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## Lesson 6      The If Function

### Lesson Topics

- Conditional (IF) Tests
- Exercise: Controlling Car Costs

### Lesson Objectives

At the end of the lesson, you will be able to:

- Use an IF function to display results based on conditional statements;
- Use six different logical operators with an IF function.

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### Student Files Used

You will use the following file from your student folder:

- New Car Options

## Conditional (IF) Tests

The *IF* function lets Excel test whether a condition is true or false. If it is true, Excel displays a value or text of your choice. If it is false, Excel displays a different value or text of your choice. To perform the tests, Excel uses *logical operators* such as = (equal to), > (greater than), and < (less than).

You are going to enter some IF statements to learn the feature, and then you will be given a practical exercise.

1. **Open a new workbook.**
2. You are going to write an IF statement that tests whether the value in A1 is 200. If it is 200, you are going to ask Excel to display a 1. If it is not 200, you are going to ask Excel to display a 2.

**In A1, type 200 and tap the ENTER key.**

3. **Go to A3.**
4. You are going to write the IF test one step at a time. Do not tap the ENTER key until you are instructed to do so.

**Type: =IF(A1=200**

This part of the formula would translate to: "If the contents of A1 equal 200." (Remember, when typing a formula, you can use either upper or lowercase letters. =*IF* can also be typed =*if*.) This is the *condition* (or *logical test*) part of the formula.

5. **Type: ,1**

This tells Excel to enter a 1 in the cell if the condition that you entered is true — that is, if the value in A1 is 200. Your formula should look like this:

=IF(A1=200,1

6. **Type: ,2**

This tells Excel to enter a 2 in the cell if the condition that you entered is false — that is, if the value in A1 is not 200. Your formula should look like this:

=IF(A1=200,1,2

7. **Finish the formula with a right parenthesis: )**

Your formula should look like this: =IF(A1=200,1,2)  
There should be no spaces on either side of the commas, which are used to separate the three parts of the formula.

The *condition* in your formula is  $A1=200$ . You told Excel to return the value 1 if the condition is true (this is the true result) and to return the value 2 if the condition is false (this is the false result). You can choose any values or text you want for the true and false results.

**8. Tap the ENTER key.**

Notice that a 1 is entered into A3, because the value in A1 is equal to 200.

**9. Go to A1 and change the value to: 300**

The condition tests false, so 2 is entered into A3.

**10. Go to A3 and change the true result to 888 and the false result to 999. Your formula should look like this: =IF(A1=200,888,999). (Remember, if you do not want to work on the Formula bar to edit a cell, double-click in the cell and you can edit directly in it.)**

**11. Tap the ENTER key.**

999 is entered into the cell, because the condition still tests false.

**12. Go to A1 and change the value back to: 200**

888 is displayed in the cell, because the condition tests true.

**13. The entries in the formula do not have to be values. If you want to use text, enclose it within quotation marks. There should be no spaces on either side of the quotation marks.**

**In A3, change the formula to this: =IF(A1=200,"good work","try again")**

*good work* is entered into cell A3, because the condition tests true.

**14. Go to A1 and change the value to: 400**

*try again* is entered into cell A3, because the condition tests false.

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You are going to write the conditional statement with five other operators. The true result will continue to display *true* and the false result, *false*.

**1. Verify that 400 is in A1.**

2. You are going to use the *greater than* (>) operator.

**In A3, change the formula to: =IF(A1>200,"yes","no")**

The condition tests true, so *yes* is displayed in A3.

**3. In A1, change 400 to 100 and notice the condition test false.**

4. You are going to use the *less than* (<) operator.

**Change the formula to: =IF(A1<200,"yes","no")**

The condition tests true.

**5. Change 100 to 300 and notice the condition test false.**

6. You are going to use the *less than or equal to* (<=) operator.

**Change the formula to: =IF(A<=200,"yes","no")**

The condition tests false.

**7. Change 300 to 200 and watch the condition test true.**

8. You are going to use the *greater than or equal to* (>=) operator.

**Change the formula to: =IF(A1>=200,"yes","no")**

The condition tests true.

