

Excel





Excel Formula

- It is the simplest form, a formula is an expression made up of cell addresses and arithmetic operators. Formulas can also be made up of discrete values i.e. =6*3. Excel evaluates the formula to a value. An example of a formula looks as follows.

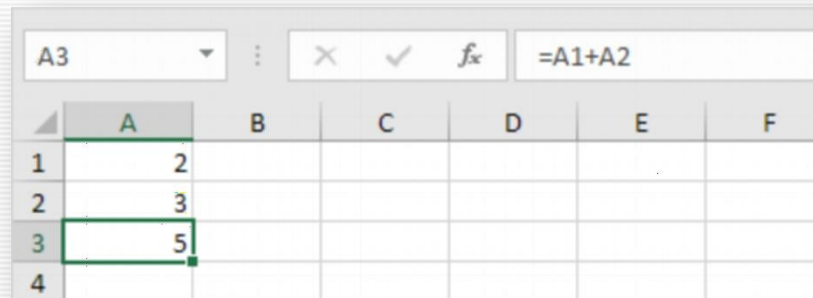
- =A2 * D2 / 2

HERE,

- "=" tells Excel that this is a formula, and it should evaluate it.
- "**A2**" * **D2**" makes reference to cell addresses A2 and D2 then multiplies the values found in these cell addresses.
- "/" is the division arithmetic operator
- "**2**" is a discrete value

Enter a Formula

- To enter a formula, execute the following steps.
 1. Select a cell.
 2. To let Excel know that you want to enter a formula, type an equal sign (=).
 3. For example, type the formula `A1+A2`.



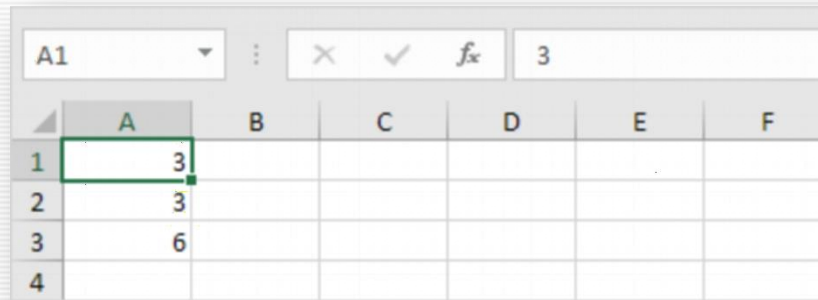
The screenshot shows an Excel spreadsheet with a formula bar at the top displaying `=A1+A2`. The spreadsheet grid shows columns A through F and rows 1 through 4. Cell A1 contains the value 2, cell A2 contains the value 3, and cell A3 is currently selected and contains the value 5, which is the result of the formula entered in the formula bar.

	A	B	C	D	E	F
1	2					
2	3					
3	5					
4						

- Tip: instead of typing `A1` and `A2`, simply select cell `A1` and cell `A2`.

Enter a Formula

4. Change the value of cell A1 to 3.



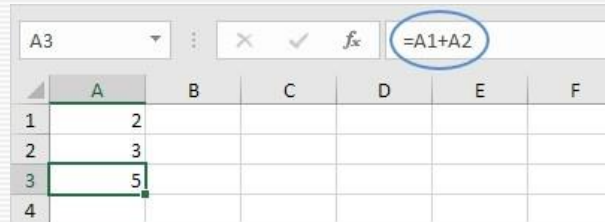
The screenshot shows an Excel spreadsheet with a grid of cells. The active cell is A1, which is highlighted with a green border. The formula bar at the top shows the value '3' being entered. The spreadsheet contains the following data:

	A	B	C	D	E	F
1	3					
2	3					
3	6					
4						

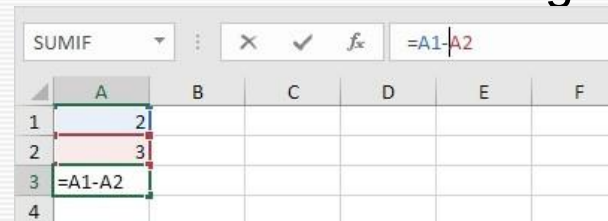
- Excel automatically recalculates the value of cell A3.
- This is one of Excel's most powerful features!

Edit a Formula

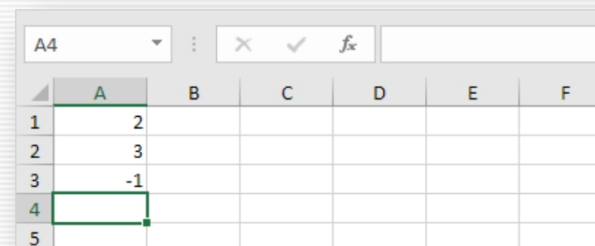
- When you select a cell, Excel shows the value or formula of the cell in the formula bar.



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

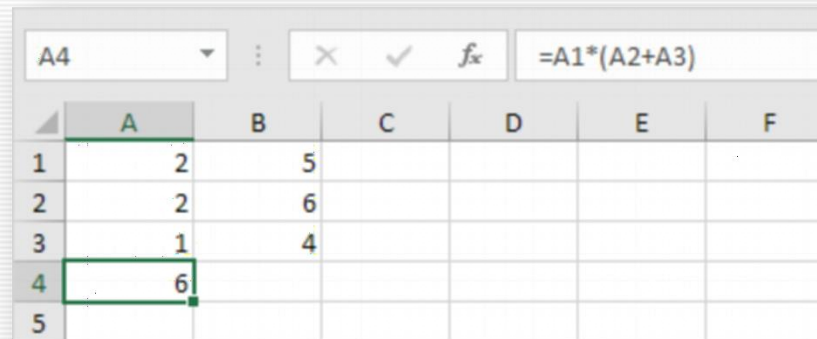


- 2. Press Enter.



Copy/Paste a Formula

- When you copy a formula, Excel automatically adjusts the cell references for each new cell the formula is copied to. To understand this, execute the following steps.
- 1. Enter the formula shown below into cell A4.



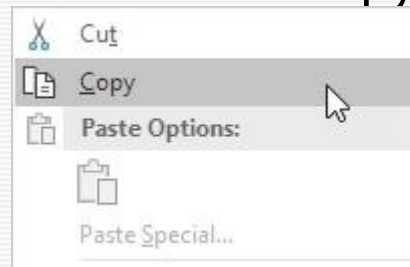
The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F
1	2	5				
2	2	6				
3	1	4				
4	6					
5						

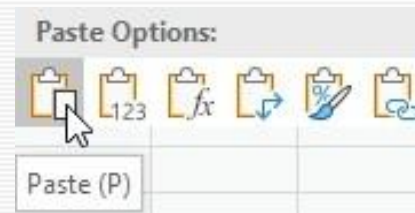
The formula bar at the top shows the formula `=A1*(A2+A3)` being entered into cell A4. The formula bar also includes a dropdown menu showing 'A4', a list of icons (X, checkmark, fx), and the formula text.

Copy/Paste a Formula

- 2a. Select cell A4, right click, and then click Copy (or press CTRL + c)...

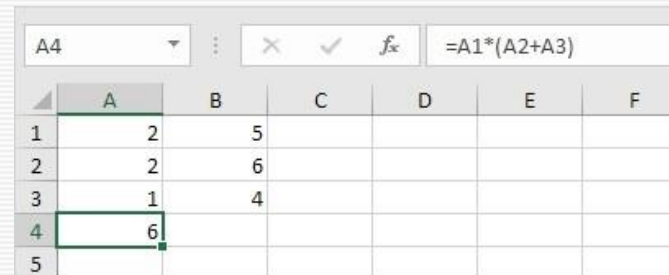


- ...next, select cell B4, right click, and then click Paste under 'Paste Options:' (or press CTRL + v).



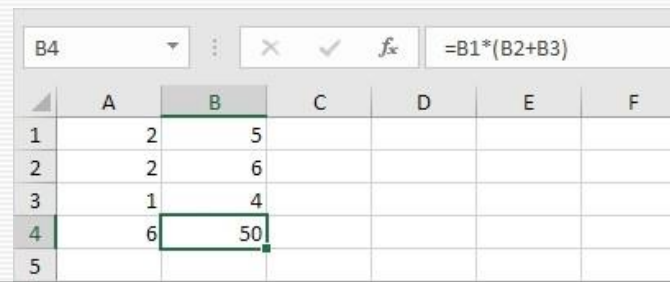
Copy/Paste a Formula

- 2b. You can also drag the formula to cell B4. Select cell A4, click on the lower right corner of cell A4 and drag it across to cell B4. This is much easier and gives the exact same result!



