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# Spreadsheet programs

Spreadsheet: is an application program used to organize and store data a tabular form. It consists if rows and columns, used to manipulate data and perform calculations using mathematical formulas and function. And it used to generate sales figures, sales taxes, commission, corporate budgeting, etc.

Features of spreadsheet program:

* Fast and effective data comparisons
* Automated calculations and autofill
* Functions and formulas
* Charts
* Sort and filter

Popular spreadsheet programs:

* MS excel ( the widely used )
* Apple iWork numbers
* Corel Quattro Pro

## Excel 2016

is a component of the MS 2016 suite and is available for both windows and Macintosh OS

**the common scenarios to use excel** 2016 is for creating schedules, inventory, report, budgeting, accounting, planning and much more.

## User interface of excel 2016

1. Ribbon: consists of a set of commands placed under different tabs. Each tab is divided into groups, having logically related commands.
2. Tell me box: this box, located to the right of the ribbon tabs, allows quick access to excel commands and feature you want to use.
3. Ribbon display option: you can show/hide a ribbon to maximize or minimize your workspace. There are options like:
	1. Auto-hide the ribbon.
	2. Show tabs only.
	3. Show tabs and commands.
4. Worksheet: sheet consist of cells organized into rows and columns. Is used to store and manage information in tabular form.
5. Call and active cell: the intersection of a row and a column in a worksheet is called a cell. An active cell is the currently selected cell, which is recognized by its green outline.
6. Columns: the vertical divisions of a worksheet. The column heading are sequential letters at the top of each column to identify it, A,B,C and so on.
7. Rows: the horizontal divisions of a worksheet. A row number identifies a specific worksheet row and appear along the left side of the worksheet, 1,2,3 and so on.
8. Name box: to the left of the formula bar is the name box, which is identifies the selected cell, chart or other object on the worksheet. Each cell has a cell address identified by column letter and the row number.
9. Formula bar: it displays the contents of the active cell and is mainly used to enter a formula to calculate cell data.
10. Sheet tab: at the bottom of the worksheet, displays the name of the sheets.
11. Status bar: the horizontal bar at the bottom of the worksheet, below the sheet tabs, is the status bar. The status bar shows quick summaries of selected cells ( count, sum, average, minimum or maximum values.) you can change its status by right clicking on it and choosing which summaries to show. By default, status bar contain **view buttons, zoom slider and zoom button.**

## New features of excel 2016

They are:

* Tell me box
* Smart lookup
* New chart types
* Quick analysis tool: is the real time-saver, which helps you to instantly create charts, apply conditional formatting, table styles and quickly calculate data.

## Create a simple workbook

Workbook: is simply an excel file that contains one or more worksheets.

Templates: are predesigned workbooks the help you to create new workbook with special formatting already available.

Excel workbook is saved as .xlsx

Excel template is saved as .xltx

## To select data in the cells

* Sequential → use the mouse or select the first one and press shift then click in the last cell.
* Non-sequential → select the cell, hold the CTRL key and select additional cells.
* Using name box (sequential) → enter the cell addresses of the 1st cell and last cell separated by the colon :. The selected cells will appear in gray color.
* Using name box (non-sequential)→ enter the cell addresses separated by commas in the name box.

## Keyboard navigation

* Arrow keys
* Tab key to move the active cell one column to the right.
* Ctrl + home to move to the cell A1
* Ctrl+end to move to the last cell in the worksheet.
* Ctrl + down arrow key to move the active cell to the last row in excel sheet that contains data
* Ctrl + right arrow key to move the active cell to the last column in excel sheet that contains data
* Or use the scroll bar.

To insert a new worksheet press shift+F11

## home tab

1. Clipboard
2. Font
3. Alignment: used to position cell data and merge cells.
	1. Adjust horizontal cell alignment: determines the position of the data within a cell relative to the left and right boarders of the cell.
		1. Align left
		2. Center
		3. Align right
	2. Adjust vertical cell alignment: determines the position of the data within a cell relative to the top and bottom boarders of the cell.
		1. Top align
		2. Middle align
		3. Bottom align
	3. Text orientation: used to rotate cell contents diagonally or vertically.
	4. Wrap text: used to display long text into multiple lines so that we can see all of it.
	5. Marge and center: combines selected cells into one larger cell and centers the contents.
4. Number: used to apply different number formats to data.
	1. Number format
		1. General: the default number format in that excel applies when you type a number.
		2. Number: used to display number with decimal point and decimal places.
		3. Accounting: used to monetary values like Currency format but align the Currency symbol at the left edge of the cell. Is mostly used for accounting purposes.
		4. Time: displays number as time value.
		5. Fraction: displays a number after decimal point as a fraction.
		6. Scientific: displays a number in exponential notation, replacing part of the number with E+n, where E stands for exponent and n represents the number, which is the nth power of the exponent.
		7. Text: treats the content if a cell as text and displays the content exactly as you type it, even when you type a number
		8. Special: display a number as a postal code, phone number, or social security number.
	2. Increase/decrease decimal: you can show more or fewer number of digits after the decimal point of a number.
		1. Increase → to add
		2. Decrease → to delete

If you have an issue with the content ######, you just need to increase the column width.

1. Styles group: used to apply various styles.

Style: is a set of formatting characteristics that is applied to cells at one.

