Excel 1

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CONTENTS

- IF, NESTED IF
- MID,LEFT, RIGHT
- AND, OR
- SUM, AVERAGE, MIN, MAX, COUNT, COUNTIF, COUNTA, COUNTIFS

The IF function

- The ***IF*** function is a logical function used for making decisions based on some condition(s)
- Conditions have to result in Boolean values. (relational expressions, true/false)

The IF function syntax

=IF(**logical_test**, **value_if_true**, ***value_if_false***)

The IF function has 3 arguments - the first 2 are required

- ***First argument*: is any value or expression that can be evaluated to TRUE or FALSE ⇨ Condition**
- ***Second argument:* the value that is returned if *logical_test* is TRUE (then)**
- ***Third argument:* the value that is returned if *logical_test* is FALSE (else) – *this argument is optional***

IF with relational expressions as conditions

	A	B	C	D	E
1		MT1	MT2	Final	*Total*
2	Possible points	100	100	200	400
3					
4	Blue	79	89	169	337
5	Jones	85	65	195	345
6	Grey	60	97	187	344
7					
8	*Max*	85	97	195	345

- Write a formula in cell F4 to determine if Blue passed or failed (a minimum of 300 points is required to pass)

  =IF(**E4>=300**, **"pass", "fail"**) or IF(**E4<300**, **"fail", "pass"**)

- Write a formula in cell G4 to determine Blue's curved grade. If the grade is below 150 add 10%, if the grade is 150 or above the grade remains the same

  =IF(**E4<150**, **E4*1.1, E4**)

Nested IF Example

Write a formula in cell F4: ***If Blue has at least 350 points he gets an "A" , if he has less than 350 points but at least 300 points he gets a "B", otherwise he gets a "C"***

	A	B	C	D	E
1		MT1	MT2	Final	*Total*
2	Possible points	100	100	200	400
3					
4	Blue	79	89	169	337
5	Jones	85	65	195	345
6	Grey	60	97	187	344
7					
8	*Max*	85	97	195	345

=IF(E4>=350, "A", IF(E4>=300, "B", "C"))

1st logical test

Value-if-True

Value-if-False is a nested If

AND

- **Purpose:**
  - Returns either TRUE or FALSE
  - Returns TRUE if all of its arguments are TRUE and it returns FALSE if any of its arguments are FALSE
- **Syntax:**

=AND(logical1, [logical2],…)

- **Arguments:**
  - *logical1, [logical2],…* : Logical conditions used to evaluate the return value of AND function

EXAMPLE

	A	B	C	D
1	**Make**	**Model**	**Color**	**Requests**
2	Lincoln	Town Car	Yellow	2
3	Hummer	H1	Purple	1
4	Toyota	RAV4	Blue	10
5	Ford	Galaxie	Yellow	6
6	Honda	Odyssey	Yellow	3
7	Maybach	57	White	8
8	Mercedes-Benz	S-Class	Black	6
9	Mercedes-Benz	SLK-Class	Green	10
10	Dodge	Challenger	Blue	4
11	Mitsubishi	Galant	Blue	1
12	Buick	Coachbuilder	Yellow	8
13	Lincoln	Town Car	Purple	4
14	Land Rover	Discovery	White	8
15	Dodge	Ram Van 2500	Black	10

AND

	C	D	
	Color	**Requests**	
	Yellow	2	
	Purple	1	
	Blue	10	
	Yellow	6	
	Yellow	3	
	White	8	
	Black	6	
	Green	10	
	Blue	4	
	Blue	1	
	Yellow	8	
	Purple	4	
	White	8	
	Black	10	