	A	B	C	D	E	F
1	2	5				
2	2	6				
3	1	4				
4	6					
5						

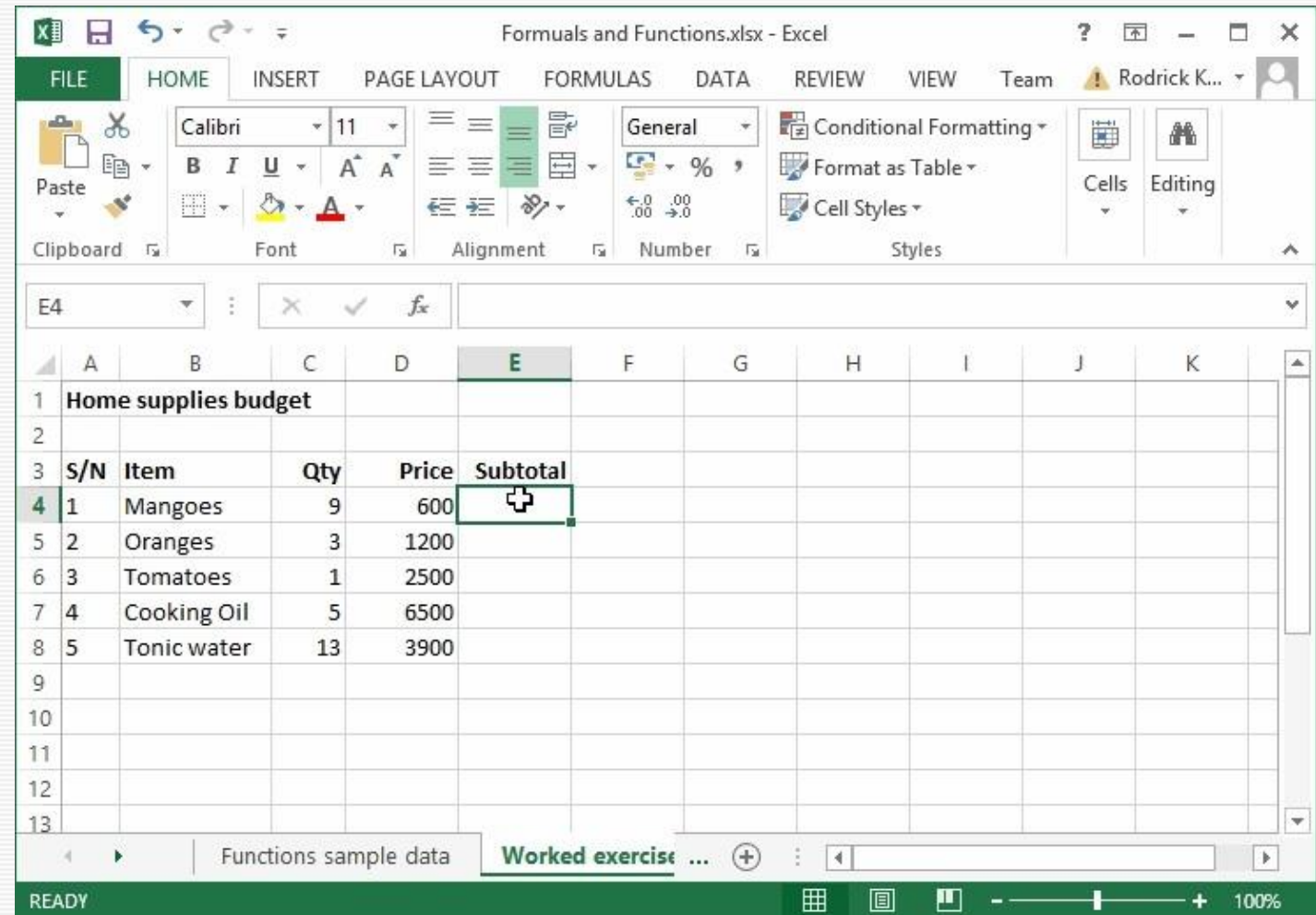
- Result. The formula in cell B4 references the values in column B.



	A	B	C	D	E	F
1	2	5				
2	2	6				
3	1	4				
4	6	50				
5						

Excel Formula

- The animated image shows you how to auto select cell address and apply the same formula to other rows.





Mistakes to avoid when working with formulas in Excel

1. Remember the rules of Brackets of Division, Multiplication, Addition, & Subtraction (**BODMAS**). This means expressions are brackets are evaluated first. For arithmetic operators, the division is evaluated first followed by multiplication then addition and subtraction is the last one to be evaluated. Using this rule, we can rewrite the above formula as $= (A2 * D2) / 2$. This will ensure that A2 and D2 are first evaluated then divided by two.
2. Formulas usually work with numeric data; you can take advantage of data validation to specify the type of data that should be accepted by a cell i.e. numbers only.
3. To ensure that you are working with the correct cell addresses referenced in the formulas, you can press F2 on the keyboard. This will highlight the cell addresses used in the formula, and you can cross check to ensure they are the desired cell addresses.
4. When you are working with many rows, you can use serial numbers for all the rows and have a record count at the bottom of the sheet. You should compare the serial number count with the record total to ensure that your formulas included all the rows.



Excel Function

- A function is a predefined formula. Functions allow you to use descriptive names to automatically apply formulas for you. Examples of functions include;
- **SUM** for summation of a range of numbers
- **AVERAGE** for calculating the average of a given range of numbers
- **COUNT** for counting the number of items in a given range



The importance of functions

- **Functions increase user productivity when working with excel.** Let's say you would like to get the grand total for the above home supplies budget. To make it simpler, you can use a formula to get the grand total. Using a formula, you would have to reference the cells E4 through to E8 one by one. You would have to use the following formula.

$$= E4 + E5 + E6 + E7 + E8$$

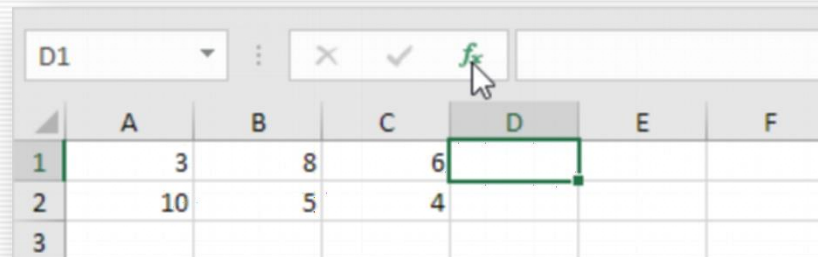
- With a function, you would write the above formula as

$$=SUM (E4:E8)$$

- As you can see from the above function used to get the sum of a range of cells, it is much more efficient to use a function to get the sum than using the formula which will have to reference a lot of cells.

