Excel Functions and Formulas

The **IF () function** is one of Excel’s super functions. It is a fundamental building-block of Excel formulas.

**Overview:**

The “IF” function (sometimes called: “IF statement”) is composed of three parts separated by commas: A condition, what to display if the condition is met, and what to display if the condition isn’t met.

**Building the IF function step by step:**

1. Select the cell in which you want the IF function to be.
2. Type the following code: `=if(`
3. Type the condition.
4. Type a comma.
5. Type what you want to display if the condition is met (if it is text, then write the text within quotation marks).
6. Type a comma.
7. Type what you want to display if the condition isn’t met.
8. Close the bracket and hit the [Enter] key.

**Function Examples**

`=if(B5>50000,”too expensive”,”let’s buy it”)`

In words: If the value of cell B5 is greater than 50,000 then show the words “too expensive”, otherwise show the words “let’s buy it”.

`=if(A6=”Monday”,”Back to work”,”Stay at vacation”)`

In words: If the value of cell A6 is the word “Monday” then show the words “Back to work”, else show the words “Stay at vacation”.

`=if(B2=”Jermey”,”A great kid”,"")`

In words: If the value of cell B2 is the word “Jermey” then show the words “A great kid”, otherwise leave the cell empty.

**Advance IF examples (using it with the OR and AND functions)**

`=if(or(A5=”Saturday”,A5=”Sunday”),”This is weekend”,”This is a working day”)`

In words: if the value of cell A5 is “Saturday” or the value of cell A5 is “Sunday” then show the words “This is weekend”, else show the words “This is a working day”.

`=if(and(A3=”Jack”,B3=”Bower”),”Found the guy”,”That isn’t him”)`
In words: if the value of cell A3 is “Jack” and the value of cell B3 is “Bower” then write “Found the guy”, else write “That isn’t him”.

**Function Examples with Calculations**

=if(A2<5,A2*2,A2*3)

In words: If the value of cell A2 is smaller than 5 then multiply this value with 2, otherwise multiply this value by 3.

=if(A6>=80,A6*110%,A6)

In words: If the value of cell A6 is greater or equal to 80, then give this value bigger by 10%, else return simply this value (with no change).

=if(C4=100,””,B5*E5+4)

In words: If the value of cell C4 equals to 100 then leave this cell blank, else multiply cell B5 with cell E5 and add 4 to it.

**Advance IF examples (using it with more functions):**

=if(and(B5<10,C5<10),B5*C5,B5+C5)

In words: If both the values of cells B5 and C5 are smaller than 10, then multiply these cells, otherwise add up these cells.

=if(A4>average(B2:B15),”Cell A4 is bigger than the average”,””)

In words: If the value of cell A4 is greater than the average of the cells of the range B2:B15, then write “Cell A4 is bigger than the average”, otherwise leave this cell empty.

---

**There is a lot more power in Excel formulas conditions than just the basic IF() function, though.**

Here are 7 conditional techniques that can help you create even more robust and useful Excel formulas:
1. Nested If Functions

This is the most basic type of ‘complex’ if() function. You can use an additional if function to create a more complex condition within your Excel formula. For instance:

\[=IF(A1>10,IF(A1<20,"In range"))\]

The function above would test whether cell A1 contains a value that’s between 10 and 20. Only if both conditions are satisfied then the formula returns the value “In range”.

It is possible to use several levels of IF() function nesting. For example:

\[=IF(A1>10,IF(A1<20,IF(B2="HAS AMMO","FIRE!!!!")))\]

The formula above tests that A1 contains a number that is within range and that B2 holds the status ‘HAS AMMO’ and only if those three conditions are satisfied, it returns a value of “FIRE!”.

2. Logical-Boolean Functions

Nesting is powerful but it is complicated and often results in a formula that is difficult to read or change. A much better way to create complex conditions is to use Excel’s Boolean functions.

The AND() function will return true if all its parameters are true conditions.

So, the formula...

\[=IF(AND(A1>10,A1<20), "In range")\]

Will also check if cell A1 is between 10 and 20 plus, it is much easier to understand (and to write) then the nested formula above.

