All essential Excel Formulas in one place

Data Cleaning, Maths, Logical, Dates, Lookups, Conditional Maths

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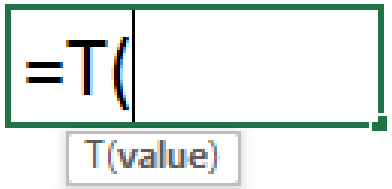
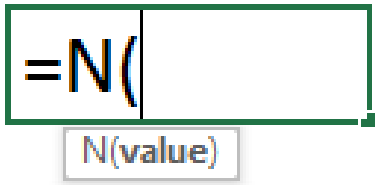
01 | Data Cleaning formulas

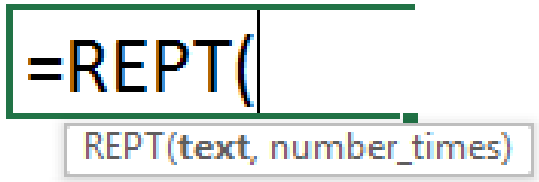
Text Formulas – T(), N(), and REPT()



- If value is or refers to text, T() returns that value. If value does not refer to text, T() returns "" (empty text).

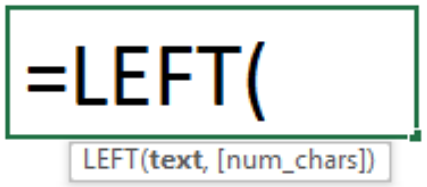


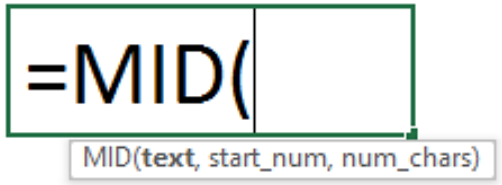
- If value is or refers to number, N() returns that value. For text, it yields zero.
- Used to leave in-cell comments. E.g., =SUM(B1:B2) + N("This is my comment – Hello World")



- Repeats a string / character specified no. of times
- E.g., =REPT("Z",3) will yield ZZZ

Text Formulas – LEFT(), RIGHT(), and MID()

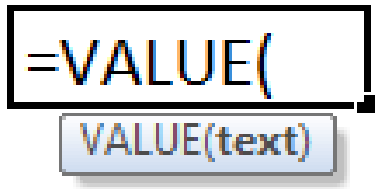




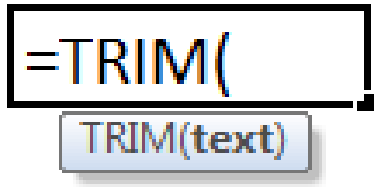
- Extract specified no. of characters from left, right or mid
- IMPORTANT – if extracted data is a number, it will be stored as text. Use VALUE()

	A	B	C
1	AJCPP1312N	AJ	=LEFT(A1,2)
2	AJCPP1312N	2N	=RIGHT(A2,2)
3	AJCPP1312N	P	=MID(A3,4,1)

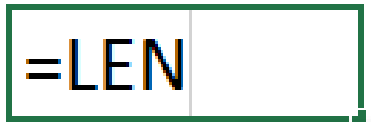
Text Formulas –VALUE(), TRIM() and LEN()



- Converts “a number stored as text” to a number
- “a number stored as text” is recognized as 0 for computations



- Removes excess spaces from text. Removes all leading & trailing spaces. However, multiple spaces inside the sentences are replaced with a single space.
- E.g., Converts “ **HSBC Inc.** ” **TO** “**HSBC Inc.**”



- Returns the number of characters in a text string. Counts spaces too. E.g., = LEN(“AK 47“) = 5

Text Formulas – SEARCH() vs. FIND()

=SEARCH(

SEARCH(**find_text**, within_text, [start_num])

- Case Sensitive? – No
- Can use wild characters in search terms? - Yes

=FIND(

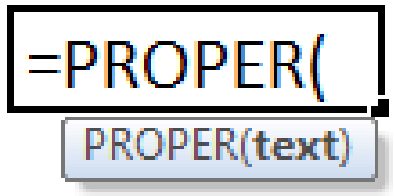
FIND(**find_text**, within_text, [start_num])

- Case Sensitive? – Yes
- Can use wild characters in search terms? - No

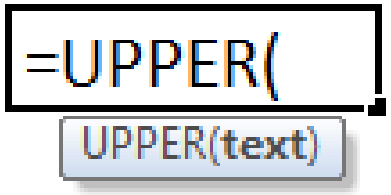
Gives you the starting position of the criteria

	A	B	C
1	user@yodalearning.com	6	=SEARCH("YO*",A1)
2	123456.....21		

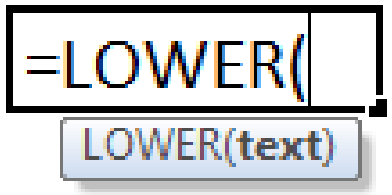
Text Formulas – PROPER(), UPPER() & LOWER()



- Capitalizes the **first letter in each word** of a text value
- E.g., Converts **“the man eats”** or **“THE MAN EATS”** TO **“The Man Eats”**

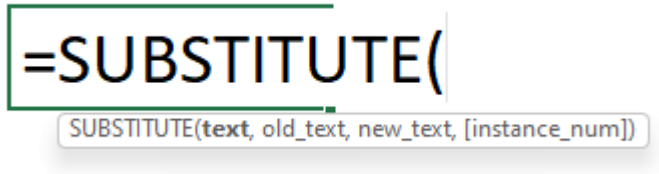


- Converts text to uppercase
- E.g., Converts **“the man eats”** or **“The Man Eats”** TO **“THE MAN EATS”**



- Converts text to lowercase
- E.g., Converts **“The Man Eats”** or **“THE MAN EATS”** TO **“the man eats”**

Text Formulas – SUBSTITUTE()



- Formula version of – Find & Replace (Ctrl H)
  - *old_text – what will be replaced*
  - *new_text – new replacement*

Joining data strings using CONCATENATE, &

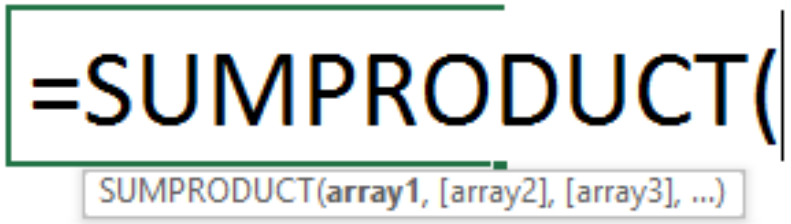
	A	B	C	D	E
1					
2	AK7	2332	AK7-2332	=A2&"-"&B2	
3					
4	AK7	2332	AK7-2332	=CONCATENATE(A4,"-",B4)	

Note:

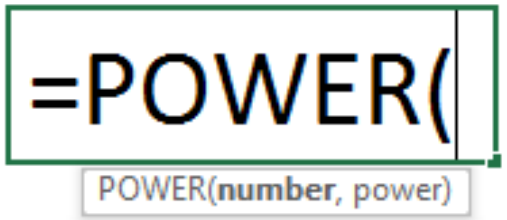
- Both of the above approaches yield the SAME output
- Any external text, number, symbol must be enclosed in a pair of double quotations. E.g., " "
- =TEXT() may be used if combining Dates. E.g., ="Today's date is " **&** TEXT(A2,"dd-mmm-yy")
- Further reading – CONCAT, TEXTJOIN

02 | Essential math formulas

For Weighted Average & Compounding/Discounting

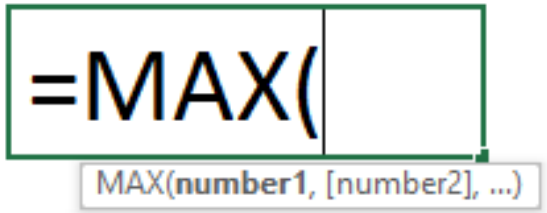


- Multiplies corresponding cells in **two or more ranges** and returns the sum of those products.
  E.g., =SUMPRODUCT(A1:A2,B1:B2) = (A1*B1) + (A2*B2)
- The array arguments must have the **same dimensions.**
  E.g., =SUMPRODUCT(A1:A2,B1:B3) is invalid
- Used with =SUM() for computing **weighted average**

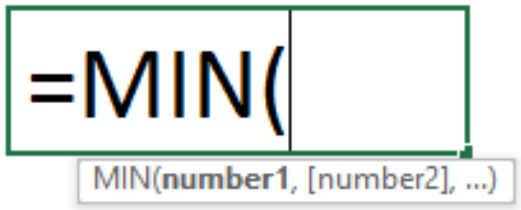


- Used in Financial Modeling – discounting cash flows, compounding
- Caret sign (^) is a perfect substitute. E.g., 25 =POWER(5,2) and is same as =5^2

Used in Financial Modeling and Tax Computation

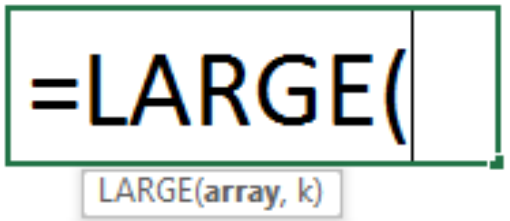


- Used in **Tax Computations & Financial Models to prevent choosing of negative numbers** for subsequent calculations.
- E.g., =MAX(0,A1) chooses 0 or value in cell A1, whichever is higher
- E.g., Penalty for late deposit = higher of 2% of dues or Rs.100

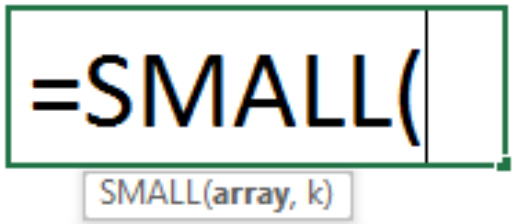


- Used in logics such as “lower of the two numbers” in the area of **Tax Computations,** specific areas of **Financial Engineering**
- =MIN(A1:A5) is same as =SMALL(A1:A5,1)

Used in pricing discovery processes

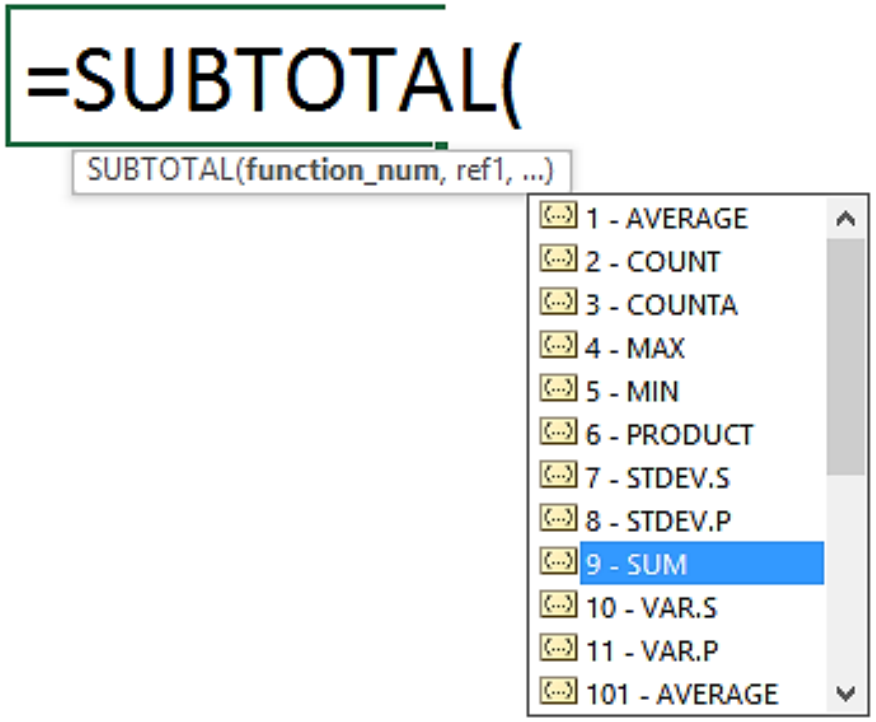


- **Auction** such as highest bid value, second highest bid value and so on.
- E.g., H2 will be =LARGE(A1:A5,2)



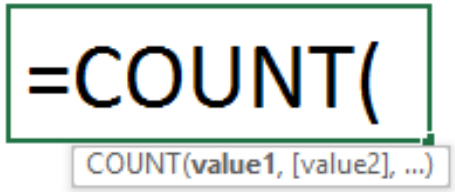
- **Vendor evaluation** such as lowest bid value L1, second lowest bid value L2 and so on.
- E.g., L2 will be =SMALL(A1:A5,2)

Using =SUBTOTAL() for calculations w. Filtered list.

