identify common cybercrimes and penalties applicable**

List of offences and the corresponding penalties as per Information Technology Act, 2000

Section	Offence	Penalty
65	Tampering with computer source documents	Imprisonment up to three years, or/and with fine up to Rs. 200,000
66	Hacking with computer system	Imprisonment up to three years, or/and with fine up to Rs. 500,000
66B	Receiving stolen computer or communication device	Imprisonment up to three years, or/and with fine up to Rs. 100,000
66C	Using password of another person	Imprisonment up to three years, or/and with fine up to Rs. 100,000
66D	Cheating using computer resource	Imprisonment up to three years, or/and with fine up to Rs. 100,000
66E	Publishing private images of others	Imprisonment up to three years, or/and with fine up to Rs. 200,000

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66F	Acts of cyberterrorism	Imprisonment up to life.
67	Publishing information which is obscene i n electronic form.	Imprisonment up to five years, or/and with fine up to Rs. 1,000,000
67A	Publishing images containing sexual acts	Imprisonment up to seven years, or/and with fine up to Rs. 1,000,000
67C	Failure to maintain records	Imprisonment up to three years, or/and with fine.
68	Failure/refusal to comply with orders	Imprisonment up to 2 years, or/and with fine up to Rs. 100,000
69	Failure/refusal to decrypt data	Imprisonment up to seven years and possible fine.
70	Securing access or attempting to secure access to a protected system	Imprisonment up to ten years, or/and with fine.
71	Misrepresentation	Imprisonment up to 2 years, or/and with fine up to Rs. 100,000
72	Breach of confidentiality and privacy	Imprisonment up to 2 years, or/and with fine up to Rs. 100,000
72A	Disclosure of information in breach of lawful contract	Imprisonment up to 3 years, or/and with fine up to Rs. 500,000
73	Publishing electronic signature certificate false in certain particulars	Imprisonment up to 2 years, or/and with fine up to Rs. 100,000
74	Publication for fraudulent purpose	Imprisonment up to 2 years, or/and with fine up to Rs. 100,000

Note: Discuss with Instructor and get the list of offences and the corresponding penalties as per Information Technology Act, 2000.

Sl.No	Section	Offence	Penalty

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Practice with IaaS using free cloud services

Objectives: At the end of this exercise you shall be able to
- **create Free cloud service account on microsoft azure**
- **state cancel your subscription**
- **creating azure virtual machines.**

Requirements

Tools/Equipment/Machines

- Desktop / Laptop PC
- OS (Windows / Linux)
- High Speed Internet (Broadband / FTTH).

PROCEDURE

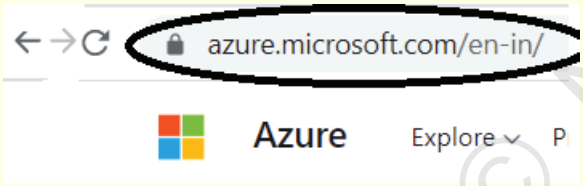
TASK 1: **How to create Free cloud service account on Microsoft Azure**

1 Go to the Azure Home Page. Use the below link on any latest browser.

https://azure.microsoft.com/en-in/

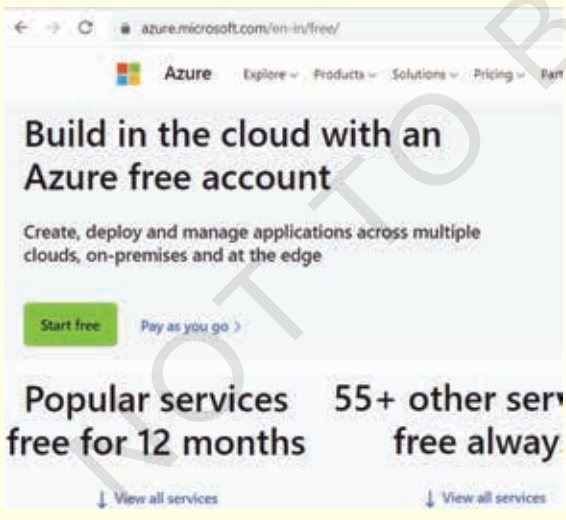
2 Click on Free Azure Account on the top right corner. (Fig 1)

Fig 1



3 Click on **Start Free (Fig 2)**

Fig 2



- Sign-in/Sign-up for a Microsoft account using an email address and password (Fig 3)

4 Choose Create OneNew Microsoft Account if you don't have already

5 Choose Create Account (Fig 4)

Fig 3

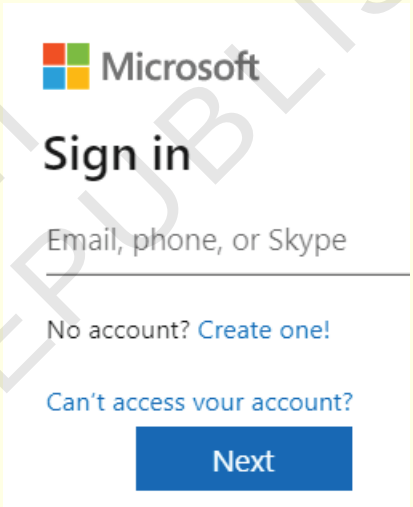
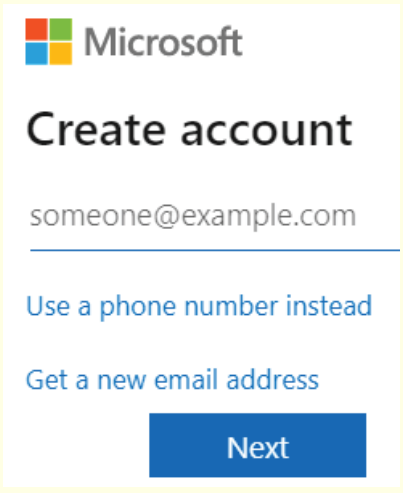


Fig 4



6 We have 3 options to create the Microsoft Account

a Use Existing Email ID like Gmail or any other Mail ID.

b Use Phone Number

c Create New Microsoft (Outlook / Hotmail) Email Address.

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7 Here we are creating Microsoft Account using Existing Gmail ID, give your Gmail ID and select Next

8 Create New Password for the account.

9 Enter the verification code received on the email address and click next.

10 Confirm that you are not Robot and Type the captcha you see on your screen and click on next.

Choose appropriate choice proposed.

11 You'll be redirected to the Azure Sign-up page. Enter your Region, Name, Phone number, Email address.

Note: You should use the same email address for Azure sign-up and for the Microsoft account

12 Verify your phone number by clicking Text Me or Call Me and enter the verification code received.

13 Enter the payment details. Make sure you have a Master Card/American Express/ Visa Credit card and international payments should be enabled.

14 Check the Terms and Conditions and click Sign-up.

15 You have successfully created a Microsoft Azure free account now have a lumpsum balance of $200 is equal to Indian Rs.14500.

16 Click on Portal on the top right corner of the screen You'll be redirected to the Azure portal.

17 If you have exhausted your free credit then you have to move to the Pay as you go subscription policy.

18 If you have crossed the limit or time limit then you will get "your subscription is disabled and cannot perform operations until its re-enabled"

19 You can not create multiple Microsoft azure free accounts or after one account expires to another account for free credit using a single Credit card.

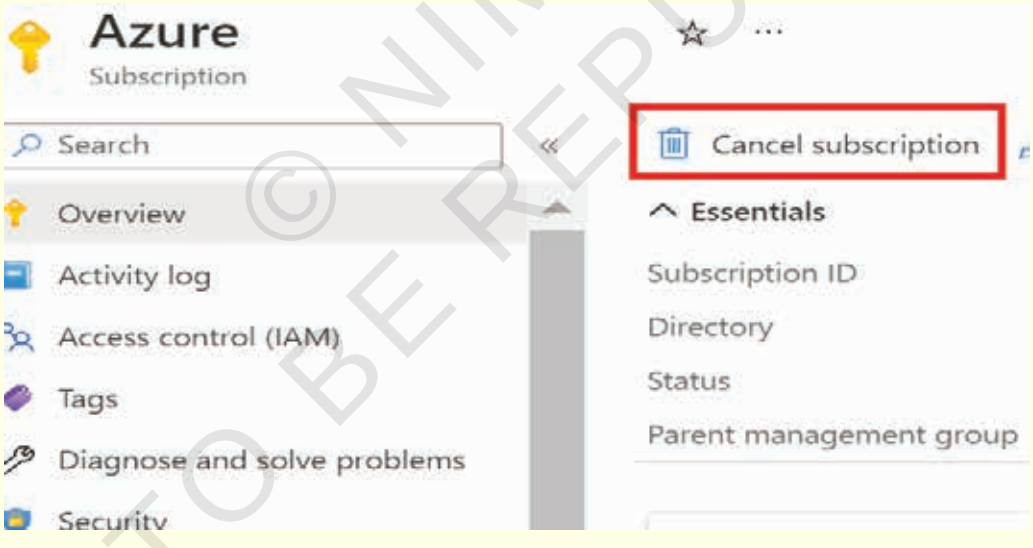
— — — — — —

TASK 2 : **Cancel your Subscription**

You will learn how to cancel your subscription if you run out of credit.

1 To View your subscription from the azure portal accountChoose View remaining credit to try any service, or browse free services included with your account. (Fig 5)

Fig 5



2 Go to Cancel subscription and click on cancel your subscriptions any time. (Fig 6)

3 Now, just confirm the subscription and click for cancellation. (Fig 7)

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Fig 6

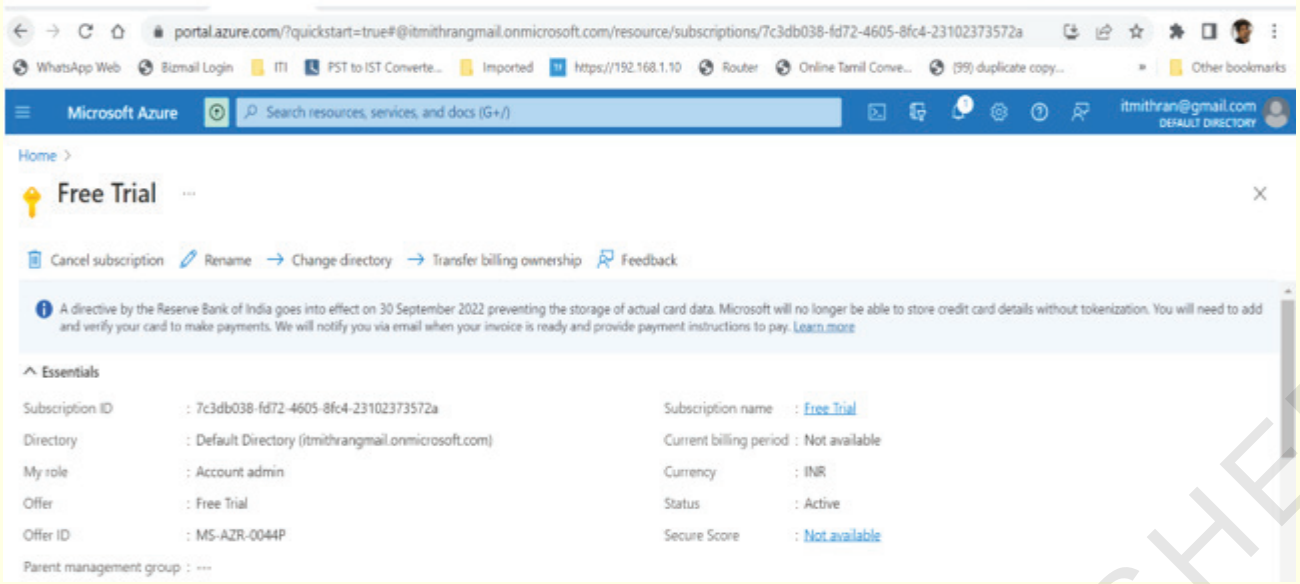
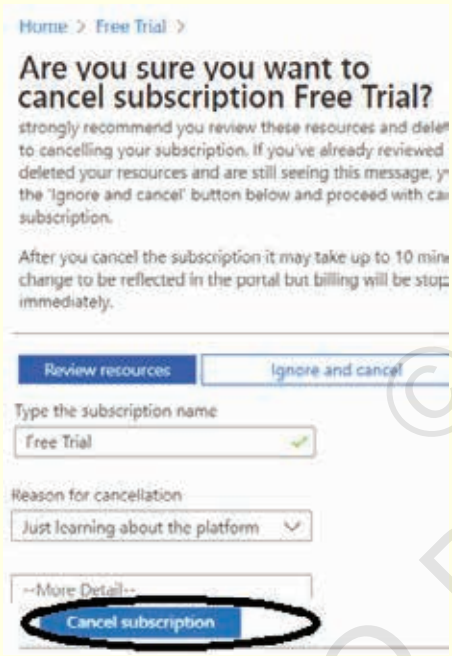


Fig 7



TASK 3 : **Creating Azure Virtual Machines**

1 Login to https://portal.azure.com/#home with free Account.

2 Click The Browse free Service on your free Azure Portal (Fig 8)

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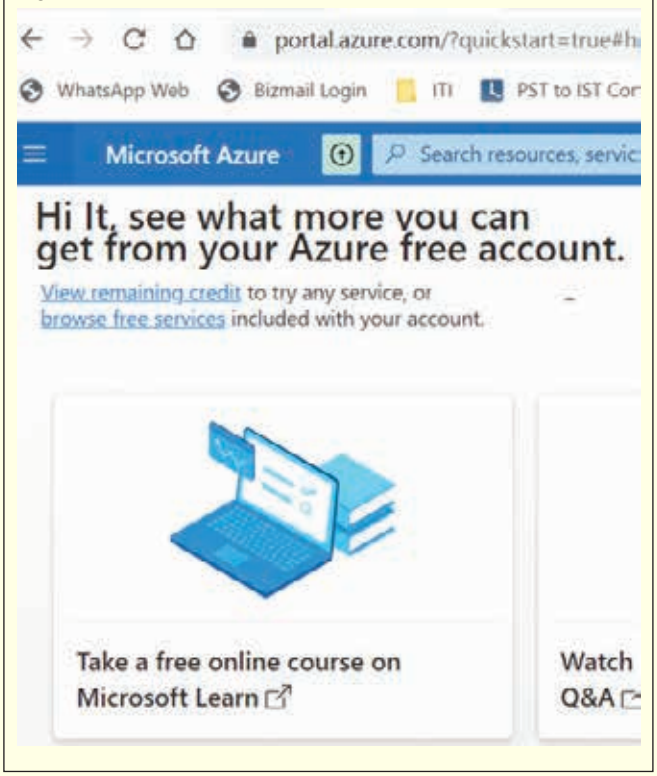
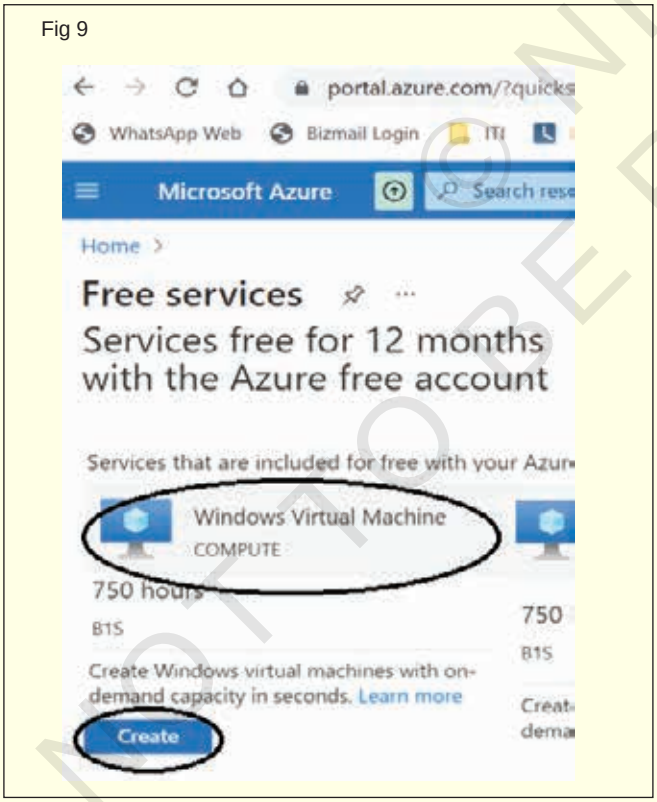
Fig 8



3 Select the Create option under the Windows Virtual Machine section in order to create a Windows VM. (Fig 9)

Fig 9



4 Next add the following details as per your requirement: (Figs 10 & 11)

- Enter the name of the virtual machine in the Virtual Machine name text box: VMWindows10
- Select the region: Asia Pacific Central India

Fig 10

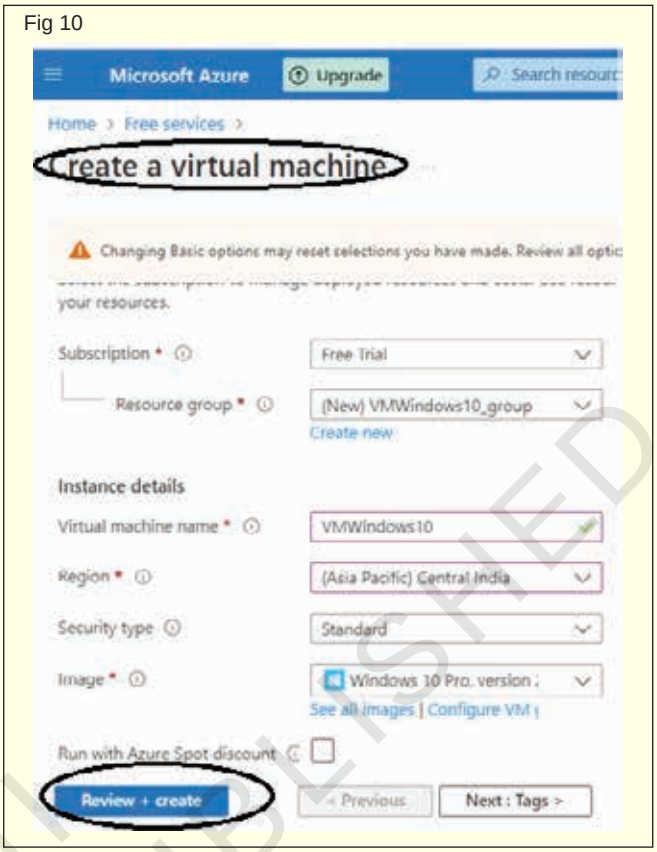


Fig 11

- Security Type: Standard
- Select the image of the Windows Machine you wish to use: Windows10 Pro, Version 21H2 – Gen 1 (Free Service Eligible)
- Select the available size: Standard_B1s-1vcpu, 1GiB Memory (Rs.589/Month) (Free Service Eligible)
- Select the authentication type as per your convenience.
- Administrator Account:

  Username: copaadmin

  Password: Welcome@1234

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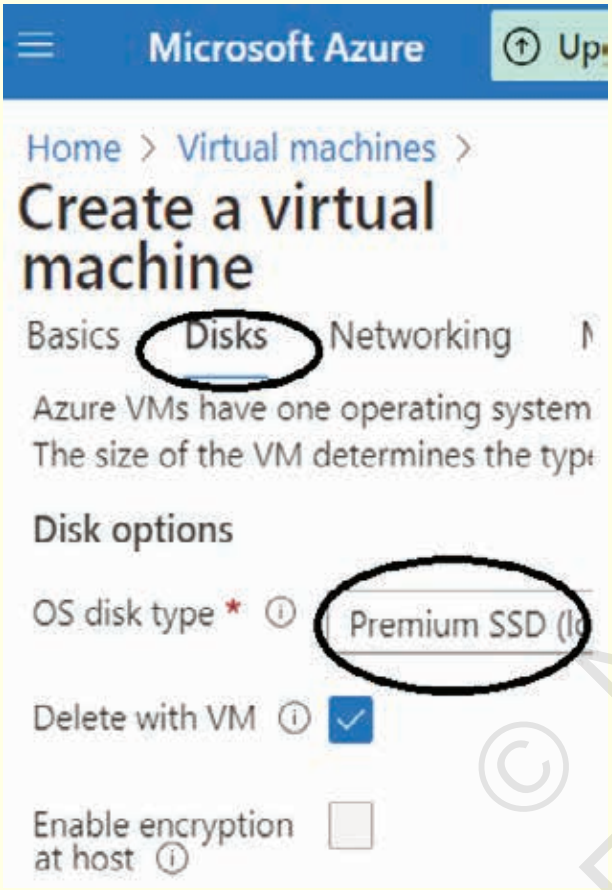
- Select the allowed ports (SSH {22}, HTTP {80}, HTTPS {443} , RDP {3389})
- Add tags as per your requirement
- Licensing: Select Check Box to agree [I confirm I have an eligible Windows 10/11 license with multi-tenant hosting rights.]

5 Add Disk as required size of creating VM (Fig 12)

Fig 12



6 Select Default setting for Networking (Fig 13)

7 Management, Advanced and Tag are with default settings. (Fig 14)

8 Click on the Review + create button, then click on create to start the deployment. (Fig 15)

9 Deployment InProgress (Fig 16)

10 Deployment Completed (Fig 17)

11 After the deployment is complete, go to the virtual machine section in the newly created virtual machine in order to connect the virtual machine to your local machine. (Fig 18)

12 Note the Public IP Address: 20.207.200.239 (Public IP will be unique for each Virtual Machine) (Fig 19)

13 Next, open the start menu and search “Remote Desktop Connection”, launch the “Remote Desktop Connection” application.

14 Enter the public IP address and username of your Windows Virtual Machine, and click connect.

Fig 13

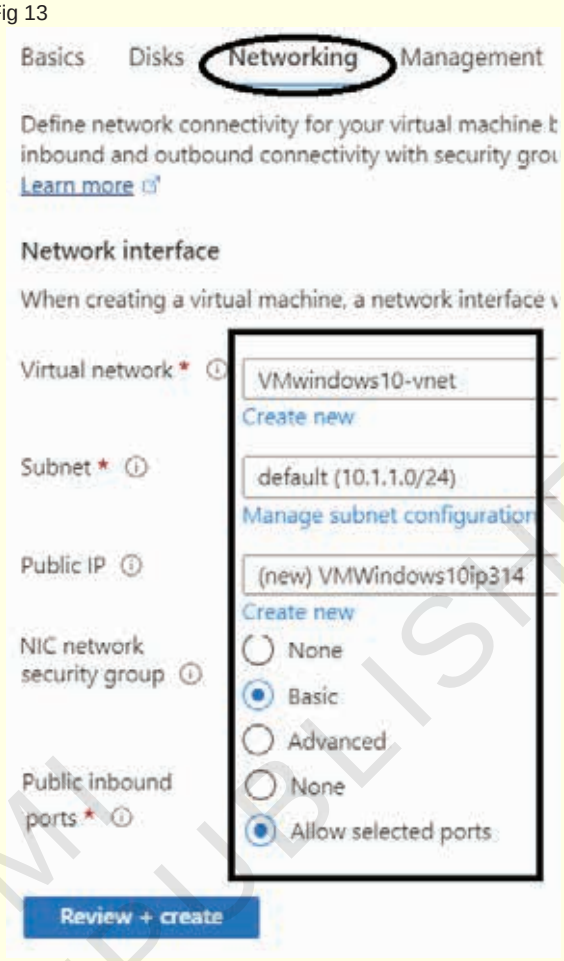


Fig 14

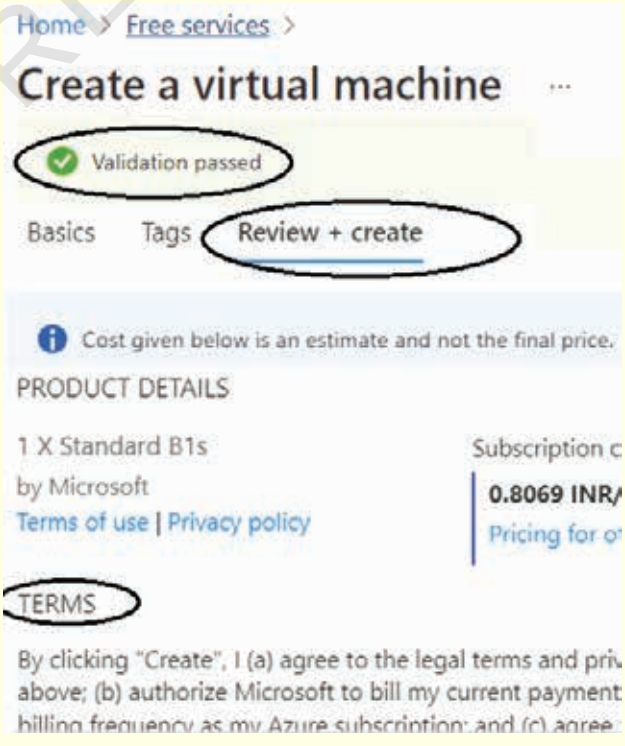


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Fig 15

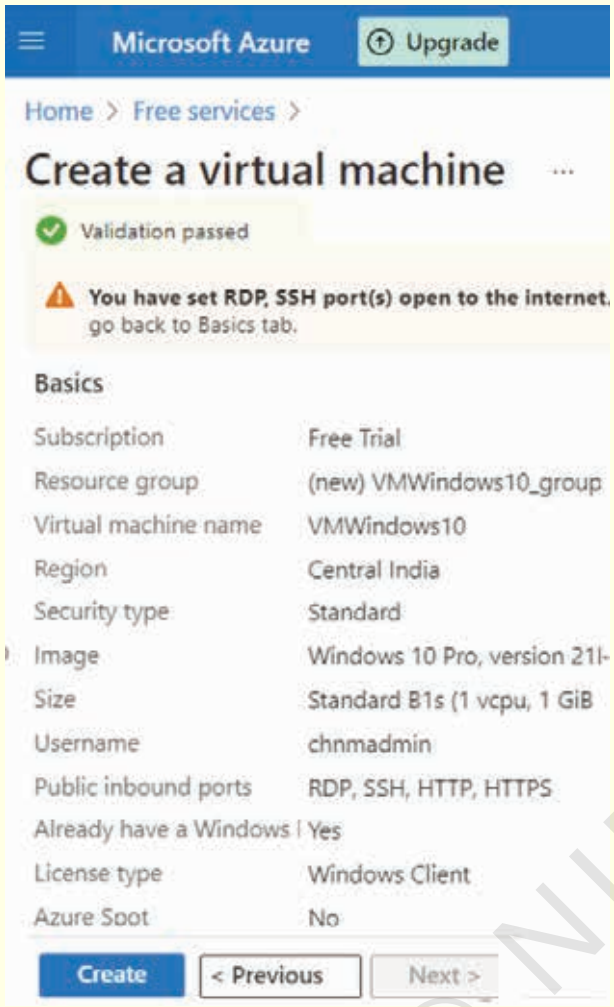


Fig 16

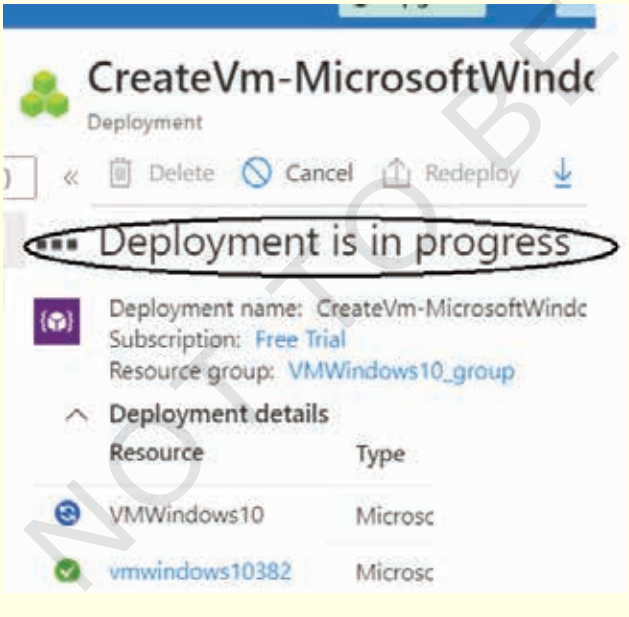


Fig 17

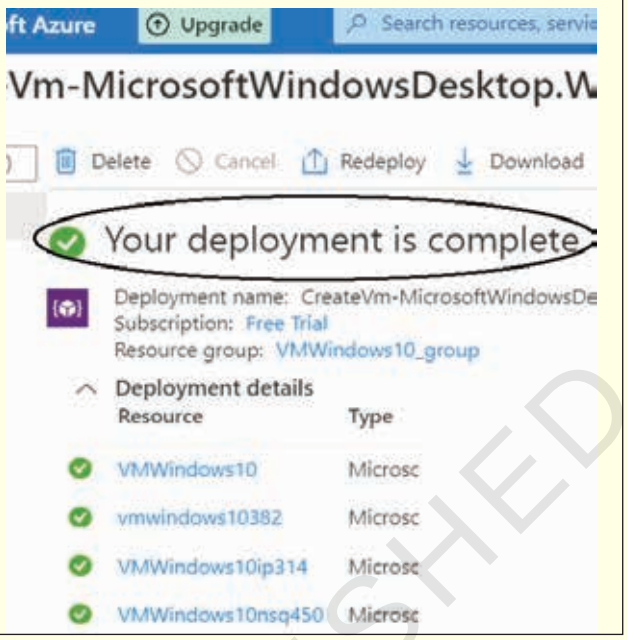


Fig 18

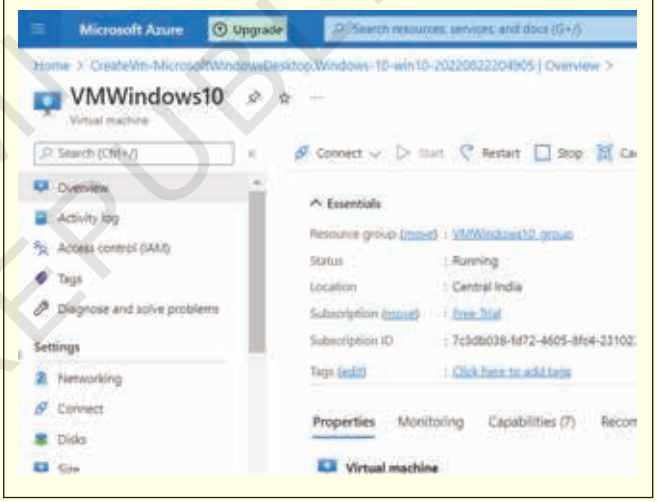
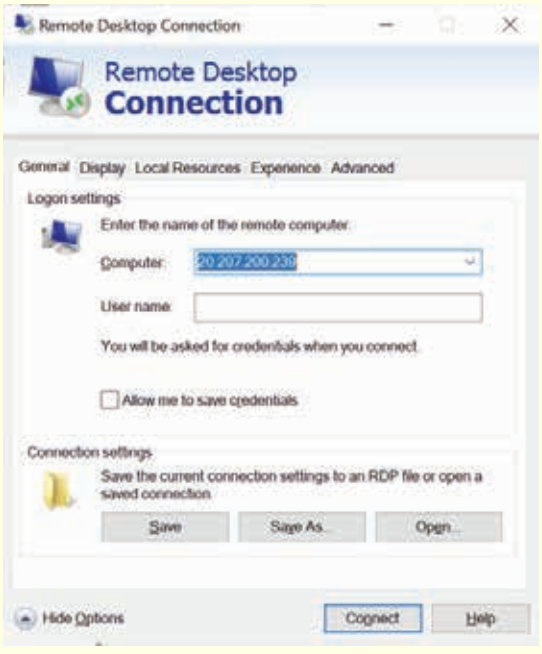