The following formula...

\[=IF(AND(A1>10,A2<20,B1="HAS AMMO"),"FIRE!")\]

Is ten times easier to write/read then the corresponding nested IF() above

Another extremely useful Boolean function is the OR() function.

The formula...

\[=IF(OR(A1="CAT IS AWAY",A1="CAT IS BUSY"),"THE MICE PLAY")\]

Will return ‘THE MICE PLAY’ if A1 equals either ‘cat is away’ or ‘cat is busy’.

3. Countif, SumIf, Averageif, etc.

This group of functions allows you to apply a range function such as SUM(), COUNT() OR AVERAGE() only to rows that meet a specific condition.

For instance, you can sum or count all the sales that were made during the year 2001 as shown below:
It goes without saying that these conditional functions are very useful.

4. **Countifs, SumIfs, Averageifs, etc.**

The COUNTIFS() and SUMIFS() function (and the rest of the multiple conditions aggregate functions) were introduced in Excel 2007. These functions enable us to apply an aggregation function to a subset of rows where those rows meet several conditions. For instance, we can use the SUMIFS() function to sum all the sales that were made in the January of 2001, with a single function...

5. **If and Array Formulas**

In Excel versions prior to 2007, the formula AVERAGEIF() did not exist. So, if for example, you wished to average a range of numbers without including Zeros in the calculation, you needed to rely on an array formula:
Array formulas can also be used to mimic the working of `countifs()`, `sumifs()` and the rest of the `xxxxxifs()` functions, that simply did not exist in Excel versions before 2007. They can also be used to implement new functions that does not exist such as `MAXIF()` and `MINIF()`.

6. IFError() function

A close relative of the IF() function is the IFERROR() function. It allows you return a valid value in case a formula returns an error. For instance, if you have a formula that might cause a division by zero error, you can use the IFERROR() function to catch this event and return a valid value, as shown below:

**Note**: It is better to use the IF() function to avoid an error then to use the ISERROR() function to catch an error. It is both faster (in terms of CPU) and better programming practice. So the same result we achieved with the ISERROR() function above can be achieved with an IF() function as shown here:
But there are cases when you cannot pretest the formula parameters and in those cases the ISERROR() function can come in handy.

7. Information functions

This group includes several functions that give you information about the type of the value contained in a cell (if it’s a string, a number, an odd number or an even number), if a cell is empty or if it contains an N/A value and more. These functions, when used in conjunction with the IF() function can be pretty handy, for example, they allow you to easily check whether a cell is empty:

Complex If Functions

Create a table like the following. Populate it using {=randbetween(40, 100)} and the “Fill handle”:
However, we want to display the following grades as well:

**A** If the student scores 80 or above  
**B** If the student scores 60 to 79  
**C** If the student scores 45 to 59  
**D** If the student scores 30 to 44  
**FAIL** If the student scores below 30

With such a lot to check for, what will the IF Function look like? Here's one that works:

```
=IF(B2>=80, "A", IF(B2>=60, "B", IF(B2>=45, "C", IF(B2 >=30, "D", "Fail" ) ) ) )
```

Quite long, isn't it? Look at the colours of the round brackets above, and see if you can match them up. What we're doing here is adding more IF Functions if the answer to the first question is NO. If it's YES, it will just display an "A". But take a look at our Student Exam spreadsheet now:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>2</td>
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<td>10</td>
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<td>11</td>
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<tr>
<td>14</td>
<td>B</td>
<td>A</td>
<td>D</td>
<td>C</td>
<td>B</td>
<td>A</td>
<td>C</td>
<td>Eliz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>B</td>
<td>A</td>
<td>D</td>
<td>C</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>C</td>
<td>A</td>
<td>C</td>
<td>B</td>
<td>C</td>
<td>B</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>B</td>
<td>D</td>
<td>C</td>
<td>B</td>
<td>D</td>
<td>B</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>A</td>
<td>B</td>
<td>Fail</td>
<td>Fail</td>
<td>A</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>A</td>
<td>B</td>
<td>Fail</td>
<td>Fail</td>
<td>A</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>21</td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After the correct answer is displayed in cell B14 on the spreadsheet above, we used AutoFill for the rest!

