



Lesson 7 Topics:

Looking up data

The VLOOKUP function

When you need to find some information in a large data-spreadsheet, or you need to search for the same kind of information throughout the spreadsheet use the Vlookup function.

Let's take an instance of Vlookup as:

Company Salary Table which is managed by the financial team of the Company – In **Company Salary Table**, you start with a piece of information which is already known (or easily retrieved). Information that serves as an index.

So as an Example:

You start with the information which is already available:

(In this Case, Employee's Name)

Employee's Name	Employee's Designation	Salary
John	Software Engineer	25000
Eric	Business Analyst	24000

To find the information you don't know:

(In this case, we want to look up for Employee's Salary)

Employee's Name	Employee's Designation	Salary
John	Software Engineer	25000
Eric	Business Analyst	24000



Excel Spreadsheet for the above instance:

	A	B	C	D	E	F	G	H	I	J
1	Employee Name	Employee Code	Employee Designation	Employee Team	Employee Salary					
2	John	PTA	Software Engineer	Engineering	25000		Employee Code			
3	Eric	PTB	Analyst	Production	22000		Employee Salary			
4	Lynda	PTC	Lead Associate	Production	28000					
5	Ronaldo	PTD	Software Engineer	Engineering	24000					
6	Messi	PTE	Lead Associate	Production	26000					
7	Neymar	PTF	Analyst	Production	23000					
8	Ashly	PTG	Lead Associate	Production	21000					
9	Ned Stark	PTH	Software Engineer	Engineering	20000					
10	Arya	PTI	Analyst	Production	18000					
11	Sansa	PTJ	Software Engineer	Engineering	30000					
12	Jon Snow	PTK	Business Developer	Production	15000					
13	Melisandre	PTL	Analyst	Production	17000					
14	Dany	PTM	Software Engineer	Engineering	19000					
15	Robb	PTN	Lead Associate	Production	28000					
16	Hodor	PTO	Business Developer	Engineering	32000					
17	Bran	PTP	Analyst	Production	35000					
18	Dwayne	PTQ	Software Engineer	Engineering	31000					
19	Priyanka	PTR	Lead Associate	Production	36000					
20	Thomas	PTS	Business Developer	Engineering	18000					
21	Louis	PTT	Lead Associate	Production	15000					
22	Michael	PTU	Software Engineer	Engineering	25000					
23	Joffery	PTV	Software Engineer	Engineering	23000					
24	Jamie	PTW	Business Developer	Engineering	28000					
25	Sam	PTX	Business Developer	Engineering	30000					

In the above spreadsheet, to find out the Employee Salary which we don't know - We will enter the Employee Code which is already available.

	A	B	C	D	E	F	G	H	I	J
1	Employee Name	Employee Code	Employee Designation	Employee Team	Employee Salary					
2	John	PTA	Software Engineer	Engineering	25000		Employee Code			
3	Eric	PTB	Analyst	Production	22000		Employee Salary			
4	Lynda	PTC	Lead Associate	Production	28000					
5	Ronaldo	PTD	Software Engineer	Engineering	24000					
6	Messi	PTE	Lead Associate	Production	26000					
7	Neymar	PTF	Analyst	Production	23000					
8	Ashly	PTG	Lead Associate	Production	21000					
9	Ned Stark	PTH	Software Engineer	Engineering	20000					
10	Arya	PTI	Analyst	Production	18000					
11	Sansa	PTJ	Software Engineer	Engineering	30000					
12	Jon Snow	PTK	Business Developer	Production	15000					
13	Melisandre	PTL	Analyst	Production	17000					
14	Dany	PTM	Software Engineer	Engineering	19000					
15	Robb	PTN	Lead Associate	Production	28000					
16	Hodor	PTO	Business Developer	Engineering	32000					
17	Bran	PTP	Analyst	Production	35000					
18	Dwayne	PTQ	Software Engineer	Engineering	31000					
19	Priyanka	PTR	Lead Associate	Production	36000					
20	Thomas	PTS	Business Developer	Engineering	18000					
21	Louis	PTT	Lead Associate	Production	15000					
22	Michael	PTU	Software Engineer	Engineering	25000					
23	Joffery	PTV	Software Engineer	Engineering	23000					
24	Jamie	PTW	Business Developer	Engineering	28000					
25	Sam	PTX	Business Developer	Engineering	30000					



Moreover, **By Applying VLOOKUP**, value(Employee's salary) of the corresponding Employee's Code will be displayed.