Fig 19



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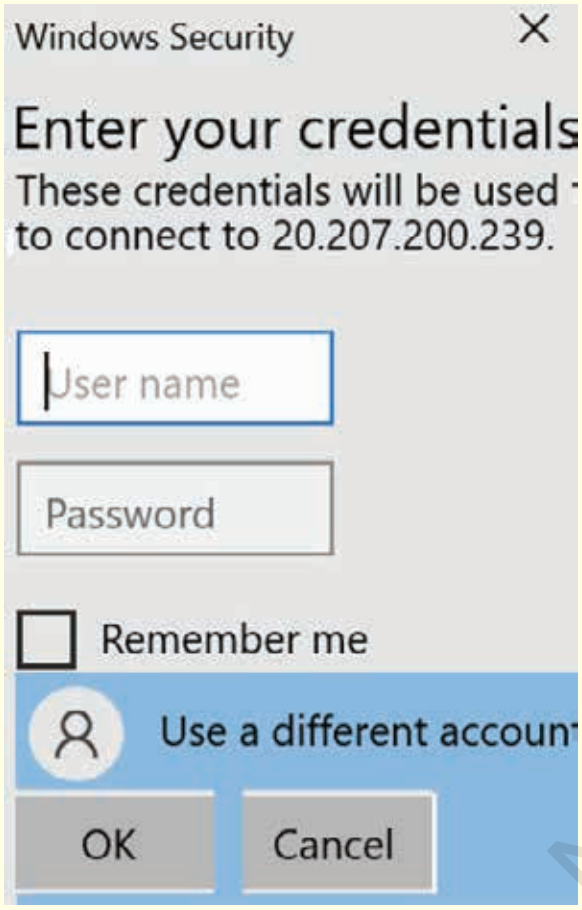
15 Enter the password to access your Windows Virtual Machine (Fig 20)

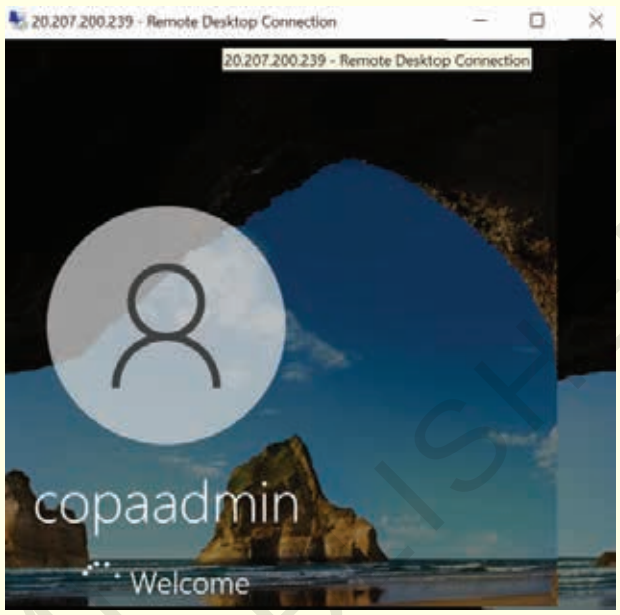
Fig 20



16 Proceed to connect and use your Windows Free Virtual Machine.

17 Booting Virtual Machine (Fig 21)

Fig 21



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Practice with PaaS using free cloud services

Objectives: At the end of this exercise you shall be able to
- **practicing with PaaS using free cloud services.**

Requirements

Tools/Equipment/Machines

- Desktop / Laptop PC
- OS (Windows / Linux)
- High Speed Internet (Broadband / FTTH).

PROCEDURE

TASK 1: **Create and configure an Azure Active Directory Domain Services managed domain**

Sign in to the Azure portal

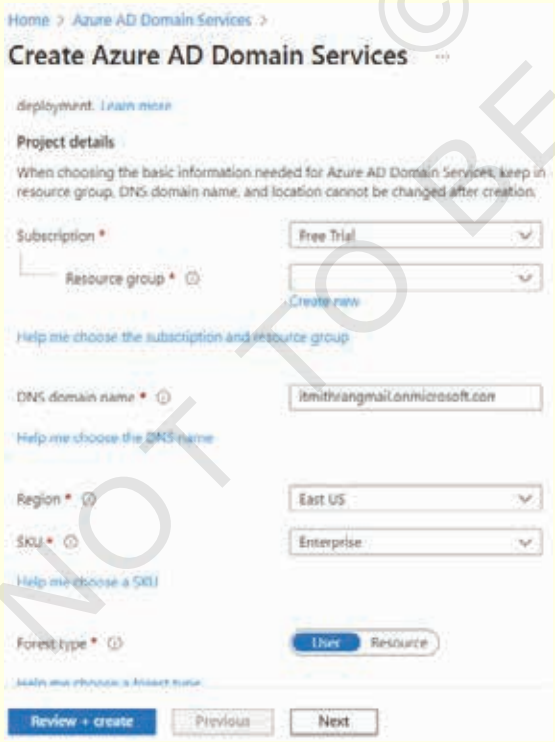
1 Sign in to the Azure portal - create and configure the managed domain using the Azure portal.

2 To get started, first sign in to the Azure portal and Login to https://portal.azure.com/#home with free Account.

Create a managed domain

3 Create a managed domain To launch the **Enable Azure AD Domain Services** wizard, complete the following steps: (Fig 1)

Fig 1



a On the Azure portal menu or from the **Home** page, select **Create a resource.**

b Enter Domain Services into the search bar, then choose Azure AD Domain Services from the search suggestions.

c. On the Azure AD Domain Services page, select **Create.** The **Enable Azure AD Domain Services** wizard is launched.

d Select the Azure **Subscription** in which you would like to create the managed domain.

e Select the **Resource group** to which the managed domain should belong. Choose to **Create new** or select an existing resource group.

4 Complete the fields in the Basics window of the Azure portal to create a managed domain:

5 Enter a DNS domain name for your managed domain, taking into consideration the previous points.

6 Choose the Azure Location in which the managed domain should be created. If you choose a region that supports Azure Availability Zones, the Azure AD DS resources are distributed across zones for additional redundancy.

7 The SKU determines the performance and backup frequency. You can change the SKU after the managed domain has been created if your business demands or requirements change. For more information, see Azure AD DS SKU concepts.

8 A forest is a logical construct used by Active Directory Domain Services to group one or more domains. By default, a managed domain is created as a User forest. This type of forest synchronizes all objects from Azure AD, including any user accounts created in an on-premises AD DS environment.

A Resource forest only synchronizes users and groups created directly in Azure AD. For more information on Resource forests, including why you may use one and how to create forest trusts with on-premises AD DS domains, see Azure AD DS resource forests overview.

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9 To quickly create a managed domain, you can select Review + create to accept additional default configuration options. The following defaults are configured when you choose this create option:

- Creates a virtual network named aadds-vnet that uses the IP address range of 10.0.2.0/24.
- Creates a subnet named aadds-subnet using the IP address range of 10.0.2.0/24.
- Synchronizes All users from Azure AD into the managed domain.

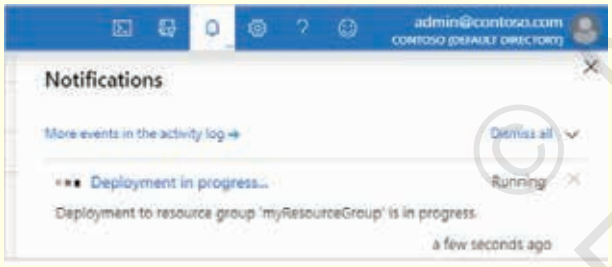
10 Select Review + create to accept these default configuration options.

Deploy the managed domain

11 To create the managed domain, select Create. A note is displayed that certain configuration options such as DNS name or virtual network can't be changed once the Azure AD DS managed has been created. To continue, select OK.

12 The process of provisioning your managed domain can take up to an hour. A notification is displayed in the portal that shows the progress of your Azure AD DS deployment. Select the notification to see detailed progress for the deployment. (Fig 2)

Fig 2



13 The page will load with updates on the deployment process, including the creation of new resources in your directory.

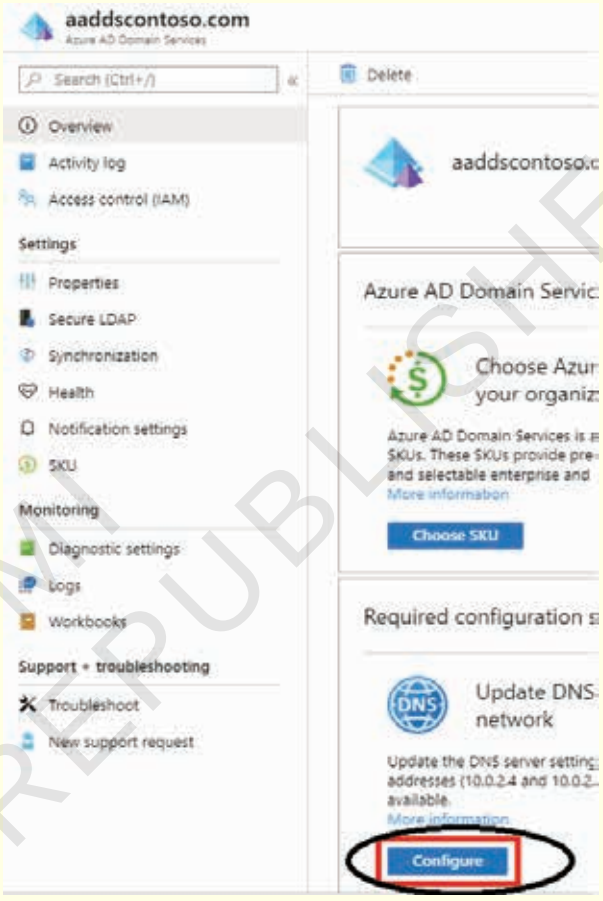
14 Select your resource group, such as myResource-Group, then choose your managed domain from the list of Azure resources, such as aaddscontoso.com. The Overview tab shows that the managed domain is currently Deploying. You can't configure the managed domain until it's fully provisioned.

15 When the managed domain is fully provisioned, the Overview tab shows the domain status as Running.

Update DNS settings for the Azure virtual network

16 The **Overview** tab for your managed domain shows some **Required configuration steps.** The first configuration step is to update DNS server settings for your virtual network. Once the DNS settings are correctly configured, this step is no longer shown. (Fig 3)

Fig 3



17 The addresses listed are the domain controllers for use in the virtual network. In this example, those addresses are 10.0.2.4 and 10.0.2.5. You can later find these IP addresses on the **Properties** tab.

18 To update the DNS server settings for the virtual network, select the Configure button. The DNS settings are automatically configured for your virtual network.

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Practice with SaaS using free cloud services

Objectives: At the end of this exercise you shall be able to
- **create a free office 365 account & switch users (sign out).**

Requirements

Tools/Equipment/Machines

- Desktop / Laptop PC
- OS (Windows / Linux)
- High Speed Internet (Broadband / FTTH).

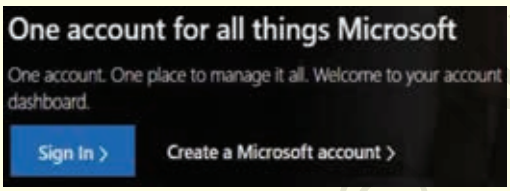
PROCEDURE

TASK 1: **Create a Free Office 365 Account & Switch Users (Sign Out)**

Step 1:

- Go to account.microsoft.com, select Sign in, and then choose Create one!
- If you'd rather create a new email address, choose Create a Microsoft account, choose Next, and then follow the instructions. (Fig 1)

Fig 1



Create a microsoft account:

Step 2: Click **Create one**

Step 3: Enter an email address you want to create and click **Next**

Step 4: Enter a password of your choosing and click **Next.**

step:1-4

Refer Ex-No:01.44.140

This will create your Office365 account. Save the user name and password to sign into Office 365.

To Switch to Another User Account:

Step 1: Click on the user icon in the top right corne.

Step 2: Click on Sign in with a different account (Fig 2).

Step 3: Enter the email address and click Next. (Fig 3)

Step 4: Enter the password and click Sign in. (Fig 4)

Support and Accessing Office 365

Once you've created your account you can access Office 365 by going to https://support.office.com/ and entering your email and password.

Fig 2

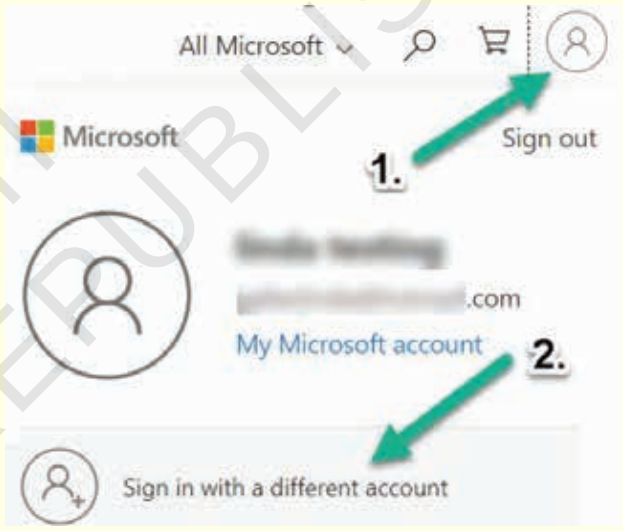


Fig 3

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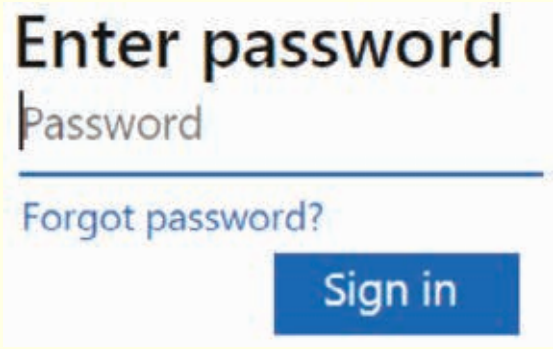
Fig 4



There are various links on the website for support in using Office 365.

1 Click on the Training link for training on the applications. (Fig 5)

2 Click on one of the Office apps links to open that program.

Fig 5

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Host a website in a free cloud

Objectives: At the end of this exercise you shall be able to
- **details the host a static website in google cloud with cloud storage.**

Requirements

Tools/Equipment/Machines

- Desktop / Laptop PC
- OS (Windows / Linux)
- High Speed Internet (Broadband / FTTH).

PROCEDURE

TASK 1: **Host a Static Website in Google Cloud with Cloud Storage**

1 **Introduction :** Every small-business owner should have a domain name and website—they are the foundation of your brand and your method to communicate with potential customers.

2 Your domain name and website are one of the primary ways that people find your business, discover what products and services you offer, find your contact details, and even transact business with you (e-commerce transactions).

3 If you're only starting your business now, then you're not expecting very much traffic, so you want to host a simple website. You can do that in Google Cloud, which makes the process very quick, easy, and inexpensive.

What you'll learn

- How to Create a CNAME record
- How to point that CNAME record to Cloud Storage
- How to create a Cloud Storage bucket named like your domain
- How to upload and set permissions on the static files for your website
- How to test your website

Prerequisites

- You need to be the owner/administrator of your domain.
- You need a Google Account.

Complete following steps one by one:

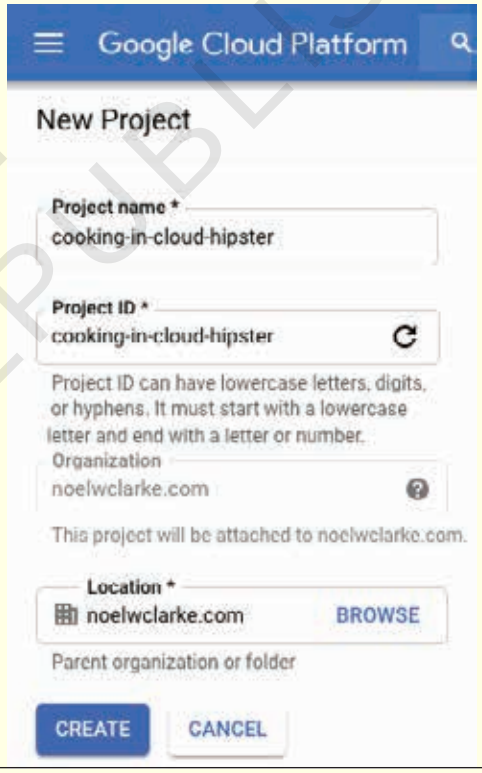
2 Setup

Google Account and new project

1 If you don't already have a Google Account, then you must create one. Sign into Cloud Console and create a new project. (Fig 1)

You can also edit the **Project ID.**

Fig 1



Domain ownership or admin rights

As mentioned in the prerequisites, you'll need a domain that you own or manage.

If you don't have an existing domain, then there are many services through which you can register a new domain, such as Google Domains.

The following tutorial uses the domain www.cookingincloudhipster.com, which is managed through Google Domains and admin.google.com

1 Verify that you own or manage the domain that you will use. Make sure that you are verifying the top-level domain, such as cookingincloudhipster.com, and not a subdomain, such as www.cookingincloudhipster.com.

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Note: If you own the domain that you are associating to a bucket, then you might have already performed this step in the past. If you purchased your domain through Google Domains, verification is automatic.

2 Go to Google Search Console. Enter your domain name and press continue. (Fig 2)

3 If you used Google Domains to purchase your domain name, then it will allow for automatic ownership verification. However, if you're using another registrar, then you could have a few more steps. (Fig 3)

Fig 2

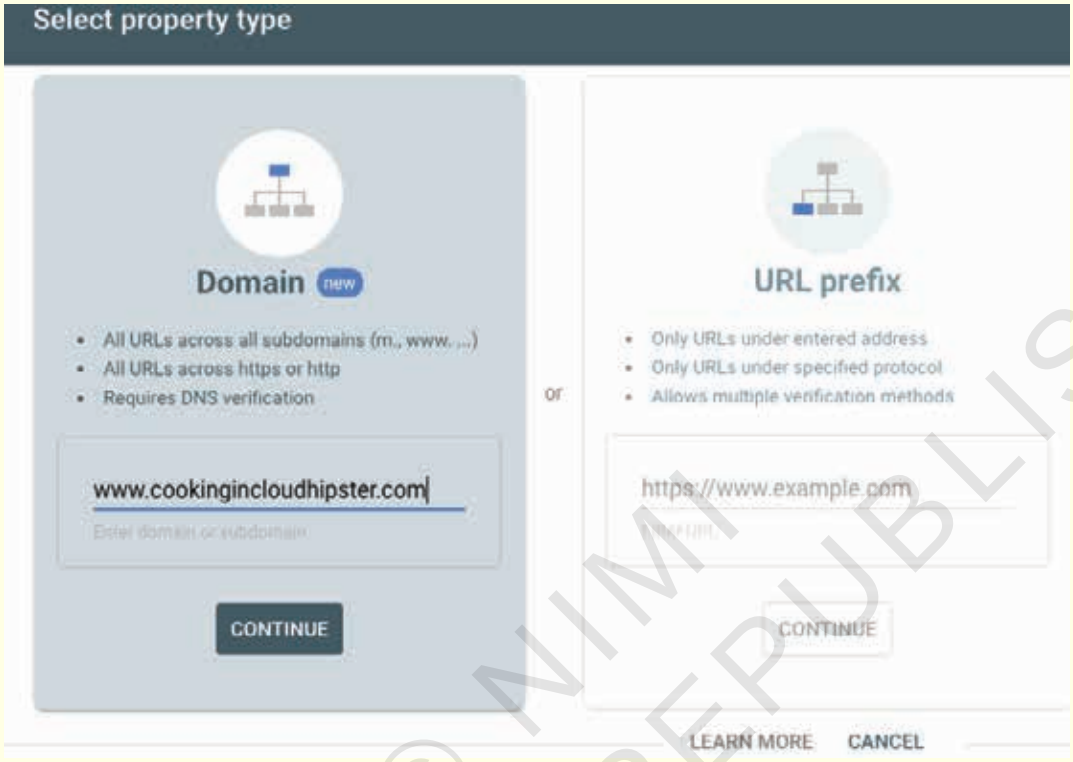
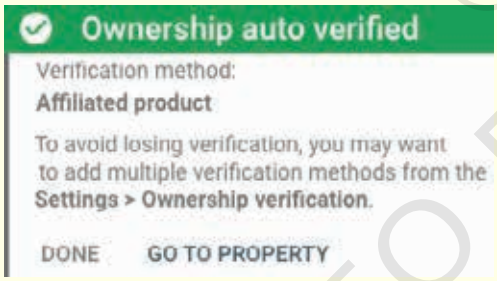


Fig 3



3 Create a CNAME record : On the web, there are numerous systems that are used to make sure that you can get where you need to go. One of those critical systems is Domain Name Services (DNS), which helps with translating human-readable names like www.cookingincloudhipster.com into the numeric IP Address number of the server that is hosting that website.

Within DNS, there is the ability to add RECORDs to the DNS entry to help other services with being correctly configured. Some of the the common ones are MX or Mail eXhange RECORDs, which help email systems work.

In this section, you'll create a CNAME, which is a Canonical Name Record or Alias Record record, so that when someone only enters cookingincloudhipster.com—without the "www"—it will still lead to the right server.

Follow these steps:

1 Go to Google Domains. Click on the "My domains" task. If you need to Sign-in or if you are a first-time user, then use your email address to log in. Find your domain— www.cookingincloudhipster.com. (Fig 4)

2 Click on "Manage," then click "DNS."

3 DNS Settings screen.

Toward the bottom, look for the "Custom resource records" panel.

4 Add a CNAME record. A CNAME record is a type of DNS record. It directs traffic that requests a URL from your domain to the re sources that you want to serve. In this case, those are objects in your Cloud Storage buckets. For more information, see CNAME redirects.

NAME	TYPE	DATA
www.cookingincloudhipster.com	CNAME	c.storage.googleapis.com

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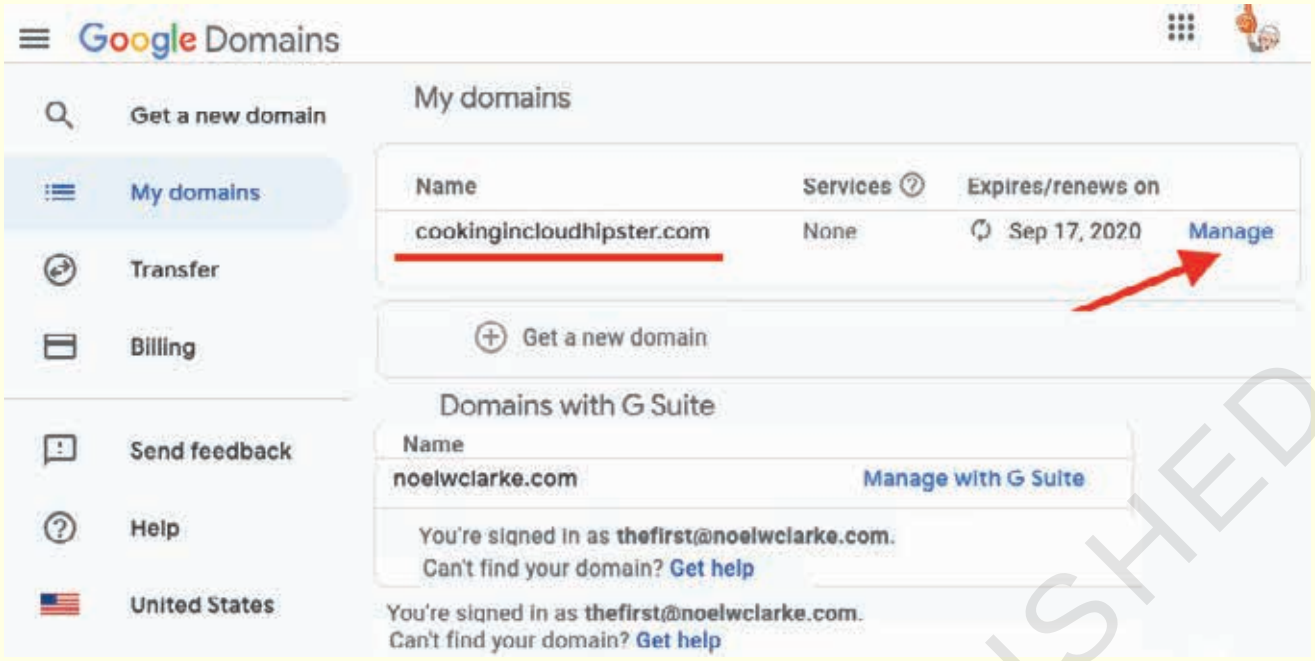
Fig 4



When you're done, it should look like this

4 Create a Cloud Storage Bucket

Next, you'll create a Cloud Storage bucket to hold your static site files.

Follow these steps:

1 Go to the Cloud Console. In the left-hand menu, scroll down to the STORAGE category and click on the Storage task.

2 Click on Create Bucket.

3 With your site name, which is www.cookingincloudhipster.com.

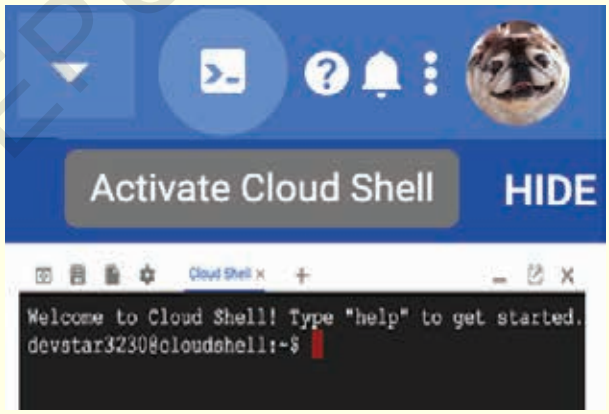
- **Choose where to store your data:** Select Multi-region so that the content is available from more than one cloud region.
- **Choose a default storage class for your data:** Select Standard. For more information, see Storage classes.
- **Choose how to control access to objects:** Set the bucket permissions for the whole bucket and its contents the same. For information, see Access control lists (ACLs).
- Click Create.

So far in this codelab, you have been using the Cloud Console graphical user interface. However, you can also control Google Cloud with Cloud Shell, which provides you with command-line access to your cloud resources directly from your browser.

This Debian-based virtual machine is loaded with all the development tools you'll need. It offers a persistent 5GB home directory and runs in Google Cloud, greatly enhancing network performance and authentication. This means that all you will need for this codelab is a browser (yes, it works on a Chromebook)

1 To activate Cloud Shell from the Cloud Console, simply click Activate Cloud Shell (it should only take a few moments to provision and connect to the environment). (Fig 5)

Fig 5



Once connected to Cloud Shell, you should see that you are already authenticated and that the project is already set to your PROJECT_ID.

gcloud auth list

Command output

Credentialed accounts:

- <myaccount>@<mydomain>.com (active)

Note: The gcloud command-line tool comes preinstalled in Cloud Shell and you'll surely enjoy its support for tab completion. For more information, see gcloud command-line tool overview.

gcloud config list project

Command output

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[core]

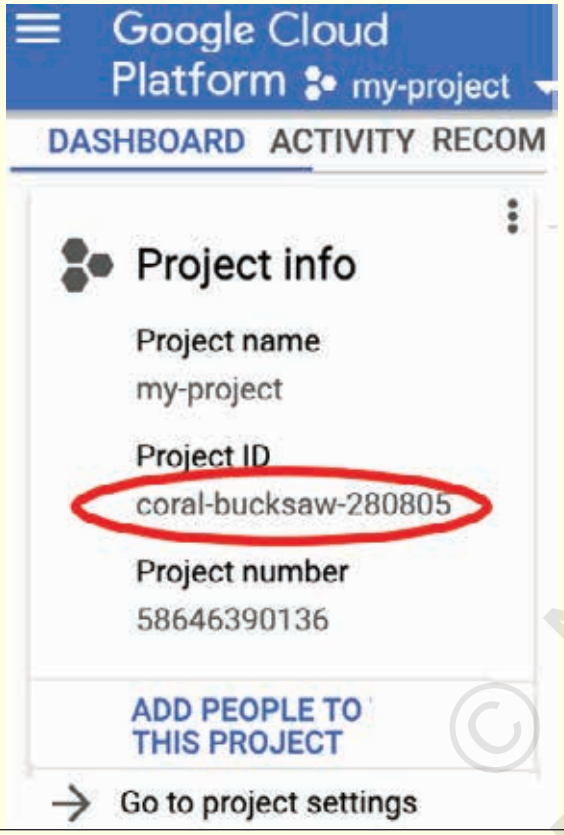
project = <PROJECT_ID>

If, for some reason, the project is not set, simply issue the following command:

gcloud config set project <PROJECT_ID>

Looking for your PROJECT_ID? Check out what ID you used in the setup steps or look it up in the Cloud Console dashboard: (Fig 6)

Fig 6



Cloud Shell also sets some environment variables by default, which may be useful as you run future commands.

echo $GOOGLE_CLOUD_PROJECT

Command output

<PROJECT_ID>

2 Finally, set the default zone and project configuration.

gcloud config set compute/zone us-central1-f

You can choose a variety of different zones. For more information, see Regions & Zones.

