SUM Function

It allows you to add values, cell references or ranges or a mix of all three.
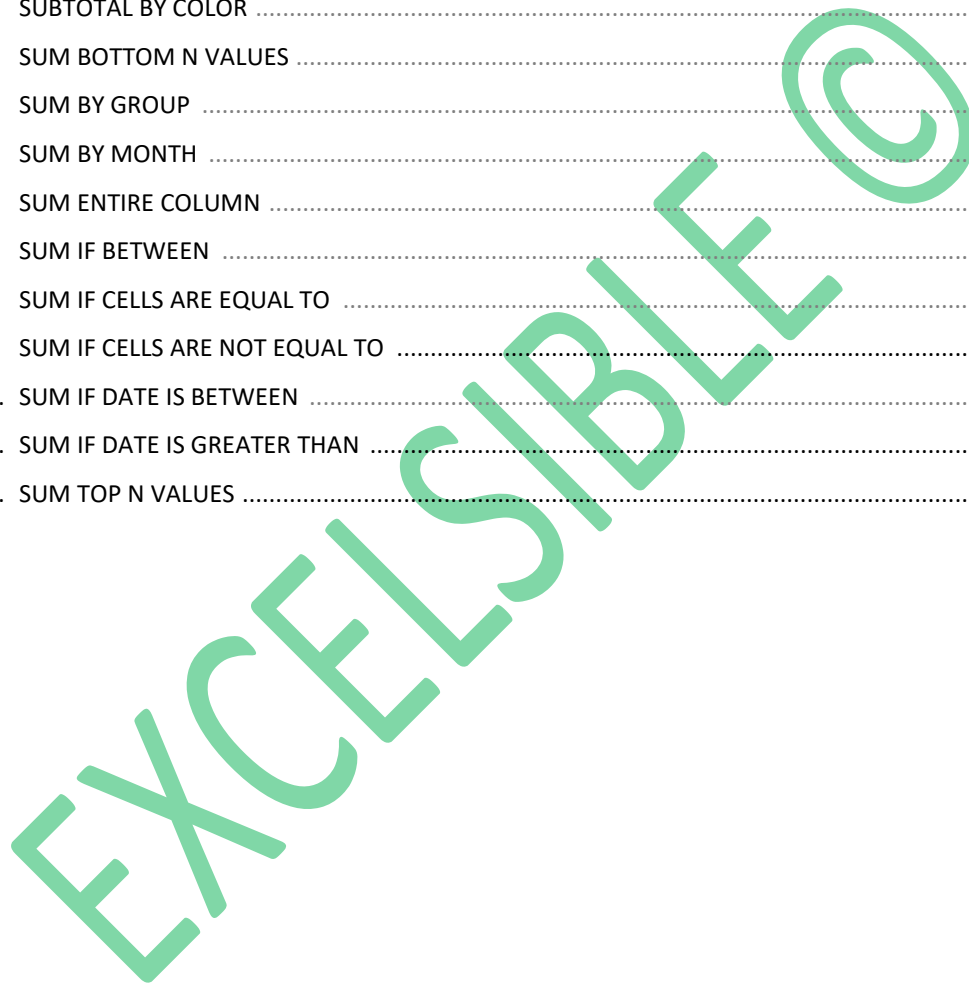
Combinations with:
1. SUM
2. SUMIF/SUMIFS
3. COUNTIF
4. SUMPRODUCT
5. SMALL/LARGE
6. DATE

SEMINAR

- Calculate Running Total
- Subtotal by Color
- Sum Bottom N Values
- Sum by Group
- Sum by Month
- Sum Entire Column
- Sum If Between
- Sum If Cells are Equal To
- Sum If Cells are Not Equal To
- Sum If Date is Between
- Sum If Date is Greater Than
- Sum Top N Values

1 CALCULATE RUNNING TOTAL

	A	B	C	D	E	F
1	**MONTH**	**DONATIONS**	**RUNNING TOTAL**	Calculate a running total using a mixed reference		
2	Jan	€ 100.00	€ 100.00	**=SUM($B$2:B2)**		
3	Feb	€ 250.00	€ 350.00			
4	Mar	€ 200.00	€ 550.00			
5	Apr	€ 450.00	€ 1,000.00			
6	May	€ 600.00	€ 1,600.00			
7	Jun	€ 550.00	€ 2,150.00			

FUNCTION 1

This function is used to **add together** the **values** in a **range of cells**. The range of cells to be added is specified as the function's argument.

In this case, the range of cells is $B$2:B2, which means all the cells from B2 to B2 (i.e., just the cell B2). The $ symbol before the row and column letters indicates that the **reference** is "**absolute**," which means that it will **not change** when the formula is **copied** or **moved** to other cells.

