Chapter Four
Microsoft Office Excel

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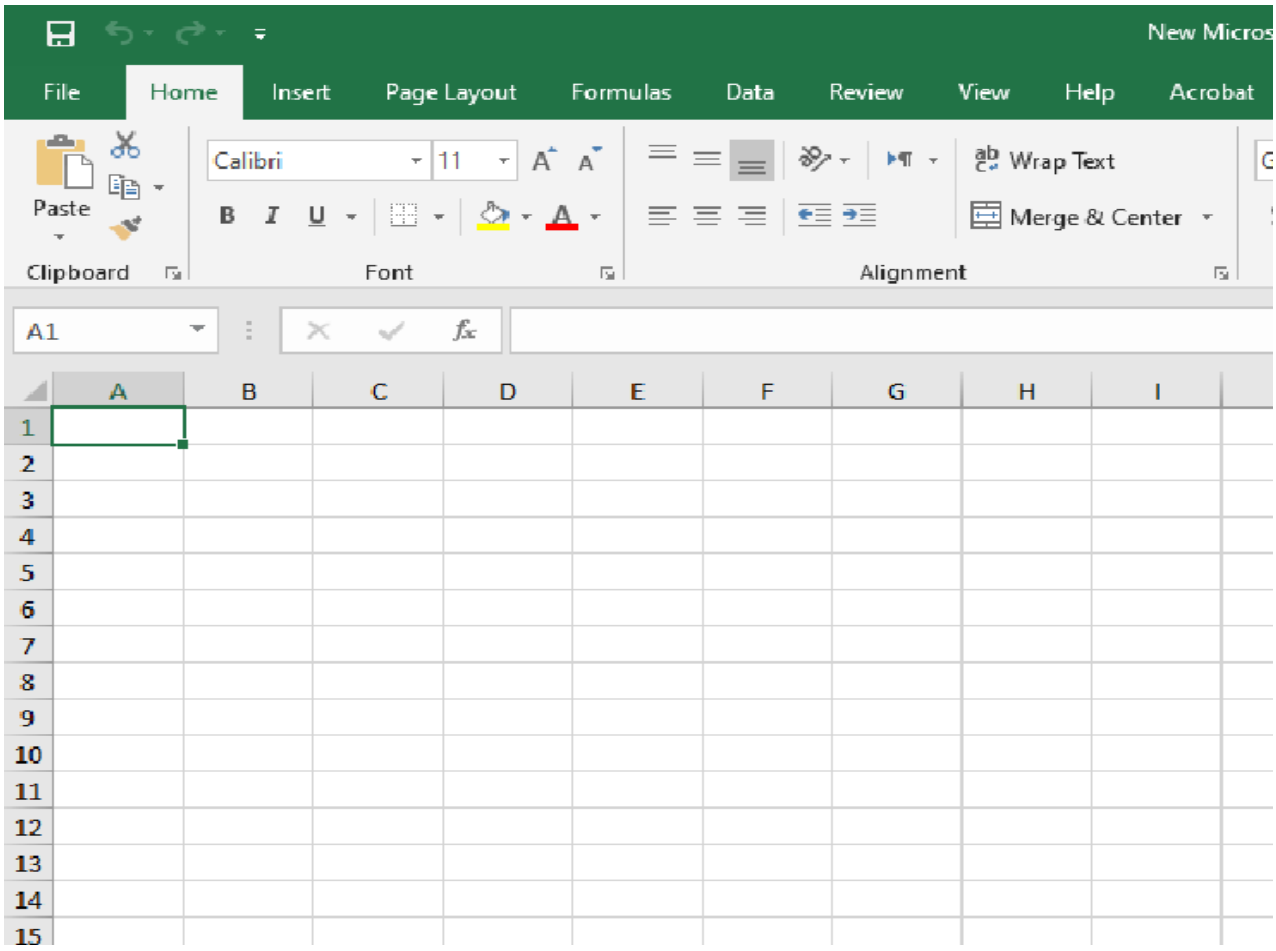
1- Identification

Excel is a spreadsheet program that allows storing a huge amount of data in tables, performing mathematical operations and statistical analyses on them, and creating graphs on them.

1.1- Run the program

To run Excel, follow these steps:

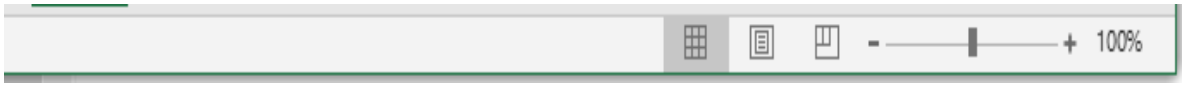
From the taskbar and from the Start menu located on the left of the bar located at the bottom of the desktop, choose All Programs. A list of programs will appear. Microsoft Office is selected, and from the submenu, **Microsoft Excel** is selected or clicked. A blank worksheet will then be created automatically containing a number of pages, as shown in the figure.



2- Basic elements of Excel

Title bar containing the title of the open workbook. When open a new workbook, Excel gives it the name **Book1**. When save the workbook with a new name, this new name appears on the title bar. This bar contains icons for closing, minimizing, and maximizing the window. It also contains a quick boot toolbar, whose commands are used frequently during work. A menu bar such as **File**, **Home**, **Insert**, **Page Layout**, **Formula**, **Date**, **....** and there is another bar which is the **Command bar** which contains separate groups each group contains a type of command. There is a very important bar in the Excel workbook, which is the **formula bar**, which shows the contents of the active cell, whether there is a mathematical formula or any other data, as we can see in the figure.

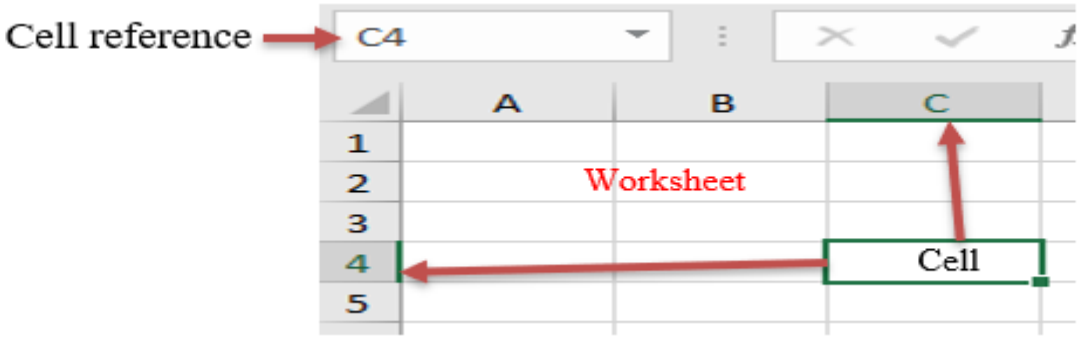
There is also a **Status bar** that appears at the bottom of the screen and shows the workbook display methods in addition to brief information about the current workbook status.



3- Work Sheet

A worksheet consists of a set of

1- Rows, which are a set of cells arranged horizontally in a table and are referred to by numbers.
2- Columns are a group of cells arranged vertically in a table and are indicated by letters.
3- Cell is the intersection of a row and a column and has an address called a cell reference, which consists of a letter and a number. The letter identifies the column and the number identifies the row.

