Lesson 3-5: Use the IF logic function

The IF function is one of Excel’s most widely used and useful functions. It is also a function that often confuses my students, so I’ll begin this lesson by explaining the concept of the logical test. Later, you’ll construct a worksheet containing three examples of the IF function at work.

The IF function requires a logical test and then performs one action if the test returns TRUE and a different action if the test returns FALSE.

Here are some examples of logical tests:

<table>
<thead>
<tr>
<th>Expression</th>
<th>Returns</th>
<th>Why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>6=2</td>
<td>False</td>
<td>Because six does not equal two.</td>
</tr>
<tr>
<td>100&lt;90</td>
<td>False</td>
<td>Because 100 is not less than 90.</td>
</tr>
<tr>
<td>6+2 = 4+4</td>
<td>True</td>
<td>Because eight does equal eight.</td>
</tr>
</tbody>
</table>

In this lesson, you’ll use three different logical tests in order to calculate several employees’ earnings during a week.

1. Open Earnings Summary-1 from your sample files folder.

   Notice the Payroll Rules section:

   Earnings Summary-1

   Logical tests will be constructed to calculate Standard Pay, Overtime Pay and Bonus:

   In the case of Standard Pay, the logical test will be:
   “Did this employee work more than 35 hours this week?”

   The formula for the logical test is: E9<=35 (Cell E9 is less than or equal to 35).

   If this returns TRUE, then standard pay will be:
   Hours Worked * Hourly Rate, (E9*D9)

   ...because the employee worked for 35 hours or less.

   If this returns FALSE, then standard pay will be:
   35*Hourly Rate (35*D9)

   ...because the employee worked more than 35 hours.
2. Use an IF function to calculate standard pay.
   1. Click in cell F9.
   2. Click: Formulas→Logical→IF.
      The Function Arguments dialog appears.
   3. Complete the dialog as follows:

   ![Logical Test Function Arguments Dialog]

   If you do not completely understand why the above formulas are used, read the introduction to this lesson again.

   4. Click the OK button.

   Standard Pay is correctly displayed in cell F9 (525.00).

3. Use an IF function to calculate overtime pay.

   It should now be clear to you why the correct arguments for the IF function, this time, are:

   ![Logical Test for Overtime Pay]

4. Use the IF function to calculate bonus.

   Once again, it should be clear to you why the correct arguments for the IF function this time are:

   ![Logical Test for Bonus]

5. Add a formula to cell I9 to calculate total pay.

   The correct formula could be either of the following:

   =F9+G9+H9
   =SUM(F9:H9)


   The payroll worksheet is now complete.

7. Save your work as Earnings Summary-2.