



## **Intermediate Excel 2019**

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# Relative & Absolute Referencing

## Relative Referencing

When you copy a formula to another cell, Excel automatically adjusts the cell reference to refer to different cells relative to the position of the formula. **Example:** If you have a formula =B1+C1 and you copy the formula down one cell, it will adjust to =B2+C2.

## Absolute Referencing

Sometimes you do not want the formula to adjust. You want to copy the exact formula. An **absolute cell reference** in a formula, such as \$A\$1, always refers to a cell in a specific location. By default, new formulas use relative references, and you need to switch them to absolute references.

### To Apply Absolute Referencing in a Formula:

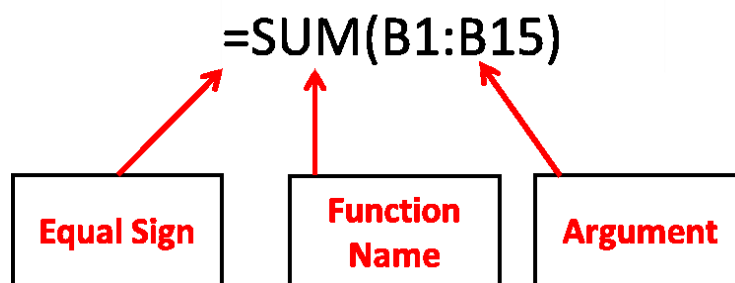
- 1) Position your cursor at the location in the formula bar where the formula exists
- 2) Press the **F4** key on the keyboard

# Functions

As we have previously seen, the power of Excel lies in its ability to perform calculations. The real strength of this is shown in **Functions**.

## Parts of a Function

The order in which you insert a function is important. Each function has a specific order (**syntax**) which must be followed for the function to work properly. The basic syntax to create a formula starts with an **equal sign (=)**, the **function name** (for example, SUM), and an **argument**. Arguments contain the range of cells you want the formula to calculate.



### Statistical Functions Defined:

- =SUM(range of cells)** returns the sum of the selected cells
- =AVERAGE(range of cells)** returns the average of the selected cells
- =MAX(range of cells)** returns the highest value of the selected cells
- =MIN(range of cells)** returns the lowest value of the selected cells
- =COUNT(range of cells)** returns the number of values of the selected cells
- =COUNTA(range of cells)** returns the number of cells that contain text/numbers within the selected cells

# Creating Functions

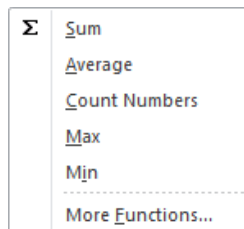
## Manually Creating a Basic Function:

- 1) Select the cell where the result will appear
- 2) Type the **equal sign (=)** and enter the **function name** (SUM, for example)
- 3) Type an open parenthesis (
- 4) Highlight the cells for the **argument**
- 5) Type a closed parenthesis )
- 6) Press **Enter**

## Using the Function Commands:

The **function** command allows you to automatically return the results for a range of cells for common functions such as SUM and AVERAGE.

- 1) Select the cell where the result will appear
- 2) Click on the **Home** tab
- 3) In the **Editing** group, click on the **AutoSum** drop-down arrow and select the function you desire
- 4) A formula will appear in the selected cell. If logically placed, Excel will select the cells for you. Otherwise, you will need to highlight the cells to choose the argument.
- 5) Press **Enter**



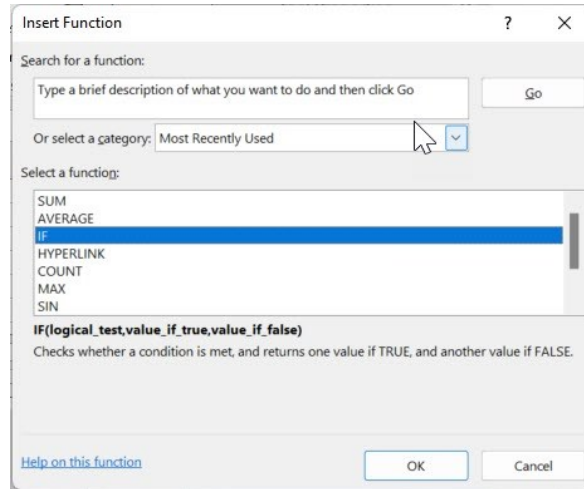
## IF Function

The IF function returns one value if a condition you specify is TRUE, and another value if that condition is FALSE. For example, the formula **=IF(A1>75,"Pass","Fail")** will return "Pass" if A1 is greater than 75, and "Fail" if A1 is less than or equal to 75.