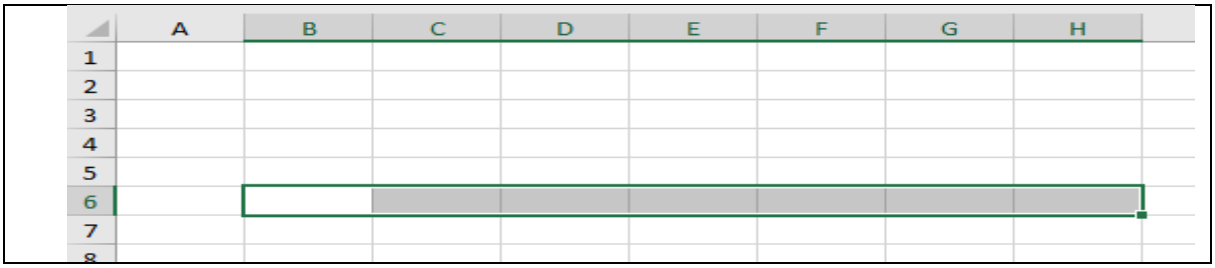


For example, this cell is located at the intersection of the letter **C** and the number **four**. read it from the **cell reference and C4** reads it. When click on any other cell in the worksheet, will read it from the cell reference. When a cell is located in column **B** and row **12**, the cell reference will read **B12**.

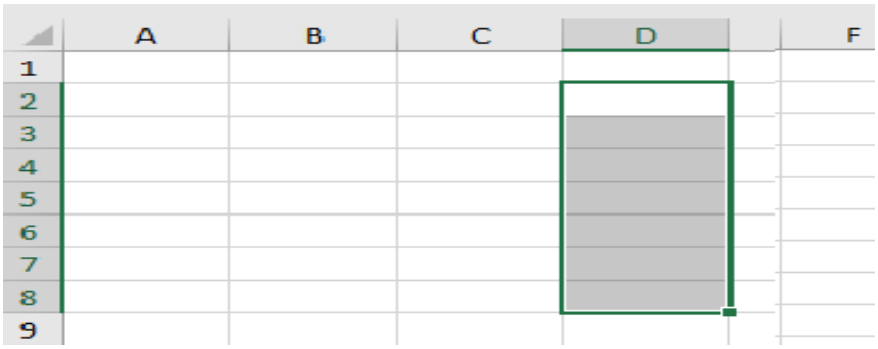
➢ Cell range

Range is the range that indicates the distance between two points and it is of three types:

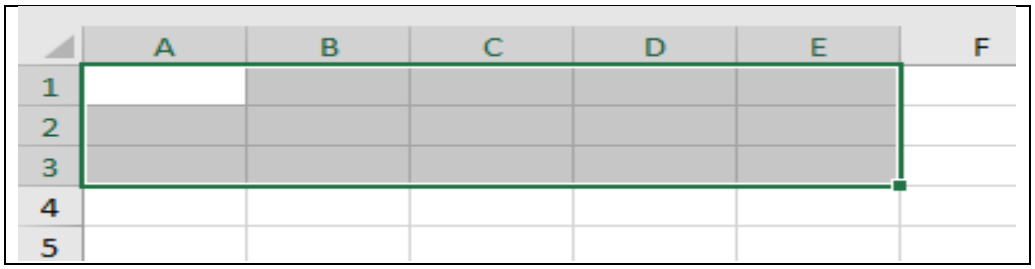
1- **Horizontal range** that includes consecutive cells horizontally within a single row as shown in the below figure, where the range **B6:H6**.



2- **Vertical range** that includes consecutive cells vertically within a single column as shown in the below figure, where the range D2:D8.

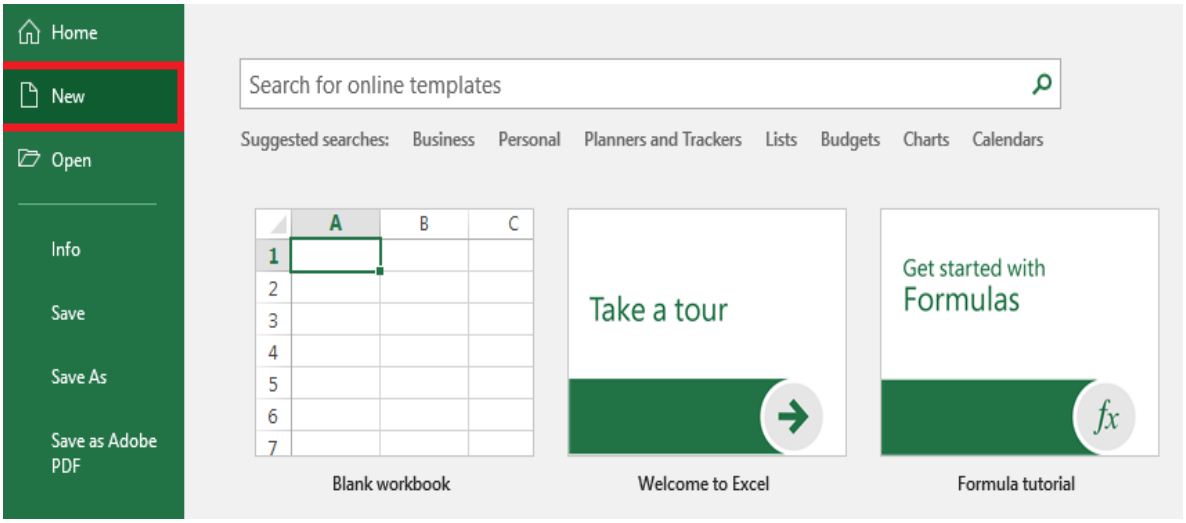


3- **Horizontal and vertical range**, which includes consecutive cells vertically and horizontally at the same time, as in the below figure, where the range A1:E3.



4- Creating New Workbook

When you open a new workbook, click on the **File menu**, then choose the **New option**. Then, the New Workbook dialog box will appear, as shown in the figure.



Then from the available templates, choose an empty workbook template.