Write a function to see which rows contain *Blue cars with high request*

Color: Blue

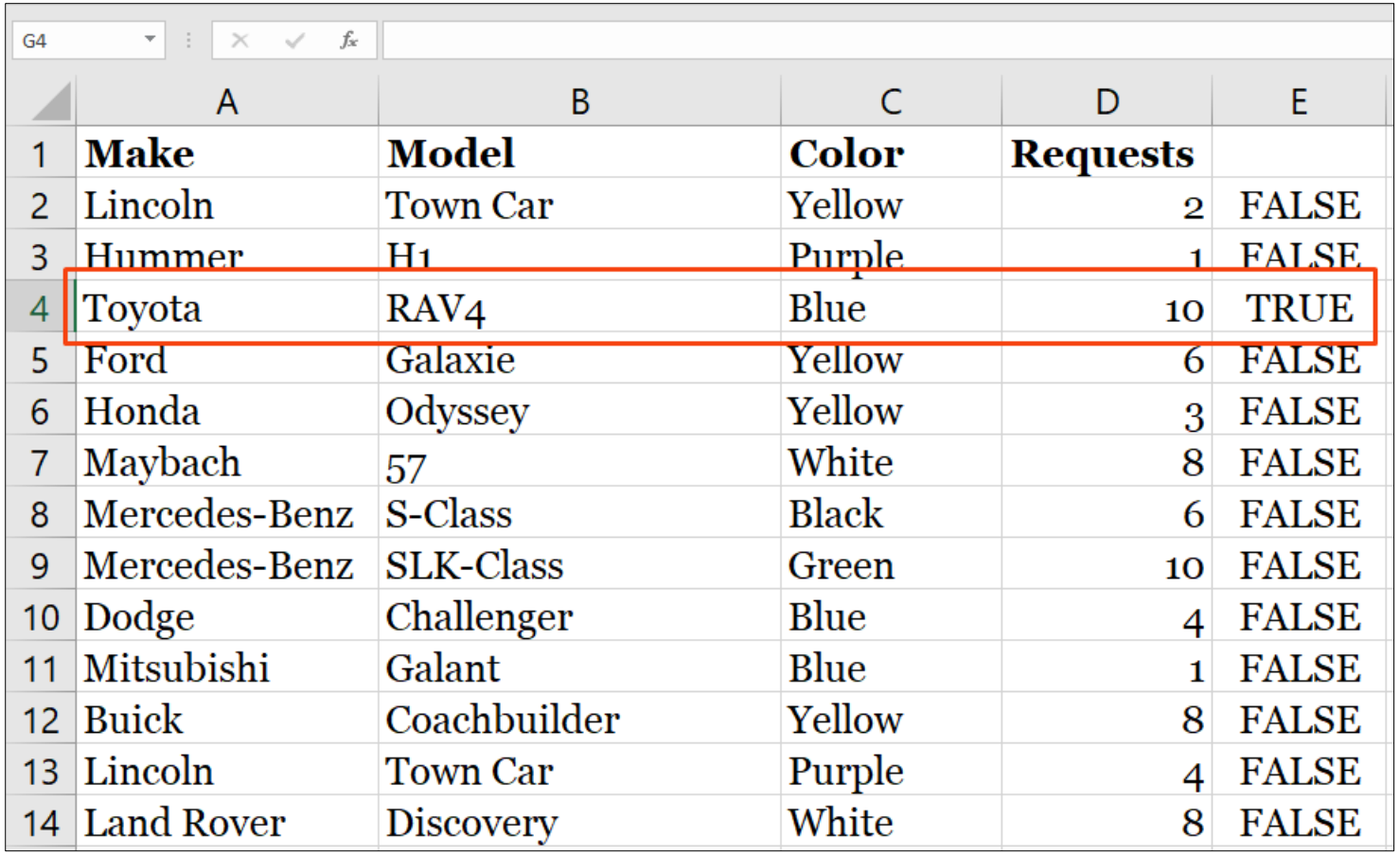
Requests: >6

AND

	C	D	E	F	G
	Color	**Requests**			
	Yellow	2	=AND(C2="Blue", D2>6)		
	Purple	1			
	Blue	10			
	Yellow	6			
	Yellow	3			
	White	8			
	Black	6			
	Green	10			
	Blue	4			
	Blue	1			
	Yellow	8			
	Purple	4			

=AND(C2=“Blue”,D2>6)

AND



	A	B	C	D	E
1	**Make**	**Model**	**Color**	**Requests**	
2	Lincoln	Town Car	Yellow	2	FALSE
3	Hummer	H1	Purple	1	FALSE
4	Toyota	RAV4	Blue	10	TRUE
5	Ford	Galaxie	Yellow	6	FALSE
6	Honda	Odyssey	Yellow	3	FALSE
7	Maybach	57	White	8	FALSE
8	Mercedes-Benz	S-Class	Black	6	FALSE
9	Mercedes-Benz	SLK-Class	Green	10	FALSE
10	Dodge	Challenger	Blue	4	FALSE
11	Mitsubishi	Galant	Blue	1	FALSE
12	Buick	Coachbuilder	Yellow	8	FALSE
13	Lincoln	Town Car	Purple	4	FALSE
14	Land Rover	Discovery	White	8	FALSE

OR

- **Purpose:**
  - Returns either TRUE or FALSE
  - Returns TRUE if any of its arguments are TRUE and returns FALSE if all of its arguments are FALSE
- **Syntax:**

=OR(logical1, [logical2],…)

- **Arguments:**
  - *logical1, [logical2],…* : Logical conditions used to evaluate the return value of OR function

OR

	A	B	C
1	**Make**		**Color**
2	Lincoln		Yellow
3	Hummer		Purple
4	Toyota		Blue
5	Ford		Yellow
6	Honda		Yellow
7	Maybach		White
8	Mercedes-Benz		Black
9	Mercedes-Benz		Green
10	Dodge		Blue
11	Mitsubishi		Blue
12	Buick		Yellow
13	Lincoln		Purple
14	Land Rover		White
15	Dodge		Black

Write a function to see which rows contain *Ford or Blue* cars

Make: Ford

Color: Blue

OR

E2 =OR(A2="Ford", C2="Blue")

	A	B	C	D	E	F	G
1	**Make**	**Model**	**Color**	**Requests**			
2	Lincoln	Town Car	Yellow	2	=OR(A2="Ford", C2="Blue")		
3	Hummer	H1	Purple	1			
4	Toyota	RAV4	Blue	10			
5	Ford	Galaxie	Yellow	6			
6	Honda	Odyssey	Yellow	3			
7	Maybach	57	White	8			
8	Mercedes-Benz	S-Class	Black	6			
9	Mercedes-Benz	SLK-Class	Green	10			
10	Dodge	Challenger	Blue	4			
11	Mitsubishi	Galant	Blue	1			
12	Buick	Coachbuilder	Yellow	8			
13	Lincoln	Town Car	Purple	4			

=OR(A2="Ford",C2="Blue")

OR

	A	B	C	D	E
1	**Make**	**Model**	**Color**	**Requests**	
2	Lincoln	Town Car	Yellow	2	FALSE
3	Hummer	H1	Purple	1	FALSE
4	Toyota	RAV4	Blue	10	TRUE
5	Ford	Galaxie	Yellow	6	TRUE
6	Honda	Odyssey	Yellow	3	FALSE
7	Maybach	57	White	8	FALSE

USING AND & OR TOGETHER

C	D
Color	**Requests**
Yellow	2
Purple	1
Blue	10
Yellow	6
Yellow	3
White	8
Black	6
Green	10
Blue	4
Blue	1
Yellow	8
Purple	4
White	8
Black	10

Write a function to see which rows contain *Blue or Yellow cars with high request*

Color: Blue/Yellow

Requests: >6

USING AND & OR TOGETHER

	A	B	C	D	E
1	**Make**	**Model**	**Color**	**Requests**	
2	Lincoln	Town Car	Yellow	2	=AND(OR(C2="Blue",C2="Yellow"),D2>6)
3	Hummer	H1	Purple	1	
4	Toyota	RAV4	Blue	10	
5	Ford	Galaxie	Yellow	6	
6	Honda	Odyssey	Yellow	3	
7	Maybach	57	White	8	
8	Mercedes-Benz	S-Class	Black	6	
9	Mercedes-Benz	SLK-Class	Green	10	
10	Dodge	Challenger	Blue	4	
11	Mitsubishi	Galant	Blue	1	
12	Buick	Coachbuilder	Yellow	8	
13	Lincoln	Town Car	Purple	4	
14	Land Rover	Discovery	White	8	
15	Dodge	Ram Van 2500	Black	10	

=AND(OR(C2=“Blue”,C2=“Yellow”),D2>6)

USING AND & OR TOGETHER

	A	B	C	D	E
1	**Make**	**Model**	**Color**	**Requests**	
2	Lincoln	Town Car	Yellow	2	FALSE
3	Hummer	H1	Purple	1	FALSE
4	Toyota	RAV4	Blue	10	TRUE
5	Ford	Galaxie	Yellow	6	FALSE
6	Honda	Odyssey	Yellow	3	FALSE
7	Maybach	57	White	8	FALSE
8	Mercedes-Benz	S-Class	Black	6	FALSE
9	Mercedes-Benz	SLK-Class	Green	10	FALSE
10	Dodge	Challenger	Blue	4	FALSE
11	Mitsubishi	Galant	Blue	1	FALSE
12	Buick	Coachbuilder	Yellow	8	TRUE
13	Lincoln	Town Car	Purple	4	FALSE
14	Land Rover	Discovery	White	8	FALSE
15	Dodge	Ram Van 2500	Black	10	FALSE

RIGHT

➢**Purpose:**

The RIGHT function returns text from the right of a string

➢**Syntax:**

=RIGHT(Text,[num_chars]).

