

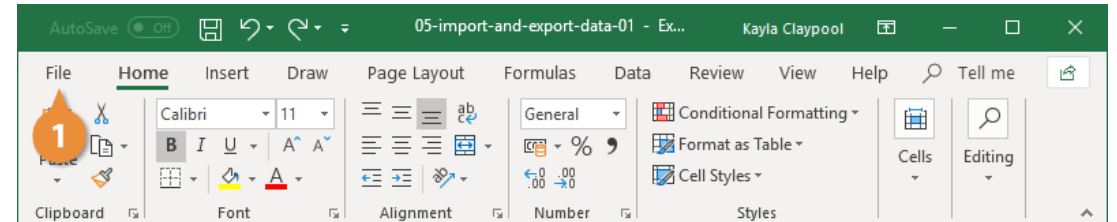
HOW TO IMPORT AND EXPORT DATA

Excel can import and export many different file types aside from the standard .xlsx format. If your data is shared between other programs, like a database, you may need to save data as a different file type or bring in files of a different file type.

EXPORT DATA

When you have data that needs to be transferred to another system, export it from Excel in a format that can be interpreted by other programs, such as a text or CSV file.

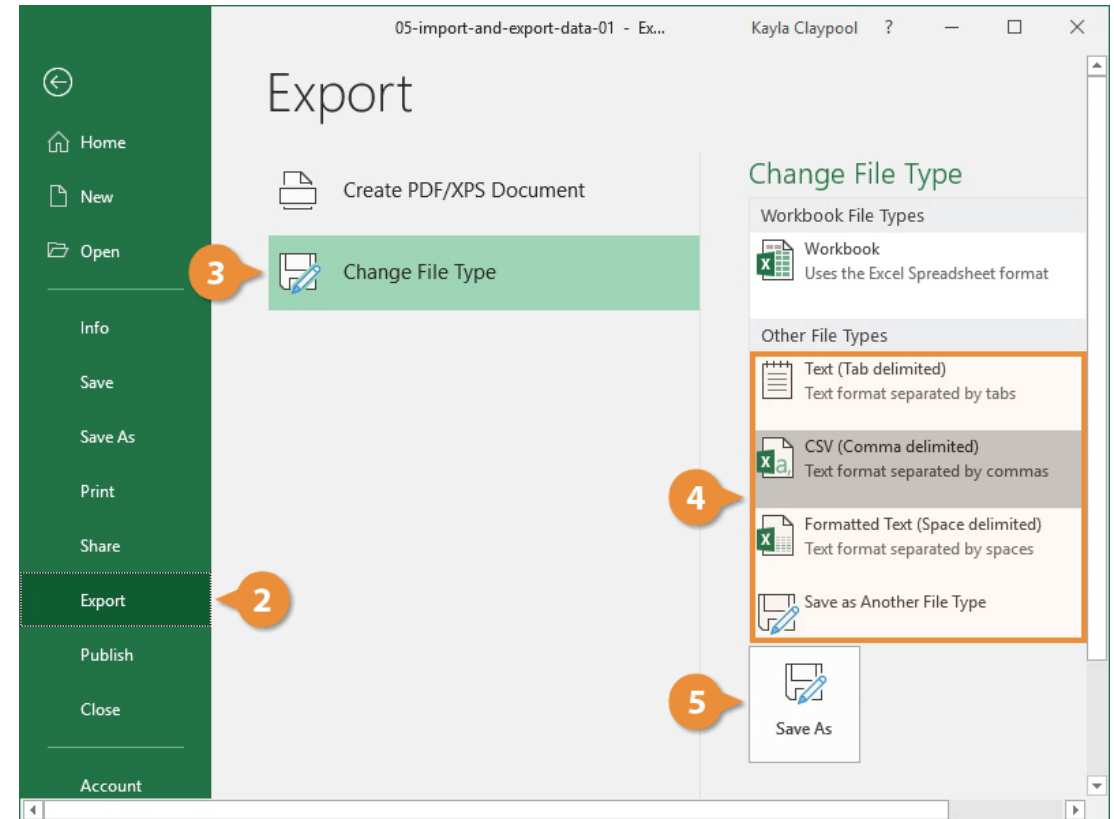
- Click the **File** tab.
- At the left, click **Export**.
- Click the **Change File Type**.
- Under Other File Types, select a file type.
 - **Text (Tab delimited)**: The cell data will be separated by a tab.
 - **CSV (Comma delimited)**: The cell data will be separated by a comma.
 - **Formatted Text (space delimited)**: The cell data will be separated by a space.
 - **Save as Another File Type**: Select a different file type when the Save As dialog box appears.



EXPORT DATA

The file type you select will depend on what type of file is required by the program that will consume the exported data.

- Click **Save As**.

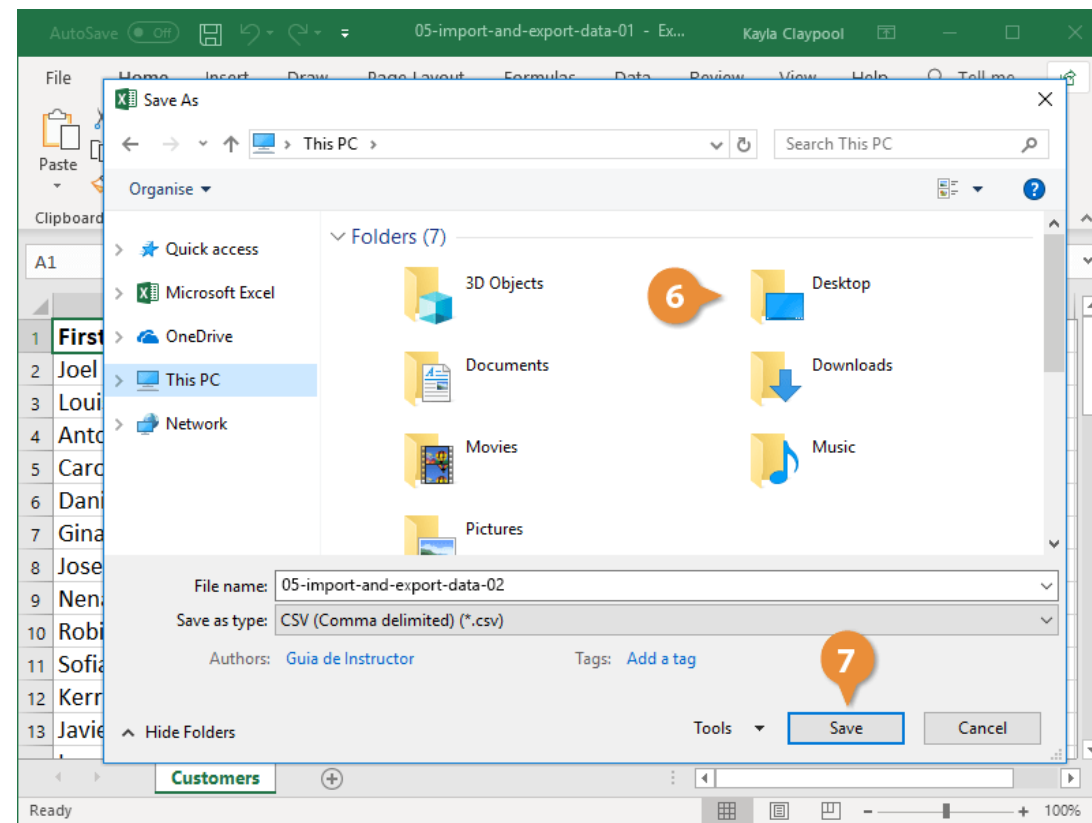


EXPORT DATA

- Specify where you want to save the file.
- Click **Save**.

A dialog box appears stating that some of the workbook features may be lost.

- Click **Yes**.



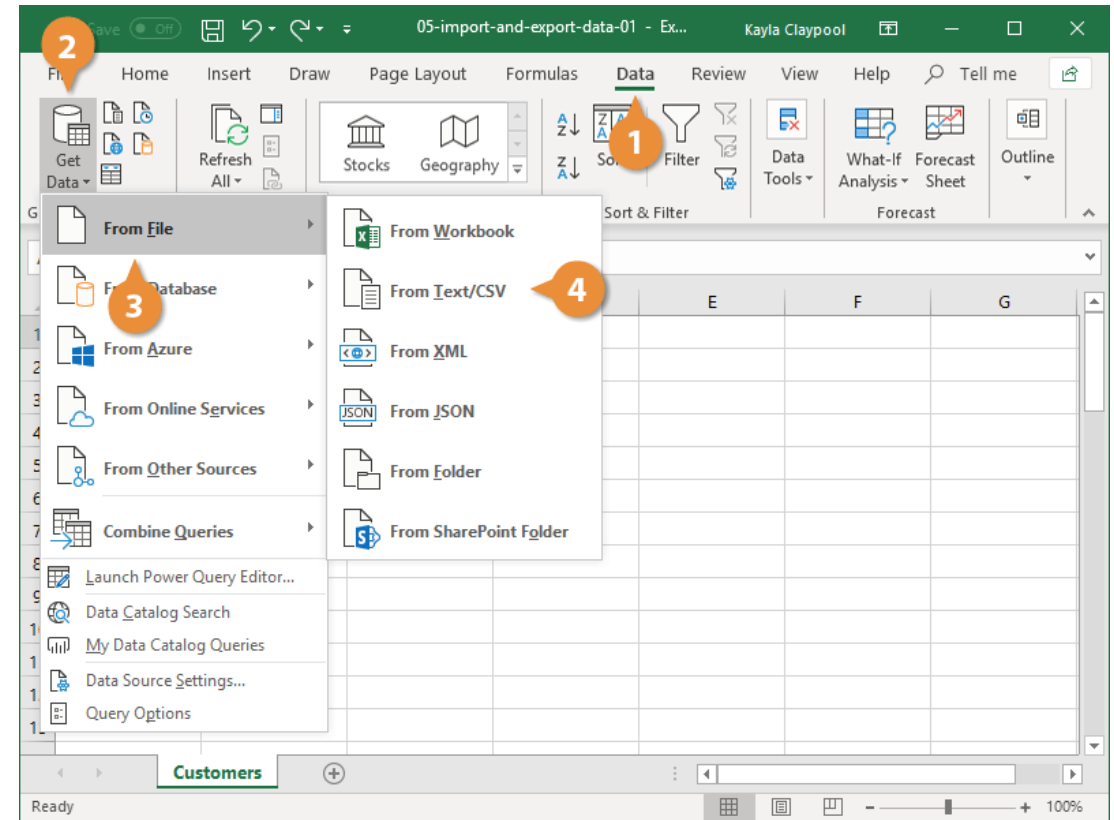
IMPORT DATA

Excel can import data from external data sources including other files, databases, or web pages.

- Click the **Data** tab on the Ribbon..
- Click the **Get Data** button.

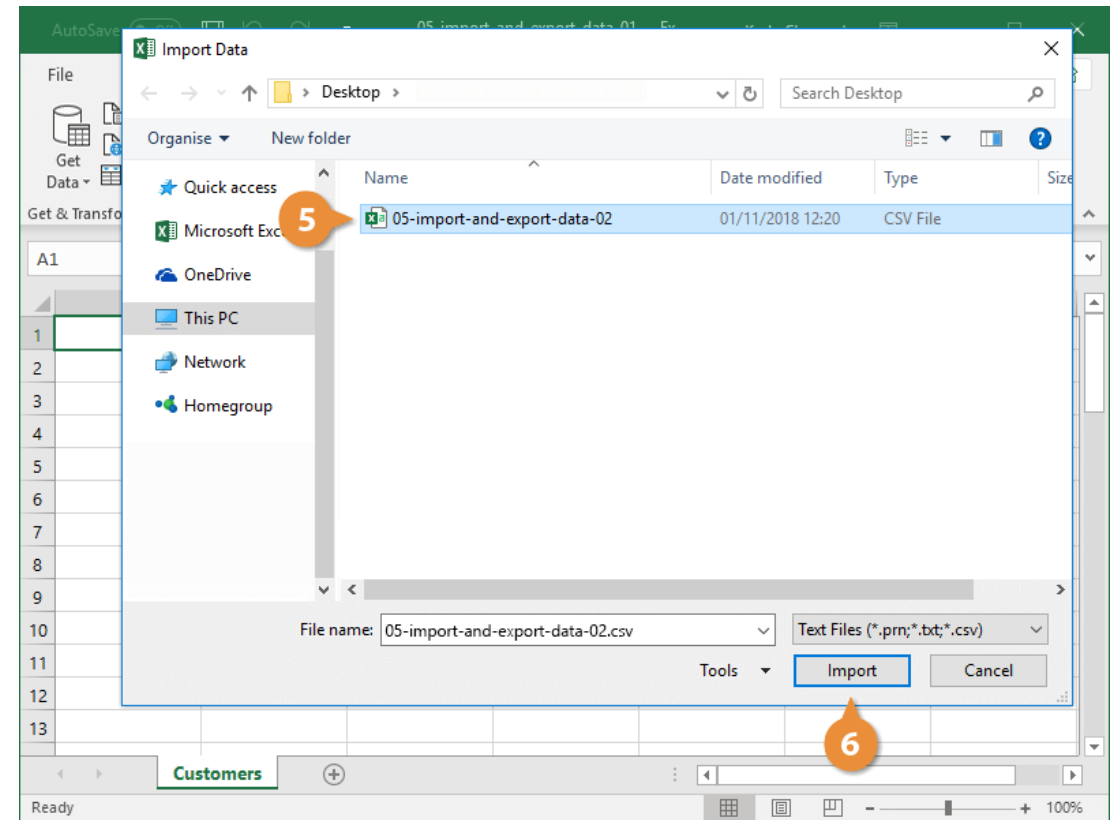
Some data sources may require special security access, and the connection process can often be very complex. Enlist the help of your organization's technical support staff for assistance.