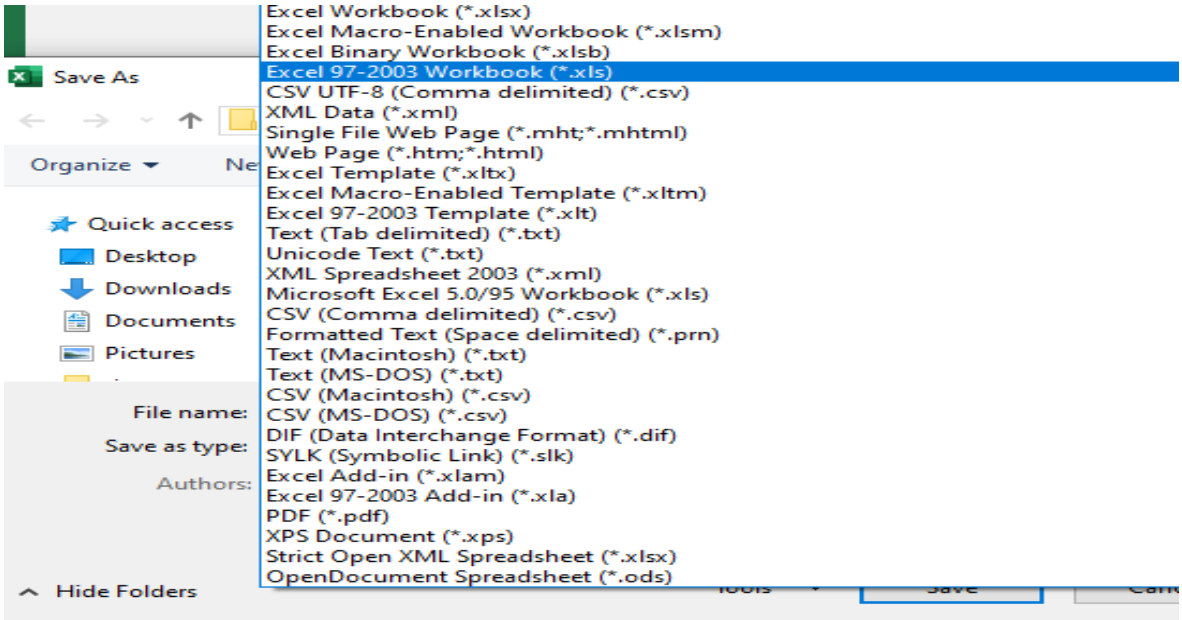
5- Saving a Workbook

After completing all the work on the worksheet, the saving process is done as follows: Go to the **File menu**, then click Save. A dialog window appears with the name **Save As**. Then, the saving location and file type are chosen.

6- Saving a Worksheet to Use it in Previous Versions of Excel

Workbooks created using Excel 2010 can be opened in earlier versions of Excel, taking into consideration the loss of some of the specifications specific to Excel 2010. To save the workbook for use in earlier versions of Excel, follow the steps below:

Click on the **File menu** and choose Safe As option, a drop-down list will appear as shown in the figure below. At the bottom of this list there are two bars, one for the name and the other for the **type of saving**. The bar for the type of saving is selected, and by clicking on it once a list of the types of saving will appear. For example, choose Excel 97 - 2003 Workbook and then select the box at the bottom of the list titled **Save**. The file is then saved in the type that was selected.



7- Entering Data In Excel 2010 Worksheet

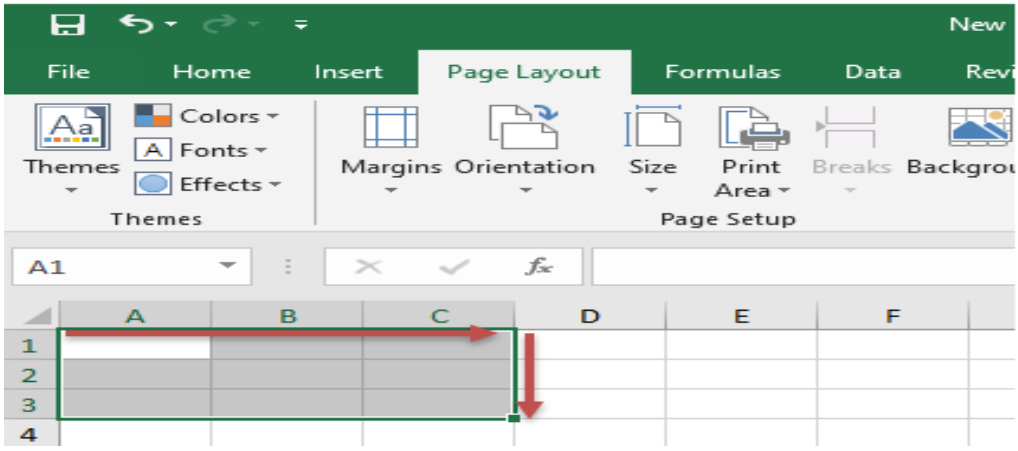
To enter data into a worksheet in an Excel workbook, place the cursor in the cell into which want to enter data by clicking in that cell or using the arrows on the keyboard. A box appears around the cell, indicating that this cell is the **active cell**. Then enter the data or mathematical formulas into it, then press the Enter key. The data inside the cells can be modified by double-clicking inside the cell. Then the data inside this cell can be modified as required.

8- Selecting Cells

When executing any command on a cell or group of cells, this cell must be selected according to the following cases:

1- Select a single cell by clicking on the cell.

2- To select a range of cells, place the mouse pointer in the cell from which the selection begins, then press the left mouse button and move in the direction as required. Continue pressing until the desired area is selected, as in the figure.



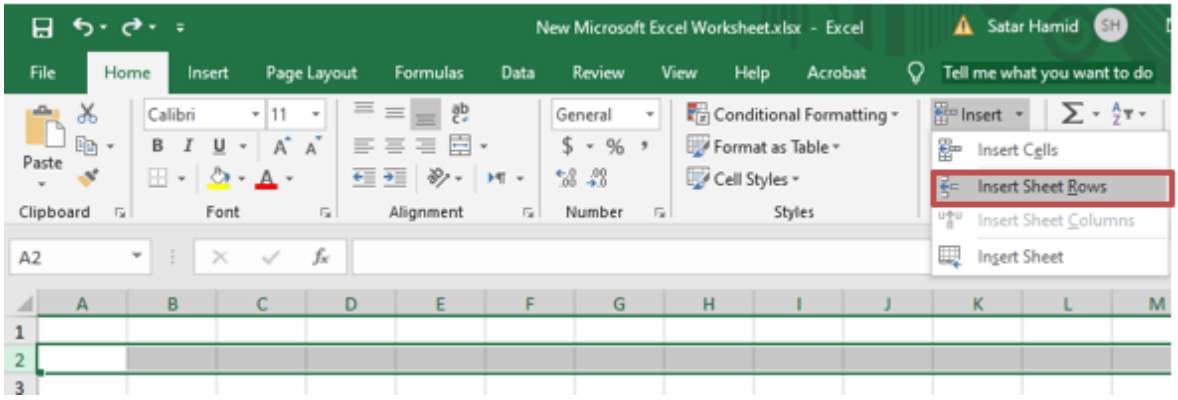
3- To select all cells in a worksheet, click the Select All button, which is **Ctrl + A** on the keyboard.

4- To select a specific row, place the cursor on the row number and the cursor will turn into a small black arrow. Then click on the number and this row will be selected.

5- The same applies when you want to specify a specific column, where the cursor is on the letter of that column.

9- Inserting a Row

To insert one or more rows at a certain point in the worksheet, place the cursor at the beginning of the row before which we want to add a new row, and from the **Home tab**, from the **Cells group**, click the arrow next to Insert, then click Insert table Rows, as in the figure.

