Lesson 10: Using Advanced Formulas

## Step-by-Step 1 – Using the SUMIF Function

**GET READY. LAUNCH Excel.**

**1.** OPEN the ***10 Fabrikam Sales*** file for this lesson, and SAVE it to the Lesson 10 folder as
***10 Fabrikam Sales Solution***.

**2.** Select **C20**. Click the **FORMULAS** tab and in the Function Library group, click **Math & Trig**. Scroll and click **SUMIF**. The Function Arguments dialog box opens with text boxes for the arguments, a description of the formula, and a description of each argument.

**3.** In the Function Arguments dialog box, click the **Collapse Dialog** button for the Range argument. This allows you to see more of the worksheet. Select the cell range **C5:C16**. Press **Enter**. By doing this, you apply the cell range that the formula will use in the calculation.

**4.** In the Criteria box, type **>200000** and press **Tab**. Figure 10-2 shows that the Sum\_range text box is not bold. This means that this agrument is optional. If you leave the Sum\_range blank, Excel sums the cells you enter in the Range box. You now applied your criteria to sum all values that are greater than $200,000.

*In your workbook, cells in column C are not highlighted and the text and amount in cells C19, E19, and E20 are empty. Figure 10-2 has been modified to show you which cells in the C5:C16 range meet the >200000 criteria (275,000+209,000+258,000+359,500+250,000+305,600) and that the total is the sum of these individual cells or 1,657,100. If you want to conditionally highlight a range, see Lesson 6.*

It is not necessary to type dollar signs or commas when entering dollar amounts in the Function Arguments dialog box. If you type them, Excel removes them from the formula and returns an accurate value.

**5.** Click **OK** to accept the changes and close the dialog box. You see that $1,657,100 of Fabrikam’s December revenue came from properties valued in excess of $200,000.

**6.** If for some reason you need to edit the formula, select the cell that contains the function, and on the FORMULAS tab, or in the Formula Bar, click the **Insert Function** button to return to the Function Arguments dialog box (see Figure 10-3).

*The result of the SUMIF formula in C20 does not include the property value in C15 because the formula specified values greater than $200,000. To include this value, the criterion needs to be >= (greater than or equal to).*

**7.** Click **OK** or press **Esc** if you have no changes.

**8.** Select cell **C21**, and in the Function Library group, click **Recently Used**, and then click **SUMIF** to once again open the Function Arguments dialog box. The insertion point should be in the Range box.

*When you click Recently Used, the last function that you used appears at the top of the list. Similarly, when you click Insert Function, the Insert Function dialog box opens with the last used function highlighted.*

**9.** In the Range field, select cells **E5:E16**. The selected range is automatically entered into the text box. Press **Tab**.

*You do not need to collapse the dialog box as you did in Step 3. You can directly highlight the range if the dialog box is not in the way. Another option is to move the dialog box by dragging the title bar.*

**10.** In the Criteria box, type **<3%** and press **Tab**. You enter the criteria to look at column E and find values less than 3%.

**11.** In the Sum\_range field, select cells **C5:C16**. The formula in C21 is different that the formula in C20. In C21, the criteria range is different than the sum range. In C20, the criteria range and the sum range are the same. In C21, SUMIF checks for values in column E that are less than 3% (E8 is the first one) and finds the value in the same row and column C (C8 in this case) and adds this to the total. Click **OK** to accept your changes and close the dialog box. Excel returns a value of $1,134,200.

**12.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 2 – Use the SUMIFS Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **C22**. On the FORMULAS tab, in the Function Library group, click **Insert**

**Function**.

**2.** In the Search for a function box, type **SUMIF S**, and then click **Go**. SUMIFS is highlighted in the Select a function box.

**3.** Click **OK** to accept the function.

**4.** In the Function Arguments dialog box, in the Sum\_range box, select cells **C5:C16**. This adds your cell range to the argument of the formula.

**5.** In the Criteria\_range1 box, select cells **F5:F16**. In the Criteria1 box, type **<=60**. This specifies that you want to calculate only those values that are less than or equal to 60. When you move to the next text box, notice that Excel places quotation marks around your criteria. It applies these marks to let itself know that this is a criterion and not a calculated value.