**9. Change 200 to 100 and watch the condition test false.**

10. You are going to use the *not equal to* (<>) operator.

**Change the formula to: =IF(A1<>200,"yes","no")**

The condition tests true.

**11. Change 100 to 200 and watch the condition test false.**

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The conditional statement can refer to more than one cell.

- 1. Go to B1.**
- 2. Type 500 and tap the ENTER key.**
- 3. In A3, change the formula to: =IF(A1>B1,"yes","no")**

The condition tests false.

- 4. Go to A1 and change 200 to: 800**

The condition tests true.

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You are going to write a conditional statement that refers to text. Remember, text has to be enclosed within quotation marks.

- 1. Go to A1.**
- 2. Type money and tap the ENTER key.**
- 3. In A3, change the formula to:  
=IF(A1="money","true","false")**

The condition tests true.

- 4. Go to A1 and change *money* to: love**

The condition tests false.

- 5. Close the workbook without saving.**

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Following is a list of the operators you have used:

=	equal to
<>	not equal to
>	greater than
<	less than
>=	greater than or equal to
<=	less than or equal to

## Exercise: Controlling Car Costs

You are going to create an IF test for a workbook named *New Car Options*.

	A	B	C	D
1	<b>New Car Options</b>			
2	<b>Price List</b>			
3				
4	<b>Options</b>	<b>Price</b>	<b>Y/N</b>	<b>Cost</b>
5	Radio	200	n	
6	Power Windows	700	n	
7	Air Conditioning	600	n	
8	Deluxe Interior	1,500	n	
9	Under Coating	500	n	
10				
11			<b>Total Cost:</b>	

1. **Open *New Car Options*.**
2. Notice that this is a price list of options for a new car. Column B has the price of the options, and column C will display whether the options have been selected – *n* is for *no* and *y* is for *yes*. In column D, you are going to write a formula that displays the option price if column C contains *y*, or a zero if column C contains *n*.

**Go to D5.**

3. **Type: =IF(C5="y",B5,0). (Make sure you type a zero, and not the letter O.)**

The condition is  $C5="y"$ . It does not matter if the person using this workbook types an uppercase or lowercase *y*.

If the condition tests *true*, the value in B5 will be displayed.

If the condition tests *false*, a zero will be displayed.

4. **Tap the ENTER key.**  
A zero appears, because the condition tests false.
5. **Copy the formula down to D6:D9.**
6. **Change some of the entries in column C to *y* and notice the results in column D change.**
7. **Go to D11 and type the following SUM function: =SUM(D5:D9) (You could also use the AutoSum button on the Standard toolbar.)**

You are going to write an IF test that lets you know whether or not you are over budget.

1. **Go to A13.**
2. **Click the Bold button on the Formatting toolbar.**
3. **Type My Budget is and tap the TAB key.**
4. **In B13, type 2300 and tap the TAB key.**
5. **In C13, click the Bold button, type Status and tap the TAB key.**
6. **In D13, type =IF(D11>B13,"Over Budget","OK") and tap the ENTER key.**

The condition is  $D11 > B13$ . This translates to: "if the cost in D11 is greater than the budget amount in B13." The true result is *Over Budget*. The false result is *OK*.

7. **Right-align cells A13, C13, and D13.**
8. **Change a few y's and n's in column C until you see the condition in D13 test both true and false.**

Depending on the items you have chosen, your screen should look similar to the following:

	A	B	C	D
1	<b>New Car Options</b>			
2	<b>Price List</b>			
3				
4	<b>Options</b>	<b>Price</b>	<b>Y/N</b>	<b>Cost</b>
5	Radio	200	y	200
6	Power Windows	700	n	0
7	Air Conditioning	600	y	600
8	Deluxe Interior	1,500	y	1,500
9	Under Coating	500	y	500
10				
11			<b>Total Cost:</b>	2,800
12				
13	<b>My Budget</b>	2,300	Status	Over Budget

9. **Change your budget in B13 to something else and watch the results.**

*End of Lesson 6*