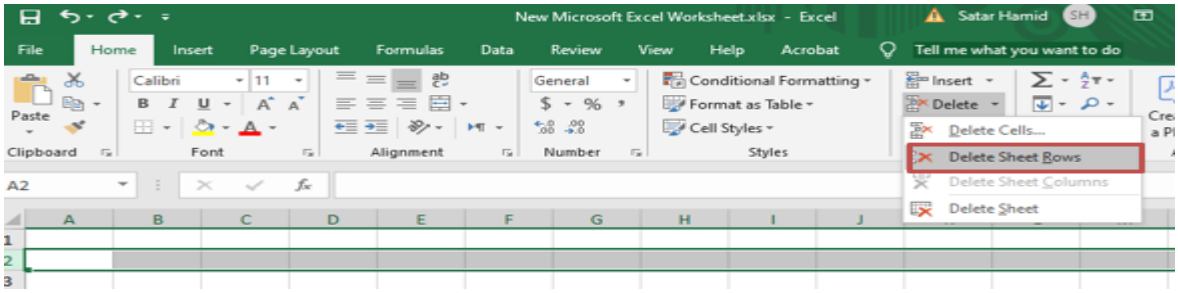


Also, to insert a column, follow the same previous steps.

10- Deleting Rows or Columns

Can be delete entire rows or columns and remove them from the worksheet as follows:

The column or row that want to delete is selected from the main page and from the Cells group. Click on the arrow on the side of the list. A new sub-list appears containing Delete. Choose to delete the selected item, whether it is a column or a row.



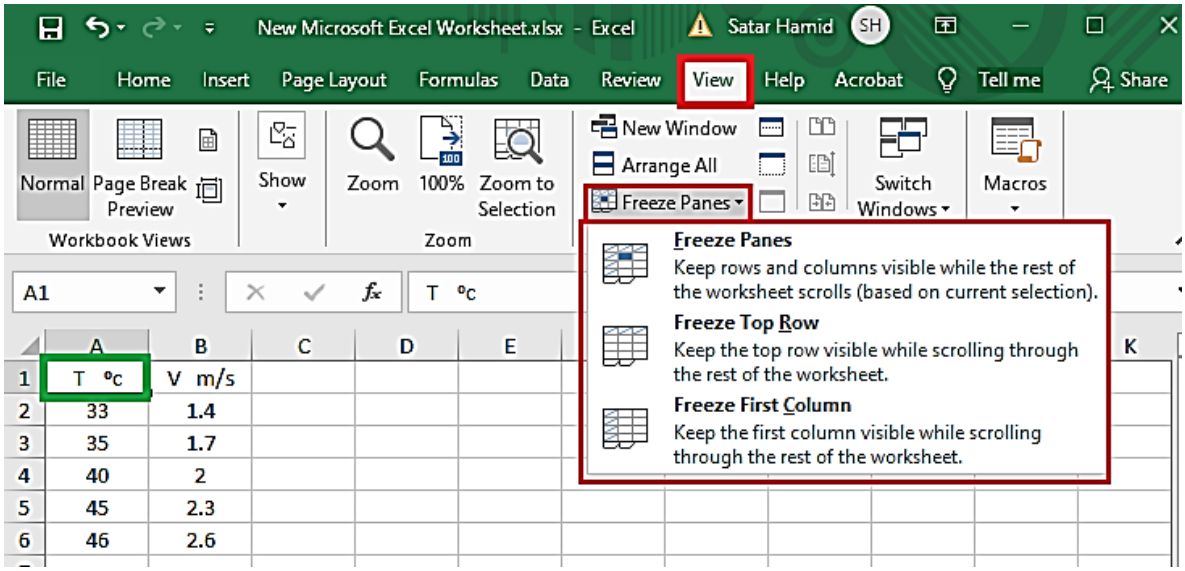
11- Adjusting Row/Column Height, width

To modify the cell dimensions (length or width) to fit the data within these cells. From the main menu and from the cells group, choose Format and click on the arrow next to this option. A drop-down list will appear containing many options such as row height, column width, etc. Choose one of these and a new message will appear in which you specify the required dimensions.

12- Freezing Rows/Column titles

When the data is wider than the width and length of the page shown on the screen, the row and column headings can be frozen when browsing the distant rows or columns.

First, place the cursor in the cell from which you want to start freezing. From the menu bar, go to the **View** menu, and from the **Window group**, choose **Freeze Pans**, and from the arrow below the option, click to display a drop-down list containing three options. The first option is to freeze the page, the second option is to freeze the top row, and the third option is to freeze the first column. Choose one of these three options according to what is required to be implemented.

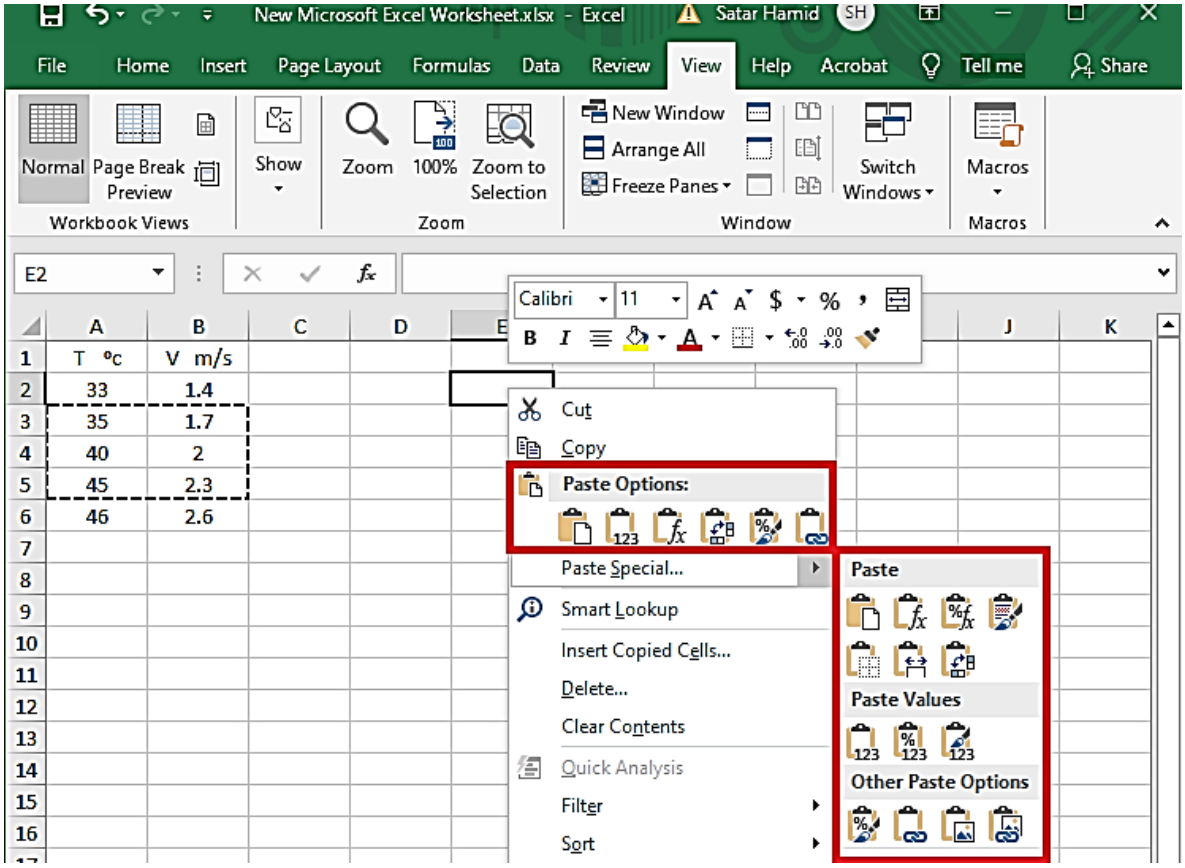


13- Copying, Move Cells Contents

The copying process is done by selecting the cells you want to copy and then right-clicking the mouse. A drop-down menu will appear, and you can choose Copy. The second way is to go to the main page, **Home**, and from the Clipboard group, click Copy. A **dotted frame** will appear around the cells you want to copy. Then, move the cursor to the location you want to copy to. From the right mouse button, a drop-down menu will appear, and you can click Paste. Or by going to **Home**, and from the Clipboard group, choose Paste, and the copy and paste process is completed. In this case, you will have two copies of the data: the original, primary copy, and the second copy, which was copied to another location or in another place. In the case of **cut** or **move**, the same previous procedures are followed, but cut is chosen instead of copy, and the data is transferred to another location and pasted in any required place. In this case, we will have one copy of the data, which is the same as the original data, as soon as it is transferred from one location to another, so we will have only one copy.