- Select **From File**.
- Select **From Text/CSV**.



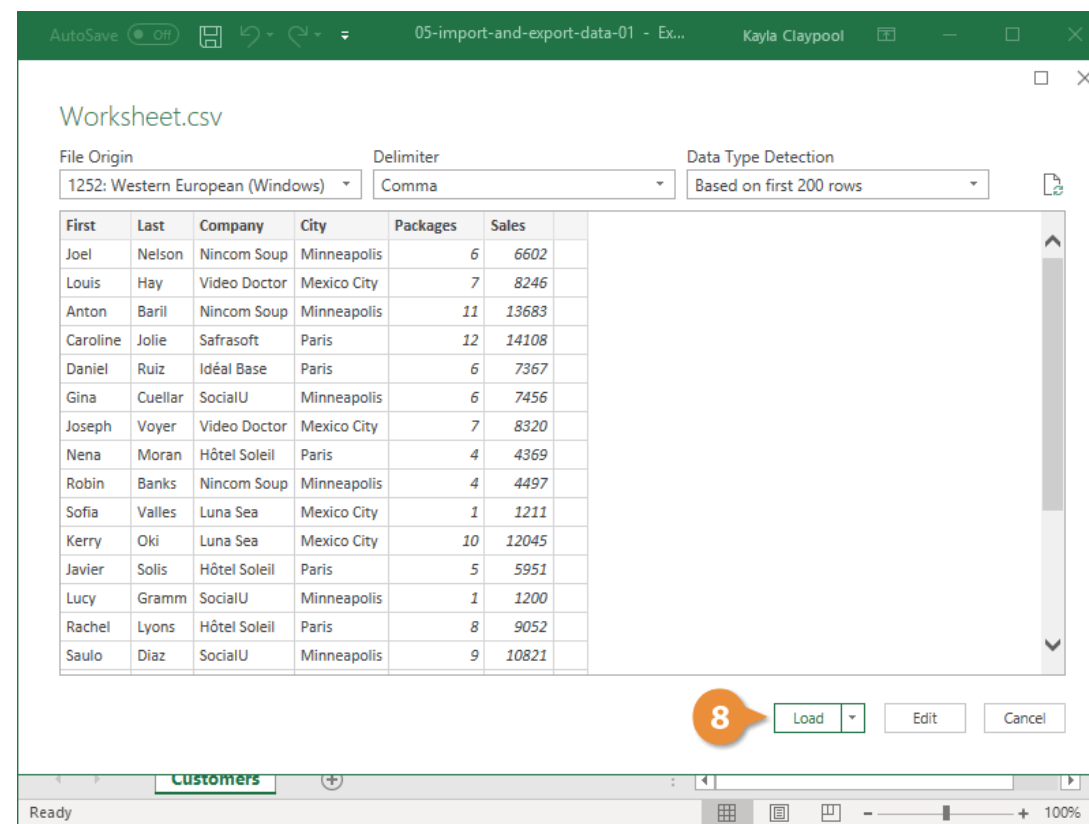
IMPORT DATA

- If you have data to import from Access, the web, or another source, select one of those options in the Get External Data group instead.
- Select the file you want to import.
- Click **Import**. If, while importing external data, a security notice appears saying that it is connecting to an external source that may not be safe, click **OK**.



IMPORT DATA

- Verify the preview looks correct.
- Because we've specified the data is separated by commas, the delimiter is already set. If you need to change it, it can be done from this menu.
- Click **Load**.



ADVANCE DATA MANIPULATION

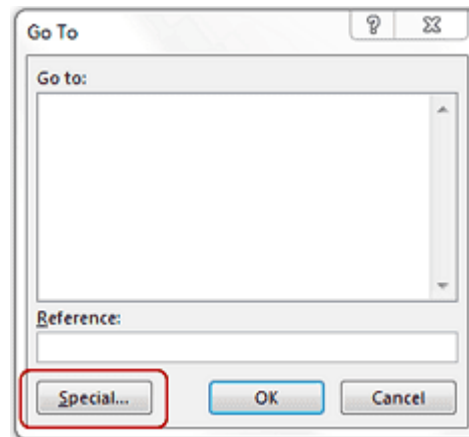
we'll delve into the world of advanced data manipulation in Excel. We'll explore techniques that go beyond the basics, empowering you to transform and analyze large datasets with efficiency and precision.

GET RID OF EXTRA SPACES

- Extra spaces are painfully difficult to spot.
- While you may somehow spot the extra spaces between words or numbers, trailing spaces are not even visible.
- Here is a neat way to get rid of these extra spaces – Use [TRIM Function](#).
- Syntax: TRIM(text)
- The Excel TRIM function takes the cell reference (or text) as the input.
- It removes leading and trailing spaces as well as the additional spaces between words (except single spaces).

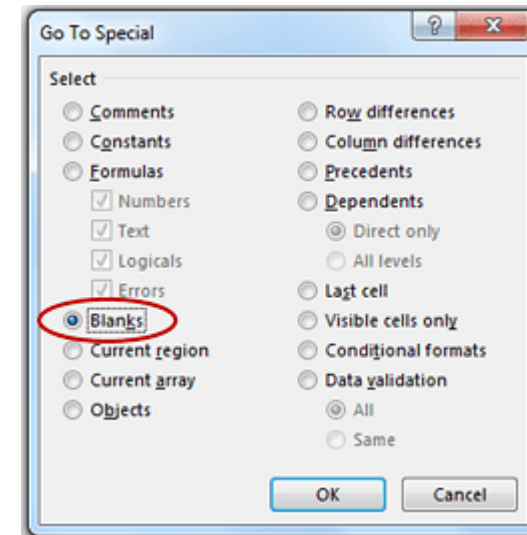
SELECT AND TREAT ALL BLANK CELLS

- Blank cells can create havoc if not treated beforehand. I often face issues with blank cells in a data set that is used to create reports/dashboards.
 - You may want to fill all blank cells with '0' or 'Not Available', or may simply want to highlight it.
 - If there is a huge data set, doing this manually could take hours. Thankfully, there is a way you can select all the blank cells at once.
1. Select the entire data set.
 2. Press F5 (this opens the Go To dialogue box)
 3. Click on the Special... button (at the bottom left). This opens the Go To Special dialog box.



SELECT AND TREAT ALL BLANK CELLS

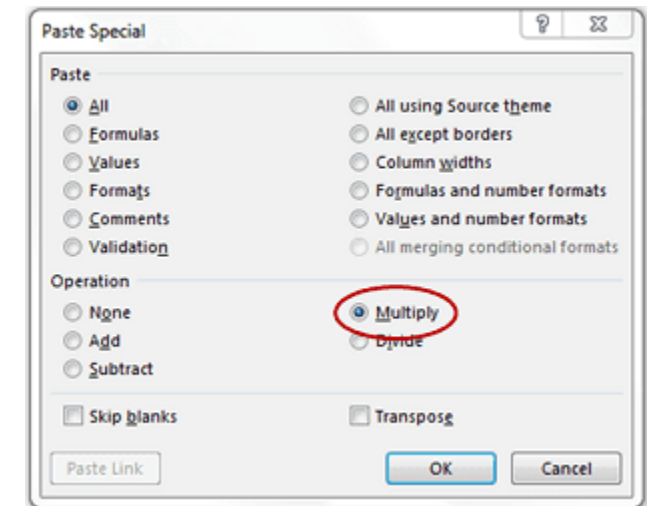
- Select Blank and Click OK
- This selects all the blank cells in your data set.
- If you want to enter 0 or Not Available in all these cells, just type it and press **Control + Enter** (remember, if you press only enter, the value is inserted only in the active cell).



CONVERT NUMBERS STORED AS TEXT INTO NUMBERS

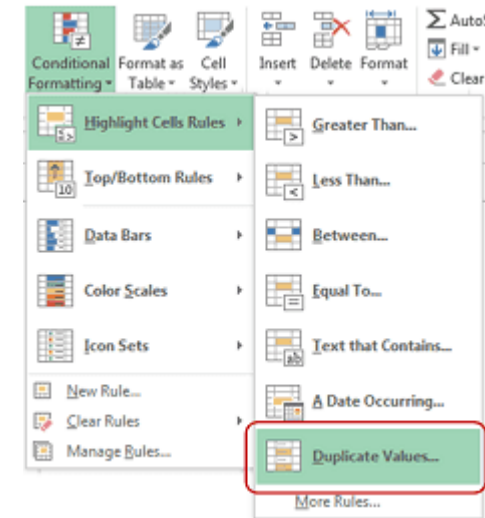
- Sometimes when you import data from text files or external databases, numbers get stored as text.
- Also, some people are in the habit of using an apostrophe (') before a number to make it text.
- This could create serious issues if you are using these cells in calculations.
- Here is a foolproof way to convert these numbers stored as text back into numbers.

1. In any blank cell, type 1
2. Select the cell where you typed 1, and press Control + C
3. Select the cell/range which you want to convert to numbers
4. Select Paste → Paste Special (Key Board Shortcut – Alt + E + S)
5. In the Paste Special Dialogue box, select Multiply (in operations category)
6. Click OK. This converts all the numbers in text format back to numbers.



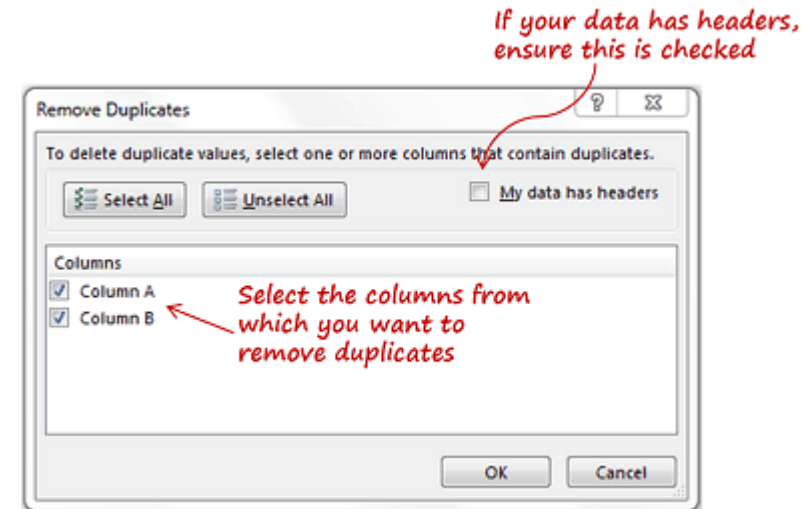
REMOVE DUPLICATES

- There can be 2 things you can do with duplicate data – ***Highlight It*** or ***Delete It***.
- **Highlight Duplicate Data:**
 - Select the data and Go to Home -> Conditional Formatting -> Highlight Cells Rules -> Duplicate Values.
 - Specify the formatting and all the duplicate values get highlighted.



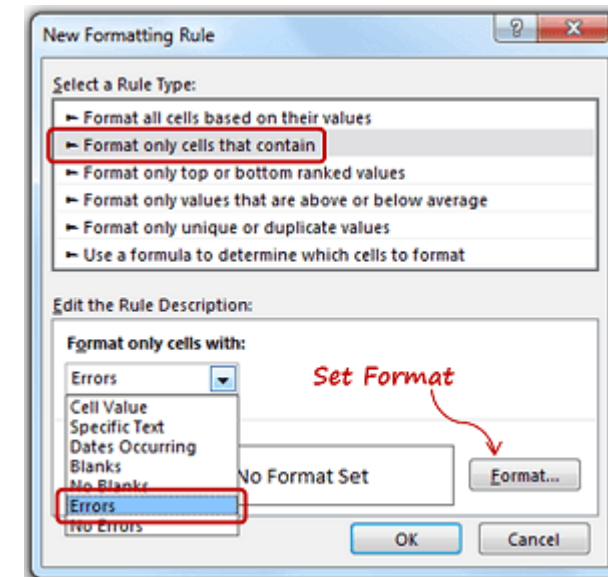
REMOVE DUPLICATES

- **Delete Duplicates in Data:** Select the data and Go to Data → Remove Duplicates.
- If your data has headers, ensure that the checkbox at the top right is checked.
- Select the Column(s) from which you want to remove duplicates and click OK.
- This removes duplicate values from the list. If you want the original list intact, copy-paste the data at some other location and then do this.