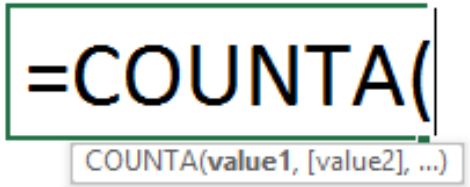


- Avoid using SUM to calculate total on a filtered dataset. Instead, use SUBTOTAL(). It ignores values in hidden rows (filtered out), regardless of *function_num*. E.g., 1 for AVERAGE, 9 for SUM
- Shortcut for SUBTOTAL() formula for autosum in filtered lists is **ALT =**
- **Pro tip:** In tables with Filter applied, SUBOTAL() with 109 i.e., SUM will ignore values in the manually hidden rows whereas SUBOTAL() with 9 will not

For Counting



Counts the number of cells which have numeric value

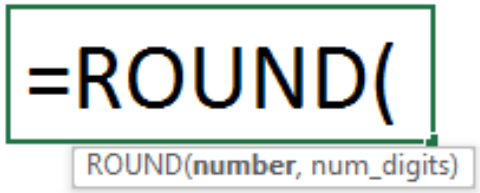


Counts the number of cells which IS NOT a blank, i.e., numbers, alphabets, alphanumeric, space)

Counts the number of cells which IS a blank

Note: COUNTIFS() will be discussed later in the book. COUNTIFS() counts those cells that meet a certain criteria.

For rounding numbers (1/2)



- "***num_digits***" signifies "number of decimal digits".
- E.g., For the starting number 52.233 – "2" implies 52.23, "1" implies 52.20, and 0 implies 52.00

- **=ROUND(A1/50, 0) * 50 - will give you** nearest 50. E.g., =ROUND(A1/10,0)*10 = 5340.0 where cell A1 = 5344.2

- The same technique can be used with ROUNDUP & ROUNDDOWN

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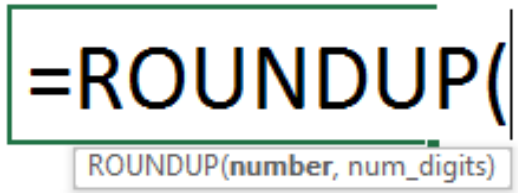
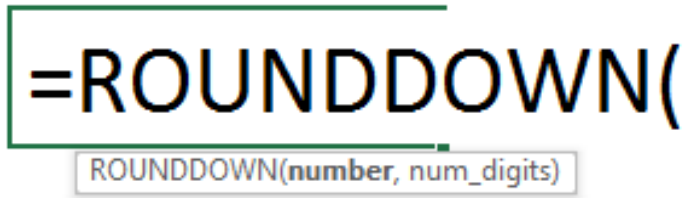
For rounding numbers (2/2)



- E.g., Cell A1 = 5342.2
- =ROUNDUP(A1/10,0)*10 = 5350.0



- E.g., Cell A1 = 5349.2
- =ROUNDDOWN(A1/10,0)*10 = 5340.0

Note: MROUND() do not work with +/– nos. simultaneously. It does not have the option to choose between round up and round down.

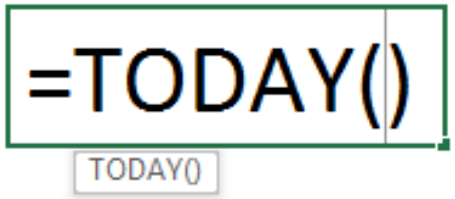
PMT – Used to find the EMI amount of a loan

	A	B
1		
2	Loan Amt. Rs.	420,682.2
3	Interest % p.a.	13.0%
4	Duration (Yrs.)	2.0
5		
6		
7	**EMI (Rs.) using PMT**	(20,000)
8		

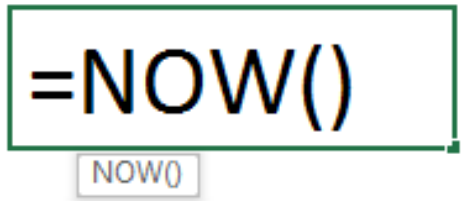
=PMT(B3/12,B4*12,B2)

03 | Date formulas

Date Formulas – TODAY() and NOW()



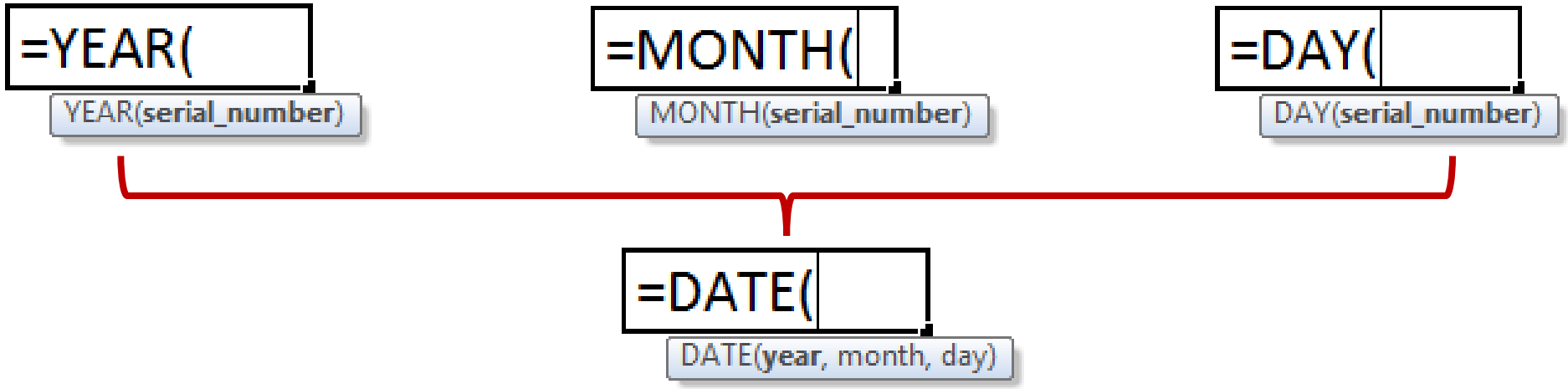
- Returns the current date as per PC's system clock
- Updates every time the file is opened (dynamic)
- **Ctrl + ;** and press **Enter** - for inserting current date (static)



- Returns the current date and time as per PC's system clock
- Updates every time the file is opened (dynamic)
- **Ctrl + Shift + ;** and press **Enter** - for inserting current time (static)

Extracting date info with - DAY(), MONTH(), YEAR()

	A	B	C	D	E	F	G
1							
2			=DAY()	=MONTH()	=YEAR()		=DATE()
3	3-Jun-11		3	6	2011		3-Jun-11
4							
5			=DAY(A3)	=MONTH(A3)	=YEAR(A3)		=DATE(E3,D3,C3)



Compiles the three components – Year, Month, Day in a date value

Extracting date info with - TEXT()

- Converts the date into Custom format. E.g., “mmmm-yyyy” will display June-2011
- **Important:** Resultant answer value is not a date value but a text value. Used for display purposes and not for subsequent formula computations.

	A	B	C	D	E
1					
2			**=TEXT()**		
3	**3-Jun-11**		Friday		=TEXT(A3,"dddd")
4	**3-Jun-11**		Fri		=TEXT(A3,"ddd")
5	**3-Jun-11**		03		=TEXT(A3,"dd")
6					
7			**=TEXT()**		
8	**3-Jun-11**		June		=TEXT(A8,"mmmm")
9	**3-Jun-11**		Jun		=TEXT(A9,"mmm")
10	**3-Jun-11**		06		=TEXT(A10,"mm")
11					

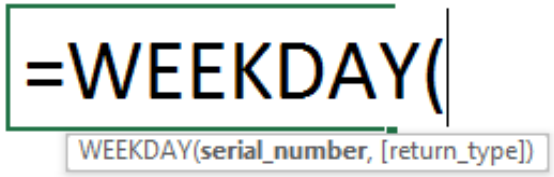
	A	B	C	D	E
12					
13			**=TEXT()**		
14	**3-Jun-11**		2011		=TEXT(A14,"yyyy")
15	**3-Jun-11**		2011		=TEXT(A15,"yyy")
16	**3-Jun-11**		11		=TEXT(A16,"yy")

Use EOMONTH() and EDATE() for Financial Modeling, Due Dates, Expiry Date

- Returns the **last day of the month** before or after a specified number of months.
- Used for due dates computations such as 5th of next month, end of current month
- Used for creating timelines in Budget & Forecast models – MoM, QoQ, YoY

- Returns the date that represents the indicated number of months before or after the start date. E.g., 2 months (may not be 60 days)
- Used for computing 3 months' notice period end date, retirement age, probation period, contract deadline, EMI installment due date

Date Formulas - WEEKDAY()



- Returns a value from 1 to 7, representing day of the week
- E.g., 1=Sunday, 2=Monday, 7= Saturday
- Used with IF() to write day based logical formula. E.g., *=IF(WEEKDAY(A1)=1,"Holiday","Office Day")*

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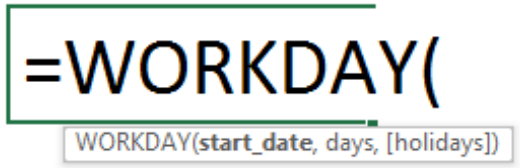
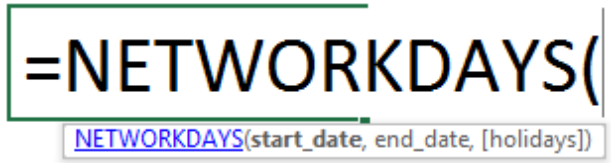
Project Management – WORKDAY() & NETWORKDAYS()



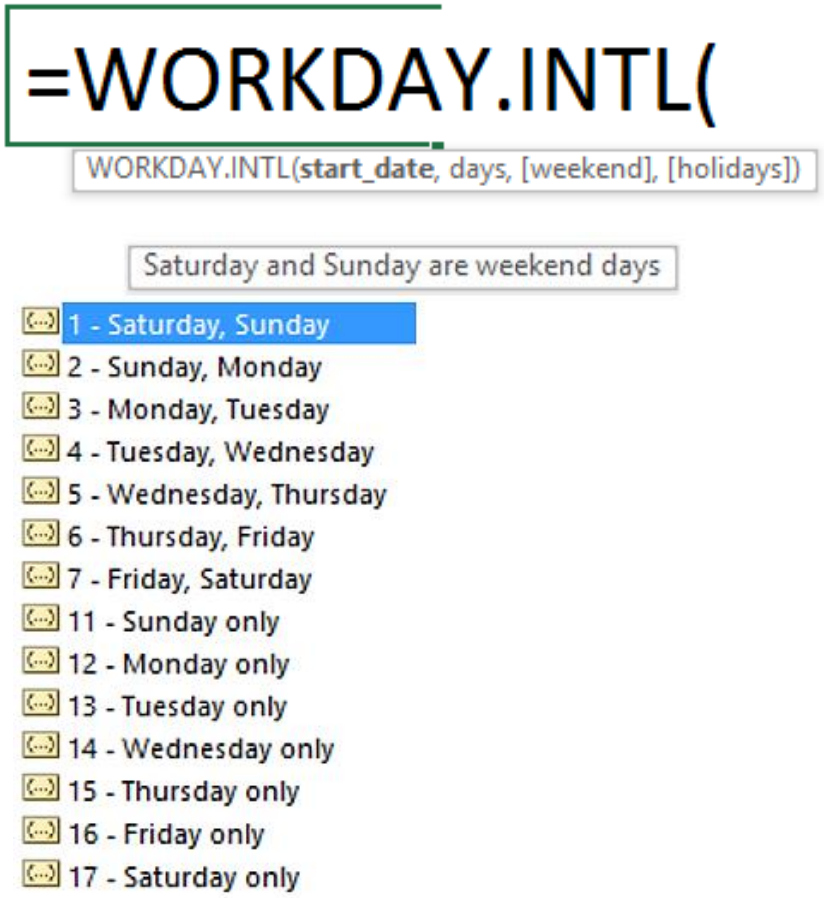
- Returns the date before or after a specified number of weekdays (weekends excluded). It **excludes start date** in computing final answer.
- E.g., If Cell A1 is 30-Dec-2011, then *=WORKDAY(A7,5)-1* will return 5-Jan-2012. 1-Jan-2012 is a Sunday and hence, excluded.
- Scheduled public holidays can also be excluded
- Used to **calculate deadline and due dates**