14- Paste Options

One of the good features of the pasting process is that there are several options for the pasting process through the button in the pasting icon or by clicking the right mouse button on the cell in which you want to paste. Then a sub-menu appears containing the pasting options as in the figure.



15- Auto Fill

The automatic filling feature is very excellent as it saves time and effort in many office, arithmetic and logical operations, as through this feature it is possible to obtain results for a very large and huge amount of data in a very short time.

This process is done by selecting the cell that contains specific data and it was required to copy the **formatting** in this cell to a number of cells. Once you click on the cell that contains the required formatting, a small square will appear in the lower right corner of the box surrounding the cell. Once you place the cursor on this small square and click on it with the left mouse button while continuing to press and drag on the cells in which you want to copy that **formatting**, and when you finish with the required cells and reach the last required cell, release the left mouse button and thus this formatting will be copied to all of these cells.

16- Inserting a New, Deleting, Renaming Worksheet

When you open an Excel workbook, it gives you three worksheets by default and tabs at the bottom of the workbook called **Sheet 1**, **Sheet 2**, **Sheet 3**. In the case of inserting a new worksheet, there is an option at the bottom of the workbook with a **plus sign** (+). Click on it with the left mouse button, then it will add a new sheet. As for deleting a specific page from the workbook, then put the mouse pointer on the name of that sheet and by clicking with the right mouse button, a drop-down list will appear containing Delete. Then, choose Delete and the sheet will be canceled.

Any page of the document or workbook can be **named** with any name according to the user and according to the names of the pages that are required to be named, by placing the cursor on the name of the page and clicking with the right mouse button. A drop-down menu will appear containing options including the option to **Rename**. Just by clicking on rename, the old name will be determined and then you can write the name that you want to name the page with.

17- Functions and Formulas

The mathematical formula may contain numbers or mathematical operations in data analysis in Excel. In the following table, notice some mathematical formulas used to complete the mathematical operations.

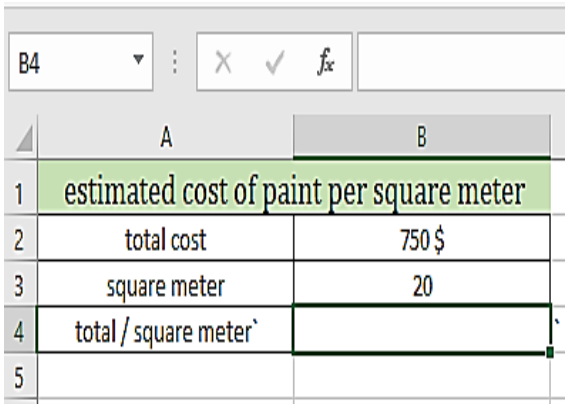
	A	B
1	Example	Meaning
2	88 + 8	Plus
3	67 - 50	subtraction
4	21 * 4	multiplication
5	47 /23	Division
6	7^6	Power
7	(22 + 2)	brackets

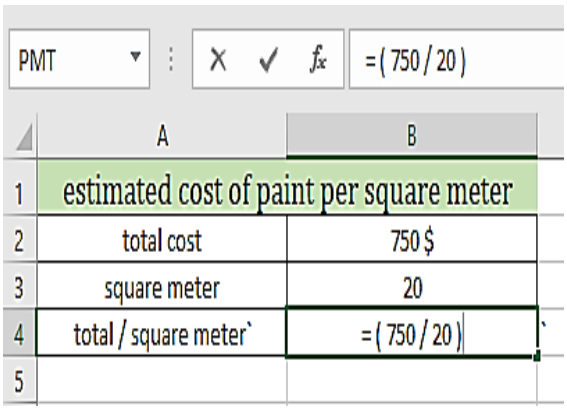
In arithmetic operations, the order must be taken into account, i.e. multiplication and division precede addition and subtraction. can be written any mathematical formula in any cell of Excel that you want to display a specific result in that cell. This function is usually preceded by an **equal sign** and the mathematical terms are surrounded by parentheses. The mathematical formula inside the bracket is performed before the operation outside the bracket.

A formula is an equation that performs a calculation. Excel can execute formulas that **add**, **subtract**, **multiply**, and **divide** like a calculator.

- **To creates a simple formula in Excel:**

1- Select the cell where the answer will appear (B4, for example).

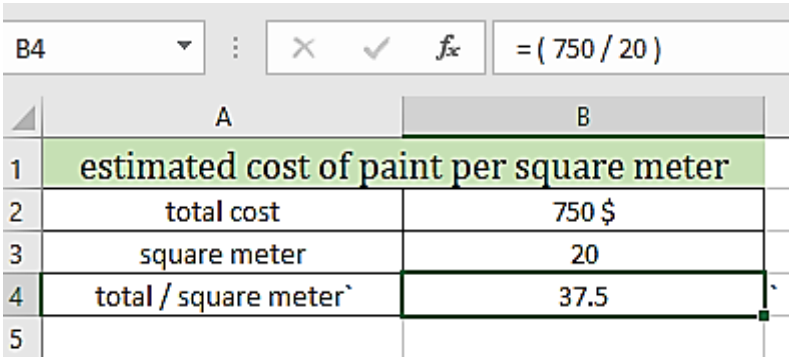




2- Type the equals sign (=).

3- Type in the formula you want Excel to calculate (75/20, for example).

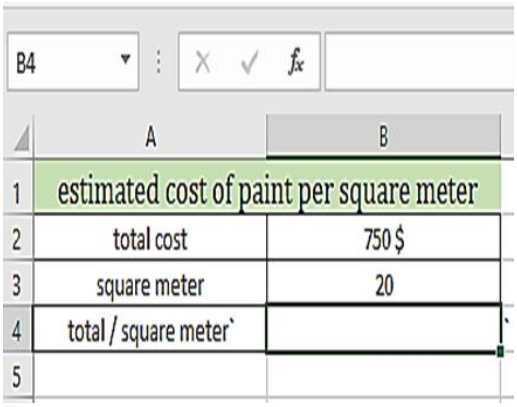
4- Press **Enter**. The formula will be calculated, and the value will be displayed in the cell.