HIGHLIGHT ERRORS

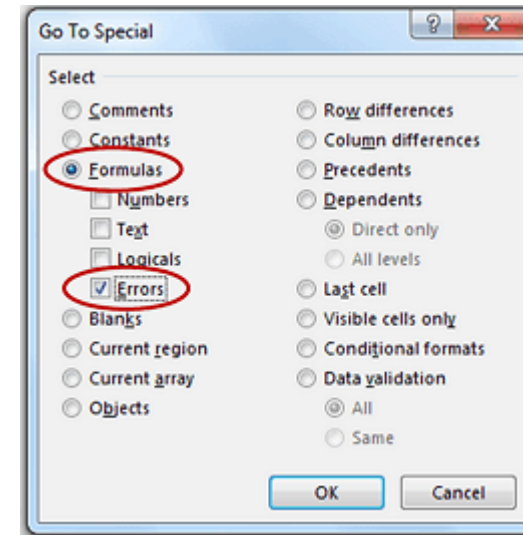
- There are two ways you can highlight Errors in Data in Excel:
- **Using Conditional Formatting**
 1. Select the entire data set
 2. Go to Home -> Conditional Formatting -> New Rule
 3. In New Formatting Rule Dialogue Box select 'Format Only Cells that Contain'
 4. In the Rule Description, select Errors from the drop down
 5. Set the format and click OK. This highlights any error value in the selected dataset



HIGHLIGHT ERRORS

■ Using Go To Special

1. Select the entire data set
2. Press F5 (this opens the Go To Dialogue box)
3. Click on Special Button at the bottom left
4. Select Formulas and uncheck all options except Errors



This selects all the cells that have an error in it. Now you can manually highlight these, delete it, or type anything into it.

CHANGE TEXT TO LOWER/UPPER/PROPER CASE

- When you inherit a workbook or import data from text files, often the names or titles are not consistent. Sometimes all the text could be in lower/upper case or it could be a mix of both. You can easily make it all consistent by using these three functions:
- **LOWER()** – Converts all text into Lower Case.
UPPER() – Converts all text into Upper Case.
PROPER() – Converts all Text into Proper Case.

PARSE DATA USING TEXT TO COLUMN

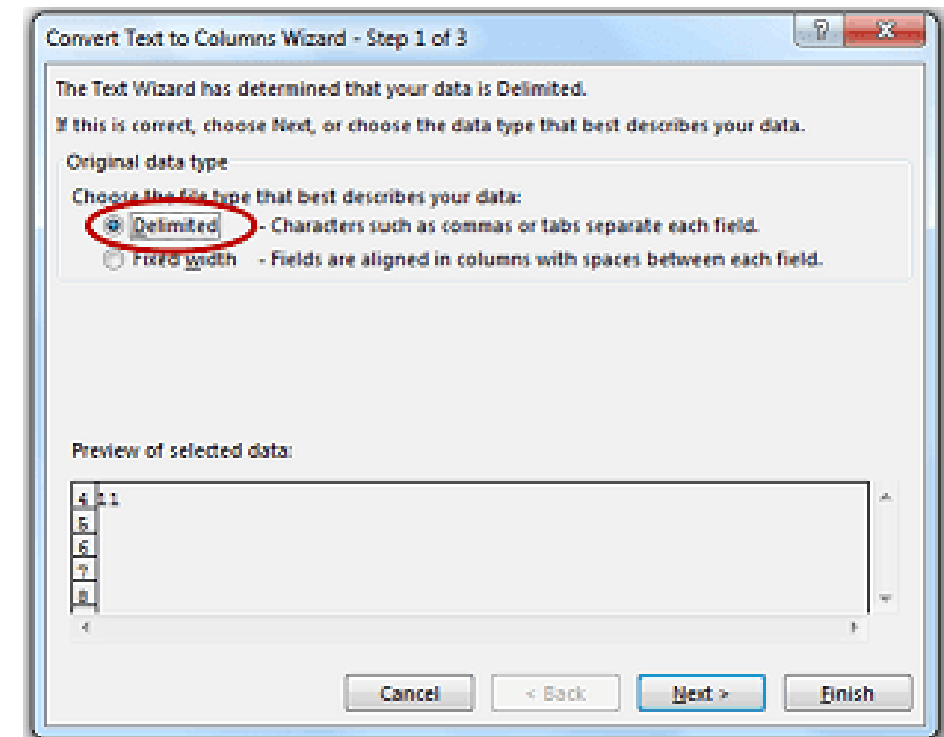
- When you get data from a database or import it from a text file, it may happen that all the text is cramped in one cell. You can parse this text into multiple cells by using Text to Column functionality in Excel.

Excel is Awesome → Excel is Awesome

1. Select the data/text you want to parse

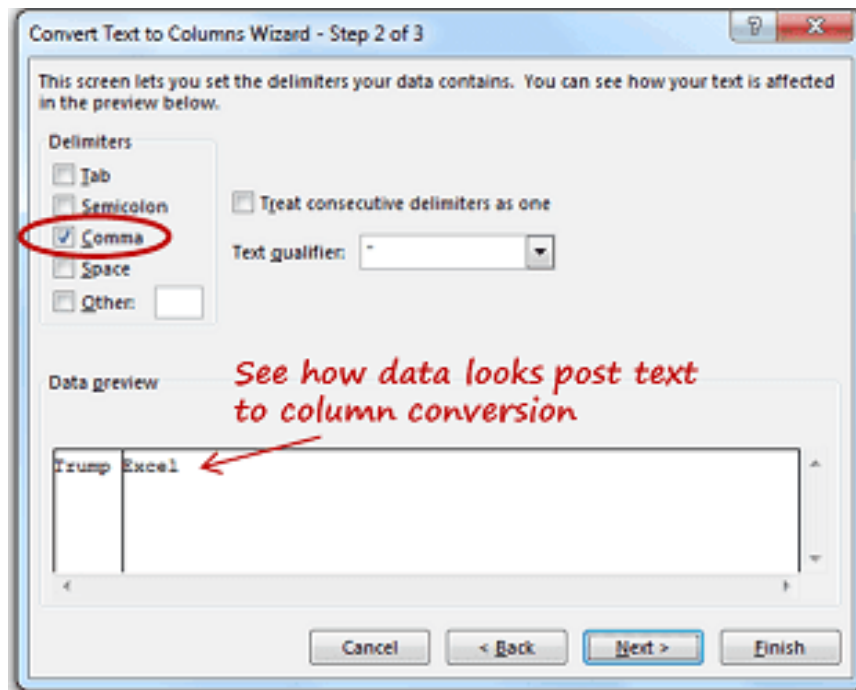
2. Go To Data → Text to Column (This opens the Text to Columns Wizard)

Step 1: Select the data type (select Delimited if your data is not equally spaced, and is separated by characters such as comma, hyphen, dot..). Click Next

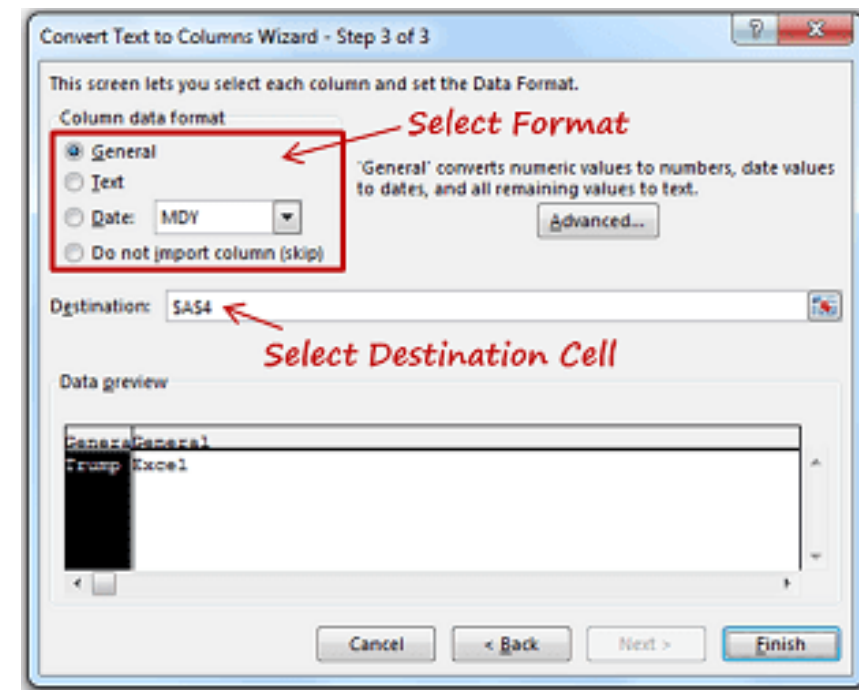


PARSE DATA USING TEXT TO COLUMN

Step 2: Select Delimiter (the character that separates your data). You can select pre-defined delimiter or anything else using the Other option



Step 3: Select the data format. Also select the destination cell. If destination cell is not selected, the current cell is overwritten

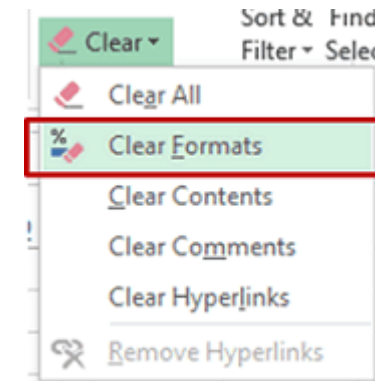


DELETE ALL FORMAT

- In my job, I used multiple databases to get the data in excel. Every database had it's own data formatting. When you have all the data in place, here is how you can **delete all the formatting** at one go:

1. Select the data set
2. Go to Home -> Clear -> Clear Formats

Similarly, you can also clear only the comments, hyperlinks, or content.



CHANGE CELL REFERENCES USING FIND AND REPLACE

- Sometimes when you work with a lot of formulas, there is a need to change a cell reference in all the formulas.
- It could take you a lot of time if you manually change it in every cell that has a formula.
- Here is where Excel Find and Replace comes in handy. It can easily find a cell reference in all the formulas in the worksheet (or in the selected cells) and replace it with another cell reference.
- For example, suppose you have a huge dataset with a formula in that uses \$A\$1 as one of the cell references (as shown below).
- If you need to change \$A\$1 with \$B\$1, you can do that using Find and Replace in Excel.

The diagram illustrates the process of replacing cell references in Excel formulas. On the left, a list of 12 formulas is shown, each using the cell reference \$A\$1. A red box highlights the \$A\$1 in the first formula. A large grey arrow points to the right, where the same 12 formulas are shown, but with \$B\$1 replacing \$A\$1. A red box highlights the \$B\$1 in the first formula of the second list.

