CHAPTER

4

DIGITAL DATA TABULATION-SPREADSHEET

Objective of Learning

4.1 *MS Excel : Introduction and Concepts of Spread Sheet and Workbook*

4.2 *Creating, Saving, Opening and Print & Print Preview*

4.3 *Closing of Spreadsheet*

4.4 *Entering Numbers, Text, Date and Time*

4.5 *Series using Auto Fill*

4.6 *Editing and formatting of Worksheet including changing color*

4.7 *Size, Font, Alignment of Text, Inserting and deleting cells*

4.8 *Row and Columns, Entering formula in call using Operator (+, –, x, /) etc.*

4.9 *Relative referencing, absolute referening and mixed referencing*

4.10 *Using Statistical functions;*

4.11 *SUM(), AVG(), MAX(), MIN(), IF() with compound statements,*

4.12 *Inserting tables in worksheet, embedding charts of various types (Lines, pie, bar, column, area) in worksheet*

4.13 *Using macros in worksheet*

4.1 INTRODUCTION

MS Excel is one of the components of Microsoft office. It is also known as Excel. MS Excel is a spreadsheet program. It is used to do calculations on your data. In Excel you can create electronic spreadsheets.

Definition : Spreadsheet appears on screen as a matrix of rows and columns, the intersections of which are identified as cells. With the use of electronic sheet there is no need of paper, pencil or pen, eraser, calculator etc and you need not to do calculation manually.

MS Excel is mainly used to do calculations. You can do any type of mathematical, statistical, trigonometric and financial calculations very easily in Excel. The results computed by excel are reliable and accurate. You can also make charts and graphs using Excel to present data in graphical form. Some commonly used spreadsheets program are: Lotus123, Tally and MS-Excel.

OPENING THE MS EXCEL

To work with Excel first of all you have to open it. The steps to start Ms-Excel are given below:

Click on Start → All Programs → Microsoft Office → Miscrosoft Office Excel 2010.

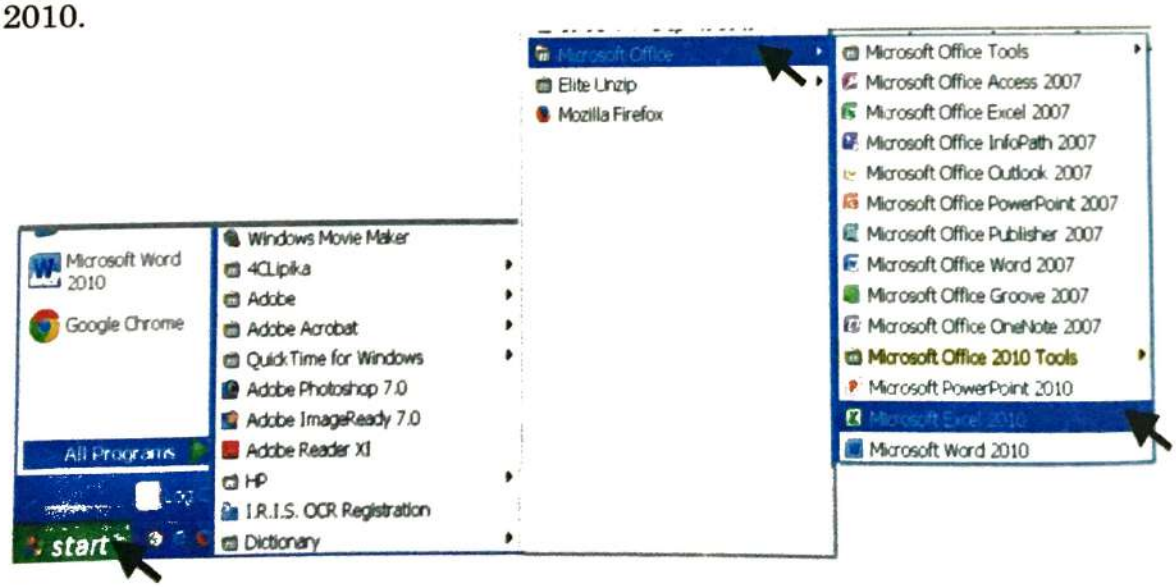


Fig. *Opening Microsoft Excel 2010*

Or

To open MS- Excel using search box do the following :

1. Click on Start button to open Search box
2. Type Excel in the search box
3. Press enter key from keyboard

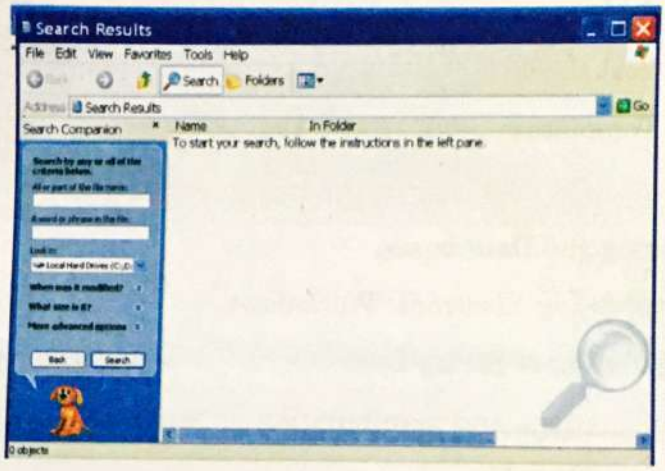


Fig. *Search box*

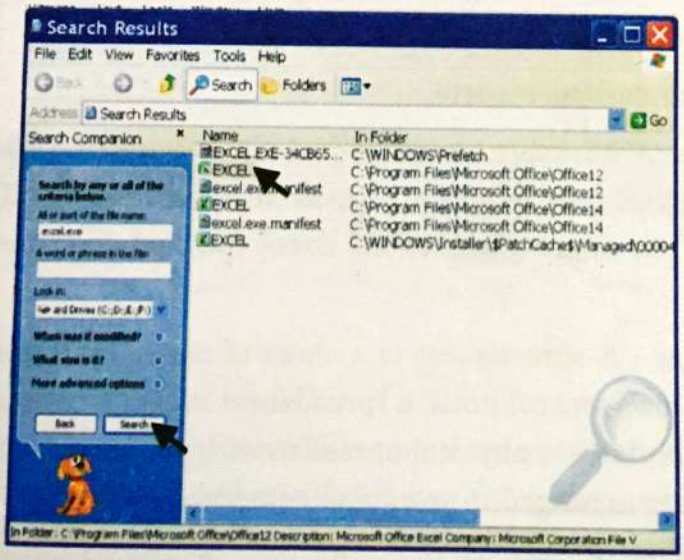


Fig. *Search dialogue box*

4.1.1 CONCEPTS OF SPREAD SHEET AND WORKBOOK

M.S. Excel is used for creating worksheets, tables and charts. In excel, we can do calculations in the easiest way. It helps us in analyzing data and making it more formative for business purpose. In excel we can work with worksheet and workbook. Worksheet is made of rows and columns. Excel allows us to create workbook in different methods. We can create workbook using two methods:

(*i*) Blank Worksheet

(*ii*) Using Templates

Excel is mainly used for following purposes:

(i) Managing the Data bases.

(ii) For processing Electronic Worksheet.

(iii) Manipulation of String Data.

(iv) For calculations and manipulation of Numbers.

(v) To prepare Bugdets.

(vi) Graphical representation of Data.

(vii) Prepare time table and chart.

(viii) Prepare various reports.

Workbook : A worksheet or sheet is a single page in a file created with an electronic spreadsheet program such as Microsoft Excel or Google Sheets. A workbook is the name given to an Excel file and contains one or more worksheets.

Spreadsheet : A spreadsheet is a sheet of paper that shows accounting or other data in rows and columns; a spreadsheet is also a computer application program that simulates a physical spreadsheet by capturing, displaying, and manipulating data arranged in rows and columns.

Worksheet : A Worksheet is a collection of cells organized in rows and columns. Each worksheet contains 1048576 rows and 16384 columns and serves

as a giant table that allows you to organize information. Typically, a workbook contains several worksheets with related content and only one of the worksheets is active at a time

Parts of MS-Excel Windows

When you start Excel, its windows will be displayed on the screen. The following figure shows the various parts of MS-Excel Window :

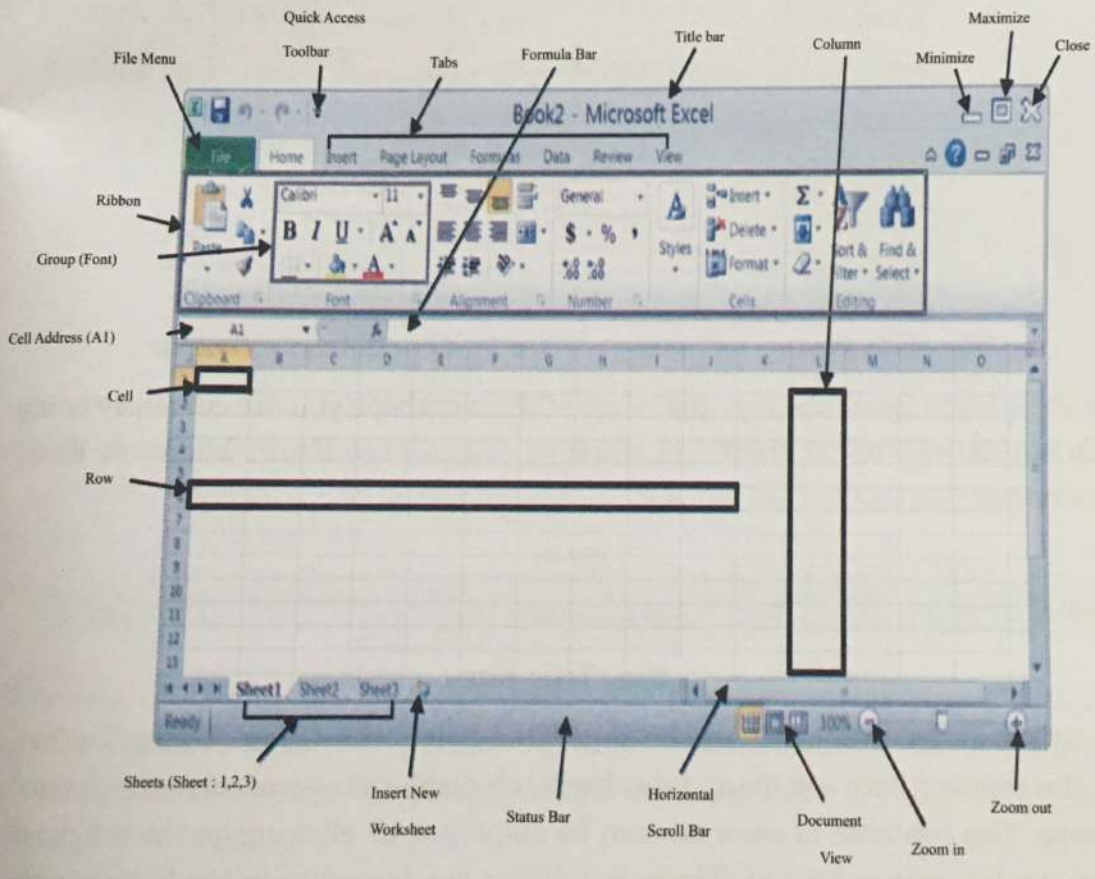


Fig. *MS-Excel Window*

Quick Access Toolbar : Above File menu there is Quick Access toolbar. It gives access to commands frequently. It has three buttons: Save as, Undo, Redo. It is a customize toolbar and you can add any button to it that you require frequently.

File Menu : The File menu is located on the upper-left corner of the Excel window.

Fig. *File Menu*

Fig. *Quick Access Toolbar*

Title Bar : Excel displays the name of the workbook you are currently using title bar. At the top of the Excel window, you can see Book1-Microsoft Excel or a name.

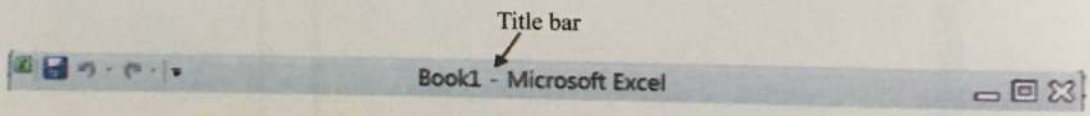


Fig. *Title Bar*

Ribbon : In Excel, the ribbon is located below the Quick Access Toolbar. On the ribbon, there are many tabs. Each tab displays several related command groups. The contents of each tab can be displayed by clicking on the tab name with the left mouse button. There is a dialog box launcher in the bottom-right corner of every group.

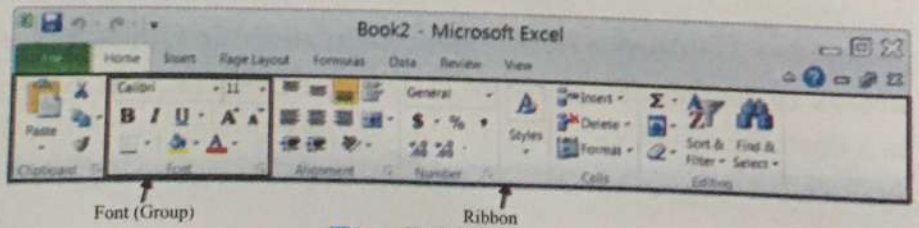


Fig. *Ribbon*

Formula Bar : In this bar the cell address of the active cell is displayed in the Name box which is located on the left side of the Formula bar. Cell entries are displayed on the right side of the Formula bar. In the other words Formula bar displays information entered in the current or active cell. The contents of a cell can also be edited in the Formula bar.

If formula bar is not displayed in the window then perform the following steps to display the Formula bar in window :

1. Click on View tab.
2. Click on Formula Bar under Show/Hide Group.

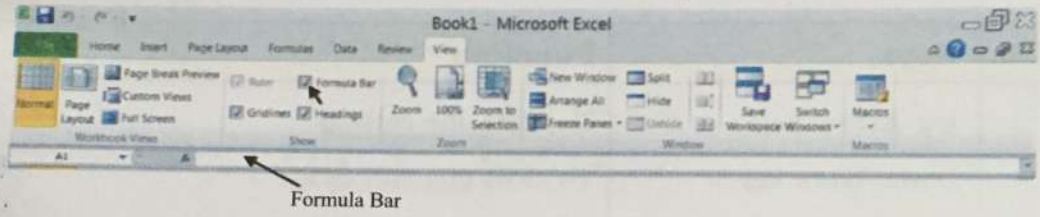


Fig. *Displaying Formula Bar*

Status Bar : This bar is located at the bottom of the Excel window and provides information such as the sum, average, minimum and maximum value of selected numbers. By right-clcking on the Status bar, you can change what displays on the Status bar.

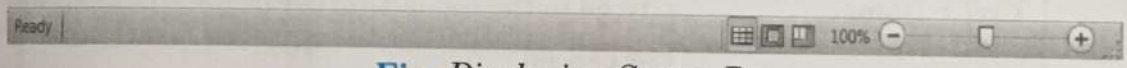


Fig. *Displaying Status Bar*

Name Box : Name box shows the address of the current selection or active cell. It is also used to go to a specific cell. In the Name box, type the cell name and then press Enter key. Perform the following steps to go to cell number A5 by using Name Box :

1. Type A5 in the Name box.
2. Press Enter.

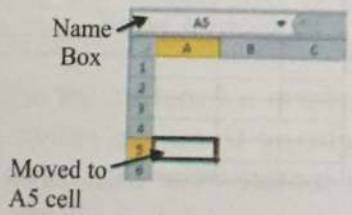


Fig. *Display Name Box*

Working in Worksheet Of MS-Excel

(i) Using the Arrow keys : You can use Arrow keys to move around your worksheet. You can use Down arrow key to move document one cell at a time and Up arrow key to move upward one cell at a time. Use the right and left arrow keys to move right or left one cell at a time.

Navigation Keys : The Page Up and Page Down keys move up and down respectively one page at a time. Press Ctrl key + Home key together, to move to the beginning of the worksheet e.g. Cell A1.