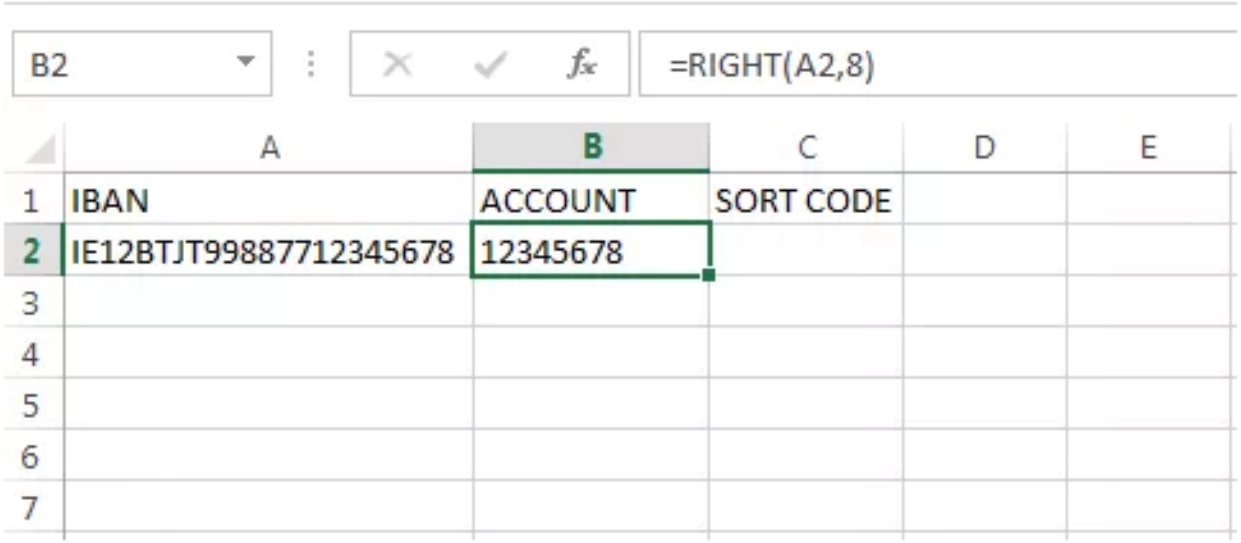
➢**Arguments**

Text is the string that we want to query

num_chars is the number of characters we want to return.

RIGHT

- If we did =RIGHT("Hello", 3) our result would be "llo" the rightmost 3 characters in our string.
- If we typed =RIGHT(A2,8) then our result would give us the rightmost 8 characters in the value of cell A2.
- In our case, we want the last 8 digits of the IBAN which is our old account number. If our IBAN is in A2, then the formula is =RIGHT(A2,8).



RIGHT

Special cases:

=RIGHT(“Quang Ninh”) => ???

=RIGHT(Can Tho, -3) => ???

=RIGHT(Nha Trang, 10) =>

=RIGHT(5/29/2018,4)=>

LEFT

➢**Purpose:**

The LEFT function returns text from the left of a string

➢**Syntax:**

=LEFT(Text,[num_chars])

➢**Arguments**

Text is the string that we want to query

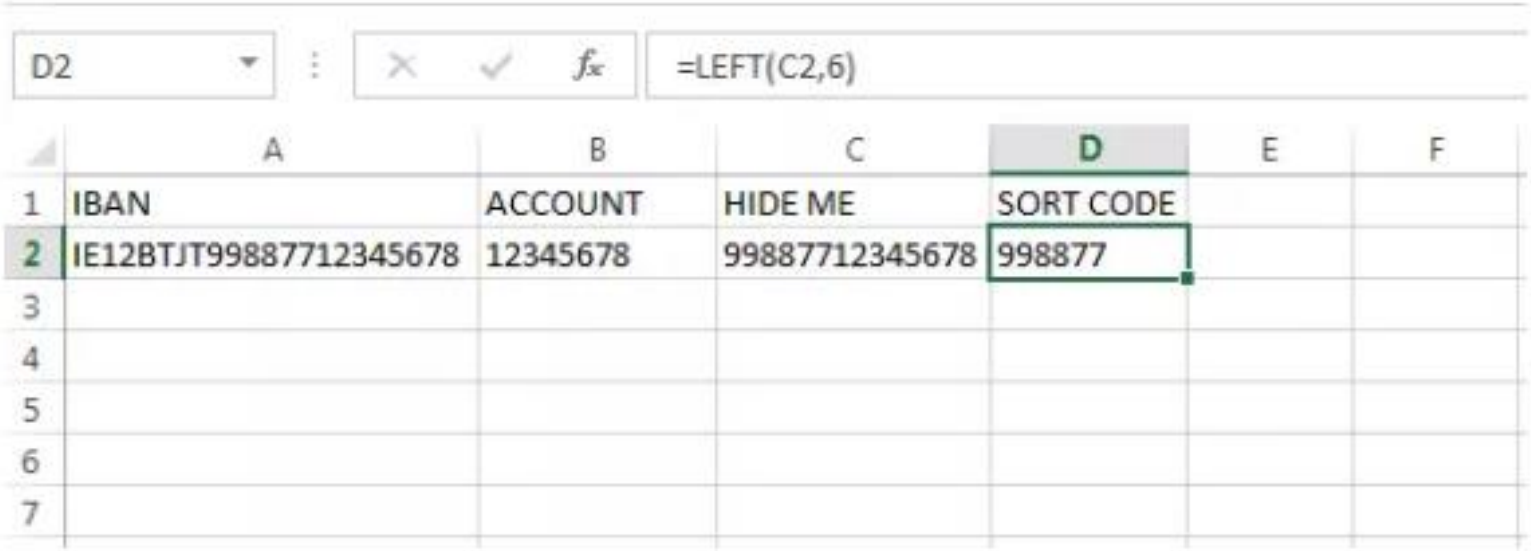
num_chars is the number of characters we want to return.

LEFT

- If we did =LEFT(“Hello”, 3) our result would be “Hel” the leftmost 3 characters in our string.
- If we typed =LEFT(A2,8) then our result would give us the leftmost 8 characters in the value of cell A2.