Left side formulas (all using \$A\$1):

```
=INDEX($A$1:$A$30,MATCH(C4,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C5,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C6,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C7,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C8,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C9,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C10,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C11,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C12,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C13,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C14,$D$1:$D$30,0),1)  
=INDEX($A$1:$A$30,MATCH(C15,$D$1:$D$30,0),1)
```

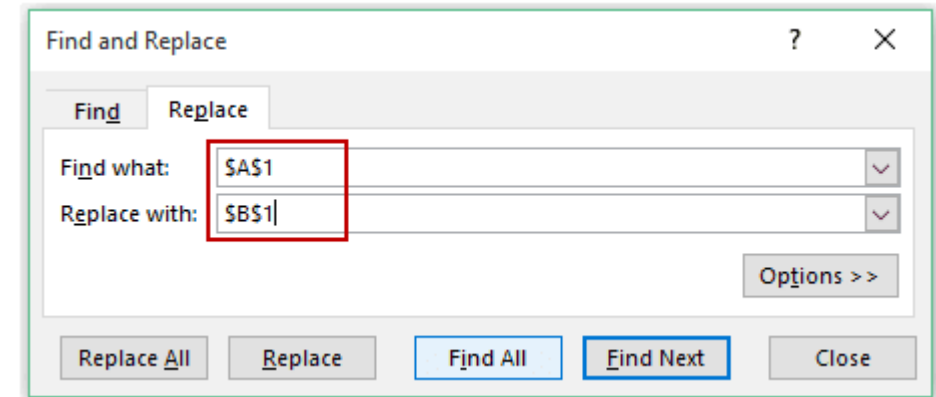
Right side formulas (all using \$B\$1):

```
=INDEX($B$1:$B$30,MATCH(C4,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C5,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C6,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C7,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C8,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C9,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C10,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C11,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C12,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C13,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C14,$D$1:$D$30,0),1)  
=INDEX($B$1:$B$30,MATCH(C15,$D$1:$D$30,0),1)
```

CHANGE CELL REFERENCES USING FIND AND REPLACE

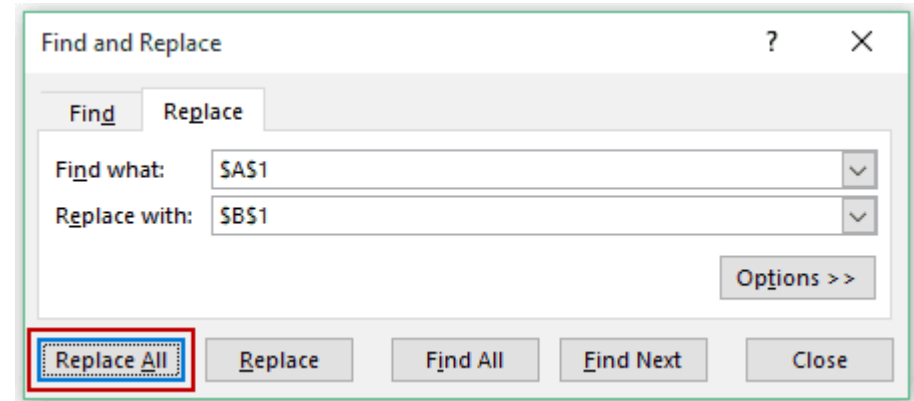
■ Here are the steps to do this:

1. Select the cells that have the formula in which you want to replace the reference. If you want to replace in the entire worksheet, select the entire worksheet.
2. Go to Home -> Find and Select -> Replace (*Keyboard Shortcut – Control + H*).
3. In the Find and Replace dialogue box, use the following details:
 1. Find what: **\$A\$1** (the cell reference you want to change).
 2. Replace with: **\$B\$1** (the new cell reference).



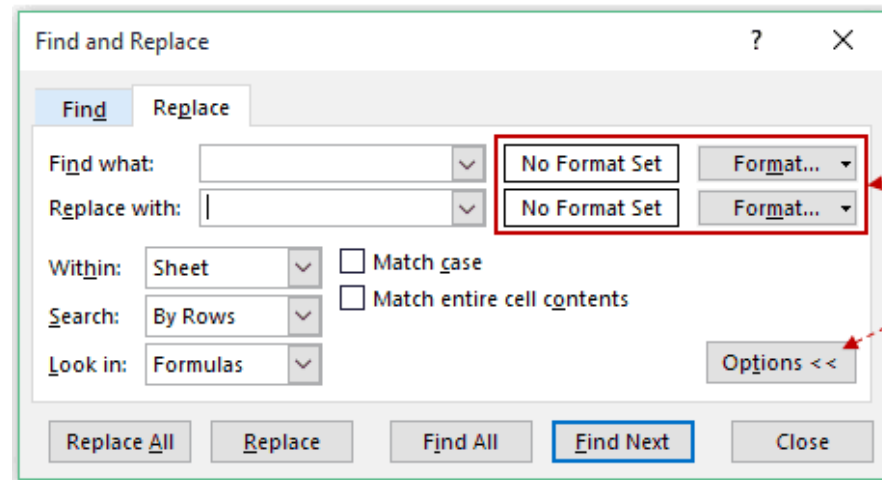
CHANGE CELL REFERENCES USING FIND AND REPLACE

- Click on Replace All.
- This would instantly update all the formulas with the new cell reference.
- Note that this would change all the instances of that reference.
- For example, if you have the reference \$A\$1 two times in a formula, both instances would be replaced by \$B\$1.



TO FIND AND REPLACE FORMATTING

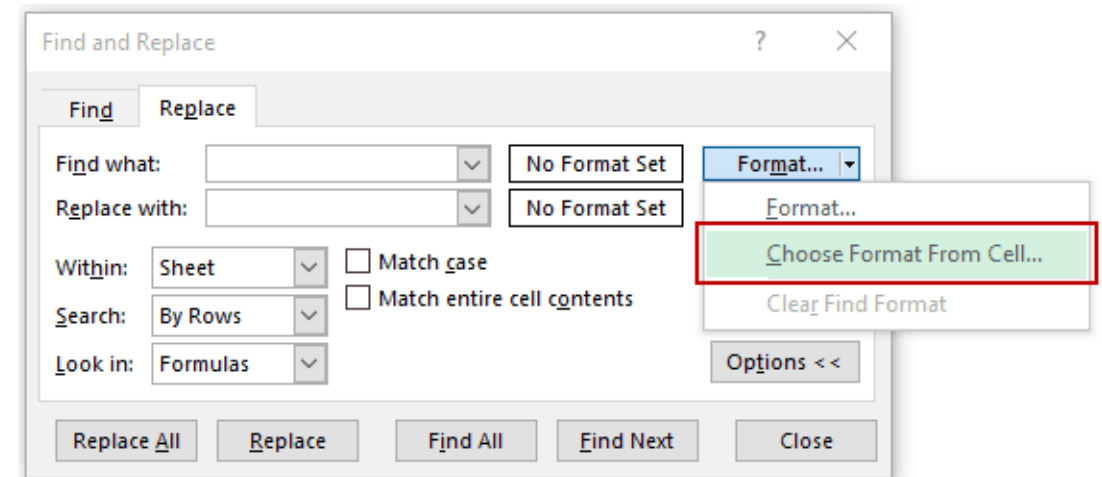
- This is a cool feature when you want to replace existing formatting with some other formatting. For example, you may have cells with an orange background color and you want to change all these cell's background color to red. Instead of manually doing this, use Find and Replace to do this all at once.
- Here are the steps to do this:
 1. Select the cells for which you want to find and replace the formatting. If you want to find and replace a specific format in the entire worksheet, select the entire worksheet.
 2. Go to Home -> Find and Select -> Replace (*Keyboard Shortcut – Control + H*).
 3. Click on the Options button. This will expand the dialogue box and show you more options.



This part gets visible when you click on Options

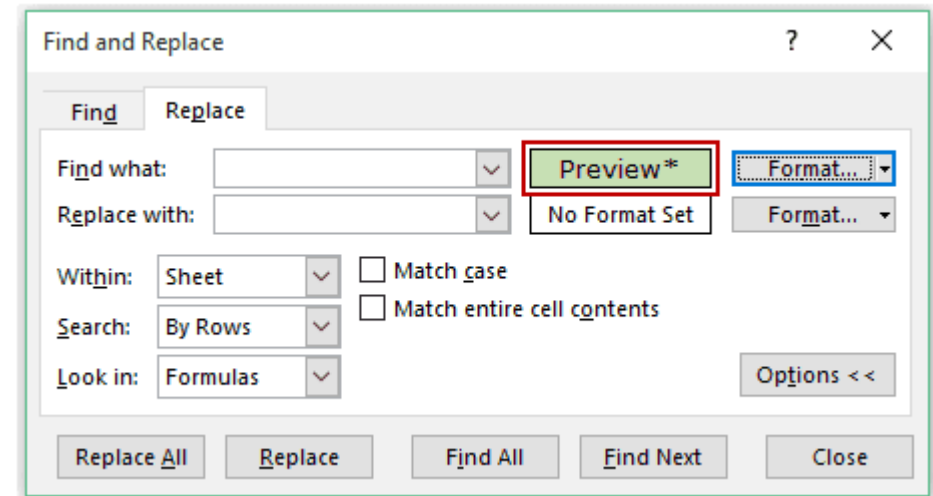
TO FIND AND REPLACE FORMATTING

- Click on the Find what Format button. It will show a drop-down with two options – Format and Choose Format from Cell.
- You can either manually specify the format that you want to find by clicking on the Format button, or you can select the format from a cell in the worksheet. To select a format from a cell, select the 'Choose Format from Cell' option and then click on the cell from which you want to pick the format.



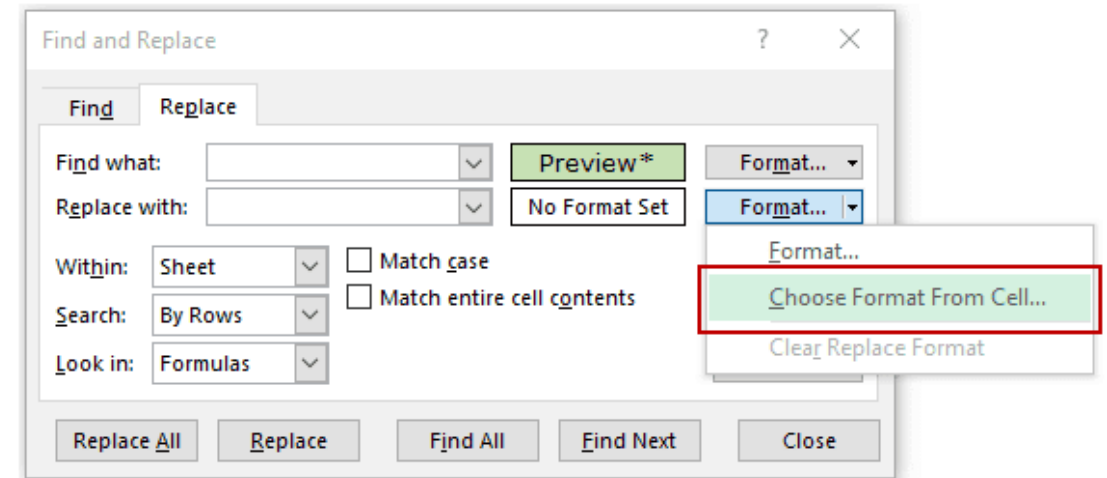
TO FIND AND REPLACE FORMATTING

- Once you select a format from a cell or manually specify it from the format cells dialogue box, you will see that as the preview on the left of the format button.



TO FIND AND REPLACE FORMATTING

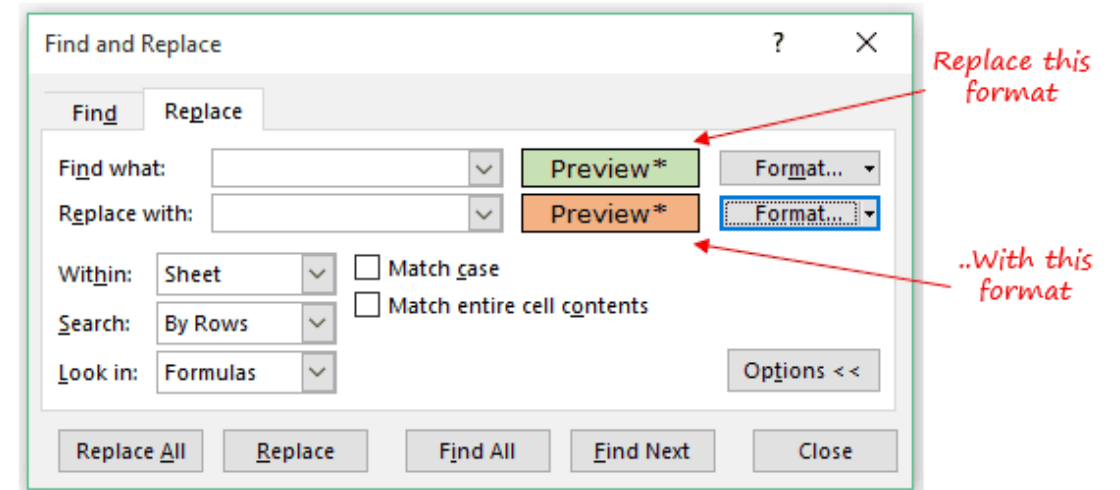
- Now you need to specify the format that you want instead of the one selected in the previous step. Click on the Replace with Format button. It will show a drop-down with two options – Format and Choose Format from Cell.
- You can either manually specify it by clicking on the Format button, or you can pick up an existing format in the worksheet by clicking on the cell that has it.



TO FIND AND REPLACE FORMATTING


- Once you select a format from a cell or manually specify it from the format cells dialogue box, you will see that as the preview on the left of the format but

- Click on the Replace All button.
- You can use this technique to replace a lot of things in formatting. It can pick up and replace formats such as background color, borders, font type/size/color, and even [merged cells](#).