1	Employee Name	Employee Code	Employee Designation	Employee Team	Employee Salary				
2	John	PTA	Software Engineer	Engineering	25000				
3	Eric	PTB	Analyst	Production	22000		Employee Code		
4	Lynda	PTC	Lead Associate	Production	28000		Employee Salary		
5	Ronaldo	PTD	Software Engineer	Engineering	24000				
6	Messi	PTE	Lead Associate	Production	26000				
7	Neymar	PTF	Analyst	Production	23000				
8	Ashly	PTG	Lead Associate	Production	21000				
9	Ned Stark	PTH	Software Engineer	Engineering	20000				
10	Arya	PTI	Analyst	Production	18000				
11	Sansa	PTJ	Software Engineer	Engineering	30000				
12	Jon Snow	PTK	Business Developer	Production	15000				
13	Melisandre	PTL	Analyst	Production	17000				
14	Dany	PTM	Software Engineer	Engineering	19000				
15	Robb	PTN	Lead Associate	Production	28000				
16	Hodor	PTO	Business Developer	Engineering	32000				
17	Bran	PTP	Analyst	Production	35000				
18	Dwayne	PTQ	Software Engineer	Engineering	31000				
19	Priyanka	PTR	Lead Associate	Production	36000				
20	Thomas	PTS	Business Developer	Engineering	18000				
21	Louis	PTT	Lead Associate	Production	15000				
22	Michael	PTU	Software Engineer	Engineering	25000				
23	Joffery	PTV	Software Engineer	Engineering	23000				
24	Jamie	PTW	Business Developer	Engineering	28000				
25	Sam	PTX	Business Developer	Engineering	30000				

Steps for Applying the VLOOKUP function

Step 1) we need to navigate to the cell where you want to view the Salary of the particular Employee.- (in this instance, Click the cell with index 'H3')

E	F	G	H	I	J
Employee Salary					
25000		Employee Code			
22000		Employee Salary			
28000					
24000					
26000					

Click - Cell index 'H3'



Step 2) Enter the VLOOKUP Function in the above Cell: Start with an **equal sign** which denotes that a function is entered, **'VLOOKUP'** keyword is used after the equal sign depicting VLOOKUP function **=VLOOKUP ()**

Employee Code	Employee Designation	Employee Team	Employee Salary
PTA	Software Engineer	Engineering	25000
PTB	Analyst	Production	22000
PTC	Lead Associate	Production	28000
PTD	Software Engineer	Engineering	24000
PTF	Lead Associate	Production	26000

The parenthesis will contain the Set of Arguments (Arguments are the piece of data that function needs in order to execute).

VLOOKUP uses four arguments or pieces of data:

Step 3) First Argument: the first argument would be the cell reference (as the placeholder) for the value that needs to be searched or the lookup value. Lookup value refers to the data which is already available or data which you know. (In this case, Employee Code is considered as the lookup value so that the first argument will be H2, i.e., the value which needs to be looked up or searched, will be present on the cell reference 'H2').

Employee Code	Employee Designation	Employee Team	Employee Salary
PTA	Software Engineer	Engineering	25000
PTB	Analyst	Production	22000
PTC	Lead Associate	Production	28000
PTD	Software Engineer	Engineering	24000

Step 4) Second Argument: It refers to the block of values that are needed to be searched. In Excel, this block of values is known as **table array** or the lookup table. In our instance, **the lookup table** would be **from cell reference B2 to E25**, i.e., the complete block where the corresponding value would be searched.

NOTE: The lookup values or the data you know have to be in the left-hand column of your lookup table, i.e., your cell range.



Employee Name	Employee Code	Employee Designation	Employee Team	Employee Salary
John	PTA	Software Engineer	Engineering	25000
Eric	PTB	Analyst	Production	22000
Lynda	PTC	Lead Associate	Production	28000
Ronaldo	PTD	Software Engineer	Engineering	24000
Messi	PTE	Lead Associate	Production	26000
Neymar	PTF	Analyst	Production	23000
Ashlly	PTG	Lead Associate	Production	21000
Ned Stark	PTH	Software Engineer	Engineering	20000
Arya	PTI	Analyst	Production	18000
Sansa	PTJ	Software Engineer	Engineering	30000
Jon Snow	PTK	Business Developer	Production	15000
Melisandre	PTL	Analyst	Production	17000
Dany	PTM	Software Engineer	Engineering	19000
Robb	PTN	Lead Associate	Production	28000
Hodor	PTO	Business Developer	Engineering	32000
Bran	PTP	Analyst	Production	35000
Dwayne	PTQ	Software Engineer	Engineering	31000
Priyanca	PTR	Lead Associate	Production	36000
Thomas	PTS	Business Developer	Engineering	18000
Louis	PTT	Lead Associate	Production	15000
Michael	PTU	Software Engineer	Engineering	25000
Joffery	PTV	Software Engineer	Engineering	23000
Jamie	PTW	Business Developer	Engineering	28000
Sam	PTX	Business Developer	Engineering	30000

Step 5) Third Argument: It refers to the column reference. In other words, it notifies VLOOKUP where you expect to find the data, you want to view. (Column reference is the column index in the lookup table of the column where the corresponding value ought to be found.) In this case, the column reference would be 4 as the Employee's Salary column has an index of 4 as per the lookup table.