**CountIF in Excel**

Another useful function that uses Conditional Logic is CountIF. This one is fairly straightforward. As its name suggests, it counts things! But it counts things IF a condition is met. For example, keep a count of how many students have an A Grade.

To get you started with this function, we'll use our [Student Grade spreadsheet](#) and count how many students have a score of 70 or above. First, add the following label to your spreadsheet:
As you can see, we've put our new label at the start of the K column.

We can now use the CountIF function to see how many of the students scored 70 or above for a given subject.

The CountIF function looks like this:

\[
\text{COUNTIF}(\text{range}, \text{criteria})
\]

The function takes two arguments (the words in the round brackets). The first argument is range, and this means the range of cells you want Excel to count. Criteria means, "What do you want Excel to look for when it's counting?".

So click inside cell K2, and then click inside the formula bar at the top. Enter the following formula:

\[=\text{CountIf}(\text{B2:12}, "\geq 70")\]

The cells B2 to I2 contain the Math scores for all 8 students. It's these scores we want to count.

Press the enter key on your keyboard. Excel should give you an answer of 4:

(If you're wondering where the columns B to I have gone in the image above, we've hidden them for convenience sake!)

To do the rest of the scores, you can use AutoFill. You should then have a K column that looks like this:
By using CountIF, we can see at a glance which subjects students are doing well in, and which subjects they are struggling in.

**Exercise**

Add a new label to the L column. In the cells L2 to L9, work out how many students got below 50 for a given subject. You should get the same results as in the image below:

![CountIF Table](image)

**SumIF**

Another useful Excel function is SumIF. This function is like CountIf, except it adds one more argument:

\[
\text{SUMIF}(\text{range}, \text{criteria}, \text{sum_range})
\]

Range and criteria are the same as with CountIF - the range of cells to search, and what you want Excel to look for. The Sum_Range is like range, but it searches a new range of cells. To clarify all that, here's what we'll use SumIF for. (Start a new spreadsheet for this.)

Five people have ordered goods from us. Some have paid us, but some haven't. The five people are Elisa, Kelly, Steven, Euan, and Holly. We'll use SumIF to calculate how much in total has been paid to us, and how much is still owed.

So in Column A, enter the names:
In Column B enter how much each person owes:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Customer</td>
<td>Total Goods Ordered</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3 Elisa</td>
<td>£120.00</td>
</tr>
<tr>
<td>4 Kelly</td>
<td>£134.00</td>
</tr>
<tr>
<td>5 Steven</td>
<td>£123.00</td>
</tr>
<tr>
<td>6 Euan</td>
<td>£145.00</td>
</tr>
<tr>
<td>7 Holly</td>
<td>£156.00</td>
</tr>
</tbody>
</table>

In Column C, enter TRUE or FALSE values. TRUE means they have paid up, and FALSE means they haven't:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Customer</td>
<td>Total Goods Ordered</td>
<td>Has Paid</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Elisa</td>
<td>£120.00</td>
<td>TRUE</td>
</tr>
<tr>
<td>4 Kelly</td>
<td>£134.00</td>
<td>FALSE</td>
</tr>
<tr>
<td>5 Steven</td>
<td>£123.00</td>
<td>FALSE</td>
</tr>
<tr>
<td>6 Euan</td>
<td>£145.00</td>
<td>TRUE</td>
</tr>
<tr>
<td>7 Holly</td>
<td>£156.00</td>
<td>FALSE</td>
</tr>
</tbody>
</table>

Add two more labels: Total Paid, and Still Owed. Your spreadsheet should look something like this one:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Customer</td>
<td>Total Goods Ordered</td>
<td>Has Paid</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Elisa</td>
<td>£120.00</td>
<td>TRUE</td>
<td></td>
</tr>
<tr>
<td>4 Kelly</td>
<td>£134.00</td>
<td>FALSE</td>
<td></td>
</tr>
<tr>
<td>5 Steven</td>
<td>£123.00</td>
<td>FALSE</td>
<td></td>
</tr>
<tr>
<td>6 Euan</td>
<td>£145.00</td>
<td>TRUE</td>
<td></td>
</tr>
<tr>
<td>7 Holly</td>
<td>£156.00</td>
<td>FALSE</td>
<td></td>
</tr>
</tbody>
</table>

In cells B10 and B11, we'll use a SumIF function to work out how much has been paid in, and how much is still owed. Here's the SumIF function again:
**SUMIF***(range, criteria, sum_range)***

So the range of cells that we want to check are the True and False values in the C column; the criteria is whether they have paid (True); and the Sum_Range is what we want to add up (in the B column).