* 1. Conditional formatting: used to apply different formatting styles to a range of cells that meet specific conditions. And it is used to apply colors, data bars or icon sets to the cells containing values that meet specific criteria or condition.
	2. Format as table: used to quickly format a range of cells and convert it to a table.
	3. Cell style: used to apply a cell style to a range of cells.
1. Cells: used to add, delete and format cells, rows, columns, and worksheets.
	1. Insert: add new cells or rows or columns.
	2. Delete: to delete cells or rows or columns.
	3. Format: used to resize rows or columns as well as organize and protect your worksheets. ( **you can specify row height from 0 to 409 points, and column width from 0 to 25 characters** )
2. Editing: used to sort , filter and calculate data.
	1. Autosum: is a built-in feature of excel 2016 that allows you to quickly calculate sum of values without manually entering a formula.
	2. Auto fill : is used to copy the contents or formula of a cell to adjacent cells. The small square is called (fill handle).
	3. Sort & filter: sort → for ascending order (s to L ) or descending order ( L to s) filter → allows you to view specific rows in a worksheet. While hiding the other rows that don’t meet the specified filtering criteria.

Formula: is an expression that performs calculations on data in the cell. And it uses arithmetic operators like +,-,\*,/,% and it always begins with an equal to (=) sign.

## Insert tab

1. Charts group
	1. It insert 2 contextual tabs, design and format.

Chart: is a graphical representation of data, used to communicate information In an easy to understand and attractive manner.

Elements of a chart:

* Chart area: the entire area of the chart, which encompasses all the charts elements.
* Plot area: the actual chart area where the data is graphically plotted in the chart.
* Chart title: the title of the chart
* Data points: they represent the data series that are plotted in the chart.
* Primary vertical axis title: Is the title of vertical ( values ) axis.
* Primary horizontal axis title: is the title of horizontal ( category ) axis.
* Legend: it shows which color represent what data in the chat.
* Data labels: helps you identify the details of the data on the chart itself.

Chart buttons:

* Chart elements button: add/remove.
* Chart styles button: to set a style or color scheme for the chart.
* Chart filters button: used to select the data points to be visible on your chart.

## Layout tab

1. Themes: a theme is a unique set of formatting characteristics that includes colors, fonts, and effect.( **if you select a theme it will applied to all the worksheets.** )
2. Page setup:
	1. Print area: is a range if cells that you select to print when you don’t want to print the entire data of the worksheet.
	2. Worksheet background
	3. Print titles : you can choose some rows and columns to show in each page.
3. Sheet option:
	1. Sheet right to left.
	2. Show\hide guidelines & heading: we can display them either in the worksheets or in the printed sheet.

## Formulas tab

1. Function: is preset or inbuilt formula that performs calculations automatically. Each function has a specific **syntax**, which is set of rules associated with it. In order:

= function name (argument list)

* 1. Logical function: used to test for a condition to evaluate it as true or false. it includes function such as AND, FALSE, IF, NOT, OT, TRUE, etc.
		1. If: allows you to evaluate a situation which has 2 possible results and calculate a different value for each result.

Logical test: any value or expression that is evaluated to true or false.

* + 1. Nested if: use it when you need to work with situations where there are more than 2 possible results.
		2. SumIf: is used to add the values in a range that meets specific criteria.
		3. CountIf: counts the number of cells within a range that meets specific criteria.
	1. Text function: used to manipulate text strings. It includes functions such as CHAR, LEN, LOWER, PROPER, TEXT, UPPER, etc.
		1. Lower: used to convert the text to lowercase.
		2. Upper: used to convert the text to uppercase.
		3. Len: used to calculate the number of characters in a text string including spaces.
		4. Proper: capitalizes the 1st letter of each word of a text string and changes all other letters to lowercase.
	2. Math & trig functions: preform arithmetic operations, conditional sum, exponents & logarithms, and the trigonometric calculations.
	3. More function: it includes statistical and engineering functions such as AVERAGE, COUNT, MAX, MIN, CONVERT, DELTA, etc.
		1. Average : used to calculate the average of the values contained in the range of cells .
		2. Count : counts the number of cells in a range that contain number only. ( for counta → the **non-empty** cells are counted )
		3. Max : used to calculate the largest or maximum value in the selected range of cells.
		4. Min: used to calculate the smallest or minimum value in the selected range of cells.
1. Formula auditing:enables you to check the worksheet for errors and accuracy, it also enables you to display the actual formula.
	1. Show formulas: used to displays the actual formula or function applied to a cell instead of the resulting value. (ctrl+~)
	2. Error checking: helps you to check for common errors that occur when using formula or function.
		1. Some common error types:
			1. #div/0!
			2. #null! → add commas to fix it.
			3. #num! → change the -number to +number.
			4. #names? → type the correct formula
			5. #ref! → delete the missed cell from the formula bar.
			6. #value! → put an arithmetic operating.

## Cell referencing

**Types of cell referencing** :

* Relative cell referencing: the cell reference automatically changes when the formula is copied across a column or a row.
* Absolute cell referencing: is fixed. The cell reference doesn’t change when you copy a formula from one cell to another cell. It is designated in a formula by the addition of a dollar sign ($) preceding both the column and the row.
* Mixed cell referencing: has **either** an absolute column and a relative row. Or an absolute row and a relative column. For example,

$A1 is an absolute to column A and relative to row 1 .

H$4 is an relative to column H and absolute to row 4.

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* Multiple sheet referencing: to take a cells from more than 1 sheet.

## View tab

1. Window
	1. Freeze panes: enables you to lock specific rows or columns in place to keep them visible while you are scrolling rest of the worksheet.
	2. Split worksheet window: enables you to split the worksheet window into separate panes.

Workbook security: you can protect your excel workbook with a password to prevent the unauthorized users for accessing it.

**Done ♥**

**جهد شخصي، يرجى فتح الملف في برنامج الوورد للحصول على جميع الميزات. شكراً.**