Employee Name	Employee Code	Employee Designation	Employee Team	Employee Salary
John	PTA	Software Engineer	Engineering	25000
Eric	PTB	Analyst	Production	22000
Lynda	PTC	Lead Associate	Production	28000
Ronaldo	PTD	Software Engineer	Engineering	24000
Messi	PTE	Lead Associate	Production	26000
Neymar	PTF	Analyst	Production	23000
Ashlly	PTG	Lead Associate	Production	21000
Ned Stark	PTH	Software Engineer	Engineering	20000
Arya	PTI	Analyst	Production	18000
Sansa	PTJ	Software Engineer	Engineering	30000
Jon Snow	PTK	Business Developer	Production	15000
Melisandre	PTL	Analyst	Production	17000
Dany	PTM	Software Engineer	Engineering	19000
Robb	PTN	Lead Associate	Production	28000
Hodor	PTO	Business Developer	Engineering	32000
Bran	PTP	Analyst	Production	35000
Dwayne	PTQ	Software Engineer	Engineering	31000
Priyanca	PTR	Lead Associate	Production	36000
Thomas	PTS	Business Developer	Engineering	18000
Louis	PTT	Lead Associate	Production	15000
Michael	PTU	Software Engineer	Engineering	25000
Joffery	PTV	Software Engineer	Engineering	23000
Jamie	PTW	Business Developer	Engineering	28000
Sam	PTX	Business Developer	Engineering	30000



Step 6) Fourth Argument: The last argument is range lookup. It tells the VLOOKUP function whether we want the approximate match or the exact match to the lookup value. In this case, we want the exact match ('FALSE' keyword).

1. **FALSE:** Refers to the Exact Match.
2. **TRUE:** Refers for Approximate Match.

C	D	E	F	G	H
Employee Designation					
Software Engineer	Engineering	25000		Employee Code	
Analyst	Production	22000		Employee Salary	
Lead Associate	Production	28000			
Software Engineer	Engineering	24000			

Formula bar: =VLOOKUP(H2,B2:E25,4,FALSE)

Dropdown menu options: TRUE - Approximate match, FALSE - Exact match

Tooltip: VLOOKUP will only find an exact match

Step 7) Press 'Enter' to notify the cell that we have completed the function. However, you get an error message as below because no value has been entered in the cell H2i.e. No employee code has been entered in Employee Code which will allow the value for lookup.

E	F	G	H	I
Employee Salary				
25000		Employee Code		
22000		Employee Salary	#N/A	
28000				

However, as you enter any Employee Code in H2, it will return the corresponding value i.e. Employee's Salary.

B	C	D	E	F	G	H
Employee Code	Employee Designation	Employee Team	Employee Salary			
PTA	Software Engineer	Engineering	25000		Employee Code	PTI
PTB	Analyst	Production	22000		Employee Salary	18000
PTC	Lead Associate	Production	28000			
PTD	Software Engineer	Engineering	24000			
PTE	Lead Associate	Production	26000			
PTF	Analyst	Production	23000			
PTG	Lead Associate	Production	21000			
PTH	Software Engineer	Engineering	20000			
PTI	Analyst	Production	18000			



So in a brief what happened is I told the cell through the VLOOKUP formula is that the values which we know are present in the left-hand column of the data, i.e., depicting the column for Employee's Code. Now you have to look through my lookup table or my range of cells and in the fourth column to the right of the table find the value on the same row, i.e., the corresponding value (Employee's Salary) in the same row of the corresponding Employee's Code.

The above instance explained about the Exact Matches in VLOOKUP, i.e., FALSE Keyword as the last parameter.

VLOOKUP for Approximate Matches (TRUE Keyword as the last parameter)

Consider a scenario where a table calculates discounts for the customers who do not want to buy exactly tens or hundreds of items.