**6.** In the Criteria\_range2 box, select cells **C5:C16**. You are now choosing your second cell range.

**7.** In the Criteria2 box, type **>200000**. Click **OK**. You now applied a second criterion that will calculate values greater than 200,000. Excel calculates your formula, returning a value of $742,000.

**8.** Select **C23** and in the Function Library group, click **Recently Used**.

**9.** Select **SUMIF S**. In the Sum\_range box, select **C5:C16**.

**10.** In the Criteria\_range1 box, select cells **F5:F16**. Type **<=60** in the Criteria1 box.

**11.** In the Criteria\_range2 box, select cells **E5:E16**. Type **<3%** in the Criteria2 box and press **Tab**. To see all arguments, scroll back to the top of the dialog box. The Function Arguments dialog box should look like Figure 10-4 in the MOAC text.

*It is a good idea to press Tab after your last entry and preview the result of the function to make sure you entered all arguments correctly.*

**12.** Click **OK**. After applying this formula, Excel returns a value of $433,000.

**13.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 3 – Use the COUNTIF Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Select **C24**. In the Function Library group, click **More Functions**, select **Statistical**, and click **COUNTIF**.

**2.** In the Function Arguments dialog box, in the Range box, select cells **B5:B16**.

**3.** In the Criteria box, type **>=200000** and press **Tab**. Preview the result and click **OK**. You set your criteria of values greater than or equal to $200,000. Excel returns a value of 9.

**4.** Select **C25** and in the Function Library group, click **Recently Used**.

**5.** Select **COUNTIF**. In the Functions Arguments box, in the Range box, select cells **C5:C16**.

**6.** In the Criteria box, type **>=200000** and press **Tab**. Preview the result and click **OK**. Excel returns a value of 7 when the formula is applied to the cell.

**7.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 4 – Use the COUNTIFS Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Select **C26**. In the Function Library group, click **Insert Function**.

**2.** In the Search for a function box, type **COUNTIF S** and then click **Go**. COUNTIFS is highlighted in the Select a function box.

**3.** Click **OK** to accept the function and close the dialog box.

**4.** In the Function Arguments dialog box, in the Criteria\_range1 box, type **F5:F16**. You selected your first range for calculation.

**5.** In the Criteria1 box, type **>=60** and press **Tab**. The descriptions and tips for each argument box in the Function Arguments dialog box are replaced with the value when you navigate to the next argument box (see Figure 10-5). The formula result is also displayed, enabling you to review and make corrections if an error message occurs or an unexpected result is returned. You now set your first criterion. Excel shows the calculation up to this step as a value of 8.

**6.** In the Criteria\_range2 box, select cells **E5:E16**. You selected your second range to be calculated.

**7.** In the Criteria2 box, type **>=5%** and press **Tab** to preview. Click **OK**. Excel returns a value of 2.

**8.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 5 – Use the AVERAGEIF Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Select **C27** and in the Function Library group, click **More Functions**. Select **Statistical** and click **AVERAGE**.

**2.** In the Number1 box, type **B5:B16** and click **OK**. A mathematical average for this range is returned.

**3.** Select **C28** and in the Function Library group, click **Insert Function**.

**4.** Select **AVERAGEIF** from the function list or use the function search box to locate and accept the AVERAGEIF function. The Function Arguments dialog box opens.

**5.** In the Function Arguments dialog box, in the Range box, select cells **B5:B16**.

**6.** In the Criteria box, type **>=200000**.

**7.** In the Average\_range box, select **F5:F16** and press **Tab** to preview the formula. In the preview, Excel returns a value of 63.33.

**8.** Click **OK** to close the dialog box.

**9.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 6 – Use the AVERAGEIFS Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **C29**. In the Function Library group, click **Insert Function**.

**2.** Type **AVERAGEIFS** in the Search for a function box and click **Go**. AVERAGEIFS is highlighted in the Select a function box.

**3.** Click **OK** to accept the function and close the dialog box.

**4.** In the Function Arguments dialog box, in the Average\_range box, select cells **F5:F16**. Press **Tab**.

**5.** In the Criteria\_range1 box, select cells **B5:B16** and press **Tab**. You selected your first criteria range.

**6.** In the Criteria1 box, type **<200000**. You set your first criteria.

**7.** In the Criteria\_range2 box, select cells **E5:E16** and press **Tab**. You have selected your second criteria range.