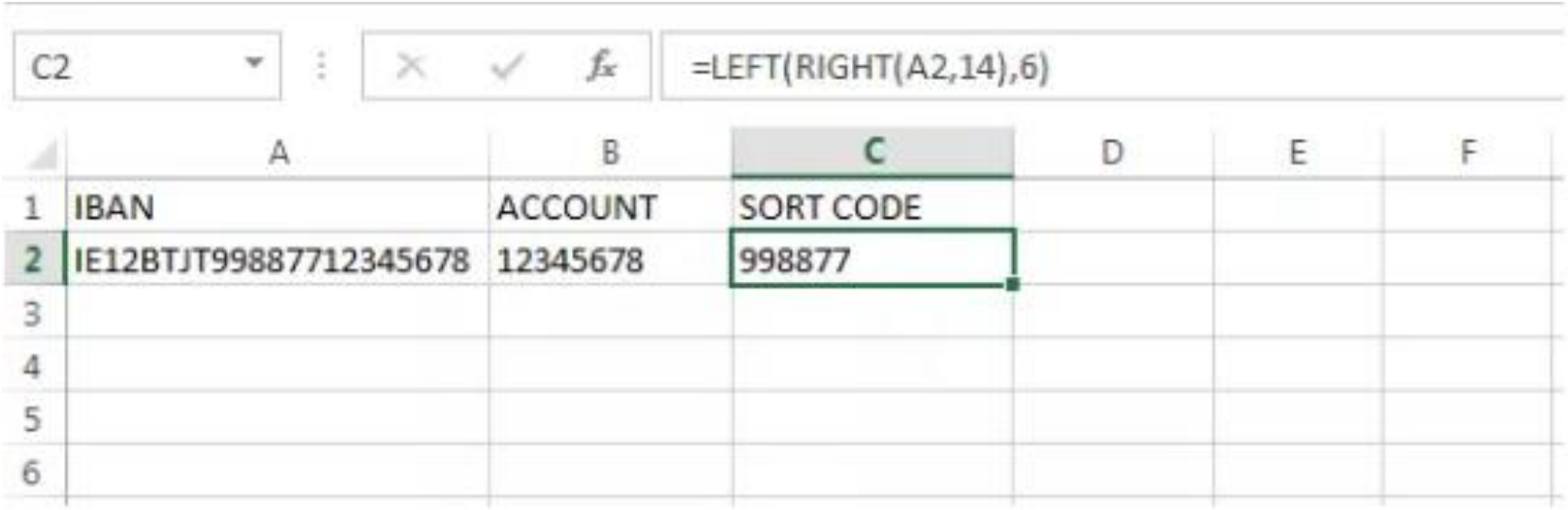
LEFT

- In our example, we are going to get the 6-digit sort code is in the middle of our IBAN
- By using the RIGHT and LEFT formula we can get the sort code.
- We can do this two ways: one would be to do the RIGHT formula to take 14 characters in column C (and hide that column later) and then use our LEFT formula to get the first 6 characters from column C.



LEFT

- Another way to do this would be to combine the RIGHT and LEFT formula in one, as below.



MID

➢**Purpose:**

The MID formula returns a number of characters after a starting position from the midle of a string text.

➢**Syntax:**

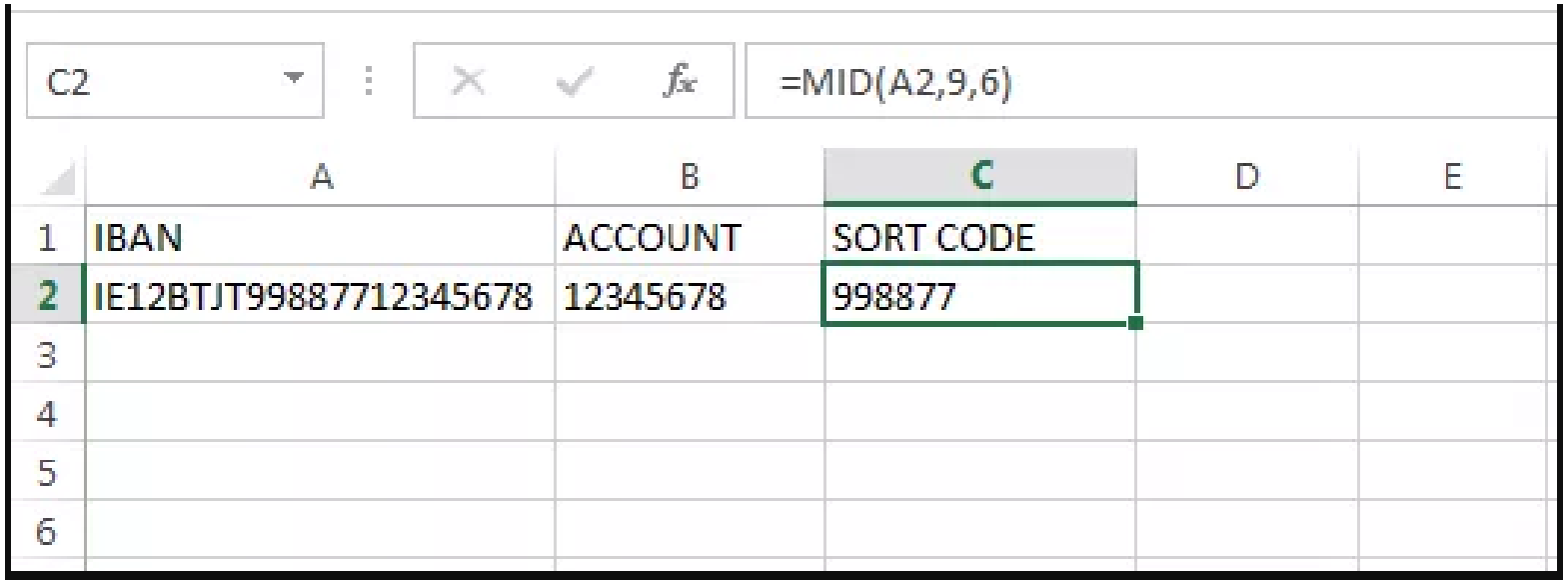
=MID(Text, start_num, num_chars)

➢**Arguments**

- Text is the string that we want to query
- This is an integer that specifies the position of the first character that you want to be returned.
- num_chars is the number of characters we want to return.