Following table describes the function of Navigation keys :

S.No.	Keys	Function
1.	Up Arrow key	To shift one cell up
2.	Down Arrow key or Enter key	To shift one cell down
3.	Left Arrow key	To shift one cell left
4.	Right arrow key or Tab	To shift one cell right
5.	Home	To go to the first column of the selected row
6.	Ctrl + Home	To go to the top left corner of the spreadsheet or cell A1
7.	Ctrl + End	To go to the bottom of the worksheet
8.	Ctrl + Right Arrow key	To go to the end of row
9.	Ctrl + Down Arrow key	To go to the end of the column
10.	Page UP	To move the cursor up one screen at a time
11.	Page Down	To move the cursor down one screen at a time
12.	Ctrl + G	To go to a particular cell in the worksheet

(ii) Selecting Cells : To perform a function on a group of cells, you must first select those cells by highlighting them. To select an area hold down the left mouse button and drag the mouse over that area as shown in following figure :

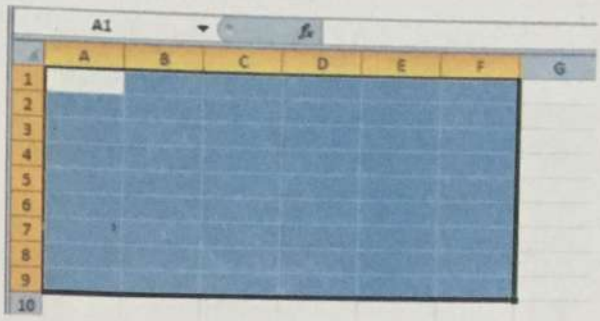


Fig. *Selecting Cells*

(iii) Entering Data :

1. Click on the cell where you want to enter the data.

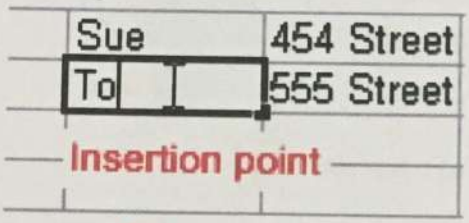


Fig. *Entering Data*

2. Type the data. An insertion point appears in the cell as the data is typed.

3. After typing data, press Tab key to go to next cell. The data can be typed in either the cell or the Formula bar.

(iv) Deleting Data : Use Backspace key to erases one character at a time in the active cell.

(v) Editing a Cell Data : You can also edit the entered data. Click on the cell whose data you want to edit and then press F2 key. You can also edit the cell by using the Formula bar or can also edit the data by double clicking the cell you want to edit.

(vi) Wrap Text : When the typed text is too long to fit in the cell, then the text overlaps the next cell. To avoid this you can wrap the text, perform the following steps to wrap text :

1. Move to cell A2.

2. Type "Sunil Chowdhary".

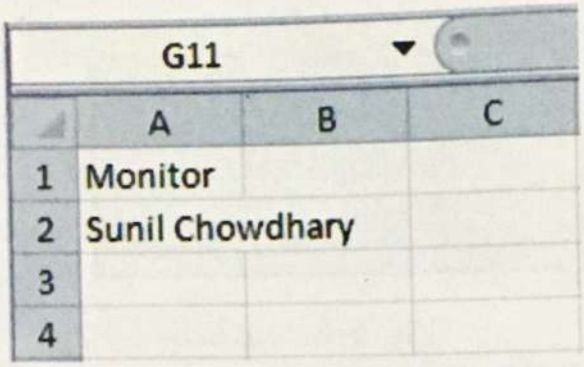


Fig. *Entering Data*

3. Press Enter.
4. Return to cell A2.
5. Select the Home tab.
6. Click on the Wrap Text button 

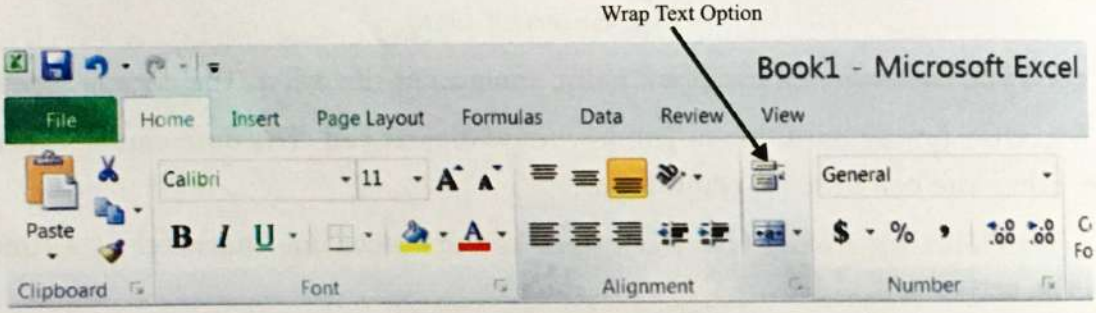


Fig. *Wrap Text*

Your text will be wrapped.

(vii) Delete a Cell Entry : To delete an entry in a cell or a group of cells, place the cursor in the cell or select the group of cells and press Delete key.

(viii) Filling a range of cells :

The steps to fill the range of cells are :

1. Select the cell, type the data in the cell.
2. Position the mouse pointer over the fill handle.

3. Press fill handle with left mouse button and drag the mouse to select the range of cell. And release the mouse button.

Or

From keyboard press Shift key and Down key and select the cells or range of cells. Press Ctrl + D keys to fill the data.

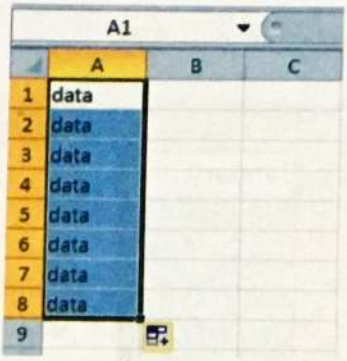


Fig. *Creating a Series*

The contents of the first cell will be copied to all the cells of the selected range.

Creating a Data Series : Data series is a series of numbers. Excel can enter numbers automatically in a form of series. The steps to generate data series are :

1. Type 100 in cell A1

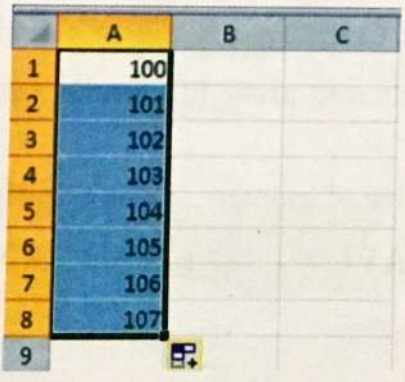


Fig. *Creating a Data Series*

2. Type 101 in cell A2

3. Select both the cells

4. Position the mouse pointer over the fill handle.

5. Click and hold the left mouse button, and then drag it down.

Perform the following steps to create a Series of Months of Year :

1. Enter the value January in cell A1.

2. Enter the value February in cell A2.

	A	B
1	January	
2	Feburary	
3	March	
4	April	
5	May	
6	June	
7	July	
8	August	
9	September	
10	October	
11	Novermber	
12	December	
13		

Fig. *Creating a Series of months*

3. Select both of the cells and press fill handle with left mouse button and drag the mouse.

4. It will create the series of months automatically.

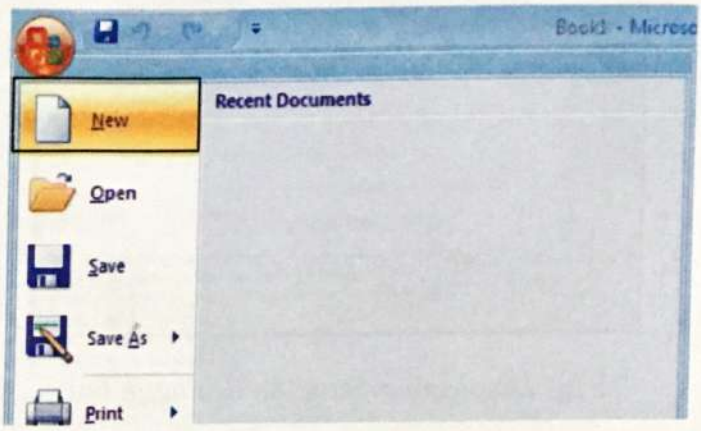
4.2 CREATING, SAVING, OPENING AND PRINT & PRINT PREVIEW

4.2.1 Creating

To create a spreadsheet, you must either have a MS Excel or a computer capable of creating a document on an online service.

Perform the following steps to Create a file :

1. Click the File tab.
2. Click New.



3. Under Available Templates, double-click Blank Workbook. Keyboard shortcut To quickly create a new, blank workbook, you can also press CTRL+N.

4.2.2 Saving A File

Perform the following steps to Save the file :

1. Click on File menu.

Fig. *Displaying Save option in File menuv*

2. Click on Save button. The Save As dialog box will appear.

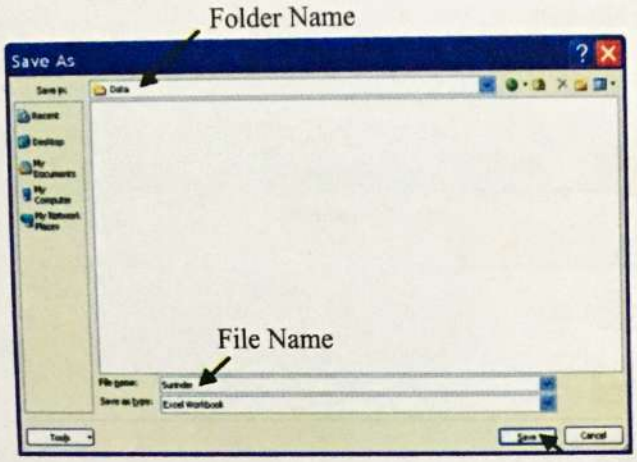


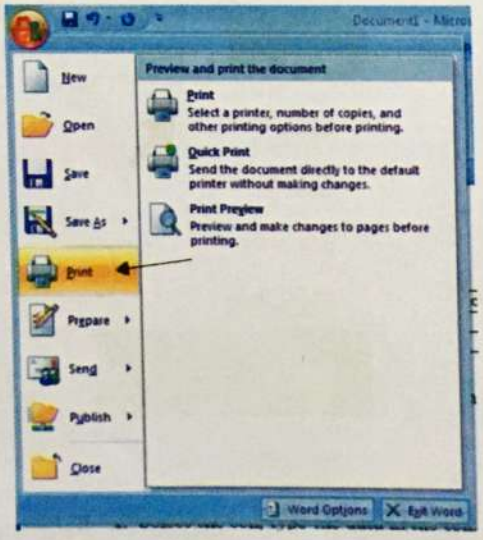
Fig. *Displaying Save As dialogue box*

3. Go to the Folder in which you want to Save the file.
4. Type the name that you want to give to your file, in the File Name box.
5. Click on Save button.

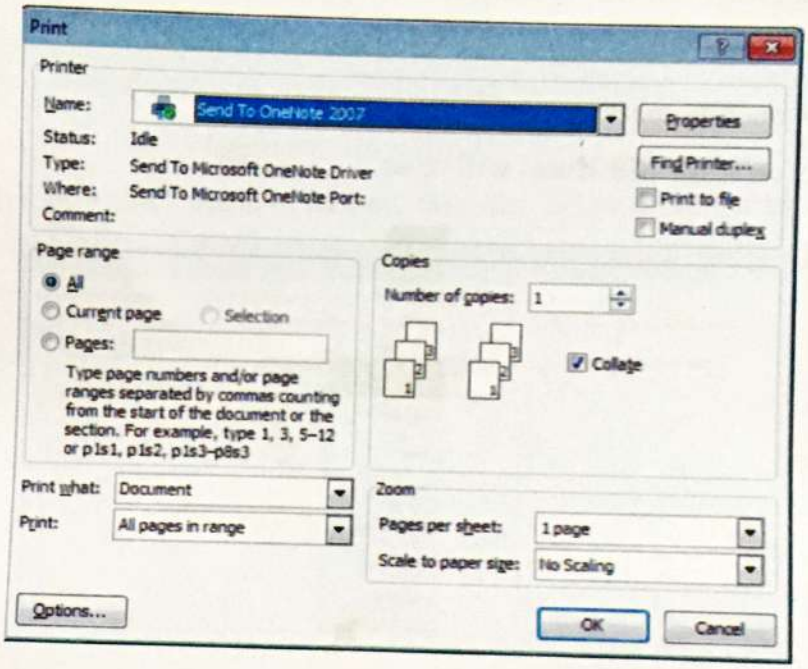
Your file will be saved with the name given by you in the folder you specify.

4.2.3 Print & Print Preview

1. Click on File → Print option or Click to Ctrl + P.

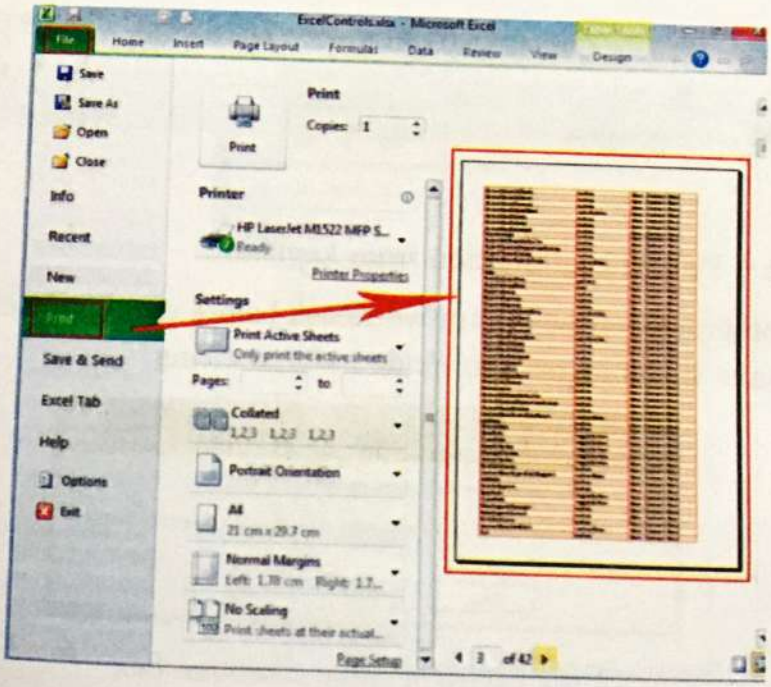


2. Then the below dialogue box will appear on the screen :



3. Enter the page no. on Page Range blank box.

4. Then check the Print Preview of mentioned page.



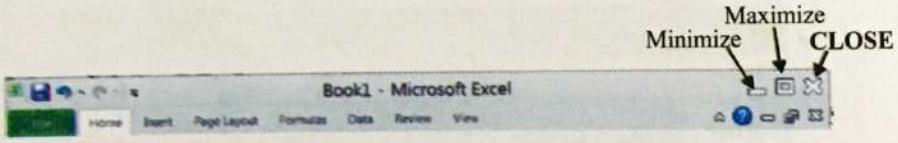
4.3 CLOSING OF SPREADSHEET

Perform the following steps to close MS-Excel :

1. Click on File menu.
2. Click on Exit. MS-Excel will close. *Or*

Fig. *In File menu displaying Exit option*

Click on Close button on the right hand side of title bar.



Or

Press Alt + F4 key combination from keyboard.

It is a good practice to save your workbook before exiting Excel. Excel always ask you to save the changes you made before exiting.

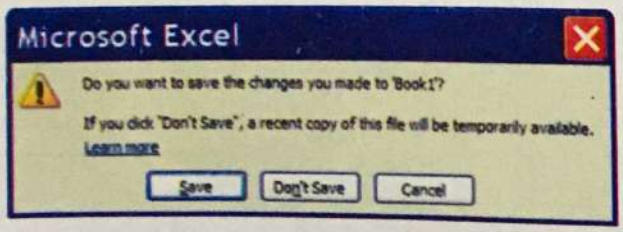


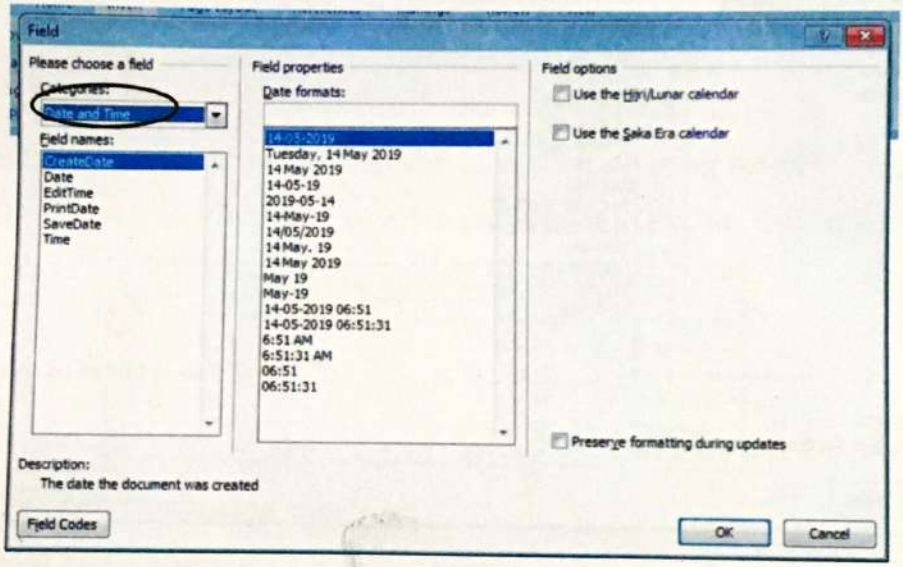
Fig. *Confirm Save dialogue box*

4.4 ENTERING NUMBERS, TEXT, DATE AND TIME

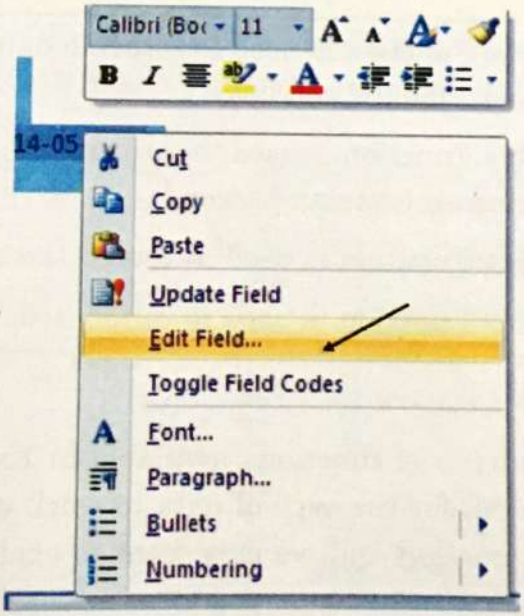
1. Insert the current date into your text. This command inserts a content control into your document — text that can be updated.