Note: When you run gcloud on your own machine, the config settings would've been persisted across sessions. But in Cloud Shell, you will need to set this for every new session or reconnection.

Here's the command-line version of "create bucket."

gsutil mb gs://www.cookingincloudhipster.com

5 Upload your website's files and images

Now, obtain the static files from your website developer or marketing team. If you're doing it yourself, then there are plenty of great tutorials on HTML and CSS. Then, upload the static files into the bucket that you created in one of three ways.

Upload files with the Cloud Console

1 Go to the Cloud Console. In the left-hand menu, click on the STORAGE category, then click Storage.

2 Click on the bucket name, which is www.cookingincloudhipster.com.

3 Under Bucket details, click Upload folder.

4 Upload your website's folders and files.

Upload files by dragging and dropping them

You can also upload files by dragging and dropping them.

Upload files using the gsutil rsync

You can also the gsutil rsync command to copy large numbers of files from your local machine to Cloud Storage. You can use the -R option to recursively copy directory trees. For example, to synchronize a local directory named local-dir with a bucket, use the following:

gsutil rsync -R local-dir gs://www.cookingincloudhipster.com

6 Set access permissions

1 You can either make all files in your bucket publicly accessible or set individual objects to be accessible through your website. Generally, making all files in your bucket accessible is easier and faster.

2 If you choose to control the accessibility of individual files, then you can set the default object ACL for your bucket so that subsequent files uploaded to your bucket are shared by default.

Note: Visitors receive an HTTP 403 response code when requesting the URL for a nonpublic or nonexistent file. See the next section for information about how to add an error page that uses an HTTP 404 response code.

Bucket-level access permissions

1 Apply access permission to the entire bucket as a whole. That is safer and, given that it is a static website, all of the contents likely need to be readable for the site to properly load.

2 If you have some design metadata (or hidden files like .DS_Store, which is used on Macintosh,is a file that stores custom attributes of its containing folder, such as the position of icons or the choice of a background image.) They can be individually hidden or deleted.

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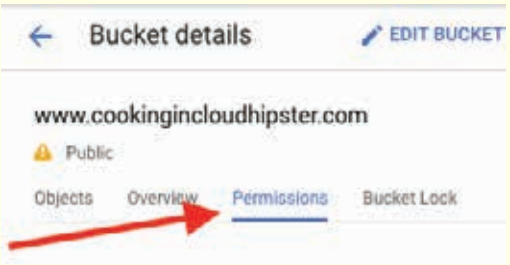
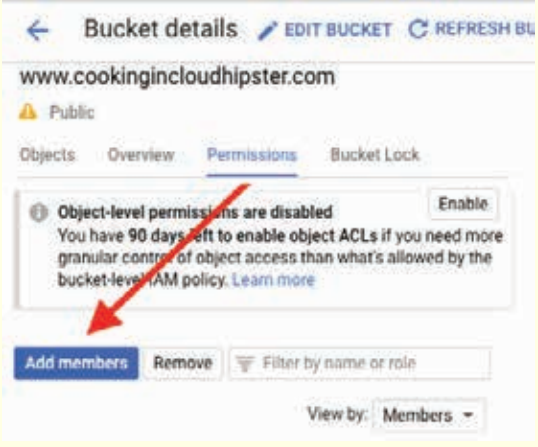
1 Click Bucket details, then click Permissions. (Fig 7)

Fig 7



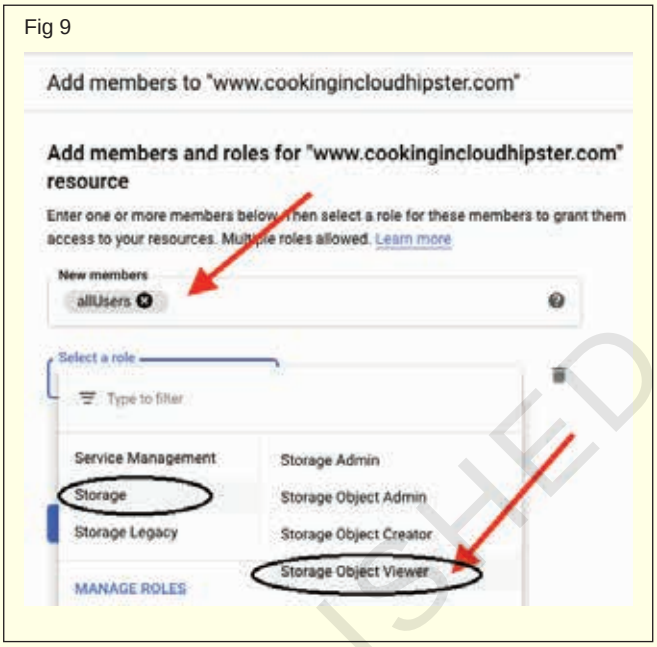
2 Click Add members. (Fig 8)

Fig 8



3 Add allUsers with Storage Object Viewer rights (Fig 9)

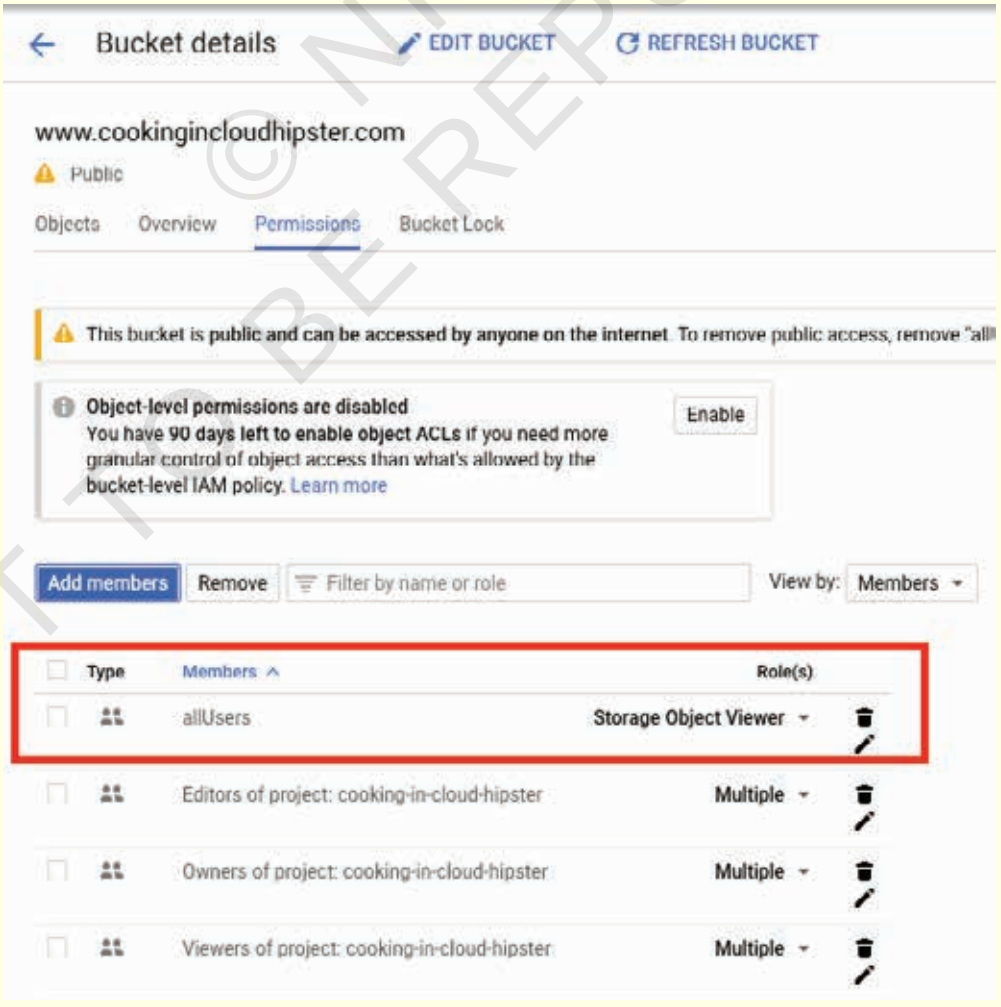
Fig 9



4 Verify that you see the following: (Fig 10)

The files are now visible to the general public. Hooray!

Fig 10



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7 Edit website configuration

1 The last step is to assign an index page suffix, which is controlled by the MainPageSuffix property, and a custom error page, which is controlled by the NotFoundPage property.

2 Assigning either is optional, but without an index page, nothing is served when users access your top-level site, in this case— http://www.cookingincloudhipster.com/.

Index pages

1 An index page (also called a webserver directory index) is a file served to visitors when they request a URL that doesn't have an associated file.

2 When you assign a MainPageSuffix, Cloud Storage looks for a file with that name and a prefix that matches the URL that the visitor requested.

3 For example, say you set the MainPageSuffix of your static website to index.html. Additionally, say you have no file named directory in your bucket www.cookingincloudhipster.com.

4 In this situation, if a user requests the URL http://www.cookingincloudhipster.com/directory, Cloud Storage attempts to serve the file www.cookingincloudhipster.com/directory/index.html.

5 If that file also doesn't exist, Cloud Storage returns an error page.

6 The MainPageSuffix also controls the file served when users request the top-level site.

7 Continuing the above example, if a user requests http://www.cookingincloudhipster.com, Cloud Storage attempts to serve the file www.cookingincloudhipster.com/index.html.

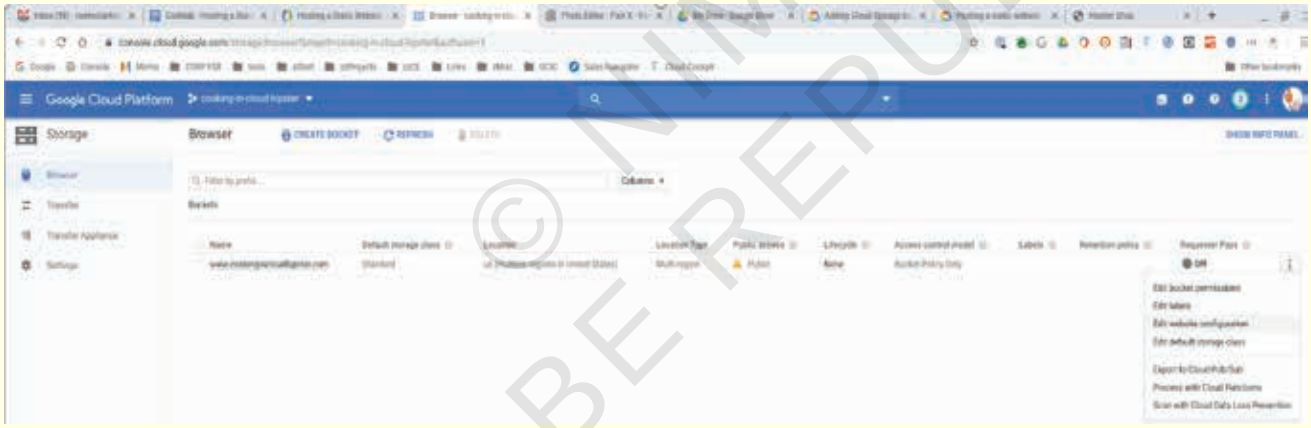
For more information on the cases in which the index page is served, see Website configuration examples.

Error page

1 The error page is the file returned to visitors of your static site who request a URL that does not correspond to an existing file.

2 If you have assigned a MainPageSuffix, then Cloud Storage only returns the error page if there is neither a file with the requested name nor an applicable index page. (Fig 11)

Fig 24



3 When returning an error page, the HTTP response code is 404. The property that controls which file acts as the error page is NotFoundPage. If you don't set NotFoundPage, then users receive a generic error page. (Fig 25)

4 In the following sample, the MainPageSuffix is set to index.html and NotFoundPage is set to 404.html: gsutil web set -m index.html -e 404-Page.html gs://www.example.com

8 Test your website

1 Now, open a browser and go to your website— www.cookingincloudhipster.com. (Fig 26)

2 Confirm that you see the following page and individual product pages:

Fig 25

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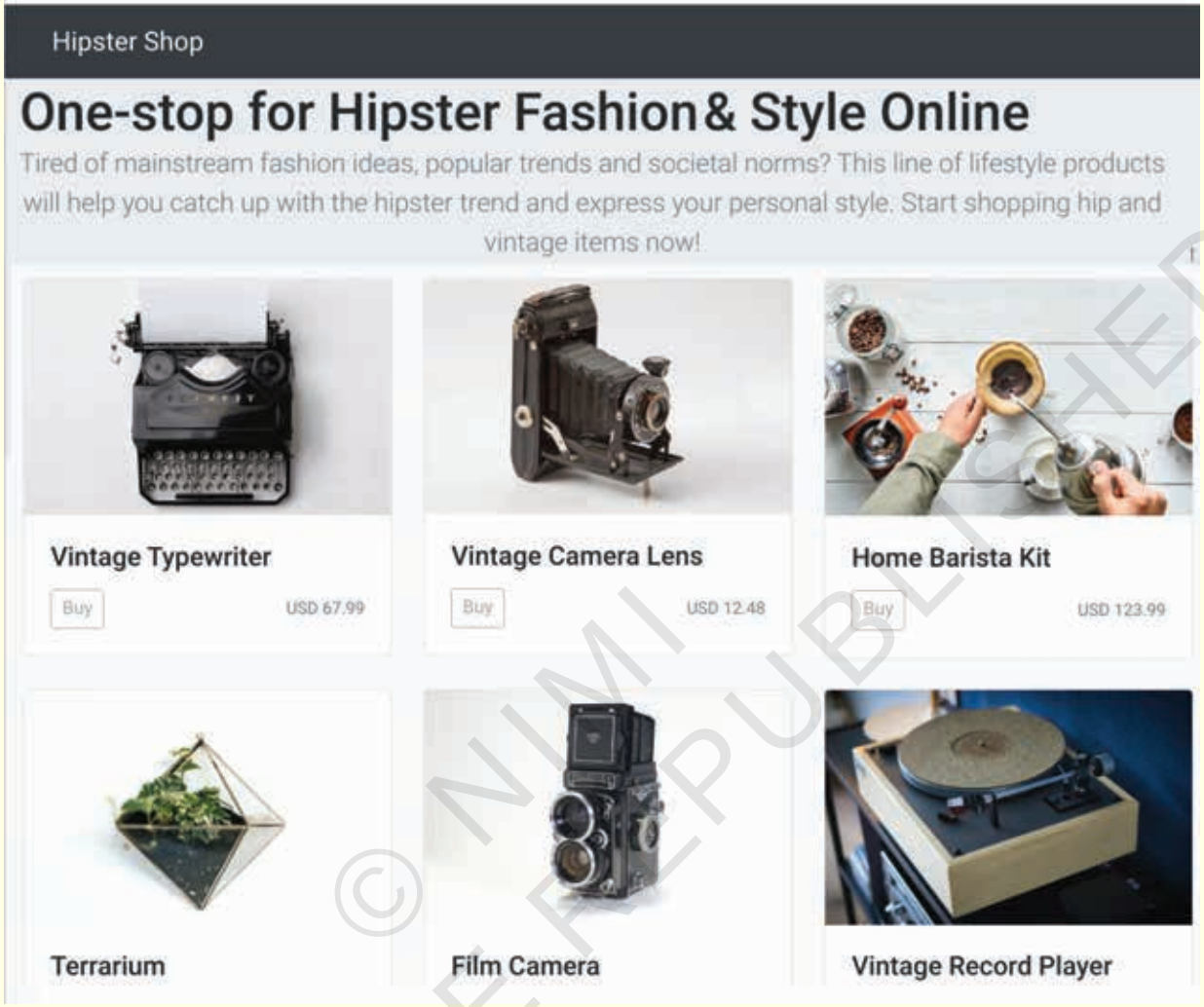
Delete the following Google Cloud resources:

- The Cloud Storage bucket
- The CNAME record

9 Congratulations!

You created a static website and hosted it in Google Cloud!

Fig 26



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Identify Phases of the Application Development life Cycle

Objectives: At the end of this exercise you shall be able to
- **identify phases pf the application development life cycle.**

Requirements			
Tools/Equipment/Machines			
• Desktop / Laptop PC	- 1 No.	• OS (Windows / Linux)	- 1 No.

PROCEDURE

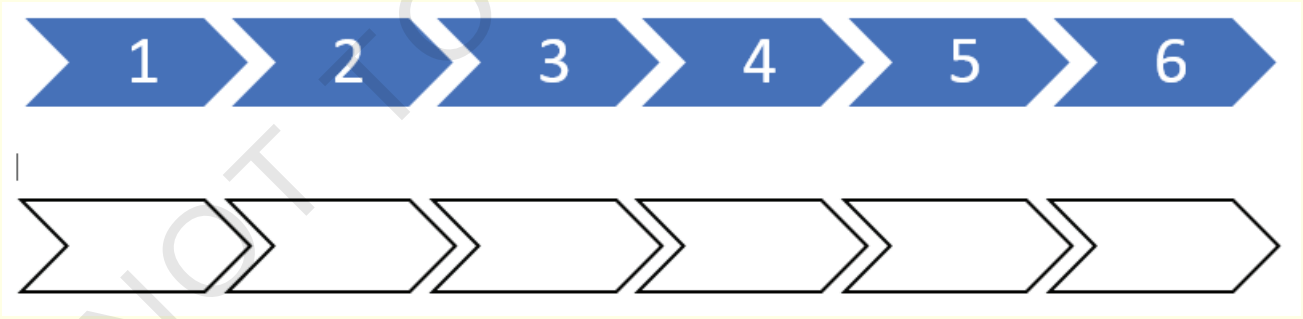
TASK 1: **Identify Phases of the Application Development Life Cycle**

1 Identify Phases of the Application Development Life Cycle (Fig 1)

2 Identify Each Phases and Write Down (Fig 2)

Fig 1

Fig 2



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Describe Role in each of the phases of Application Development life Cycle

Objectives: At the end of this exercise you shall be able to
- **descibe roles in each of the phases of application development life cycle.**

Requirements

Tools/Equipment/Machines

• Desktop / Laptop PC	- 1 No.	• OS (Windows / Linux)	- 1 No.

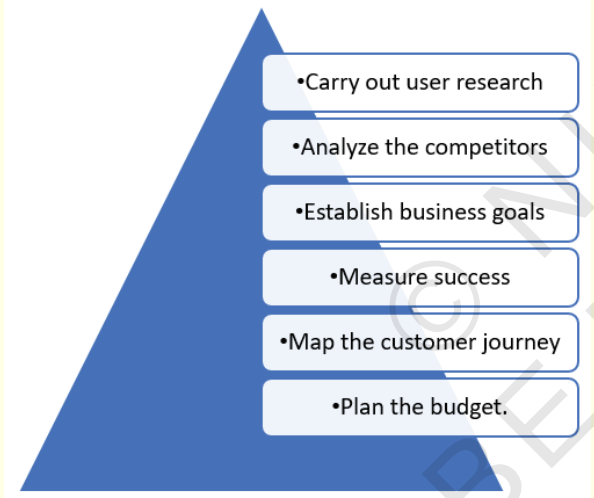
PROCEDURE

TASK 1: **Describe Roles in each of the phases of Application Development Life Cycle**

1 Describe each role and Write on the process chart.

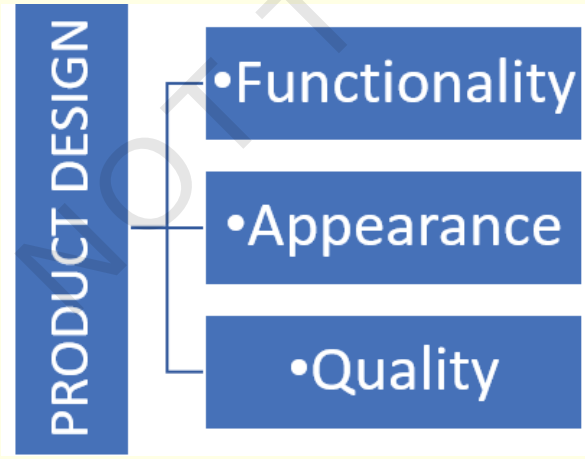
ANALYSIS (Fig 1)

Fig 1



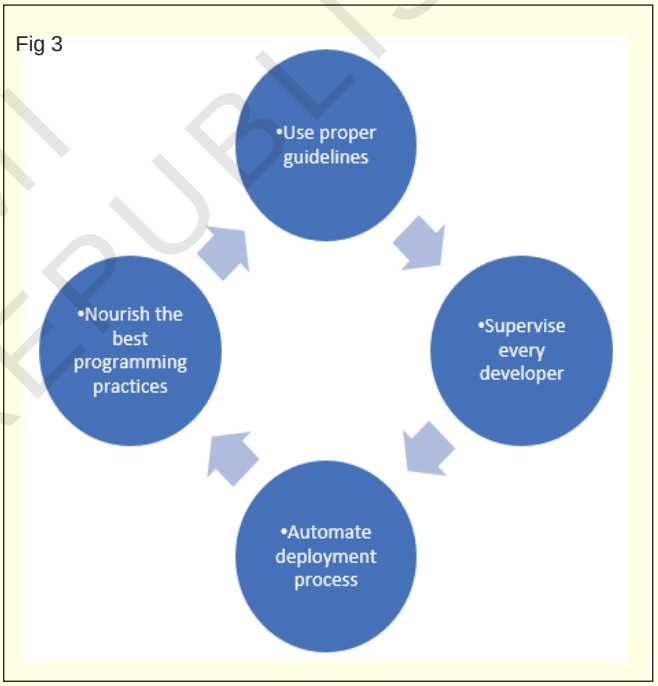
PRODUCT DESIGN (Fig 2)

Fig 2



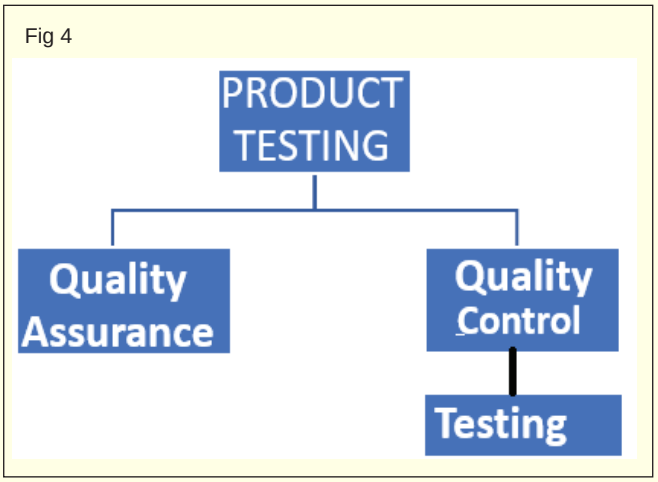
SOFTWARE DEVELOPMENT (Fig 3)

Fig 3



PRODUCT TESTING (Fig 4)

Fig 4



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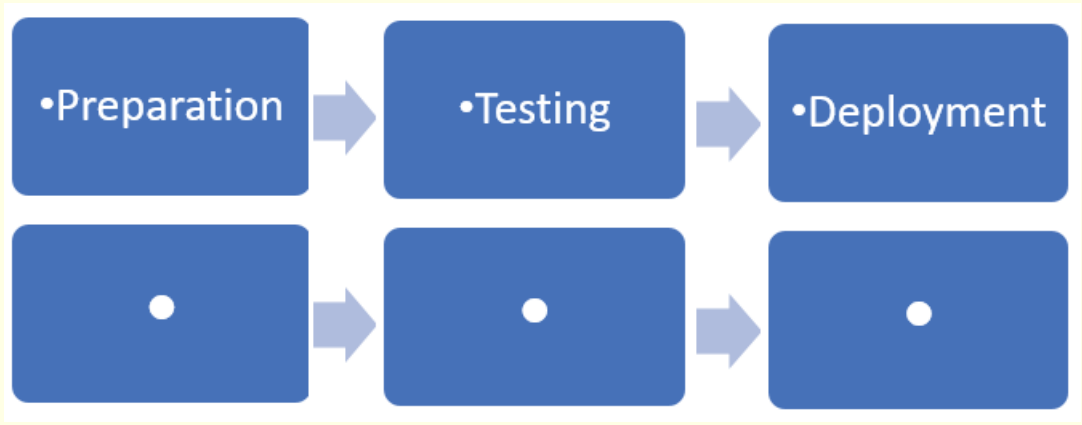
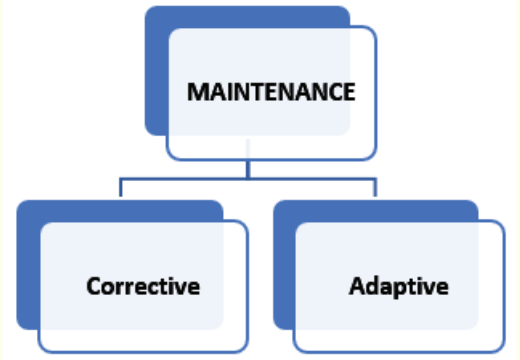
DEPLOYMENT (Fig 5)

Fig 5



MAINTENANCE (Fig 6)

Fig 6



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Install, set up the environment & run Python

Objectives: At the end of this exercise you shall be able to
- **install Python**
- **setup or verify environment path**
- **run Python.**

Requirements

Tools/Equipment/Machines

- Desktop/ laptop PC - 1 No.
- Windows OS - 1 No.
- Python Ver 3.10.5 or latest - 1 No.

The version 3.10.5 or Latest of Python IDLE (Integrated Development Learning Environment) is used to develop and run Python code. It can be downloaded from the web resource www.python.org →Downloads

PROCEDURE

TASK 1: **Install Python**

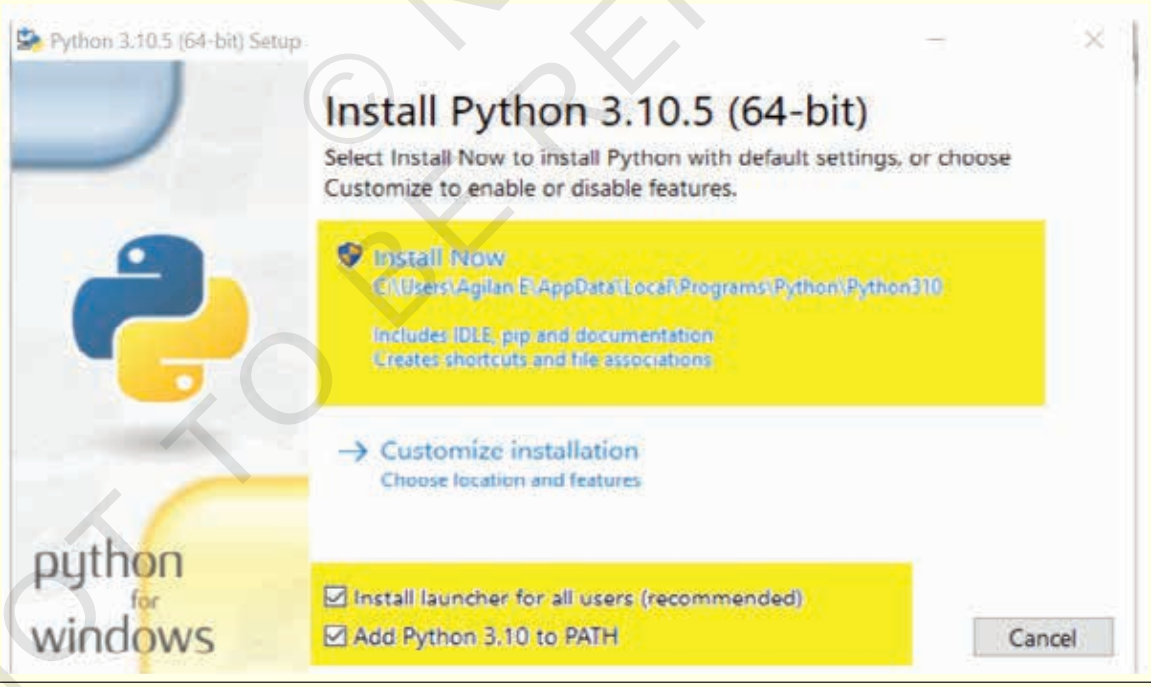
1 Run the Python Installer once downloaded (python-3.10.5-amd64.exe) to start the installation.

2 Make sure you select the Install launcher for all users and Add Python 3.10 to PATH checkboxes. (Fig 1)

Note: older versions of Python that do not support the Add Python to Path checkbox.

3 Choose Install Now with default installation location.

Fig 1



Note: For all recent versions of Python, the recommended installation options include Pip and IDLE. Older versions might not include such additional features.

4 Installation in progress…

5 The next dialog will prompt you to select whether to Disable path length limit.

Choosing this option will allow Python to bypass the 260-character MAX_PATH limit. Effectively, it will enable Python to use long path names.