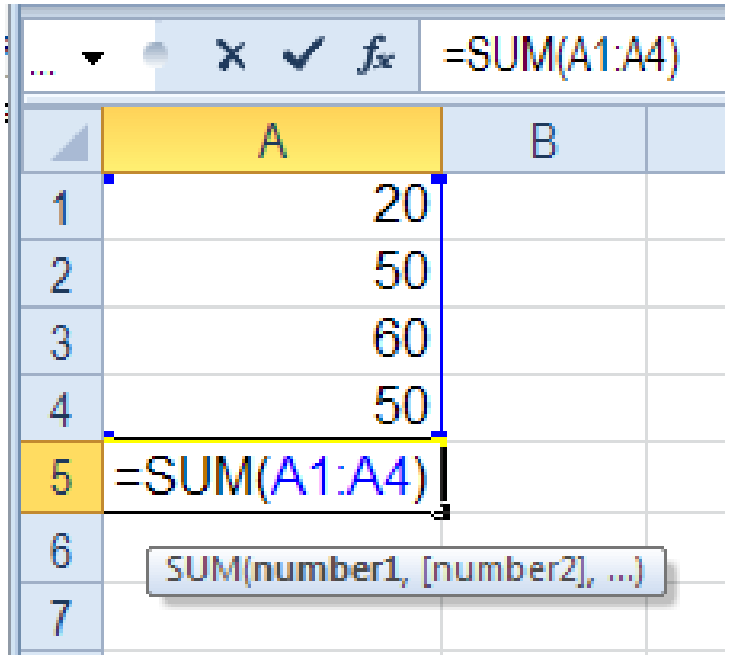
MID

- Our formula is =MID(A2,9,6)
- Querying cell A2, we want the 6 characters starting from the 9th.



SUM

- **Syntax:** =SUM(number1, number2,…)
- **Purpose:** To sum a range of cells
- **Example:** =SUM(A1:A4)



AVERAGE

- Description: Returns the average of the arguments. For example, if the range A1:A20 contains numbers, the formula =AVERAGE(A1:A20) returns the average of those numbers.
- Syntax=AVERAGE(number1, [number2],...)

MIN, MAX

- Description

MIN function to find the minimum number in a selected range.

MAX function to find the maximum number in a selected range.

- Syntax =MIN(number1, [number2],...)

=MAX(number1, [number2],...)

SUMIF FUNCTION

Sums the number of items in a range that meet a specific criteria

=SUMIF(criteria_range, criteria,[sum_range])

- Criteria_Range: A continuous range
- Criteria: Determines what cells to sum
- Sum_Range: If criteria is met, the computer will sum the corresponding entry in this range
- Same criteria syntax as COUNTIF

- If a sum_range argument is not used, the sum_range will be the same as the criteria_range

	A	B	C	D	E	F
1		Property Overview				
2		Type	Pool Type	Units In Use	Monthly Rent Per Unit	Monthly Revenue
3	Lakeshore Realty	TownHouse	Free Form	50	$ 950.00	$ 47,500.00
4	Belmont Apts	1 BR	Diving	75	$ 700.00	$ 52,500.00
5	Swan Lake Apts	Flat	Free Form	50	$ 725.00	$ 36,250.00
6	Heritage Condos	TownHouse	Free Form	40	$ 1,100.00	$ 44,000.00
7	Fairview Apts	Flat	Diving	80	$ 600.00	$ 48,000.00
8					Total Revenue	$228,250.00
9	Number of Townhouses or 1 BR Units in use			165		
10						
11	Summary of Monthly Revenue by Apartment Type					
12		TownHouse	Flat	1 BR		
13	Total Revenue	$ 91,500.00	$ 84,250.00	$52,500.00		

	B
12	TownHouse
13	=SUMIF($B3:$B7,B12,$F3:$F7)

=SUMIF(criteria_range, criteria,[sum_range])

COUNT

- Description:

The COUNT function counts the number of cells that contain numbers within a range.

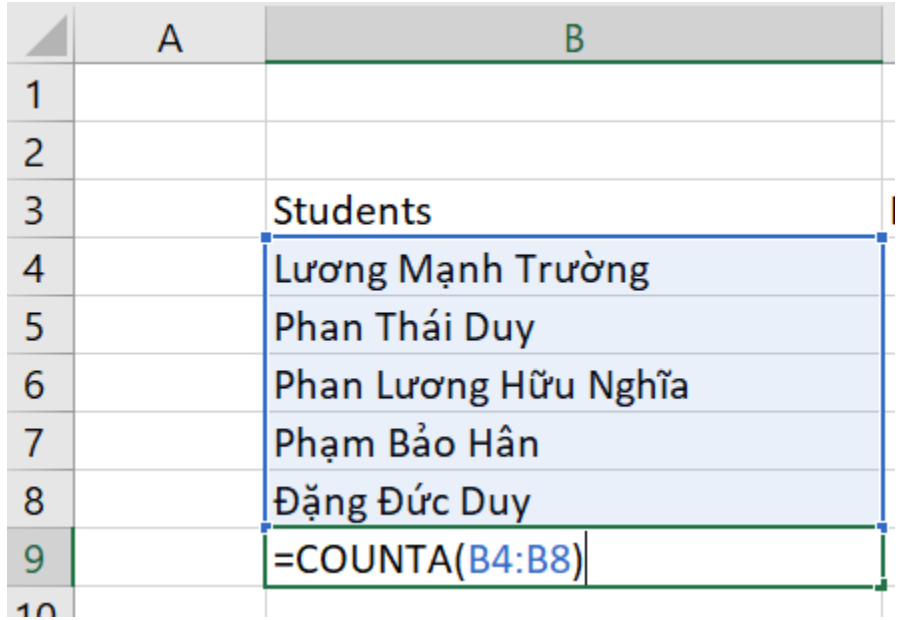
- Syntax =COUNT([value1], [value2],...)

COUNTA

➢Description

The COUNTA function counts the number of cells in a range that are not empty.

➢Syntax =COUNTA([value1], [value2],...)