## Creating an IF Function:

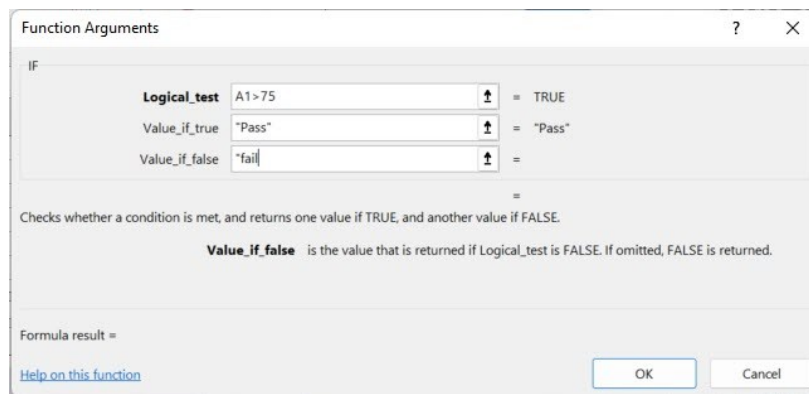
This example is using the IF function to determine a pass or fail grade:

- 1) Select the cell where the result will appear
- 2) Click on the **Home** tab
- 3) In the **Editing** group, click on the **AutoSum** drop-down arrow and select **More Functions**
- 4) Select the category **Logical** from the drop-down list
- 5) Select **IF** from the list
- 6) Click **OK**



- 7) Click in **Logical\_test** and type **A1>75**
- 8) Click in **Value\_if\_true** and type **"Pass"**
- 9) Click in **Value\_if\_false** and type **"Fail"**
- 10) Click **OK**

**Note:** When you wish to have text or a value returned, it has to be within double quotes. If you wish to leave the cell blank, you must enter 2 double quotes "".



## Order of Operation

When more than one operator is used in a formula, there is a specific order Excel follows to perform these mathematical operations. This **order of operation** can be changed by adding parentheses to the equation.

### Mathematical Operators

Subtraction ( - )  
 Addition ( + )  
 Division ( / )  
 Multiplication ( \* )  
 Exponentiation ( ^ )

### Order of Operation

Parentheses  
 Exponents  
 Multiplication  
 Division  
 Addition  
 Subtraction

## How the Order of Operation Works

Any operation(s) in parentheses will be calculated first, followed by any exponents. After that, Excel calculates multiplication and/or division operations (both equally) in the order they occur left to right in the equation. Then Excel looks for addition and/or subtraction and processes the one that comes first as well.

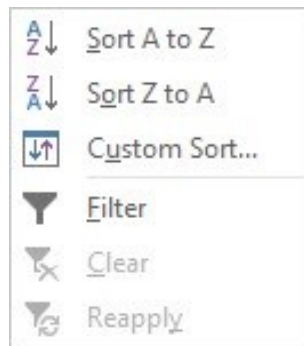
## Sorting and Filtering Data

When working with large spreadsheets with many rows of data it can be helpful to sort and filter the information to find what you are looking for.

### Sorting Data

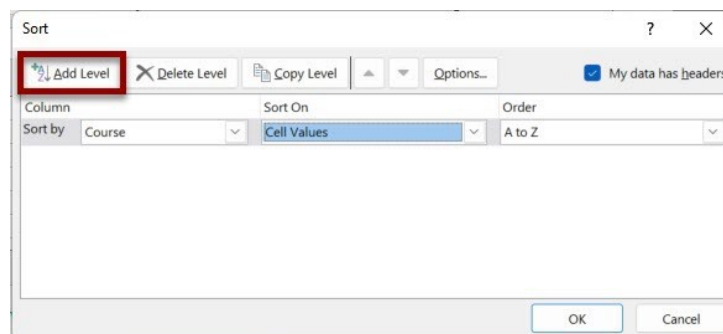
#### To Create a Simple Sort:

- 1) Click in the column you wish to sort by
- 2) Click on **Sort & Filter** on the **Home** tab in the **Editing** group
- 3) Select either Sort A to Z or Sort Z to A



#### To Create a Custom Sort:

- 1) Click anywhere within the data
- 2) Click on **Sort & Filter** on the **Home** tab in the **Editing** group
- 3) Click on Custom Sort
- 4) Click on the **Sort by** drop-down arrow under **Column** and select the primary sort field
- 5) Click Add Level
- 6) Click on the **Then by** drop-down arrow and select the secondary sort field
- 7) Repeat steps if there are additional sort fields (you can choose up to 64 levels)
- 8) Click **OK**



# Filtering Data

## Autofilter

Using **Autofilter** to filter data is a quick and easy way to find and work with a subset of data in a range of cells or table.