6 Click Close to Complete the Setup.

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TASK 2: **Setup or Verify environment path**

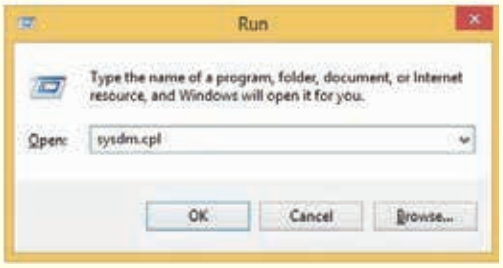
1 Add Python Path to Environment Variables

2 We recommend you go through this step if your version of the Python installer does not include the Add Python to PATH checkbox or if you have not selected that option.

3 Setting up the Python path to system variables alleviates the need for using full paths. It instructs Windows to look through all the PATH folders for “python” and find the install folder that contains the python.exe file.

i Open the Start menu and start the Run app. (Fig 2)

Fig 2



ii Type sysdm.cpl and click OK. This opens the System Properties window.

iii Navigate to the Advanced tab and select Environment Variables.

iv Under User Variables, find and select the Path variable.

v Click Edit.

vi Verify the path of Python installed location are added here, if not Select the New to add the Variable value field path that where python.exe file installed on your computer preceded with a semicolon (;).

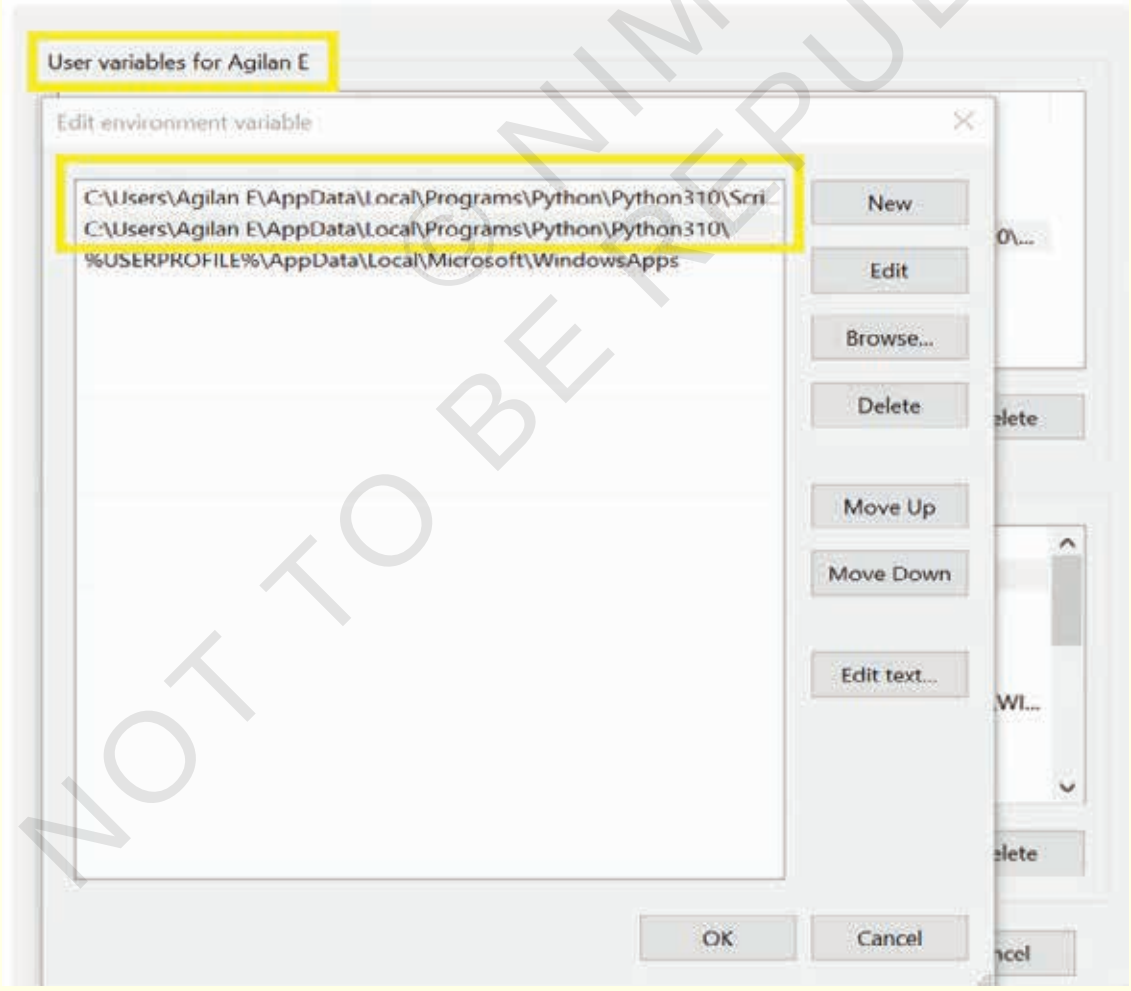
For example, in the image below, we have added “;C:\Python34.” (Fig 3)

vii Click OK and close all windows.

By setting this up, you can execute Python scripts like this: Python script.py

Instead of this: C:/Python34/Python script.py

Fig 3



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TASK 3: **Run Python**

1 Invoking Python IDLE

2 The following command can be used to invoke Python IDLE from Window OS.

Start → All Programs → Python 3.x → IDLE (Python 3.x) (Or)

3 Click python Icon on the Desktop if available.

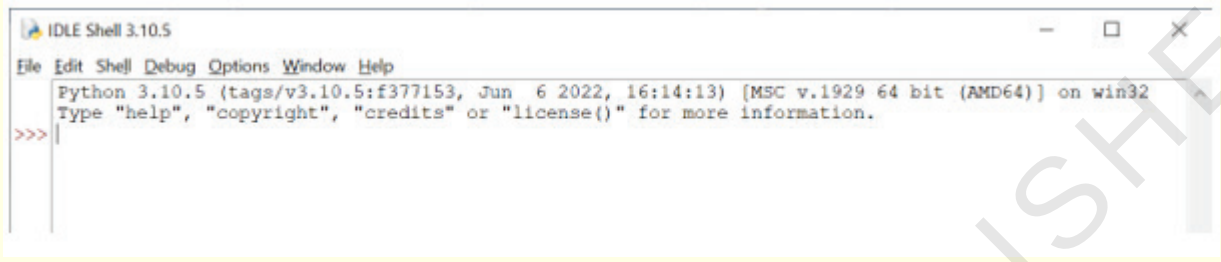
4 Now Python IDLE window appears as shown in the Figure (Fig 4).

Menu Bar Tilte Bar

Python prompt (>>>)

Python IDLE Window : The prompt (>>>) indicates that Interpreter is ready to accept instructions. Therefore, the prompt on screen means IDLE is working in interactive mode.

Fig 4



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Use Command Line and IDE to create and execute a python program

Objectives: At the end of this exercise you shall be able to
- **IDE Interactive mode execution**
- **command line script mode execution.**

Requirements

Tools/Equipment/Machines

- Desktop/ laptop PC - 1 No.
- Windows OS - 1 No.
- Python Ver 3.10.5 or latest - 1 No.

In Python, programs can be written in two ways namely Interactive mode and Script mode. The Interactive mode allows us to write codes in Python command prompt (>>>) whereas in script mode programs can be written and stored as separate file with the extension .py and executed. Script mode is used to create and edit python source file.

PROCEDURE

TASK 1: **IDE Interactive mode Execution**

1 Interactive mode Programming

In interactive mode Python code can be directly typed and the interpreter displays the result(s) immediately. The interactive mode can also be used as a simple calculator.

The following command can be used to invoke Python IDLE from Window OS.

Start → All Programs → Python 3.x → IDLE (Python 3.x) (Or)

2 Click python Icon on the Desktop if available.

3 Now Python IDLE window appears as shown in the Fig 1.

Menu Bar Tilte Bar

Python prompt (>>>)

Python IDLE Window

The prompt (>>>) indicates that Interpreter is ready to accept instructions.

Example 1:

>>>print (“Python Programming Language”)

Python Programming Language

>>>x=5

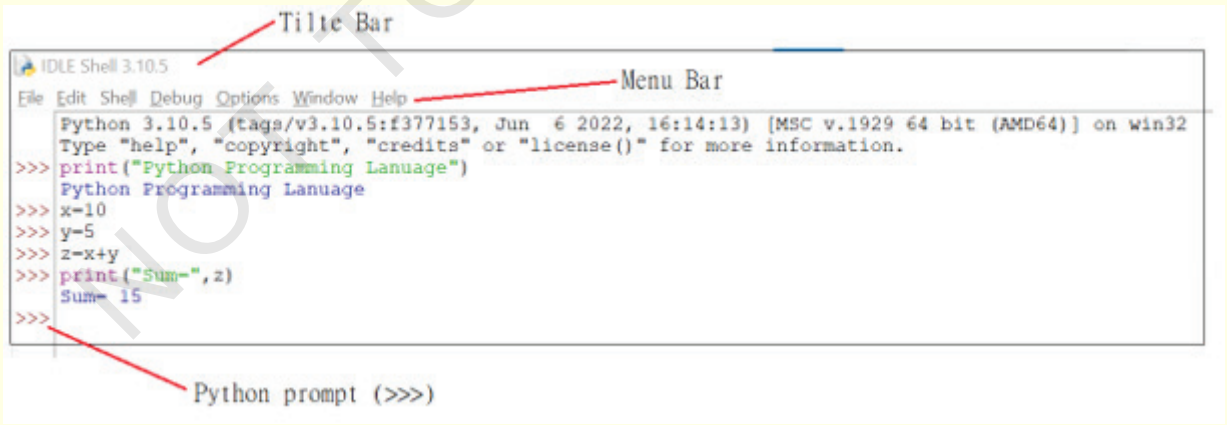
>>>y=10

>>>z=x + y

>>>print (“The Sum”, z)

The Sum = 15

Fig 1



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TASK 2: **Command Line Script mode Execution**

Basically, a script is a text file containing the Python statements. Python Scripts are reusable code. Once the script is created, it can be executed again and again without retyping. The Scripts are editable.

Creating Scripts in Python

1 Choose File → New File or press Ctrl + N in Python shell window

2 An untitled blank script text editor will be displayed on screen as shown in Fig 2.

Fig 2

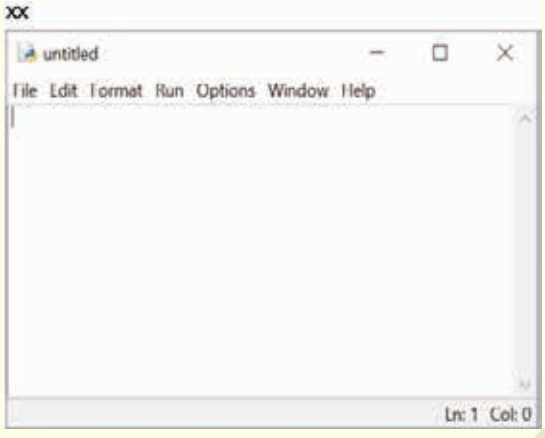

Figure xx. Untitled, blank Python script editor

3 Type the following code in Script editor

```
a =100
b = 350
c = a+b
print (“The Sum=”, c) (Fig 3)
```

Fig 3

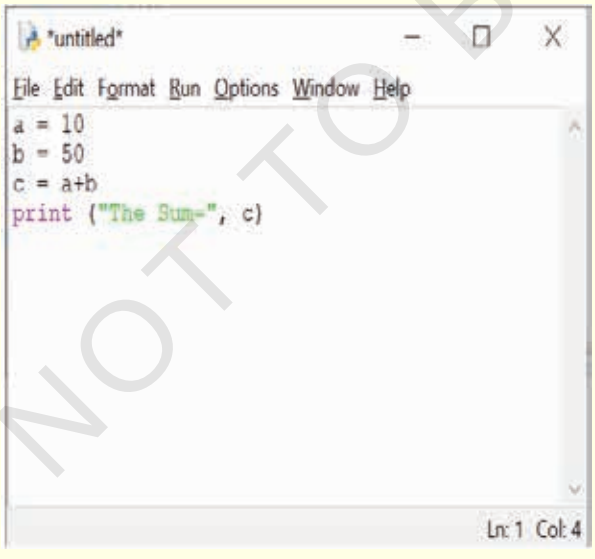

Figure xx– Python Sample code

4 Choose File → Save or Press Ctrl + S

5 Now, Save As dialog box appears on the screen as shown in the Figure xx (Fig 4)

Fig 4

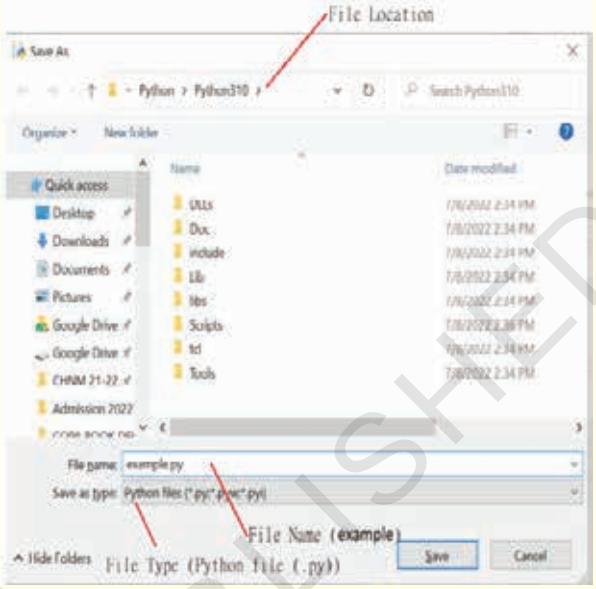

Figure xx – Save As Dialog Box

6 In the Save As dialog box, select the location where you want to save your Python code, and type the file name in File Name box. Python files are by default saved with extension .py. Thus, while creating Python scripts using Python Script editor, no need to specify the file extension.

7 Finally, click Save button to save your Python script.

Executing Python Script

1 Choose Run → Run Module or Press F5

2 If your code has any error, it will be shown in red color in the IDLE window, and Python describes the type of error occurred. To correct the errors, go back to Script editor, make corrections, save the file using Ctrl + S or File → Save and execute it again.

3 For all error free code, the output will appear in the IDLE window of Python as shown in Figure xx (Fig 5)

Figure xx – Python Script Output Window

Executing Python Script by Command Prompt

1 Start Run → using Windows Key + R (Fig 6)

2 Type CMD and Enter

3 Command Prompt will appear then navigate the location where python program saved

4 Execute the Python program using command by “python <filename.py>” then output will appear on the next line as shown in figure. (Fig 7)

Figure xx –Python Script CMD prompt Output Window

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Fig 5

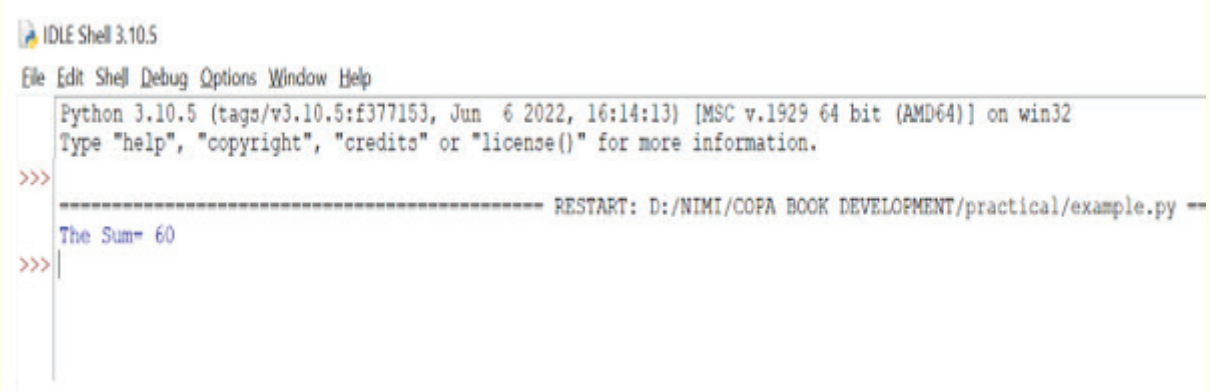


Fig 6

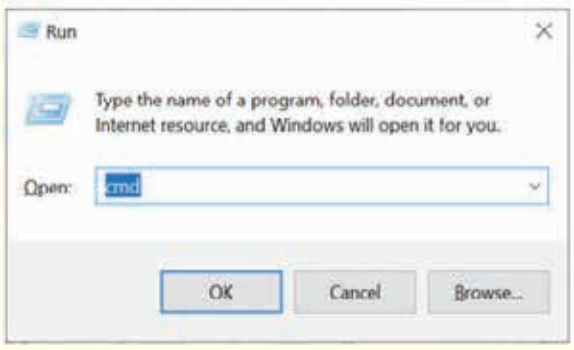
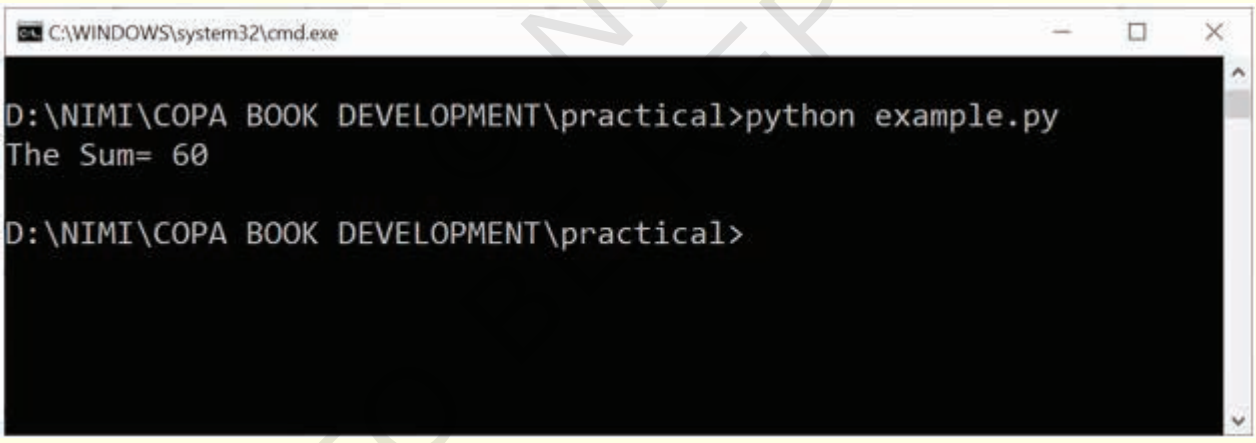


Fig 7



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Write and test a python program to demonstrate print statement, comments, different types of variables

Objectives: At the end of this exercise you shall be able to
- **state print statement**
- **state comments**
- **different types of variables.**

Requirements

Tools/Equipment/Machines

- Desktop/ laptop PC - 1 No.
- Windows OS - 1 No.
- Python Ver 3.10.5 or latest - 1 No.

PROCEDURE

TASK 1: **Print statement**

1 Print statement will appear as shown in Fig 1

2 Output (Fig 2)

Fig 1

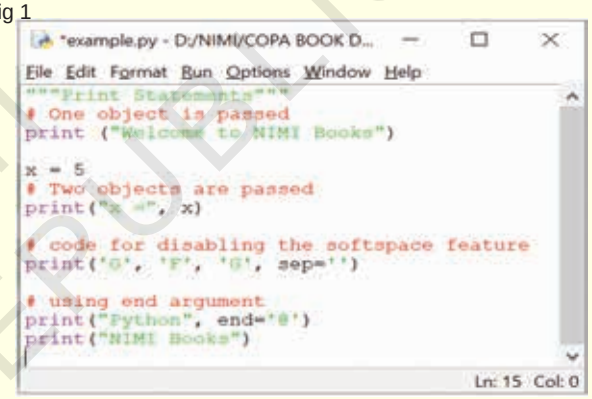

Fig 2

— — — — — —

TASK 2: **Comment statement**

1 Exampe1: Single line Comment (Fig 3)

2 Output 60 (Fig 4)

3 Exampe 2: Multi line Comment (Fig 5)

4 Output 60 (Fig 6)

Fig 3

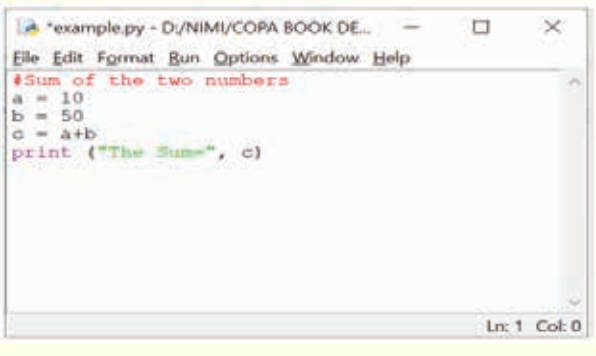

Fig 4

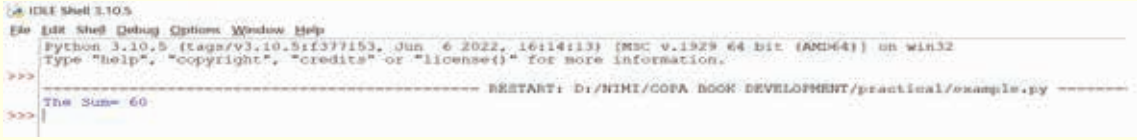

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Fig 5

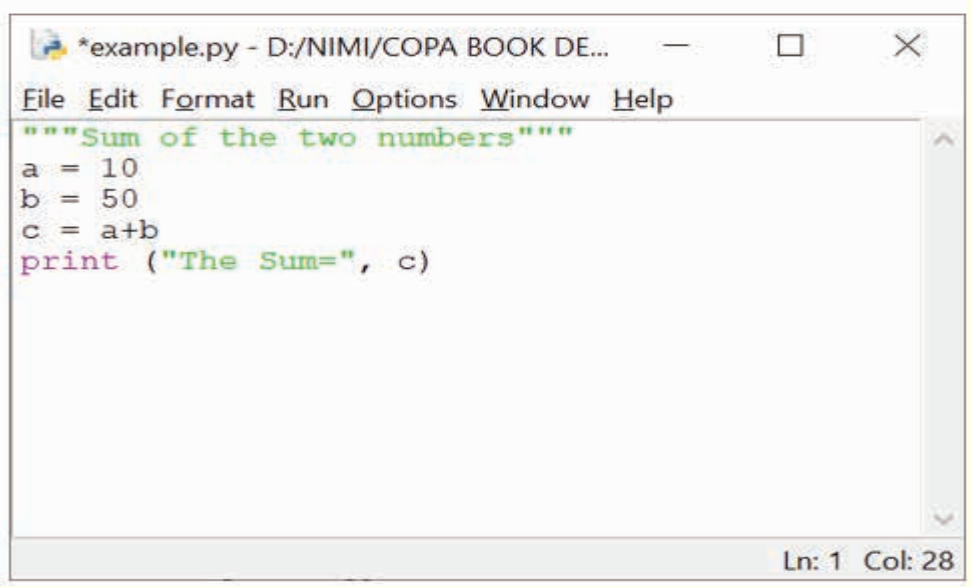
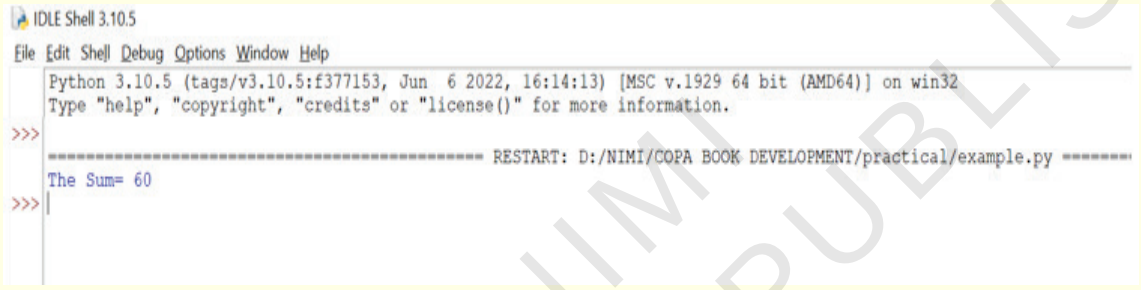


Fig 6



TASK 3: **Different type of Variables**

1 Different types of variables (Figs 7 & 8)

Fig 7

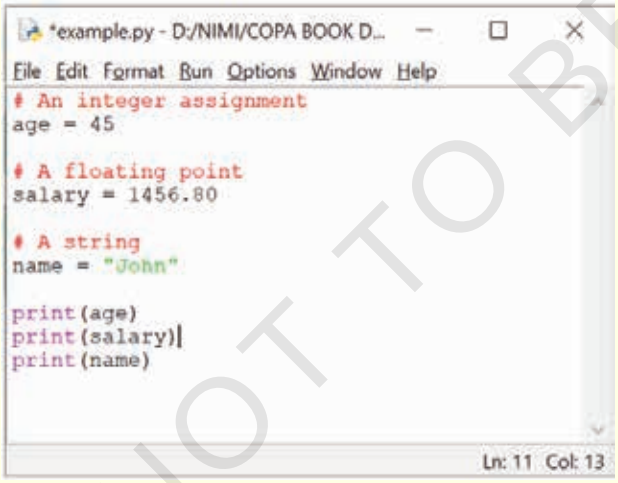
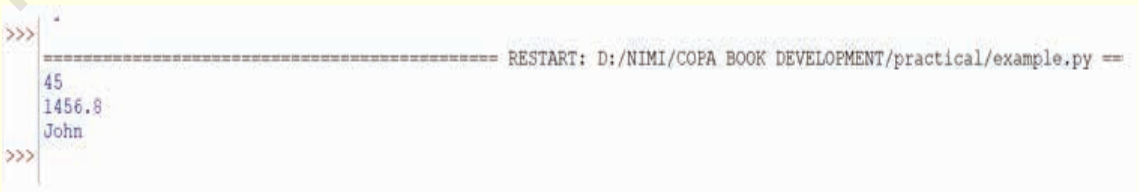


Fig 8



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Write and test a python program to perform data and data type operations, string operations, date, input and output, output formatting and operators

Objectives: At the end of this exercise you shall be able to
- **state data type operations**
- **state string operations**
- **state date operations**
- **state input and output**
- **state output formatting**
- **state opeartors in output formatting.**

Requirements

Tools/Equipment/Machines

• Desktop/ laptop PC	- 1 No.	• Python Ver 3.10.5 or latest	- 1 No.
• Windows OS	- 1 No.		

PROCEDURE

TASK 1: **Data type operations**

1 Data type operations is shown in Fig 1&2.

Fig 1

example.py - D:/NIMI/COPA BOOK DEVELOPMENT/practical/ex...