In cell B10, then, enter the following formula:

\[=\text{SUMIF(C3:C7, TRUE, B3:B7)}\]

When you press the enter key, Excel should give you the answer:

So 265 is has been paid in. But we told SumIF to first check the values in the cells C3 to C7 (range). Then we said look for a value of TRUE (criteria). Finally, we wanted the values in the B column adding up, if a criteria of TRUE was indeed found (sum_range).

Exercise

Use SumIF to work out how much is still owed. Put your answer in cell B11.

**COUNTIFS**(criteria_range1, criteria1, [criteria_range2, criteria2]...)

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Gender</th>
<th>Subject</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>F</td>
<td>Math</td>
<td>63%</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>F</td>
<td>English</td>
<td>78%</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>F</td>
<td>Science</td>
<td>39%</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>M</td>
<td>Math</td>
<td>55%</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>M</td>
<td>English</td>
<td>71%</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>M</td>
<td>Science</td>
<td>51%</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>F</td>
<td>Math</td>
<td>78%</td>
</tr>
</tbody>
</table>
Example 1

If we want to know how many female test scores were greater than 60%, we could use the following formula:

\[=\text{COUNTIFS}( B2:B13, "Female", D2:D13, ">60\%" )\]

which gives the result 4.

In this example, the formula has counted the number of rows where:

- The entry in column B is equal to "Female"

and

- The entry in column D is greater than "60%"

Example 2

If we want to know how many science tests scores were less than 50%, we could use the formula:

\[=\text{COUNTIFS}( C2:C13, "Science", D2:D13, ",<50\%" )\]

which gives the result 2.

Countifs Function Errors

The error that you are most likely to get from the Excel Countifs function is the #VALUE! error:

Common Error#VALUE! - Occurs if the supplied criteria_range arrays do not all have equal length.
**Sumif() and Sumifs()**

SUMIF() is used by many accountants who need to sum information based on a criteria. As an example and account number. The SUMIF() function will look for that specific account number and then sum the requested column. or the contents of an equivalent range of codes in another column, match a particular criteria.

You could use SUMIF() to sum all the values in a column that are above a particular value (this example uses a criteria of >1000 which is directly entered. It is better practice to have this criteria entered in a cell and the function formula references that cell e.g >$E$56):

=SUMIF(B1:B23,">1000")

Or, if column A contains a list of dates, you could use SUMIF() to sum all the amounts in column B that are on or after a particular date in column A:


New in Excel 2007 is the SUMIFS() function which extends the functionality of SUMIF() by allowing the inclusion addition of multiple range/criteria pairs. If use use the same example as our date example we could use SUMIFS() as follows:


Take note that in the SUMIFS() function the sum range is the first argument, whereas in SUMIF() it is the (optional) last argument. Also, in SUMIFS() all the criteria ranges must be the same size and shape as the sum range.

Our two range/criteria pairs are:

A1:A23,">=01/08/07" – include all amounts in B1:B23 where the corresponding date in A1:A23 is greater than or equal to 1 August 2007;
A1:A23,"<=31/05/07" – include all amounts in B1:B23 where the corresponding date in A1:A23 is less than or equal to 31 August 2007

We could use a similar approach where our transactions cover multiple columns, and we need to base the conditions for the sum on several columns. In this example we are assuming that we have some sort of code in column C and we only want to sum items with a May 2007 date and a code of A:


You can apparently have up to 127 range/criteria pairs which should be enough for most uses. There is also an equivalent COUNTIFS() function for counting rather than summing items in this way.