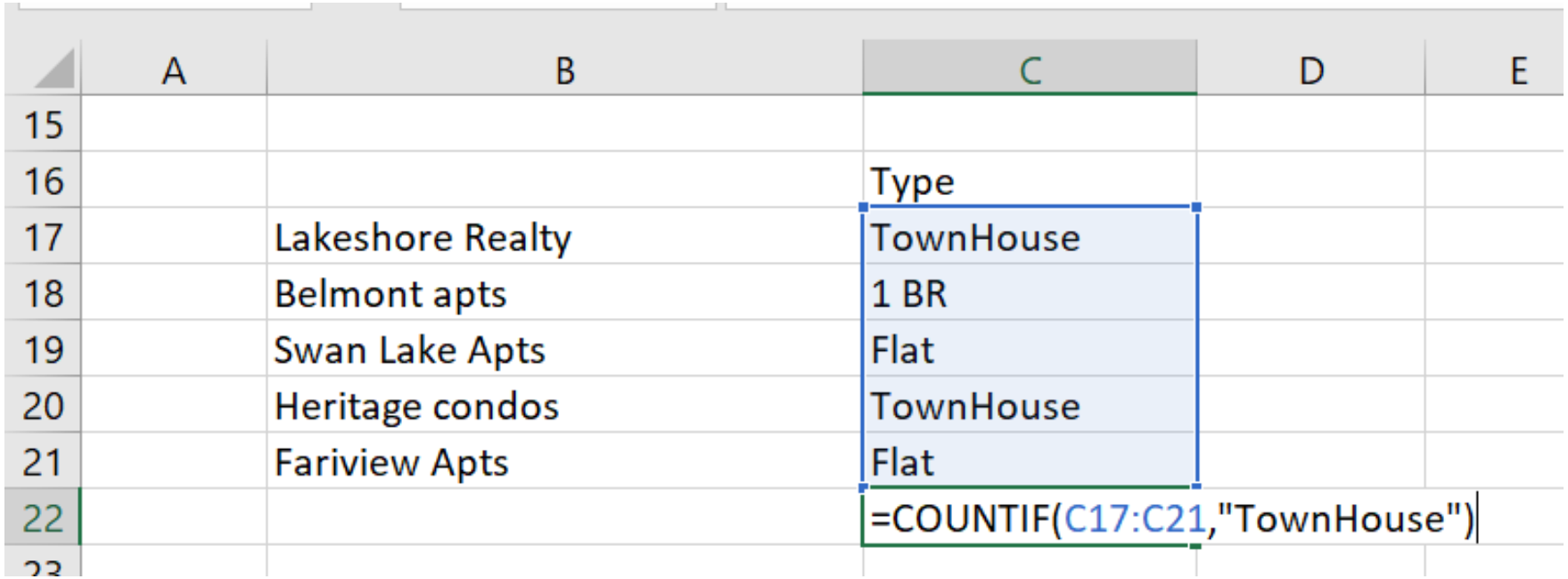


COUNTIF

➢Description

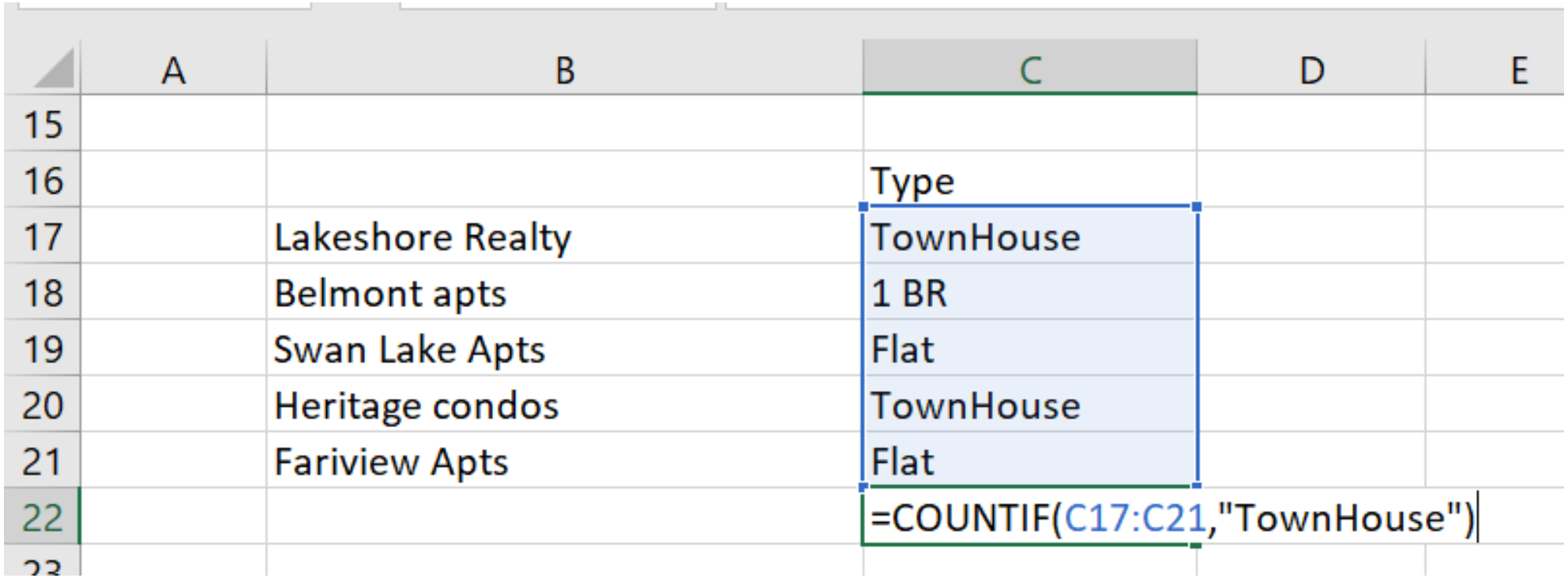
COUNTIF function is used for counting cells within a specified range that meet a certain criterion, or condition.

Syntax: =COUNTIF(range, criteria)



	A	B	C	D	E
15					
16			Type		
17		Lakeshore Realty	TownHouse		
18		Belmont apts	1 BR		
19		Swan Lake Apts	Flat		
20		Heritage condos	TownHouse		
21		Fariview Apts	Flat		
22			=COUNTIF(C17:C21,"TownHouse")		
23					

COUNTIF



	A	B	C	D	E
15					
16			Type		
17		Lakeshore Realty	TownHouse		
18		Belmont apts	1 BR		
19		Swan Lake Apts	Flat		
20		Heritage condos	TownHouse		
21		Fariview Apts	Flat		
22			=COUNTIF(C17:C21,"TownHouse")		