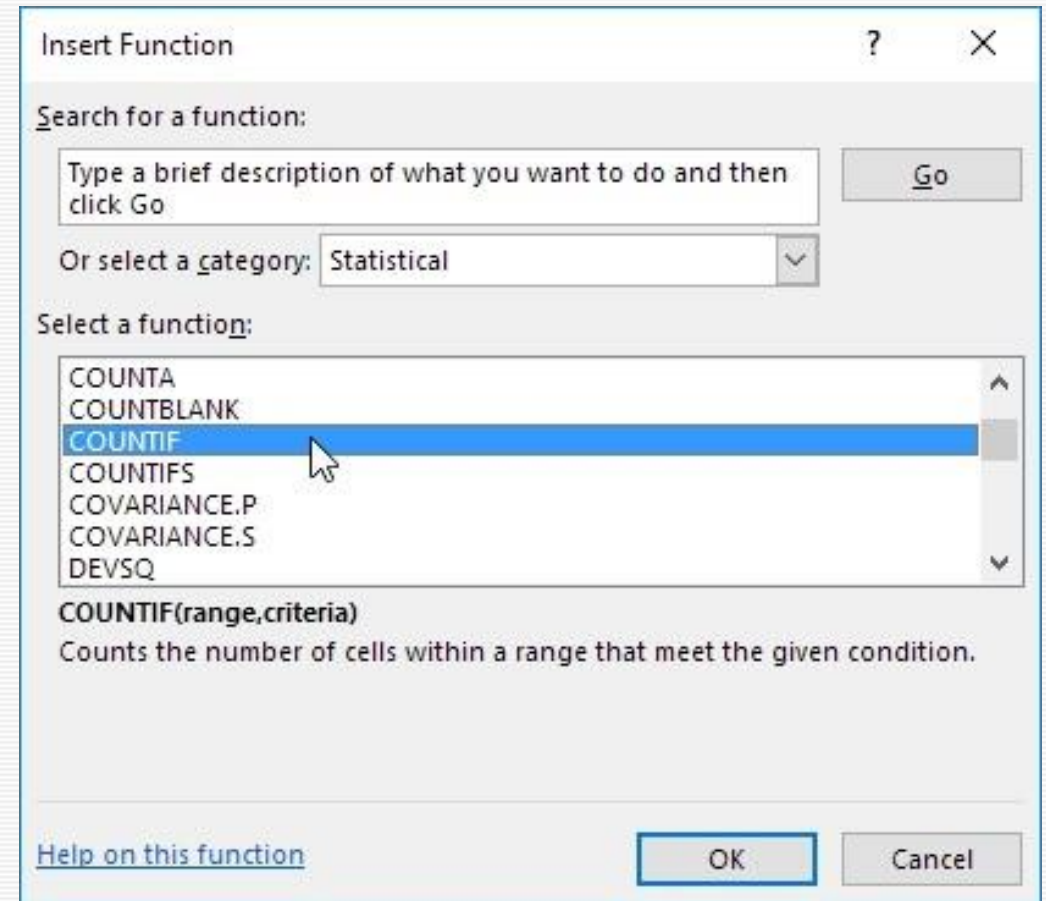
Insert a Function

- Every function has the same structure. For example, SUM(A1:A4). The name of this function is SUM. The part between the brackets (arguments) means we give Excel the range A1:A4 as input. This function adds the values in cells A1, A2, A3 and A4. It's not easy to remember which function and which arguments to use for each task. Fortunately, the Insert Function feature in Excel helps you with this.
- To insert a function, execute the following steps.
 1. Select a cell.
 2. Click the Insert Function button.



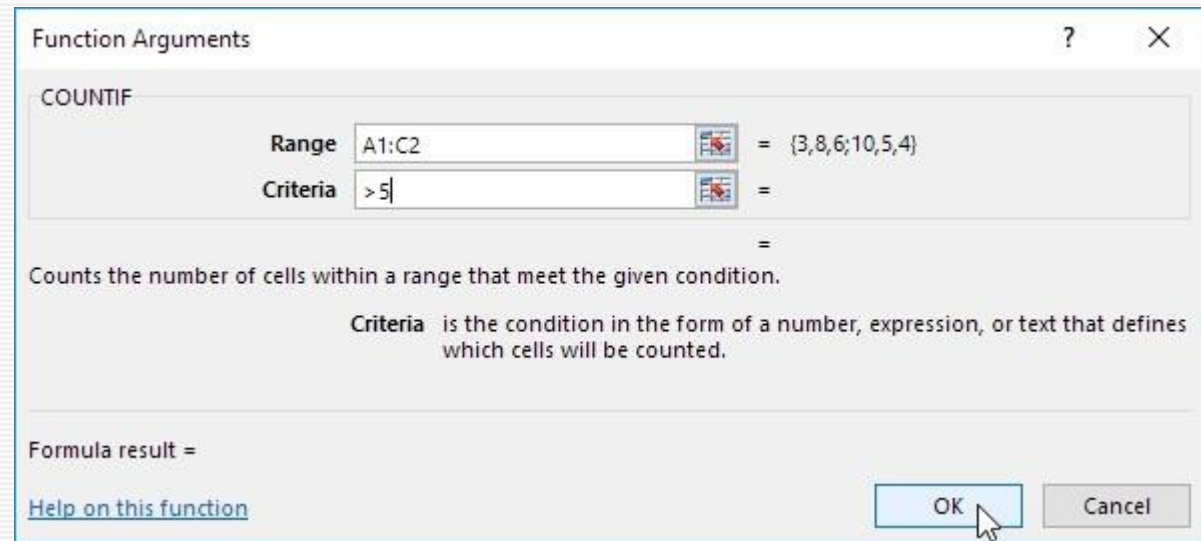
Insert a Function

- The 'Insert Function' dialog box appears.
- 3. Search for a function or select a function from a category. For example, choose COUNTIF from the Statistical category.
- 4. Click OK.



Function Arguments

- The 'Function Arguments' dialog box appears.
- 5. Click in the Range box and select the range A1:C2.
- 6. Click in the Criteria box and type >5.
- 7. Click OK.



The image shows the 'Function Arguments' dialog box for the COUNTIF function. The dialog has a title bar with a question mark and a close button. The function name 'COUNTIF' is displayed at the top. There are two input fields: 'Range' with the value 'A1:C2' and 'Criteria' with the value '>5'. To the right of each field is a small icon with a red 'X' and an equals sign, followed by a list of values: '{3,8,6;10,5,4}' for the Range and an empty list for the Criteria. Below the input fields, there is a description: 'Counts the number of cells within a range that meet the given condition.' and a definition of the 'Criteria' argument: 'Criteria is the condition in the form of a number, expression, or text that defines which cells will be counted.' At the bottom, there is a 'Formula result =' field, a link to 'Help on this function', and 'OK' and 'Cancel' buttons. A mouse cursor is pointing at the 'OK' button.

Function Arguments

COUNTIF

Range A1:C2 = {3,8,6;10,5,4}

Criteria >5 =

Counts the number of cells within a range that meet the given condition.

Criteria is the condition in the form of a number, expression, or text that defines which cells will be counted.

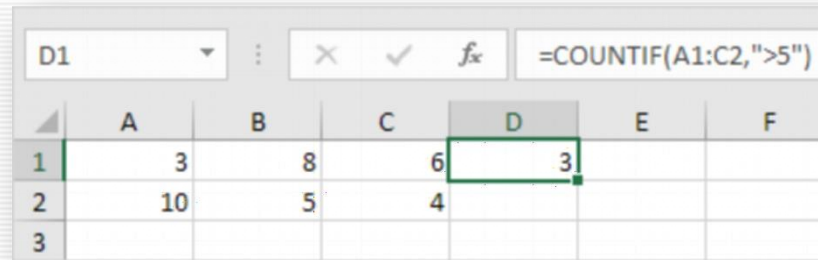
Formula result =

[Help on this function](#)

OK Cancel

Result of the COUNTIF function

- Result. The [COUNTIF function](#) counts the number of cells that are greater than 5.



The image shows a screenshot of an Excel spreadsheet. The formula bar at the top displays the formula `=COUNTIF(A1:C2,">5")`. The spreadsheet has columns A through F and rows 1 through 3. The data in the range A1:C2 is as follows:

	A	B	C
1	3	8	6
2	10	5	4

The result of the formula, which is 3, is displayed in cell D1. This is because there are three cells (A1, B1, and A2) in the range A1:C2 that contain values greater than 5.

- Note: instead of using the Insert Function feature, simply type `=COUNTIF(A1:C2,">5")`. When you arrive at: `=COUNTIF(` instead of typing A1:C2, simply select the range A1:C2.

Common functions

- Some of the most commonly used functions in Excel. We will start with statistical functions.

S/N	FUNCTION	CATEGORY	DESCRIPTION	USAGE
01	SUM	Math & Trig	Adds all the values in a range of cells	=SUM(E4:E8)
02	MIN	Statistical	Finds the minimum value in a range of cells	=MIN(E4:E8)
03	MAX	Statistical	Finds the maximum value in a range of cells	=MAX(E4:E8)
04	AVERAGE	Statistical	Calculates the average value in a range of cells	=AVERAGE(E4:E8)
05	COUNT	Statistical	Counts the number of cells in a range of cells	=COUNT(E4:E8)
06	LEN	Text	Returns the number of characters in a string text	=LEN(B7)
07	SUMIF	Math & Trig	Adds all the values in a range of cells that meet a specified criteria. =SUMIF(range,criteria,[sum_range])	=SUMIF(D4:D8,">=1000",C4:C8)
08	AVERAGEIF	Statistical	Calculates the average value in a range of cells that meet the specified criteria. =AVERAGEIF(range,criteria,[average_range])	=AVERAGEIF(F4:F8,"Yes",E4:E8)
09	DAYS	Date & Time	Returns the number of days between two dates	=DAYS(D4,C4)
10	NOW	Date & Time	Returns the current system date and time	=NOW()

Numeric Functions

- As the name suggests, these functions operate on numeric data. The following table shows some of the common numeric functions.

