



UNIVERSITÀ  
DEGLI STUDI  
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Dipartimento  
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dell'Informazione e della Produzione

# 22059 – APPLIED TOPICS IN MANAGEMENT ENGINEERING

**Excel, Access and Matlab**

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# AGENDA

## Lecture II

- CONDITIONAL OPERATIONS
  - SUM
    - SUMIF
    - SUMIFS
  - COUNT
    - COUNTIF
    - COUNTIFS
  - COUNTA
  - AVERAGE
    - AVERAGEIF
    - AVERAGEIFS
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# CONDITIONAL OPERATIONS

- Conditional operations allow to perform calculations on only numbers that meet certain criteria (one or multiple).
- Usually, a conditional formula can be created by using «IF function»:
- IF(logical\_test [,value\_if\_true] [,value\_if\_false])
  - It returns one value if the condition is «TRUE»
  - It returns a different value if the condition is «FALSE»

	A	B	C	D	E
1	<b>Name</b>	<b>Salary</b>			
2	Jack	25.000 €	= SE(B2<30000; VERO; FALSO)		
3	Ann	32.000 €			
4	Megan	28.500 €			
5	Luke	31.500 €			
6	Logan	40.000 €			

	A	B	C
1	<b>Name</b>	<b>Salary</b>	
2	Jack	25.000 €	VERO
3	Ann	32.000 €	
4	Megan	28.500 €	
5	Luke	31.500 €	
6	Logan	40.000 €	

	A	B	C
1	<b>Name</b>	<b>Salary</b>	
2	Jack	25.000 €	VERO
3	Ann	32.000 €	FALSO
4	Megan	28.500 €	VERO
5	Luke	31.500 €	FALSO
6	Logan	40.000 €	FALSO

Fig.1: Example

## CONDITIONAL OPERATIONS

### SUM

- **SUMIF** → when there is only one criterion



SUMIF(range; criterion; [sum\_range])

- Range: The range of cells on which you want apply the criterion.
- Criterion: The criterion to be met.
- [sum\_range]: The cells to add.

	A	B	C	D	E	F	G	H
1	Product	Quantity	Supplier					
2	1	1200	Agatha					
3	2	672	Luke		Total Sales			
4	1	982	Agatha		1	=somma.se(A2:A8; 1; B2:B8)		
5	3	341	Logan		2			
6	4	822	Mike		3			
7	2	457	Luke		4			
8	1	1131	Ann					

	A	B	C	D	E	F
1	Product	Quantity	Supplier			
2	1	1200	Agatha			
3	2	672	Luke		Total Sales	
4	1	982	Agatha		1	3313
5	3	341	Logan		2	
6	4	822	Mike		3	
7	2	457	Luke		4	
8	1	1131	Ann			

Fig.2: Example of SUMIF Formula

# CONDITIONAL OPERATIONS

## SUM

- **SUMIFS** → when there are at least two criteria



SUMIFS (sum\_range, criteria\_range1, criteria1, [criteria\_range2, criteria2], ...)

- Sum\_range: the cells to add.
- Criteria\_range1: The range that is tested using Criteria1.
- Criteria1: The criteria that defines which cells in Criteria\_range1 will be added.

	A	B	C	D	E	F	G	H
1	Product	Quantity	Supplier					
2	1	1200	Agatha					
3	2	672	Luke		Agatha			
4	1	982	Agatha	=SOMMA.PIÙ.SE(B2:B9; A2:A9; 1; C2:C9; "Agatha")				
5	3	341	Logan					
6	4	822	Mike					
7	2	457	Luke					
8	1	1131	Ann					
9	2	123	Agatha					

	A	B	C	D	E	F
1	Product	Quantity	Supplier			
2	1	1200	Agatha			
3	2	672	Luke		Agatha	
4	1	982	Agatha		Product 1	2182
5	3	341	Logan			
6	4	822	Mike			
7	2	457	Luke			
8	1	1131	Ann			
9	2	123	Agatha			

Fig.3: Example of SUMIFS formula

## CONDITIONAL OPERATIONS

### COUNT

- The count formula counts the number of cells in a range that have numbers in them.



	A	B	C	D
1	1		Formula Result	9
2	2		Formula	=COUNT(A1:A10)
3	3			
4	4			
5	5			
6	6			
7	7			
8	8			
9	doesn't work with text			
10	10			

Fig.3: Example of Count Formula

**N.B.**

The formula only counts the cells where there is a number

## CONDITIONAL OPERATIONS

### COUNT

- **COUNTIF** → when there is only one criterion
  - It can be used to count cells with dates, numbers, and text that meet specific criteria.