File Edit Format Run Options Window Help

```
x = "Hello World"                          #str
print(type(x))
x = 20                                     #int
print(type(x))
x = 20.5                                   #float
print(type(x))
x = 1j                                     #complex
print(type(x))
x = ["apple", "banana", "cherry"]          #list
print(type(x))
x = ("apple", "banana", "cherry")          #tuple
print(type(x))
x = range(6)                               #range
print(type(x))
x = {"name" : "John", "age" : 36}          #dict
print(type(x))
x = {"apple", "banana", "cherry"}          #set
print(type(x))
x = frozenset({"apple", "banana", "cherry"})    #frozenset
print(type(x))
x = True                                   #bool
print(type(x))
x = b"Hello"                               #bytes
print(type(x))
x = bytearray(5)                           #bytearray
print(type(x))
x = memoryview(bytes(5))                   #memoryview
print(type(x))
x = None                                   #NoneType
print(type(x))
```

Ln: 28 Col: 14

Fig 2

```
>>> ========== RESTART: D:/NIMI/COPA BOOK DEVELOPMENT/practical/example.py ==========
<class 'str'>
<class 'int'>
<class 'float'>
<class 'complex'>
<class 'list'>
<class 'tuple'>
<class 'range'>
<class 'dict'>
<class 'set'>
<class 'frozenset'>
<class 'bool'>
<class 'bytes'>
<class 'bytearray'>
<class 'memoryview'>
<class 'NoneType'>
>>>
```

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TASK 2: **String operations**

1 Example 1: Creation of string (Fig 3)

2 Output (Fig 4)

Fig 3

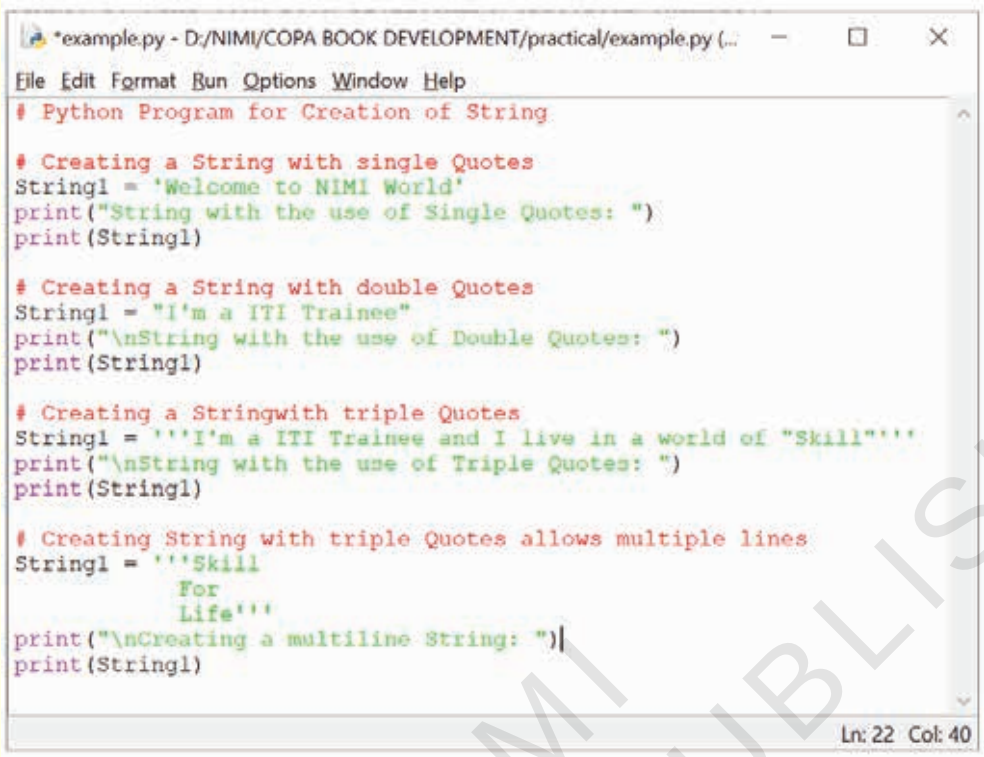

Fig 4

Example2: Accessing characters in Python String

Python Program to Access

characters of String

String1 = “WelcometoNIMI”

print(“Initial String: “)

print(String1)

Printing First character

print(“\nFirst character of String is: “)

print(String1[0])

Printing Last character

print(“\nLast character of String is: “)

print(String1[-1])

Output:

Initial String:

WelcometoNIMI

First character of String is:

W

Last character of String is:

I

Example3: Reversing a String

#Program to reverse a string

gfg = “welcometoNIMI”

print(gfg[::-1])

Output:

IMINotemoclew

Example4: Formatting of Strings

Python Program for

Formatting of Strings

Default order

String1 = “{} {} {}”.format(‘Welcome’, ‘to’, ‘NIMI’)

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```
print("Print String in default order: ")
print(String1)
# Positional Formatting
String1 = "{1} {0} {2}".format('Welcome', 'to', 'NIMI')
print("\nPrint String in Positional order: ")
print(String1)
# Keyword Formatting
String1 = "{l} {f} {g}".format(g='NIMI', f='to', l='Welcome')
print("\nPrint String in order of Keywords: ")
print(String1)
```

Output:

```
Print String in default order:
Welcome to NIMI
Print String in Positional order:
to Welcome NIMI
Print String in order of Keywords:
Welcome to NIMI
```

— — — — — —

TASK 3: **Date operations**

Example1:

```
import datetime
x = datetime.datetime.now()
print(x)
```

Output:

```
2022-07-09 16:05:52.588848
```

Example 2:

```
import datetime
x = datetime.datetime.now()
print(x.year)
print(x.strftime("%A"))
```

Output:

```
2022
Saturday
```

Example3:

```
import datetime
x = datetime.datetime(2020, 5, 17)
print(x)
```

Output:

```
2020-05-17 00:00:00
```

— — — — — —

TASK 4: **Input and output operations**

Example for Input:

```
x = int (input("Enter Number 1: "))
y = int (input("Enter Number 2: "))
print ("The sum = ", x+y)
```

Output:

```
Enter Number 1: 5
Enter Number 2: 10
The sum =  15
```

Example for Output:

```
print ("Welcome to Python Programming")
x = 5
y = 6
z = x + y
print (z)
print ("The sum = ", z)
print ("The sum of ", x, " and ", y, " is ", z)
```

Output:

```
Welcome to Python Programming
11
The sum =  11
The sum of  5  and  6  is  11
```

Example for Input and Output:

```
# Python program showing how to multiple input and
    output using split
# taking two inputs at a time
x, y = input("Enter two values: ").split()
print("Number of boys: ", x)
print("Number of girls: ", y)
print()
# taking three inputs at a time
x, y, z = input("Enter three values: ").split()
print("Total number of students: ", x)
print("Number of boys is : ", y)
print("Number of girls is : ", z)
print()
```

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```
# taking two inputs at a time
a, b = input("Enter two values: ").split()
    print("First number is {} and second number is {}".
    format(a, b))
print()
# taking multiple inputs at a time
# and type casting using list() function
x = list(map(int, input("Enter multiple values: ").split()))
print("List of students: ", x)
```

output:

```
Enter two values: 10 15
Number of boys:  10
Number of girls:  15
Enter three values: 10 15 20
Total number of students:  10
Number of boys is :  15
Number of girls is :  20
Enter two values: 10 15
First number is 10 and second number is 15
Enter multiple values: 10 15 12 13 15
List of students:  [10, 15, 12, 13, 15]
```

— — — — — —

TASK 5: **Output formatting**

```
# Python program showing use of format() method using format() method
print('Welcome {} to "{}!"'.format('NIMI', 'NIMI'))
# using format() method and referring  a position of the object
print('{0} and {1}'.format('NIMI', 'Portal'))
 print('{1} and {0}'.format('NIMI', 'Portal'))
# the above formatting can also be done by using f-Strings Although, this features work only with python
 print(f"Welcome {'nimi'} for \"{'NIMI'}!\"")
# using format() method and referring  a position of the object
print(f"{'NImi'} and {'Portal'}")
```

Output:

```
Welcome NIMI to "NIMI!"
NIMI and Portal
Portal and NIMI
Welcome nimi for "NIMI!"
NImi and Portal
```

— — — — — —

TASK 6: **Operators in output formatting**

```
# Python program showing how to use
# string modulo operator(%) to print
# fancier output
# print integer and float value
print("Integer : %2d, Float : %5.2f" % (1, 2.0))
# print integer value
print("Integer: %3d, Boys : %2d" % (240, 120))
# print octal value
print("Octal: %7.3o" % (25))
# print exponential value
print("Exponential: %10.3E" % (356.08977))
```

Output:

```
Integer :  1, Float :  2.00
Integer: 240, Boys : 120
Octal:     031
Exponential:  3.561E+02
```

— — — — — —

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Determine the sequence of execution based on operator precedence

Objectives: At the end of this exercise you shall be able to
- **state arithmetic operators in Python**
- **state comparison operators**
- **state logical operators**
- **state bitwise operators**
- **state assignment operators**
- **state operator precedence.**

Requirements

Tools/Equipment/Machines

• Desktop/ laptop PC	- 1 No.	• Python Ver 3.10.5 or latest	- 1 No.
• Windows OS	- 1 No.		

PROCEDURE

TASK 1: **Arithmetic operators in Python**

1 Arithmatic opeartions as follows:

```
# Examples of Arithmetic Operator
a = 9
b = 4
# Addition of numbers
add = a + b
# Subtraction of numbers
sub = a - b
# Multiplication of number
mul = a * b
# Division(float) of number
div1 = a / b
# Division(floor) of number
div2 = a // b
# Modulo of both number
mod = a % b
# Power
p = a ** b
# print results
print(add)
print(sub)
print(mul)
print(div1)
print(div2)
print(mod)
print(p)
```

Output:

```
13
5
36
2.25
2
1
6561
```

— — — — — —

TASK 2: **Comparison operators**

1 Comparison opeartors as follows:

```
# Examples of Relational Operators
a = 13
b = 33
# a > b is False
print(a > b)
# a < b is True
print(a < b)
# a == b is False
print(a == b)
# a != b is True
```

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```
print(a != b)                    True
# a >= b is False                False
print(a >= b)                    True
# a <= b is True                 False
print(a <= b)                    True
Output:
False
```

— — — — — —

TASK 3: **Logical operators**

```
1  Logical opeartors as follows:
# Examples of Logical Operator
a = True
b = False
# Print a and b is False
print(a and b)
# Print a or b is True
print(a or b)
# Print not a is False
print(not a)
output:
False
True
False
```

— — — — — —

TASK 4: **Bitwise operators**

```
1  Bitwise opeartors as follows:
# Examples of Bitwise operators
a = 10
b = 4
# Print bitwise AND operation
print(a & b)
# Print bitwise OR operation
print(a | b)
# Print bitwise NOT operation
print(~a)
# print bitwise XOR operation
print(a ^ b)
# print bitwise right shift operation
print(a >> 2)
# print bitwise left shift operation
print(a << 2)
Output:
0
14
-11
14
2
40
```

— — — — — —

TASK 5: **Assignment operators**

```
1  Assignment opeartors as follows:
# Examples of Assignment Operators
a = 10
# Assign value
b = a
print(b)
# Add and assign value
b += a
print(b)
# Subtract and assign value
b -= a
print(b)
# multiply and assign
b *= a
print(b)
# bitwise lishift operator
```

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```
b <<= a
print(b)
```

Output:

```
10
20
```

```
10
100
102400
```

— — — — — —

TASK 6: **Operator precedence**

1 Operator precedence as follows:

```
# Examples of Operator Precedence
# Precedence of '+' & '*'
expr = 10 + 20 * 30
print(expr)
# Precedence of 'or' & 'and'
name = "Alex"
age = 0
if name == "Alex" or name == "John" and age >= 2:
print("Hello! Welcome.")
else:
print("Good Bye!!")
```

Output:

```
610
Hello! Welcome.
```

— — — — — —

TASK 7: **Operator associativity**

1 Operator associativity as follows:

```
# Examples of Operator Associativity
# Left-right associativity
# 100 / 10 * 10 is calculated as
# (100 / 10) * 10 and not
# as 100 / (10 * 10)
print(100 / 10 * 10)
# Left-right associativity
# 5 - 2 + 3 is calculated as
# (5 - 2) + 3 and not
# as 5 - (2 + 3)
print(5 - 2 + 3)
# left-right associativity
print(5 - (2 + 3))
# right-left associativity
# 2 ** 3 ** 2 is calculated as
# 2 ** (3 ** 2) and not
# as (2 ** 3) ** 2
print(2 ** 3 ** 2)
```

Output

```
100.0
6
0
```

— — — — — —

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Construct and analyze code segments that use branching statements

Objectives: At the end of this exercise you shall be able to
- **state if statement**
- **state if-else**
- **state nested-if**
- **state if-elif-else .**

Requirements

Tools/Equipment/Machines

- Desktop/ laptop PC - 1 No.
- Windows OS - 1 No.
- Python Ver 3.10.5 or latest - 1 No.

PROCEDURE

TASK 1: **if statement**

1 if statement as follows:

Example1:

```
i = 10
if (i < 15): print("10 is less than 15")
print("Welcome to If Statement")
```

Output:

```
10 is less than 15
Welcome to If Statement
```

Example 2:

```
i = 10
if (i > 15): print("10 is less than 15")
print("Welcome to If Statement")
```

Output:

```
Welcome to If Statement
```

TASK 2: **if-else**

1 if-else as follows:

Example1:

```
# python program to illustrate If else statement
#!/usr/bin/python
i = 20
if (i > 15):
    print("i is smaller than 15")
    print("I'm in if Block")
else:
    print("i is greater than 15")
    print("I'm in else Block")
print("I'm not in if and else Block")
```

Output:

```
 is smaller than 15
i'm in if Block
i'm not in if and else Block
```

Example2: Check Whether a String is Palindrome or Not (Fig 1)

Fig 1

```
# Program to check if a string is palindrome or not

my_str = 'aIbohPhoBiA'

# make it suitable for caseless comparison
my_str = my_str.casefold()

# reverse the string
rev_str = reversed(my_str)

# check if the string is equal to its reverse
if list(my_str) == list(rev_str):
  print("The string is a palindrome.")
else:
  print("The string is not a palindrome.")
```

Output

```
The string is a palindrome.
```

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TASK 3: **nested-if**

1 nested-if as follows:

Example1:

```
# python program to illustrate nested If statement
#!/usr/bin/python
i = 10
if (i == 10):
    # First if statement
    if (i < 15):
        print("i is smaller than 15")
    # Nested - if statement
    # Will only be executed if statement above
    # it is true
    if (i < 12):
        print("i is smaller than 12 too")
    else:
        print("i is greater than 15")
```

Output:

```
i is smaller than 15
i is smaller than 12 too
```

— — — — — —

TASK 4: **if-elif-else**

1 if-elif-else as follows:

Example1:

```
# Python program to illustrate if-elif-else ladder
#!/usr/bin/python
i = 20
if (i == 10):
    print("i is 10")
elif (i == 15):
    print("i is 15")
elif (i == 20):
    print("i is 20")
else:
    print("i is not present")
```

Output:

```
    i is 20
```

Example2: Find the Largest Among Three Numbers

Fig 2

```
# Python program to find the largest number among the three input numbers

# change the values of num1, num2 and num3
# for a different result
num1 = 10
num2 = 14
num3 = 12

# uncomment following lines to take three numbers from user
#num1 = float(input("Enter first number: "))
#num2 = float(input("Enter second number: "))
#num3 = float(input("Enter third number: "))

if (num1 >= num2) and (num1 >= num3):
   largest = num1
elif (num2 >= num1) and (num2 >= num3):
   largest = num2
else:
   largest = num3

print("The largest number is", largest)
```

Output

```
The largest number is 14.0
```

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Construct and analyze code segments that perform iteration

Objectives: At the end of this exercise you shall be able to
- **state for loop**
- **state while loop**
- **state while loop with else**
- **state nested loop**
- **state break, continue and pass statement.**

Requirements

Tools/Equipment/Machines

- Desktop/ laptop PC - 1 No.
- Windows OS - 1 No.
- Python Ver 3.10.5 or latest - 1 No.

PROCEDURE

TASK 1: **Demonstration of for loop**

1 Example1: Sum of N numbers (Fig 1)

Fig 1

```
# Program to find the sum of all numbers stored in a list

# List of numbers
numbers = [6, 5, 3, 8, 4, 2, 5, 4, 11]

# variable to store the sum
sum = 0

# iterate over the list
for val in numbers:
    sum = sum+val

print("The sum is", sum)
```

Output: (Fig 2)

Fig 2

```
The sum is 48
```

Example2: Find the Factorial of a Number (Fig 3)

Output : (Fig 4)

Example3: Check Prime Number Using a flag variable (Fig 5)

Example4: Using a for...else statement. (Figs 6&7)

Output (Fig 8)

Fig 3

```
# Python program to find the factorial of a number provided by the user.

# change the value for a different result
num = 7

# To take input from the user
#num = int(input("Enter a number: "))

factorial = 1

# check if the number is negative, positive or zero
if num < 0:
   print("Sorry, factorial does not exist for negative numbers")
elif num == 0:
   print("The factorial of 0 is 1")
else:
   for i in range(1,num + 1):
       factorial = factorial*i
   print("The factorial of",num,"is",factorial)
```

Fig 4

```
The factorial of 7 is 5040
```

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Fig 5

```
# Program to check if a number is prime or not

num = 29

# To take input from the user
#num = int(input("Enter a number: "))

# define a flag variable
flag = False
```

Fig 6

```
# prime numbers are greater than 1
if num > 1:
   # check for factors
   for i in range(2, num):
      if (num % i) == 0:
         # if factor is found, set flag to True
         flag = True
         # break out of loop
         break

# check if flag is True
if flag:
   print(num, "is not a prime number")
else:
   print(num, "is a prime number")
```

Fig 7

```
# Program to check if a number is prime or not

num = 407

# To take input from the user
#num = int(input("Enter a number: "))

# prime numbers are greater than 1
if num > 1:
   # check for factors
   for i in range(2,num):
      if (num % i) == 0:
         print(num,"is not a prime number")
         print(i,"times",num//i,"is",num)
         break
   else:
      print(num,"is a prime number")

# if input number is less than
# or equal to 1, it is not prime
else:
   print(num,"is not a prime number")
```

Fig 8

```
407 is not a prime number
11 times 37 is 407
```

TASK 2: **Demonstration while loop**

Example1: Program to Add Natural Numbers (Fig 9)

Fig 9

```
# Program to add natural
# numbers up to
# sum = 1+2+3+...+n

# To take input from the user,
# n = int(input("Enter n: "))

n = 10

# initialize sum and counter
sum = 0
i = 1

while i <= n:
   sum = sum + i
   i = i+1    # update counter

# print the sum
print("The sum is", sum)
```

the output will be: (Fig 10)

Fig 10

```
Enter n: 10
The sum is 55
```

Example2: Find the Sum of Natural Numbers (Fig 11)

Output (Fig 12)

Example3: Print the Fibonacci sequenc e (Fig 13)

Output (Fig 14)

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Fig 11

```
# Sum of natural numbers up to num

num = 16

if num < 0:
   print("Enter a positive number")
else:
   sum = 0
   # use while loop to iterate until zero
   while(num > 0):
      sum += num
      num -= 1
   print("The sum is", sum)
```

Fig 12

```
The sum is 136
```

Fig 13

```
# Program to display the Fibonacci sequence up to n-th term

nterms = int(input("How many terms? "))

# first two terms
n1, n2 = 0, 1
count = 0

# check if the number of terms is valid
if nterms <= 0:
   print("Please enter a positive integer")
# if there is only one term, return n1
elif nterms == 1:
   print("Fibonacci sequence upto",nterms,":")
   print(n1)
# generate fibonacci sequence
else:
   print("Fibonacci sequence:")
   while count < nterms:
      print(n1)
      nth = n1 + n2
      # update values
      n1 = n2
      n2 = nth
      count += 1
```

Fig 14

```
How many terms? 7
Fibonacci sequence:
0
1
1
2
3
5
8
```

TASK 3: **While loop with else**

Example : (Fig 15)

Output : (Fig 16)

Fig 15

```
'''Example to illustrate
the use of else statement
with the while loop'''

counter = 0

while counter < 3:
   print("Inside loop")
   counter = counter + 1
else:
   print("Inside else")
```

Fig 16

```
Inside loop
Inside loop
Inside loop
Inside else
```

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TASK 4: **Nested loop**

Example : (Fig 17)

Fig 17

```
i=1
while (i<=6):
        for j in range (1,i):
                print (j,end='¥t')
        print (end='¥n')
        i +=1
```

Output : (Fig 18)

Fig 18

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

TASK 5: **Break , continue and pass statement**

Example : Python break (Fig 19)

Fig 19

```
# Use of break statement inside the loop

for val in "string":
    if val == "i":
        break
    print(val)

print("The end")
```

Output (Fig 20)

Fig 20

```
s
t
r
The end
```

Example2: Python continue (Fig 21)

Fig 21

```
# Program to show the use of continue statement inside loops

for val in "string":
    if val == "i":
        continue
    print(val)

print("The end")
```

Run Code

Output (Fig 22)

Fig 22

```
s
t
r
n
g
The end
```

Example3: pass Statement

a=int (input("Enter any number :"))

if (a==0):

pass

else:

print ("non zero value is accepted")

Output:

Enter any number :3

non zero value is accepted

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Document code segments using comments and documentation strings

Objectives: At the end of this exercise you shall be able to
- **state python comments**
- **state pyhton docstrings.**

Requirements

Tools/Equipment/Machines

- Desktop/ laptop PC - 1 No.
- Windows OS - 1 No.
- Python Ver 3.10.5 or latest - 1 No.

PROCEDURE

TASK 1: **Python Comments**

1 Example1: single-line comment (Fig 1)

Fig 1

```
# Program to print "Hello World"
print("Hello World")
```

2 Example2: multi-line strings comment (Fig 2)

Fig 2

```
"I am a single-line comment"

I am a
multi-line comment!
'''

print("Hello World")
```

TASK 2: **Python docstrings**

1 Example1: sing (Fig 3)

Fig 3

```
def square(n):
  '''Takes in a number n, returns the square of n'''
  return n**2

print(square.__doc__)
```

Ouput (Fig 4)

Fig 4

```
Takes in a number n, returns the square of n
```

Example2: Multi-line Docstrings

```
def my_function(arg1):
    """
    Summary line.
    Extended description of function.
    Parameters:
    arg1 (int): Description of arg1
    Returns:
    int: Description of return value
    """
    return arg1
print(my_function.__doc__)
```

Output:

```
Summary line.
Extended description of function.
Parameters:
arg1 (int): Description of arg1
Returns:
int: Description of return value
```

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Example 3:Docstrings for Python functions (Fig 5)

Fig 5

```
def add_binary(a, b):
    '''
    Returns the sum of two decimal numbers in binary digits.

        Parameters:
            a (int): A decimal integer
            b (int): Another decimal integer

        Returns:
            binary_sum (str): Binary string of the sum of a and b
    '''
    binary_sum = bin(a+b)[2:]
    return binary_sum


print(add_binary.__doc__)
```

Output (Fig 6)

Fig 6

```
Returns the sum of two decimal numbers in binary digits.

        Parameters:
                a (int): A decimal integer
                b (int): Another decimal integer

        Returns:
                binary_sum (str): Binary string of the sum of a and b
```

Example 4: Docstrings for Python class (Fig 7)

Fig 7

```
class Person:
    """
    A class to represent a person.

    ...

    Attributes
    ----------
    name : str
        first name of the person
```

Output (Figs 8 & 9)

Fig 8

```
    -------
    info(additional=""):
        Prints the person's name and age.
    """

    def __init__(self, name, surname, age):
        """
        Constructs all the necessary attributes for the person object.

        Parameters
        ----------
            name : str
                first name of the person
            surname : str
                family name of the person
            age : int
                age of the person
        """

        self.name = name
        self.surname = surname
        self.age = age

    def info(self, additional=""):
        """
        Prints the person's name and age.

        If the argument 'additional' is passed, then it is appended after the main info.

        Parameters
        ----------
        additional : str, optional
            More info to be displayed (default is None)

        Returns
        -------
        None
        """
```

Fig 9

```
    A class to represent a person.

    ...

    Attributes
    ----------
    name : str
        first name of the person
    surname : str
        family name of the person
    age : int
        age of the person

    Methods
    -------
    info(additional=""):
        Prints the person's name and age
```

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Construct and analyze code segments that include list comprehensions, tuple, set and dictionary comprehensions

Objectives: At the end of this exercise you shall be able to
- **state list comprehensions**
- **state tuple in list comprehension**
- **state set comprehensions**
- **state dictionary comprehension.**

Requirements

Tools/Equipment/Machines

- Desktop/ laptop PC - 1 No.
- Windows OS - 1 No.
- Python Ver 3.10.5 or latest - 1 No.

PROCEDURE

TASK 1: **: List comprehensions**

1 Example1: Finding Even Numbers Using List Comprehension

```
#Using List Comprehension
evenno=[n for n in range(1,11) if n%2==0]
print (evenno)
```

Output:

[2, 4, 6, 8, 10]

Example2: Finding square of numbers using List Comprehension

```
#Using List Comprehension
square=[x*x for x in range(1,11)]
print (square)
```

Output:

[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]

Example3: Nested List Comprehension

List of even numbers from 0 to 10. Nested list comprehension will return that expression (list of even numbers from 0 to 10) three times(range(3))

```
#Using List Comprehension
l1=[[n for n in range(10) if n %2==0] for n1 in range(3)]
print (l1)
```

Output:

[[0, 2, 4, 6, 8], [0, 2, 4, 6, 8], [0, 2, 4, 6, 8]]

— — — — — —

TASK 2 **: Tuple in List Comprehension**

1 Example 1: Creating a list of tuples using List Comprehension with two 'for' clause:

```
#Using tuple in List Comprehension
a1=['red','green','blue']
b1=[0,1,2]
a2=[(a,b) for a in a1 for b in b1]
print (a2)
```

Output:

[('red', 0), ('red', 1), ('red', 2), ('green', 0), ('green', 1), ('green', 2), ('blue', 0), ('blue', 1), ('blue', 2)]

Example2: Example tuple comprehension Python

```
#Using tuple Comprehension
tuple1 = (1, 6, 5, 9, 9, 1, 25, 76)
tuple2 = tuple((i for i in tuple1 if i % 5 == 0))
print(tuple2)
```

Output:

(5, 25)

— — — — — —

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TASK 3 **: Set Comprehensions**

Example1: How to find even numbers using set Comprehension

```
#Using Set Comprehension
s1={n for n in range(1,11) if n%2==0}
print (s1)
```

Output:

{2, 4, 6, 8, 10}

Example2: How to find the square of numbers using Set Comprehension.

```
#Using Set Comprehension
s1={n*n for n in range(1,11)}
#Sets are unordered.
print (s1)
```

Output:

{64, 1, 4, 36, 100, 9, 16, 49, 81, 25}

— — — — — —

TASK 4 **: Dictionary Comprehension**

Example1: How to find the square of numbers using Dictionary Comprehension.

```
#Using Dictionary Comprehension
d1={n:n*n for n in range(1,11)}
print (d1)
```

Output:

{1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81, 10: 100}

Example2: How to iterate through two dictionaries using dictionary comprehension.

```
#Using Dictionary Comprehension
d1={'color','shape','fruit'}
d2={'red','circle','apple'}
d3={k:v for (k,v) in zip(d1,d2)}
print (d3)
```

Output:

{'shape': 'circle', 'color': 'red', 'fruit': 'apple'}

— — — — — —

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Perform basic operations using built-in modules

Objectives: At the end of this exercise you shall be able to
- **state basic operations using built-in modules.**

Requirements

Tools/Equipment/Machines

- Desktop/ laptop PC - 1 No.
- Windows OS - 1 No.
- Python Ver 3.10.5 or latest - 1 No.

PROCEDURE

TASK 1: **: Basic operations using built in modules**

1 Example1: User Defined Modules

A module is a file containing Python definitions and statements. The file name is the module name with the suffix .py appended. Within a module, the module's name (as a string) is available as the value of the global variable __name__. For instance, use your favorite text editor to create a file called fibo.py in the current directory with the following contents: (Fig 1)

Now enter the Python interpreter and import this module with the following command: (Fig 2)

Fig 1

```
# Fibonacci numbers module

def fib(n):    # write Fibonacci series up to n
    a, b = 0, 1
    while a < n:
        print(a, end=' ')
        a, b = b, a+b
    print()

def fib2(n):   # return Fibonacci series up to n
    result = []
    a, b = 0, 1
    while a < n:
        result.append(a)
        a, b = b, a+b
    return result
```

Fig 2

```
>>> import fibo

>>> fibo.fib(5)
0 1 1 2 3

>>> fibo.fib2(100)
[0, 1, 1, 2, 3]
```

Example 2: importing built-in module math

Now enter the Python interpreter and import this module with the following command:

importing built-in module math

import math

using square root(sqrt) function contained

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```
# in math module
print(math.sqrt(25))
# using pi function contained in math module
print(math.pi)
# 2 radians = 114.59 degrees
print(math.degrees(2))
# 60 degrees = 1.04 radians
print(math.radians(60))
# Sine of 2 radians
print(math.sin(2))
# Cosine of 0.5 radians
print(math.cos(0.5))
# Tangent of 0.23 radians
print(math.tan(0.23))
# 1 * 2 * 3 * 4 = 24
print(math.factorial(4))
```

Output:

```
5.0
3.141592653589793
114.59155902616465
1.0471975511965976
0.9092974268256817
0.8775825618903728
0.23414336235146527
24
```

Example3: importing built-in module random

Now enter the Python interpreter and import this module with the following command:

```
# importing built in module random
import random
# printing random integer between 0 and 5
print(random.randint(0, 5))
# print random floating point number between 0 and 1
print(random.random())
# random number between 0 and 100
print(random.random() * 100)
List = [1, 4, True, 800, “python”, 27, “hello”]
# using choice function in random module for choosing
# a random element from a set such as a list
print(random.choice(List))
```

Output:

```
0
0.026096725940513155
26.894824199392342
27
```

Example4: importing built-in module datetime

Now enter the Python interpreter and import this module with the following command:

```
# importing built in module datetime
import datetime
from datetime import date
import time
# Returns the number of seconds since the
# Unix Epoch, January 1st 1970
print(time.time())
# Converts a number of seconds to a date object
print(date.fromtimestamp(454554))
```

Output:

```
1659024623.8910193
1970-01-06
```

Example5: Directories List for Modules

```
# importing sys module
>>import sys
# importing sys.path
>>print(sys.path) (Fig 3)
```

Fig 3

```
['',
'C:\\Python33\\Lib\\idlelib',
'C:\\Windows\\system32\\python33.zip',
'C:\\Python33\\DLLs',
'C:\\Python33\\lib',
'C:\\Python33',
'C:\\Python33\\lib\\site-packages']
```

Example 6.1: importing built-in module OS

```
import os
os.mkdir(“d:\\tempdir”)
os.chdir(“d:\\tempdir”)
```

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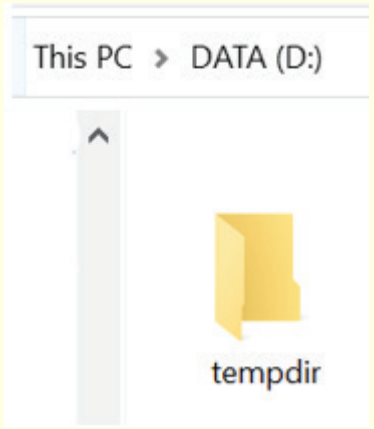
os.getcwd()

Output:

Check the created folder on the mentioned location in D Drive or not. (Fig 4)

Fig 4



Example6.2: importing built-in module OS

import os

os.chdir("..")

os.getcwd()

os.rmdir("d:\\tempdir")

Output:

Created folder will be deleted from the mentioned location.

Example6.3: importing built-in module OS

import os

os.listdir("d:")

Output: It will list all the available folder and file on the mentioned drive or location.

['$MfeDeepRem', '$RECYCLE.BIN', '1_5071341518753628456.mkv', 'Angamaly_Diaries_720p.mp4', 'Beast.mkv', 'Belse wedding', 'Binaries', 'CC', 'Garden', 'GOVT ITI', 'I_Am_Legend_(2007)_720p_Tamil.mp4', 'LAPTOP-M1EH6EN', 'MediaID.bin', 'msdia80.dll', 'NIMI', 'Personal_Agilan', 'RRR.mkv', 'Sai Studies', 'Sai UKG School Documents', 'SAIMI Academy', 'Software', 'System Volume Information', 'The_Pursuit_Of_Happyness_(2006)_720p_BDRip_[Tamil_+_Telugu_+.mp4', 'VirtualBox VMs', 'WebADI.xls', 'WINDOWS OS ISO', 'WindowsImageBackup', 'www.TamilBlasters.click - K.G.F Chapter 2 (2022) Tamil - 720p HDRip - x264 - AAC - 1.4GB - HC ESubs.mkv',]

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Solve complex computing problems by using built-in modules

Objectives: At the end of this exercise you shall be able to
- **state complex computing problems by using built-in modules .**

Requirements			
Tools/Equipment/Machines			
• Desktop/ laptop PC	- 1 No.	• Python Ver 3.10.5 or latest	- 1 No.
• Windows OS	- 1 No.		

PROCEDURE

TASK 1: **: Complex computing problems by using built-in modules**

Example1: Write a Python program to generate a random color hex, a random alphabetical string, random value between two integers (inclusive) and a random multiple of 7 between 0 and 70

```
import random
import string
print("Generate a random color hex:")
print("#{:06x}".format(random.randint(0, 0xFFFFFF)))
print("\nGenerate a random alphabetical string:")
max_length = 255
s = ""
for i in range(random.randint(1, max_length)):
    s += random.choice(string.ascii_letters)
print(s)
print("Generate a random value between two integers, inclusive:")
print(random.randint(0, 10))
print(random.randint(-7, 7))
print(random.randint(1, 1))
print("Generate a random multiple of 7 between 0 and 70:")
print(random.randint(0, 10) * 7)
```

Output:

```
Generate a random color hex:
#2566f8
Generate a random alphabetical string:
6
-5
1
Generate a random multiple of 7 between 0 and 70:
35
```

Example2: . Python program to find the area of a triangle whose sides are given

```
import math
a = float(input("Enter the length of side a: "))
b = float(input("Enter the length of side b: "))
c = float(input("Enter the length of side c: "))
s = (a+b+c)/2
area = math.sqrt(s*(s-a)*(s-b)*(s-c))
print(" Area of the triangle is: ", area)
```

Output:

```
Enter the length of side a: 10
Enter the length of side b: 15.5
Enter the length of side c: 23.9
 Area of the triangle is:  51.69470379062058
```

Example3: Python program to find the roots of a quadratic equation

```
import math
a = float(input("Enter the first coefficient: "))
b = float(input("Enter the second coefficient: "))
c = float(input("Enter the third coefficient: "))
if (a!=0.0):
    d = (b*b)-(4*a*c)
    if (d==0.0):
        print("The roots are real and equal.")
        r = -b/(2*a)
        print("The roots are ", r,"and", r)
    elif(d>0.0):
```

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```
        print("The roots are real and distinct.")
        r1 = (-b+(math.sqrt(d)))/(2*a)
        r2 = (-b-(math.sqrt(d)))/(2*a)
        print("The root1 is: ", r1)
        print("The root2 is: ", r2)
    else:
        print("The roots are imaginary.")
        rp = -b/(2*a)
        ip = math.sqrt(-d)/(2*a)
        print("The root1 is: ", rp, "+ i",ip)
        print("The root2 is: ", rp, "- i",ip)
else:
    print("Not a quadratic equation.")
```

Output:

Enter the first coefficient: 5.5

Enter the second coefficient: 6.5

Enter the third coefficient: 7.8

The roots are imaginary.