S/N	FUNCTION	CATEGORY	DESCRIPTION	USAGE
1	ISNUMBER	Information	Returns True if the supplied value is numeric and False if it is not numeric	=ISNUMBER(A3)
2	RAND	Math & Trig	Generates a random number between 0 and 1	=RAND()
3	ROUND	Math & Trig	Rounds off a decimal value to the specified number of decimal points	=ROUND(3.14455,2)
4	MEDIAN	Statistical	Returns the number in the middle of the set of given numbers	=MEDIAN(3,4,5,2,5)
5	PI	Math & Trig	Returns the value of Math Function PI(π)	=PI()
6	POWER	Math & Trig	Returns the result of a number raised to a power. POWER(number, power)	=POWER(2,4)
7	MOD	Math & Trig	Returns the Remainder when you divide two numbers	=MOD(10,3)
8	ROMAN	Math & Trig	Converts a number to roman numerals	=ROMAN(1984)

String functions

- These functions are used to manipulate text data. The following table shows some of the common string functions.

S/N	FUNCTION	CATEGORY	DESCRIPTION	USAGE	COMMENT
1	LEFT	Text	Returns a number of specified characters from the start (left-hand side) of a string	=LEFT("GURU99",4)	Left 4 Characters of "GURU99"
2	RIGHT	Text	Returns a number of specified characters from the end (right-hand side) of a string	=RIGHT("GURU99",2)	Right 2 Characters of "GURU99"
3	MID	Text	Retrieves a number of characters from the middle of a string from a specified start position and length. =MID (text, start_num, num_chars)	=MID("GURU99",2,3)	Retrieving Characters 2 to 5
4	ISTEXT	Information	Returns True if the supplied parameter is Text	=ISTEXT(value)	value - The value to check.
5	FIND	Text	Returns the starting position of a text string within another text string. This function is case-sensitive. =FIND(find_text, within_text, [start_num])	=FIND("oo","Roofing",1)	Find oo in "Roofing", Result is 2
6	REPLACE	Text	Replaces part of a string with another specified string. =REPLACE (old_text, start_num, num_chars, new_text)	=REPLACE("Roofing",2, 2,"xx")	Replace "oo" with "xx"

Date Time Functions

- These functions are used to manipulate date values. The following table shows some of the common date functions.

S/N	FUNCTION	CATEGORY	DESCRIPTION	USAGE
1	DATE	Date & Time	Returns the number that represents the date in excel code	=DATE(2015,2,4)
2	DAYS	Date & Time	Find the number of days between two dates	=DAYS(D6,C6)
3	MONTH	Date & Time	Returns the month from a date value	=MONTH("4/2/2015")
4	MINUTE	Date & Time	Returns the minutes from a time value	=MINUTE("12:31")
5	YEAR	Date & Time	Returns the year from a date value	=YEAR("04/02/2015")



VLOOKUP function

- The VLOOKUP function is used to perform a vertical look up in the left most column and return a value in the same row from a column that you specify.
- For Example:- The home supplies budget has a serial number column that uniquely identifies each item in the budget. Suppose you have the item serial number, and you would like to know the item description, you can use the VLOOKUP function. Here is how the VLOOKUP function would work.

-

VLOOKUP function

- =VLOOKUP (C12, A4:B8, 2, FALSE)
- **HERE,**
- "**=VLOOKUP**" calls the vertical lookup function
- "**C12**" specifies the value to be looked up in the left most column
- "**A4:B8**" specifies the table array with the data
- "**2**" specifies the column number with the row value to be returned by the VLOOKUP function
- "**FALSE,**" tells the VLOOKUP function that we are looking for an exact match of the supplied look up value

	A	B	C	D	E	F	G
1	Home supplies budget						
2							
3	S/N	Item	Qty	Price	Subtotal	Is it Affordable?	
4	1	Mangoes	9	600	5400	Yes	
5	2	Oranges	3	1200	3600	Yes	
6	3	Tomatoes	1	2500	2500	Yes	
7	4	Cooking Oil	5	6500	32500	No	
8	5	Tonic water	7	3900	27300	No	
9							
10							
11	Home supplies VLOOKUP						
12	Item S/N:		Description:				
13							

Mathematical operations

- Operators specify the type of calculation that you want to perform on elements in a formula—such as addition, subtraction, multiplication, or division.
- The following are the type of Mathematical operations:
 1. Arithmetic operators
 2. Comparison operators
 3. Text concatenation operator
 4. Reference operators

1. Arithmetic operators

- To perform basic mathematical operations such as addition, subtraction, or multiplication—or to combine numbers—and produce numeric results, use the arithmetic operators in this table.

Arithmetic operator	Meaning	Example
+ (plus sign)	Addition	=3+3
– (minus sign)	Subtraction Negation	=3–1 =–1
* (asterisk)	Multiplication	=3*3
/ (forward slash)	Division	=3/3
% (percent sign)	Percent	=20%
^ (caret)	Exponentiation	=

2.Comparison operators

- With the operators in the table below, you can compare two values. When two values are compared by using these operators, the result is a logical value either TRUE or FALSE.

Comparison operator	Meaning	Example
= (equal sign)	Equal to	=A1=B1
> (greater than sign)	Greater than	=A1>B1
< (less than sign)	Less than	=A1<B1
>= (greater than or equal to sign)	Greater than or equal to	=A1>=B1
<= (less than or equal to sign)	Less than or equal to	=A1<=B1
<> (not equal to sign)	Not equal to	=A1<>B1

3.Text concatenation operator

- Use the ampersand (&) to join, or concatenate, one or more text strings to produce a single piece of text.

Text operator	Meaning	Example
& (ampersand)	Connects, or concatenates, two values to produce one continuous text value.	= "North" & "wind"

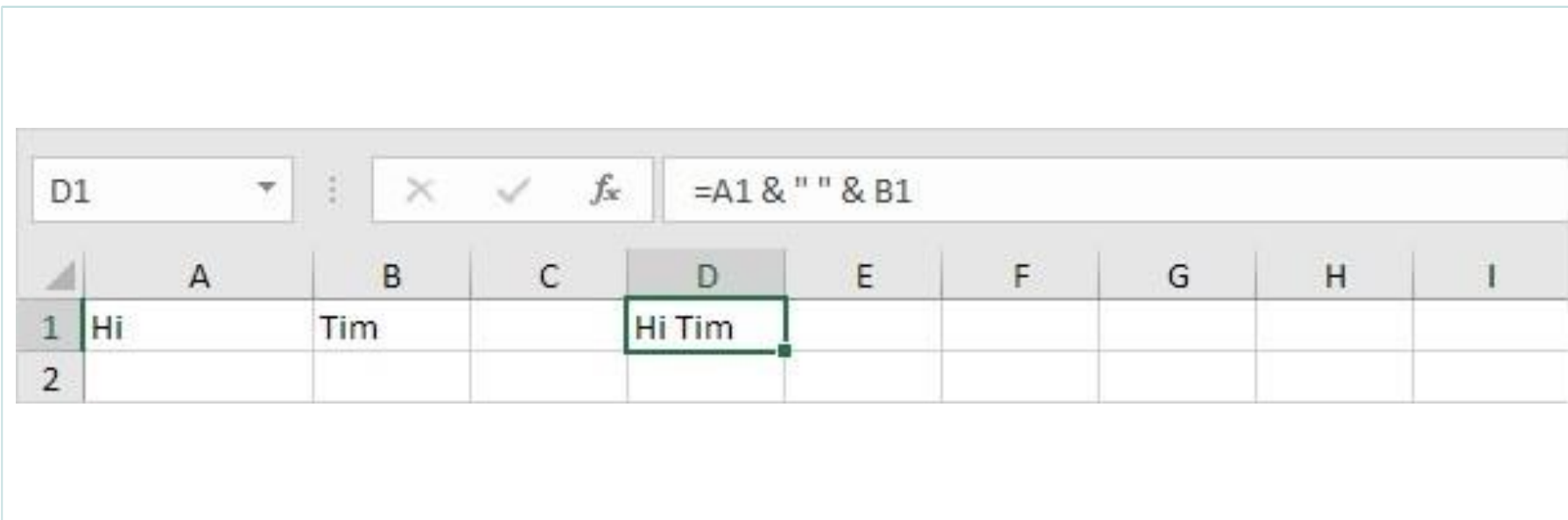
4. Reference operators

- Combine ranges of cells for calculations with these operators.