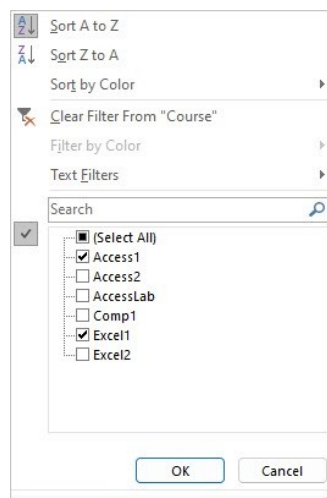
- 1) Click within the data range to be filtered
- 2) Click on **Sort & Filter** on the **Home** tab in the **Editing** group
- 3) Click on **Filter**

The first row of the data becomes the filtering row.

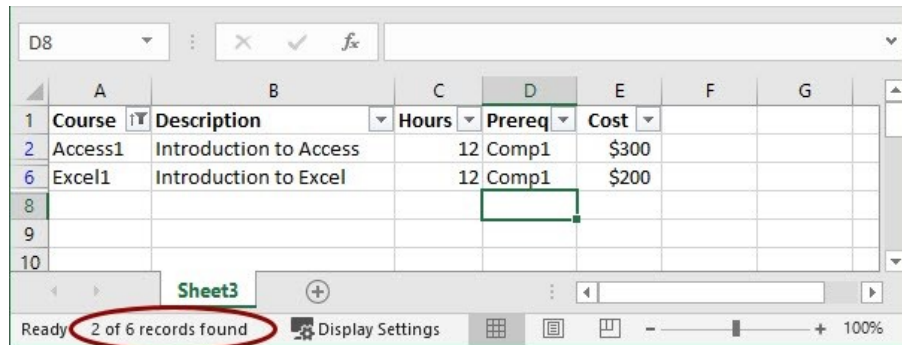
	A	B	C	D	E	F
1	Course	Description	Hours	Prereq	Cost	
2	Access1	Introduction to Access	12	Comp1	\$300	
3	Access2	Intermediate Access	24	Access1	\$400	
4	AccessLab	Access Case Problems	12	Access2	\$200	
5	Comp1	Computer Fundamentals	12		\$200	
6	Excel1	Introduction to Excel	12	Comp1	\$200	
7	Excel2	Intermediate Excel	12	Excel1	\$200	

- 4) Click on the **down arrow** next to the heading of the column you want to filter by
- 5) Select the criteria
- 6) Click **OK**

You may filter by more than one column:



The example below is filtered by the Prereq = Comp 1. Note the status bar - **2 out of 6 records found**.



## Clearing the Filter:

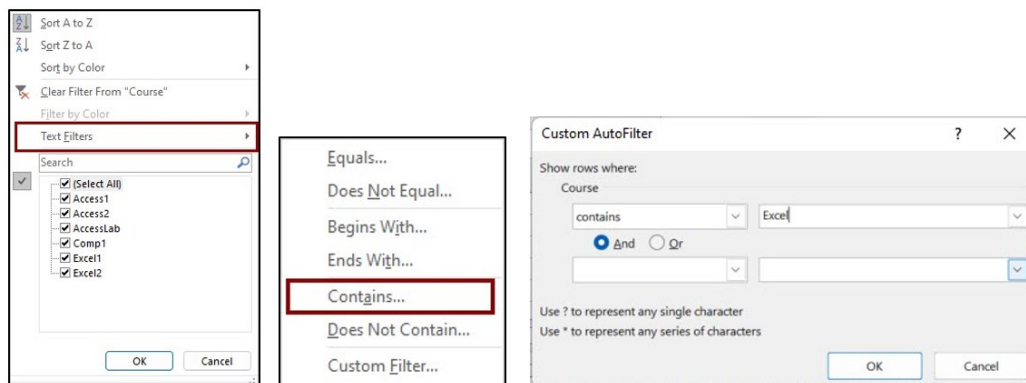
- 1) Click on **Sort & Filter** on the **Home** tab in the **Editing** group
- 2) Click on **Filter**
- 3) Click on **Clear**

## Custom Autofilter

**Custom Autofilter** allows you to locate records that either match all criteria or meet one or the other criteria. You can use this method for more flexibility when filtering text.