- Returns the number of weekdays (weekends excluded) between two dates. It **includes start date** in computing final answer.
- Scheduled public holidays can also be excluded
- Used to calculate **no. of working days between two dates**

WORKDAY.INTL() and NETWORKDAY.INTL() - They have an additional logic to identify different weekends. E.g., Fri-Sat vs Sat-Sun vs Sun

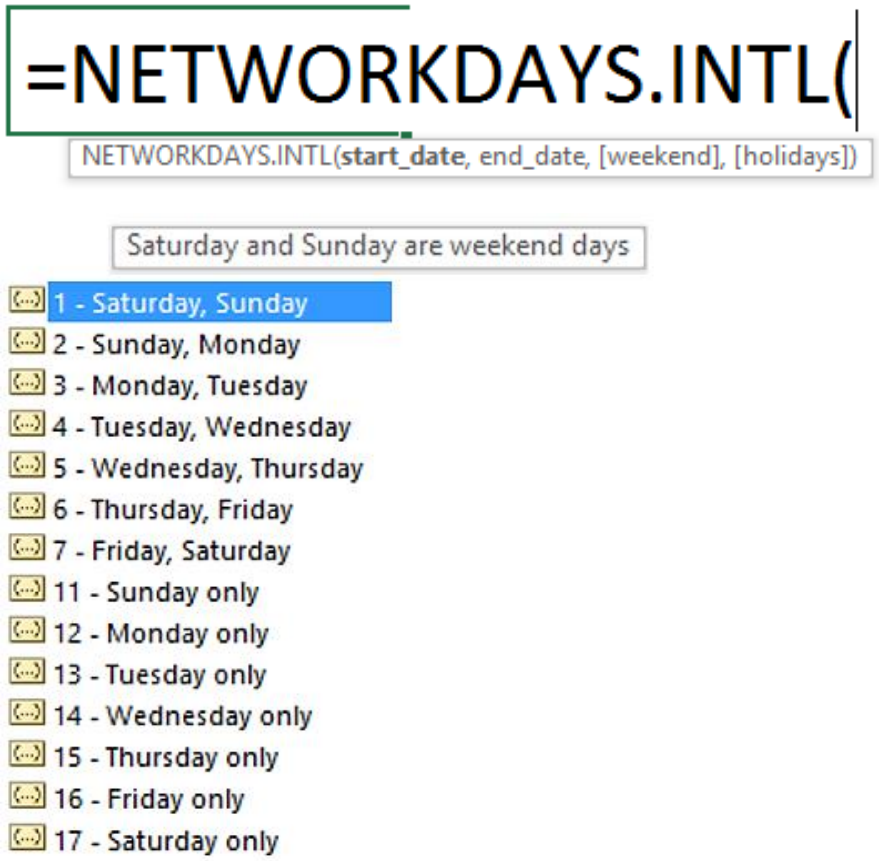
WORKDAY.INTL()



- Returns the date before or after a specified number of weekdays (weekends excluded). It **excludes start date** in computing final answer

- Scheduled public holidays can also be excluded
- Used to **calculate deadline and due dates**
- **How is it different from =WORKDAY()?** It allows the user to specify which days are counted as weekends. E.g., Fri-Sat vs Sat-Sun vs Sun

NETWORKDAYS.INTL()



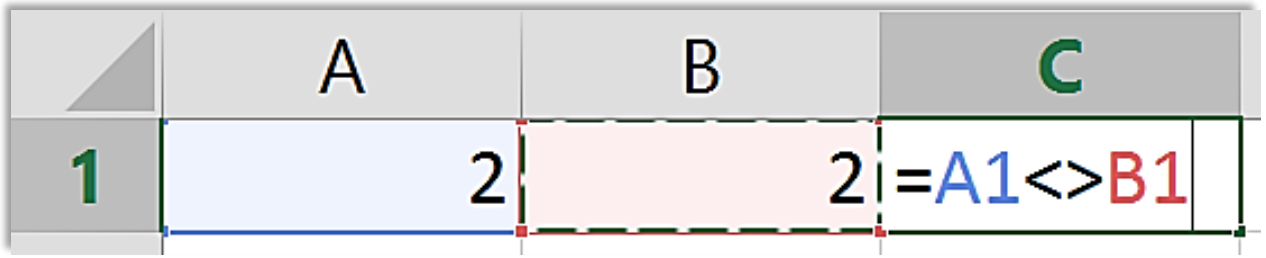
- Returns the number of weekdays (weekends excluded) between two dates.
- It **includes start date** in computing final answer

- Scheduled public holidays can also be excluded
- Used to calculate no. of business days between two dates and in Project Management

- **How is it different from =NETWORKDAYS()?** It allows the user to specify which days are counted as weekends. E.g., Fri-Sat vs Sat-Sun vs Sun

04 | Logical formulas

Not Equal To Operator <>



Answer will be FALSE
since A1 = B1

Logical formulas - generally used with IF()

=ISBLANK

ISBLANK — Checks whether a reference is to an empty cell, and returns TRUE or FALSE

=ISNUMBER

ISNUMBER — Checks whether a value is a number, and returns TRUE or FALSE

[ISNUMBER is used to check the validity of dates as technically every valid date in Excel is a "number"]

=ISTEXT

ISTEXT — Checks whether a value is text, and returns TRUE or FALSE

=ISERROR

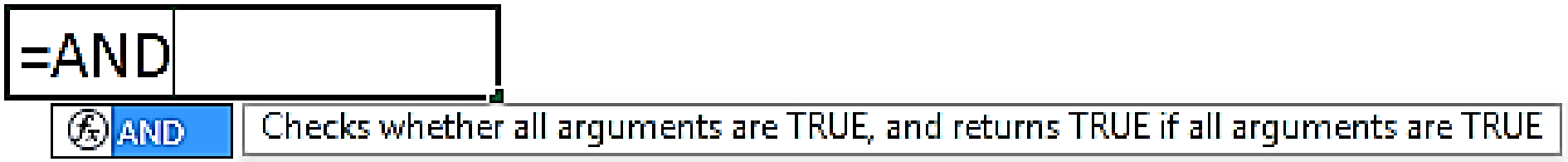
ISERROR — Checks whether a value is an error (#N/A, #VALUE!, #REF!, #DIV/0!, #NUM!, #NAME?, or #NULL!), and returns TRUE or FALSE

=ISFORMULA

ISFORMULA — Checks whether a reference is to a cell containing a formula, and returns TRUE or FALSE

Others: ISNA(), ISREF(), ISERR()

Logical formulas – AND(), OR(), IF()



Example:

	A	B	C	D	E	G
8	Name	Salary p.a. (US$)	Division	Rating	Rating 1-3 AND Division "CDFD" AND Salary < 50K	
9	AbduSalaam, Ismael	38,261	HFD	3	=AND(D9<4,C9="CDFD",B9<50000)	
426					AND(logical1, **[logical2]**, [logical3], [logical4], ...)	

[FALSE because Division is not equal to “CDFD”]

Logical formulas – AND(), OR(), IF()

=OR

OR | Checks whether any of the arguments are TRUE, and returns TRUE or FALSE. Returns FALSE only if all arguments are FALSE

Example:

	A	B	C	D	F	G
8	Name	Salary p.a. (US$)	Division	Rating	Rating 1-3 AND Division "CDFD" AND Salary < 50K	
9	AbduSalaam, Ismael	38,261	HFD	3	=OR(D9<4,C9="CDFD",B9<50000)	
426						

OR(**logical1**, [logical2], [logical3], [logical4], ...)

[TRUE because at least one of **three conditions** is TRUE]

Combine Logical formulas – AND(), OR(), IF()

=IF(

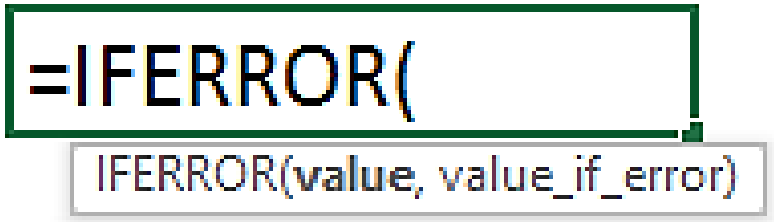
IF(logical_test, [value_if_true], [value_if_false])

Example:

	A	B	C	D	F	G	H	I
8	Name	Salary p.a. (US$)	Division	Rating	Rating 1-3 AND Division "CDFD" AND Salary < 50K			
9	AbduSalaam, Ismael	38,261	HFD	3	=IF(OR(D9<4,C9="CDFD",B9<50000),"Bonus","No Bonus")			

[Bonus]

IFERROR() – what's the message or action if error



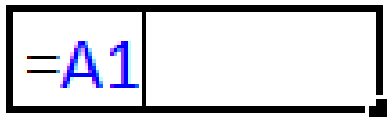
- =IFERROR(VLOOKUP() , "Data Not Available") - alternative message
- =IFERROR(VLOOKUP() , VLOOKUP()) - alternative action

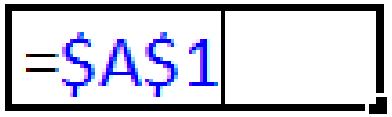
- Nested IFERROR:

  =IFERROR(VLOOKUP() , IFERROR(VLOOKUP() , "Data Not Available"))

Absolute & Relative referencing using $ - locking the cell or a range

After selecting a cell or a range of cells, keep pressing the function key **<F4>** or **<Fn+F4>** to toggle between the four combinations of cell referencing (as indicated):