Reference operator	Meaning	Example
: (colon)	Range operator, which produces one reference to all the cells between two references, including the two references.	=SUM(B5:B15)
, (comma)	Union operator, which combines multiple references into one reference.	=SUM(B5:B15,D5:D15)
(space)	Intersection operator, which produces a reference to cells common to the two references.	=SUM(B7:D7 C6:C8)
# (pound)	The # symbol is used in several contexts: •Used as part of an error name. •Used to indicate insufficient space to render. In most cases, you can widen the column until the contents display properly. •Spilled range operator, which is used to reference an entire range in a dynamic array formula.	•#VALUE! •##### •=SUM(A2#)
@ (at)	Reference operator, which is used to indicate implicit intersection in a formula.	=@A1:A10 =SUM(Table1[@[January]:[December]])

Using Formulas to Manipulate Text

- Although Excel is well known for its mathematical capabilities and features, it also has some powerful tools for creating text formulas to manipulate text.
- The following are some text manipulation functions:
- Join Strings
- Left
- Right
- Mid
- Len
- Find
- Substitute



The image shows an Excel spreadsheet with a formula bar at the top. The formula bar displays the formula `=A1 & " " & B1`. Below the formula bar, the spreadsheet grid shows columns A through I and rows 1 through 2. Cell A1 contains the text "Hi" and cell B1 contains the text "Tim". Cell D1, which is selected, contains the result of the formula, "Hi Tim".

	A	B	C	D	E	F	G	H	I
1	Hi	Tim		Hi Tim					
2									

To join strings, use the & operator.

Join Strings

D1									
=LEFT(A1, 4)									
	A	B	C	D	E	F	G	H	I
1	example text			exam					
2									

To extract the leftmost characters from a string, use the LEFT function.

Left

D1									
=RIGHT(A1, 2)									
	A	B	C	D	E	F	G	H	I
1	example text			xt					
2									

To extract the rightmost characters from a string, use the RIGHT function.

Right

D1									
=MID(A1, 5, 3)									
	A	B	C	D	E	F	G	H	I
1	example text			ple					
2									

To extract a substring, starting in the middle of a string, use the MID function.

Note: started at position 5 (p) with length 3.

Mid

D1 ✕ ✓ <i>f_x</i> =LEN(A1)									
	A	B	C	D	E	F	G	H	I
1	example text			12					
2									

To get the length of a string, use the LEN function.

Note: space (position 8) included!

Len

D1 ✕ ✓ <i>f_x</i> =FIND("am", A1)									
	A	B	C	D	E	F	G	H	I
1	example text			3					
2									

To find the position of a substring in a string, use the FIND function.

Note: string "am" found at position 3. Visit our page about the [FIND function](#) for more examples.

Find

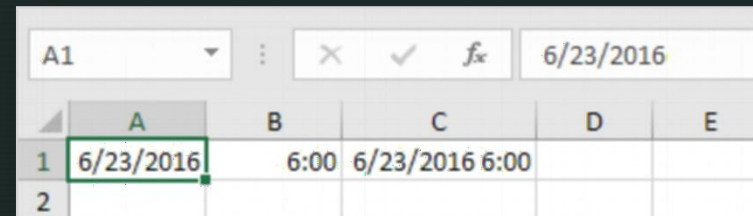
D1									
=SUBSTITUTE(A1, "Tim", "John")									
	A	B	C	D	E	F	G	H	I
1	Hi Tim			Hi John					
2									

To replace existing text with new text in a string, use the SUBSTITUTE function.

Substitute

Date & Time Functions

- To enter a date in Excel, use the "/" or "-" characters. To enter a time, use the ":" (colon).
- You can also enter a date and a time in one cell.
- Note: Dates are in US Format. Months first, Days second.
- This type of format depends on your windows regional settings.



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E
1	6/23/2016	6:00	6/23/2016 6:00		
2					

The formula bar at the top shows the active cell A1 containing the date 6/23/2016. The spreadsheet shows that in cell A1, the date 6/23/2016 is entered. In cell B1, the time 6:00 is entered. In cell C1, the combined date and time 6/23/2016 6:00 is entered. The cells are formatted to display the date and time correctly.



Year, Month, Day

- To get the year of a date, use the YEAR function.

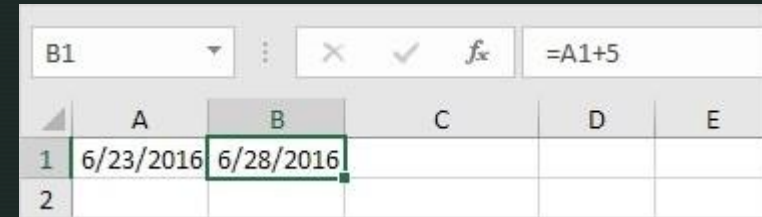
The screenshot shows an Excel spreadsheet with a formula bar at the top displaying `=YEAR(A1)`. The spreadsheet has columns A through E and rows 1 through 2. Cell A1 contains the date `6/23/2016`, and cell B1 contains the result `2016`. The formula bar also shows the active cell is B1.

	A	B	C	D	E
1	6/23/2016	2016			
2					

- Note: use the MONTH and DAY function to get the month and day of a date.

Date Function

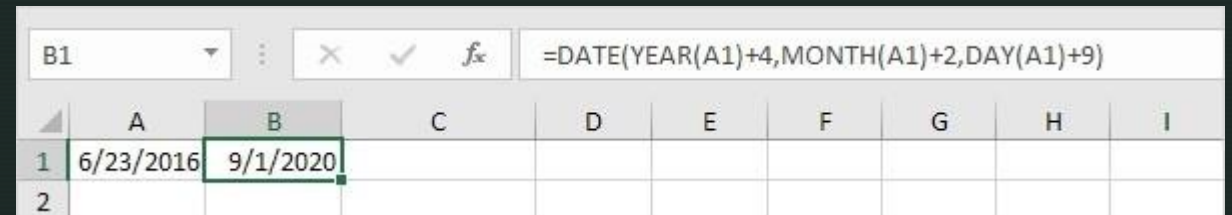
- 1. To add a number of days to a date, use the following simple formula.



The screenshot shows an Excel spreadsheet with a formula bar at the top displaying `=A1+5`. The spreadsheet has columns A through E and rows 1 and 2. Cell A1 contains the date 6/23/2016, and cell B1 contains the result 6/28/2016, which is highlighted with a green border.

	A	B	C	D	E
1	6/23/2016	6/28/2016			
2					

- 2. To add a number of years, months and/or days, use the DATE function.



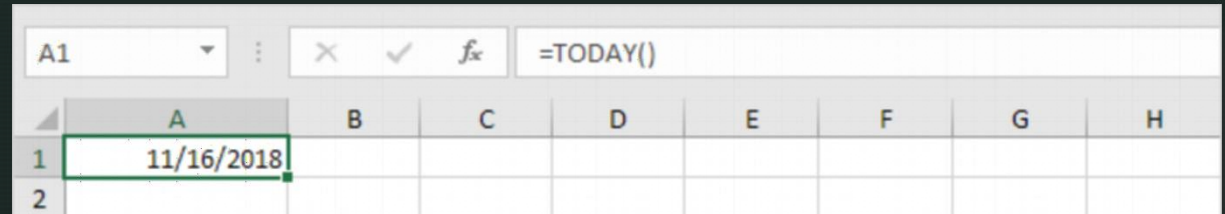
The screenshot shows an Excel spreadsheet with a formula bar at the top displaying `=DATE(YEAR(A1)+4,MONTH(A1)+2,DAY(A1)+9)`. The spreadsheet has columns A through I and rows 1 and 2. Cell A1 contains the date 6/23/2016, and cell B1 contains the result 9/1/2020, which is highlighted with a green border.

	A	B	C	D	E	F	G	H	I
1	6/23/2016	9/1/2020							
2									

- Note: the DATE function accepts three arguments: year, month and day. Excel knows that $6 + 2 = 8$ = August has 31 days and rolls over to the next month (23 August + 9 days = 1 September).

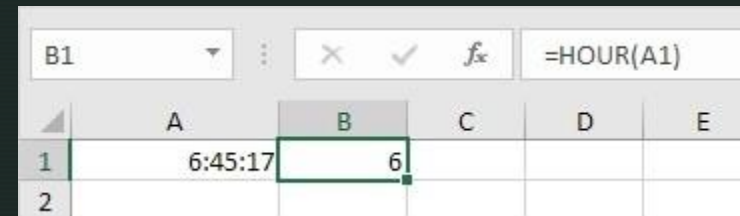
Current Date & Time

- To enter today's date in Excel, use the TODAY function.



Hour, Minute, Second

- To return the hour, use the HOUR function.