COUNTIF (range, criteria)

- Range: The range of cells to count.
- Criteria: The criteria that controls which cells should be counted.

	A	B	C	D	E
1	Product	Quantity	Supplier		
2	1	1200	Agatha		
3	2	672	Luke		Quantity over 700
4	1	982	Agatha	=COUNTA(SE(B2:B9; ">700"))	
5	3	341	Logan	COUNTA.SE(intervallo; criterio)	
6	4	822	Mike		
7	2	457	Luke		
8	1	1131	Ann		
9	2	123	Agatha		

	A	B	C	D	E
1	Product	Quantity	Supplier		
2	1	1200	Agatha		
3	2	672	Luke		Quantity over 700
4	1	982	Agatha		4
5	3	341	Logan		
6	4	822	Mike		
7	2	457	Luke		
8	1	1131	Ann		
9	2	123	Agatha		

Fig.4: Example of COUNTIF Formula

## CONDITIONAL OPERATIONS

### COUNT

- **COUNTIFS** → when there are at least two criteria



COUNTIFS (criteria\_range1, criteria1, [criteria\_range2, criteria2]...)

- Criteria\_range1: The range that is tested using Criteria1.
- Criteria1: The criteria in the form of a number, expression, cell reference, or text that define which cells will be counted.

	A	B	C	D	E	F
1	Product	Quantity	Supplier			
2	1	1200	Agatha			
3	2	672	Luke		Agatha quantities	
4	1	982	Agatha		over 700	
5	3	341	=CONTA.PIÙ.SE(B2:B9; ">700"; C2:C9; "Agatha")			
6	4	822	Mike			
7	2	457	Luke			
8	1	1131	Ann			
9	2	123	Agatha			

	A	B	C	D	E
1	Product	Quantity	Supplier		
2	1	1200	Agatha		
3	2	672	Luke		Agatha quantities
4	1	982	Agatha		over 700
5	3	341	Logan		2
6	4	822	Mike		
7	2	457	Luke		
8	1	1131	Ann		
9	2	123	Agatha		

Fig.5: Example of COUNTIFS Formula



## CONDITIONAL OPERATIONS

### COUNTA

- COUNTA function returns the count of cells that contain numbers, text, logical values, error values.
- COUNTA does not count empty cells.

COUNTA (value1, [value2],...)

- value1: An item, cell reference, or range.



	A	B	C
1	VALUE		
2	rate		
3		=CONTA.VALORI(A2:A5)	
4	3%		
5	2		

  

	A	B
1	VALUE	
2	rate	
3		3
4	3%	
5	2	

Fig.6: Example of COUNTA Formula

## CONDITIONAL OPERATIONS

### AVERAGE

- AVERAGE function returns the average of values provided.

AVERAGE (number1, [number2],...)

- number1: A number or cell reference that refers to numeric values.

	A	B	C	D	E
1	Product	Quantity	Supplier		
2	1	1200	Agatha		Average of purchased products by Agatha  =MEDIA(B2;B4;B9)  MEDIA(num1; [num2]
3	2	672	Luke		
4	1	982	Agatha		
5	3	341	Logan		
6	4	822	Mike		
7	2	457	Luke		
8	1	1131	Ann		
9	2	123	Agatha		

	A	B	C	D	E
1	Product	Quantity	Supplier		
2	1	1200	Agatha		Average of purchased products by Agatha  768,3333333
3	2	672	Luke		
4	1	982	Agatha		
5	3	341	Logan		
6	4	822	Mike		
7	2	457	Luke		
8	1	1131	Ann		
9	2	123	Agatha		

Fig.7: Example of AVERAGE Formula

**AVERAGEIF** → when there is only one criterion

**AVERAGEIFS** → when there are at least two criteria



# FURTHER MATERIAL

To review and deepen the topics of this lecture



1. Alexander, M., Kusleika, R., & Walkenbach, J. (2018). Excel 2019 Bible. John Wiley & Sons
2. <https://www.youtube.com/watch?v=2mzGsJtJvLc&list=PLIKpQrBME6xLYoubjOqowzcCCd0ivQVLY&index=7>
3. <https://www.youtube.com/watch?v=0i07w2w7d44&list=PLIKpQrBME6xLYoubjOqowzcCCd0ivQVLY&index=10&t=0s>
4. <https://www.youtube.com/watch?v=AZuBNWMh7VM>