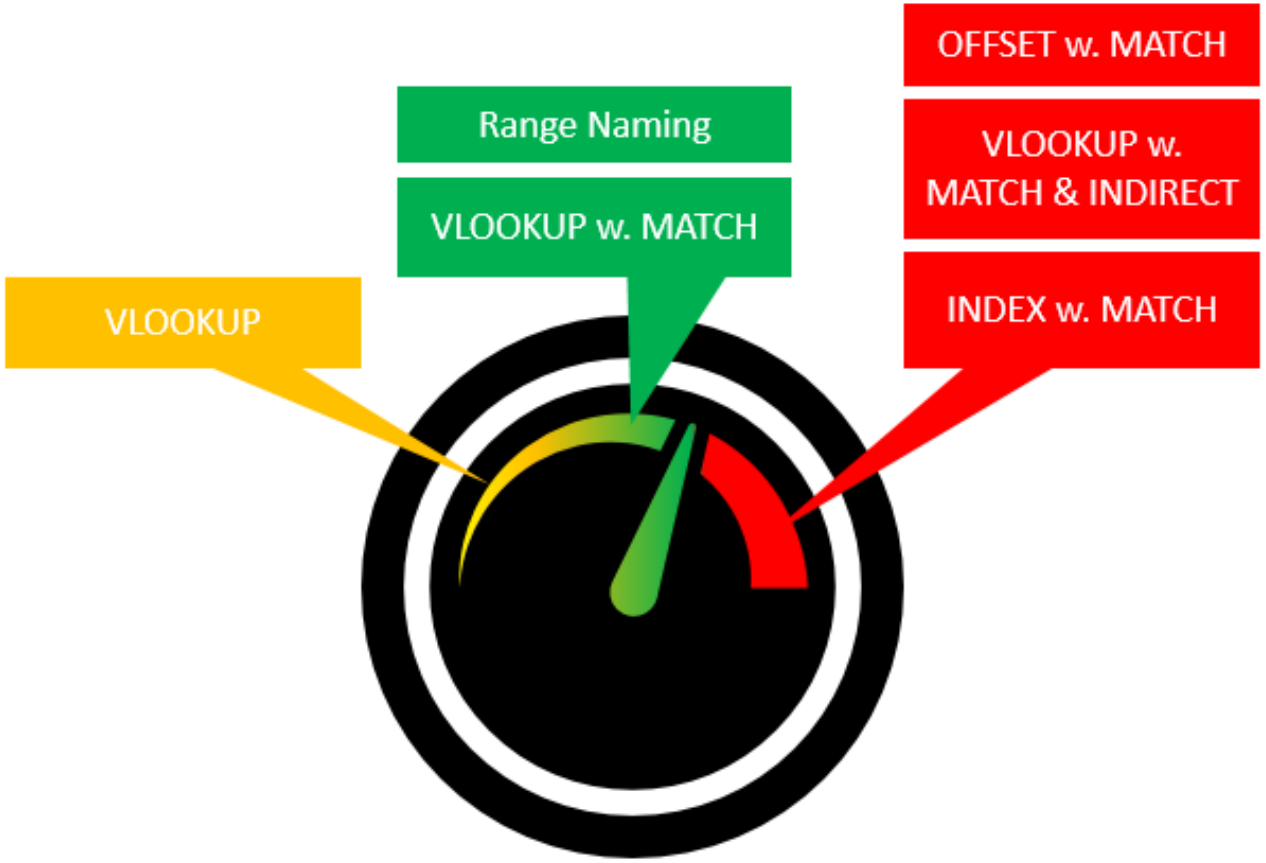




–	Row Fixed&Col Fixed	Row Fixed	Col FixedCol Fixed
A1 becomes B1 if copied **sideways (right)**	$A$1 remains $A$1 if copied **sideways**	A$1 becomes B$1 if copied **sideways (right)**	$A1 remains $A1 if copied **sideways**
A1 becomes A2 if copied **downwards**	$A$1 remains $A$1 if copied **downwards**	A$1 remains A$1 if copied **downwards**	$A1 becomes $A2 if copied **downwards**

05 | Lookup Formulas

Overview of Lookup formulas



Further reading – XLOOKUP

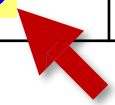
What is VLOOKUP?

When you are looking up for a name (ID) in a list (top to down), then it's a vertical lookup (VLOOKUP)

Step 1 – Whose details are you looking for?

SN	ID	Name	Score
01	1222	Karl	76
02	2134	Jenny	56
03	2111	Sam	42
04	2199	John	71
05	1221	Carol	92
06	1009	Ray	62

ID	Score
2199	?



lookup_value

Step 2 – Which table will you find the details in?

SN	ID	Name	Score
01	1222	Karl	76
02	2134	Jenny	56
03	2111	Sam	42
04	2199	John	71
05	1221	Carol	92
06	1009	Ray	62

***table_array* with ID as 1st column**

ID	Score
2199	?

lookup_value

Step 3 – Which column of the table will you find the details in?

SN	ID	Name	Score
01	1222	Karl	76
02	2134	Jenny	56
03	2111	Sam	42
04	2199	John	71
05	1221	Carol	92
06	1009	Ray	62

3

col_index_num

ID	Score
2199	?

lookup_value

table_array with ID as 1st column

Step 4 – False or True?

SN	ID	Name	Score
01	1222	Karl	76
02	2134	Jenny	56
03	2111	Sam	42
04	2199	John	**71**
05	1221	Carol	92
06	1009	Ray	62

3

col_index_num

ID	Score
2199	**71**

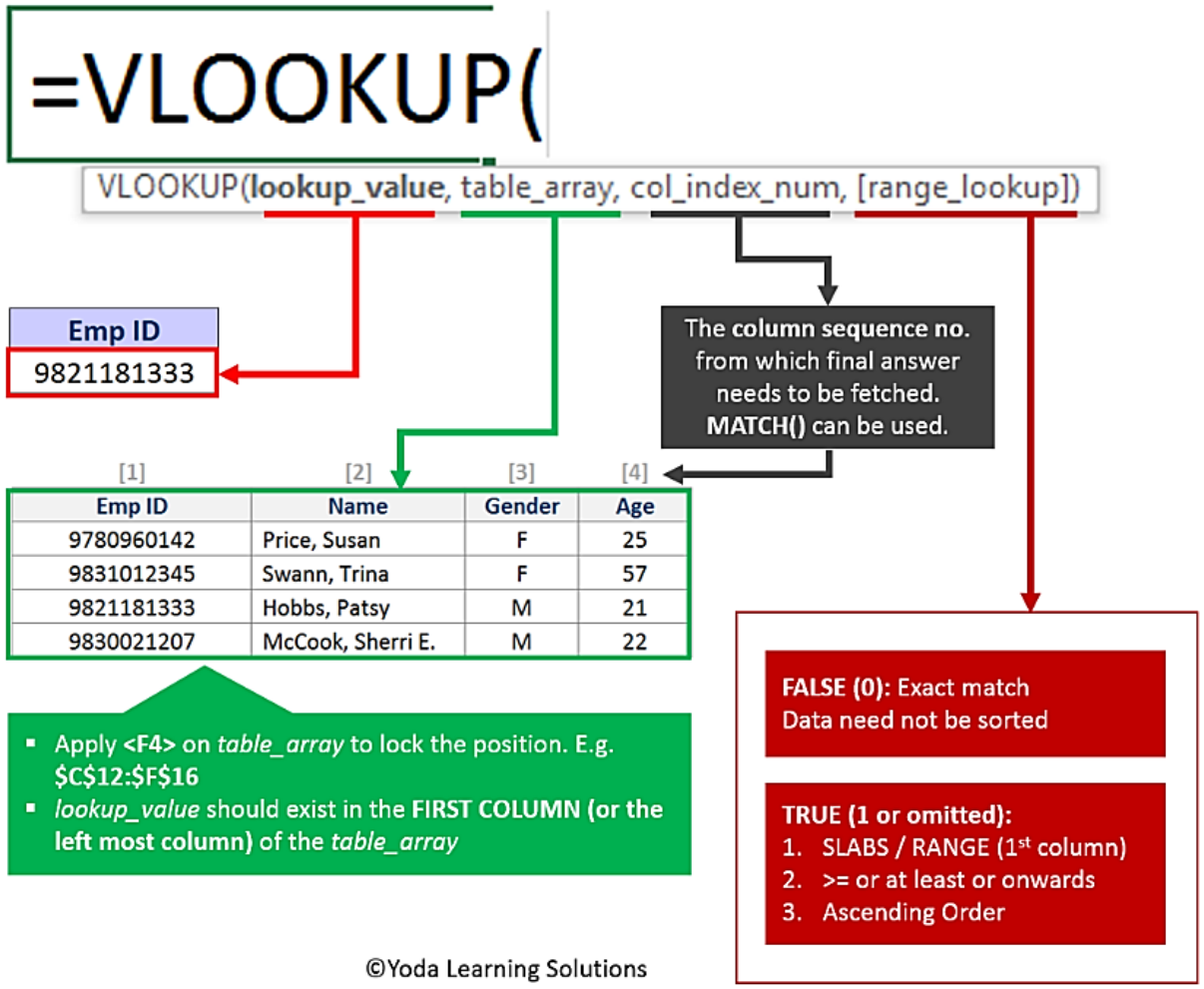
lookup_value

table_array with ID as 1st column

- **FALSE (0) is for EXACT match**
- TRUE (1) is for SLABS cases…

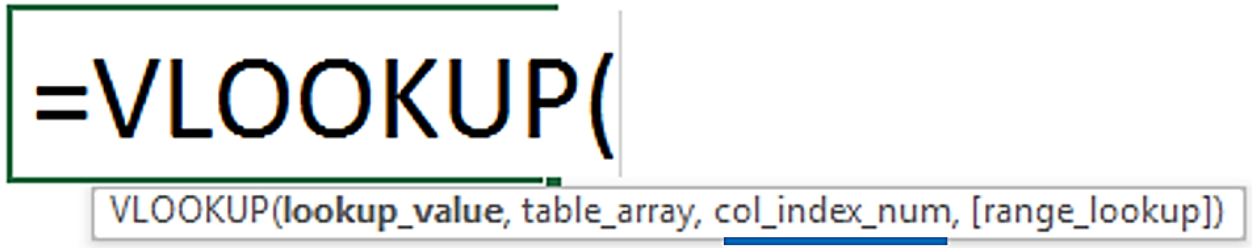
  to be discussed later

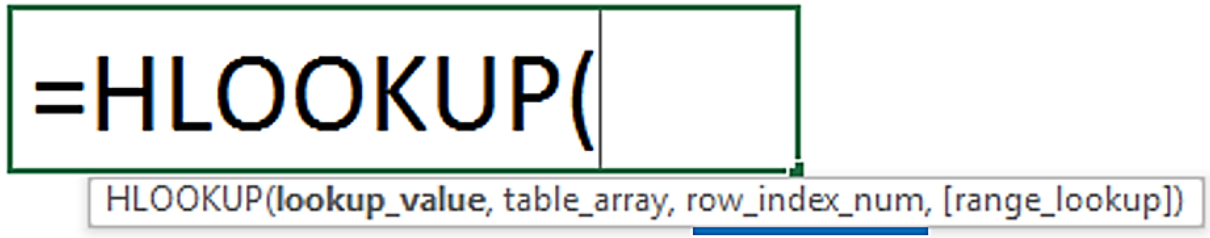
VLOOKUP Summarized



- "lookup_value" should be in the same format as the values stored in the first column of the selected "table_array"
- **Detect format using:** ISNUMBER(), ISTEXT(), LEN()
- **Rectify format of 'nos. stored as text'** – VALUE(), Text-to-Columns (Step 3/3) – General
- Avoid pressing F2 & Enter continuously on individual cells to update the format manually

HLOOKUP() vs. VLOOKUP()





Use VLOOKUP with TRUE when 3 conditions met

- Values of **slabs** (0-10, 11-30, etc.) are re-arranged in …
- an **ascending** order, and where each of these value are read as…
- **at least (>=)**

=VLOOKUP(E5,$A$1:$C$7,2,True)

VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])

TRUE - Approximate match
FALSE - Exact match

Remember: TRUE or 1 DOES NOT mean *Approximate match*

Example: Let's say you scored 77.

%	Grades
93.00 - 100	A
91.00 - 92.99	A -
83.33 - 90.99	B +
79.00 - 83.32	B
76.67 - 78.99	B -
73.33 - 76.66	C +
70.00 - 73.32	C
66.67 - 69.99	C -
63.33 - 66.66	D +
60.00 - 63.32	D
56.67 - 59.99	D -
0.00 - 56.66	F

What grade will you receive?

Which formula will you prefer to write - 1 or 2?

%	Grades
93.00 - 100	A
91.00 - 92.99	A -
83.33 - 90.99	B +
79.00 - 83.32	B
76.67 - 78.99	B -
73.33 - 76.66	C +
70.00 - 73.32	C
66.67 - 69.99	C -
63.33 - 66.66	D +
60.00 - 63.32	D
56.67 - 59.99	D -
0.00 - 56.66	F

1

```
=IF(K5>92.99,"A, 4.00",IF(K5>90.99,"A-, 3.67",IF(K5>83.32,"B+, 3.33",IF(K5>78.99, "B, 3.00",IF(K5>76.66,"B-, 2.67",IF(K5> 73.32,"C+, 2.33",IF(K5>69.99,"C, 2.00",IF( K5>66.66,"C-, 1.67","D+, 1.33")))))))))
```

OR

2

```
=VLOOKUP(K8,$W$9:$X$21,2,1)
```

Convert table format (left → right)

%	Grades
93.00 - 100	A
91.00 - 92.99	A -
83.33 - 90.99	B +
79.00 - 83.32	B
76.67 - 78.99	B -
73.33 - 76.66	C +
70.00 - 73.32	C
66.67 - 69.99	C -
63.33 - 66.66	D +
60.00 - 63.32	D
56.67 - 59.99	D -
0.00 - 56.66	F

% >=	Grades
0	F
56.67	D -
60.00	D
63.33	D +
66.67	C -
70.00	C
73.33	C +
76.67	B -
79.00	B
83.33	B +
91.00	A -
93.00	A

- Values of **slabs** (0-10, 11-30, etc.) are re-arranged in ...
- an **ascending** order, and where each of these value are read as...
- **at least (>=)**

```
=VLOOKUP(K8,$W$9:$X$21,2,1)
```

Let’s take a simpler example to understand…

Case Study

- **Situation:** The table to assign the grade (A+ to E) based on the scores (0 to 5) have been provided.
- **Complexity:** To calculate the correct grade, it will take a complex Nested IF statement.