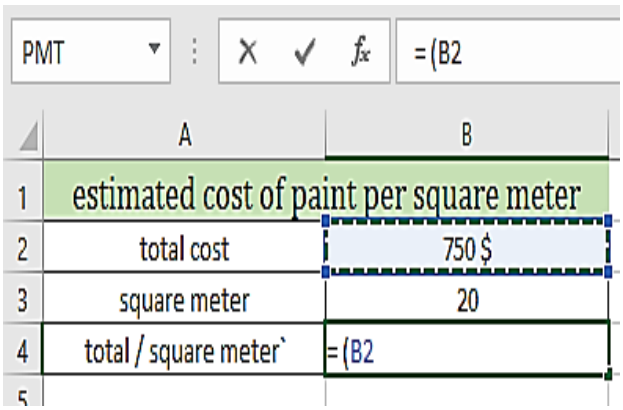


If the result of a formula is too large to be displayed in a cell, it may appear as pound signs (#######) instead of a value. This means the column is not wide enough to display the cell content. Increase the column width to show the cell content.

- **To creates a formula using cell references:**

1- Select the cell where the answer will appear (B4, for example).



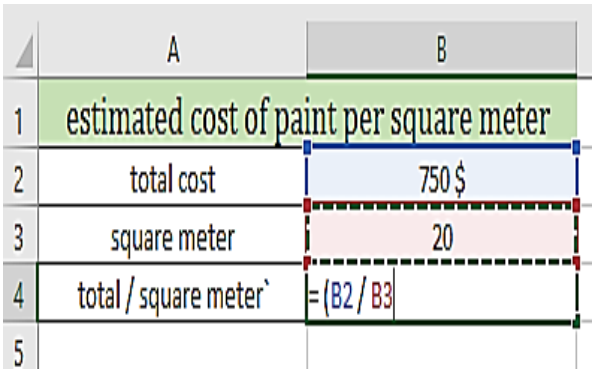


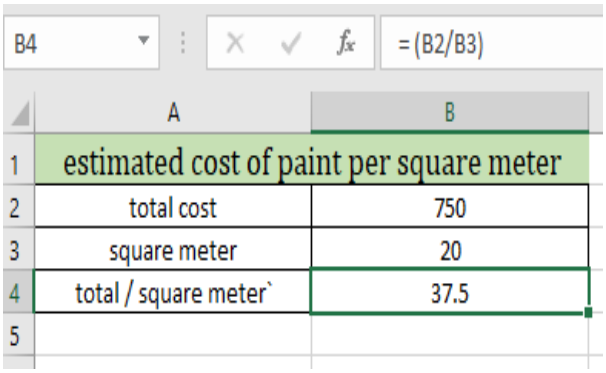
2- Type the equals sign (=).

3- Type the cell address that contains the first number in the equation (B2, for example).

4- Type the operator you need for your formula. For example, type the divide sign (/).

5- Type the cell address that contains the second number in the equation (B3, for example).



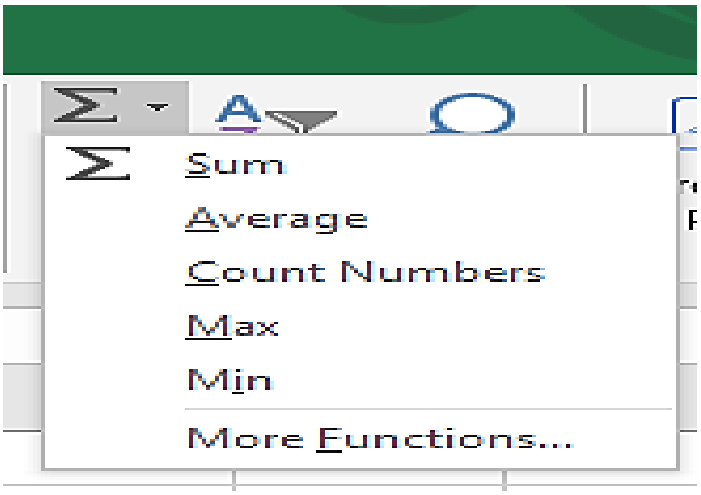


6- Press Enter. The formula will be calculated, and the value will be displayed in the cell.

If you change a value in either B2 or B3, the total will automatically recalculate.

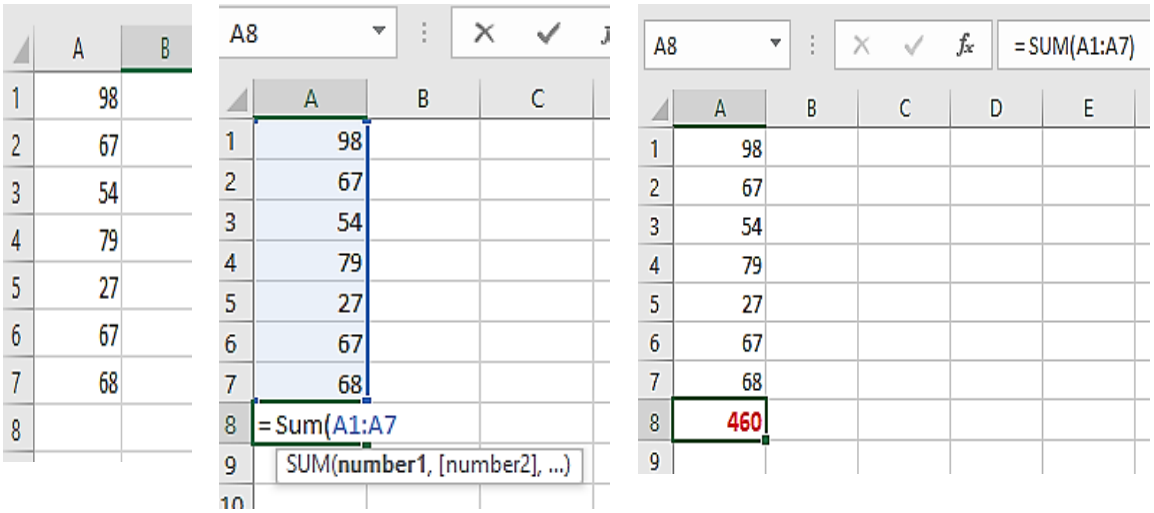
18- Sum, Average, Maximum and Minimum Formula

Many mathematical operations and formulas are performed in Excel, and among these formulas are the **Sum**, **Average** determining the **Maximum value**, and determining the Minimum value. This is done through the Home menu, and by going to the Editing group, the Sigma option (**∑**) is selected via the small arrow located below this option. By left-clicking on this arrow, a drop-down list will appear containing the required formulas. Then, the formula that is required to be performed on the selected cell or cells is selected.



To take advantage of these features in Excel, there is some data as shown in the figure below: There are ways to perform mathematical operations on this data. For example, when performing the addition operation for all these numbers in the cells shown in the figure, after selecting the cell in which you want to put the result

1- An equal sign is placed in the cell, then the phrase **Sum** is written. Then the contents of the cells that need to be calculated are written in this cell, or selecting these and by pressing Enter, the process of calculating the sum of these cells will be done directly.



2- The second method is to only select the cell in which the result is, and by going to the main page, Home, to the Editing group, and to the list of mathematical formulas, which are sum, average, maximum value, and minimum value, you only click on the **Sum** option, pressing Enter, and then the sum of the numbers in the selected cells will appear directly.