Click on Alt + Shift + D

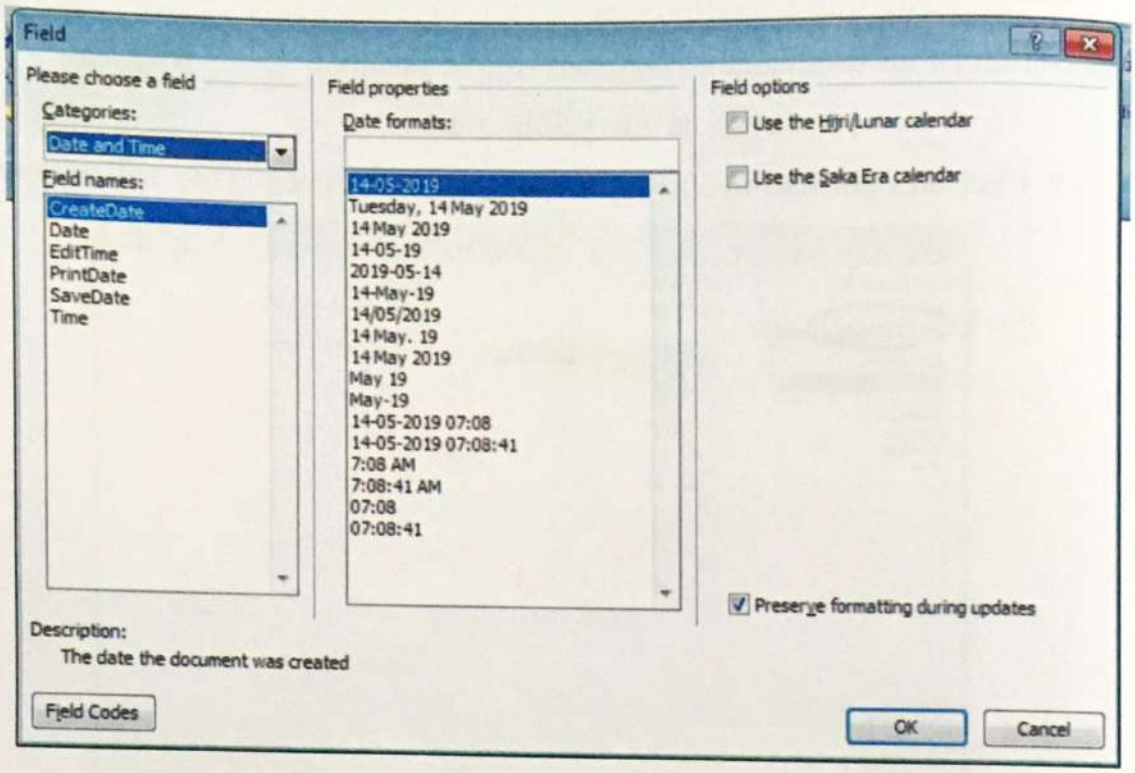
2. Click on right button of mouse, then the below dialogue box will appear.



3. Then Click on Edit Field... option.



3. Now the Field dialogue will appear. Choose the Date and Time option from drop down option. Now we can change required date, time and text.



Function	Use
DATE( )	This Function is used to return a date, from a user-supplied year, month and day.
TIME( )	This Function is used to return a time, from a user-supplied hour, minute and second
NOW( )	This Function is used to return the current date & time
TODAY( )	This Function is used to return today's date.

The Function Library

There are hundreds of functions available in Excel. Only some of these function will be useful for the type of data to work with. There is no need to learn every single function, but we may want to explore some of these.

These functions can be accessed in the **Function Library** on the Formulas tab. Here, we can search and select Excel functions based on categories such as **Fincancial, Logical, Text,** and **Date & Time**. Now we will learn about there function :

Inserting a function from the Function Library :

(*i*) Type your data in our worksheet take the following steps :

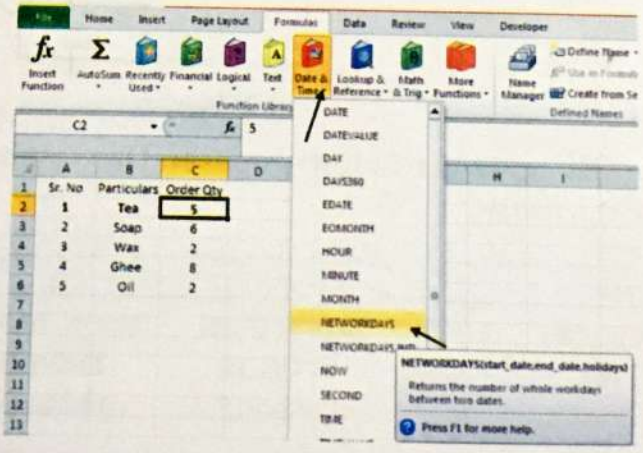
(*ii*) Select the cell where the answer will appear (**F3,** for example).

	A	B	C	D	E
1	Sr. No	Particulars	Order Qty	Date of Order	Date of Delivery
2	1	Tea	5	16-Oct-15	20-Oct-15
3	2	Soap	6	12-Sep-15	14-Sep-15
4	3	Wax	2	10-Jun-15	15-Jun-15
5	4	Ghee	8	10-Jun-15	12-Jun-15
6	5	Oil		20-Feb-15	22-Feb-15

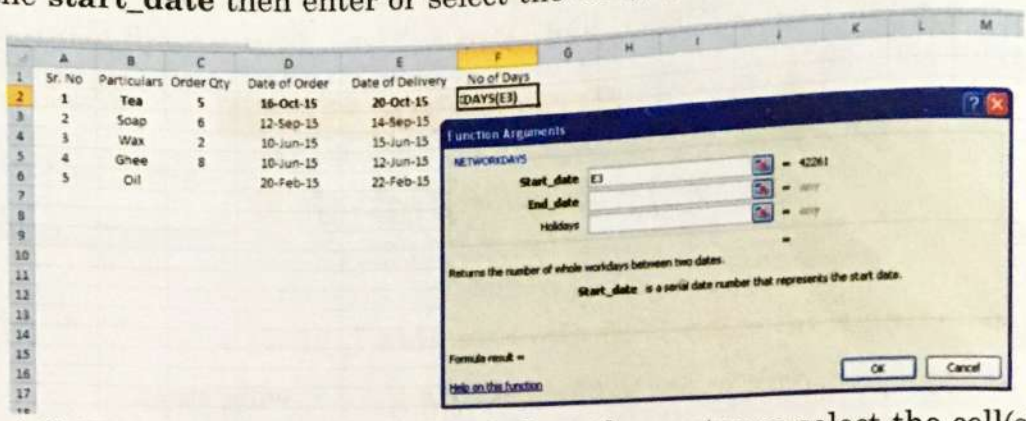
(*iii*) Click the **Formulas** tab.

(*iv*) From the **Function Library** group, select the **function category** which is required. Here we select **Date & Time.**

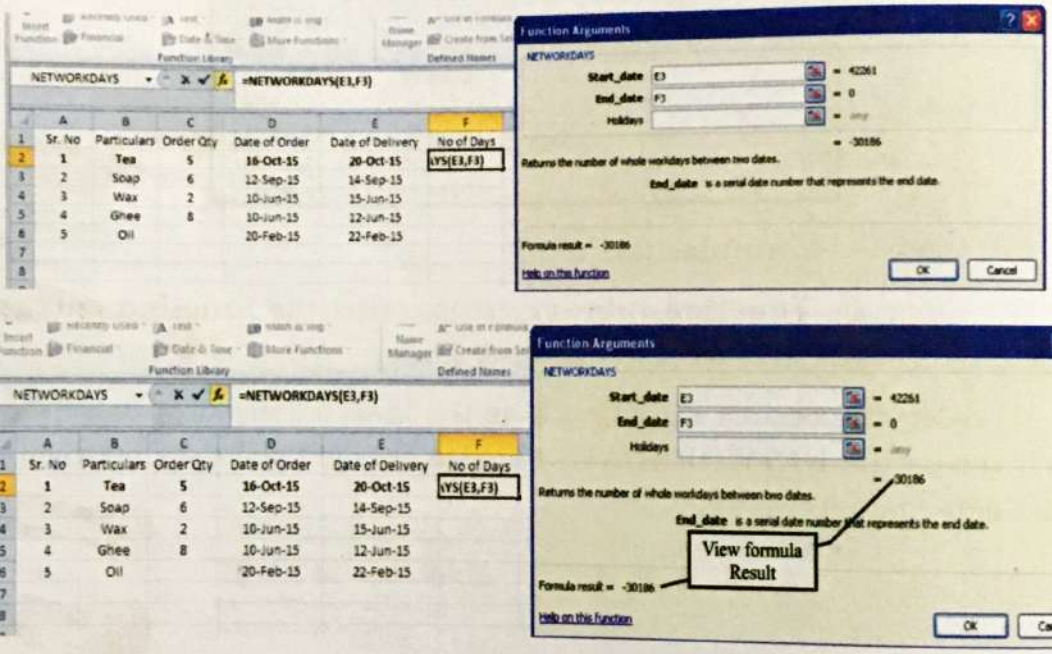
(*v*) Select the desired **Function** from the Date & Time drop-down menu. We'll choose the **NETWORKDAYS** function to count the days between the order date and receive date.



(*vi*) The **Function Arguments** dialog box will appear. Insert the cursor in the **start_date** then enter or select the cell(s) you want (**E3**).



(*vii*) Insert the cursor in the **End_date** then enter or select the cell(s) we want (**F3**).



(*viii*) Click on **OK**, and the result will appear. Our results show that it took 10 day to deliver the order.

	A	B	C	D	E	F
1	Sr. No	Particulars	Order Qty	Date of Order	Date of Delivery	No of Days
2	1	Tea	5	16-Oct-15	20-Oct-15	-30186
3	2	Soap	6	12-Sep-15	14-Sep-15	

4.5 SERIES USING AUTO FILL

If the step value is a simple number, the fastest way to specify a growth series is to enter the first two numbers and use the RIGHT-click menu of the Fill Handle. Follow the steps below :

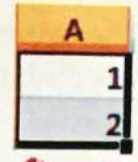


figure 1

figure 2

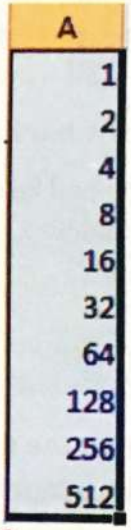


figure 3

1. Type the first two numbers in the first two worksheet cells (figure 1).

2. Select these two cells, and hover the cursor over the lower right corner to display the Fill Handle (+).

3. With the RIGHT mouse button pressed, drag the Fill Handle up, down, or across to select the cells to be filled. Release the mouse.

4. From the menu that now displays, select Growth Trend (figure 2).

The autofill results are shown in figure 3. Because two numbers were entered, Excel could determine the step value.

If you want a step value of 3, enter 1 and 3 into the first two cells (1x3=3). What if you want a step value of 2, but you want the series to begin with the number 5? You would enter 5 and 10 (5x2=10) in the first two cells.

4.6 EDITING AND FORMATTING OF WORKSHEET INCLUDING CHANGING COLOR

In Microsoft Excel, a user can change the properties of text in any cell, including font type, size, color, as well as make it bold, italic, or underlined. A user can also change the color of a cell's background and the border around a cell. The following picture is a graphic illustration of the font and cell format bar in Excel, as well as a description of each of the tools contained within it.

Changing cell background color

To change the cell background color within a Microsoft Excel spreadsheet, follow the steps below.

1. Select the cell for which you want to change the background color.

2. Click the down arrow next to the cell color icon. It is usually displayed as tipping paint can with a yellow underline, as shown in the example above.

3. After clicking the down arrow for the cell color, select the color you want to make the cell background.

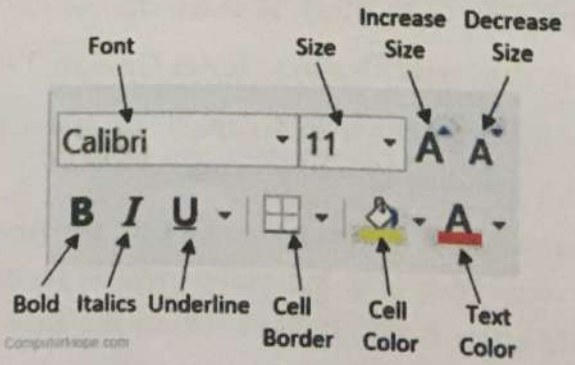
Changing cell border

By default, a cell does not have a border. To change the cell border within a Microsoft Excel spreadsheet, follow the steps below.

1. Select the cell for which you want to add a border.

2. Click the down arrow next to the cell border icon.

3. After clicking the down arrow for the cell border, select the border type you want to set for the cell.

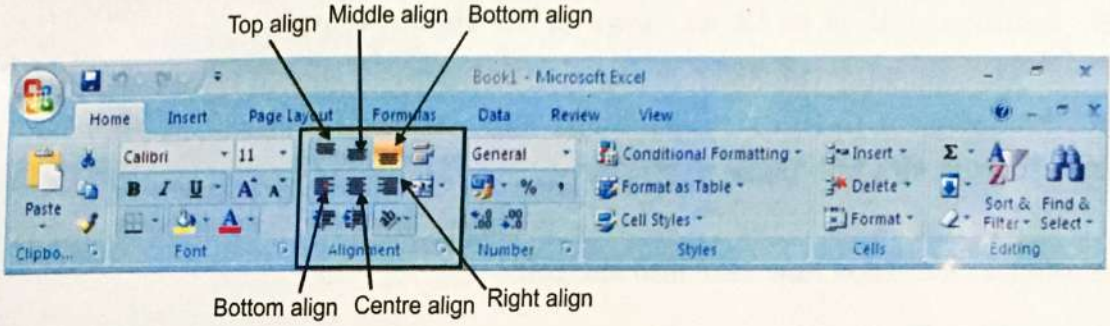


4.7 SIZE, FONT, ALIGNMENT OF TEXT, INSERTING AND DELETING CELLS

Alignment of Text :

1. Select the cells that have the text you want aligned.
2. On the Home tab choose one of the following alignment options:

Alignment of text



To vertically align text, pick Top Align Button image , Middle Align Button image , or Bottom Align.

When you have a long line of text, part of the text might not be visible. To fix this without changing the column width, click Wrap Text.

Changing font type

To change the text font within a Microsoft Excel spreadsheet, follow the steps below :

1. Select the cell containing the text you want to change.

2. Click the down arrow next to the font field on the format bar. (If you want to change the font to bold, italic, or underlined, click on the B, I, or U on the format bar.)

3. After clicking the down arrow for the font, you should be able to select from each of the installed fonts on your computer. Click the font you want to use, and the text in the selected cell will change.

Note: If the selected cell does not contain any text, the font type will change as soon as you type new text into the cell.

Changing font size

To change the text size within a Microsoft Excel spreadsheet, follow the steps below.

1. Select the cell containing the text you want to change.

2. Click the down arrow next to the size box on the format bar. Typically, the default size is 11 or 12, as shown in the above example.

3. After clicking the down arrow for the size, you should have a selection of different sizes to choose. Some fonts may not scale properly, so they may have limited size options.