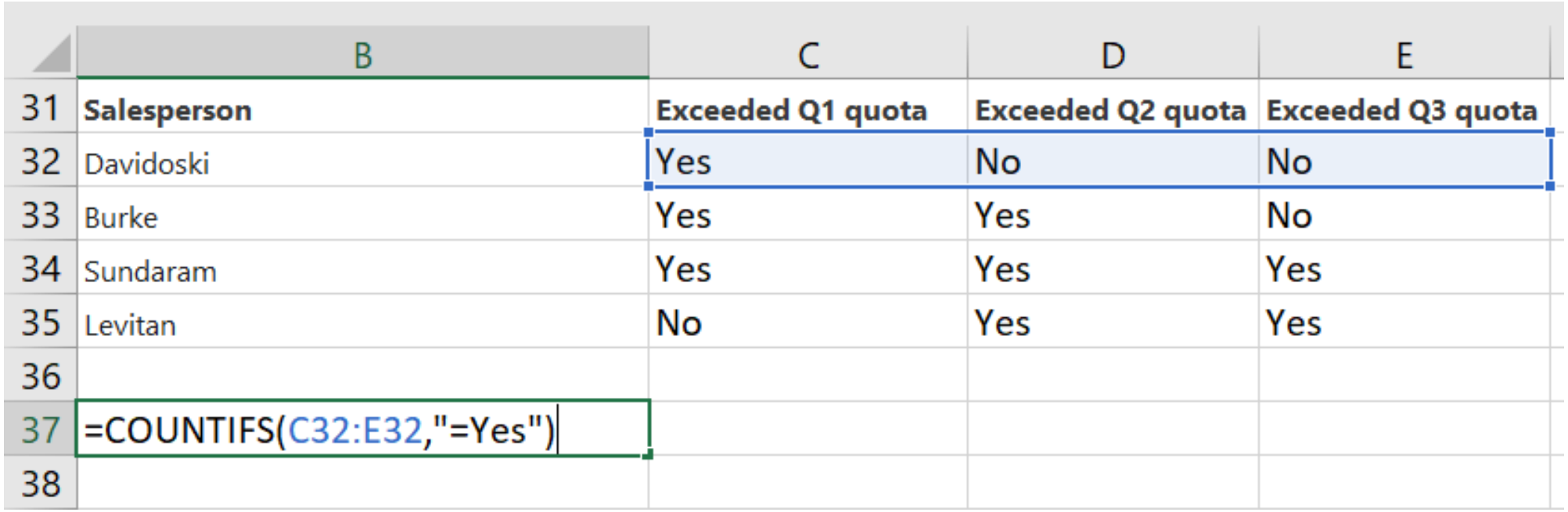
COUNFIFS

- Description: The **COUNTIFS** function applies criteria to cells across multiple ranges and counts the number of times all criteria are met.
- Syntax: =COUNTIFS(criteria_range1, criteria1, [criteria_range2, criteria2]…)

- **criteria_range1** Required. The first range in which to evaluate the associated criteria.
- **criteria1** Required. The criteria in the form of a number, expression, cell reference, or text that define which cells will be counted. For example, criteria can be expressed as 32, ">32", B4, "apples", or "32".
- **criteria_range2, criteria2, ...** Optional. Additional ranges and their associated criteria. Up to 127 range/criteria pairs are allowed.

COUNTIFS sample

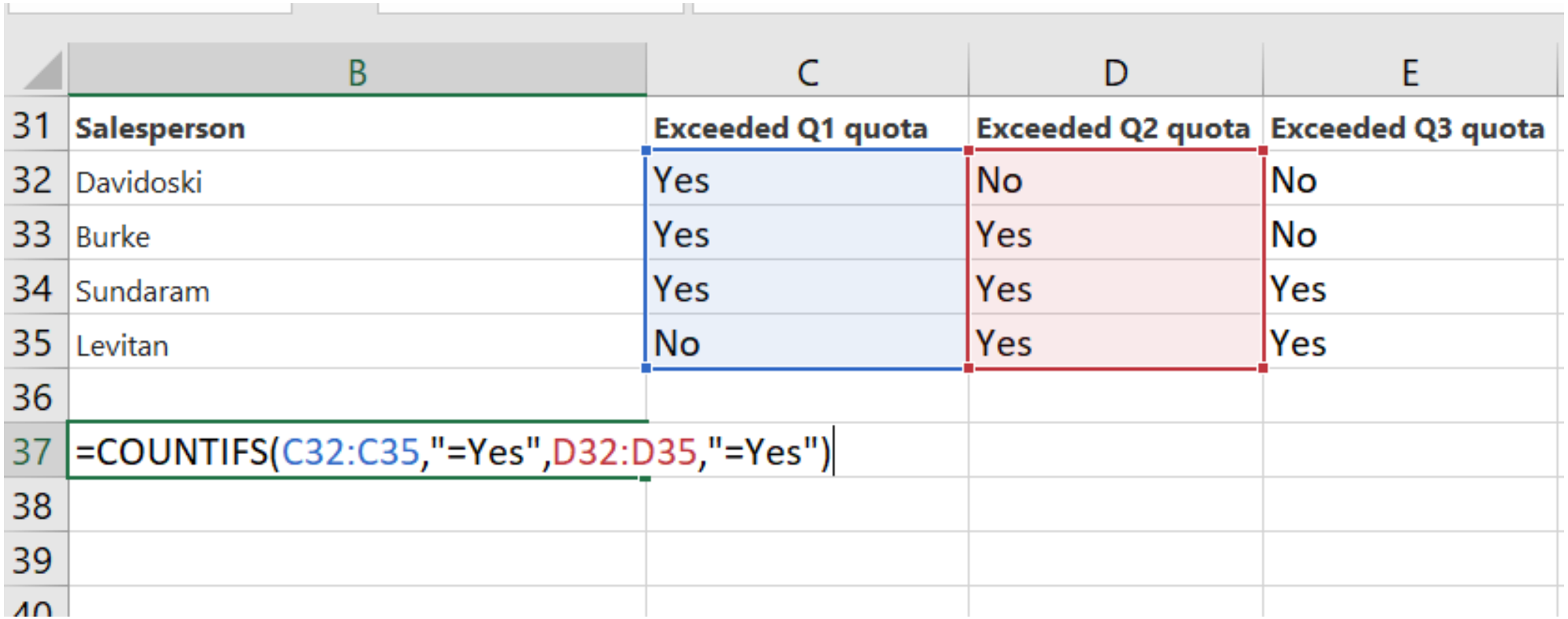
- Counts how many times Davidoski exceeded a sales quota for periods Q1, Q2, and Q3



	B	C	D	E
31	**Salesperson**	**Exceeded Q1 quota**	**Exceeded Q2 quota**	**Exceeded Q3 quota**
32	Davidoski	Yes	No	No
33	Burke	Yes	Yes	No
34	Sundaram	Yes	Yes	Yes
35	Levitan	No	Yes	Yes
36				
37	=COUNTIFS(C32:E32,"=Yes")			
38				