And also, for the rest of the existing formulas such as the Average or finding the Maximum value or finding the Minimum value, etc., the same as the previous processor. All that is required is to click or choose the desired option to perform the calculation on the contents of the selected cells.

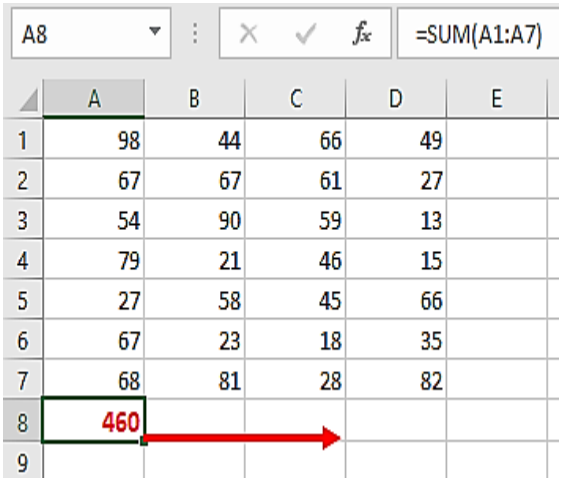
- ## Editing a Formula

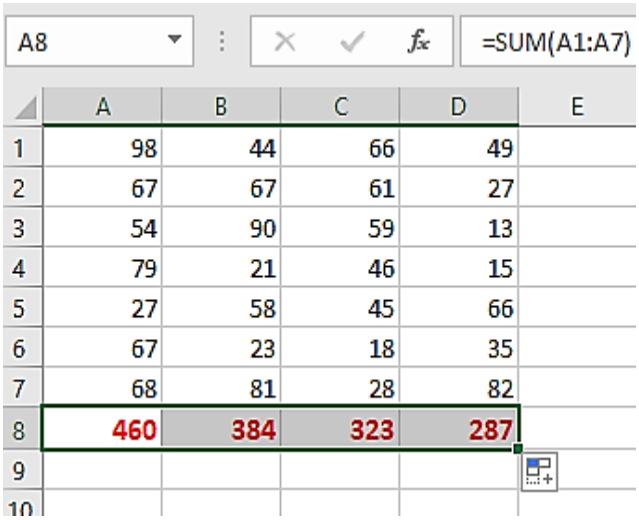
The equation can be **modified** either from **the equation bar** or from the **cell** that contains the equation. We click in this cell and the equation appears on the equation bar. We make the required modifications and when we finish that, press the Enter key or double-click the cell and the required modified equation appears.

- ## Copy formatting

If there are several columns of data as in the figure below, and you want to sum this data as in the first column on the left side, this is done by

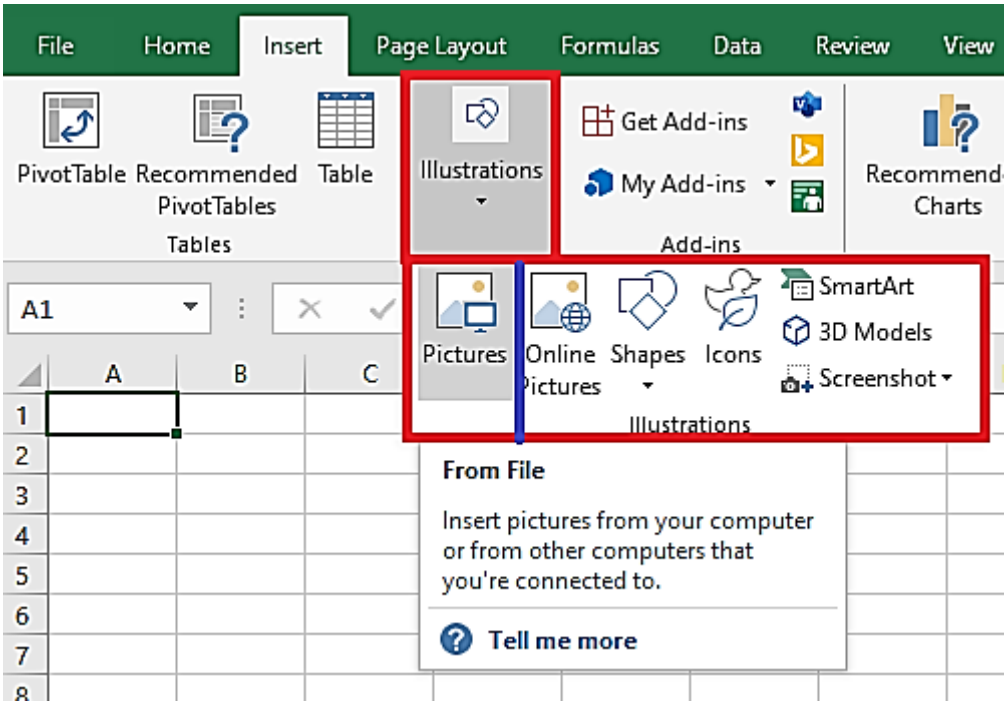
clicking on the small square located in the lower right side of the box surrounding the cell that contains the result of the first column, and by dragging it to the rest of the cells adjacent to it, which will contain the sum result of the columns whose data you want to sum, then the formatting in the cell will be copied to the rest of the cells as shown in the figure