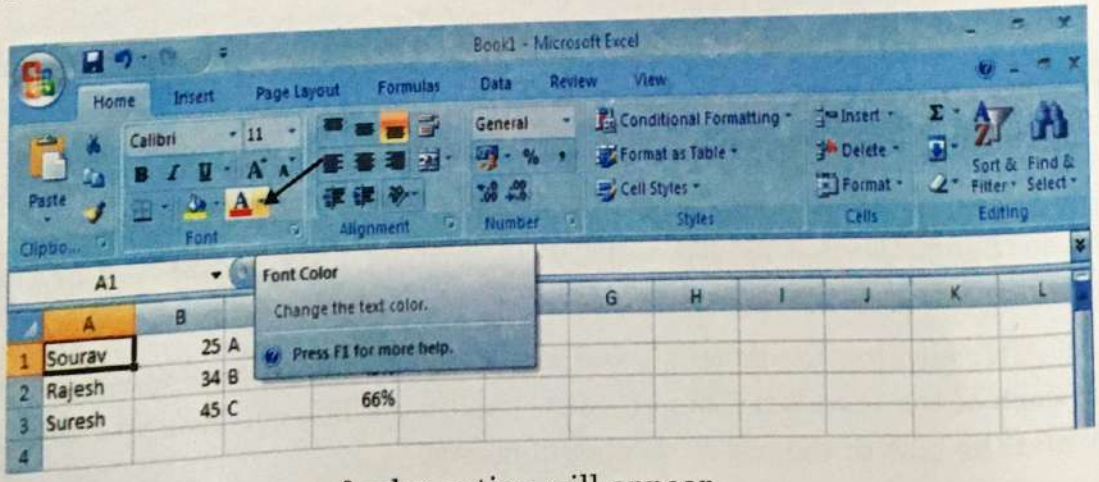
Note: If the selected cell does not contain any text, the font size will change as soon as you type new text into the cell.

Changing font color

To change the text color within a Microsoft Excel spreadsheet, follow the steps below.

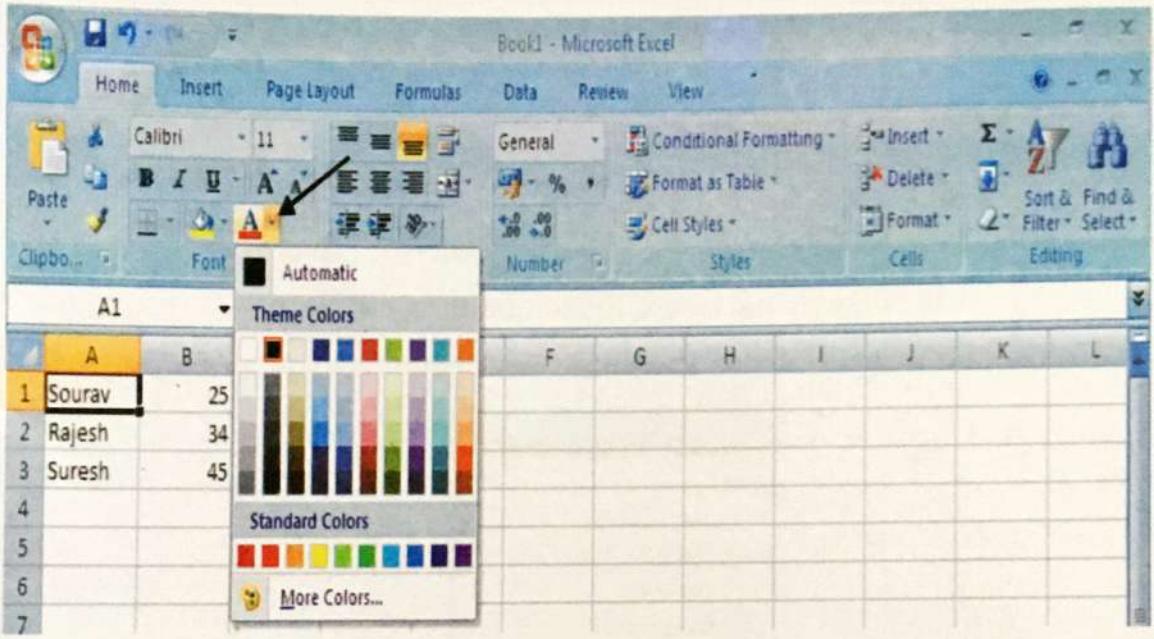
1. Type a paragraph in a document.

2. Select a line to change the color of a text and click on Font color option in Font ribbon.



3. Now the Theme of color option will appear.

4. Select any one color of your choice. Now the color of text will be change.



Inserting and deleting cells

If there is a need to add new data within an existing worksheet we need to enter blank cells. So we can insert new cells, columns, or rows in the worksheet.

For inserting new cells, rows, or columns in an Excel worksheet, do the follow steps :

(*i*) Select the cells, rows, or columns where we want the new blank cells.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Roll No.	Name of the Student	Class	Selection	English	Punjabi	Hindi	Maths	Science	Social Studies	Computer	Phy. Edu.
2	1	Vikas	7th	A	88	89	83	80	87	85	83	67
3	2	Meena	7th	B	55	83	80	83	80	84	81	57
4	3	Neha	7th	A	65	86	75	91	85	82	88	80
5	4	Bindia	7th	A	75	82	72	75	83	92	90	75
6	5	Jasmeet	7th	A	55	96	74	65	81	88	78	68
7	6	Sahil	7th	A	60	91	88	75	90	93	75	75
8	7	Vishal	7th	B	50	65	90	59	88	89	73	70
9	8	Jasmeet	7th	B	48	55	92	78	82	78	68	78
10	9	Alisha	7th	B	90	78	98	69	78	76	60	80
11	10	Shashi	7th	B	67	90	91	60	70	77	90	90

(*ii*) Click the drop-down arrow attached to the Insert button in the Cells group of the Home tab.

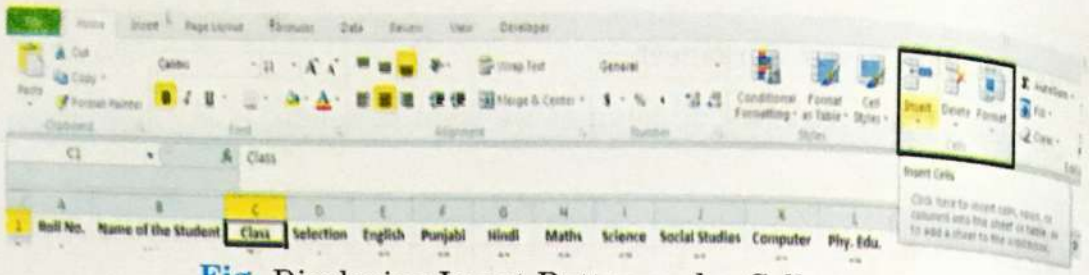


Fig. Displaying Insert Button under Cells group

(*iii*) Click on Insert Cells on the drop-down menu as show in figure.

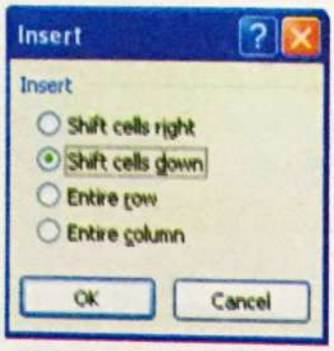


Fig. Displaying Insert option

The Insert dialog box opens and displays the following options :

(a) Shift Cells Right : It is used shift the existing cells to the right to make room for the blank cells you want to insert.

(b) Shift Cells Down : It is used to shift existing cells down. This is the default option.

(c) Entire Row : It inserts complete rows in the cell range. We can also select the row number on the frame before we choose the Insert command.

(d) Select the desired option and click on OK button.

Deleting cells, rows, or columns

Unnecessary cells/rows/columns can be easily deleted. We can delete a cell structure along with all its contents and formatting. When we delete a cell (or an entire row or column), Excel has to shuffle the position of entries in the surrounding cells to plug up any gaps caused by the deletion.

For deleting the actual cell selection rather than just clear the cell contents, follow these steps:

(*i*) Type data in our worksheet.

(*ii*) Select the cells, rows, or columns we want to delete.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Roll No.	Name of the Student	Class	Selection	English	Punjabi	Hindi	Maths	Science	Social Studies	Computer	Phy. Edu.
2	1	Vikas	7th	A	88	89	83	80	87	85	83	67
3	2	Meena	7th	B	55	83	80	83	80	84	81	57
4	3	Neha	7th	A	65	86	75	91	85	82	88	80
5	4	Bindia	7th	A	75	82	72	75	83	92	90	75
6	5	Jasmeet	7th	A	55	96	74	65	81	88	78	68
7	6	Sahil	7th	A	60	91	88	75	90	93	75	75
8	7	Vishal	7th	B	50	65	90	59	88	89	73	70
9	8	Jasmeet	7th	B	48	55	92	78	82	78	68	78
10	9	Alisha	7th	B	90	78	98	69	78	76	60	80
11	10	Shashi	7th	B	67	90	91	60	70	77	90	90

Fig. A School Worksheet

(*iii*) Click the drop-down button attached to the Delete button in the Cells group of the Home tabe as shown in figure.

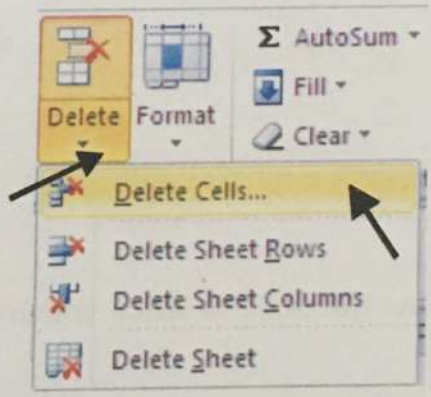


Fig. Delete Cells... option

(*iv*) Click Delete Cells on the drop-down menu.

Delete dialog box opens, displaying these options for filling in the gaps in cells.

(a) Shift Cells Left : It is used to move entries from neighboring columns on the right to the left to fill in gaps created when we delete the cell selection. This is the default option.

(b) Shift Cells Up : It is used to move entries up from neighboring rows below.

(c) Entire Row : It removes all the rows in the current cell selection.

(d) Entire Column : It is used to delete all the columns in the current cell selection.

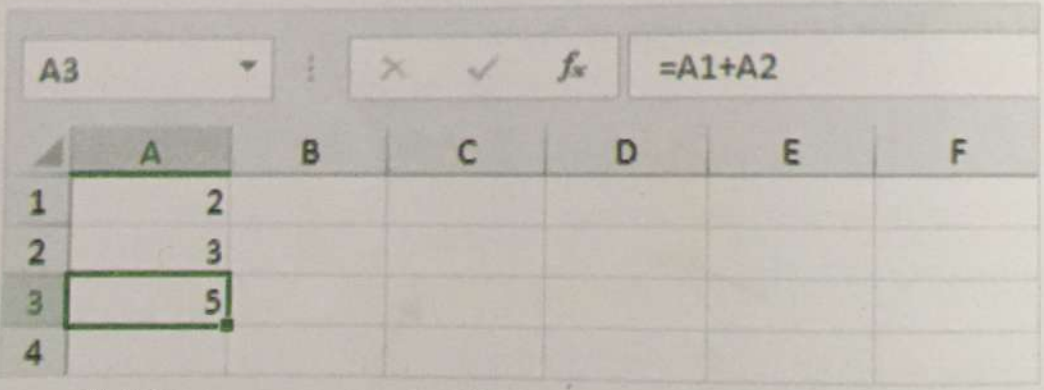
Select the desired option and click OK button to delete.

4.8 ENTERING FORMULA IN CELL USING OPERATOR (+, –, X, /) ETC.

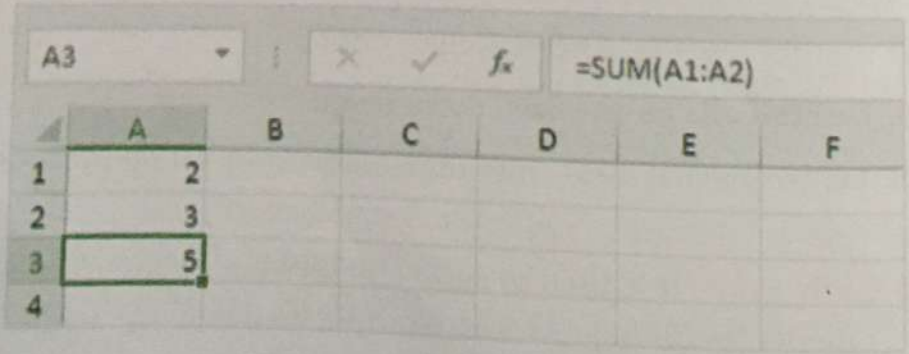
A formula is an expression which calculates the value of a cell. Functions are predefined formulas and are already available in Excel.

(a) Addition (+)

For example, cell A3 below contains a formula which adds the value of cell A2 to the value of cell A1.



e.g. cell A3 below contains the SUM function which calculates the sum of the range A1:A2.



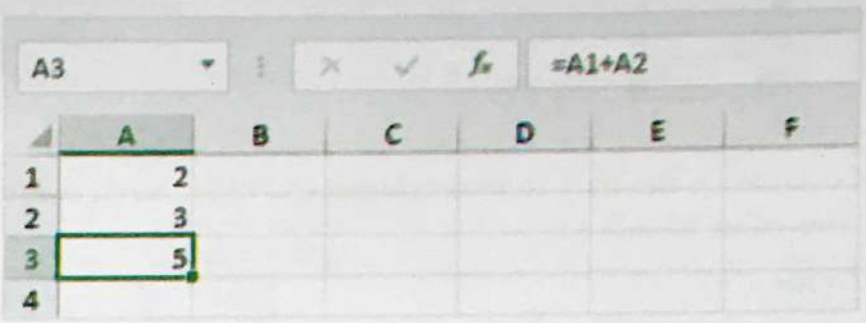
Enter a Formula

To enter a formula, execute the following steps.

1. Select a cell.

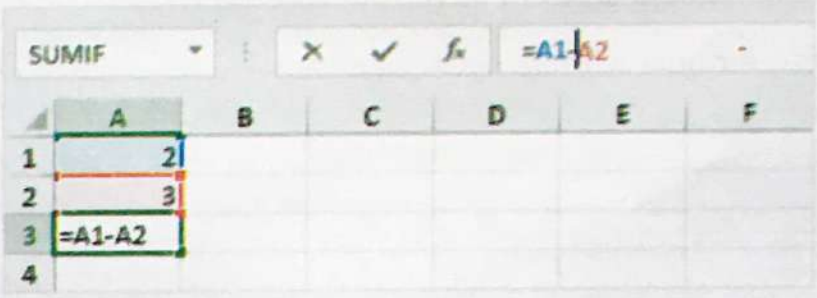
2. To let Excel know that you want to enter a formula, type an equal sign (=).

3. For example, type the formula A1+A2.

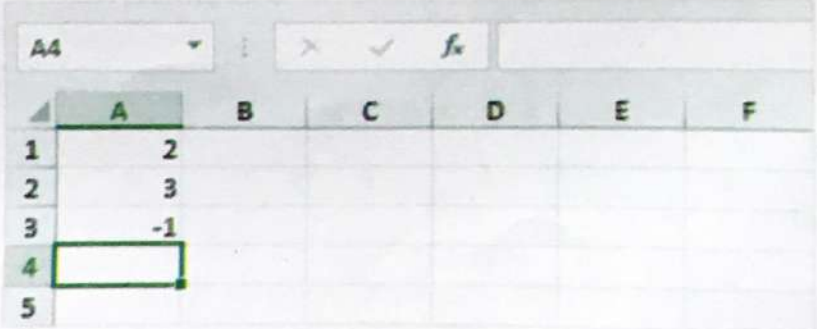


(b) Subtraction (–)

1. To edit a formula, click in the formula bar and change the formula.

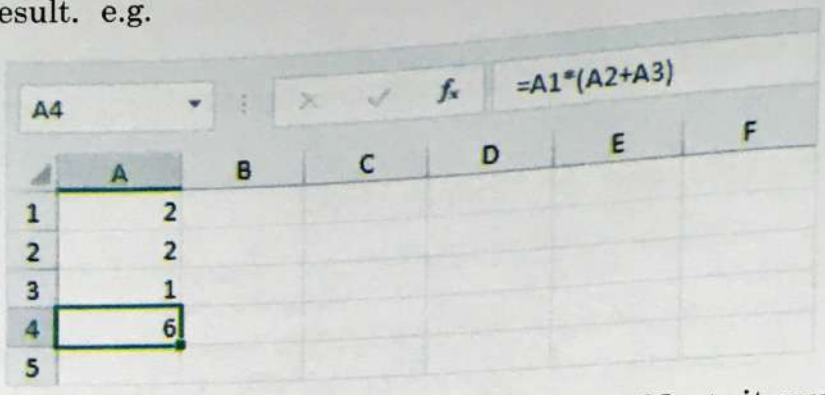


2. Press Enter.



(c) Multiplication (*)

Excel performs multiplication (A1 * A2). Next, Excel adds the value of cell A3 to this result. e.g.

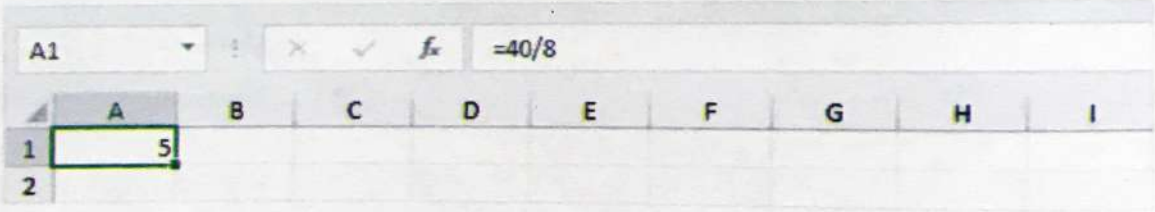


Excel calculates the part in parentheses (A2+A3). Next, it multiplies this result by the value of cell A1.