The root1 is: -0.5909090909090909 + i 1.033928558684211

The root2 is: -0.5909090909090909 - i 1.033928558684211

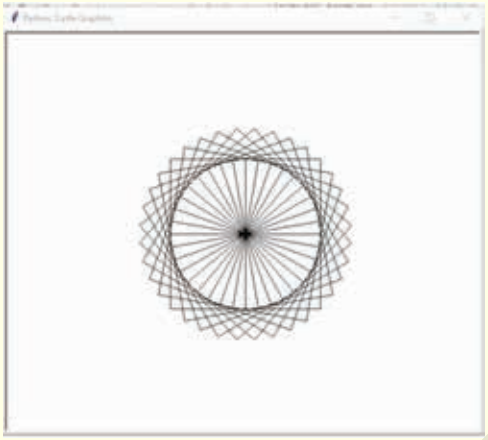
Example4: Python program to draw a circle of squares using Turtle

```
import turtle
x=turtle.Turtle()
def square(angle):
    x.forward(100)
    x.right(angle)
    x.forward(100)
    x.right(angle)
    x.forward(100)
    x.right(angle)
    x.forward(100)
    x.right(angle+10)
for i in range(36):
    square(90)
```

Output: (Fig 1)

Example5: Write a Python program to generate a random integer between 0 and 6 - excluding 6, random integer between 5 and 10 - excluding 10, random integer between 0 and 10, with a step of 3 and random date between two dates.

Fig 1



```
import datetime
print("Generate a random integer between 0 and 6:")
print(random.randrange(5))
print("Generate random integer between 5 and 10, excluding 10:")
print(random.randrange(start=5, stop=10))
print("Generate random integer between 0 and 10, with a step of 3:")
print(random.randrange(start=0, stop=10, step=3))
print("\nRandom date between two dates:")
start_dt = datetime.date(2019, 2, 1)
end_dt = datetime.date(2019, 3, 1)
time_between_dates = end_dt - start_dt
days_between_dates = time_between_dates.days
random_number_of_days = random.randrange(days_between_dates)
random_date = start_dt + datetime.timedelta(days=random_number_of_days)
print(random_date)
```

Output:

Generate a random integer between 0 and 6:

1

Generate random integer between 5 and 10, excluding 10:

6

Generate random integer between 0 and 10, with a step of 3:

0

Random date between two dates:

2019-02-26

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Installing JAVA

Objectives: At the end of this exercise you shall be able to

- **learn how to install JAVA and to set the class path, learn and execute different types of data types and operators in java, declaration of variables**
- **review and reply to comments.**

Requirements

Tools /Equipment/ Instruments

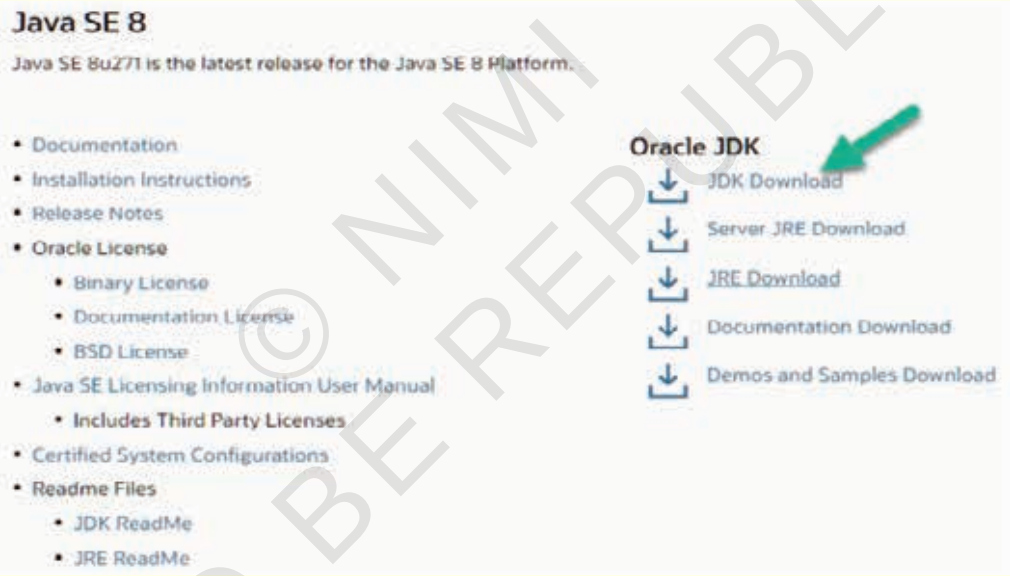
- A working PC, internet connection, Text editor, Browser & Java JDK -1 No. / trainee

PROCEDURE

TASK 1: **Installation of java**

1 open browser, go to link. Click on JDK Download for Java download JDK 8. (Fig 1)

Fig 1

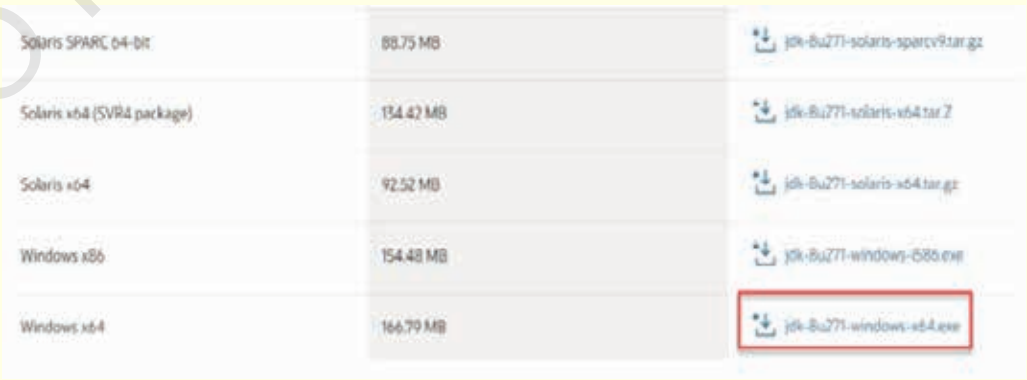


2 Next, (Fig 2)

1 Accept License Agreement

2 Download Java 8 JDK for your version 32 bit or JDK download 64 bit.

Fig 2



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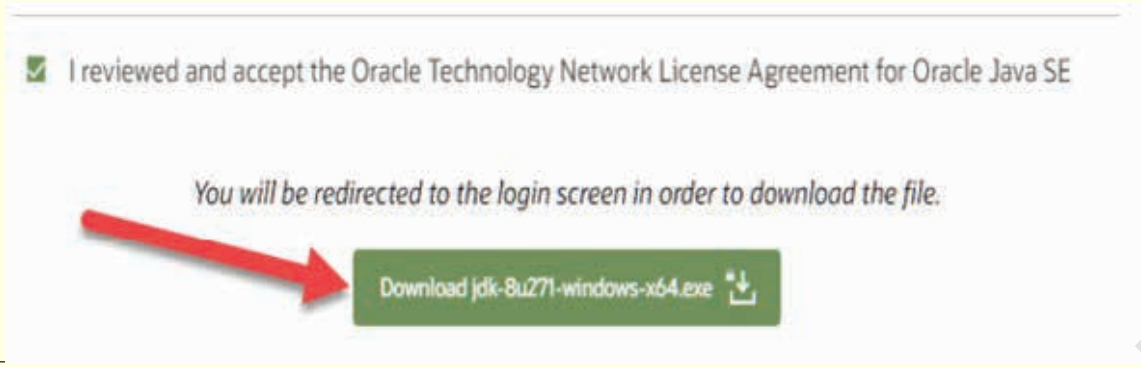
3 Click on download (Fig 3)

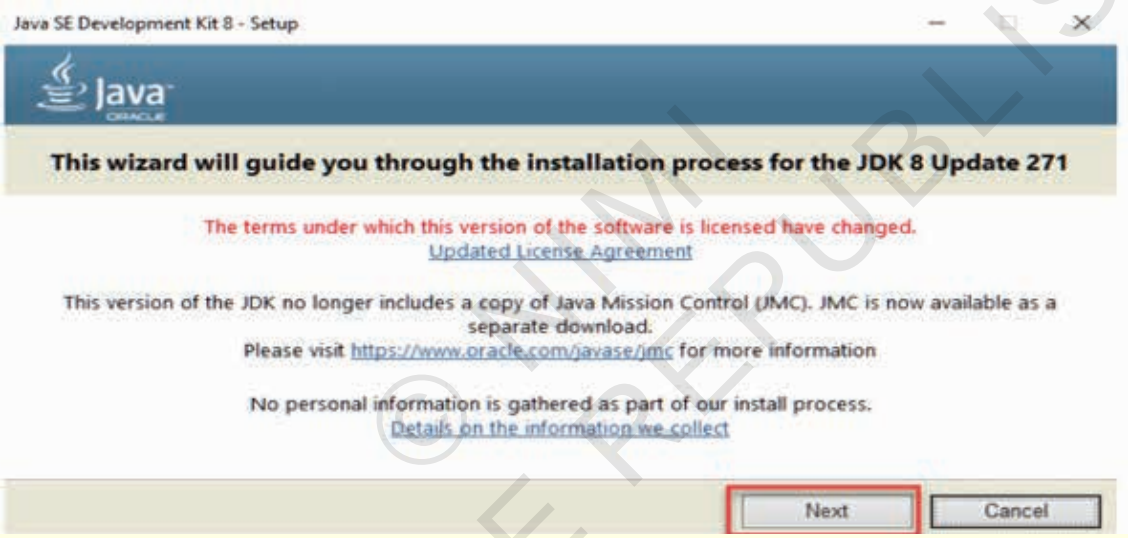
NOTE: When you click on the Installation link the popup will be open. Click on I reviewed and accept the Oracle Technology Network License Agreement for Oracle Java SE development kit and you will be redirectedto the login page. If you don't have an oracle account, you can easily sign up by adding basics details of yours.

Fig 3



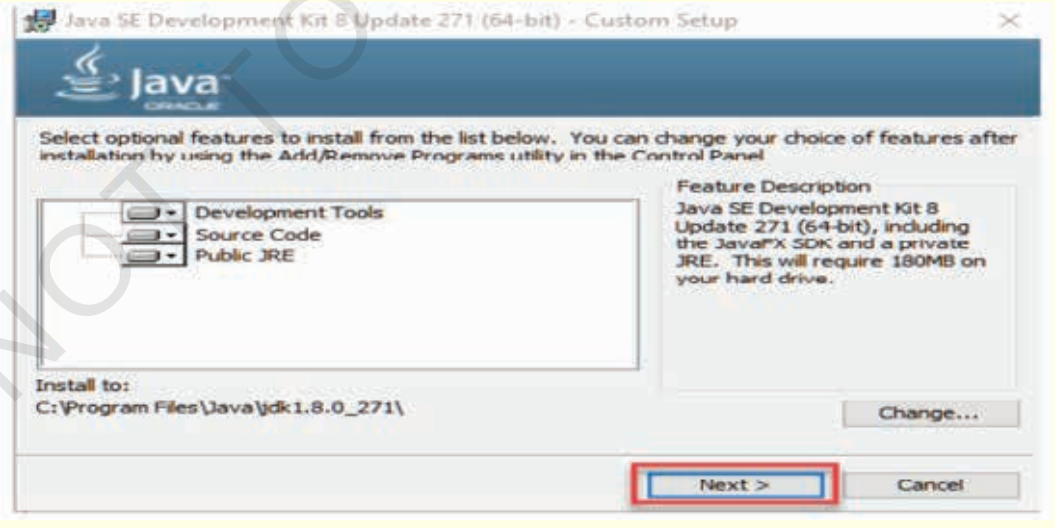
4 Once the Java JDK 8 download is complete, run the exe for install JDK. Click Next (Fig 4)

Fig 4



5 Select the PATH to install Java in Windows… You can leave it Default. Click next. (Fig 5)

Fig 5



6 Once you install Java in windows, click Close.

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Setting the Class path

Objectives: At the end of this exercise you shall be able to
- **create setting class path.**

Requirements

Tools /Equipment/ Instruments

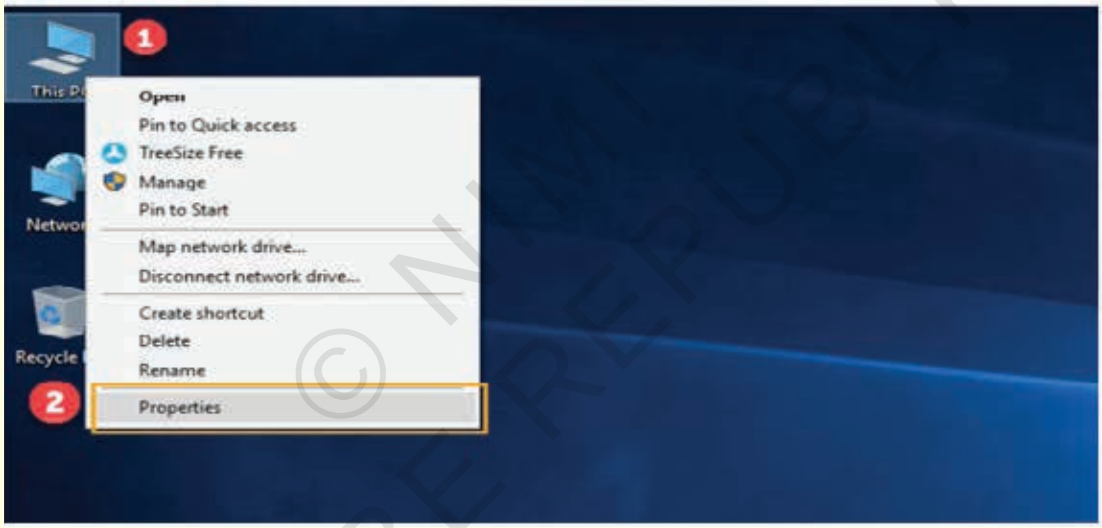
- A working PC, internet connection, Text editor, Browser & Java JDK — 1 No. / trainee

PROCEDURE

TASK 1: **Create setting class path**

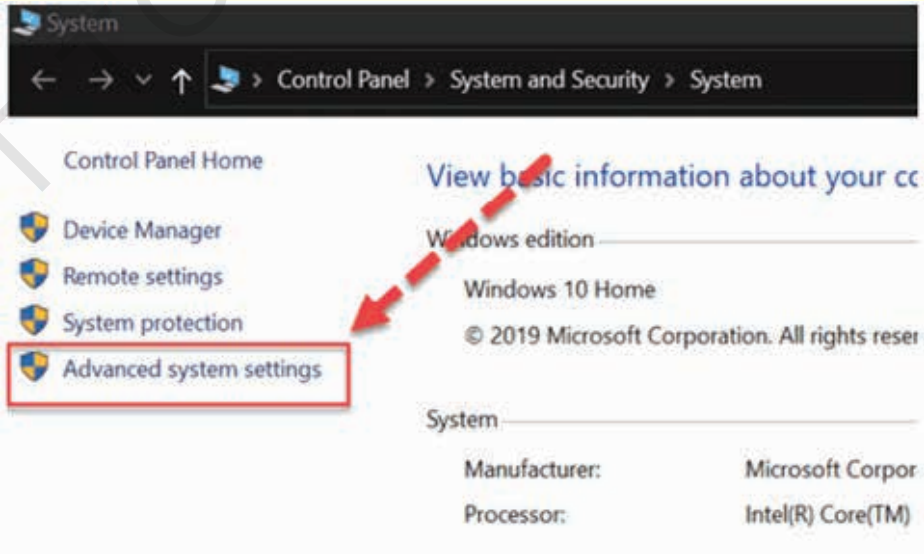
1 Right Click on the My Computer and Select the properties. (Fig 1)

Fig 1



2 Click on advanced system settings. (Fig 2)

Fig 2



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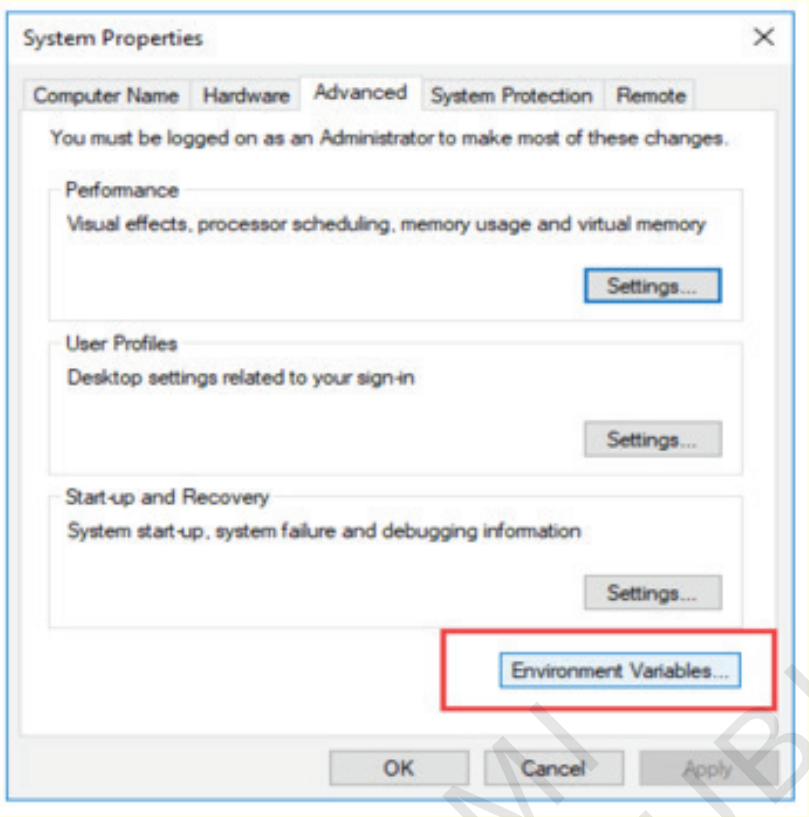
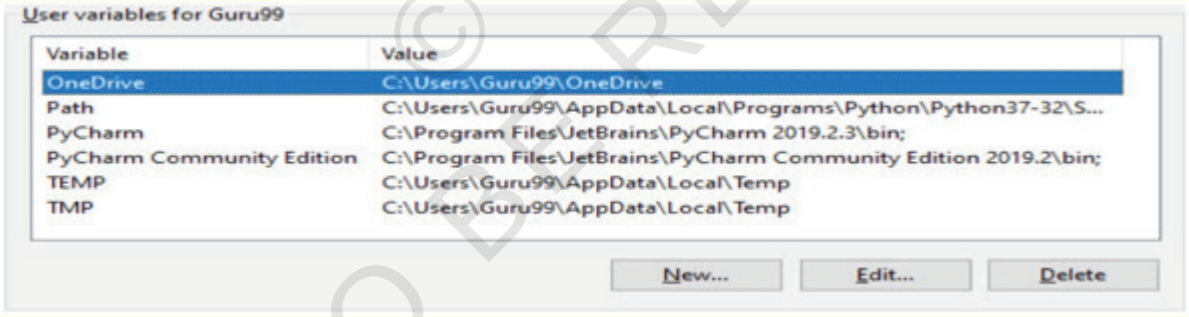
3 Click on Environment Variables to set Java runtime environment. (Fig 3)

Fig 3



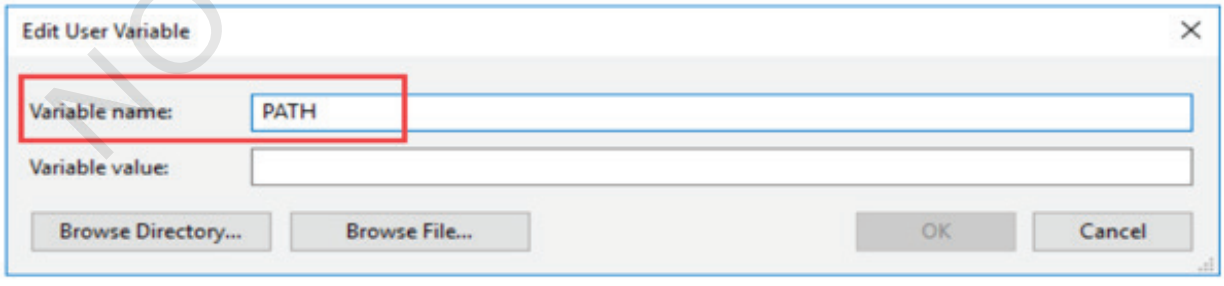
4 Click on new button of user variables. (Fig 4)

Fig 4



5 Type PATH in the variable name . (Fig 5)

Fig 5



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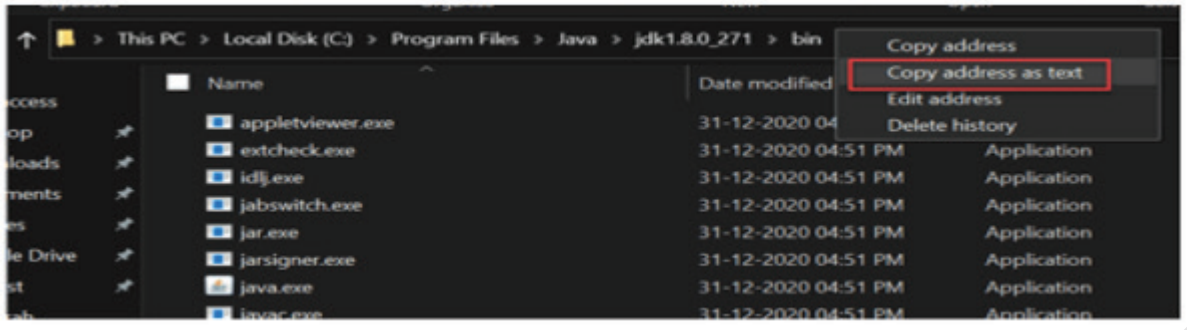
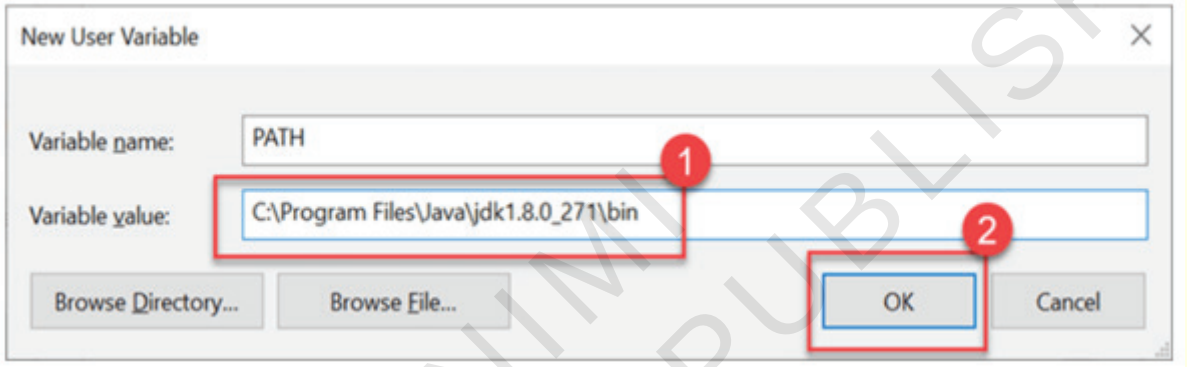
6 Copy the path of bin folder which is installed in JDK folder. (Fig 6)

Fig 6



7 Paste Path of bin folder in Variable value. Click on OK Button. (Fig 7)

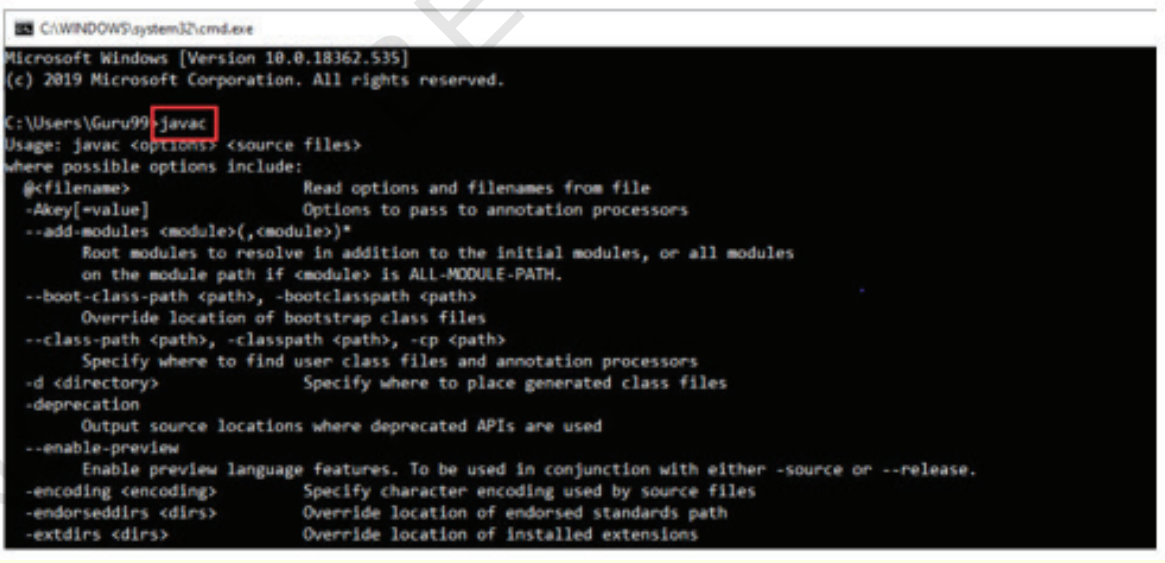
Fig 7



8 Go to command prompt and type javac commands. (Fig 8)

If you see a screen like below, Java is installed.

Fig 8



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Writing and Executing a simple JAVA Program to display “Hello”

Objectives: At the end of this exercise you shall be able to
- **write and execute java program**
- **use various data type in Java.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No. / trainee

PROCEDURE

TASK 1: **Write and execute java program**

Step 1: open text editor

Step 2: write the code

Step 3: Save the file with .java extension

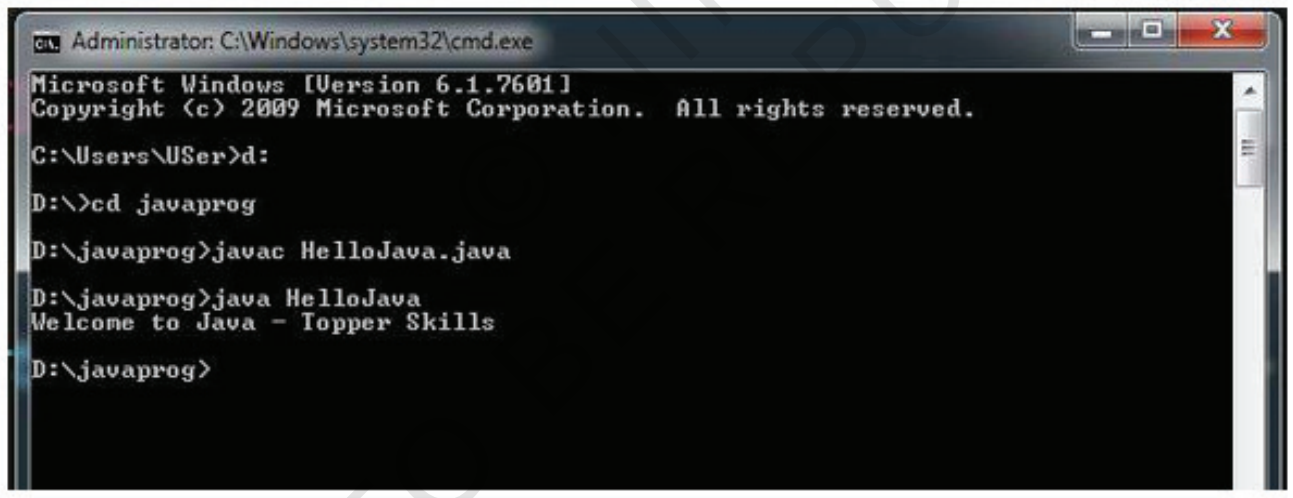
Step 4: open the command prompt

Step 5: change the file path (where your file is existing)

Step 6: give the command javac filename.java (ex: javac Demo.java)

Step 7: give command java classname (ex: java Demo) (Fig 1)

Fig 1



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Use of various data types in JAVA

Objectives: At the end of this exercise you shall be able to
- **use of various data types in JAVA.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK - 1 No. / trainee.