2 SUBTOTAL BY COLOR

	A	B	C	D	E	F	G	H
1	**COLOR**	**QTY**	**AMOUNT**					
2	Red	10	€ 150.00		Calculate subtotal numbers by color.			
3	Blue	20	€ 340.00					
4	Green	25	€ 350.00		**COLOR**	**TOTAL**		
5	Blue	30	€ 510.00		Red	€ 300.00	=SUMIF($A$2:$A$9, E5,$C$2:$C$9)	
6	Green	20	€ 280.00		Blue	€ 1,530.00		
7	Blue	30	€ 510.00		Green	€ 630.00		
8	Red	10	€ 150.00		**Total**	**€ 2,460.00**	=SUM(F5:F7)	
9	Blue	10	€ 170.00					

FUNCTION 1

This function will **sum all the values** in the range $C$2:$C$9 where the corresponding cell in the range $A$2:$A$9 meets the **criterion** specified in cell E5.

FUNCTION 2

This function will add the values in cells F5, F6, and F7.

3 SUM BOTTOM N VALUES

	A	B	C	D	E	F	G
1	**VALUES**		Calculate the sum of the lowest 3 values.				
2	10		Calculate the sum of the lowest 5 values.				
3	20						
4	30		**Example**	**RESULT**			
5	40		Sum bottom 3 values	60	=SUMPRODUCT(SMALL(A2:A11,{1,2,3}))		
6	50		Sum bottom 5 values	150	=SUMPRODUCT(SMALL(A2:A11,{1,2,3,4,5}))		
7	60						
8	70						
9	80						
10	90						
11	100						

FUNCTION 1

The `SMALL` function is being used to return an **array of the smallest 3 values** in the range `A2:A11`. The `SUMPRODUCT` function will then **multiply each of these 3 values by 1** and return the **sum of those products**.

FUNCTION 2

The `SMALL` function is being used to return an **array of the smallest 5 values** in the range `A2:A11`. The `SUMPRODUCT` function will then **multiply each of these 5 values by 1** and return the **sum of those products**.

4 SUM BY GROUP

	A	B	C	D	E	
1	**Group**	**Amount**	**RESULT**	Calculate the sum by group.		
2	Blue	€ 16.00	€ 38.00	**=IF(A2=A1, "",SUMIF(A:A,A2,B:B))**		
3	Blue	€ 14.00				
4	Blue	€ 8.00				
5	Red	€ 12.00	€ 30.00			
6	Red	€ 8.00				
7	Red	€ 10.00				
8						
9	*Note: data must be sorted by the grouping column to get sensible results.*					

FUNCTION 1

This function **sums the values** in the range `B:B` that meet a certain **criteria**. In this case, the **criteria** is that the corresponding cells in the range `A:A` must **be equal to the value** in cell `A2`.

5 SUM BY MONTH

	A	B	C	D	E	F	G	H	I	J
1	**Date**	**Amount**		Calculate the sum by month						
2	01-Jan-22	€ 100.00		=SUMIFS($B$2:$B$13,$A$2:$A$13,">="&D4,$A$2:$A$13,"<="&EOMONTH(D4,0))						
3	01-Jan-22	€ 100.00		**Month**	**Sum**					
4	05-Feb-22	€ 100.00		01-Jan-22	€ 200.00					
5	05-Feb-22	€ 50.00		01-Feb-22	€ 250.00					
6	05-Feb-22	€ 100.00		01-Mar-22	€ 175.00					
7	07-Mar-22	€ 25.00		01-Apr-22	€ 100.00					
8	07-Mar-22	€ 150.00		01-May-22	€ 400.00					
9	09-Apr-22	€ 100.00								
10	09-May-22	€ 50.00								
11	12-May-22	€ 200.00								
12	12-May-22	€ 50.00								
13	12-May-22	€ 100.00								

①

FUNCTION 1

This function will sum the values in the `$B$2:$B$13` where the **values** in the `$A$2:$A$13` are **both greater than or equal to the value** in `D4` and **less than or equal to the last day of the month of the value** in `D4`.

