

COMMON LOGICAL FUNCTIONS

FUNCTION	DESCRIPTION
AND	Returns TRUE if all arguments are met
FALSE	Returns the logical value FALSE
IF	Specified a logical test to perform
IFERROR	Returns a value specified if a formula evaluates to an error, otherwise, returns the result of the formula
NOT	Reverses the logic of its argument
OR	Returns TRUE if any argument is True
TRUE	Returns the logical value of TRUE

THE AND FUNCTION

1. Enter the following data into cells D1 to D3: 78 , 110 , 45
2. Click on cell E1 - the location where the results will be displayed
3. Click on the Formulas tab|Function Library group|Logical|AND
4. Provide D1<100 in the logical1 area
5. Provide D2<100 in the logical2 area
6. Provide D3<100 in the logical3 area
7. Click OK
8. The value FALSE should appear in cell E1 because the data in cell D2 is greater than 100
9. Modify D2 to read 75 and check the results

THE IF FUNCTION

The IF function tests to see if a certain condition in a spreadsheet is true or false. The syntax for the IF function is:

=IF (logical_test, value_if_true, value_if_false)

- ✓ logical_test - a value or expression that is tested to see if it is true or false
- ✓ value_if_true - the value that is displayed if logical_test is true
- ✓ value_if_false - the value that is displayed if logical_test is false

1. Enter 35 into cell D1
2. Click on cell E1 - the location where the results will be displayed
3. Click on the Formulas tab
4. Choose Function Library|Logical Functions from the ribbon to open the drop down list
5. Click on IF in the list
6. On the Logical_test line in the dialog box, click on cell D1
7. Type the *less than* symbol (<) and then the number 26
8. On the Value_if_true line of the dialog box, type 100
9. On the Value_if_false line of the dialog box, type 200 and click OK
10. The value 200 should appear in cell E1, as the value in D1 is > than 26

CHANGING THE IF FUNCTION'S RESULTS

1. To change the result in cell E1, change the number in cell D1. For example, change E1 to 15 and press the Enter key
2. The value 100 should now be present in cell E1 since the value in D1 is now less than 26
3. If you click on cell E1, the complete function = IF (D1 < 26 , 100 , 200) appears in the formula bar

TRUE OR FALSE

1. The syntax of this function is :
IF(logical_test, [value_if_true], [value_if_false])
2. Create the following:

STUDENT	SCORE	RESULT	GRADE
Student 1	35		
Student 2	67		
Student 3	88		
Student 4	70		
Student 5	95		

3. To determine who passed or failed the test, the formula results reads:

TEXT SCORE	RESULT
Greater than or equal to 70	Passed
Less than 70	Failed

4. In cell C2, enter the following formula:
IF(B2>=70, "Passed", "Failed")
5. To turn the list of test scores into grades, we will embed an additional IF function as follows:

TEST SCORE	GRADE
Greater than 89	A
From 80 to 89	B
From 70 to 79	C
From 60 to 69	D
Less than 60	F

6. Based on these conditions, the nested formula entered in cell D2, will be:
IF(B2>89, "A", IF(B2>79, "B", IF(B2>69, "C", IF(B2>59, "D", "F"))))
7. If we use the IF function four times, we need to include four ending parentheses in the formula.

IFERROR FUNCTION

1. The Excel IFError function tests if an initial supplied value (or expression) returns an error, and if so, returns a second supplied argument; Otherwise the function returns the initial tested value.
2. The IFError function is new to Excel 2007, so is not available in earlier versions of MS Excel
3. The syntax of the function is:
IFERROR(value, value_if_error)

COMBINING THE OR WITH THE IF FUNCTION

1. By itself, the OR function has limited usefulness. By combining it with another function, such as the IF function, the OR function can increase the capabilities of your spreadsheet.
2. To Nest an OR function inside an IF function
=IF(OR(B1>100,B2>100,B3>100),"Over Budget","Acceptable")
3. Assuming this function is located in cell C1, if any of these three cells (B1,B2, or B3) contains a value greater than 100, the IF function will show the statement Over Budget in cell C1. If all three cells have numbers less than or equal to 100, the IF function shows the statement *Acceptable* in cell C1.