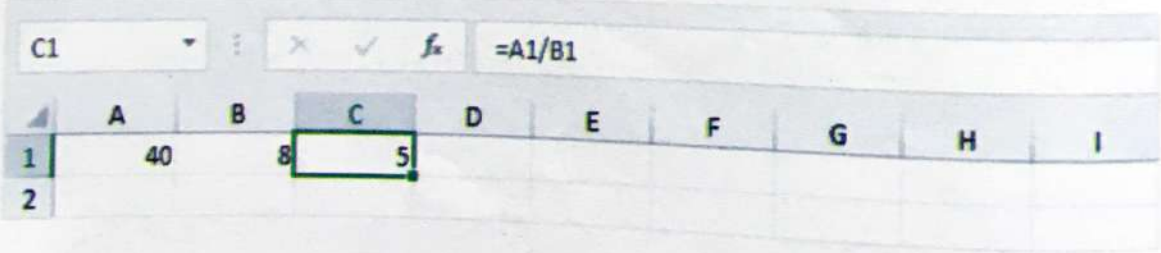
(d) Divide (/)

It is simply use the forward slash (/) to divide numbers in Excel.

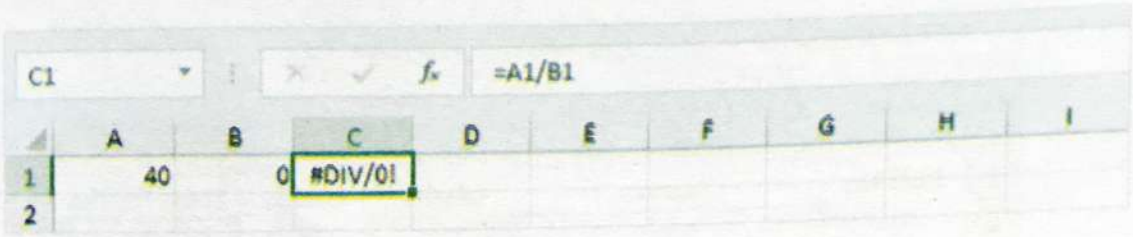
1. The formula below divides numbers in a cell.
2. Use the forward slash (/) as the division operator.
3. Start a formula with an equal sign (=).



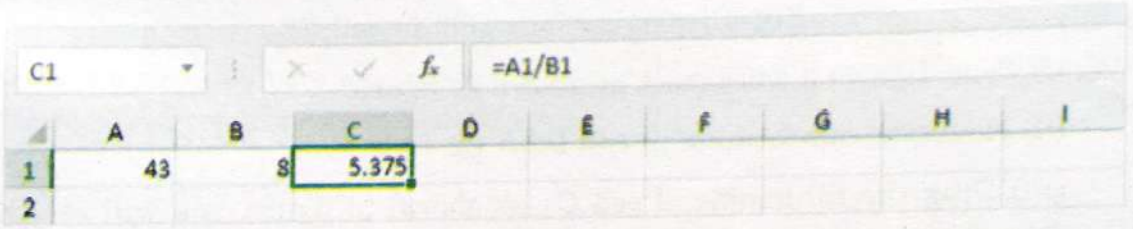
4. The formula below divides the value in cell A1 by the value in cell B1.



5. Excel displays the #DIV/0! error when a formula tries to divide a number by 0 or an empty cell.



6. The formula below divides 43 by 8. Nothing special.



4.9 RELATIVE REFERENCING, ABSOLUTE REFERENING AND MIXED REFERENCING

Cell Reference is method to access the various cell.

Cell Reference is very important for calculation in Excel, Cell Reference means to calculate important calculations by using a cell address or a range of cells for a formula to calculate the result of the formula in a worksheet. We can use a cell reference for a single formula or for multiple formulas.

There are three types of Cell References :

(*i*) Relative Reference.

(*ii*) Absolute Reference.

(*iii*) Mixed Reference.

Relative Reference :

Definition : Relative reference is used by default in MS-Excel. When it is copied to multiple cells then it changes according to cell position.

Example : If you want to calculate a formula in cell D2 = B2 + C2 and you copy it to cell D3 then it becomes = B3 + C3. Take the following example to use it.

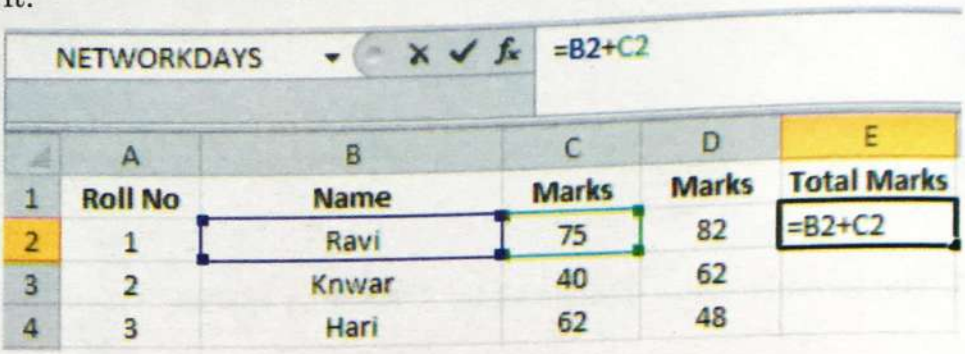


Fig. Displaying forumula in cell E2

(*i*) Type data in a worksheet as shown in figure.

(*ii*) Now type our formula in cell D2 = B2 + C2.

(*iii*) Drag the fill handle of cell C1 as shown in figure, you will see that the formula becomes in cell C2 = A2 + B2.

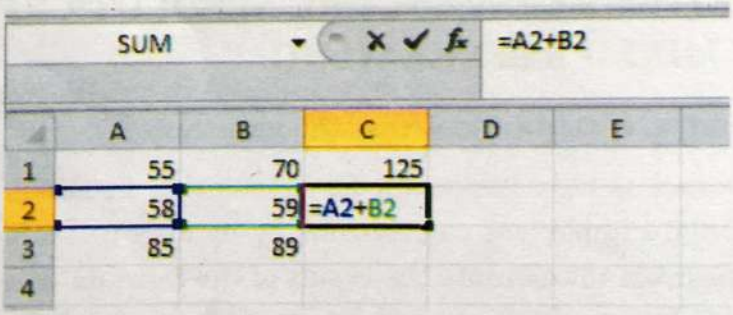


Fig. Copying formula in C2

Absolute Reference :

It is observed that sometimes you want that during copying a formula from one cell to another, its cell reference should not be changed. So, in this case Absolute Reference is used, in this type of reference the cell address doesn't change even during copying a formula. Using this reference we can keep a row/ column constant.Dollar ($) sign is used during typing a formula using Absolute Reference. Dollar ($) sign can be used either for a row or a column. You can also use it for both together. Take the following examples to clear it :

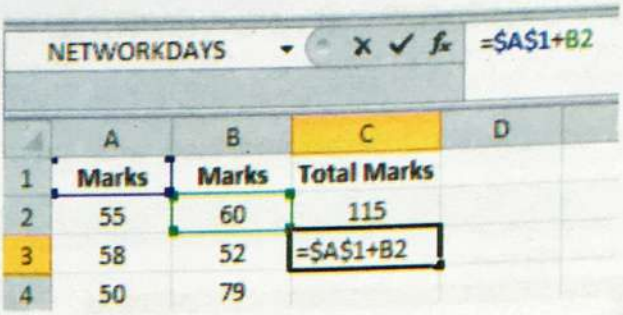


Figure showing absolute cell reference

(*i*) Type data in a worksheet as shown in fig.

(*ii*) Type our formula in cell C1 = $A$1+B1

(*iii*) Now drag the fill handle of cell C1 as shown in figure, you will see that the formula becomes in cell C2=$A$1+B2. You will notice that cell address in formula remain constant as C2=$A$1.

Mixed Reference :

Mixed Reference is the combination of both Relative and Absolute Reference. In Mixed Reference a Dollar($) sign is used either to a column or row.

(*i*) Type data in a worksheet as shown in figure.

(*ii*) Now type our formula in cell C1=A1+B$1

(*iii*) Drag the fill handle of cell C1 as shown in figure, you will see that the formula becomes in cell C2=A2+B$1. Note that cell address in formula has changed in cell C2 to A2 which is an example of Relative Cell and B$1 remains constant, in case of Abolute Reference.

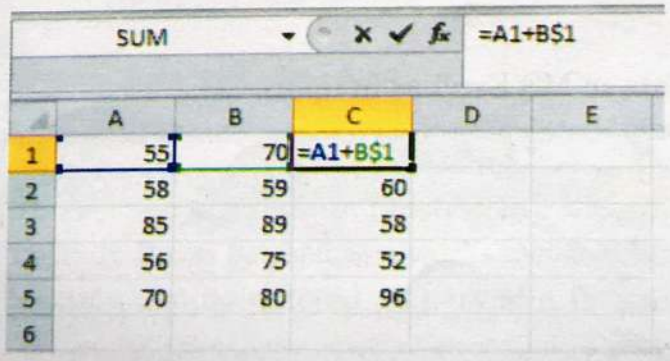
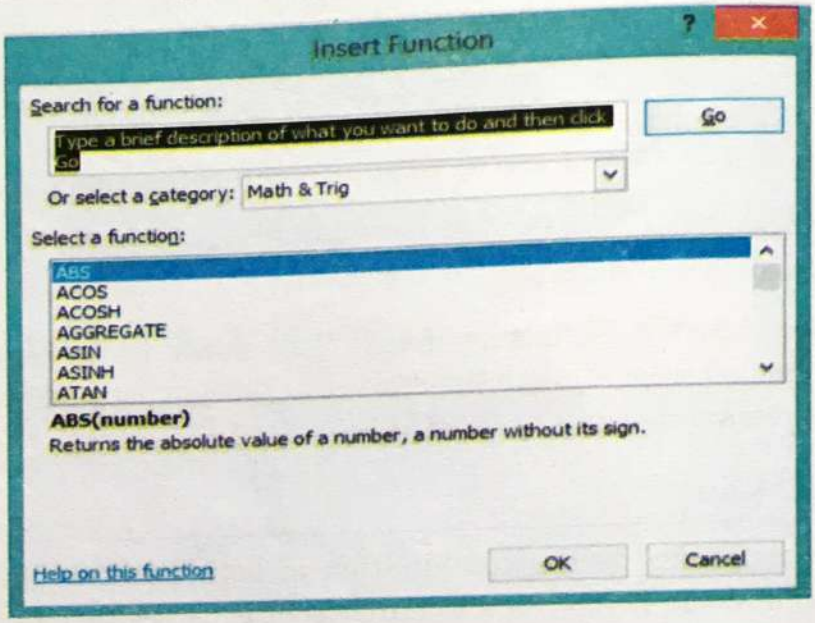


Figure copying refrence cells

4.10 USING STATISTICAL FUNCTIONS

Follow the below steps to identify the Statistical function in excel.

1. Click the Formulas tab in excel and then click the insert function.



Statistical function are given below :

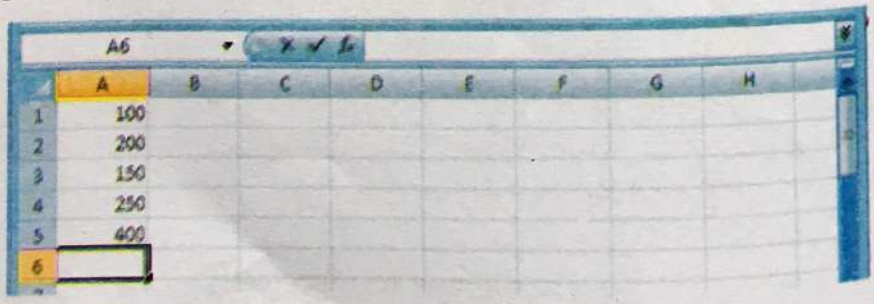
1. SUM( ), 2. MAX( ), 3. MIN( ), 4. AVERAGE( ), 5. IF( ).

4.10.1 Sum( )

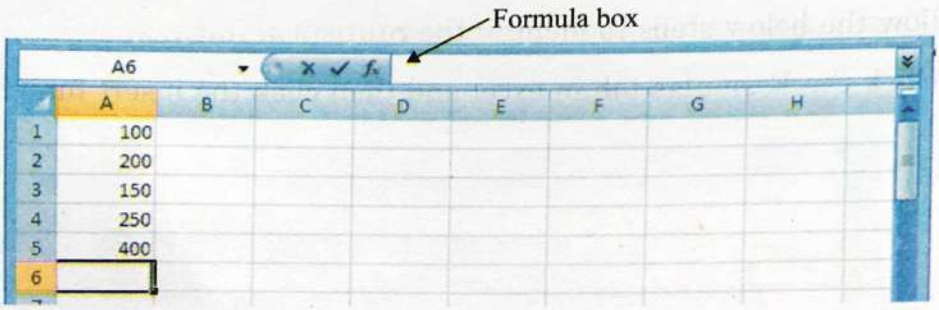
Sum( ) is used to calculate the total value of given table. You can put the cursor in the blank cell at the bottom of the column that has the numbers you want to sum.

Example :

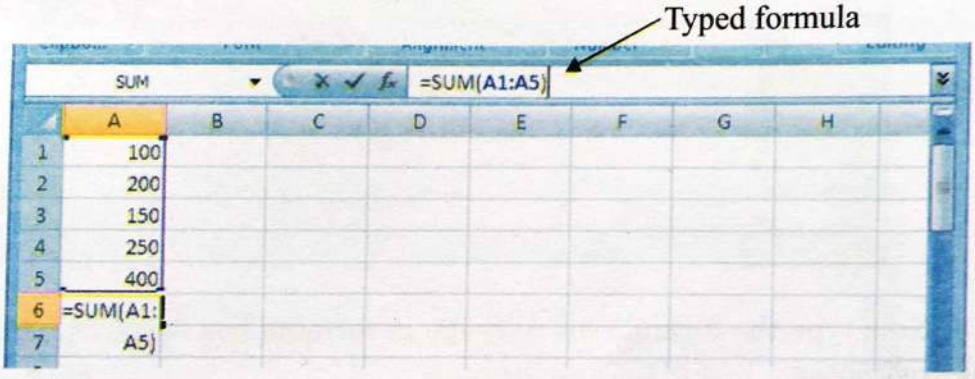
1. Type a data in MS Excel as in figure.



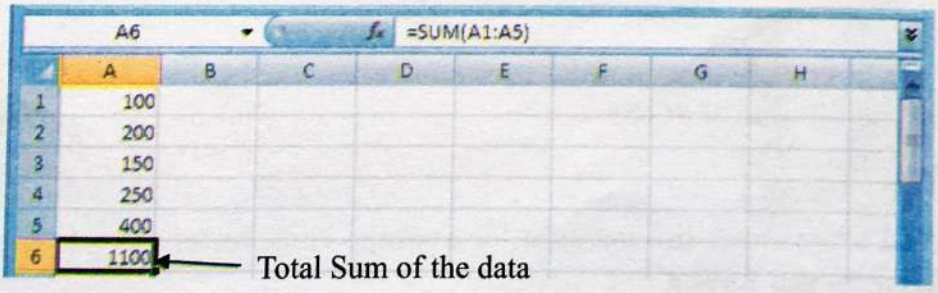
2. Click on Insert Formula Box.



3. Now type the formula for sum in formula box =SUM(A1:A5) (as in figure)



4. And after enter the formula for sum click Enter button. The result will appear in the screen.



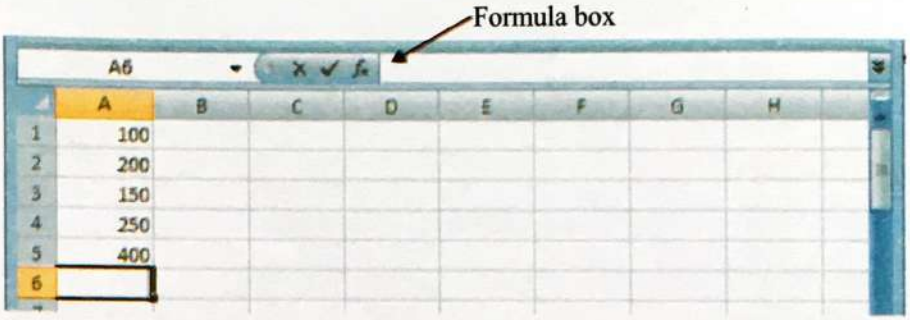
4.10.2 AVG( )

The AVERAGE function is a built-in function in Excel that is categorized as a Statistical Function. It can be used as a worksheet function (WS) in Excel, the AVERAGE function can be entered as part of a formula in a cell of a worksheet.