Ratings Range	Grade
0-3	E
3.1 to 3.5	D
3.6 to 4.0	C
4.1 to 4.5	B
4.6 to 4.9	A
5	A+

	A	B	C	D
1				
2	**Name**	AbduSalaam, Ismael		
3	**Rating**	3.5		
4	**Grade**	=IF(B3<3.1,"E",IF(B3<3.6,"D",IF(B3<4.1,"C",		
5		IF(B3<4.6,"B",IF(B3<5,"A","A+")))))		

Complex nested IF statement

... cont'd

- **Solution:** Use VLOOKUP with TRUE

1. Create a new column with ratings range (number) arranged in an **ascending order** and where every value is read top to down with the meaning of **>=**

Ratings Range	Grade
0-3	E
3.1 to 3.5	D
3.6 to 4.0	C
4.1 to 4.5	B
4.6 to 4.9	A
5	A+

	F	G	H
1			
2			© YL Academy
1	>=	Ratings Range	Grade
4	0	0-3	E
5	3.1	3.1 to 3.5	D
6	3.6	3.6 to 4.0	C
7	4.1	4.1 to 4.5	B
8	4.6	4.6 to 4.9	A
9	5	5	A+
10			

... cont'd

2. Use VLOOKUP with TRUE

Applications: VLookup() with "True"

Name	Rating	Grade
AbduSalaam, Ismael	3.5	=VLOOKUP(C4,$F$4:$H$9,3,TRUE)
Abney, Jeffery	3.9	C
Adams, Jennifer M	3.7	C

2

TRUE means 1

>=	Ratings Range	Grade
0	0-3	E
3.1	3.1 to 3.5	D
3.6	3.6 to 4.0	C
4.1	4.1 to 4.5	B
4.6	4.6 to 4.9	A
5	5	A+

Values of **slabs** (0-10, 11-30, etc.) are re-arranged in an **ascending** order, and where each of these value are read as **at least (>=)**

Real-life use cases of VLOOKUP with TRUE

[Simple score grading]

%	Grades
0 - 39	Fail
40 - 79	Pass
80 - 99	Scholar
100	Hall of Fame

% >=	Grades
0	Fail
40	Pass
80	Scholar
100	Hall of Fame

[Debtors' ageing]

Overdue Days	Risk-level
0 - 30	L1
31 - 60	L2
61 - 90	L3
91 - 180	L4
>180	L5

% >=	Overdue Days	Risk-level
0	0 - 30	L1
31	31 - 60	L2
61	61 - 90	L3
91	91 - 180	L4
181	>180	L5

[Dates]

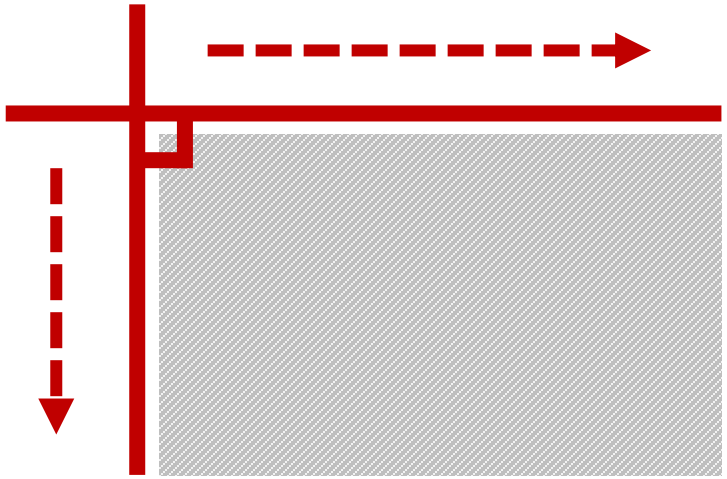
Effective time period	Tax Rate (%)
01-Apr-2012 to 31-May-2015	12.36
01-Jun-2015 to 14-Nov-2015	14.00
15-Nov-2015 to 31-May-2016	14.50
01-Jun-2016 to 30-Jun-2017	15.00
01-Jul-2017 onwards	18.00

Effective from (WEF) >=	Tax Rate (%)
01-Apr-2012	12.36
01-Jun-2015	14.00
15-Nov-2015	14.50
01-Jun-2016	15.00
01-Jul-2017	18.00

Why 2-D Lookup?

VLOOKUP() with MATCH()

2-D Lookup – When you have to pull a value from a cross-tab or pivoted table using two inputs



Product Name	Product 1
Location	London
Price	

Price List:

	Amsterdam	London	New York
Product 1	4,500	4,000	4,250
Product 2	3,400	2,800	3,500
Product 3	10,300	9,400	9,850
Product 4	450	400	458
Product 5	6,700	5,786	7,000

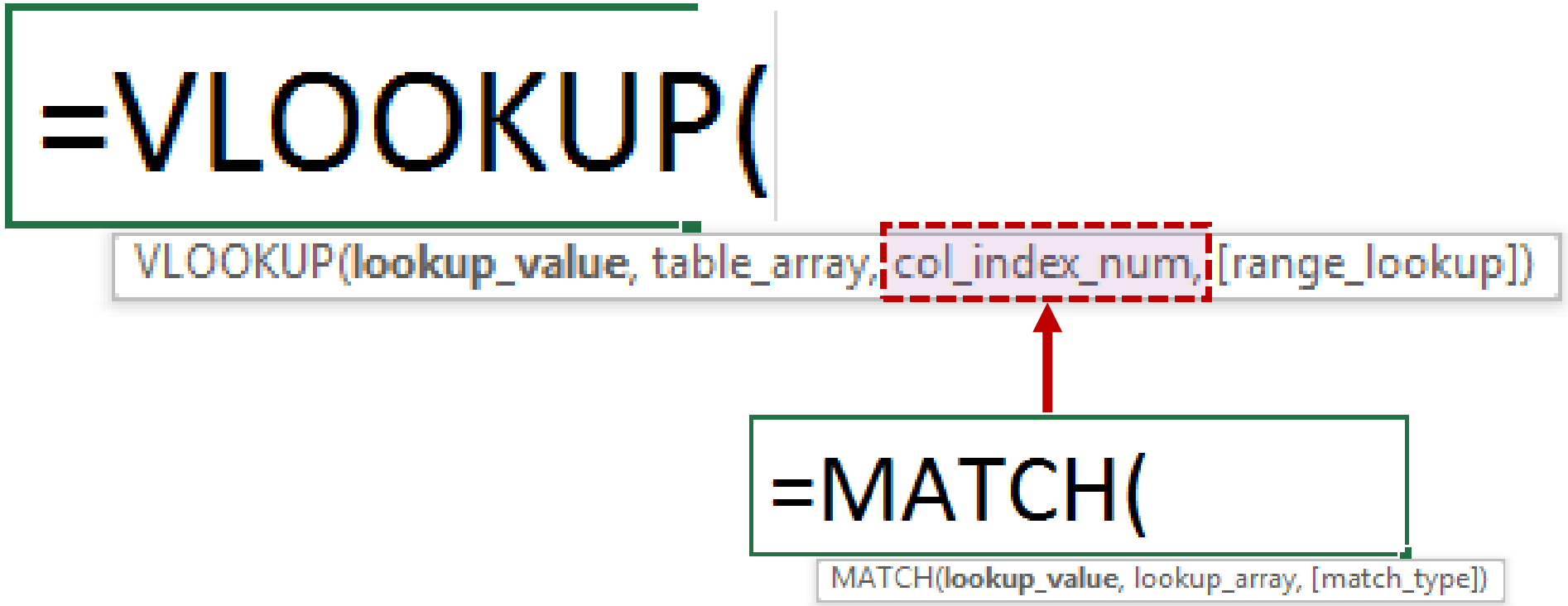
Option 1: Complex Nested IFs

Product Name	Product 1
Location	London
Price	=IF(AND(C3="Product 1",C4="London"),4000,IF(AND(

Price List:

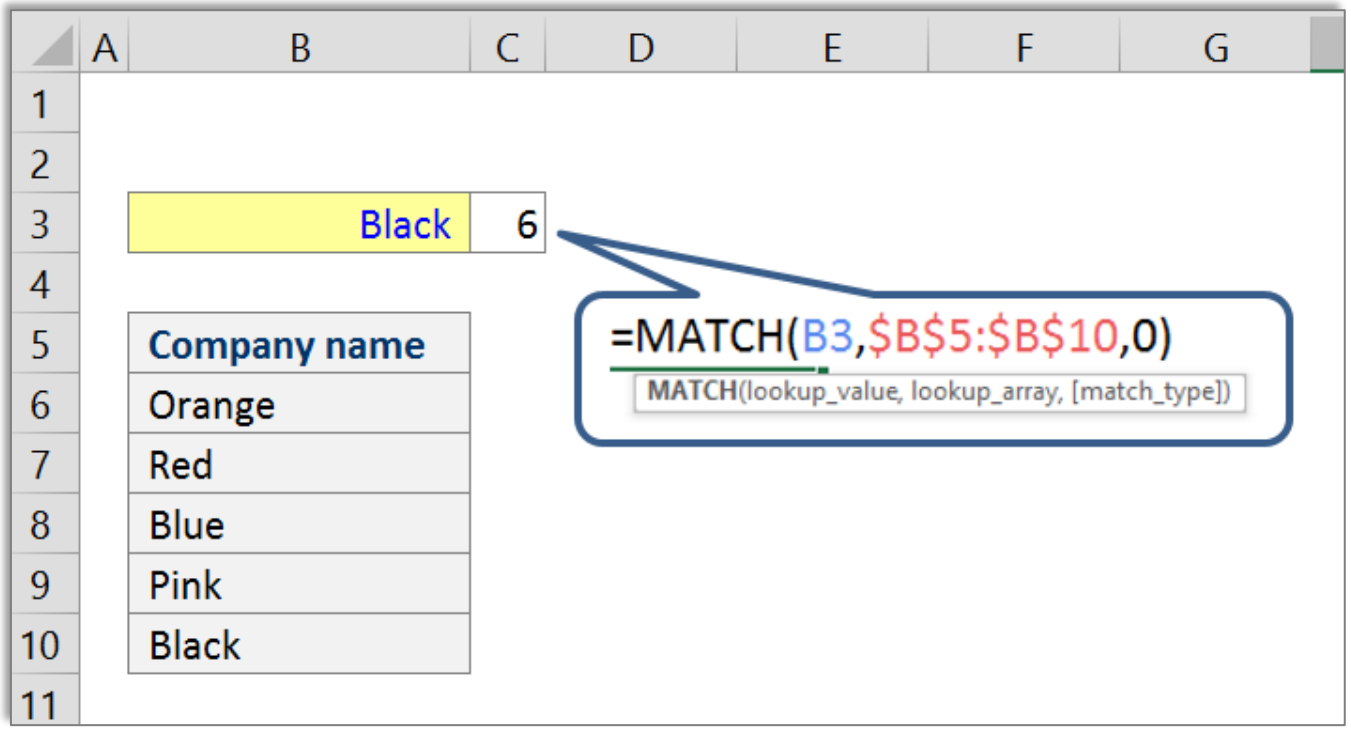
	Amsterdam	London	New York
Product 1	4,500	4,000	4,250
Product 2	3,400	2,800	3,500
Product 3	10,300	9,400	9,850
Product 4	450	400	458
Product 5	6,700	5,786	7,000

Option 2: VLOOKUP + MATCH



MATCH function assists VLOOKUP in finding the position no. (col_index_num)