COUNIFS sample

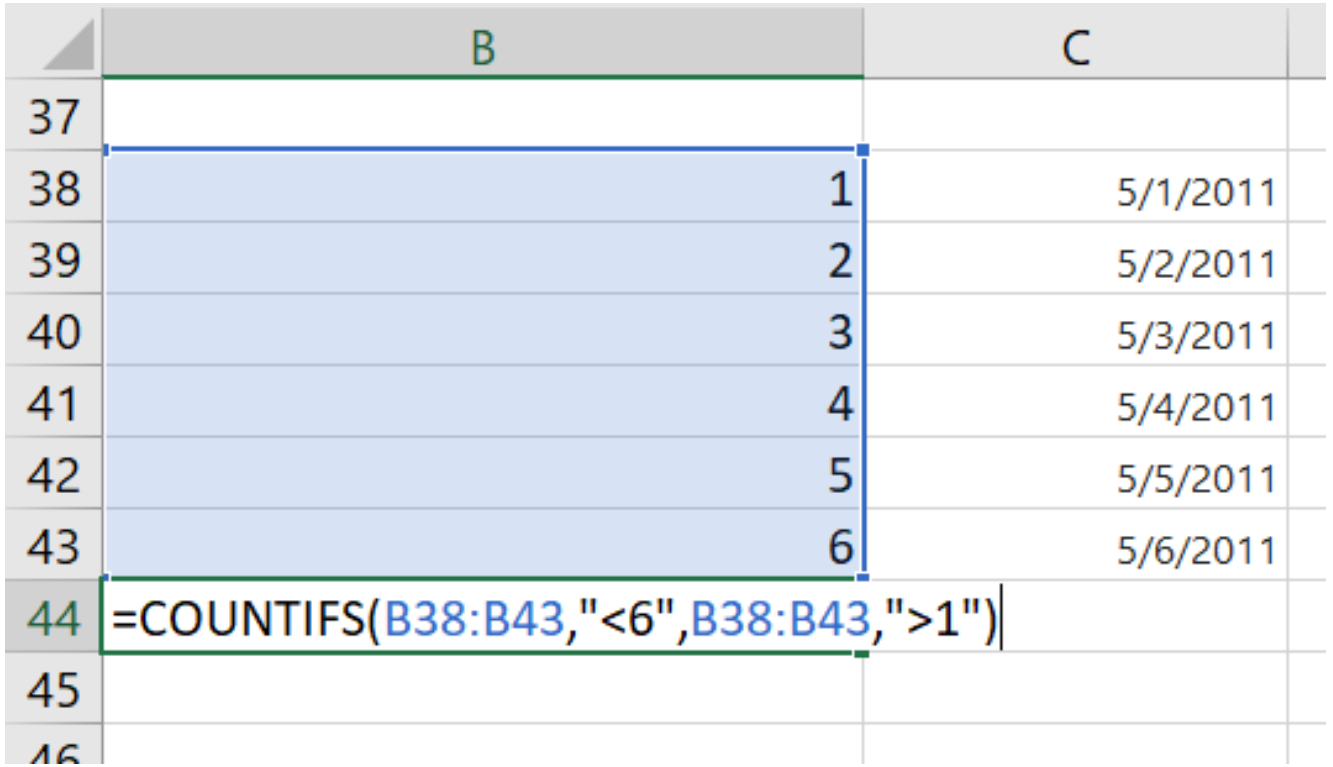
- Counts how many salespeople exceeded both their Q1 and Q2 quotas



	B	C	D	E
31	**Salesperson**	**Exceeded Q1 quota**	**Exceeded Q2 quota**	**Exceeded Q3 quota**
32	Davidoski	Yes	No	No
33	Burke	Yes	Yes	No
34	Sundaram	Yes	Yes	Yes
35	Levitan	No	Yes	Yes
36				
37	=COUNTIFS(C32:C35,"=Yes",D32:D35,"=Yes")			
38				
39				
40				

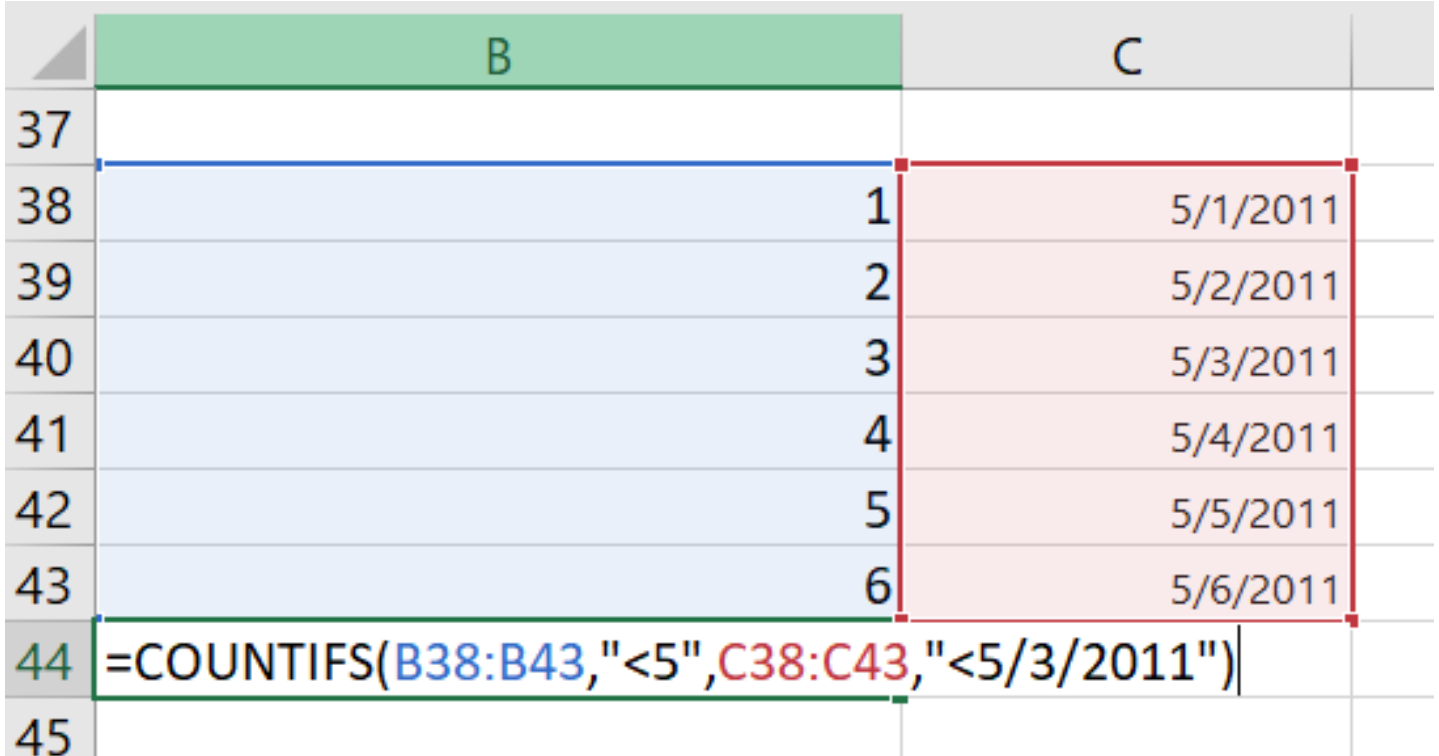
COUNIFS sample

- Counts how many numbers between 1 and 6 (not including 1 and 6) are contained in cells B38 through B43.



COUNIFS sample

- Counts how many rows have numbers that are less than 5 in cells B38 through B43, and also have dates that are earlier than 5/3/2011 in cells C38 through C43.



Thank you for listening