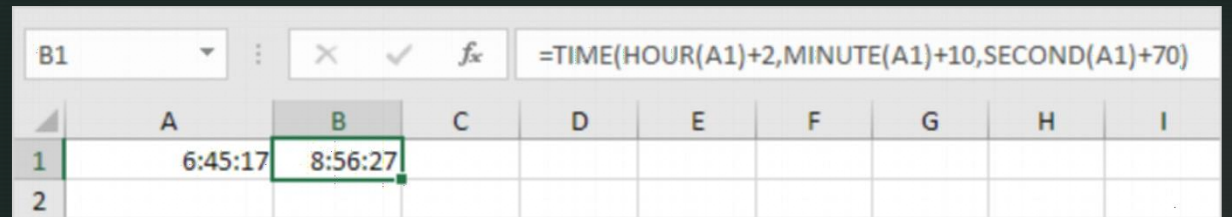
The screenshot shows an Excel spreadsheet with a formula bar at the top displaying '=HOUR(A1)'. The spreadsheet has columns A through E and rows 1 and 2. Cell A1 contains the time '6:45:17'. Cell B1 is selected and contains the value '6', which is the result of the HOUR function applied to A1.

	A	B	C	D	E
1	6:45:17	6			
2					

- Note: use the MINUTE and SECOND function to return the minute and second.

Time Function

- To add a number of hours, minutes and/or seconds, use the TIME function.



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H	I
1	6:45:17	8:56:27							
2									

The formula bar for cell B1 displays: `=TIME(HOUR(A1)+2,MINUTE(A1)+10,SECOND(A1)+70)`

- Note: Excel adds 2 hours, $10 + 1 = 11$ minutes and $70 - 60 = 10$ seconds.

Using Formulas for Conditional Analysis

- Conditional formatting in Excel enables you to highlight cells with a certain color, depending on the cell's value.
- The following are the steps for Conditional analysis using formulas:
 1. Select the range A1:A10.
 2. On the Home tab, in the Styles group, click Conditional Formatting.
 3. Click Highlight Cells Rules, Greater Than (Or any other Conditional Formula).
 4. Enter the value 80 and select a formatting style.
 5. Click OK.

Using Formulas for Conditional Analysis

- Select the range A1:A10.

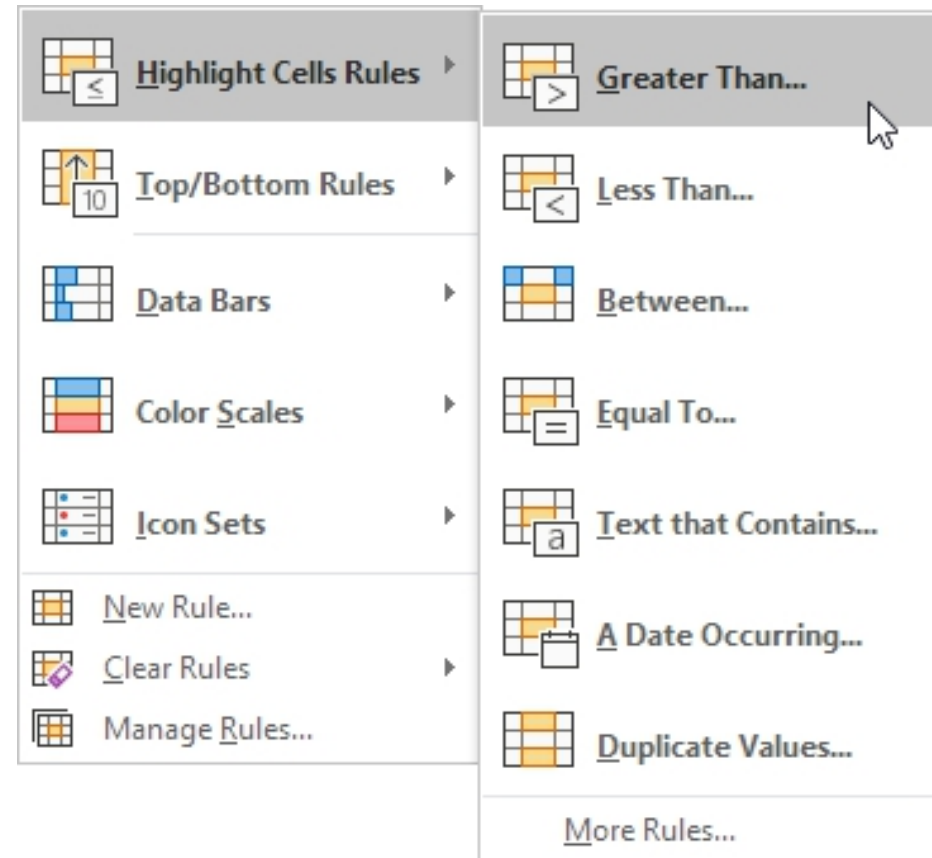
	A	B
1	14	
2	6	
3	39	
4	43	
5	2	
6	95	
7	5	
8	11	
9	86	
10	57	
11		

Using Formulas for Conditional Analysis

- On the Home tab, in the Styles group, click Conditional Formatting.

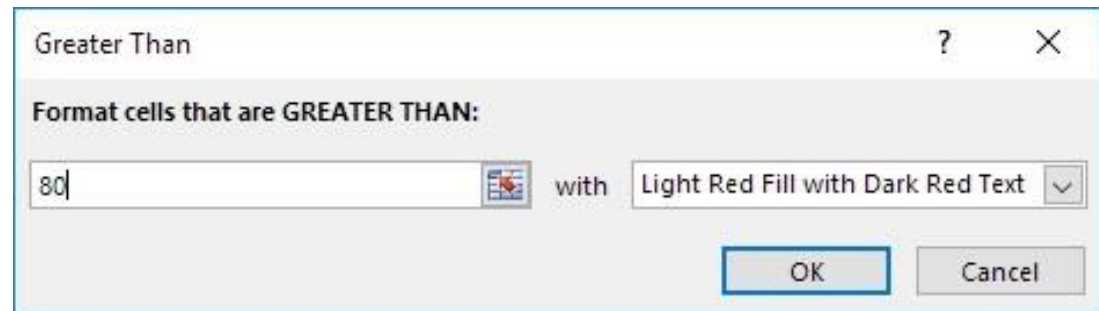
Using Formulas for Conditional Analysis

- Click Highlight Cells Rules, Greater Than.



Using Formulas for Conditional Analysis

- Enter the value 80 and select a formatting style.



Using Formulas for Conditional Analysis

- Click OK.
- Result. Excel highlights the cells that are greater than 80.

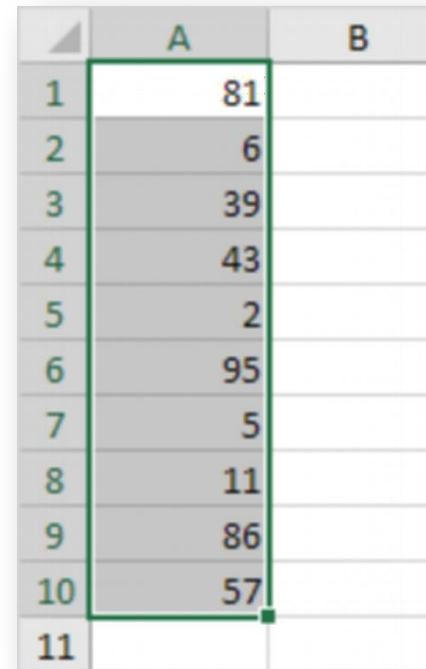
	A	B
1	14	
2	6	
3	39	
4	43	
5	2	
6	95	
7	5	
8	11	
9	86	
10	57	
11		

Using Formulas for Conditional Analysis

- Top/Bottom Rules
- To highlight cells that are above average, execute the following steps.
 1. Select the range A1:A10.
 2. On the Home tab, in the Styles group, click Conditional Formatting.
 3. Click Top/Bottom Rules, Above Average.
 4. Select a formatting style.
 5. Click OK.

Using Formulas for Conditional Analysis

- Top/Bottom Rules
- Select the range A1:A10.

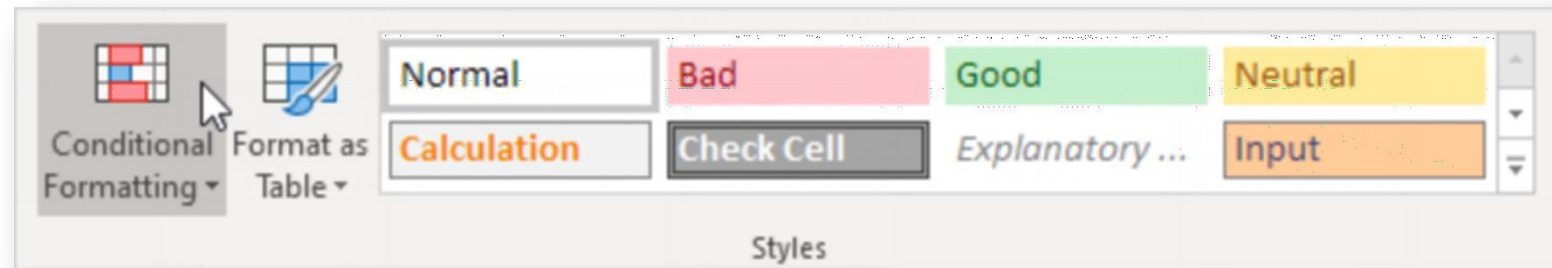


An Excel spreadsheet with two columns, A and B, and rows numbered 1 to 11. Column A contains the following values: 81, 6, 39, 43, 2, 95, 5, 11, 86, 57. Column B is empty. The range A1:A10 is highlighted with a green border, and a small green square is visible at the bottom right corner of the selection.