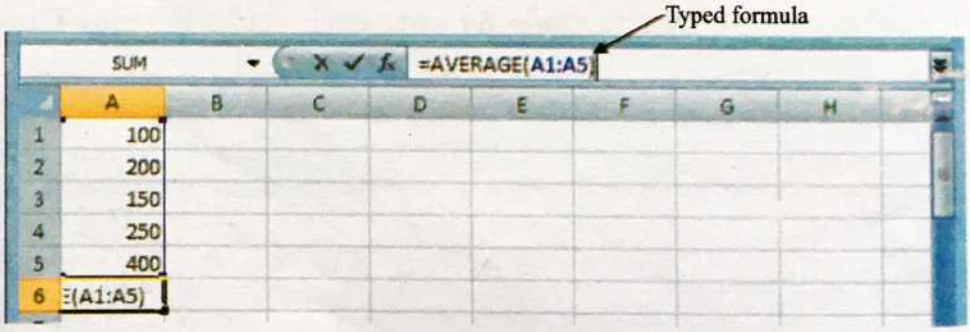
Example :

1. Type a data in MS Excel as in figure.

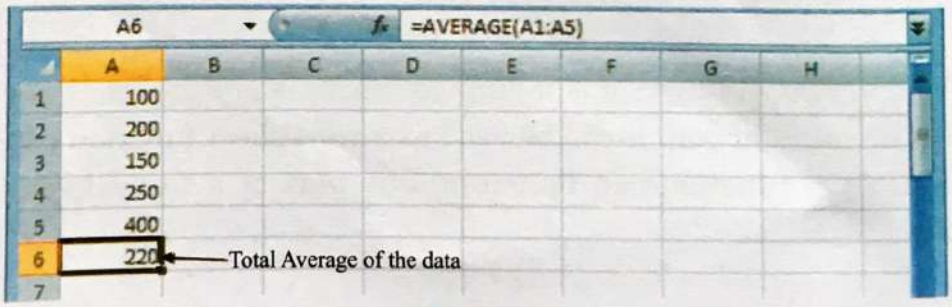
2. Click on Insert Formula Box.



3. Now type the formula for Average in formula box =Average(A1:A5) (as in figure)



4. And after enter the formula for average click Enter button. The result will appear in the screen.

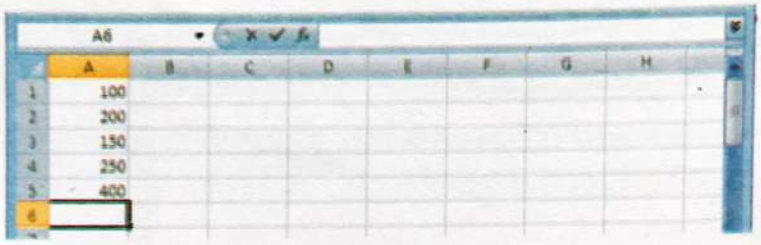


4.10.3 MIN( )

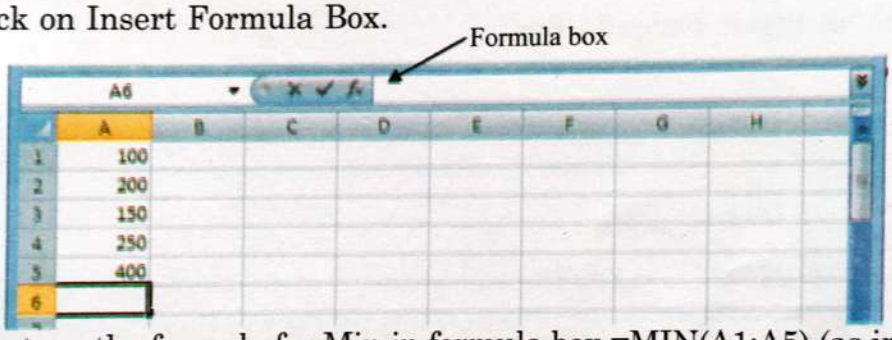
The Excel MIN function returns the smallest numeric value in a range of values. The MIN function ignores empty cells, the logical values TRUE and FALSE, and text values.

Example :

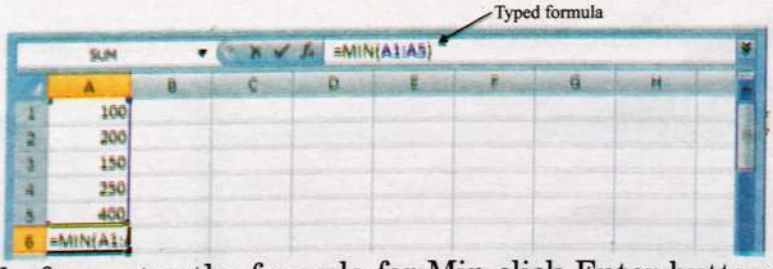
1. Type a data in MS Excel as in figure.



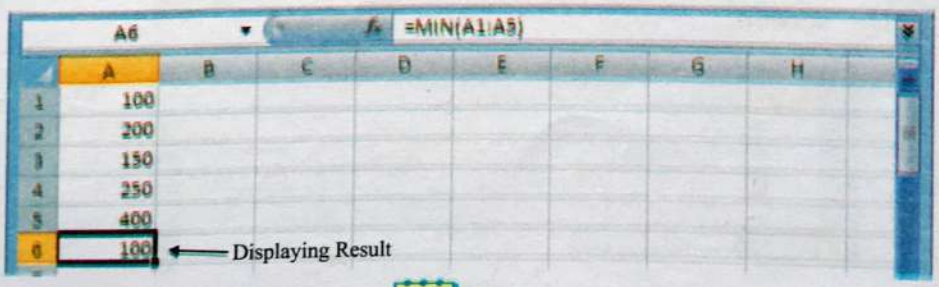
2. Click on Insert Formula Box.



3. Now type the formula for Min in formula box =MIN(A1:A5) (as in figure)



4. And after enter the formula for Min click Enter button. The result will appear in the screen.

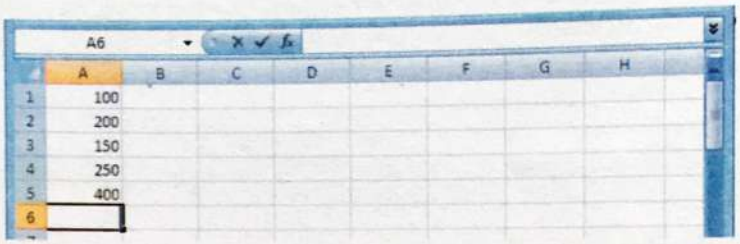


4.10.4 MAX( )

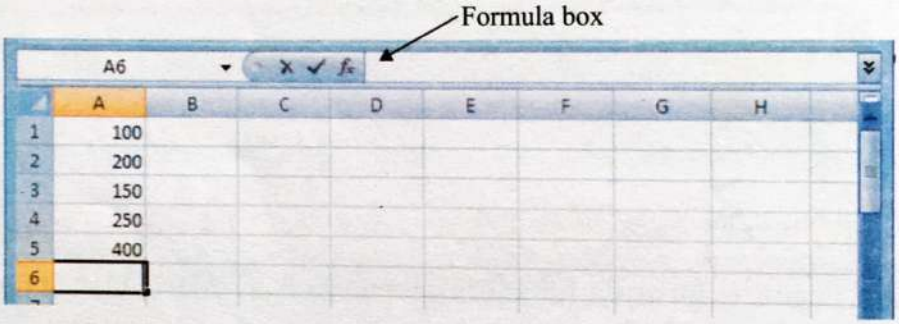
The Excel MAX function returns the maximum numeric value in a range of values. The MAX function ignores empty cells, the logical values TRUE and FALSE, and text values.

Example :

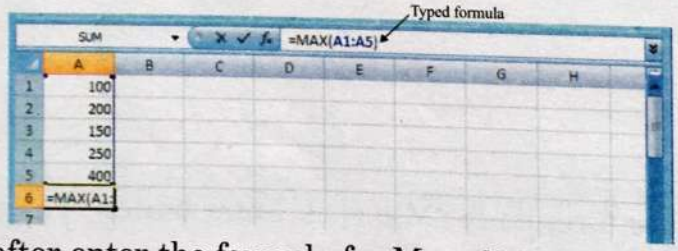
1. Type a data in MS Excel as in figure.



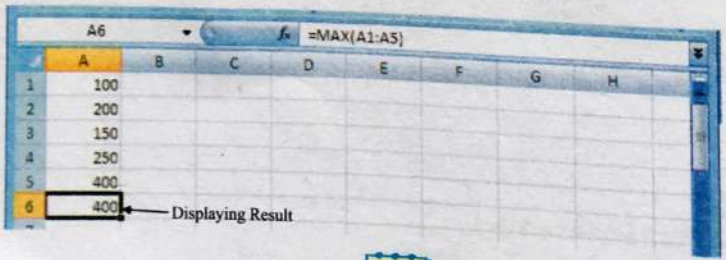
2. Click on Insert Formula Box.



3. Now type the formula for Max in formula box =Max(A1:A5) (as in figure)



4. And after enter the formula for Max click Enter button. The result will appear in the screen.



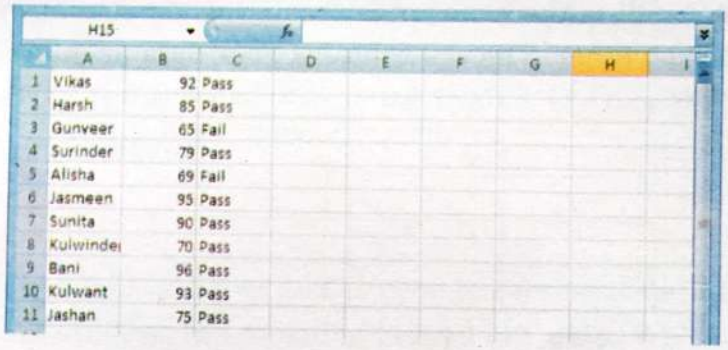
4.10.4 IF( )

The IF function can perform a logical test and return one value for a TRUE result, and another for a FALSE result.

For example, to "pass" scores above 70: =IF(A1 >= 70,"Pass","Fail"). More than one condition can be tested by nesting IF functions. The IF function can be combined with logical functions like AND and OR.

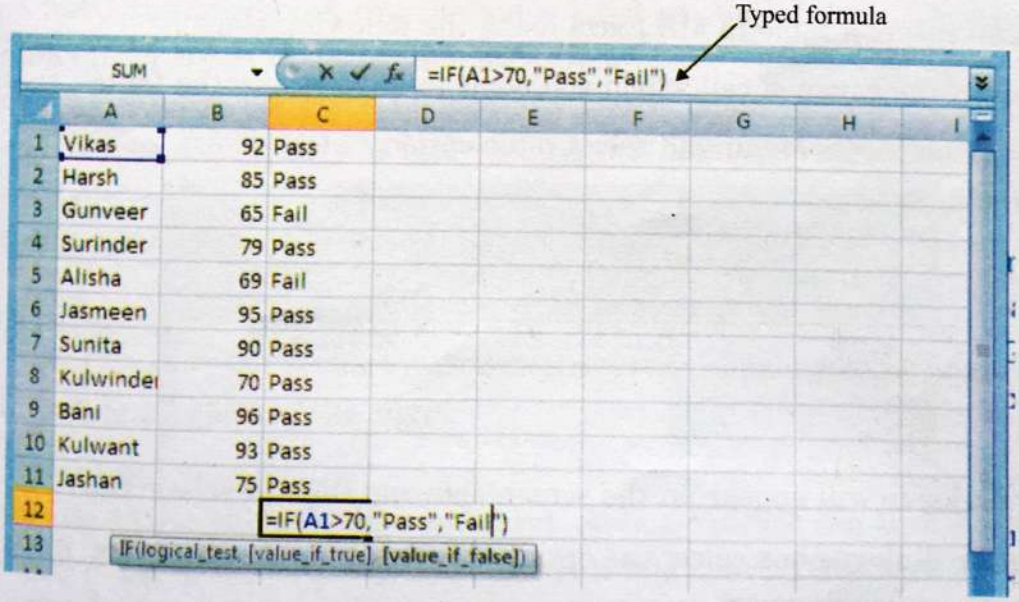
Example :

1. Type a data in MS Excel as in figure.



	A	B	C
1	Vikas	92	Pass
2	Harsh	85	Pass
3	Gunveer	65	Fail
4	Surinder	79	Pass
5	Alisha	69	Fail
6	Jasmeen	95	Pass
7	Sunita	90	Pass
8	Kulwinder	70	Pass
9	Bani	96	Pass
10	Kulwant	93	Pass
11	Jashan	75	Pass

2. Now type the formula in formula box =IF(A1 >= 70, "Pass", "Fail") (as in figure) the result will appear in the figure.



	A	B	C
1	Vikas	92	Pass
2	Harsh	85	Pass
3	Gunveer	65	Fail
4	Surinder	79	Pass
5	Alisha	69	Fail
6	Jasmeen	95	Pass
7	Sunita	90	Pass
8	Kulwinder	70	Pass
9	Bani	96	Pass
10	Kulwant	93	Pass
11	Jashan	75	Pass
12			=IF(A1>70,"Pass","Fail")
13			

4.11 INSERTING TABLES IN WORKSHEET, EMBEDDING CHARTS OF VARIOUS TYPES (LINES, PIE, BAR, COLUMN, AREA) IN WORKSHEET

Inserting tables in worksheet

What is a Table ?

Table is a collection of rows and columns. A row is a horizontal line in a table. And a column is vertical line in table. The intersection of row and column is called a cell.

In other words, a cell is the box that is created when your rows and your columns intersect each other. The cell contains your data or information.

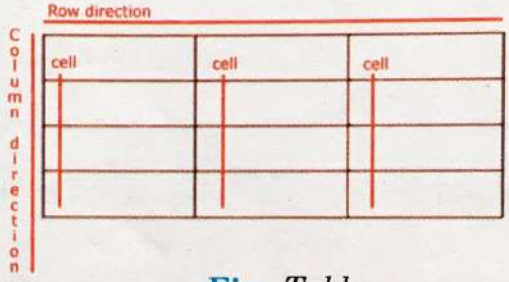
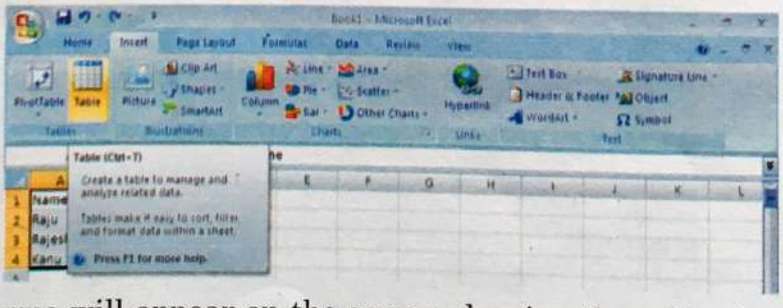


Fig. *Table*

CREATING A TABLE

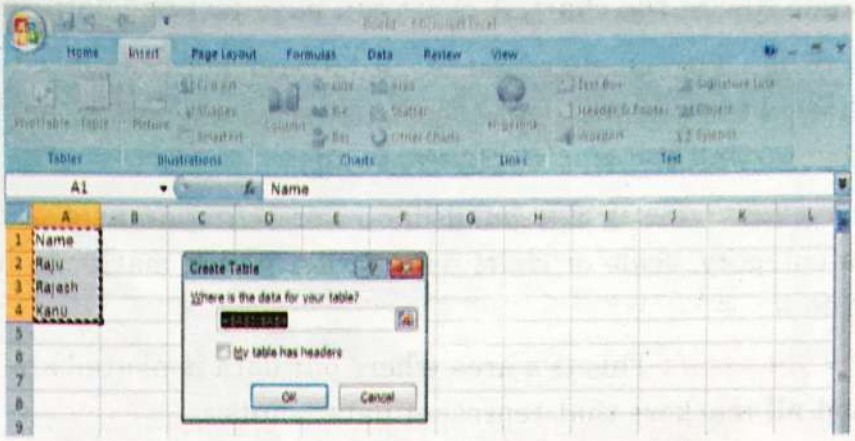
We can insert a table in MS Excel using the following steps :

1. Select the range of cell which you want to convert into the table.
2. Click on insert Menu and select table option.



3. A dialogue will appear on the screen showing the cell reference.
4. In the dialogue box select the option "My table has heading row" if your table contains heading row.

5. Click on OK button.



Embedding Charts of various types (Line, pie, bar, column, area) in worksheet

Charts

A chart is a tool in Excel that is used to represent data pictorially. A chart can allow us to know the meaning behind our data. We can use these charts to make comparisons much easier. You can use different types of charts to represent data.