**SUMIF Formula first:**

The function wizard in Excel describes the SUMIF Formula as:
=SUMIF(range, criteria, sum_range)

Not very helpful is it? Let’s translate it into English with an example. In the table below we want to sum the total number of Units (in column D) for Dave:

Translated, our formula would read like this:

=SUMIF(the name in column C, = Dave, add the figures in column D)

We could even put a summary table at the bottom of the list for each builder like this:

Our formula in cell D11 would be:

=SUMIF(C2:C7,“Dave”,D2:D7)

While the above formula is good, if we were to copy it to the rest of the summary table (cells D11 to D14 and F11 to F14) we would have to manually change the cell references and builder’s name to get the correct answers.
The solution is to use absolute references to help speed up the process of copying the formula to the remainder of column D and column F. With absolute references our formula would look like this:

\[=\text{SUMIF}\left(\text{C2:C7, C11, D2:D7}\right)\]

We could then copy and paste the formula to the remaining cells in our summary table without having to modify it at all. As we copied it down column D, Excel would dynamically update the formula to automatically pick up the next builder in the list. Then when we copied it across to column F, Excel would dynamically alter the reference to column D to F.

**SUMIFS Formula:**

The function wizard in Excel describes the SUMIF Formula as:

\[=\text{SUMIFS( sum_range, criteria_range_1, criteria_1, criteria_range_2, criteria_2... and so on if required)\right)\]

Extending the SUMIF example above, say we wanted to only summarise the data by builder, for jobs in the central region. We could use the SUMIFS formula as it allows us to set more than one condition.

Here’s how the formula would be interpreted if we wanted to add up the Units in column D, for Doug’s jobs in the Central region:

\[=\text{SUMIFS( add the units in column D if, in column C, they are for Doug and, if in column B, they are also for the Central region)\right)\]

Note: Excel will only include the figures in column D in the sum when both conditions (Doug & Central) are met.

In Excel our formula would read:

\[=\text{SUMIFS(D2:D7, C2:C7, C18, B2:B7, B17)\right)\]
Note: again I’ve used a simple example to illustrate this formula, but you could also achieve this summary table for each builder by region using Pivot Tables. To watch a tutorial on how to insert a Pivot Table sign up to our Premium Microsoft Office Online Training or read our Pivot Table Tutorial.

Try other operators in your SUMIF and SUMIFS

Just like the IF formula, the SUMIF and SUMIFS are based on logic. This means you can employ different tests other than the text matching (Doug & Central) we’ve used above.

Other operators you could use are:

- = Equal to
- < Less Than
- <= Less than or equal to
- >= Greater than or equal to
- <> Less than or greater than

For example, if you wanted to sum units greater than 5 the formula would be:

=SUMIF($D$2:$D$7,">5",$D$2:$D$7)
**The Vlookup function (finding an exact match)**

**Building the function step by step:**
1. Type the following code: =vlookup(  
2. Type the address of the cell containing the value that you wish to look for in the table.  
3. Type the range of the table to look inside, (or better: Name the table before starting with the function, and type now its name). Remember: don’t include the table’s heading row.  
4. Type the column number from which you want to retrieve the result.  
5. Type the word FALSE which means: “Please find me exactly the value of the cell mentioned in step 2. (Don’t round it down to the closest match)”.
6. Close the bracket and hit the [Enter] key.  

Note: The function will always look for the value mentioned on step 2 only on the first column (the utmost left column) of the table.  

**Vlookup Examples:**
Let’s assume you are using the following Excel worksheet:  

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name</td>
<td>Test1</td>
<td>Test2</td>
<td>Test3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Andrew</td>
<td>76</td>
<td>98</td>
<td>56</td>
<td>77</td>
</tr>
<tr>
<td>3</td>
<td>Becky</td>
<td>75</td>
<td>87</td>
<td>95</td>
<td>86</td>
</tr>
<tr>
<td>4</td>
<td>Dan</td>
<td>99</td>
<td>45</td>
<td>66</td>
<td>70</td>
</tr>
<tr>
<td>5</td>
<td>Jake</td>
<td>79</td>
<td>85</td>
<td>95</td>
<td>86</td>
</tr>
<tr>
<td>6</td>
<td>Nancy</td>
<td>96</td>
<td>87</td>
<td>85</td>
<td>89</td>
</tr>
<tr>
<td>7</td>
<td>William</td>
<td>89</td>
<td>77</td>
<td>85</td>
<td>88</td>
</tr>
</tbody>
</table>

=vlookup(C10,A2:E7,2,FALSE)  

In words: Look for the value in cell C10 inside table located at A2:E7, and retrieve me the value on the 2’nd column. Please find me exactly what’s in cell C10.  
The value of the above formula will be: 99 (on Dan’s row, the second column).  