CONDITIONAL FORMATTING

1. Create the following:

	A	B	C	D	E
1	Product	Qtr 1	Qtr 2	Qtr 3	Qtr 4
2	Mars	50	43	66	45
3	Baby Ruth	74	75	83	45
4	Skittles	85	86	94	56
5	Malt Balls	92	93	101	63
6	Red Hots	100	101	106	71
7					

2. Select B2:E6
3. Click the Home tab|Styles group|Conditional Formatting|Highlight Cells Rules|Greater Than.
4. Type 85 in the Greater Than dialog
5. Click OK
6. All entries greater than 85 will display with a red background. If there had been a 85 in the selected range it would not be affected by the rule
7. To remove the formatting, with B2:B6 active, select Home tab|Editing group|Clear|Clear Formats
8. Save the copy of the unformatted data to the desktop

TOP/BOTTOM RULE

1. Select B2:E8 in the above created data sheet
2. In the Home tab|Styles group|Conditional formatting|Top/Bottom Rules|Top 10 Items
3. Using the spinner, select 5 from the drop-down list and click OK
4. Follow the above and display the bottom 10 entries and in case of ties, more than the designated cell will be marked.

DATA BARS ON TOTAL COLUMN

1. Create the following:

	A	B	C	D	E
1		Score 1	Score 2	Score 3	Score 4
2	Mary	78	80	91	86
3	John	81	88	92	91
4	Bill	69	76	83	62
5	Ann	73	94	94	80
6	Average	75	85	90	80
7					

2. With the Average data highlighted (B6:E6), click Home tab|Styles group|Conditional Formatting|Color Scales and a scale background
3. Repeat the above, Home tab|Styles group|Conditional Formatting|Color Scales and to choose your own color values, click on More Rules
4. At Select a Rule Type, highlight Format only cells that contain
5. Type the values 0 and 75 for the two boxes that are blank
6. Click the Format button to choose a fill color and font, if required
7. Click OK back to the worksheet
8. To format the remainder of the selected cells, click Home tab|Styles group|Conditional |Manage Rules
9. Click New Rule and Format Styles to Data Bar
10. Set a new color for the next scores of 76 to 80 and a color
11. Click OK until you get back to the Rules Manager
12. Repeat the above to complete the remainder of the scores with the scores as follows:
0 to 75, 76 to 80, 81 to 89 and 90 to 100
13. If necessary, delete any unwanted bars
14. When completed, your data should display with four colors.

APPLYING ICON SETS

1. Using the data from the previous task, we are considering three categories: scores ≥ 90 , ≥ 79 and < 79 and with a Type of Number on all
2. Select the column(s) on which you want to show Icons (B2:E5)
3. Select the Home tab|Styles group|Conditional Formatting|Icon Sets|More Rules
4. At New Formatting Rule|Select a Rule Type |select an appropriate one. The first one is OK for now
5. Under Edit the Rule Description|Format Style| icon sets
6. Under Icon pane ,we need a set which contains 3 icons, so we can apply icons with each category, as shown in the screenshot below



7. Click OK to apply rules over the selected columns

NUMBERS WITHIN A NUMBER

1. Using the data from the previous task, click in G2
2. Type the following formula: `=ISNUMBER(FIND("9",D2))`
3. Depress Enter to find that the response is TRUE

ROWS WITH BLANK CELLS

1. Using the data from the previous task, delete the contents of D2
2. Click in H2
3. Type the following formula: `=D2=""`
4. Depress Enter to find that the response is TRUE
5. Modify the formula so is returns FALSE

COUNTING DATA ENTRIES

1. Using the data from the previous task, click in A8
2. Type the formula `=COUNT(A2:A5)`
3. Depress Enter to return a four

COUNTING VALUE ENTRIES

1. Using the data from the previous task, click in B8
2. Type the formula `=COUNTA(B2:B5)`
3. Depress Enter to return a four

CREATE A SPARKLINE

1. Using the data from the previous task, select F2:F5
2. Select Insert tab| Sparklines group| Line
3. In the Data box, type the range of the cells that contain the target data (B2:E5)
4. Click OK
5. Try changing the appearance of the graph

SOME INTERESTING SHORTCUTS

CTRL+1	Displays the Format Cells dialog box.
CTRL+2	Applies or removes bold formatting.
CTRL+3	Applies or removes italic formatting.
CTRL+4	Applies or removes underlining.
CTRL+5	Applies or removes strikethrough.
CTRL+6	Alternates between hiding & displaying objects.
CTRL+8	Displays or hides the outline symbols.
CTRL+9	Hides the selected rows.
CTRL+0	Hides the selected columns.