TO REMOVE TEXT USING WILDCARD CHARACTERS

- This one saved me hours. I got a list as shown, and I had to remove the text between parenthesis.
- If you have a huge data-set, [removing the parentheses](#) and the text between it can take you hours. But Find and Replace in Excel can do this in less than 10 seconds.



Company Name
Company ABC (Code: ABC)
Company DEF (Code: DEF)
Company GHI (Code: GHI)
Company JKL (Code: JKL)
Company MNO (Code: MNO)
Company PQR (Code: PQR)

Company Name
Company ABC
Company DEF
Company GHI
Company JKL
Company MNO
Company PQR

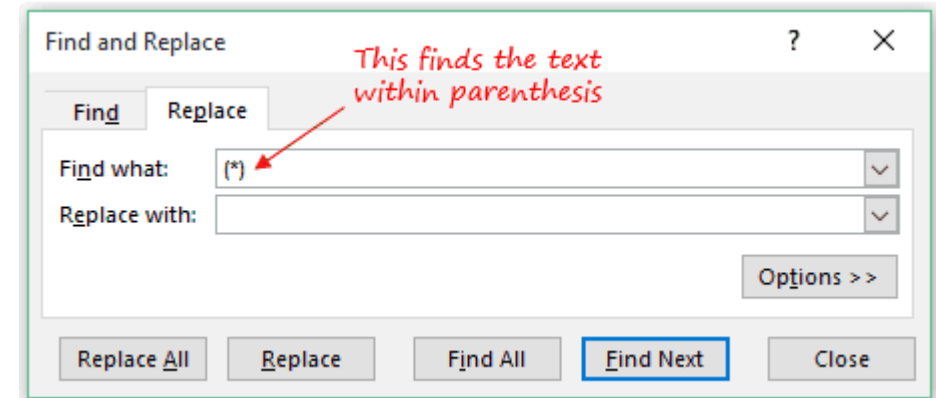
1. Select the data
2. Go to Home -> Find and Select -> Replace (Keyboard Shortcut – *Control + H*)

3. In the Find and Replace Dialogue Box:

1. Find What: (*)

Note I have used an asterisk, which is a wildcard character that represents any number of characters.

2. Replace With: **Leave this Blank**



ADVANCE FUNCTIONS FOR ANALYSIS

we'll delve into the world of advanced Excel functions, empowering you to unlock deeper insights from your data. We'll explore powerful tools that go beyond basic calculations, transforming you from a spreadsheet user into a data analysis

COUNTIF – NUMERIC CRITERIA

- Use the COUNTIF function in Excel to count cells that are equal to a value, count cells that are greater than or equal to a value, etc.

1. The COUNTIF function below counts the number of cells that are equal to 20.

A7									
	A	B	C	D	E	F	G	H	I
1	10								
2	1								
3	7								
4	20								
5	3								
6									
7	1								
8									

COUNTIF – NUMERIC CRITERIA

2. The following COUNTIF function gives the exact same result.

A7 ✕ ✓ fx =COUNTIF(A1:A5,C1)									
	A	B	C	D	E	F	G	H	I
1	10		20						
2	1								
3	7								
4	20								
5	3								
6									
7	1								
8									

3. The COUNTIF function below counts the number of cells that are greater than or equal to 10.

A7 ✕ ✓ fx =COUNTIF(A1:A5,">=10")									
	A	B	C	D	E	F	G	H	I
1	10								
2	1								
3	7								
4	20								
5	3								
6									
7	2								
8									

COUNTIF – NUMERIC CRITERIA

4. The following COUNTIF function gives the exact same result.

A7 X ✓ fx =COUNTIF(A1:A5,">="&C1)									
	A	B	C	D	E	F	G	H	I
1	10		10						
2	1								
3	7								
4	20								
5	3								
6									
7	2								
8									

5. The COUNTIF function below counts the number of cells that are not equal to 7.

A7 X ✓ fx =COUNTIF(A1:A5,"<>7")									
	A	B	C	D	E	F	G	H	I
1	10								
2	1								
3	7								
4	20								
5	3								
6									
7	4								
8									

Explanation: the & operator joins the 'greater than or equal to' symbol and the value in cell C1.

COUNTIF – NUMERIC CRITERIA

6. The COUNTIF functions below count the number of cells that are equal to 3 or 7.

A7									
	A	B	C	D	E	F	G	H	I
1	10								
2	1								
3	7								
4	20								
5	3								
6									
7	2								
8									

COUNTIF – TEXT TRICKS

- Use the COUNTIF function in Excel and a few tricks to count cells that contain specific text. Always enclose text in double quotation marks.

1. The COUNTIF function below counts the number of cells that contain exactly star.

A9		✕ ✓ <i>f_x</i>		=COUNTIF(A1:A7,"star")					
	A	B	C	D	E	F	G	H	I
1	star								
2	moon								
3	stars								
4	9								
5	star								
6	star								
7	star12								
8									
9	2								
10									

COUNTIF – TEXT TRICKS

2. The COUNTIF function below counts the number of cells that contain exactly star + 1 character. A question mark (?) matches exactly one character.

A9 X ✓ fx =COUNTIF(A1:A7,"star?")									
	A	B	C	D	E	F	G	H	I
1	star								
2	moon								
3	stars								
4	9								
5	star								
6	star								
7	star12								
8									
9	1								
10									

3. The COUNTIF function below counts the number of cells that contain exactly star + a series of zero or more characters. An asterisk (*) matches a series of zero or more characters.

A9 X ✓ fx =COUNTIF(A1:A7,"star*")									
	A	B	C	D	E	F	G	H	I
1	star								
2	moon								
3	stars								
4	9								
5	star								
6	star								
7	star12								
8									
9	4								
10									

COUNTIF – TEXT TRICKS

4. The COUNTIF function below counts the number of cells that contain star in any way.

=COUNTIF(A1:A7,"*star*")									
	A	B	C	D	E	F	G	H	I
1	star								
2	moon								
3	stars								
4	9								
5	star								
6	star								
7	star12								
8									
9	5								
10									

5. The COUNTIF function below counts the number of cells that contain text.

=COUNTIF(A1:A7,"*")									
	A	B	C	D	E	F	G	H	I
1	star								
2	moon								
3	stars								
4	9								
5	star								
6	star								
7	star12								
8									
9	6								
10									

COUNTIF – COUNT BOOLEANS

Use the COUNTIF function in Excel to count Boolean values (TRUE or FALSE).

1. The COUNTIF function below counts the number of cells that contain the Boolean TRUE.

A7		✕ ✓ fx		=COUNTIF(A1:A5,TRUE)					
	A	B	C	D	E	F	G	H	I
1	5								
2	TRUE								
3	sun								
4	FALSE								
5	TRUE								
6									
7	2								
8									

2. The COUNTIF function below counts the number of cells that contain the Boolean FALSE.

A7		✕ ✓ fx		=COUNTIF(A1:A5,FALSE)					
	A	B	C	D	E	F	G	H	I
1	5								
2	TRUE								
3	sun								
4	FALSE								
5	TRUE								
6									
7	1								
8									

COUNTIF – COUNT ERRORS

Use the COUNTIF function in Excel to count specific errors.

1. The COUNTIF function below counts the number of cells that contain the #NAME? error.

D5 ✕ ✓ fx =COUNTIF(A1:C3,"#NAME?")									
	A	B	C	D	E	F	G	H	I
1	#REF!		#DIV/0!						
2	4	7	2						
3	5	3	#NAME?						
4									
5				1					
6									

2. The array formula below counts the total number of errors in a range of cells.

D5 ✕ ✓ fx {=COUNT(IF(ISERROR(A1:C3),1,""))}									
	A	B	C	D	E	F	G	H	I
1	#REF!		#DIV/0!						
2	4	7	2						
3	5	3	#NAME?						
4									
5				3					
6									

COUNTIF – AND CRITERIA

Counting with And criteria in Excel is easy. The COUNTIFS function (with the letter S at the end) in Excel counts cells based on two or more criteria.

1. For example, to count the number of rows that contain Google and Stanford, simply use the COUNTIFS function.

B10		=COUNTIFS(A1:A8,"Google",B1:B8,"Stanford")								
	A	B	C	D	E	F	G	H	I	
1	Google	Stanford								
2	Facebook	Harvard								
3	Twitter	Stanford								
4	Facebook	Columbia								
5	Google	Harvard								
6	Twitter	Harvard								
7	Google	Stanford								
8	Twitter	Harvard								
9										
10		2								
11										

COUNTIF – OR CRITERIA

1. The COUNTIF functions below count the number of cells that contain Google or Facebook (one column). No rocket science so far.

A10		=COUNTIF(A1:A8,"Google")+COUNTIF(A1:A8,"Facebook")							
	A	B	C	D	E	F	G	H	I
1	Google								
2	Facebook								
3	Twitter								
4	Facebook								
5	Google								
6	Twitter								
7	Google								
8	Twitter								
9									
10	5								
11									

COUNTIF – OR CRITERIA

2. However, if you want to count the number of rows that contain Google or Stanford (two columns), you cannot simply use the COUNTIF function twice (see the picture below).

B10		=COUNTIF(A1:A8,"Google")+COUNTIF(B1:B8,"Stanford")							
	A	B	C	D	E	F	G	H	I
1	Google	Stanford							
2	Facebook	Harvard							
3	Twitter	Stanford							
4	Facebook	Columbia							
5	Google	Harvard							
6	Twitter	Harvard							
7	Google	Stanford							
8	Twitter	Harvard							
9									
10		6							
11									

3. The array formula below does the trick.

B10		{=SUM(IF((A1:A8="Google")+(B1:B8="Stanford"),1,0))}							
	A	B	C	D	E	F	G	H	I
1	Google	Stanford							
2	Facebook	Harvard							
3	Twitter	Stanford							
4	Facebook	Columbia							
5	Google	Harvard							
6	Twitter	Harvard							
7	Google	Stanford							
8	Twitter	Harvard							
9									
10		4							
11									

COUNT CHARACTERS

Use the LEN function to count characters in Excel. Use LEN and SUBSTITUTE to count specific characters in Excel.

1. The LEN function in Excel counts the number of characters in a cell.

	A	B	C	D	E	F	G	H	I
1	50 states								
2	9								
3									

Explanation: the LEN function counts 2 numbers, 1 space and 6 letters.

2. Use SUM and LEN to count the number of characters in a range of cells.

	A	B	C	D	E	F	G	H	I
1	50 states								
2	Utah								
3	Alaska								
4	Texas								
5	24								
6									

Note: as you can imagine, this formula can get quite long.

COUNT CHARACTERS

3. The array formula below counts the number of characters in a range of cells.

	A	B	C	D	E	F	G	H	I
1	50 states								
2	Utah								
3	Alaska								
4	Texas								
5	24								
6									

Note: finish an [array formula](#) by pressing CTRL + SHIFT + ENTER. Excel adds the curly braces {}. In Excel 365 or Excel 2021, finish by simply pressing Enter. You won't see curly braces. The array constant {9;4;6;5} is used as an argument for the SUM function, giving a result of 24.

4. Use LEN and SUBSTITUTE to count how many times a specific character (in this example, the character a) occurs in a cell.

	A	B	C	D	E	F	G	H	I
1	50 states								
2	1								
3									

Explanation: the SUBSTITUTE function replaces the character a (second argument) with an empty string (third argument). LEN(SUBSTITUTE(A1,"a","")) equals 8 (the length of the string without the character a). If we subtract this number from 9 (total number of characters in cell A1), we get the number of occurrences of the character a in cell A1.

COUNT CHARACTERS

5. The array formula below counts how many times a specific character (in this example, the character a) occurs in a range of cells.

A5									
	A	B	C	D	E	F	G	H	I
1	50 states								
2	Utah								
3	Alaska								
4	Texas								
5	5								
6									

Explanation: the array constant {1;1;2;1} is used as an argument for the SUM function, giving a result of 5. The SUBSTITUTE function is case-sensitive. The A in Alaska is not counted.

6. The array formula below counts both lower and upper case occurrences of a specific character (in this example, the character a).

A5									
	A	B	C	D	E	F	G	H	I
1	50 states								
2	Utah								
3	Alaska								
4	Texas								
5	6								
6									

Explanation: The LOWER function converts all letters to lowercase first.

COUNT CELLS WITH TEXT

1a. Use the COUNTIF function and the asterisk symbol (*) to count cells with text.

	A	B	C	D	E	F	G	H	I
1	100								
2	golf								
3	baseball								
4									
5	tennis								
6									
7	3								
8									

1b. You can also create an array formula to count cells with text.

	A	B	C	D	E	F	G	H	I
1	100								
2	golf								
3	baseball								
4									
5	tennis								
6									
7	3								
8									

COUNT CELLS WITH TEXT

1c. You can also use the SUMPRODUCT function to count cells with text.