As shown below, certain Company has imposed discounts on the quantity of items ranging from 1 to 10,000:

	A	B	C	D	E	F	G	H	I	J
1					Quantity	Discount		Quantity		
2					1	0%		Discount		
3					10	3%				
4					100	6%				
5					1000	9%				
6					10000	12%				
7										
8										
9										
10										
11										
12										
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21										
22										
23										
24										
25										

Now it is uncertain that the customer buys exactly hundreds or thousands of items. In this case, Discount will be applied as per the VLOOKUP's Approximate Matches. In other words, we do not want to limit them for finding matches to just the values present in the column that are 1, 10, 100, 1000, 10000. Here are the steps:



Step 1) Click on the cell where the **VLOOKUP** function needs to be applied i.e. Cell reference 'I2'.

E	F	G	H	I	J	K
Quantity	Discount		Quantity			
1	0%		Discount			
10	3%					
100	6%					
1000	9%					
10000	12%					

Cell reference where VLOOKUP needs to be applied

Step 2) Enter '=VLOOKUP()' in the cell. In the parenthesis **enter the set of Arguments** for the above instance.

D	E	F	G	H	I	J	K	L	M
	Quantity	Discount		Quantity					
	1	0%		Discount	=VLOOKUP()				
	10	3%							
	100	6%							
	1000	9%							
	10000	12%							

These Parenthesis will contain the set of Arguments that VLOOKUP function needs in order to run.

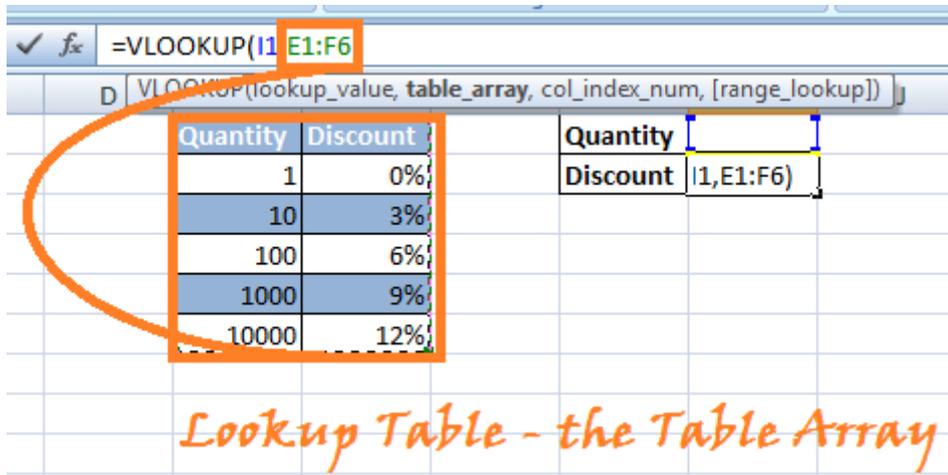
Step 3) Enter the Arguments:

Argument 1: Enter the Cell reference of the cell at which the value present will be searched for the corresponding value in the lookup table.

D	E	F	G	H	I	J	K	L	M
	Quantity	Discount		Quantity					
	1	0%		Discount	VLOOKUP(I1,)				
	10	3%							
	100	6%							
	1000	9%							
	10000	12%							

Cell reference of the column where the value to be searched will be entered

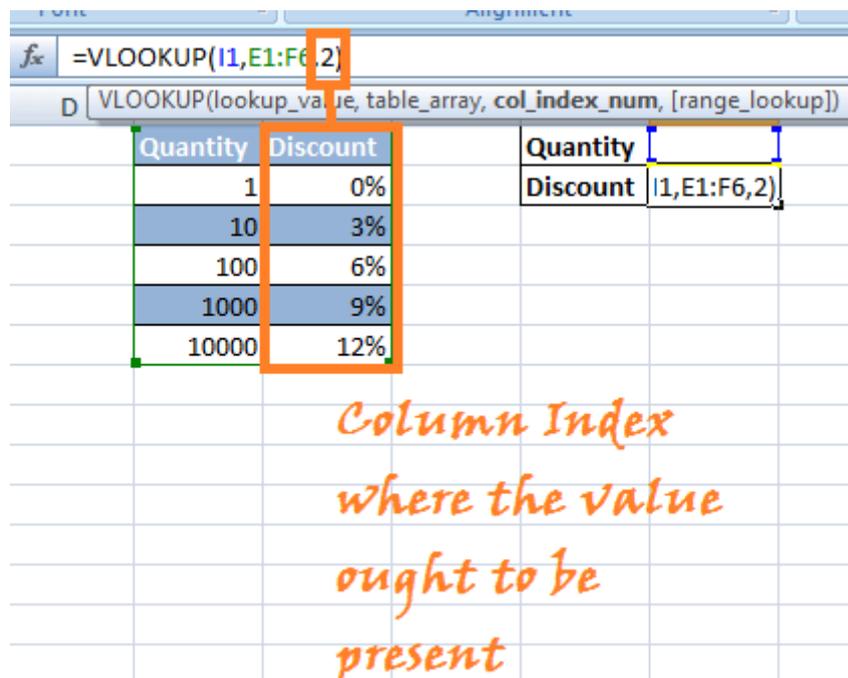
Step 4) Argument 2: Choose the lookup table or the table array in which you want VLOOKUP to search for the corresponding value. (In this case, choose the columns Quantity and Discount)