**8.** In the Criteria2 box, type **<=5%** and press **Tab**. Click **OK**. Excel returns a value of 60.

**9.** SAVE the *10 Fabrikam Sales Solution* workbook, and then close it.

**PAUSE. LEAVE Excel open for the next exercise.**

## Step-by-Step 7 – Use the VLOOKUP Function

**GET READY. LAUNCH Excel if it is not already open.**

**1.** OPEN the ***10 Fabrikam Bonus*** file for this lesson.

**2.** With the Performance sheet active, select cells **A15:C20** in the worksheet. Click the **FORMULAS** tab, and in the Defined Names group, click **Define Name**. The New Name dialog box opens.

**3.** In the New Name dialog box, in the Name box, type **Bonus**. Click **OK** to close the dialog box. You defined the range name.

**4.** Click cell **E5**, in the Function Library group, click **Lookup & Reference**, and select **VLOOKUP**.

**5.** In the Lookup value text box, type **B5** and press **Tab**. The insertion point moves to the Table array box.

**6.** In the Table array box, click the **Collapse Dialog** button. In the Defined Names group, click **Use in Formula** and select **Bonus**. Press **Enter** and **Tab**. The insertion point moves to the next text box.

**7.** In the Col\_index\_num box, type **2**, which is the column containing the individual bonus amounts. Press **Tab**.

**8.** In the Range\_lookup box, type **True**, which means that VLOOKUP can check for the nearest value that does not go over the number in the first column; the same bonus is paid for a range of years, so you enter **True** in the Range\_lookup box so that a value will be returned for all agents. The Function Arguments dialog box should look similar to the one shown in Figure 10-8. Click **OK**. Excel returns a value of 2.5%.

**9.** Using the fill handle in cell E5, copy the formula to the range **E6:E11**. This calculates bonus rates for the other sales agents. The #N/A error message appears in cell E11 because a value is not available for agents who have been employed for less than one year. (Agents become eligible for a bonus only after a full year of service.) You change this error message in another exercise.

**10.** Click in cell **F5** and type **=VLOO KUP(B5,Bonus,3)**. Notice that the ScreenTip gives you information and help as you go. This looks up values in the third column of the Bonus range. Press **Enter**.

**11.** Copy the formula from **F5** to the range **F6:F11**.

**12.** SAVE the workbook as ***10 Fabrikam Bonus Solution***.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 8 – Use the HLOOKUP Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click on the **Standards** worksheet tab to move to the Standards worksheet.

**2.** Click cell **F11**, and in the Function Library group, click **Lookup & Reference**, and select **HLOOKUP**.

**3.** In the Lookup\_value text box, type **E11**. This is the cell you will change and the box previews to Feet because that is what is currently typed in cell E11.

**4.** In the Table\_array text box, type **A1:D7**. This will be the range of cells you will look in.

**5.** In the Row\_index\_num, type **D11+1**. This currently evaluates to 3. If you just do the number of beds that is in D11, you don’t come down enough rows because of the labels in the first row of the Table\_array. The number of beds is actually one row more than the number of beds because the labels (Beds, CO2, Exits, and Feet) count as the first row and row 2 is for 1 bed.

**6.** In Range\_lookup, type **FALSE** because you want an exact match. The screen should look like Figure 10-11. Click **OK**. In the following steps, you will change the values in D11 and D11 and see what happens when there are different values and when there is not an exact match.

**7.** In cell D11, type **5** and notice that the result in F11 changes to 2500.

**8.** In cell E11, type **CO2** and notice that the result changes to the result for the CO2 column for 5 beds, which is 3.

**9.** Click cell **D11**, and then type **7**. Notice that you get a #REF! error because the table goes up to five beds.

**10.** In cell D11, type **1**. Cell F11 displays a result of 1.

**11.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 9 – Use the IF Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click the **Performance** worksheet tab to make it the active worksheet.

**2.** Click cell **G5**. In the Function Library group, click **Logical** and click **IF**. The Function Arguments dialog box opens.