A7 ✕ ✓ fx =SUMPRODUCT(--(ISTEXT(A1:A5)))									
	A	B	C	D	E	F	G	H	I
1	100								
2	golf								
3	baseball								
4									
5	tennis								
6									
7	3								
8									

2a. Numbers, Booleans (TRUE or FALSE), blanks and errors are not counted as text.

A7 ✕ ✓ fx =COUNTIF(A1:A5,"*")									
	A	B	C	D	E	F	G	H	I
1	100								
2	golf								
3	TRUE								
4									
5	#DIV/0!								
6									
7	1								
8									

COUNT CELLS WITH TEXT

2b. The formula below counts cells with text and counts cells with Booleans.

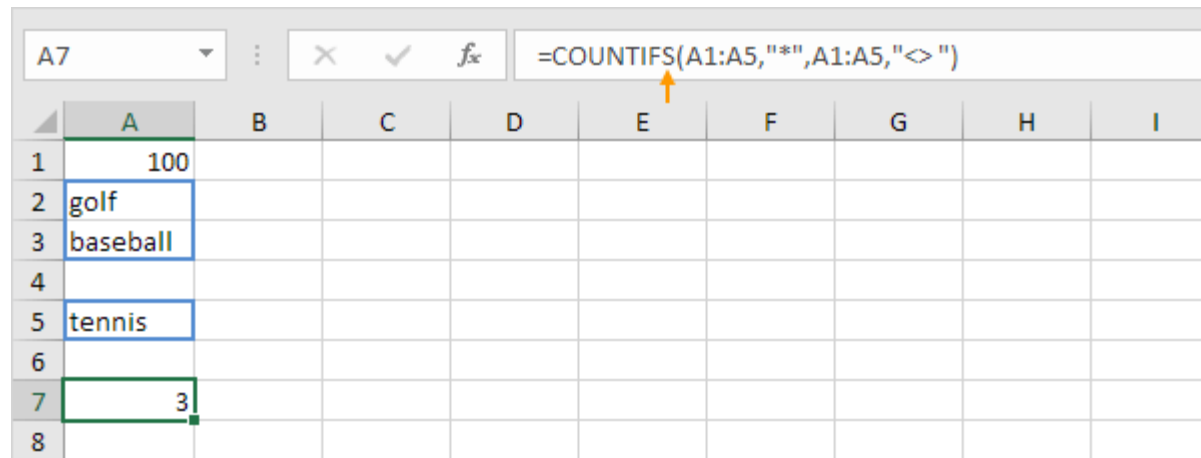
=SUMPRODUCT(--(ISTEXT(A1:A5)))+SUMPRODUCT(--ISLOGICAL(A1:A5))									
	A	B	C	D	E	F	G	H	I
1	100								
2	golf								
3	TRUE								
4									
5	#DIV/0!								
6									
7	2								
8									

3a. Enter a space into cell A4. The COUNTIF function at step 1a and step 2a also counts cells with a space character.

=COUNTIF(A1:A5,"*")									
	A	B	C	D	E	F	G	H	I
1	100								
2	golf								
3	baseball								
4									
5	tennis								
6									
7	4								
8									

COUNT CELLS WITH TEXT

3b. The COUNTIFS function below counts cells with text and excludes cells with a space character.



	A	B	C	D	E	F	G	H	I
1	100								
2	golf								
3	baseball								
4									
5	tennis								
6									
7	3								
8									

Note: the COUNTIFS function in Excel counts cells based on two or more criteria.

SUMIF – NUMERIC CRITERIA

Use the SUMIF function in Excel to sum cells based on numbers that meet specific criteria.

1. The SUMIF function below (two arguments) sums values in the range A1:A5 that are less than or equal to 10.

	A	B	C	D	E	F	G	H	I
1	10								
2	1								
3	7								
4	20								
5	3								
6									
7	21								
8									

2. The following SUMIF function gives the exact same result. The & operator joins the 'less than or equal to' symbol and the value in cell C1.

	A	B	C	D	E	F	G	H	I
1	10		10						
2	1								
3	7								
4	20								
5	3								
6									
7	21								
8									

SUMIF – NUMERIC CRITERIA

3. The SUMIF function below (three arguments, last argument is the range to sum) sums values in the range B1:B5 if the corresponding cells in the range A1:A5 contain the value 25.

B7 ✕ ✓ <i>f_x</i> =SUMIF(A1:A5,25,B1:B5)									
	A	B	C	D	E	F	G	H	I
1	75	10							
2	25	1							
3	100	7							
4	50	20							
5	25	3							
6									
7		4							
8									

4. The following SUMIF function gives the exact same result (second argument refers to cell D1).

B7 ✕ ✓ <i>f_x</i> =SUMIF(A1:A5,D1,B1:B5)									
	A	B	C	D	E	F	G	H	I
1	75	10		25					
2	25	1							
3	100	7							
4	50	20							
5	25	3							
6									
7		4							
8									

SUMIF – TEXT CRITERIA

Use the SUMIF function in Excel to sum cells based on text strings that meet specific criteria. Always enclose text in double quotation marks.

1. The SUMIF function below sums values in the range B1:B5 if the corresponding cells in the range A1:A5 contain exactly circle.

B7 ✕ ✓ <i>f_x</i> =SUMIF(A1:A5,"circle",B1:B5)									
	A	B	C	D	E	F	G	H	I
1	circle6	10							
2	triangle	1							
3	circle	7							
4	circle8	20							
5	triangle5	3							
6									
7		7							
8									

2. The SUMIF function below sums values in the range B1:B5 if the corresponding cells in the range A1:A5 do not contain exactly triangle.

B7 ✕ ✓ <i>f_x</i> =SUMIF(A1:A5,"<>triangle",B1:B5)									
	A	B	C	D	E	F	G	H	I
1	circle6	10							
2	triangle	1							
3	circle	7							
4	circle8	20							
5	triangle5	3							
6									
7		40							
8									

SUMIF – TEXT CRITERIA

3. The SUMIF function below sums values in the range B1:B5 if the corresponding cells in the range A1:A5 contain exactly circle + 1 character. A question mark (?) matches exactly one character.

	A	B	C	D	E	F	G	H	I
1	circle6	10							
2	triangle	1							
3	circle	7							
4	circle8	20							
5	triangle5	3							
6									
7		30							
8									

4. The SUMIF function below sums values in the range B1:B5 if the corresponding cells in the range A1:A5 contain a series of zero or more characters + le. An asterisk (*) matches a series of zero or more characters.

	A	B	C	D	E	F	G	H	I
1	circle6	10							
2	triangle	1							
3	circle	7							
4	circle8	20							
5	triangle5	3							
6									
7		8							
8									

SUMIF – TEXT CRITERIA

B7		=SUMIF(A1:A5,"triangle",B1:B5)+SUMIF(A1:A5,"circle8",B1:B5)							
	A	B	C	D	E	F	G	H	I
1	circle6	10							
2	triangle	1							
3	circle	7							
4	circle8	20							
5	triangle5	3							
6									
7		21							
8									

5. The SUMIF functions below sum values in the range B1:B5 if the corresponding cells in the range A1:A5 contain exactly triangle or circle8.

SUMIF – DATA CRITERIA

Use the SUMIF function in Excel to sum cells based on dates that meet specific criteria.

1. The SUMIF function below sums the sales after January 20th, 2018.

B7		✕		✓		fx		=SUMIF(A1:A5,">"&DATE(2018,1,20),B1:B5)	
	A	B	C	D	E	F	G	H	I
1	1/21/2018	10							
2	9/25/2017	1							
3	8/3/2018	7							
4	8/30/2017	20							
5	4/6/2017	3							
6									
7		17							
8									

Note: the DATE function in Excel accepts three arguments: year, month and day.

2. The SUMIF function below sums today's sales.

B7		✕		✓		fx		=SUMIF(A1:A5,TODAY(),B1:B5)	
	A	B	C	D	E	F	G	H	I
1	1/21/2018	10							
2	9/25/2017	1							
3	8/3/2018	7							
4	8/30/2017	20							
5	4/6/2017	3							
6									
7		7							
8									

Note: today is August 3rd, 2018.

SUMIF – DATA CRITERIA

3. The SUMIFS function (with the letter S at the end) below sums the sales between two dates.

Note: the SUMIFS function in Excel sums cells based on two or more criteria (first argument is the range to sum, followed by two or more range/criteria pairs). Adjust the dates to sum the sales in a specific month, year, etc.

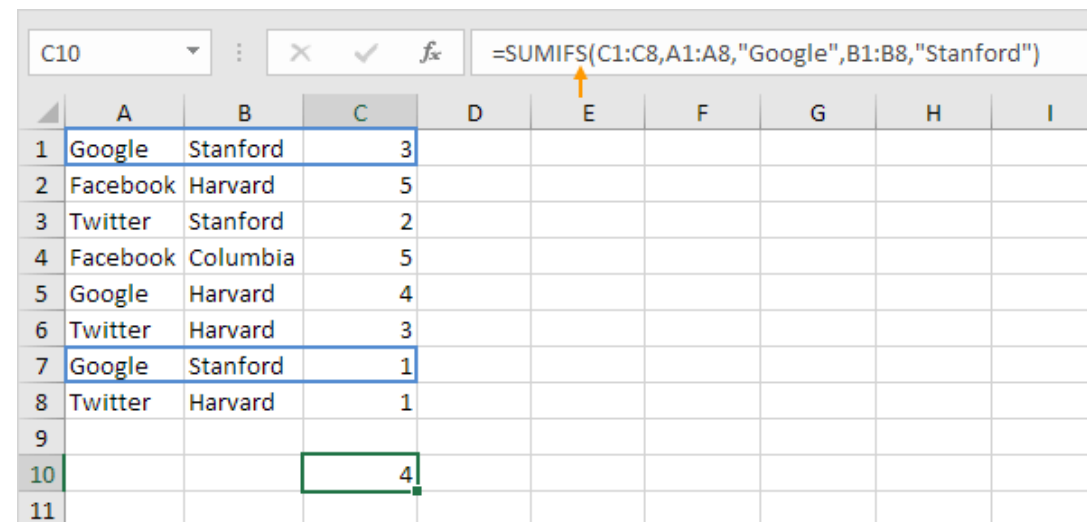
B7		=SUMIFS(B1:B5,A1:A5,">="&DATE(2017,6,1),A1:A5,"<="&DATE(2017,12,31))							
	A	B	C	D	E	F	G	H	I
1	1/21/2018	10							
2	9/25/2017	1							
3	8/3/2018	7							
4	8/30/2017	20							
5	4/6/2017	3							
6									
7		21							
8									

SUMIF – AND CRITERIA

Summing with And criteria in Excel is easy.

For example, to sum the cells that meet the following criteria: Google and Stanford (two criteria ranges), simply use the SUMIFS function (with the letter S at the end).

Note: remember, when using the SUMIFS function, the first argument is the range to sum, followed by two or more range/criteria pairs.



	A	B	C	D	E	F	G	H	I
1	Google	Stanford	3						
2	Facebook	Harvard	5						
3	Twitter	Stanford	2						
4	Facebook	Columbia	5						
5	Google	Harvard	4						
6	Twitter	Harvard	3						
7	Google	Stanford	1						
8	Twitter	Harvard	1						
9									
10			4						
11									

SUMIF – OR CRITERIA

Summing with Or criteria in Excel can be tricky.

1. The formula below sums the cells that meet the following criteria: Google or Facebook (one criteria range). No rocket science so far.

B10		=SUMIF(A1:A8,"Google",B1:B8)+SUMIF(A1:A8,"Facebook",B1:B8)							
	A	B	C	D	E	F	G	H	I
1	Google	3							
2	Facebook	5							
3	Twitter	2							
4	Facebook	5							
5	Google	4							
6	Twitter	3							
7	Google	1							
8	Twitter	1							
9									
10		18							
11									

SUMIF – OR CRITERIA

2. However, if you want to sum the cells that meet the following criteria: Google or Stanford (two criteria ranges), you cannot simply use the SUMIF function twice (see the picture below).

Note: cells that meet the criteria Google and Stanford are added twice, but they should only be added once. 10 is the answer we are looking for.