PROCEDURE

TASK 1: **Use various data type in Java**

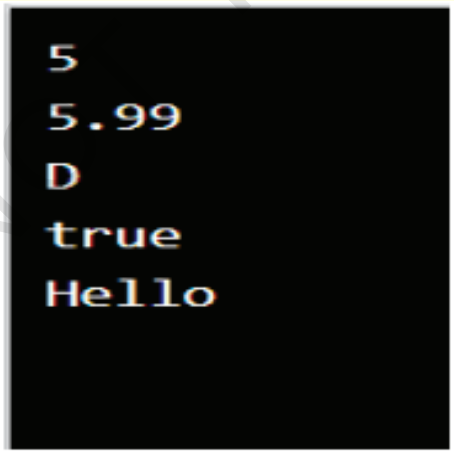
1 Create file

2 Follow the below code and execute

SOURCE CODE

```
public class Main {
       public static void main(String[] args) {
       int myNum = 5;                  // integer (whole number)
       float myFloatNum = 5.99f;       // floating point number
       char myLetter = 'D';            // character
       boolean myBool = true;          // boolean
       String myText = "Hello";        // String
       System.out.println(myNum);
       System.out.println(myFloatNum);
       System.out.println(myLetter);
       System.out.println(myBool);
       System.out.println(myText);
  }
}
```

Fig 1



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Use various operators in JAVA

Objectives: At the end of this exercise you shall be able to
- **use various operators in Java.**

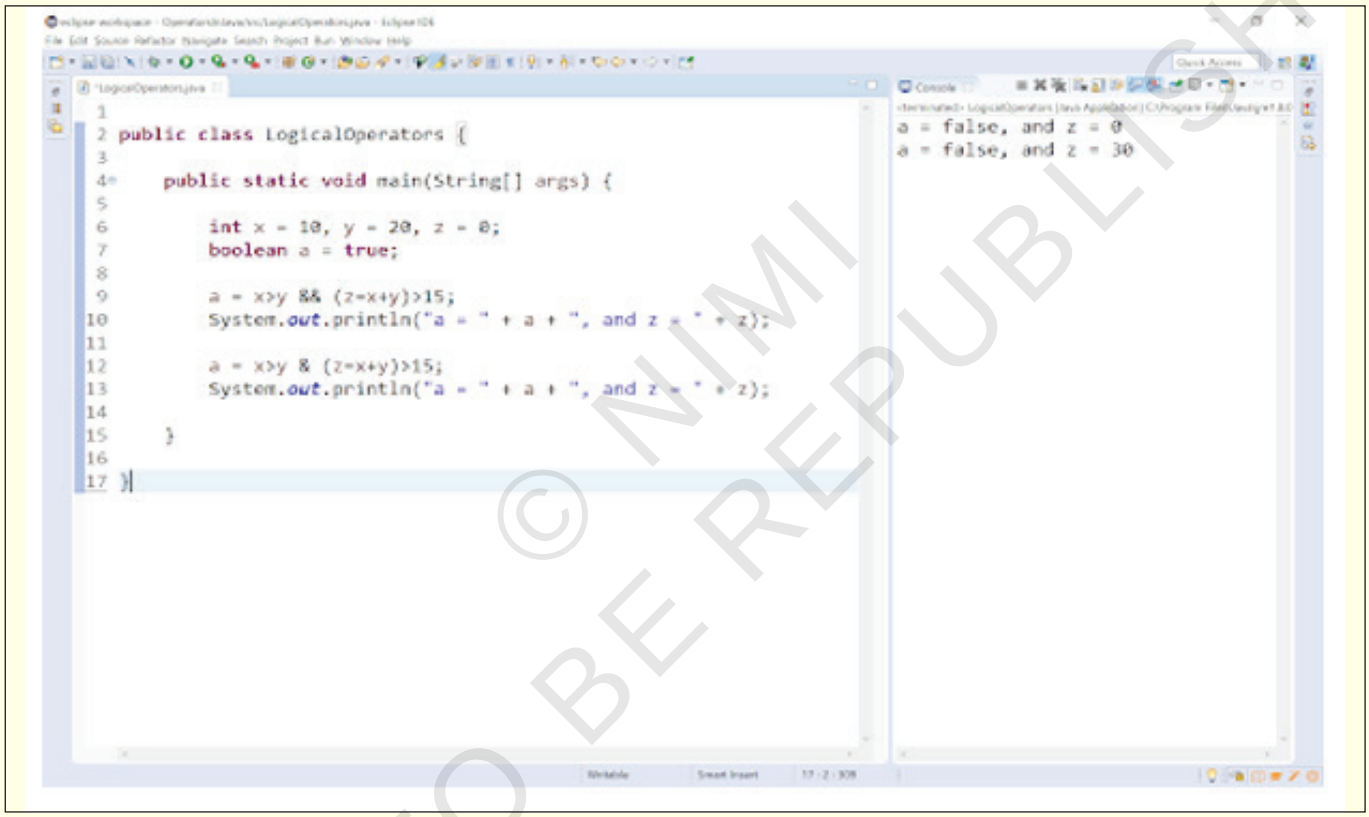
Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No. / trainee.

PROCEDURE

TASK 1: **Use various operators in Java**



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Create and use of local, Instance and class variables

Objectives: At the end of this exercise you shall be able to
- **use various operators in Java.**

Requirements	
Tools /Equipment/ Instruments	
• A working PC, internet connection, Text editor, Browser & Java JDK	-1 No. / trainee.

RelationalOperators.java

```
1  package JavaOperators;
2
3  import java.util.Scanner;
4
5  public class RelationalOperators {
6      private static Scanner sc;
7      public static void main(String[] args) {
8          int a, b;
9          sc = new Scanner(System.in);
10         System.out.println(" Please Enter two integer Value: ");
11         a = sc.nextInt();
12         b = sc.nextInt();
13
14         System.out.println(" Result of a >  b is = " + (a > b));
15         System.out.println(" Result of a >=  b is = " + (a >= b));
16         System.out.println(" Result of a <  b is = " + (a < b));
17         System.out.println(" Result of a <=  b is = " + (a <= b));
18         System.out.println(" Result of a ==  b is = " + (a == b));
19         System.out.println(" Result of a !=  b is = " + (a != b));
20     }
21 }
```

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Problems Javadoc Declaration Console

```
<terminated> RelationalOperators [Java Application] C:\Program Files\Java\jre1.8.0_73\bin\javaw.exe (Mar 16, 2016, 5
 Please Enter two integer Value:
15
30
 Result of a >  b is = false
 Result of a >=  b is = false
 Result of a <  b is = true
 Result of a <=  b is = true
 Result of a ==  b is = false
 Result of a !=  b is = true
```

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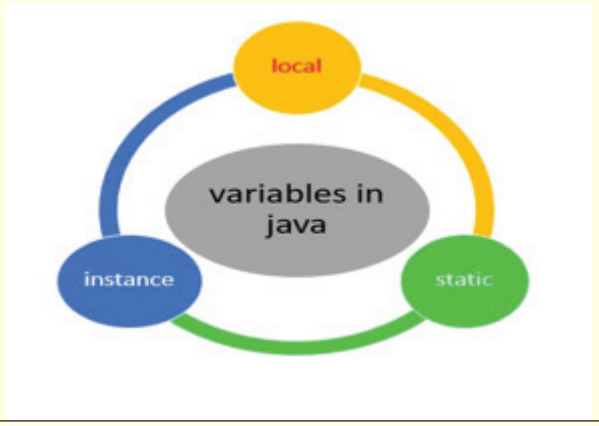
TASK 1: **Variables in Java**



- Declaring (creating) variables

Syntax: - type variableName = value;

SOURCE CODE

```
public class VariableExample{
   int myVariable;
   static int data = 30;
   public static void main(String args[]){
      int a = 100;
      VariableExample obj = new VariableExample();
      System.out.println("Value of instance variable myVariable: "+obj.myVariable);
      System.out.println("Value of static variable data: "+VariableExample.data);
      System.out.println("Value of local variable a: "+a);
   }
}
```

Fig 1

```
Value of instance variable myVariable: 0
Value of static variable data: 30
Value of local variable a: 100
```

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Read text from the keyboard using scanner class read text from keyboard using console class

Objectives: At the end of this exercise you shall be able to
- **read text from the keybroard using scanner class.**

Requirements

Tools /Equipment/ Instruments

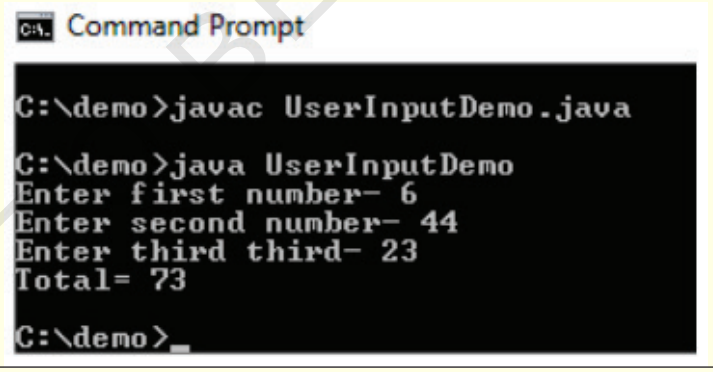
- A working PC, internet connection, Text editor, Browser & Java JDK 1 No.

Follow the below code:-

SOURCE CODE

```
import java.util.*;
class UserInputDemo
{
public static void main(String[] args)
{
Scanner sc= new Scanner(System.in);    //System.in is a standard input stream
System.out.print("Enter first number- ");
int a= sc.nextInt();
System.out.print("Enter second number- ");
int b= sc.nextInt();
System.out.print("Enter third number- ");
int c= sc.nextInt();
int d=a+b+c;
System.out.println("Total= " +d);
}
}
```

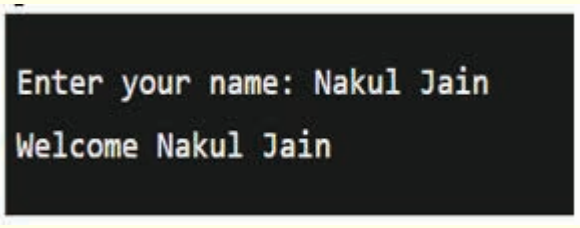
Fig 1



SOURCE CODE

```
import java.io.Console;
class ReadStringTest{
public static void main(String args[]){
Console c=System.console();
System.out.println("Enter your name: ");
String n=c.readLine();
System.out.println("Welcome "+n);
}
```

Fig 2



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Use if tge if and if ... else statement

Objectives: At the end of this exercise you shall be able to

- **learn conditional statements like IF, IF .... ELSE, Switch statement; understand difference between BREAK & CONTINUE keywords; Different kind of loops in JAVA like WHILE, DO-WHILE, FOR Loops.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No. / trainee.

PROCEDURE

TASK 1: **Use the if and if.....else statements, Break and Continue keyword**

If statement

Syntax:

```
if (condition) {
// block of code to be executed if the condition is true
}
```

Fig 1

IfStatement.java

```
1  package ConditionalStatements;
2
3  import java.util.Scanner;
4
5  public class IfStatement {
6      private static Scanner sc;
7
8      public static void main(String[] args) {
9          int Number;
10         sc = new Scanner(System.in);
11         System.out.println(" Please Enter any integer Value: ");
12         Number = sc.nextInt();
13
14         if (Number > 1) {
15             System.out.println("You have entered POSITIVE Number");
16         }
17         System.out.println("This Message is coming from Outside the IF STATEMENT");
18     }
19 }
```

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Problems Javadoc Declaration Console

```
<terminated> IfStatement [Java Application] C:\Program Files\Java\jre1.8.0_73\bin\javaw.exe (Mar 21, 2016, 2:54:23 PM)
 Please Enter any integer Value:
23
You have entered POSITIVE Number
This Message is coming from Outside the IF STATEMENT
```

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If…….else statement

Follow the below syntax:

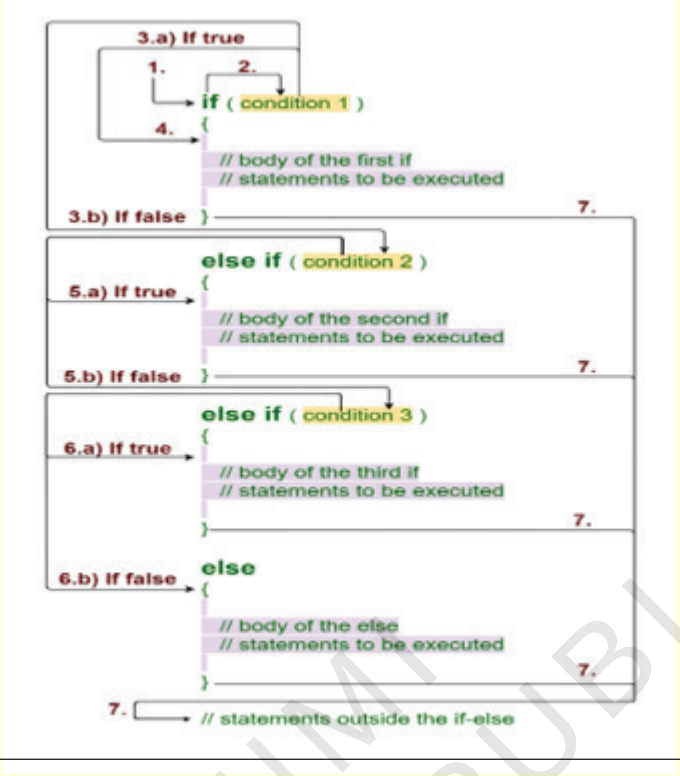
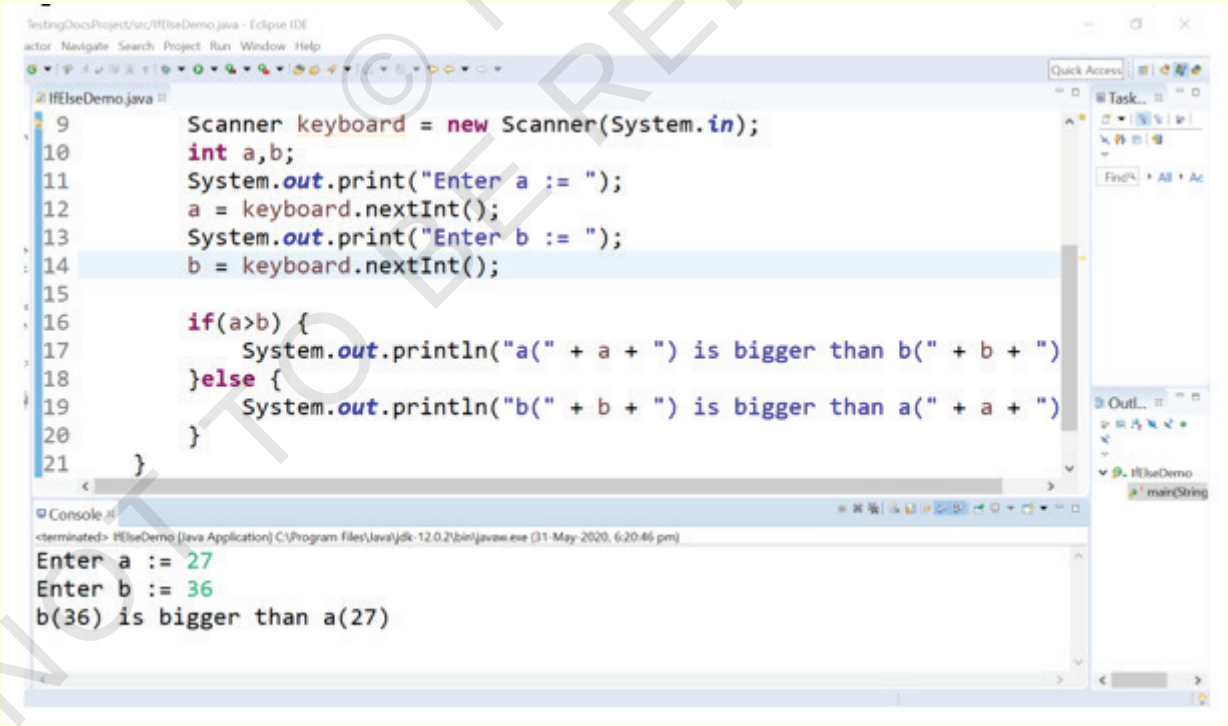


Fig 2



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Use of the Switch Statements & Break and continue keywords

Objectives: At the end of this exercise you shall be able to
- **use of the switch statements**
- **use of the break and contine keywords.**

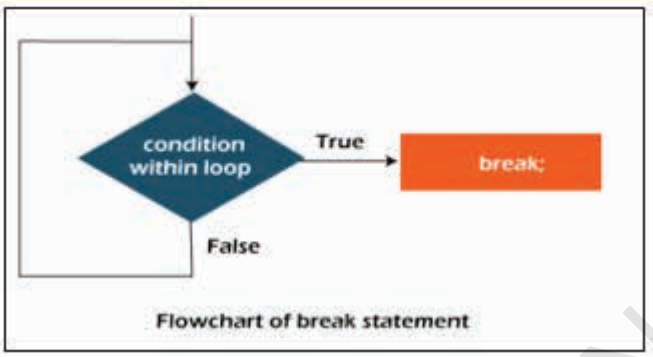
Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No. / trainee.

Switch statement & Break Keyword

Follow the below syntax:



Flowchart of break statement

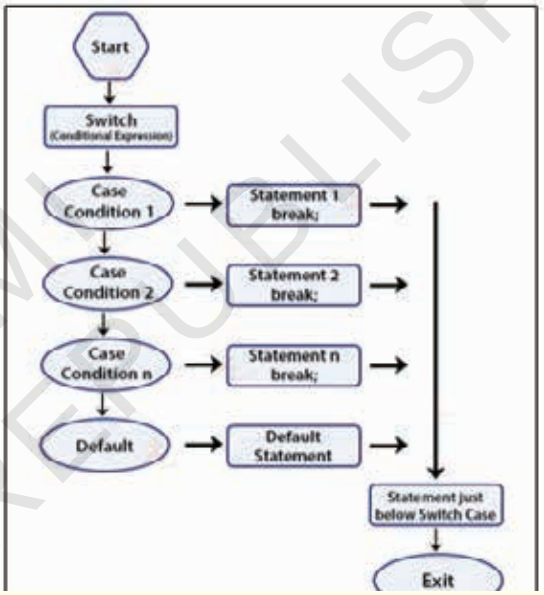


Fig 1

```
SwitchExample.java
1  package com.huongdanjava;
2
3  public class SwitchExample {
4
5      public static void main(String[] args) {
6          int n = 1;
7          switch (n) {
8              case 1:
9                  System.out.println("Khanh");
10                 break;
11             case 2:
12                 System.out.println("Huong Dan Java");
13                 break;
14             case 3:
15                 System.out.println("Lap Trinh Java");
16                 break;
17             default:
18                 break;
19         }
20     }
21
22 }
```

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```
<terminated> SwitchExample [Java Application] /Library/Java/JavaVirtualMachines/j
Khanh
```

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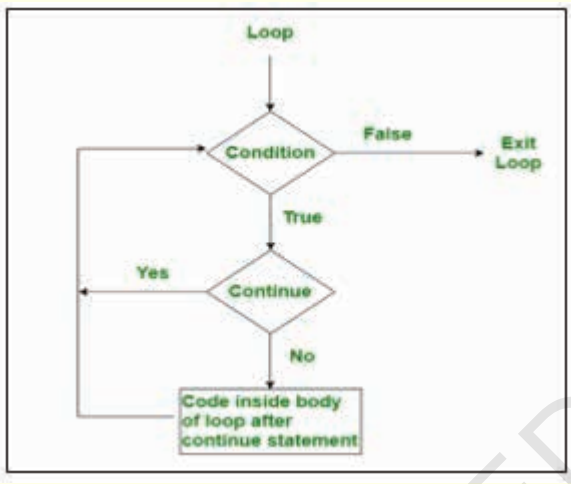
Continue Keyword

Syntax: -

jump-statement;

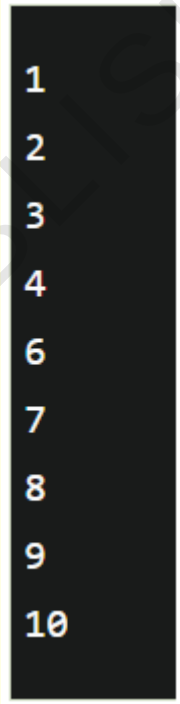
continue



SOURCE CODE

```
//inside the for loop.
public class ContinueExample {
public static void main(String[] args) {
   //for loop
   for(int i=1;i<=10;i++){
         if(i==5){
            //using continue statement
           continue;//it will skip the rest statement
          }
         System.out.println(i);
    }
}
}
```

Fig 2



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Use of the Do ... While and while - do loops

Objectives: At the end of this exercise you shall be able to
- **use of the Do ... While and while - do loops.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No. / trainee.

While loop

Syntax: -

```
while (condition){
//code to be executed
Increment / decrement statement
}
```

Fig 1

```
2
3  public class JavaWhileLoop {
4
5      public static void main(String[] args) {
6
7          int i = 5;
8          while (i <= 10) {
9              System.out.println(i);
10             i++;
11         }
12     }
13 }
14
```

Problems Javadoc Declaration Console

<terminated> JavaWhileLoop [Java Application] /Library/Java/Java

```
5
6
7
8
9
10
```

Do-While loop

Syntax: -

```
do{
//code to be executed / loop body
//update statement
}while (condition);
```

Fig 2

```
3  public class JavaDoWhileLoop {
4
5      public static void main(String[] args) {
6
7          int i = 5;
8          do {
9              System.out.println(i);
10             i++;
11         } while (i <= 10);
12     }
13 }
```

Problems Javadoc Declaration Console

<terminated> JavaDoWhileLoop [Java Application] /Library/Java/

```
5
6
7
8
9
10
```

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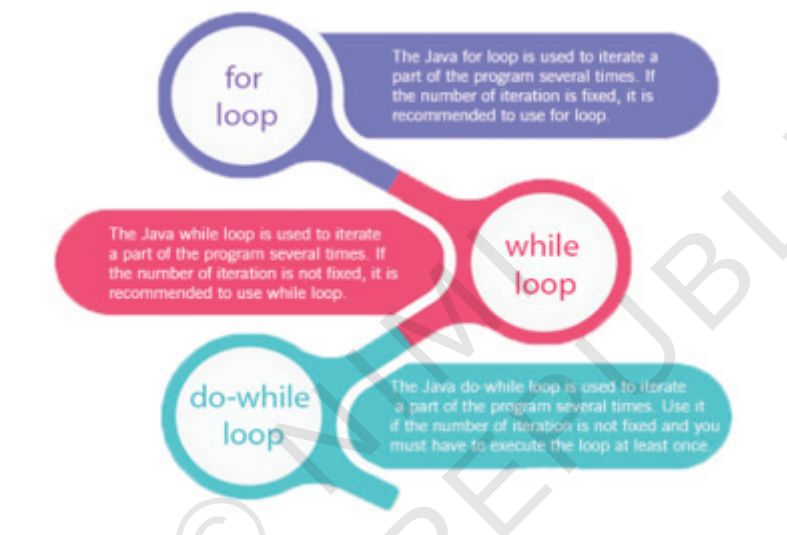
Use of the For Loop

Objectives: At the end of this exercise you shall be able to
- **use of the For Loop in JAVA.**

Requirements	
Tools /Equipment/ Instruments	
• A working PC, internet connection, Text editor, Browser & Java JDK	-1 No. / trainee.

PROCEDURE

TASK 1: **Loops in JAVA**



For loop

Syntax:

for (initialization; condition; increment/decrement) {

//statement or code to be executed

}

Fig 1

```
3  public class JavaForLoop {
4
5      public static void main(String[] args) {
6
7          //print integers 5 to 10
8          for (int i=5; i<=10; i++) {
9              System.out.println("Java for loop example - " + i);
10         }
11     }
12
13 }
```

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<terminated> JavaForLoop [Java Application] /Library/Java/JavaVirtualMachines/jdk-9.j

```
Java for loop example - 5
Java for loop example - 6
Java for loop example - 7
Java for loop example - 8
Java for loop example - 9
Java for loop example - 10
```

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Use of the JAVA Character Class Methods

Objectives: At the end of this exercise you shall be able to
- **use of the JAVA Character Class Methods.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No. / trainee.

Java Number Class

Java Number class is an abstract class which is placed in java.lang package. It has four abstract methods and two concrete methods. The abstract class Number is the superclass of classes BigDecimal, BigInteger, Byte, Double, Float, Integer, Long, and Short. This class contains a single consructor number().

Number Class Methods

Java Number class provides methods to convert the represented numeric value to byte, double, float, int, long, and short type. The various Java Number methods are as follows-

Flowchart of Break Statement

SN	Modifier & Type	Method	Description
1)	Byte	byteValue()	It converts the given number into a byte type and returns the value of the specified number as a byte.
2)	abstract double	doubleValue()	It returns the value of the specified number as a double equivalent.
3)	abstract float	floatValue()	It returns the float equivalent value of the specified Number object.
4)	abstract int	intValue()	It returns the value of the specified number as an int.
5)	abstract long	longValue()	It returns the value of the specified number object as long equivalent.
6)	short	shortValue()	It returns the value of the specified number as a short type after a primitive conversion.

Java Number byteValue() Method

The byteValue() is a method of Java Number class which automatically converts the given number into a primitive byte type and returns the value of the specified number as a byte.

Syntax:

Following is the declaration of byteValue() method:

1 public byte byteValue()

Parameter:

DataType	Parameter	Description
byte	NA	It returns the value of number object as byte.

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Returns:

The byteValue() method returns the numeric value represented by this object after conversion to the primitive byte type.

Compatibility Version:

Java 1.1 and above

Example 1

```
1  public class NumberByteValueExample1 {
2  public static void main(String[] args) {
3  Integer i = 123456;
4  //Convert number value into byte type
5  int Result = i.byteValue();
6  System.out.println("Number as Byte: "+Result);
7  }
8  }
```

Output:

Number as Byte: 64

Example 2

```
1  public class NumberByteValueExample2 {
2  public static void main(String[] args) {
3  Integer i = -123456;
4  Float f = 435f;
5  Double d = 65868.685;
6  //Convert number value into byte type
7  System.out.println("Integer Number as Byte: "+i.
   byteValue());
8  System.out.println("Float Number as Byte: "+f.
   byteValue());
9  System.out.println("Double Number as Byte: "+d.
   byteValue());
10 }
11 }
```

Output:

Integer Number as Byte: -64

Float Number as Byte: -77

Double Number as Byte: 76

Example 3

```
1  import java.io.IOException;
2  import java.util.Scanner;
3  public class NumberByteValueExample3 {
4  public static void main(String[] args)throws
   IOException {
5  Scanner scan = new Scanner(System.in);
6  System.out.print("Enter the Number Value: ");
7  Integer num = scan.nextInt();
8   //Convert number value into byte type
9  System.out.println("Integer Number as Byte: "+num.
   byteValue());
10 scan.close();
11  }
12 }
```

Output:

Enter the Number Value: ABCDEF

Exception in thread "main" java.util.InputMismatchException

at java.base/java.util.Scanner.throwFor(Scanner.java:939)

at java.base/java.util.Scanner.next(Scanner.java:1594)

at java.base/java.util.Scanner.nextInt(Scanner.java:2258)

at java.base/java.util.Scanner.nextInt(Scanner.java:2212)

at myPackage.NumberByteValueExample3.main(NumberByteValueExample3.java:9)

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Character class methods in JAVA

Objectives: At the end of this exercise you shall be able to
- **character class methods in JAVA.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No. / trainee.

PROCEDURE

TASK 1: **Character class methods in Java**

Method	Description
isUpperCase()	Tests if character is uppercase
toUpperCase()	Returns the uppercase equivalent of the argument; no change is made if the argument is not a lowercase letter
isLowerCase()	Tests if character is lowercase
toLowerCase()	Returns the lowercase equivalent of the argument; no change is made if the argument is not an uppercase letter
isDigit()	Returns true if the argument is a digit (0–9) and false otherwise
isLetter()	Returns true if the argument is a letter and false otherwise
isLetterOrDigit()	Returns true if the argument is a letter or digit and false otherwise
isWhitespace()	Returns true if the argument is whitespace and false otherwise; this includes the space, tab, newline, carriage return, and form feed

```
public class Test {

   public static void main(String args[]) {
      //isLetter()........
      System.out.println(Character.isLetter('S'));
      System.out.println(Character.isLetter('9'));
      //isDigit()..........
      System.out.println(Character.isDigit('S'));
      System.out.println(Character.isDigit('9'));
      //isWhitespace()........
      System.out.println(Character.isWhitespace('S'));
      System.out.println(Character.isWhitespace(' '));
      System.out.println(Character.isWhitespace('\n'));
      //isUpperCase()........
      System.out.println(Character.isUpperCase('M'));
      System.out.println(Character.isUpperCase('m'));
      //isLowerCase()..........
      System.out.println(Character.isLowerCase('g'));
      System.out.println(Character.isLowerCase('G'));
      //toUpperCase()..........
      System.out.println(Character.toUpperCase('a'));
      //toLowerCase()..........
      System.out.println(Character.toLowerCase('A'));
   }
}
```

Fig 1