MATCH() – Basics & match_type: -1 vs. 0 vs. 1



[MATCH helps count the **position number** (1st, 2nd, 3rd…) in a **one-dimensional data range**]

MATCH() with 1	MATCH() with -1
• Slab • with values in ascending order • Greater than equal to (>=)	• Slab • with values in descending order • Less than equal to (<=)

The chemistry between VLOOKUP & MATCH…

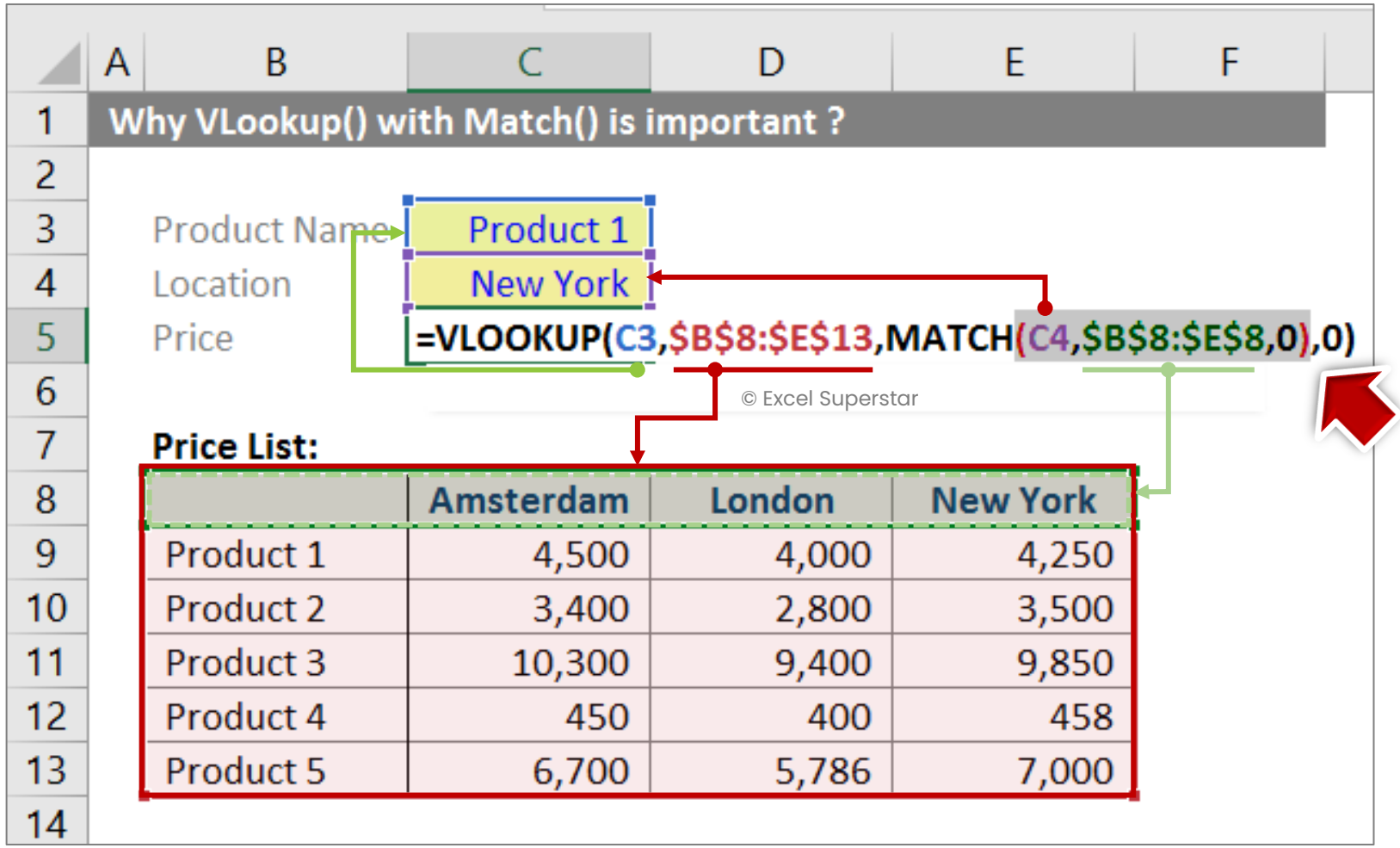
VLOOKUP() is the ***senior*** here

Emp ID	Name	Gender	Age
9780960142	Price, Susan	F	25
9831012345	Swann, Trina	F	57
9821181333	Hobbs, Patsy	M	21
9830021207	McCook, Sherri E.	M	22

Junior (header) follows Senior (table)

MATCH() is the ***junior*** here

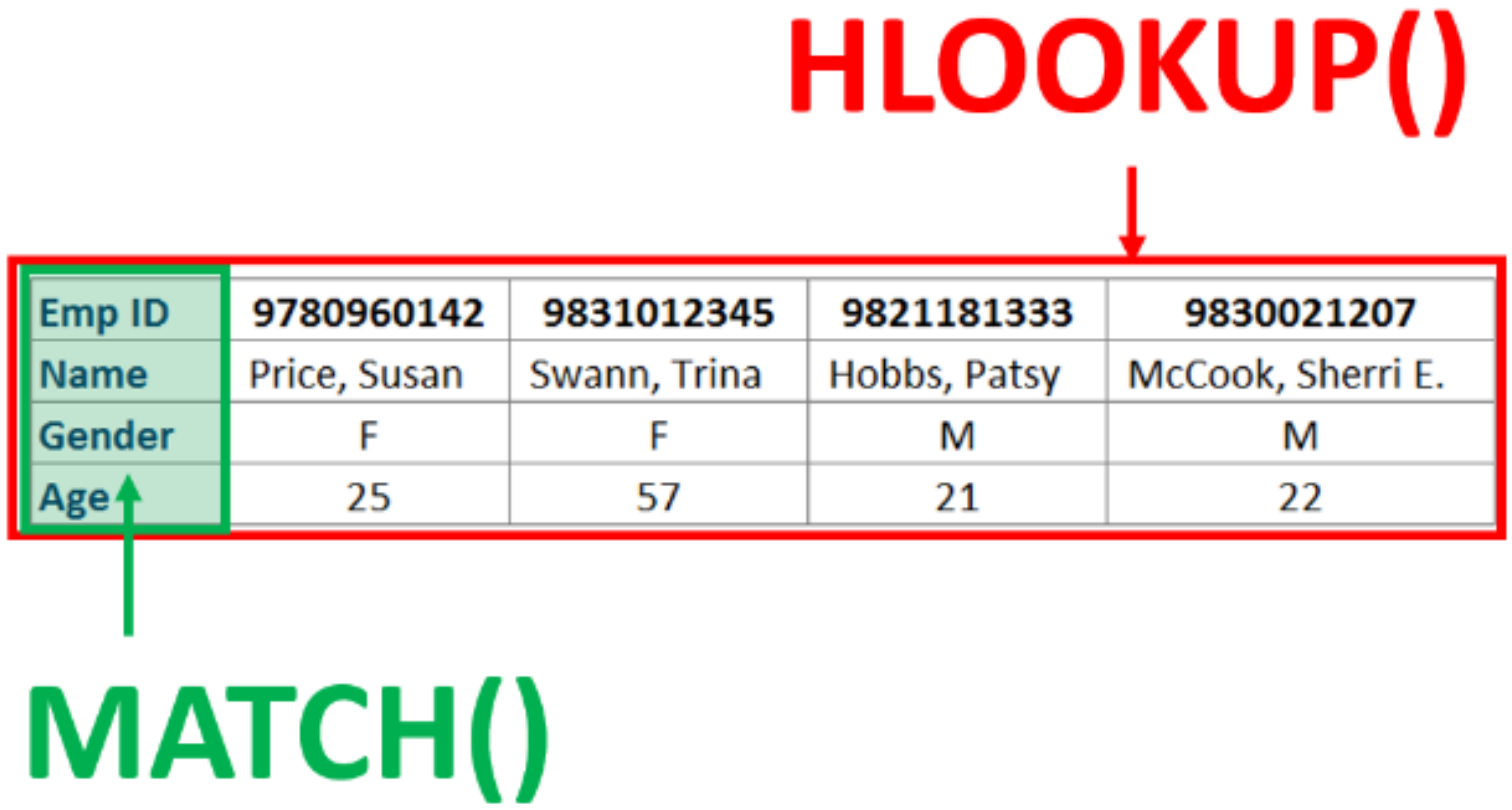
How VLOOKUP & MATCH look like when they are together?



0 (zero) for exact match.

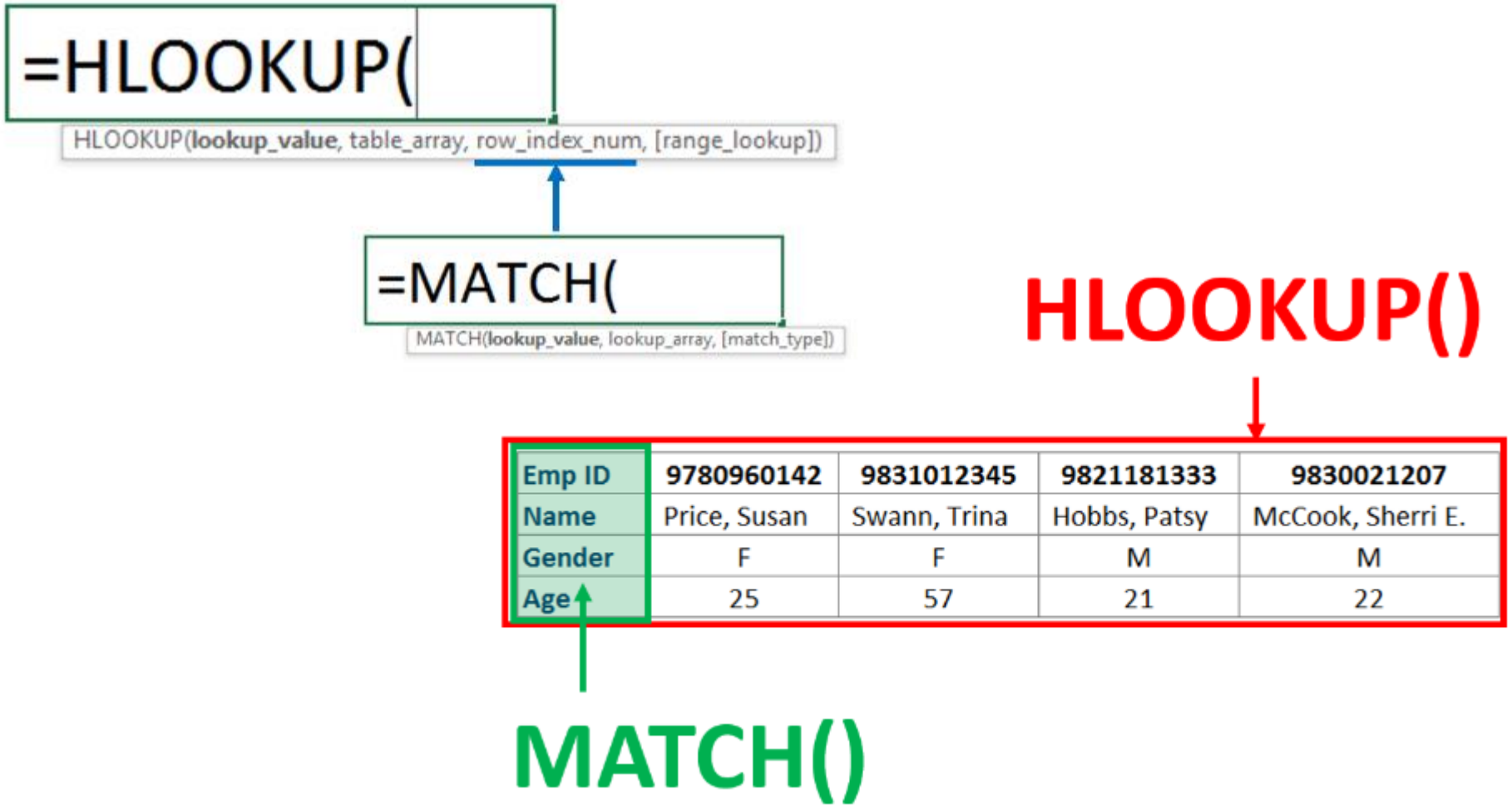
How HLOOKUP & MATCH look like?

```
=HLOOKUP(H2,$A$2:$E$5,MATCH(G1,$A$2:$A$5,0),0)
```