C10		=SUMIF(A1:A8,"Google",C1:C8)+SUMIF(B1:B8,"Stanford",C1:C8)							
	A	B	C	D	E	F	G	H	I
1	Google	Stanford	3	6					
2	Facebook	Harvard	5						
3	Twitter	Stanford	2	2					
4	Facebook	Columbia	5						
5	Google	Harvard	4	4					
6	Twitter	Harvard	3						
7	Google	Stanford	1	2					
8	Twitter	Harvard	1						
9									
10			14						
11									

SUMIF – OR CRITERIA

3. The array formula below does the trick.

Note: finish an array formula by pressing CTRL + SHIFT + ENTER. Excel adds the curly braces {}. In Excel 365 or Excel 2021, finish by simply pressing Enter. You won't see curly braces

C10		{=SUM(IF((A1:A8="Google")+(B1:B8="Stanford"),1,0)*C1:C8)}							
	A	B	C	D	E	F	G	H	I
1	Google	Stanford	3						
2	Facebook	Harvard	5						
3	Twitter	Stanford	2						
4	Facebook	Columbia	5						
5	Google	Harvard	4						
6	Twitter	Harvard	3						
7	Google	Stanford	1						
8	Twitter	Harvard	1						
9									
10			10						
11									

CREATING COMPLEX VISUALIZATIONS

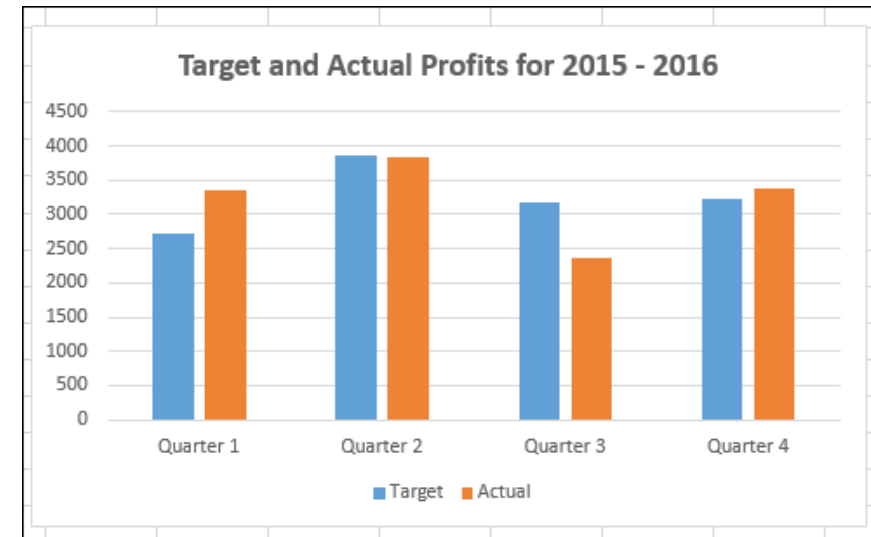
In Excel, charts are used to make a graphical representation of any set of data. A chart is a visual representation of the data, in which the data is represented by symbols such as bars in a Bar Chart or lines in a Line Chart. Excel provides you with many chart types and you can choose one that suits your data or you can use the Excel Recommended Charts option to view charts customized to your data and select one of those.

CREATING COMBINATION CHARTS

- Suppose you have the target and actual profits for the fiscal year 2015-2016 that you obtained from different regions.

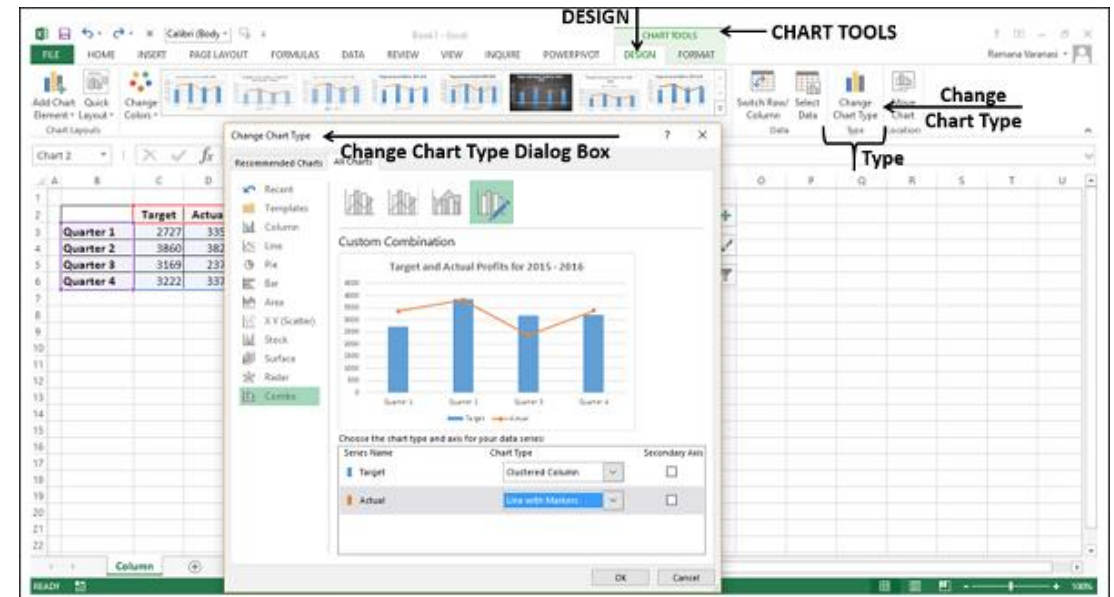
	A	B	C	D
1				
2			Target	Actual
3		Quarter 1	2727	3358
4		Quarter 2	3860	3829
5		Quarter 3	3169	2374
6		Quarter 4	3222	3373

We will create a Clustered Column Chart for these results.



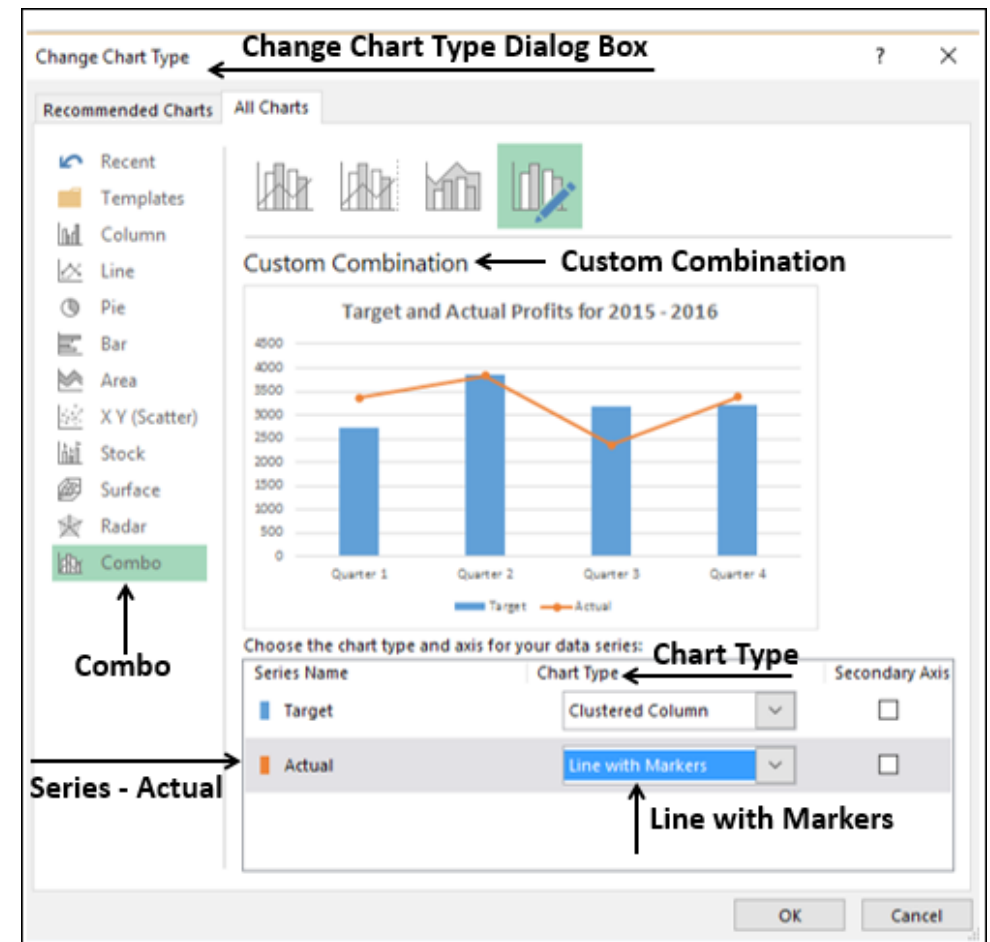
CREATING COMBINATION CHARTS

- Click the DESIGN tab under the CHART TOOLS tab on the Ribbon.
- Click Change Chart Type in the Type group. The Change Chart Type dialog box appears.



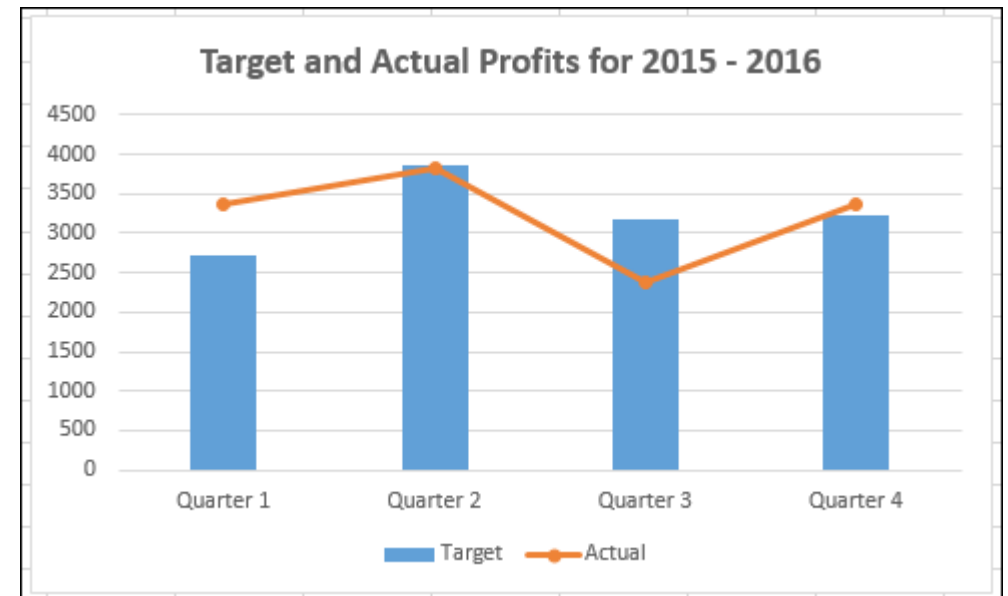
CREATING COMBINATION CHARTS

- Click Combo.
- Change the Chart Type for the series Actual to Line with Markers. The preview appears under Custom Combination.
- Click OK.



CREATING COMBINATION CHARTS

- Your Customized Combination Chart will be displayed.



As you observe in the chart, the Target values are in Columns and the Actual values are marked along the line. The data visualization has become better as it also shows you the trend of your results.

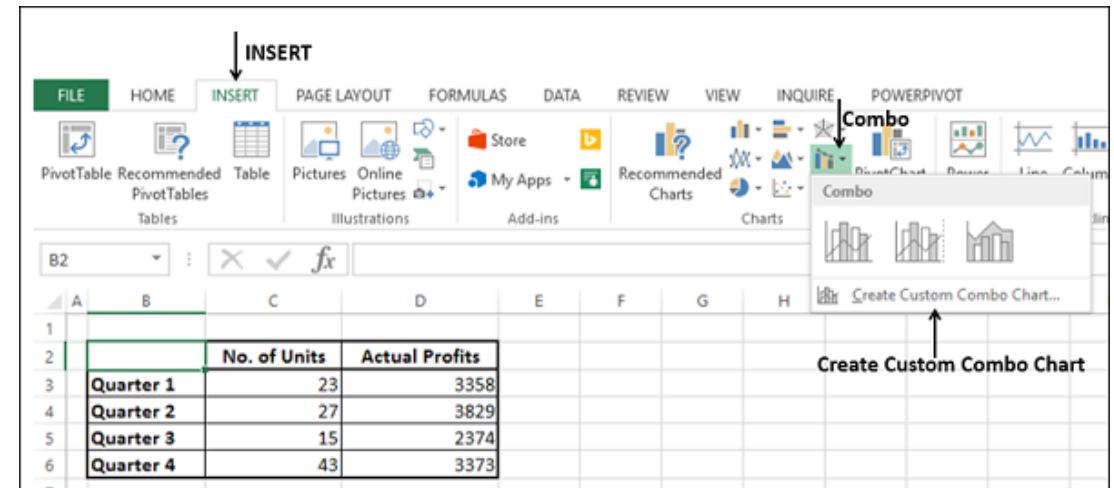
CREATING A COMBO CHART WITH SECONDARY AXIS

- Suppose you have the data on the number of units of your product that was shipped and the actual profits for the fiscal year 2015-2016 that you obtained from different regions.