The **2ⁿᵈ** criteria, `"<="&EOMONTH(D4,0)`, means that the **values** in the `$A$2:$A$13` must be **less than or equal to the last day of the month of the value** in cell `D4`.
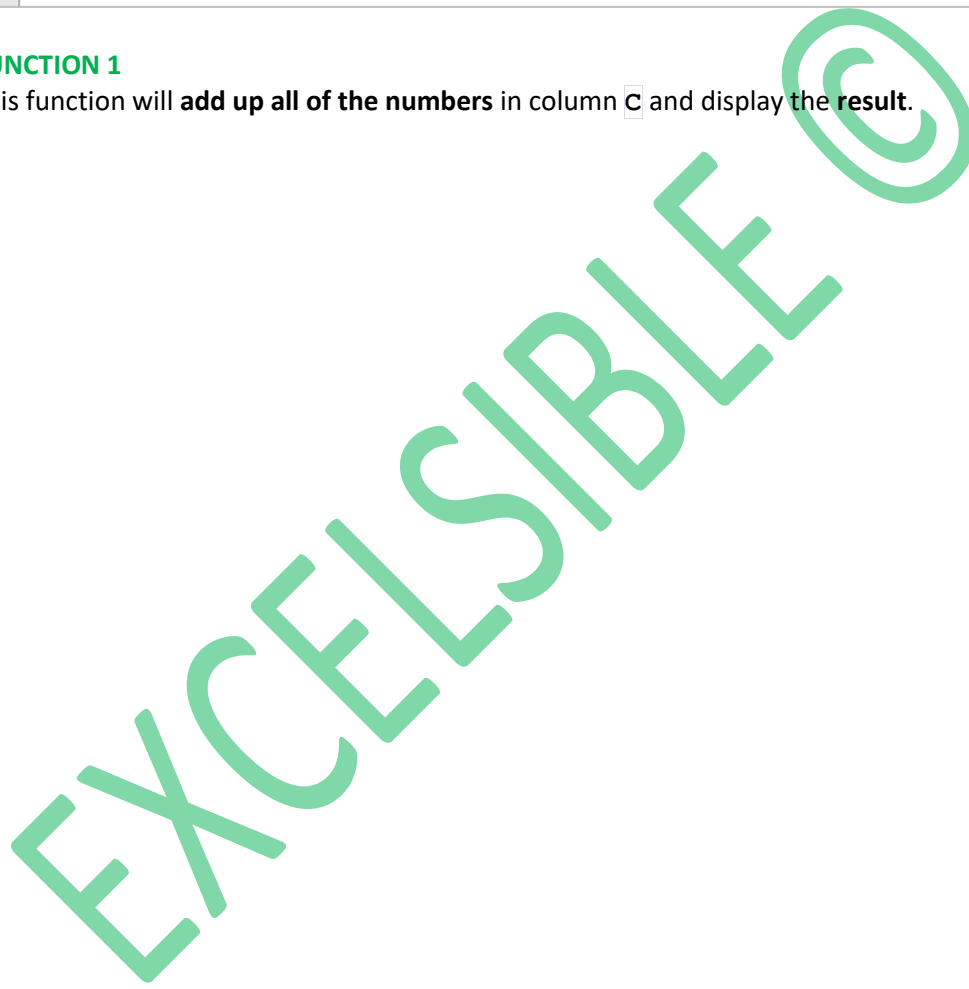
6 SUM ENTIRE COLUMN

	A	B	C	D	E	F	G
1	**Order**	**Item**	**Amount**		Calculate the sum of Amount column		
2	01001	Red T-shirt	€ 14.00		without upper/lower bounds.		
3	01002	Blue T-shirt	€ 14.00				
4	01003	Black Hat	€ 9.00		**Total Sales**		
5	01004	Gray Hoodie	€ 18.00		€ 96.00	=SUM(C:C)	
6	01005	Red T-shirt	€ 14.00				
7	01006	Gray Hoodie	€ 18.00		1		
8	01007	Black Hat	€ 9.00				

FUNCTION 1

This function will **add up all of the numbers** in column C and display the **result**.

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7 SUM IF BETWEEN

	A	B	C	D	E	F	G
1	**Invoice #**	**Date**	**Amount**				
2	100123	01-Jan-22	€ 900.00		Calculate the sum between the		
3	100234	01-Jan-22	€ 1,400.00		amounts 50 and 1000		
4	100236	05-Feb-22	€ 1,250.00		**Total > 500 and <1000**	1	
5	100238	05-Feb-22	€ 825.00		€ 2,725.00		
6	100242	05-Feb-22	€ 500.00		=SUMIFS(C2:C8,C2:C8,">=500",C2:C8,"<=1000")		
7	100243	07-Mar-22	€ 1,100.00				
8	100244	07-Mar-22	€ 500.00				

FUNCTION 1

This function will **add up all of the values** in the range `C2:C8` that are **greater than or equal to 500** and **less than or equal to 1000**.

8 SUM IF CELLS ARE EQUAL TO

	A	B	C	D	E	F	G	H	I	J	K
1	**Date**	**Region**	**Units**	**New price**							
2	01-Jan-22	West	500	€ 27,000							
3	01-Jan-22	North	750	€ 36,000							
4	05-Feb-22	East	400	€ 22,000							
5	05-Feb-22	South	700	€ 33,600							
6	05-Feb-22	West	350	€ 19,950							
7	07-Mar-22	East	350	€ 18,900							
8	07-Mar-22	South	600	€ 31,200							
9	08-Mar-22	North	650	€ 31,200							

Calculate the sum of New Price if cells are equal to region 'West'

SUMIF	€ 46,950	=SUMIF(B2:B9,"West",D2:D9)
SUMIFS	€ 46,950	=SUMIFS(D2:D9,B2:B9,"West")

FUNCTION 1

In this function, the range `B2:B9` is the range of cells that is checked for the criterion, "**West**". The range `D2:D9` is the range of cells that is **summed** if their corresponding cells in the range `B2:B9` meet the criterion.