MS Excel Workbook can contain a large amount of data. Therefore it is difficult for us to interpret this data. If we have numbers in our worksheet and we want to know the highest and lowest numbers from these numbers. So it can be done clearly by representing this data as a chart. Excel has different types of charts to represent data, so we can choose one that most effectively represents our data in the worksheet.

Elements of chart : Following are the elements of chart :

(*i*) Chart area : A chart area contains everything inside the chart window, including all parts of the chart.

(*ii*) Data marker (or Data point) : It is a symbol on the chart that represents a single value in the worksheet. A data marker can be a bar in a bar chart, a pie in a pie chart, or a line on a line chart. Data markers with the same shape or pattern represent a single data series in the chart.

(iii) Data series : There are group of related values such as all the values in a single row in the chart. A chart can have just one data series.

(iv) Axis : Axis is a line that is used as a major reference for plotting data in a chart. In two-dimensional charts there are two axis the x-axis (horizontal/category) and the y-axis (vertical/value).

(v) Tick mark : It is a small line intersecting an axis. A tick mark indicates a category, scale or chart data series. A tick mark can have a label attached to it.

(vi) Plot area : This is a area where our data is plotted and it includes the axis and all markers that represent data points.

(vii) Gridlines : These are the optional lines extending from the tick marks across the plot area. It make easier to view the data values represented by the tick marks.

(viii) Chart text : Chart text is a label or title that we add to our chart. Attached text in a title or label that is linked to an axis such as the Chart Title.

(ix) Legend : Legend is a key that identifies patterns, colours, or symbols associated with the markers of a chart data series. The legend shows the data series name corresponding to each data marker.

(a) Types of Chart :

(i) Pie Chart (ii) Column Chart

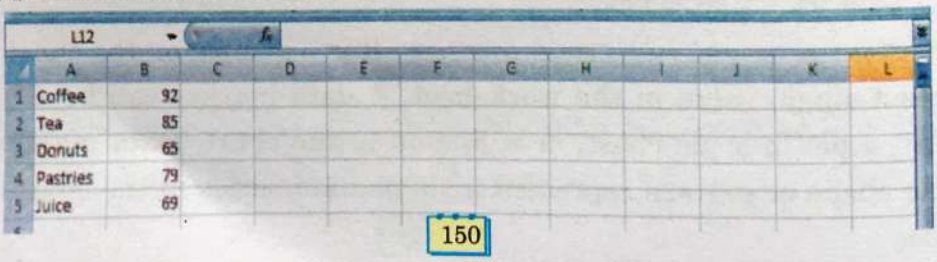
(iii) Line Chart (iv) Bar Chart

(v) Area Chart (vi) Scatter Chart etc.

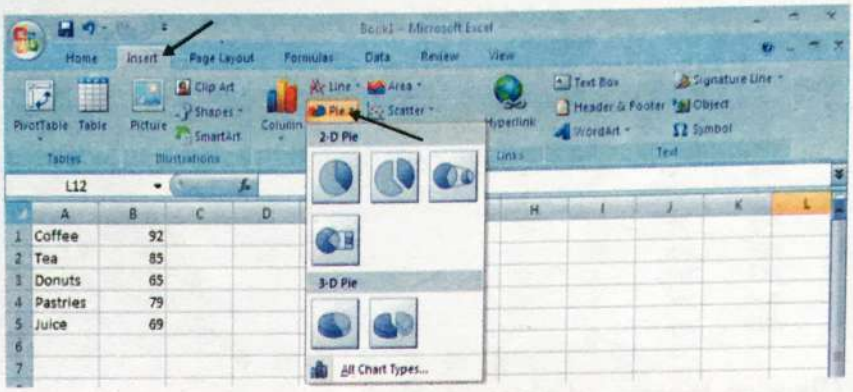
(i) Pie Chart : Pie charts can show a lot of information in a small amount of space. They primarily show how different values add up to a whole.

To create Pie Chart, follow the following steps :

1. Type data in MS Excel.

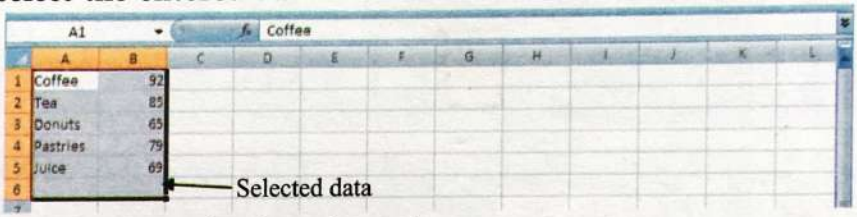


2. Click on Insert → Pie chart option.



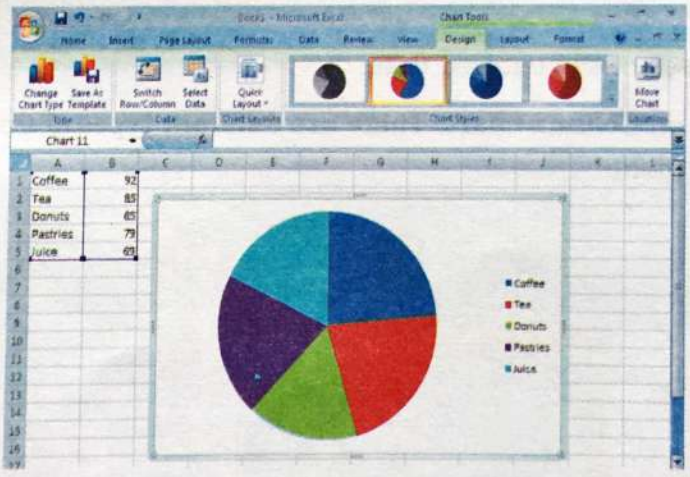
3. There are different types of Pie chart in drop down option.

4. Now select the entered data.



4. The select any one pie chart from them.

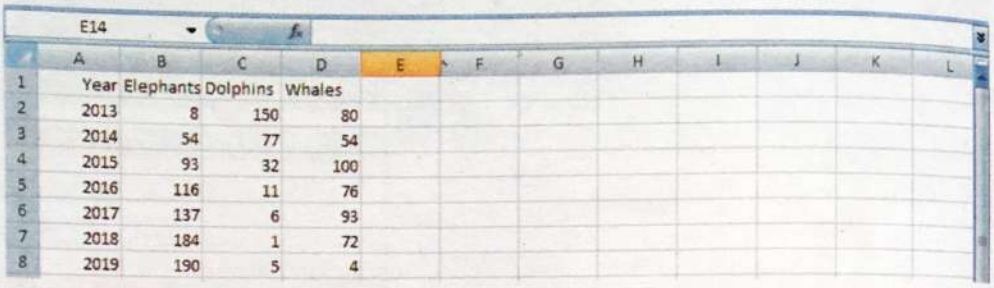
5. The Pie chart will appear on the screen.



(ii) Column Chart : A column chart is a graph that shows vertical bars with the axis values for the bars displayed on the left side of the graph. It is a graphical object used to represent the data in your Excel spreadsheet. You can use a column chart when you want to compare values across categories.

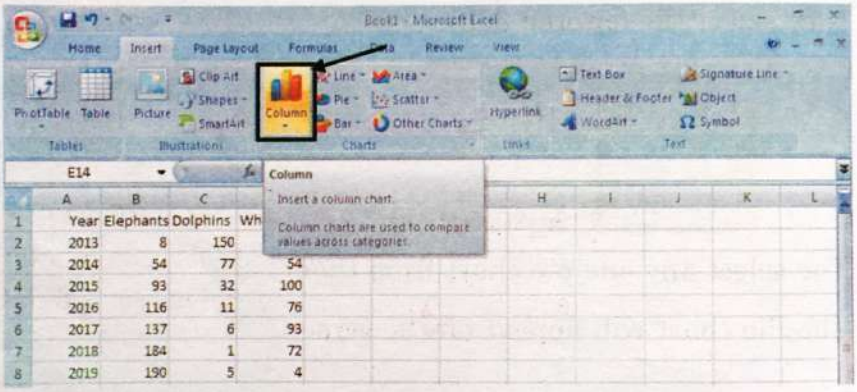
To create Column Chart, follow the following steps :

1. Type data in MS Excel.



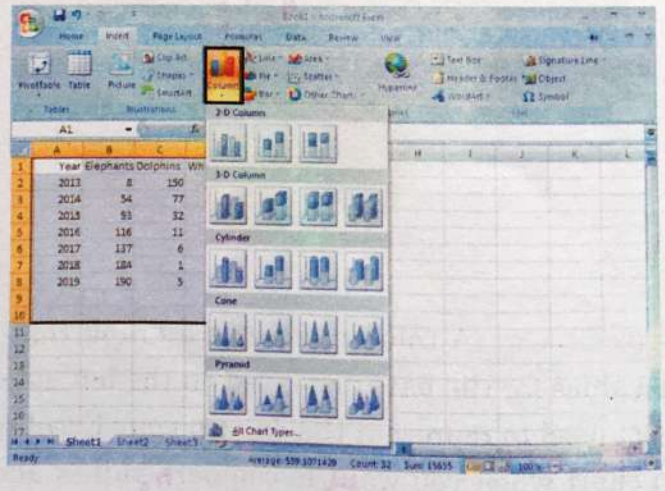
	A	B	C	D
1	Year	Elephants	Dolphins	Whales
2	2013	8	150	80
3	2014	54	77	54
4	2015	93	32	100
5	2016	116	11	76
6	2017	137	6	93
7	2018	184	1	72
8	2019	190	5	4

2. Click on Insert → Column option.



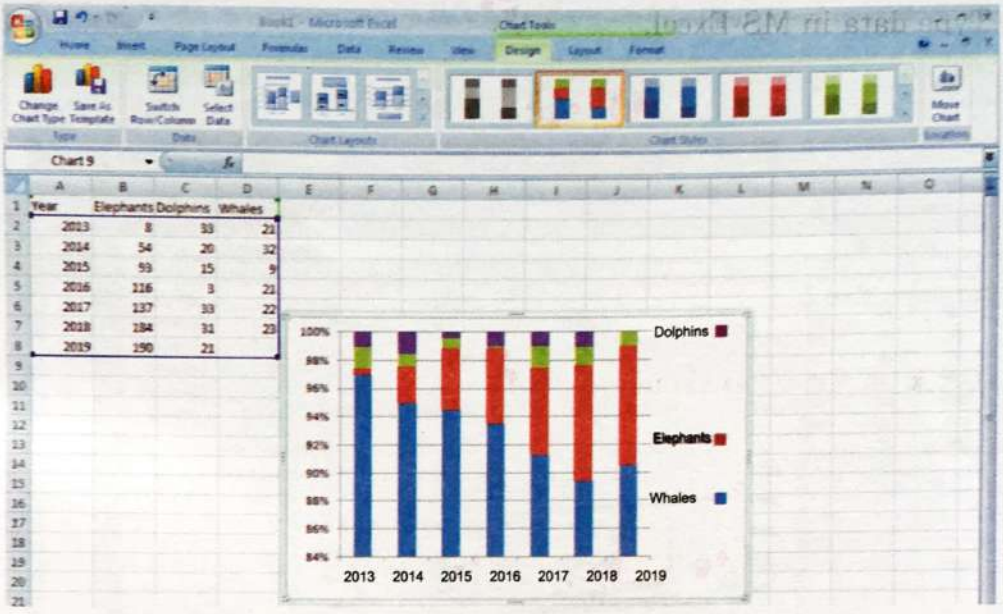
3. Now select the entered data.

4. Click on Column chart. There are different types of Column chart in th drop down menu.



4. Select any one Column chart from them.

5. The Column chart will appear on the screen.

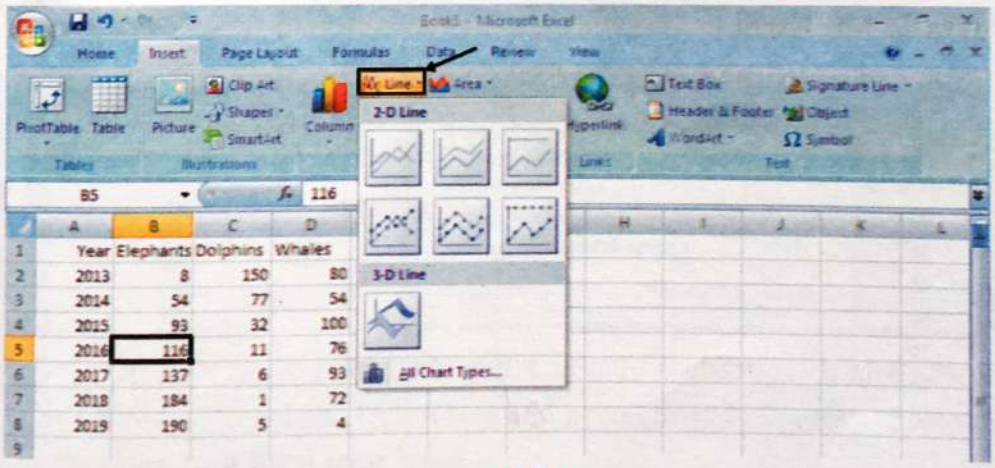


***(iii)* Line Chart :** Line charts are used to display trends over time. Use a ine chart if you have text labels, dates or a few numeric labels on the hori- ontal axis. Use a scatter chart (XY chart) to show scientific XY data.

To create Line Chart, follow the following steps :

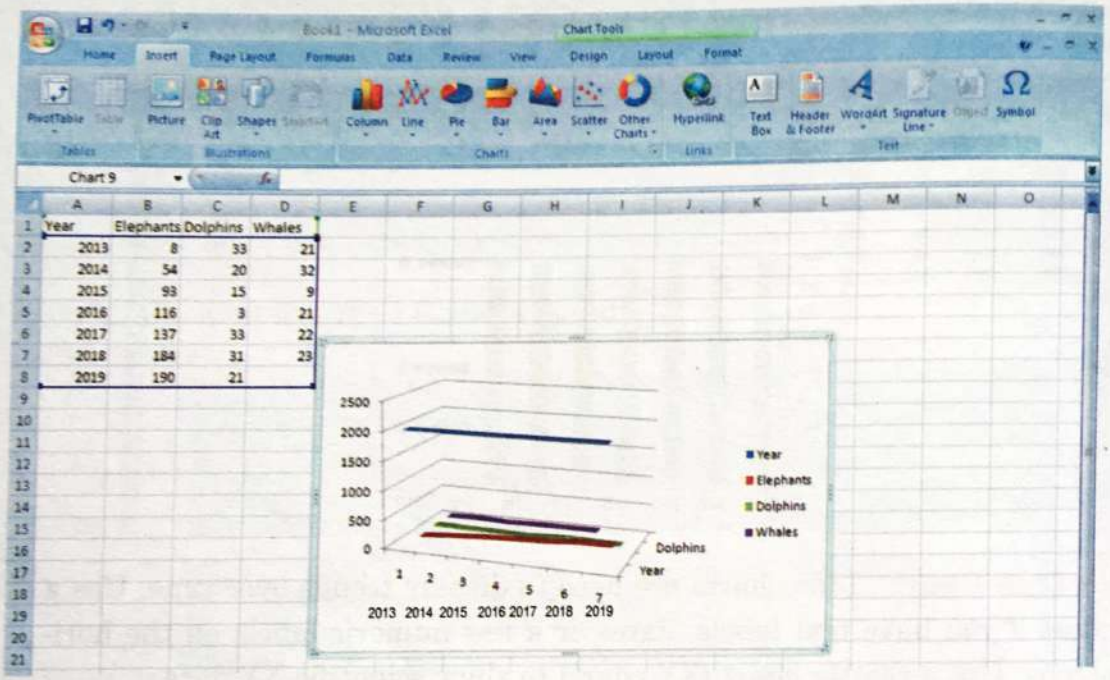
1. Type data in MS Excel.

2. Click on Insert → Line option from chart ribbon.



2. There are different types of Line chart available in this option. Select any one of them.

3. Now the Line chart will appear on the screen.

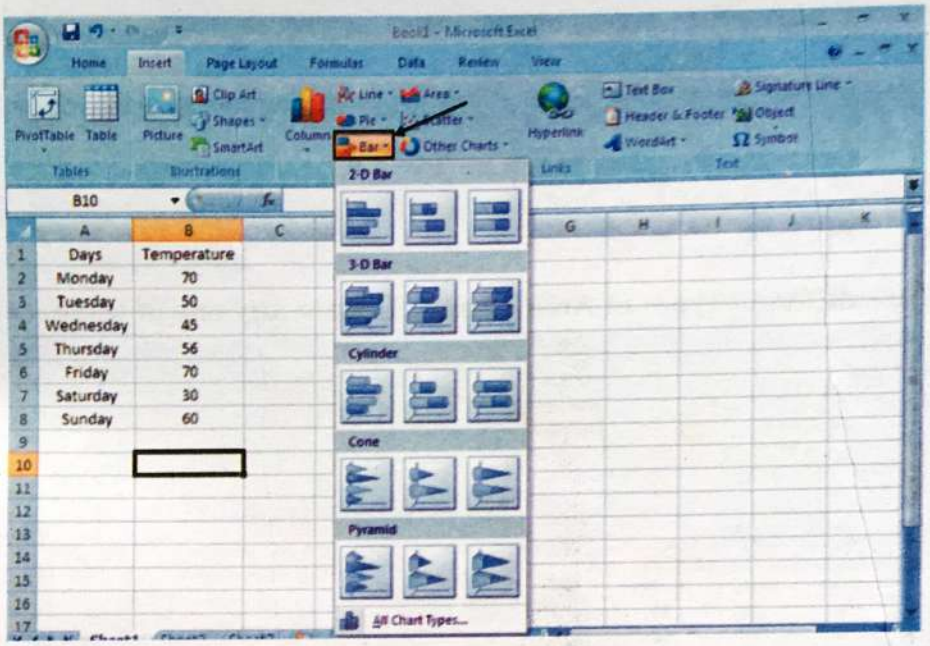


***(iv)* Bar Chart :** A bar chart is a graph that shows horizontal bars with the axis values for the bars displayed on the bottom of the graph. It is a graphical object used to represent the data in your Excel spreadsheet.