	A	B
1	81	
2	6	
3	39	
4	43	
5	2	
6	95	
7	5	
8	11	
9	86	
10	57	
11		

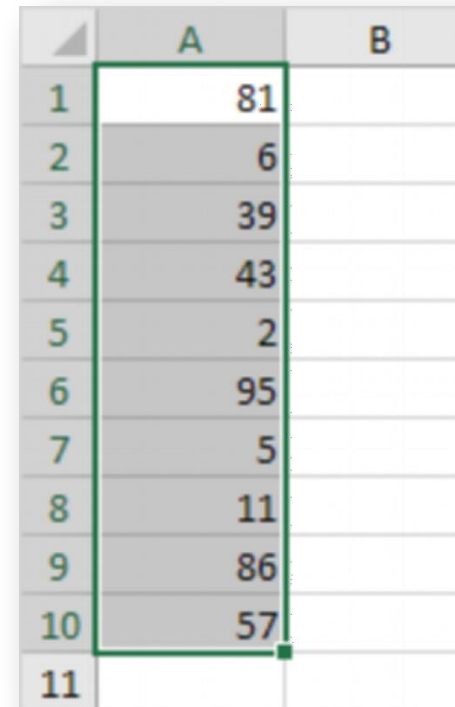
Using Formulas for Conditional Analysis

- On the Home tab, in the Styles group, click Conditional Formatting.



Using Formulas for Conditional Analysis

- Click Top/Bottom Rules, Above Average.

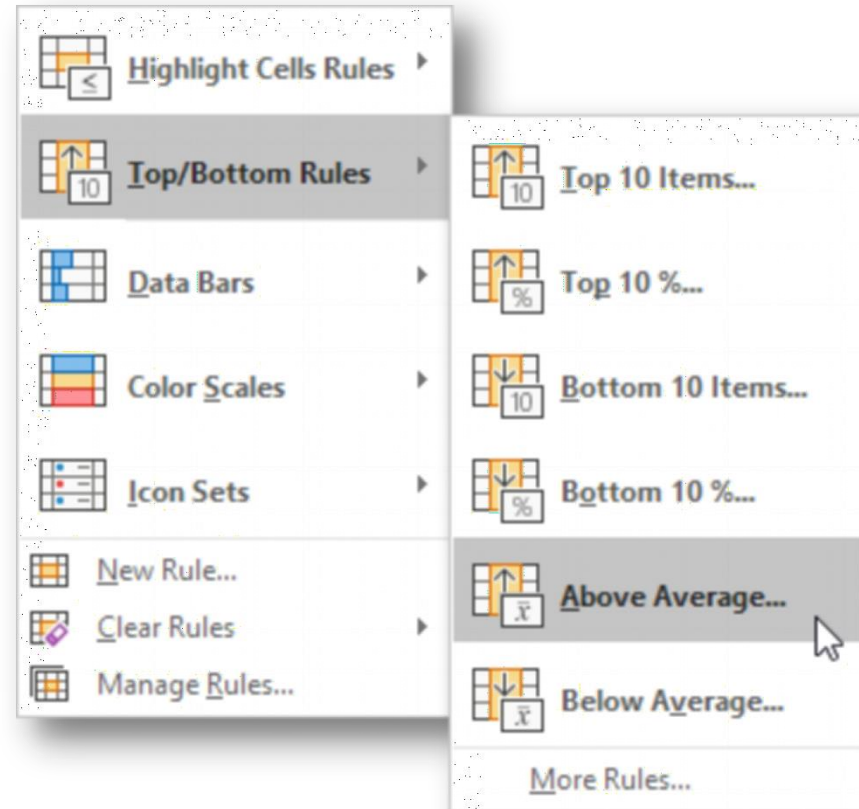


An Excel spreadsheet with two columns, A and B. Column A contains the following values: 81, 6, 39, 43, 2, 95, 5, 11, 86, 57. Column B is empty. A green selection box highlights the range A1:A10. The row numbers 1 through 11 are visible in the left margin.

	A	B
1	81	
2	6	
3	39	
4	43	
5	2	
6	95	
7	5	
8	11	
9	86	
10	57	
11		

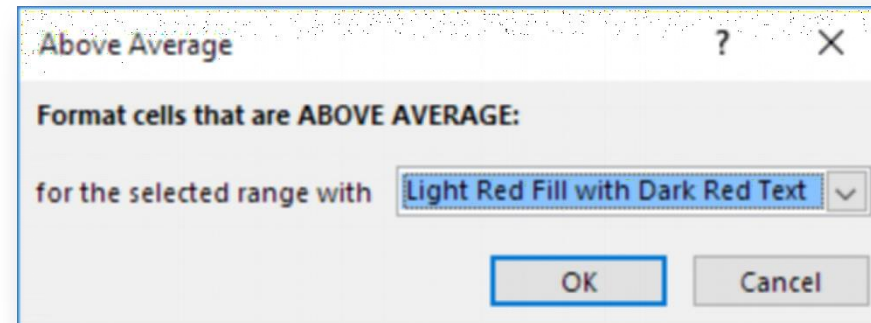
Using Formulas for Conditional Analysis

- Click Top/Bottom Rules, Above Average.



Using Formulas for Conditional Analysis

- Select a formatting style.



Using Formulas for Conditional Analysis

- Click OK.
- Result. Excel calculates the average (42.5) and formats the cells that are above this average.

	A	B
1	81	
2	6	
3	39	
4	43	
5	2	
6	95	
7	5	
8	11	
9	86	
10	57	
11		

Using Formulas for Conditional Analysis

- Conditional Formatting with Formulas
 - Take your Excel skills to the next level and use a formula to determine which cells to format. Formulas that apply conditional formatting must evaluate to TRUE or FALSE.
1. Select the range A1:E5.
 2. On the Home tab, in the Styles group, click Conditional Formatting.
 3. Click New Rule.
 4. Select 'Use a formula to determine which cells to format'.
 5. Enter the formula =ISODD(A1)
 6. Select a formatting style and click OK.
 7. Select the range A2:D7.
 8. Repeat steps 2-4 above.
 9. Enter the formula =\$C2="USA"
 10. Select a formatting style and click OK.

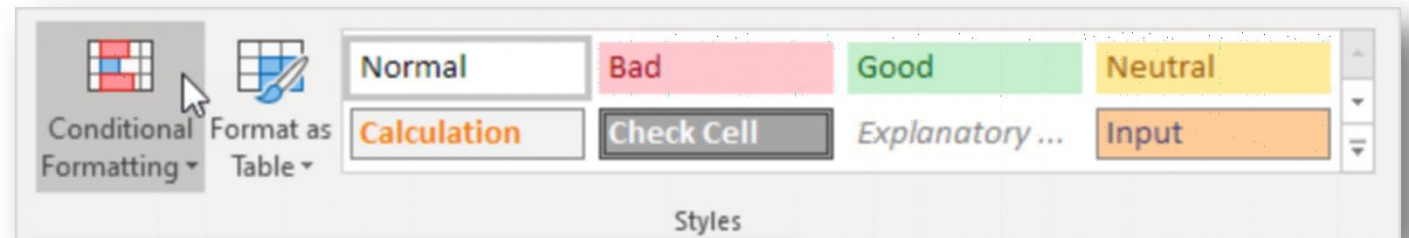
Using Formulas for Conditional Analysis

- Conditional Formatting with Formulas
- Select the range A1:E5.

	A	B	C	D	E	F
1	90	77	33	20	96	
2	59	66	20	61	44	
3	94	99	97	41	52	
4	36	43	70	13	54	
5	15	6	28	28	15	
6						

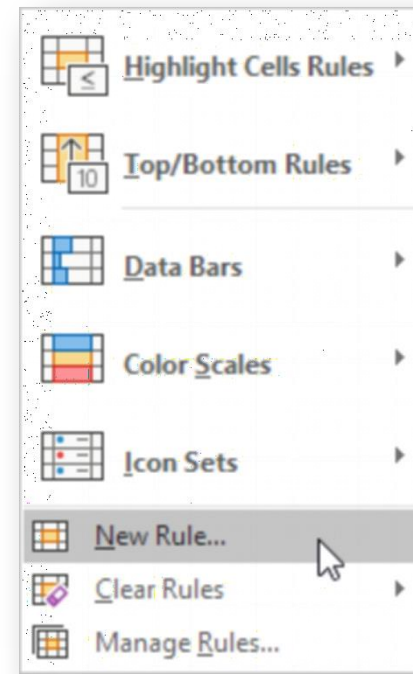
Using Formulas for Conditional Analysis

- Conditional Formatting with Formulas
- On the Home tab, in the Styles group, click Conditional Formatting.