- 1) Click on the **down arrow** next to the heading of the column you want to filter by
- 2) Select Text Filters or Number Filters
- 3) Click on one of the comparison filters
- 4) Type the filter criteria
- 5) Click **OK**

To choose additional criteria, select **And** or **Or**; then specify the data for the second criteria. Choosing "And" means that both criteria must be met; choosing "Or" means that either criteria can be met.



## Working with Multiple Worksheets

By clicking on worksheets at the bottom of the window, you can quickly select a different sheet. If you want to enter or edit data on several worksheets at the same time, you can group worksheets by selecting multiple sheets.

# Selecting Sheets

## Selecting a Single Sheet

Click on the sheet tab

If you don't see the tab that you want, click the tab scrolling buttons to display the tab.



## Selecting Multiple Sheets - Adjacent

Click the tab for the first sheet and hold down **SHIFT** while you click the tab for the last sheet.

## Selecting Multiple Sheets – Non-adjacent

Click the tab for the first sheet and hold down **CTRL** while you click the tabs of the other sheets that you want to select.

## Selecting All Sheets in a Workbook

Right-click a sheet tab and then click **Select All Sheets** on the shortcut menu.

**Note:** When multiple worksheets are selected, *[Group]* appears in the title bar at the top of the worksheet.

## Ungrouping Multiple Sheets

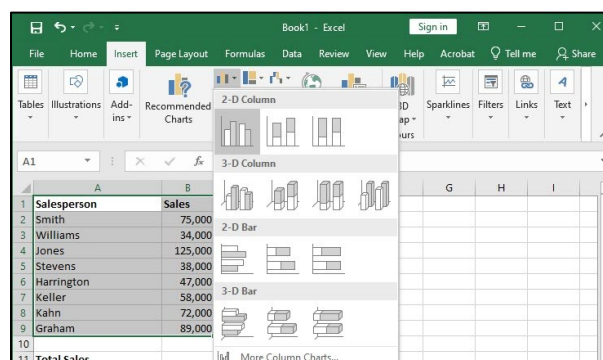
Click any unselected worksheet or if no unselected sheet is visible, right-click the tab of a selected sheet and click **Ungroup Sheets**.

# Charting

Creating a **chart** in Excel allows you to further analyze your data and look at it another way.

## To Create a Chart:

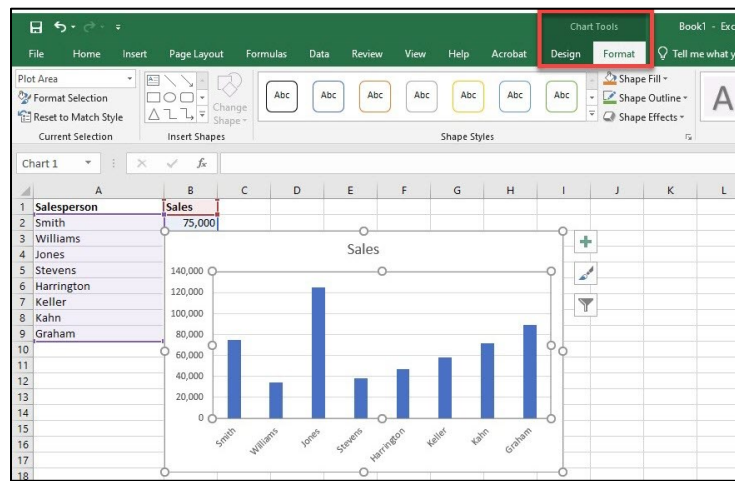
- 1) Select the data to be charted (include the column(s) and row(s) labels)
- 2) Click the **Insert** tab
- 3) Click the **chart type** you would like in the **Charts** group
- 4) Click on a **chart style**





## Modifying the Chart:

When a chart is selected the tab – **Chart Tools** – becomes available. Chart Tools has two chart tabs: **Design** and **Format**. Click on **Design** to change the style of your chart or change the way the data is displayed. Click on **Format** to change the style and or color of the chart lines, shapes, etc.



You can also modify the chart by clicking on the icons that appear on the right of the chart when it is selected.



**Chart Elements** – Add, remove or change chart elements such as title, legend, gridlines, etc.



**Chart Styles** – Choose a style and color scheme for your chart.



**Chart Filters** – Edit what data points and names are visible on your chart.

## To Move the Chart to a New Location on the Page:

- 1) Position your mouse in an empty area of the chart
- 2) Make sure your mouse has the appearance of a four-headed arrow
- 3) Click and drag the chart to a new location

## To Size the Chart:

- 1) Click once on the chart to select it
- 2) Position your mouse on one of the corners of the chart
- 3) Notice the mouse shape changes into a two-headed arrow
- 4) Click and drag to size the chart