Emp ID	9780960142	9831012345	9821181333	9830021207
Name	Price, Susan	Swann, Trina	Hobbs, Patsy	McCook, Sherri E.
Gender	F	F	M	M
Age	25	57	21	22

Bonus: HLOOKUP (senior) with MATCH (junior)

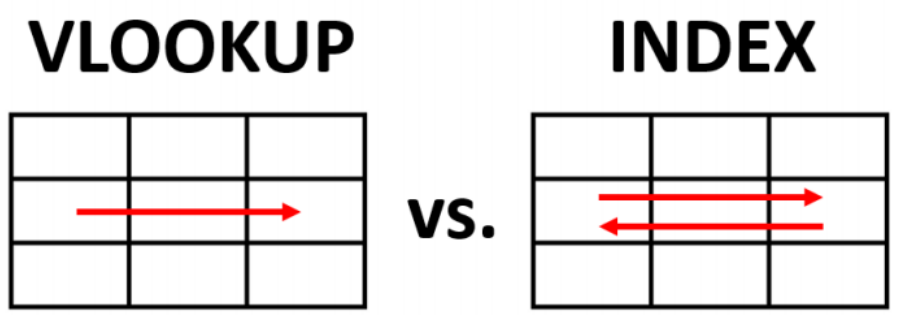


Emp ID	9780960142	9831012345	9821181333	9830021207
Name	Price, Susan	Swann, Trina	Hobbs, Patsy	McCook, Sherri E.
Gender	F	F	M	M
Age	25	57	21	22

Why reverse Lookup?

INDEX() with MATCH()

Reverse Lookup - INDEX() w. MATCH()



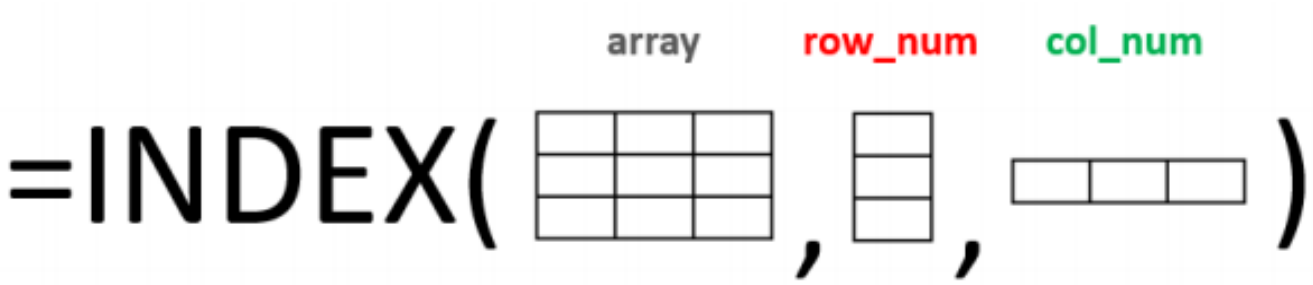
VLOOKUP cannot look left-side.

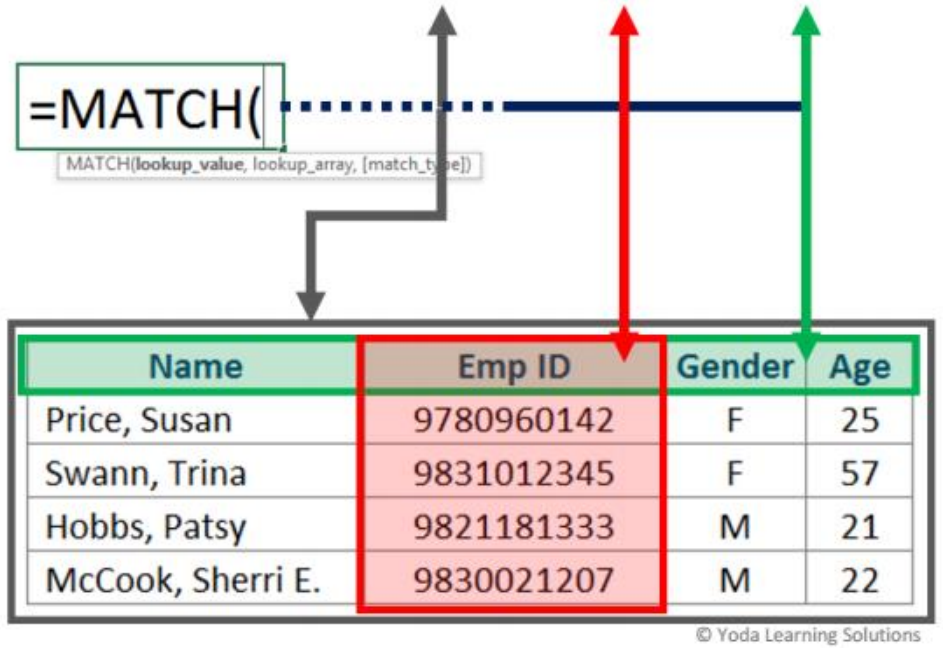
Product Name	Product 1	
Location	NCR	
	???	

Mumbai	Product Name	NCR
4,500	Product 1	4,000
3,400	Product 2	2,800
10,300	Product 3	9,400
450	Product 4	400
6,700	Product 5	5,786

IMM vs VM: Both VM and IMM approaches are useful for pulling data from any 2x2 data matrix. However, IMM is useful for reverse Lookup. Unlike VM, IMM doesn't require the common link values to be in the left-most column of the database.

Formula for INDEX() & MATCH() - simplified

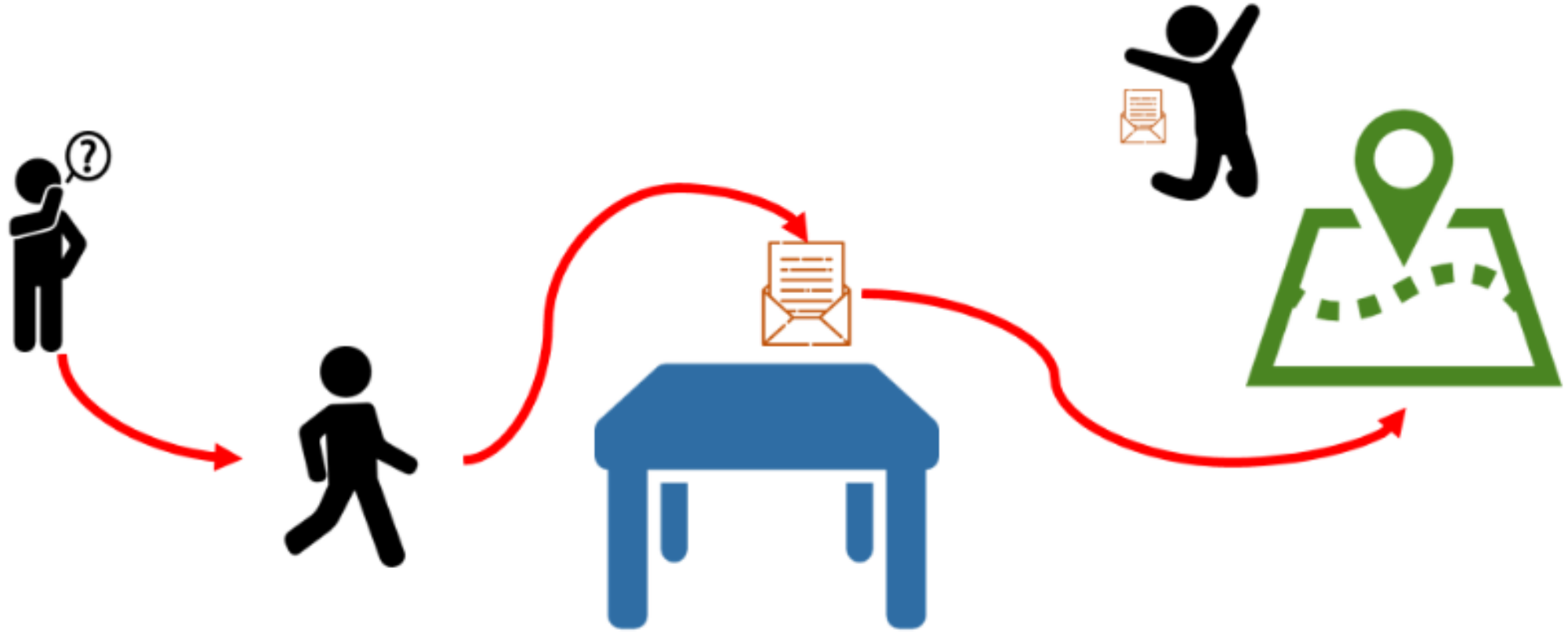




VLOOKUP's parameter

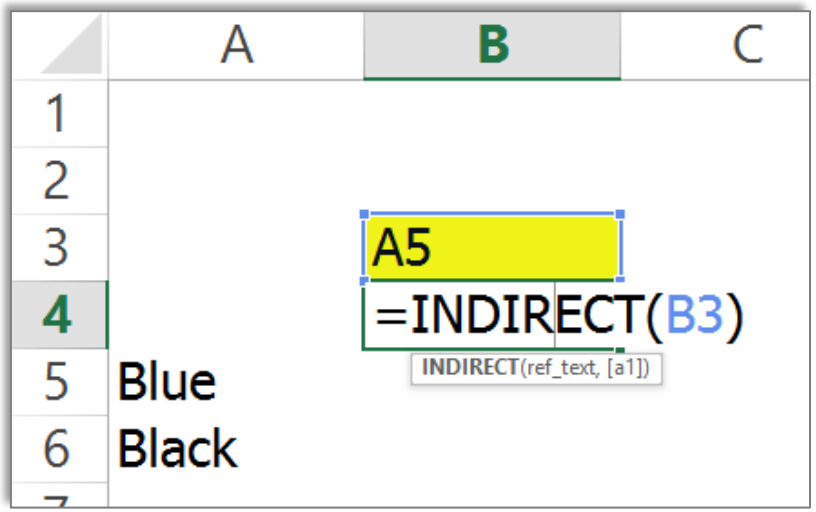
col_index_num cannot be **-1**

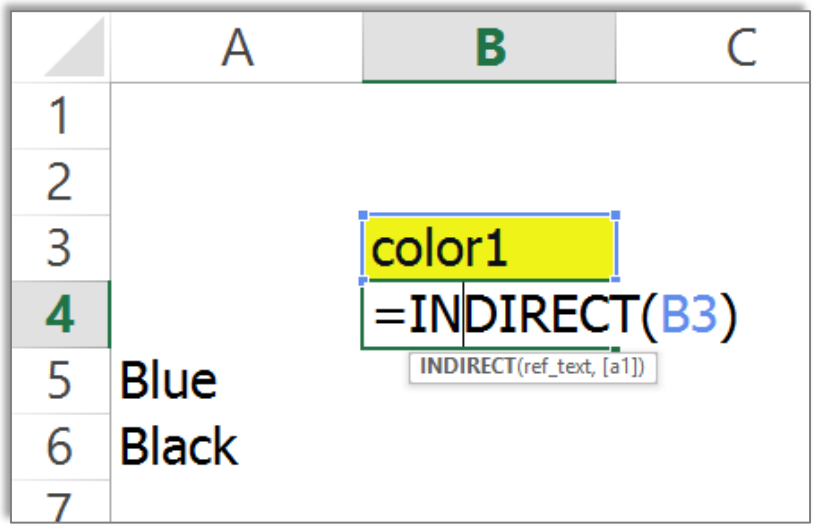
INDIRECT() – Applications ["RE-DIRECTION"]



INDIRECT() basics - with Range Naming

INDIRECT() w. cell reference	INDIRECT() w. named range



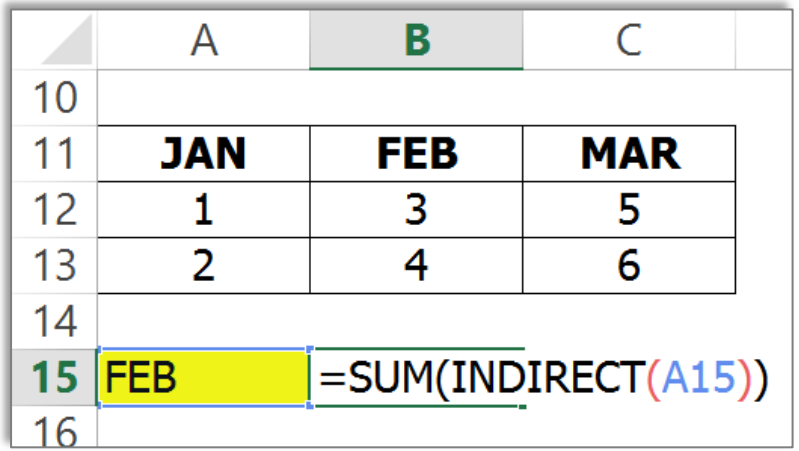


Solution in cell B4 is Blue

Note:

- Use INDIRECT when you want to change the reference to a cell within a formula without changing the formula itself.
- Named Cell/Range can be used as an input for INDIRECT
- Often used to create 3D Lookup formulas along with VLookup + Match
- INDIRECT() is used for references within the SAME workbook. Cross-linking different workbook is best avoided as it works only when all relevant workbooks are open - Yields a #REF! error if not done so.