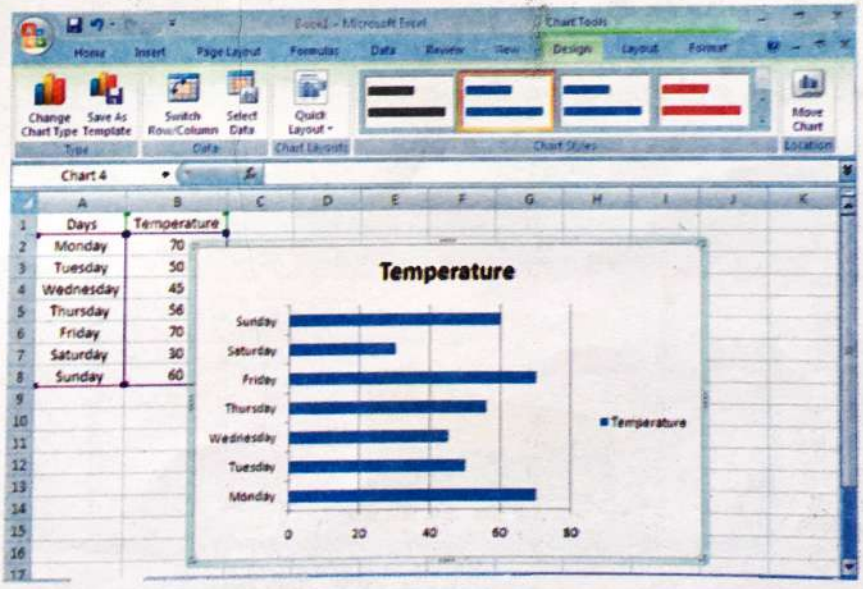
To create Bar Chart, follow the following steps :

1. Type data in MS Excel.

2. Now click on Bar option from Charts ribbon. There are different types of Bar Charts. Choose any one of them.



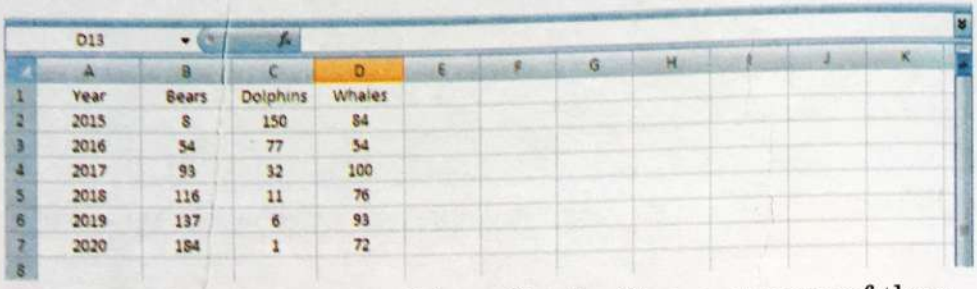
3. Now the Bar chart will appear on the screen.



(v) Area Chart : An area chart is a line chart with the areas below the lines filled with colors. Use a stacked area chart to display the contribution of each value to a total over time.

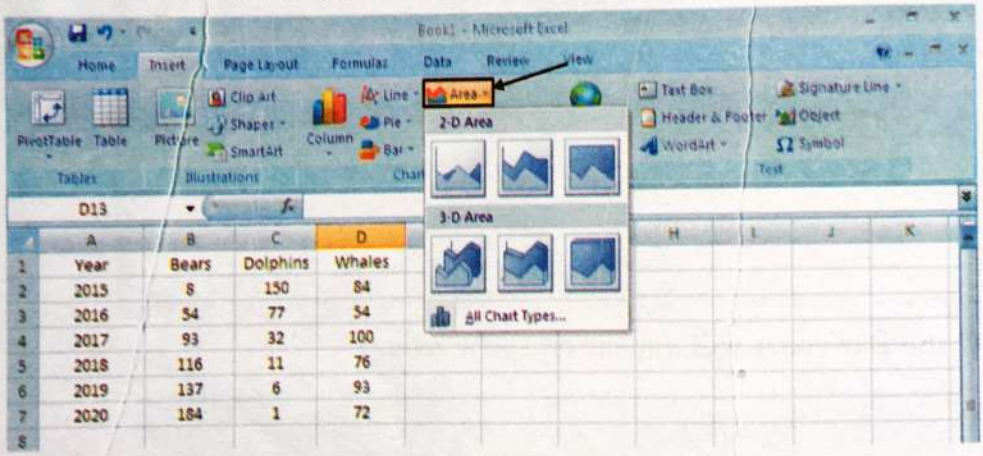
To create Area Chart, follow the following steps :

1. Type data in MS Excel.



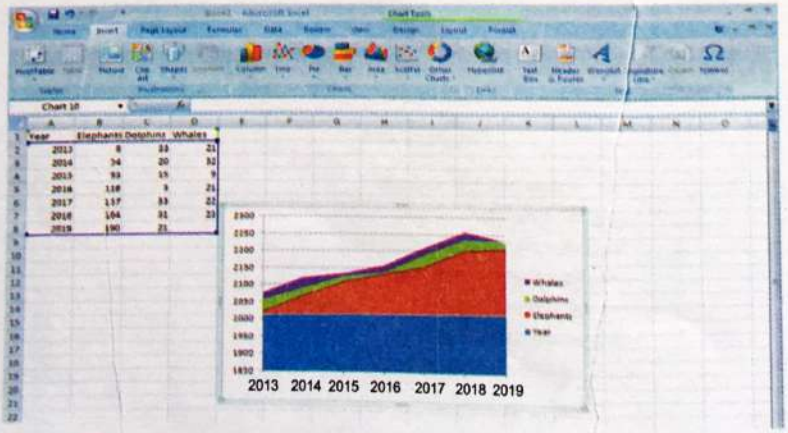
	A	B	C	D
1	Year	Bears	Dolphins	Whales
2	2015	8	150	84
3	2016	54	77	54
4	2017	93	32	100
5	2018	116	11	76
6	2019	137	6	93
7	2020	184	1	72

2. There are different types of Area Charts. Choose any one of them.



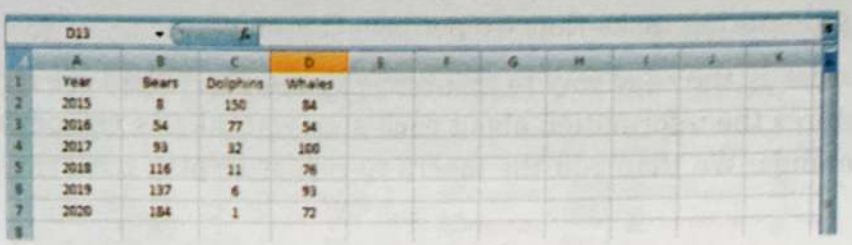
	A	B	C	D
1	Year	Bears	Dolphins	Whales
2	2015	8	150	84
3	2016	54	77	54
4	2017	93	32	100
5	2018	116	11	76
6	2019	137	6	93
7	2020	184	1	72

3. The Area chart will appear on the screen.



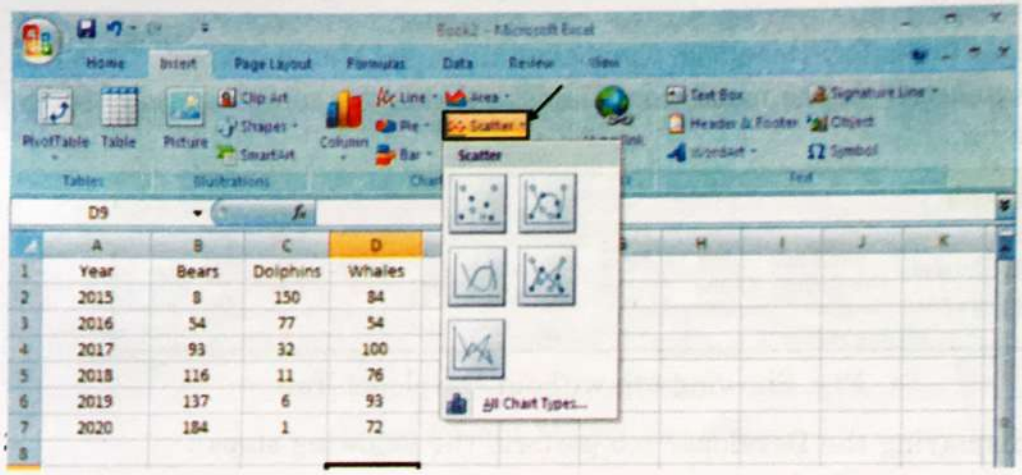
***(vi)* Scatter Chart :** Use a scatter chart (XY chart) to show scientific XY data. Scatter charts are often used to find out if there's a relationship between variable X and Y.

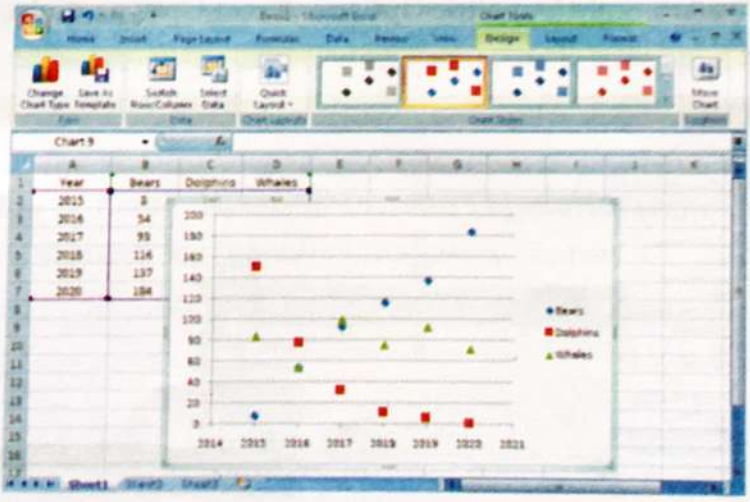
1. Type data in MS Excel.



	A	B	C	D
1	Year	Bears	Dolphins	Whales
2	2015	8	150	84
3	2016	54	77	54
4	2017	93	32	100
5	2018	116	11	76
6	2019	137	6	93
7	2020	184	1	72

2. Now click on Scatter Chart. There are different types of Scatter Chart. Choose any one of them.





4.13 Macros in worksheet

Macros are very useful, where we want to repeat same steps repeatedly. A macro is a series of commands that is grouped together so that we can run

whenever we need to perform the specific task. We can use macros in Excel to save time by automating tasks that we perform frequently.

Macro recorder is the easy way to create many macros. When we record a macro Excel stores the information about each step you take as you perform a series of commands. We than run the macro to repeat or play back the set of commands.

The macro recorder records every action we complete. So before we start the process of recording it is very important to plan macro that what steps we need to record.

We need to display Developer Tab before to record Macro in Excel. This tab helps us to access to the macro commands, but this tab doesn't appear by default see fig.

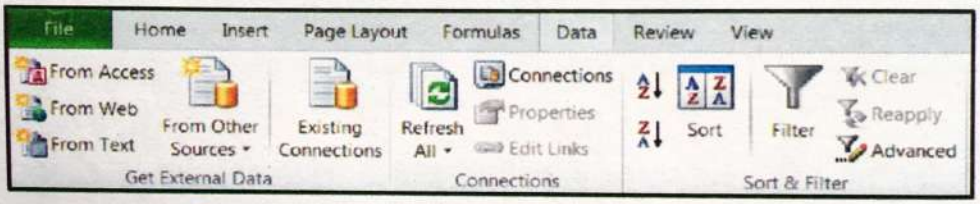


Fig. Showing tab without Developer Tab

For displaying the Developer tab perform the following steps :

(*i*) Click the File tab and then click Options. Excel Options dialog box appears before you :

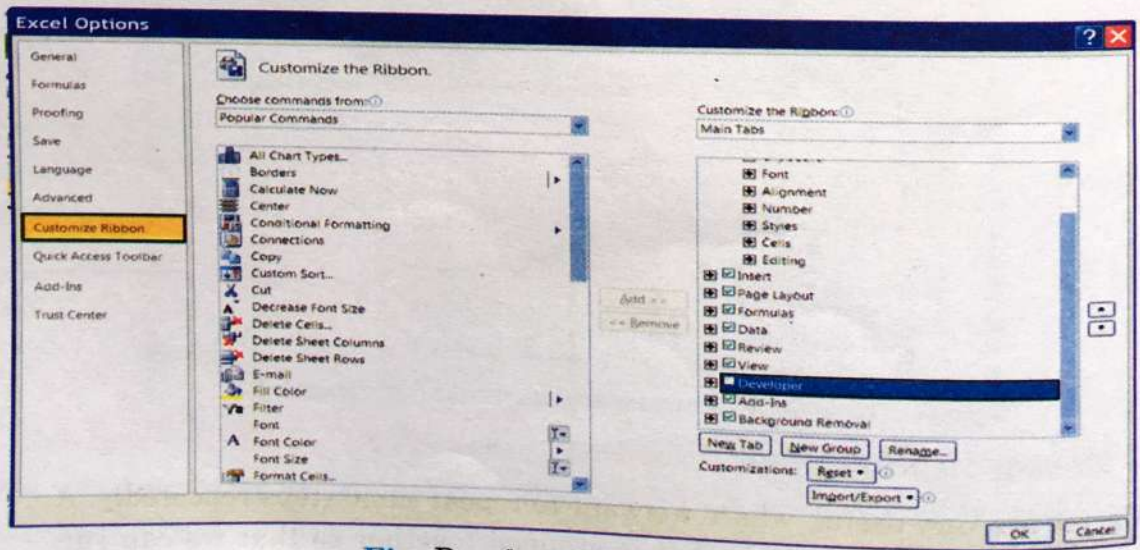


Fig. Developer Tab Settings

(*ii*) Click Customize Ribbon in the left pane and then select the Developer check box under Main Tabs on the right side of the dialog box see fig.

(*iii*) Click OK. The Developer tab appears in the Ribbon.

Fig. Displaying the Developer tab to work with macros in Excel

Recording a macro : To record a Macro perform the following steps :

(*i*) Choose Record Macro in the Code group of the Developer tab.

The Record Macro dialog box appears.

Fig. Record Macro dialog box

(*ii*) Type a name for the macro in the Macro Name text box.

First character of the macro name must be a letter and the name cannot contain spaces or cell references. Macro names are not case-sensitive.

(*iii*) Assign a Shortcut Key to Macro: If you have already selected a shortcut key in Excel, the macro shortcut key overrides the Excel shortcut key while the workbook that contains the macro is open.

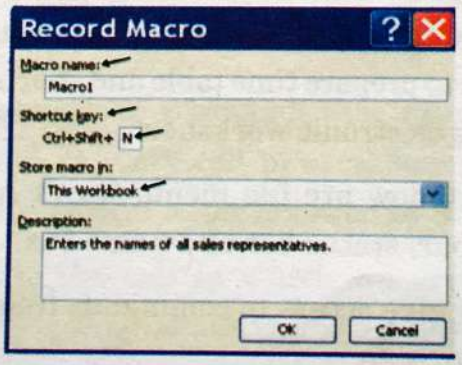


Fig. Record Macro Dialog Box

(*iv*) On the Store Macro In drop-down list, select where we want to store the macro:

This Workbook : It is used to save the macro in the current workbook file.

New Workbook : Create macros that we can run in any new workbooks created during the current Excel session.

Personal Macro Workbook : This option is selected if you want to macro to be available whenever we use Excel, regardless of which worksheet we'e using.

(*v*) Type a description of the macro in the Description text box as shown in figure.

(*vi*) Click on OK. The Record Macro option on the Developer tab changes to Stop Recording.

(*vii*) Perform the actions you want to record : Excel records our steps exactly, but we can also record the steps relative to any current cell.

(*viii*) Choose Stop recording in the Code group of the Developer tab: The macro recorder stops recording keystrokes and the macro is complete.