```
true
false
false
true
false
true
true
true
false
true
false
A
a
```

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String class methods in JAVA

Objectives: At the end of this exercise you shall be able to
- **string class methods in JAVA.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No. / trainee.

PROCEDURE

TASK 1: **String class methods in Java**

Follow below example: -

```
public class Test {

   public static void main(String args[]) {
      // create first string
    String first = "Java ";
    System.out.println("First String: " + first);
    // create second
    String second = "Programming";
    System.out.println("Second String: " + second);
    // join two strings
    String joinedString = first.concat(second);
    System.out.println("Joined String: " + joinedString);
    System.out.println("-------------------------------------------------");

    // create 3 strings
    String first1 = "java programming";
    String second1 = "java programming";
    String third1 = "python programming";
    // compare first and second strings
    boolean result1 = first1.equals(second1);
    System.out.println("strings first and second are equal: " + result1);
    // compare first and third strings
    boolean result2 = first1.equals(third1);
    System.out.println("strings first and third are equal: " + result2);
    System.out.println("-------------------------------------------------");

    String str1 = "bat ball";
    // replace b with c
    System.out.println(str1.replace('b', 'c'));
    System.out.println("-------------------------------------------------");

    String text = "Java is a fun programming language";
    // split string from space
    String[] result = text.split(" ");
    System.out.print("result = ");
    for (String str : result) {
      System.out.print(str + ", ");
    }
   }
}
```

Fig 1

```
First String: Java
Second String: Programming
Joined String: Java Programming
-------------------------------------------------
Strings first and second are equal: true
Strings first and third are equal: false
-------------------------------------------------
cat call
-------------------------------------------------
result = Java, is, a, fun, programming, language,
```

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Create and use array

Objectives: At the end of this exercise you shall be able to
- **create and use array.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No. / trainee.

PROCEDURE

TASK 1: **Create and use array**

1 To declare an array, define the variable type with square brackets.

2 use comma to separate inserted value.

SOURCE CODE

```
public class Main {
  public static void main(String[] args) {
    String[] cars = {“Volvo”, “BMW”, “Ford”, “Mazda”};
    System.out.println(cars[0]);
    int[] num = {23,12,9,17};
    System.out.println(num[2]);
  }
}
```

Fig 1

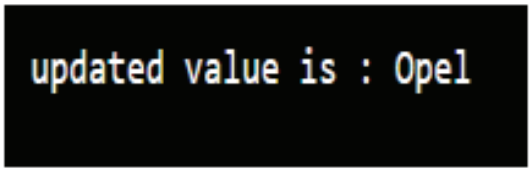
Change an Array Element:

To change the value of a specific element, refer to the index number.

SOURCE CODE

```
public class Main {
  public static void main(String[] args) {
    String[] cars = {“Volvo”, “BMW”, “Ford”, “Mazda”};
    cars[0] = “Opel”;
    System.out.println(“updated value is : “+cars[0]);
  }
}
```

Fig 2



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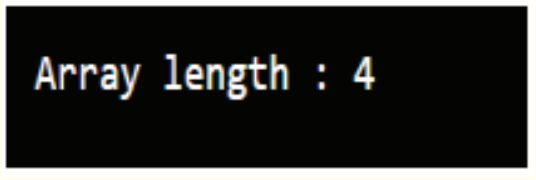
To find out how many elements an array has, use the length property:

SOURCE CODE

```
public class Main {
  public static void main(String[] args) {
    String[] cars = {“Volvo”, “BMW”, “Ford”, “Mazda”};
    System.out.println(“Array length : “+cars.length);
  }
}
```

Fig 3



Loop Through an Array :

1 use for loop

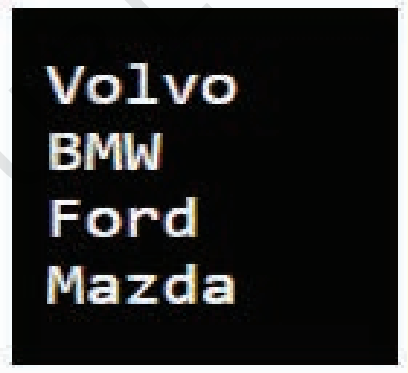
2 use length property

3 follow the below code

SOURCE CODE

```
public class Main {
  public static void main(String[] args) {
    String[] cars = {“Volvo”, “BMW”, “Ford”, “Mazda”};
    for (int i = 0; i < cars.length; i++) {
      System.out.println(cars[i]);
    }
  }
}
```

Fig 4



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Create and use of simple classes, objects and methods in JAVA

Objectives: At the end of this exercise you shall be able to
- **create and use of simple classes, objects and methods in JAVA.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK - 1 No.

PROCEDURE

TASK 1: **Create and use simple classes, objects and methods in JAVA**

1 To create class, use “class” keyword.

2 To create object use “new” keyword.

3 To declare method use “access_modifier return_type function_name()” .

SOURCE CODE

```
// Create a Main class
public class Main {

  // Create a fullThrottle() method
  public void fullThrottle() {
    System.out.println(“The car is going as fast as it can!”);
  }

  // Create a speed() method and add a parameter
  public void speed(int maxSpeed) {
    System.out.println(“Max speed is: “ + maxSpeed);
  }

  // Inside main, call the methods on the myCar object
  public static void main(String[] args) {
    Main myCar = new Main();     // Create a myCar object
    myCar.fullThrottle();      // Call the fullThrottle() method
    myCar.speed(200);          // Call the speed() method
  }
}
```

Fig 1

```
The car is going as fast as it can!
Max speed is: 200
```

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Passing and returning data and objects to method

Objectives: At the end of this exercise you shall be able to
- **Passing and returning data and objects to method.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No.

PROCEDURE

TASK 1: **Passing and returning data and objects to method**

1 Follow below code

2 Save that with '.java' extension

3 Compile and run that.

SOURCE CODE

```
public class PassByValue {
   static int k =10;
   static void passPrimitive(int j) {
      System.out.println("the value of passed primitive is " + j);
      j = j + 1;
   }
   static void passReference(EmployeeTest emp) {
      EmployeeTest reference = emp;
      System.out.println("the value of name property of our object is "+ emp.getName());
      reference.setName("Bond");
   }
   public static void main(String[] args) {
      EmployeeTest ref = new EmployeeTest();
      ref.setName("James");
      passPrimitive(k);
      System.out.println("Value of primitive after get passed to method is "+ k);
      passReference(ref);
       System.out.println("Value of property of object after reference get passed to method
is "+          ref.getName());
   }
}
class EmployeeTest {
   String name;
   public String getName() {
      return name;
   }
   public void setName(String name) {
      this.name = name;
   }
}
```

Fig 1

Output

```
the value of passed primitive is 10
Value of primitive after get passed to method is 10
the value of name property of our object is James
Value of property of object after reference get passed to method is Bond
```

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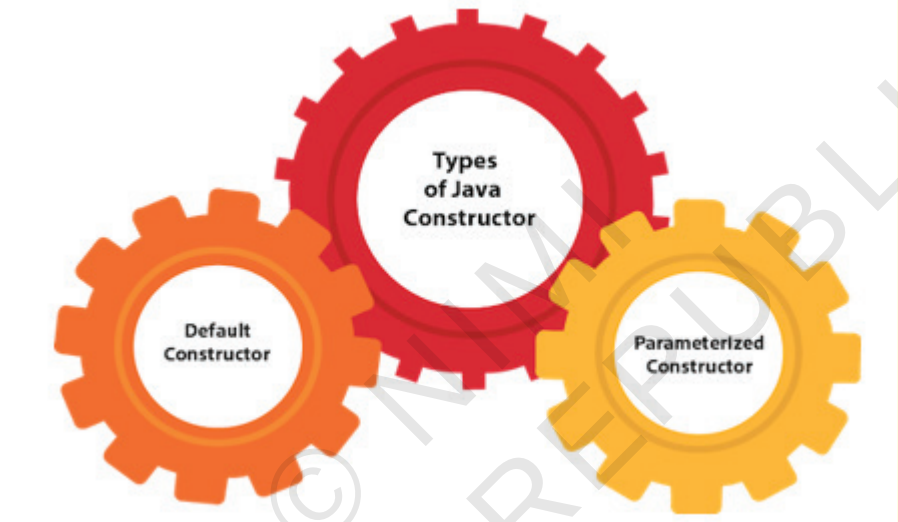
Use constructors in JAVA

Objectives: At the end of this exercise you shall be able to
- **use constructors in JAVA.**

Requirements	
Tools /Equipment/ Instruments	
• A working PC, internet connection, Text editor, Browser & Java JDK	-1 No.

PROCEDURE

TASK 1: **use constructors in Java**




```
public class College {
 College()
 {
    .....
 }
 College(String name, int year)
 {
  this(name);
    .......
 }
 College(String name)
 {
  this();
  .....
 }
public static void main(String [ ] args)
{
  College c=new College("ISM", 1926 );
 }
}
```

Calls default constructor

Calls one argument constructor

Calls two arguments constructor

Fig: Constructor chaining in the same class using this keyword

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1 Constructor name must be the same as its class name

2 A Constructor must have no explicit return type

3 A Java constructor cannot be abstract, static, final, and synchronized

NOTE: You can use access modifiers while declaring a constructor. It controls the object creation. In other words, we can have private, protected, public or default constructor in Java.

SOURCE CODE

```
// Java program to illustrate Constructor Chaining
// within same class Using this() keyword
class Temp
{
   // default constructor 1
   // default constructor will call another constructor
   // using this keyword from same class
   Temp()
   {
      // calls constructor 2
      this(5);
      System.out.println("The Default constructor");
   }

   // parameterized constructor 2
   Temp(int x)
   {
      // calls constructor 3
      this(5, 15);
      System.out.println(x);
   }

   // parameterized constructor 3
   Temp(int x, int y)
   {
      System.out.println(x * y);
   }

   public static void main(String args[])
   {
      // invokes default constructor first
      new Temp();
   }
}
```

Fig 1

Output:

```
75
5
The Default constructor
```

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Create and use overloaded methods in JAVA

Objectives: At the end of this exercise you shall be able to
- **create and use overloaded methods in JAVA.**

Requirements

Tools /Equipment/ Instruments

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No.

PROCEDURE

TASK 1: **Create and use overloaded methods in Java**

There are two ways to overload the method in java

1 By changing number of arguments

2 By changing the data type

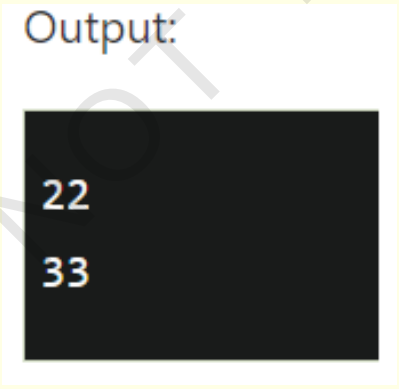
NOTE: In Java, Method Overloading is not possible by changing the return type of the method only.

- **Method Overloading: changing no. of arguments**

SOURCE CODE

```
class Adder{
static int add(int a,int b){return a+b;}
static int add(int a,int b,int c){return
a+b+c;}
}
class TestOverloading1{
public static void main(String[] args){
System.out.println(Adder.add(11,11));
System.out.println(Adder.add(11,11,11));
}
}
```

Fig 1

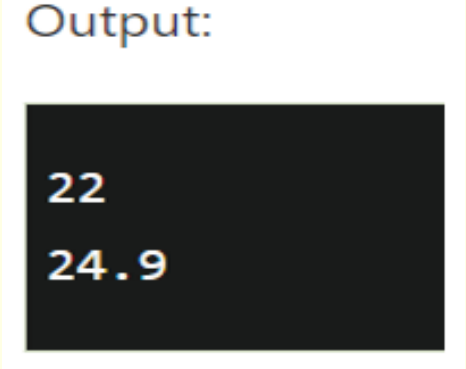


- **Method Overloading: changing data types of arguments**

SOURCE CODE

```
class Adder{
static int add(int a, int b){
 return a+b;
}
static double add(double a, double b){
     return a+b;
}
}
class TestOverloading2{
public static void main(String[] args){
.System.out.println(Adder.add(11,11));
.System.out.println(Adder.
add(12.3,12.6));
.}
}
```

Fig 2



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Override methods in JAVA

Objectives: At the end of this exercise you shall be able to
- **create and use of Overriding methods in JAVA.**

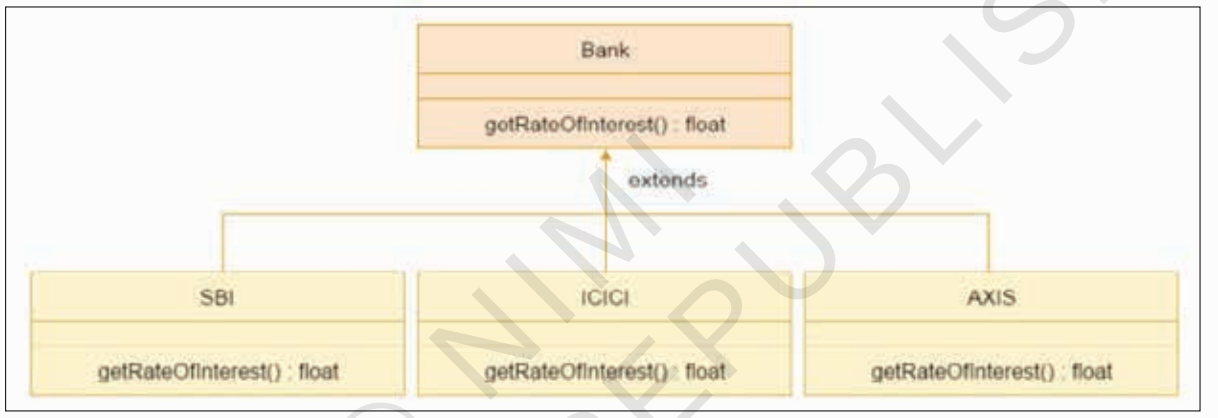
Requirements

Tools /Equipment/ Instruments
- A working PC, internet connection, Text editor, Browser & Java JDK -1 No.

PROCEDURE

TASK 1: **Create and use of Overriding methods in JAVA**

1 The method must have the same name as in the parent class
2 The method must have the same parameter as in the parent class.
3 There must be an IS-A relationship (inheritance).



SOURCE CODE

```
//Java Program to demonstrate the real scenario of Java Method Overriding
   //where three classes are overriding the method of a parent class.
   //Creating a parent class.
   class Bank{
   int getRateOfInterest(){return 0;}
}
   //Creating child classes.
   class SBI extends Bank{
   int getRateOfInterest(){return 8;}
}
class ICICI extends Bank{
int getRateOfInterest(){return 7;}
}
class AXIS extends Bank{
int getRateOfInterest(){return 9;}
}
//Test class to create objects and call the methods
class Test2{
public static void main(String args[]){
SBI s=new SBI();
ICICI i=new ICICI();
AXIS a=new AXIS();
System.out.println("SBI Rate of Interest: "+s.getRateOfInterest());
System.out.println("ICICI Rate of Interest: "+i.getRateOfInterest());
System.out.println("AXIS Rate of Interest: "+a.getRateOfInterest());
}
}
```

Fig 1

```
Output:
SBI Rate of Interest: 8
ICICI Rate of Interest: 7
AXIS Rate of Interest: 9
```

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Create and use super class, sub class in JAVA

Objectives: At the end of this exercise you shall be able to
- **create and use super class and sub class.**

Requirements	
Tools /Equipment/ Instruments	
• A working PC, internet connection, Text editor, Browser & Java JDK	-1 No.

PROCEDURE

TASK 1: **Create and use super class and sub class**

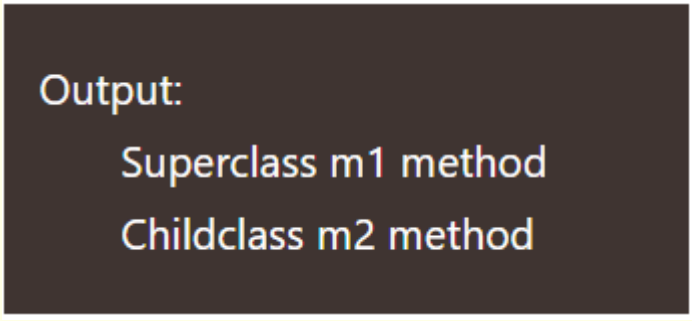
- subclass (child) - the class that inherits from another class
- superclass (parent) - the class being inherited from

To inherit from a class, use the extends keyword.

SOURCE CODE

```
Package inheritance;
public class Parentclass
{
  void m1()
  {
    System.out.println("Superclass m1 method");
  }
}
public class Childclass extends Parentclass
{
  void m2()
  {
     System.out.println("Childclass m2 method");
  }
}
public class Test
{
  public static void main(String[] args)
  {
 // Creating an object of superclass.
   Childclass c = new Childclass(); // Accessing superclass and subclass members using
   subclass object reference variable.
    c.m1();
    c.m2();
   }
 }
```

Fig 1



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Virtual methods, abstract class in JAVA

Objectives: At the end of this exercise you shall be able to:

- **create thread and know about some methods of the Thread class and multithreading**
- **handle exceptions. Know about try-catch, "throw" & "finally" keyword, virtual method and abstract class and methods.**

Requirements

Tools/Equipment/Machines

- A working PC, internet connection, Text editor, Browser & Java JDK — 1 No.

PROCEDURE

TASK 1: **Create and use virtual methods**

1 You can override the virtual function with the inheriting class function using the same function name.

2 The virtual function is supposed to be defined in the derived class. You can call it by referring to the derived class's object using the reference or pointer of the base class.

3 A virtual function should have the same name and parameters in the base and derived class.

4 For the virtual function, an IS-A relationship is necessary, which is used to define the class hierarchy in inheritance.

The Virtual function cannot be private, as the private functions cannot be overridden.

5 A virtual function or method also cannot be final, as the final methods also cannot be overridden.

6 Static functions are also cannot be overridden; so, a virtual function should not be static.

7 By default, every non-static method in Java is a virtual function

Let's understand it with some examples:

Parent.Java:

SOURCE CODE

```
class Parent {
void v1() //Declaring function
{
System.out.println("Inside the Parent Class");
}
}
```

Child.java:

SOURCE CODE

```
public class Child extends Parent{
    void v1() // Overriding function from the Parent class
    {
    System.out.println("Inside the Child Class");
    }
    public static void main(String args[]){
    Parent ob1 = new Child(); //Refering the child class object using the parent class
    ob1.v1();
    }
    }
```

Output:

```
Inside the Child Class
```

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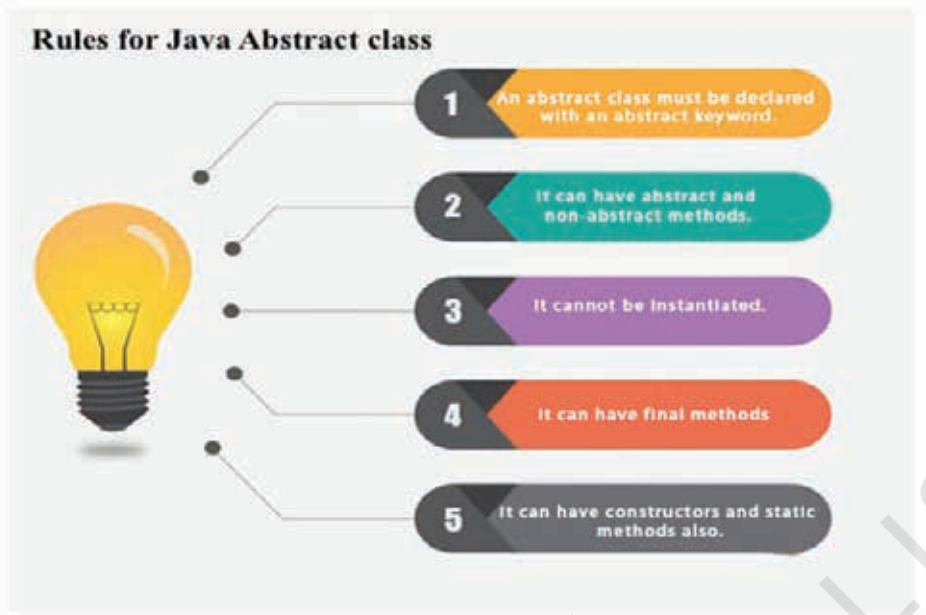
TASK 2: **Create abstract class and methods**

1 Create abstract class and methods as follows.



SOURCE CODE

```
abstract class Bike{
  abstract void run();
}
class Honda4 extends Bike{
void run(){System.out.println("running safely");}
public static void main(String args[]){
 Bike obj = new Honda4();
 obj.run();
}
}
```

Compile by: javac Honda4.java

Run by: java Honda4

```
running safely..
```

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Create interfaces in JAVA

Objectives: At the end of this exercise you shall be able to:
- **create interfaces in JAVA.**

Requirements

Tools/Equipment/Machines

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No.

PROCEDURE

TASK 1: **Create interfaces in JAVA**

1 To declare an interface use “interface” keyword.

Syntax:

```
interface <interface_name>{
// declare constant fields
// declare methods that abstract
// by default.
}
```

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Override method in JAVA

Objectives: At the end of this exercise you shall be able to:
- **override method in JAVA.**

Requirements

Tools/Equipment/Machines

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No.

PROCEDURE

TASK 1: **Override method in JAVA**

There are two ways to overload the method in java

1 By changing number of arguments.

2 By changing the data type.

NOTE: In Java, Method Overloading is not possible by changing the return type of the method only

Fig 1

```
Parent's show()
Child's show()
```

SOURCE CODE

```
// A Simple Java program to demonstrate
// method overriding in java
// Base Class
class Parent {
        void show()
        {
                System.out.println("Parent's show()");
        }
}

// Inherited class
class Child extends Parent {
        // This method overrides show() of Parent
        @Override
        void show()
        {
                System.out.println("Child's show()");
        }
}

// Driver class
class Main {
        public static void main(String[] args)
        {
                // If a Parent type reference refers
                // to a Parent object, then Parent's
                // show is called
                Parent obj1 = new Parent();
                obj1.show();

                // If a Parent type reference refers
                // to a Child object Child's show()
                // is called. This is called RUN TIME
                // POLYMORPHISM.
                Parent obj2 = new Child();
                obj2.show();
        }
}
```

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Create and implement interfaces in JAVA

Objectives: At the end of this exercise you shall be able to:
- **create and implement interfaces in Java.**

Requirements

Tools/Equipment/Machines

- A working PC, internet connection, Text editor, Browser & Java JDK — 1 No.

PROCEDURE

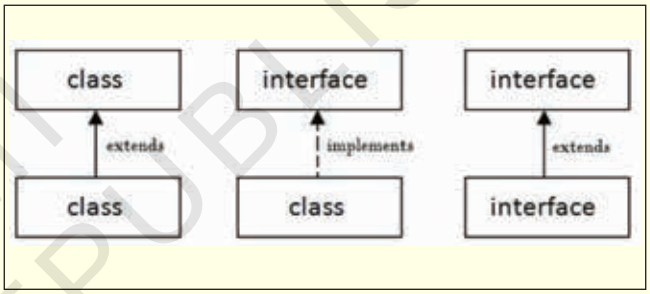
TASK 1: **Create and implement interfaces in JAVA**

1 To implement interface use “implements” keyword.

2 You cannot instantiate an interface.

3 An interface does not contain any constructors.

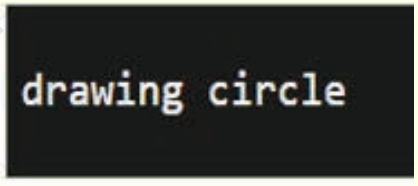
4 All of the methods in an interface are abstract.



SOURCE CODE

```
//Interface declaration: by first user
interface Drawable{
void draw();
}
//Implementation: by second user
class Rectangle implements Drawable{
public void draw(){System.out.println("drawing rectangle");}
}
class Circle implements Drawable{
public void draw(){System.out.println("drawing circle");}
}
//Using interface: by third user
class TestInterface1{
public static void main(String args[]){
Drawable d=new Circle();//In real scenario, object is provided by method e.g. getDrawable()
d.draw();
}}
```

Fig 1



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Extend interfaces in Java

Objectives: At the end of this exercise you shall be able to:
- **extend interfaces in Java.**

Requirements

Tools/Equipment/Machines

- A working PC, internet connection, Text editor, Browser & Java JDK -1 No.

PROCEDURE

TASK 1: **Extend interfaces in Java**

1 To extend any interface use “extends” keyword.

SOURCE CODE

```
interface Printable{
void print();
}
interface Showable extends Printable{
void show();
}
class TestInterface4 implements Showable{
public void print(){System.out.println("Hello");}
public void show(){System.out.println("Welcome");}

public static void main(String args[]){
TestInterface4 obj = new TestInterface4();
obj.print();
obj.show();
 }
}
```

Fig 1

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Create and use a package in JAVA

Objectives: At the end of this exercise you shall be able to:
- **create and use a package in JAVA.**

Requirements

Tools/Equipment/Machines

- A working PC, internet connection, Text editor, Browser & Java JDK — 1 No.

PROCEDURE

TASK 1: **Create and use a package in JAVA**

1 To create package use “package” keyword

2 Follow below syntax:

package package_name;

Procedure

1. To generate the output from the above program
Command: javac Demo.java

2. This Command Will Give you a Class File
Command: javac -d . Demo.java

3. So This Command Will Create a New Folder Called **data**.
Command: java data.Demo

Note: *In data Demo.java & Demo.class File should be present*

SOURCE CODE (ncj.java)

```
// Name of the package
import data.*;

// Class to which the package belongs
class ncj {

        // main driver method
        public static void main(String arg[])
        {

                // Creating an object of Demo class
                Demo d = new Demo();

                // Calling the functions show() and view()
                // using the object of Demo class
                d.show();
                d.view();
        }
}
```

SOURCE CODE (Demo.java)

```
// Name of package to be created
package data;

// Class to which the above package belongs
public class Demo {

        // Member functions of the class- 'Demo'
        // Method 1 - To show()
        public void show()
        {

                // Print message
                System.out.println("Hi Everyone");
        }

        // Method 2 - To show()
        public void view()
        {

                // Print message
                System.out.println("Hello");
        }
}
```

Procedure

Again the following commands will be used in order to generate the output as first a file ill be created **‘ncj.java’** outside the **data** directory.
Command: javac Demo.java
The Above Command Will Give us a class file that is non-runnable so we do need a command further to make it an executable run file.

Command: java ncj
// To Run This File
Output: Generated on the terminal after the above command Is executed

Fig 1

```
Hi Everyone
Hello
```

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Basic troubleshooting tips for Java issues

Objectives: **At the end of this exercise you shall be able to**:
- **download and Install Java**
- **use Java, test Java**
- **remove Old Versions of Java**
- **find Java, always redirected to the java.com download page.**

TASK 1: **Download and Install Java**

1 If you are having problems related to Java, the following tips should help you getting things working.

2 Try the offline installer package (Windows only)

3 The offline installer package will often complete successfully even though the online

4 installer package has encountered a problem. The offline installer package file is large and will take longer to download than the online installer.

- Download the Windows Offline installer

5 Uninstall any non-working Java installations

6 Remove prior installations of Java that are not working before trying to install again.

- Uninstall Java for Windows
- Uninstall Java for Mac

7 Temporarily turn off firewall or antivirus clients

8 Active firewall or antivirus software may prevent Java from installing properly.

9 Remember to turn your firewall or antivirus software back on when you have successfully completed the Java install.

10 Why do I get file corrupt message during Java installation?

11 This message is most commonly seen by Windows XP users. Running a Microsoft utility and trying the offline installer may resolve the issue. See the installshield FAQ for more details.

— — — — —

TASK 2: **Check and verify java configuration and Test JAVA**

1 This application will check for Java versions on your computer.

2 Out-of-date versions of Java on your computer may present a serious security risk. If out-of-date versions are found, this tool will help you remove them.

3 Close applications and other browser windows, and make sure there are no other installations pending, before continuing.

4 UAC (User Account Control) dialogs As removing Java from your computer requires administrative permissions, when the application is started, Windows might trigger a warning requesting permission to run as an administrator.

— — — — —

TASK 3: **Remove old versions of JAVA**

Why should I uninstall older versions of Java from my system?

This article applies to:

1 Platform(s): Windows 10, Windows 7, Windows 8, Windows Vista, Windows XP, Windows 2008 Server, Windows Server 2012

2 Windows Users: Improve the security of your computer by checking for old versions of Java and removing them when you install Java 8 (8u20 and later versions) or by using the Java Uninstall Tool.

3 The latest version of Java is always the recommended version as it contains feature updates, vulnerability fixes and performance improvements to previous versions. You can confirm that you have the latest version with the Java Verification page or manually checking the Java version.

Should I uninstall older versions of Java?

We highly recommend that you uninstall all older versions of Java from your system.

1 Keeping old versions of Java on your system presents a serious security risk.

2 Uninstalling older versions of Java from your system ensures that Java applications will run with the latest security and performance improvements on your system.

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How can I remove older versions of Java?

Windows users can safely uninstall older versions of Java:

- when installing Java 8 (8u20 and above) or
- by using the Java uninstall tool or
- by manually uninstalling Java for Windows

— — — — —

TASK 4: **Always redirected to Java.com when visiting a page with a Java app.**

Install the latest Java version

The continual redirection to java.com was a known issue affecting Java versions 7u25 and older. This issue was fixed with the 7u40 release of Java. To prevent prevent the redirect to java.com, download the latest Java version from http://java.com.

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