**Copying and replicating the function**
If you plan on copying the vlookup function, either by “copy” and “paste” or by dragging it with the fill handle, make sure to set the table’s address with fixed reference (e.g. $A$2:$E$7), but it would be better instead to name the table, as in the following example.  

You can name the range A2:E7 by selecting it, and typing the name in the name box.  
Let’s assume you named it studentsTable (spaces are not allowed, but you may use underscores).
=vlookup(c10,studentsTable,3,false)

In words: Look for the value in cell C10 inside studentsTable, and retrieve the value from the table’s 3’rd column. Please find me exactly what’s in cell C10. The value of the above function will be: 45 (on Dan’s row, the value in the third column of the table).

**Troubleshoot (advanced usage with more functions)**

If the vlookup doesn’t find a match, it will write the following code: #N/A. You can overcome this code, and set what do display in case it doesn’t find a value by using the IF function with the ISNA() function. Look at the following example:

=if(isna(vlookup(c10,studentsTable,3,false)),"didn’t find any match", vlookup(c10,studentsTable,3,false))

In words: if the vlookup function gives us the #N/A code, then write “didn’t find any match”, else compute the vlookup function.

Explanation:
The 3 parts of the above IF function are:
1. isna(vlookup(c10,studentsTable,3,false))
2. “didn’t find any match”
3. vlookup(c10,studentsTable,3,false)

The first part is a condition, which says: Does the vlookup function gives us the #N/A code? If it does, write “didn’t find any match”, otherwise compute the vlookup function.

Tip:
Instead of the part “didn’t find any match”, you can put only double quotation marks “” which will leave the cell empty in case no match is found:

=if(isna(vlookup(c10,studentsTable,3,false)),””, vlookup(c10, studentsTable,3,false))

or let it retrieve the value 0 in case of no match:

=if(isna(vlookup(c10,studentsTable,3,false)),0, vlookup(c10, studentsTable,3,false))
The Vlookup function - closest match

Building the function step by step:
This is exactly the same process as building the vlookup with exact match, but with the following difference: Instead of writing FALSE at the end of the function, write TRUE.

Example:
Let’s assume you have the following worksheet, and the table is named “sales_table”:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of sales</td>
<td>Meaning</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>100</td>
</tr>
</tbody>
</table>

Today’s sales: 14

=vlookup(B10, sales_table, 2, true)

In words: find me the value of cell B10 inside the first column of sales_table, and retrieve me the value next to it from the table’s second column. If you don’t find the value, relate to the closest smaller value you can find.

Hence, the value 14 doesn’t appear on the first column of the table, so the function will relate to the value 10 which is the closest smaller value, and retrieve the word “medium” from the second column.

If the value of cell B10 was changed to 90, the vlookup would return us the word “Great” (the closest smaller match it finds would be 50)
**Getting Rid of the Vlookup #N/A Error Code**

When the vlookup function doesn’t find the value inside the range specified, it will write the #N/A code, meaning “Not Available”.

To get rid of this error code, you can put the vlookup inside an IF function together with the ISNA function in the following format:

```
=If (isna (vlookup(blabla)) , “”, vlookup(blabla))
```

In words: If the vlookup function is N/A, then leave the cell blank, otherwise perform the vlookup function.

**An Example (taken from the related video):**

```
=If(isna(vlookup(D9,oldList,2,false)),””,vlookup(D9,oldList,2,false))
```

(Note the double parenthesis after the word “false” in both of its occurrences)

Let’s cut the above function into three parts, and examine them one by one:

**First part:**

```
=If(isna(vlookup(D9,oldList,2,false)),
```

In words:
If the function vlookup(D9,oldList,2,false) gives N/A - (this will happen if it didn’t find the value of cell D9 inside oldList),

**Second part:**

```
””,
```

In words:
Then leave the cell blank (double quotation marks mean “blank”)

**Third part:**

```
vlookup(D9,oldList,2,false))
```

In words: Otherwise perform the vlookup as usual.