FUNCTION 2

This function will **sum the values** in the range `D2:D9` only if the corresponding cells in the range `B2:B9` contain the text "**West**".

9 SUM IF CELLS ARE NOT EQUAL TO

	A	B	C	D	E	F	G	H	I	J	K
1	**Date**	**Region**	**Units**	**New price**							
2	01-Jan-22	West	500	€ 27,000							
3	01-Jan-22	North	750	€ 36,000							
4	05-Feb-22	East	400	€ 22,000							
5	05-Feb-22	South	700	€ 33,600		West	€ 46,950	=SUMIF(B2:B9,"West",D2:D9)			
6	05-Feb-22	West	350	€ 19,950		NOT West	€ 172,900	=SUMIF(B2:B9,"<>West",D2:D9)			
7	07-Mar-22	East	350	€ 18,900							
8	07-Mar-22	South	600	€ 31,200							
9	08-Mar-22	North	650	€ 31,200							

Calculate the sum of New Price if cells are NOT equal to region 'West'

FUNCTION 1

This function, will **sum the values** in the range `D2:D9`, if the corresponding cell in the range `B2:B9` meets the criteria "**West**".

FUNCTION 2

This function will sum the values in the range `D2:D9`, if the corresponding cell in the range `B2:B9` does <u>not</u> meet the criteria "**West**".

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10 SUM IF DATE IS BETWEEN

	A	B	C	D	E	F	G	H	I
1	Invoice #	Date	Amount	Age		Calculate the sum of Amount if date is			
2	100123	2-Jan-22	€ 900.00	50		between 1st of January 2022 and 28th of			
3	100234	5-Jan-22	€ 1,400.00	45		February 2022			
4	100236	1-Feb-22	€ 1,250.00	30		After	1-Jan-22		
5	100238	5-Feb-22	€ 825.00	29		Before	28-Feb-22		
6	100242	23-Feb-22	€ 500.00	15		Total	€ 4,875.00		
7	100243	7-Mar-22	€ 1,100.00	10		=SUMIFS(C2:C8,B2:B8,">="&G4,B2:B8,"<="&G5)			
8	100244	7-Mar-22	€ 500.00	10					

FUNCTION 1

This function, will **sum** the values of **Amount** in the range of cells `C2:C8` where the values in the the range of cells `B2:B8` are **greater than or equal to the value** in `G4` and **less than or equal to the value** in `G5`.

11 SUM IF DATE IS GREATER THAN

	A	B	C	D	E	F	G	H	I
1	Invoice #	Date	Amount	Age					
2	100123	02-Jan-22	€ 900.00	50					
3	100234	05-Jan-22	€ 1,400.00	45					
4	100236	01-Feb-22	€ 1,250.00	30					
5	100238	05-Feb-22	€ 825.00	29					
6	100242	23-Feb-22	€ 500.00	15					
7	100243	07-Mar-22	€ 1,100.00	10					
8	100244	07-Mar-22	€ 500.00	10					

Calculate the sum if date is greater than 31st of January 2022

After Jan 31   € 4,175.00   ①

=SUMIF(B2:B8,">"&DATE(2022,1,31),C2:C8)

FUNCTION 1

This function will **sum** the values of **Amount** in the range of cells `C2:C8` where the corresponding values in the range of cells `B2:B8` are **greater than** the date **2022-01-31**.

12 SUM TOP N VALUES

	A	B	C	D	E	F	G
1	VALUES		Calculate the sum of the top 3 values.				
2	10		Calculate the sum of the top 5 values.				
3	20						
4	30		Example	RESULT			
5	40		Sum top 3 values	270	=SUMPRODUCT(LARGE(A2:A11,{1,2,3}))		
6	50		Sum top 5 values	400	=SUMPRODUCT(LARGE(A2:A11,{1,2,3,4,5}))		
7	60						
8	70						
9	80						
10	90						
11	100						

FUNCTION 1

The `LARGE` function is being used to return an array of the **3 largest values** from the range `A2:A11`. The `SUMPRODUCT` function then **multiply each of these 3 values by 1** and return the **sum of those products**.

FUNCTION 2

The `LARGE` function is being used to return an array of the **5 largest values** from the range `A2:A11`. The `SUMPRODUCT` function then **multiply each of these 5 values by 1** and return the **sum of those products**.