Quantity	Discount
1	0%
10	3%
100	6%
1000	9%
10000	12%

Lookup Table - the Table Array

Step 5) Argument 3: The third argument would be the column index in the lookup table you want to be searched for the corresponding value.

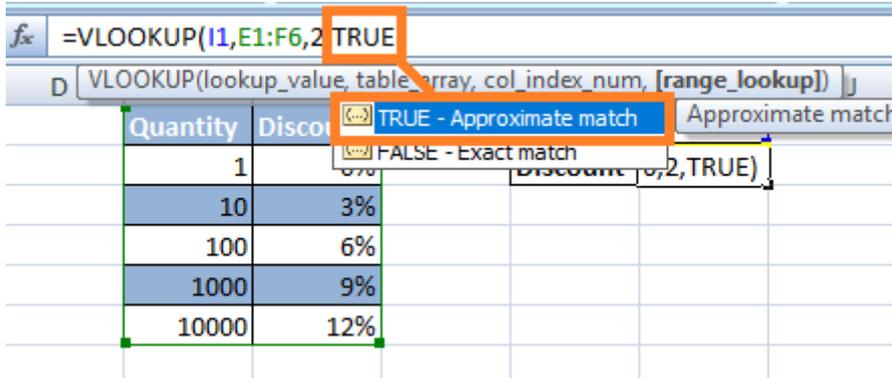


Quantity	Discount
1	0%
10	3%
100	6%
1000	9%
10000	12%

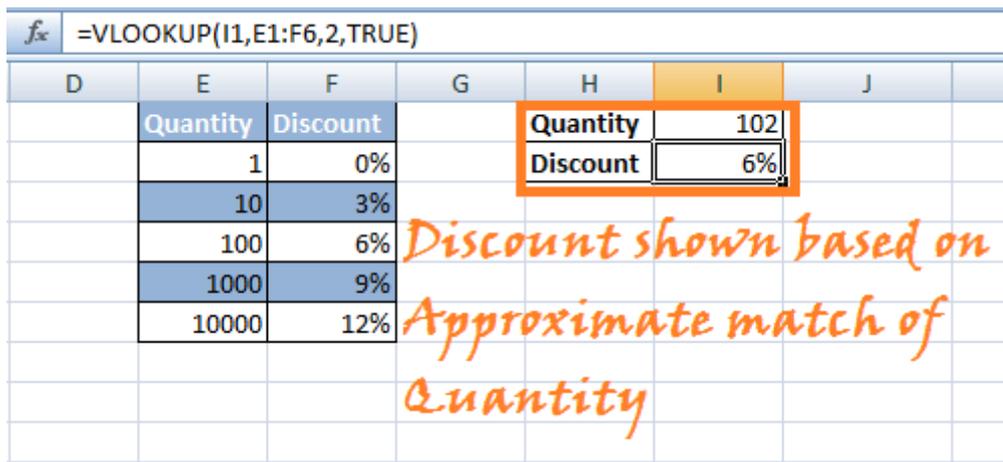
*Column Index
where the value
ought to be
present*



Step 5) Argument4: Last argument would be the condition for **Approximate Matches or Exact Matches**. In this instance, we are particularly looking for the Approximate matches (**TRUE Keyword**).



Step 6) Press 'Enter.' Vlookup formula will be applied to the mentioned Cell reference, and when you enter any number in the quantity field, it will show you the discount imposed based on **Approximate Matches in VLOOKUP**.



NOTE: If you want to use TRUE as the last parameter, you can leave it blank and by default it chooses TRUE for Approximate Matches.

For more information:

<https://www.guru99.com/excel-vlookup-tutorial.html>

<https://www.laptopmag.com/articles/excel-2013-vlookup>

<https://corporatefinanceinstitute.com/resources/excel/study/vlookup-guide/>

<https://edu.gcfglobal.org/en/excel-tips/how-to-use-excel-vlookup-function/1/>