Example:

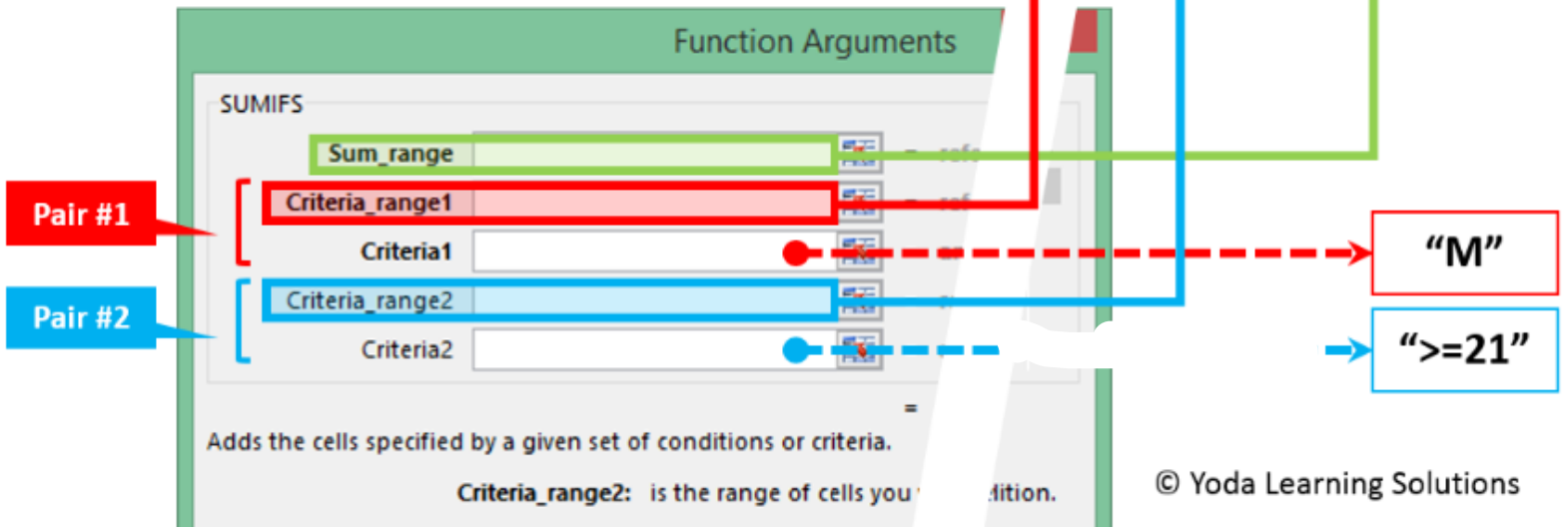


06 | Conditional math formulas

SUMIFS() - Conditional Summation

=SUMIFS()

Name	Gender	Age	Stipend
Price, Susan	F	25	$ 10,000
Swann, Trina	F	57	$ 12,000
Hobbs, Patsy	M	21	$ 8,000 ✓
McCook, Sherri E.	M	22	$ 20,000 ✓



Solution:

28,000 i.e., 8,000 + 20,000

Note:

(1) Use <F4> to lock *Criteria_range* & *Sum_range*

(2) Maintain SAME HEIGHT for all the RANGES

(3) SUMIFS can accept multiple criteria (127 !) whereas SUMIF can accept only one

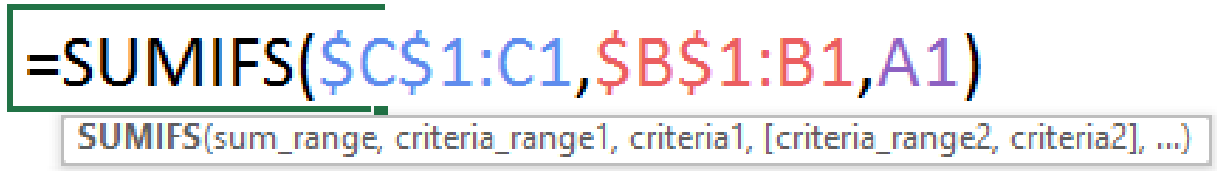
SUMIFS() – Operator for a date range

- If cell A1 contains “21-May-2001”, then the *Criteria_1* can be **“>=”&A1** indicating date 21-May-2001 onwards.
- The operators (> < = etc.) has to be enclosed in a pair of double-quotes and concatenated (&) with the cell reference containing valid date(s).

- For a date range, i.e., between {date1} and {date2}, two criteria will be needed. (1) >=date1 and (2) <=date2

SUMIFS() - ID based running total

- Careful use of relative references ($) can help yield **differential cumulative running total.** E.g., start of the range has been locked using <F4> -



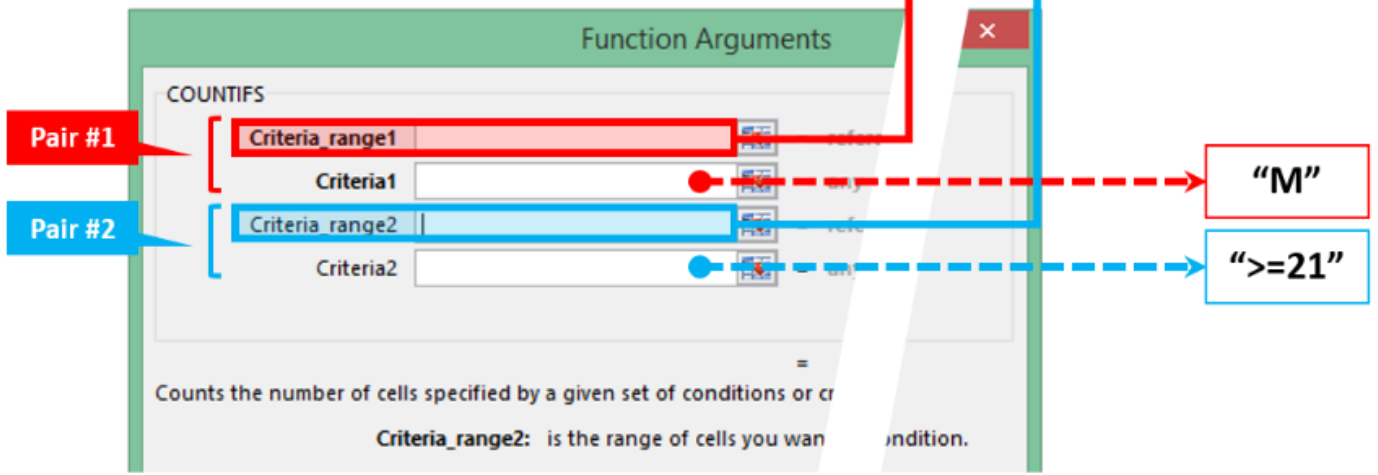
  - *C1:C1 refers to sum_range*
  - *B1:B1 refers to criteria_range*
  - *A1 refers to criteria*

COUNTIFS() - Conditional Counting

=COUNTIFS()

Name	Gender	Age	Stipend
Price, Susan	F	25	$ 10,000
Swann, Trina	F	57	$ 12,000
Hobbs, Patsy	M	21	$ 8,000 ✓
McCook, Sherri E.	M	22	$ 20,000 ✓

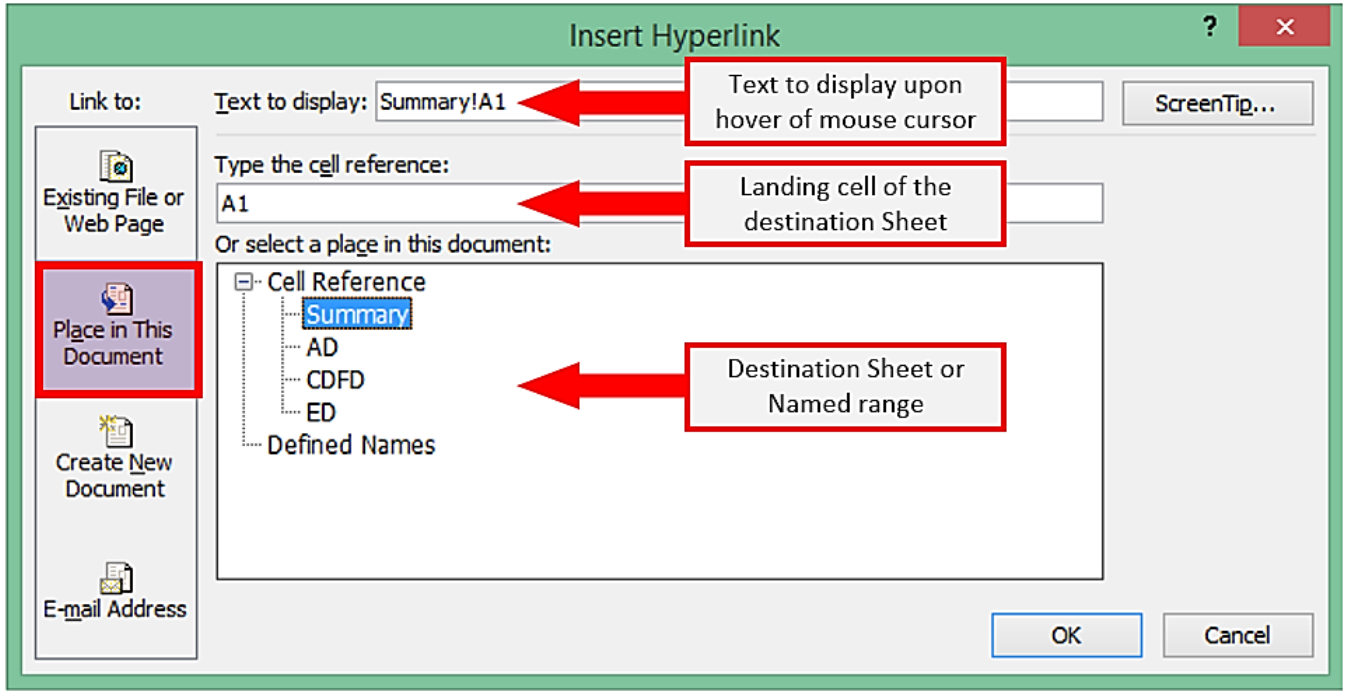
Solution: 2



- Used for 2-way list-reconciliation and duplicate counting. E.g., **=COUNTIFS($A$1:$A$100,A1)**
- Used for Instance No./Occurrence No. **=COUNTIFS($A$1:A1,A1)** – a name appearing 1st time, 2nd time…

07 | Misc. Formulas

Hyperlinking (Ctrl + K)



- **Example:** =HYPERLINK("http://www.yodalearning.com", "Click here for Excel Tricks")
- For more details, refer Microsoft Excel help