Using Formulas for Conditional Analysis

- Conditional Formatting with Formulas
- Click New Rule.



Using Formulas for Conditional Analysis

- Select 'Use a formula to determine which cells to format'.
- Enter the formula =ISODD(A1)
- Select a formatting style and click OK.

Using Formulas for Conditional Analysis

- Excel highlights all odd numbers.

	A	B	C	D	E	F
1	90	77	33	20	96	
2	59	66	20	61	44	
3	94	99	97	41	52	
4	36	43	70	13	54	
5	15	6	28	28	15	
6						

- Explanation: always write the formula for the upper-left cell in the selected range. Excel automatically copies the formula to the other cells. Thus, cell A2 contains the formula =ISODD(A2), cell A3 contains the formula =ISODD(A3), etc.

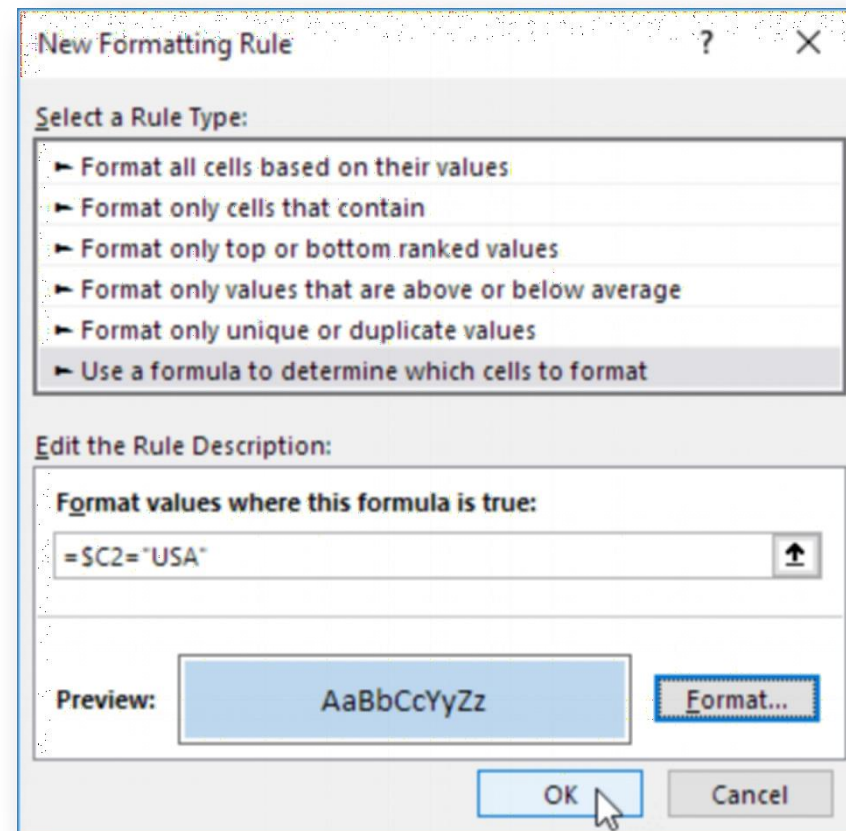
Using Formulas for Conditional Analysis

- Select the range A2:D7.

	A	B	C	D	E
1	Last Name	Sales	Country	Quarter	
2	Smith	\$16,753.00	UK	Qtr 3	
3	Johnson	\$14,808.00	USA	Qtr 4	
4	Williams	\$10,644.00	UK	Qtr 2	
5	Jones	\$1,390.00	USA	Qtr 3	
6	Brown	\$4,865.00	USA	Qtr 4	
7	Williams	\$12,438.00	UK	Qtr 1	
8					

Using Formulas for Conditional Analysis

- Repeat steps 2-4 above.
- Enter the formula `= $C2="USA"`
- Select a formatting style and click OK.



Using Formulas for Conditional Analysis

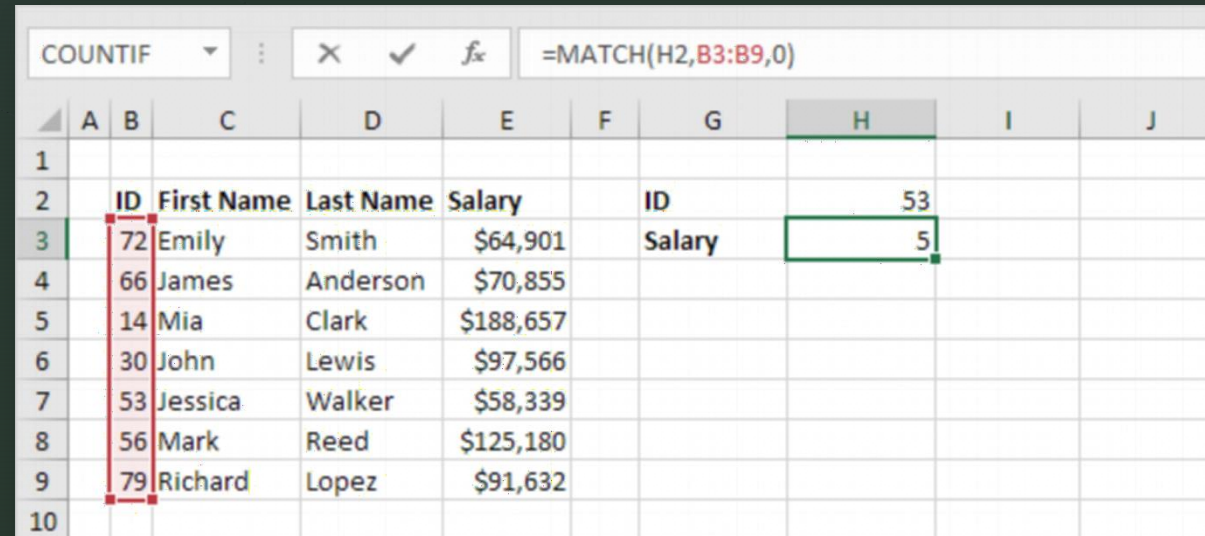
- Result. Excel highlights all USA orders.

	A	B	C	D	E
1	Last Name	Sales	Country	Quarter	
2	Smith	\$16,753.00	UK	Qtr 3	
3	Johnson	\$14,808.00	USA	Qtr 4	
4	Williams	\$10,644.00	UK	Qtr 2	
5	Jones	\$1,390.00	USA	Qtr 3	
6	Brown	\$4,865.00	USA	Qtr 4	
7	Williams	\$12,438.00	UK	Qtr 1	
8					

- Explanation: we fixed the reference to column C by placing a \$ symbol in front of the column letter (\$C2). As a result, cell B2, C2 and cell D2 also contain the formula =\$C2="USA", cell A3, B3, C3 and D3 contain the formula =\$C3="USA", etc.

MATCH function

- The MATCH function returns the position of a value in a given range. For example, the MATCH function below looks up the value 53 in the range B3:B9.



The screenshot shows an Excel spreadsheet with a formula bar at the top displaying `=MATCH(H2,B3:B9,0)`. The spreadsheet contains a table with employee data. The first column (B) contains IDs, and the second column (C) contains first names. The value 53 is located in cell B7, which is highlighted with a red border. The value 53 is also shown in cell H2, and the result of the MATCH function, 5, is shown in cell H3.

	A	B	C	D	E	F	G	H	I	J
1										
2		ID	First Name	Last Name	Salary		ID	53		
3		72	Emily	Smith	\$64,901		Salary	5		
4		66	James	Anderson	\$70,855					
5		14	Mia	Clark	\$188,657					
6		30	John	Lewis	\$97,566					
7		53	Jessica	Walker	\$58,339					
8		56	Mark	Reed	\$125,180					
9		79	Richard	Lopez	\$91,632					
10										

- Explanation: 53 (first argument) found at position 5 in the range B3:B9 (second argument). In this example, we use the MATCH function to return an exact match so we set the third argument to 0.

- to perform a case-sensitive lookup.

[illegible]

- M

[illegible]

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[illegible]