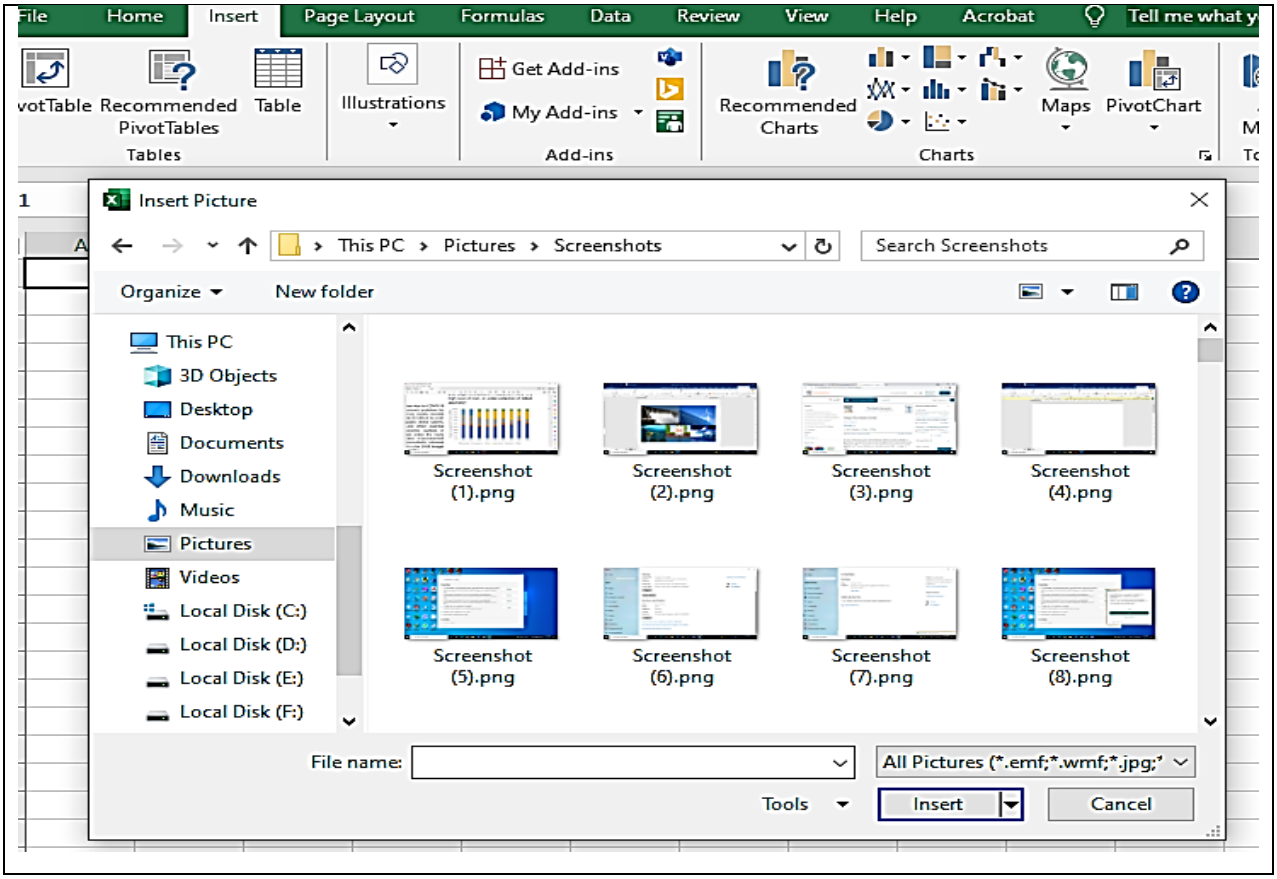




19- Inserting Picture

You can insert a specific image or shape from the computer, the Internet, or an external hard drive and paste it into an Excel document. This is done by selecting the cell in which you want to paste the shape. By going to the **Insert** menu and from the **Illustrations group**, choose Picture. A list of options will appear showing many files containing images found on the computer. If the required image is from the Internet, select Online. The process is shown as in the figure below.


File
Home
Insert
Page Layout
Formulas
Data
Review
View
PivotTable
Recommended PivotTables
Table
Tables
Illustrations
Get Add-ins
My Add-ins
Add-ins
Recommend Charts
A1
Pictures
Online Pictures
Shapes
Icons
SmartArt
3D Models
Screenshot
Illustrations
From File
Insert pictures from your computer or from other computers that you're connected to.
Tell me more


Insert Picture
This PC > Pictures > Screenshots
Search Screenshots
Organize
New folder
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
Local Disk (D:)
Local Disk (E:)
Local Disk (F:)
Screenshot (1).png
Screenshot (2).png
Screenshot (3).png
Screenshot (4).png
Screenshot (5).png
Screenshot (6).png
Screenshot (7).png
Screenshot (8).png
File name:
All Pictures (*.emf;*.wmf;*.jpg;*
Tools
Insert
Cancel

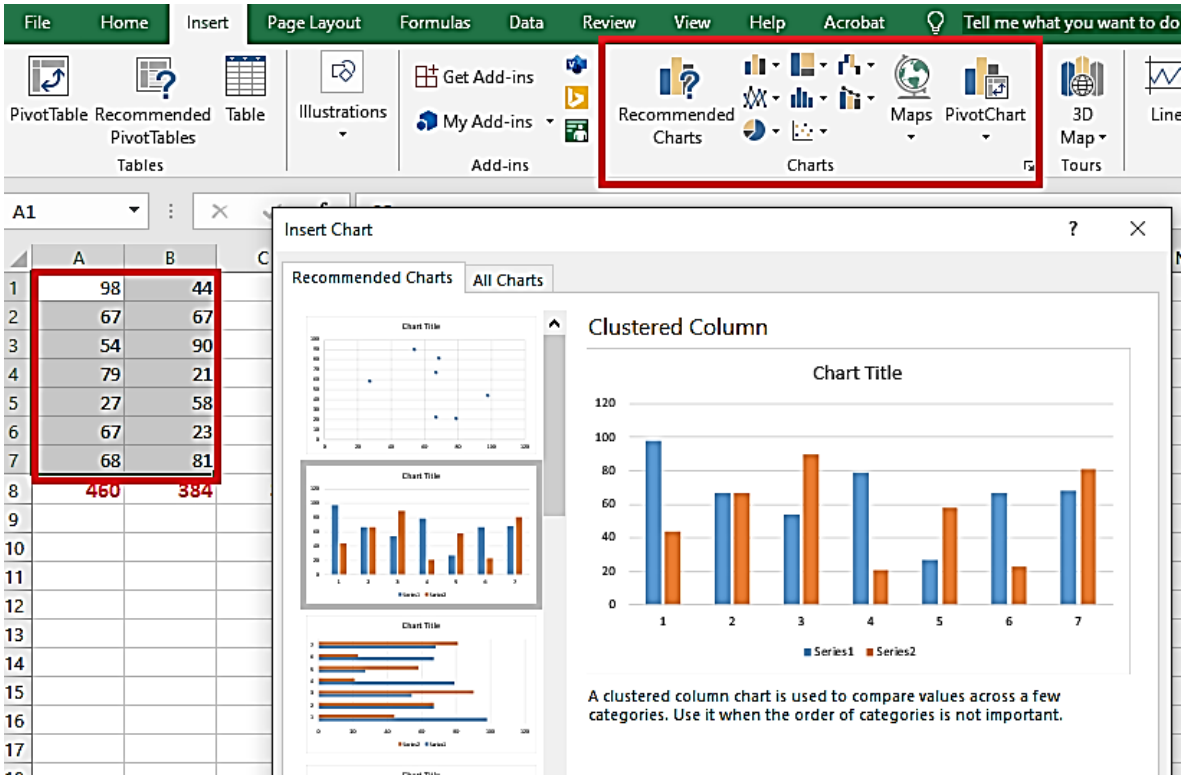
20- Protect Sheets

Sometimes it is required to protect the page or document in order to preserve the existing data from any change or tampering by any user. Therefore, there is an option in a Excel document that protects the sheet work, bookwork. It can be used by the person who created this document, according to the following method.

After completing the work, go to the **Review menu** and then go to the **Protect group**, which contains several options. You can choose the desired option, such as **Protect Sheet**, and thus the sheet becomes protected from any changes that may occur to it by other users.

21- Charts

One of the important features in Excel is the process of drawing data, the purpose of which is to know the behavior of a specific physical condition whose data has been collected and placed in an Excel document. This is done by selecting this data and going to the **Insert menu**, then going to the **charts group** and choosing the appropriate chart. A new drop-down list will then appear containing a group of chart types from which the appropriate drawing or format can be chosen.


File
Home
Insert
Page Layout
Formulas
Data
Review
View
Help
Acrobat
Tell me what you want to do
PivotTable
Recommended PivotTables
Table
Tables
Illustrations
Get Add-ins
My Add-ins
Add-ins
Recommended Charts
Maps
PivotChart
Charts
3D Map
Tours
Line
A1
Insert Chart
Recommended Charts
All Charts
Clustered Column
Chart Title
Series1
Series2
A clustered column chart is used to compare values across a few categories. Use it when the order of categories is not important.