	A	B	C	D
1				
2			No. of Units	Actual Profits
3		Quarter 1	23	3358
4		Quarter 2	27	3829
5		Quarter 3	15	2374
6		Quarter 4	43	3373

CREATING A COMBO CHART WITH SECONDARY AXIS

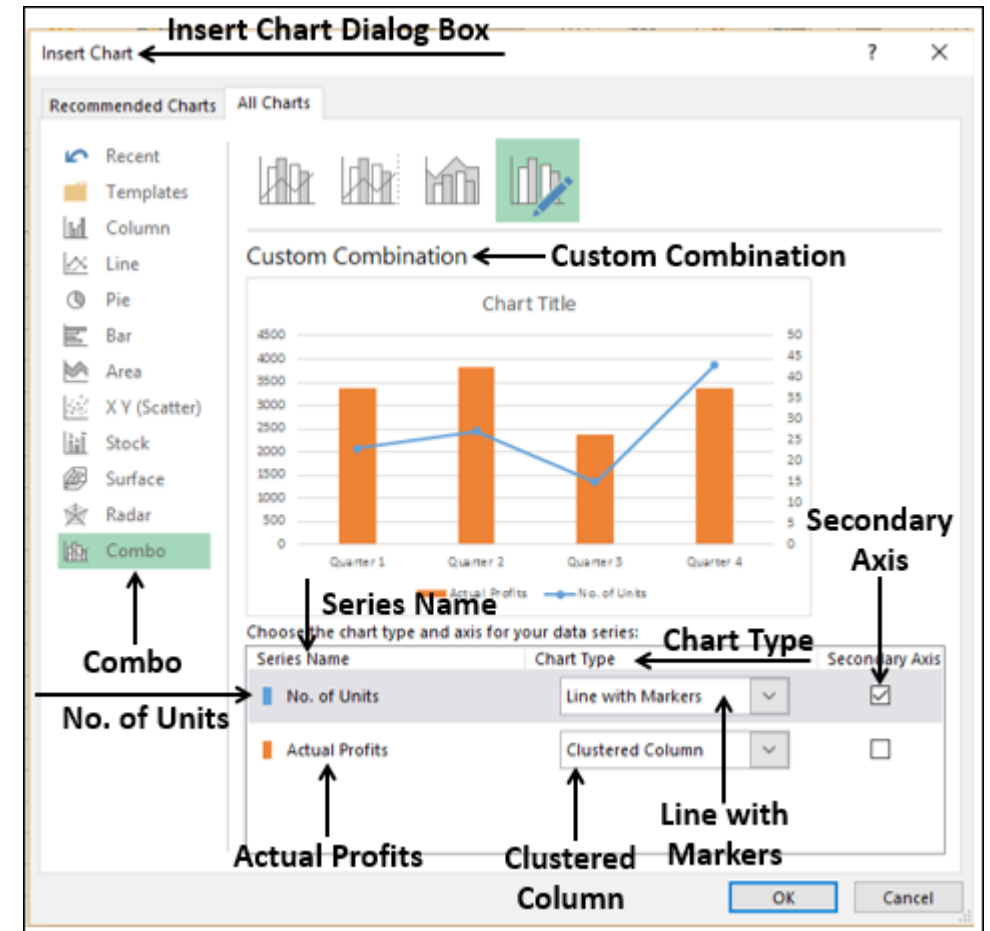
- Click the INSERT tab.
- Click Combo in Charts group.
- Click Create Custom Combo Chart from the drop-down list.



CREATING A COMBO CHART WITH SECONDARY AXIS

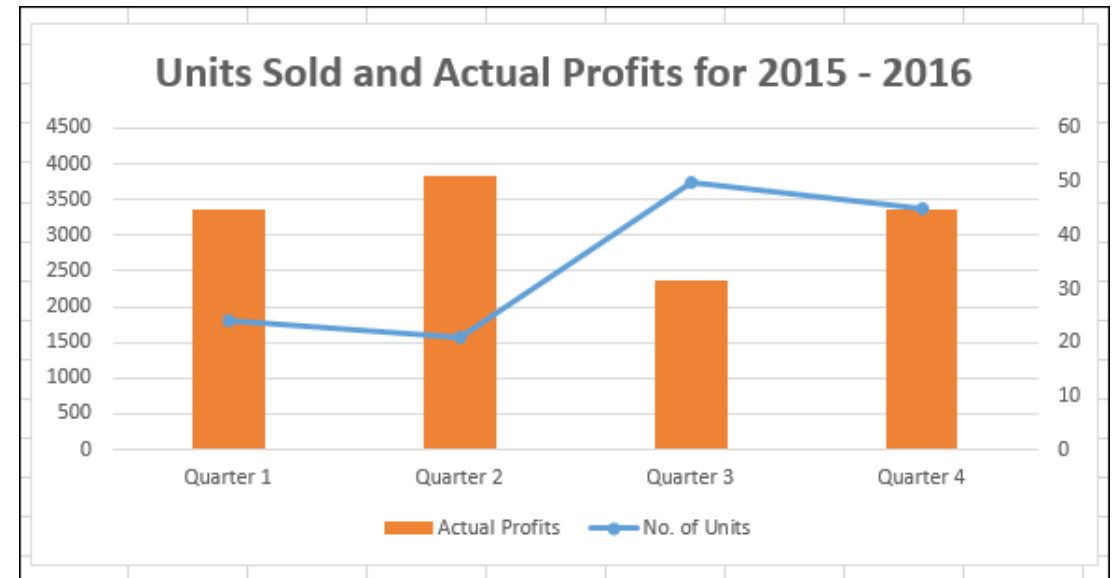
- The Insert Chart dialog box appears with Combo highlighted.
- For Chart Type, choose –
 - Line with Markers for the Series No. of Units
 - Clustered Column for the Series Actual Profits
- Check the Box Secondary Axis to the right of the Series No. of Units and click OK.

A preview of your chart appears under Custom Combination.



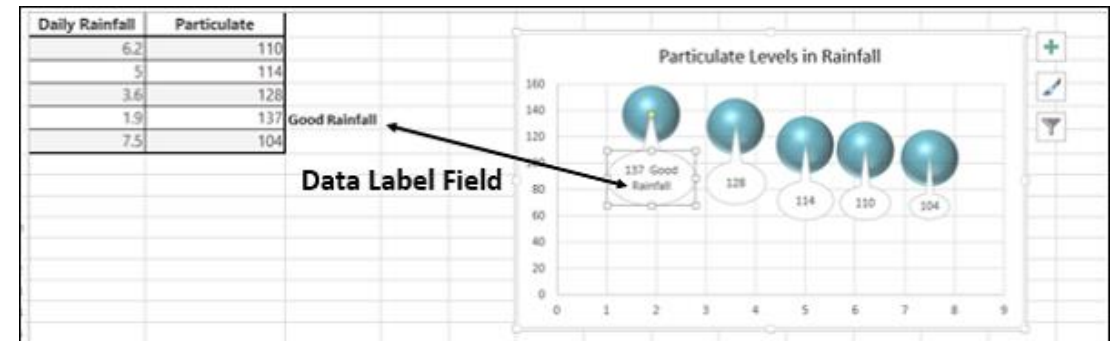
CREATING A COMBO CHART WITH SECONDARY AXIS

- Your Combo chart appears with Secondary Axis.



DATA LABELS

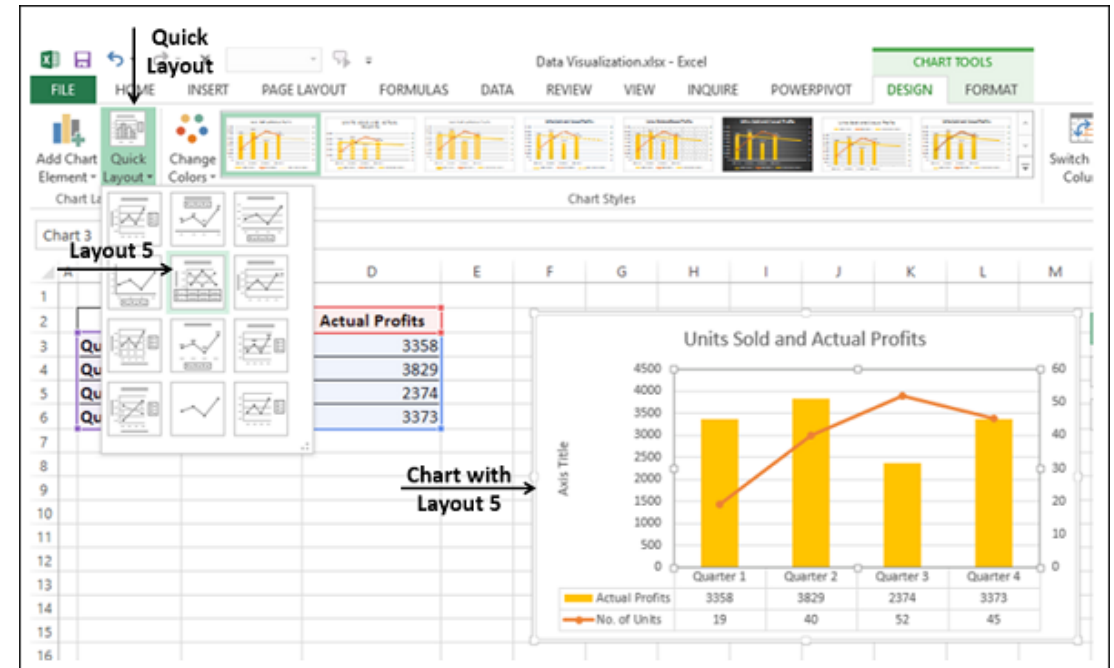
- Excel 2013 and later versions provide you with various options to display Data Labels. You can choose one Data Label, format it as you like, and then use Clone Current Label to copy the formatting to the rest of the Data Labels in the chart.
- The Data Labels in a chart can have effects, varying shapes and sizes.
- It is also possible to display the content of a cell as part of the Data Label with Insert Data Label Field.



QUICK LAYOUT

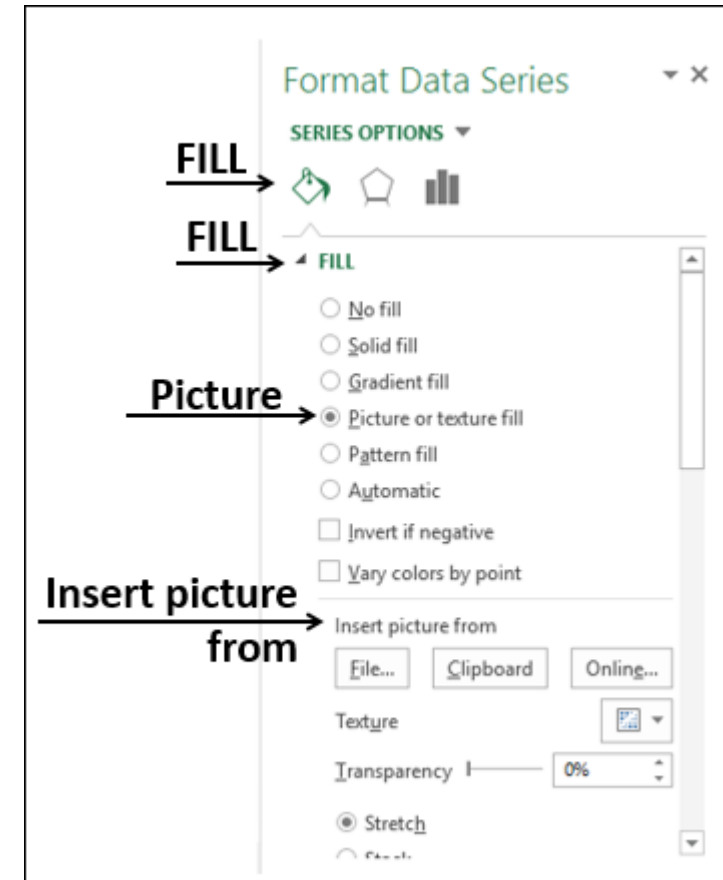
- You can use Quick Layout to change the overall layout of the chart quickly by choosing one of the predefined layout options.
- Click the chart.
- Click the DESIGN tab under CHART TOOLS.
- Click Quick Layout.
- Different possible layouts will be displayed. As you move on the layout options, the chart layout changes to that particular option.

Select the layout you like. The chart will be displayed with the chosen layout.



USING PICTURE IN COLUMN CHARTS

- You can create more emphasis on your data presentation by using a picture in place of columns.
- Click on a Column on the Column Chart.
- In the Format Data Series, click on Fill.
- Select Picture.
- Under Insert picture from, provide the filename or optionally clipboard if you had copied an image earlier.



USING PICTURE IN COLUMN CHARTS

- The picture you have chosen will appear in place of columns in the chart.





THANK YOU