**3.** In the Logical\_test box, type **D5>=C5**. This component of the formula determines whether the agent has met his or her sales goal.

**4.** In the Value\_if\_true box, type **Yes**. This is the value returned if the agent met his or her goal.

**5.** In the Value\_if\_false box, type **No** and click **OK**.

**6.** With G5 still selected, use the fill handle to copy the formula to **G6:G12**. Excel returns the result that three agents earned the performance award by displaying Yes in the cells.

*The entire company is evaluated on making the goal, and bonuses are awarded to the back office staff if the company goal is met. The result in G12 is used for the formulas in column I. When you copy, the formatting is included.*

**7.** Click the **Auto Fill Options** button in the bottom right corner of the range and choose **Fill Without Formatting**.

**8.** In cell H5, type **=IF (G5=”Yes”,E5\*D5,0**. Before you complete the formula, notice the ScreenTip, the cells selected, and the colors (see Figure 10-13). Move the mouse pointer to each of the arguments and they become a hyperlink. E5 is the individual bonus rate and D5 is the actual sales. The bonus is the rate times the sales.

**9.** Press **Enter** to finish the formula.

*In some cases, Excel completes the formula. In Step 8, the closing parenthesis was not added, and Excel was able to complete the formula.*

**10.** Use the fill handle in H5 to copy the formula from to **H6:H11**.

**11.** In I5, type **=IF ($G$12=”Yes”,F5\*D5,0)**, and then press **Enter**.

*Remember that dollar signs before the column and row indicate an absolute reference. When you copy the formula, $G$12 remains the same in every cell.*

**12.** Use the fill handle in I5 to copy the formula from cto **I6:I11**. Notice that Richard Carey, the Senior Partner, did not receive an Agent Bonus and there was no bonus for Back Office.

**13.** The final pending sale of $700,000 of the year came through. In D5, type **$3,900,000**. Notice that H5 and the amounts in column I go from 0 to bonuses.

**14.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 10 – Use the AND Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click the **Annual Sales** worksheet tab. Click the **FOR MULAS** tab if necessary.

**2.** Click cell **B6**. In the Function Library group, click **Logical** and click the **AND** option. The Function Arguments dialog box opens with the insertion point in the Logical1 box.

**3.** Click cell **B3**, type **<=**, select cell **B16**, and press **Enter**. This argument represents the first condition: Did actual sales equal or exceed the sales goal? Because this is the first year, only one logical test is entered.

**4.** Select cell **C6**, click the **Recently Used** button, and click **AND**. In the Logical1 box, type **C3<=C16**. This is the same as the condition in Step 3 (sales exceed or equals sales goal).

**5.** In the Logical2 box, type **C16>=B16\*1.05** and press **Tab**. The preview of the formula returns True, which means that both conditions in the formula have been met. The AND function arguments are illustrated in Figure 10-15 in the MOAC text.

**6.** Click **OK** to complete the formula.

**7.** Select cell **C6** and copy the formula to **D6:F6.**

**8.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 11 – Use the OR Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click on the **Performance** worksheet tab to activate this worksheet. Select **J5** and in the Function Library group, click **Logical** .

**2.** Click **OR**. The Function Arguments dialog box opens. You create a formula that answers the following question: Has Carey worked with the company for less than 4 years?

**3.** In the Logical1 box, type **B5<4** and press **Tab**.

**4.** In the Logical2 box, type **G5=”No”** and press **Tab**. This argument answers the second question: Did Carey not achieve the sales goal? Each of the arguments evaluates to false and so the entire function evaluates to false.

**5.** Click **OK** to close the dialog box.

**6.** Select cell **J5** and copy the formula to **J6** through **J11**.

**7.** Cell J7 is the first in the column that returns a True value. To see each of the arguments, click cell **J7** and then click the **Insert Function** button and you return to the Function Arguments dialog box (see Figure 10-17).

**8.** Click **OK** to close the dialog box and return to the workbook.

**9.** SAVE the workbook.

*As you add arguments, the Logical fields in the Function Arguments dialog box expand to allow you to enter multiple arguments.*

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 12 – Use the NOT Function

**GET READY. USE the workbook from the previous exercise. The Performance worksheet should still be active.**

**1.** Copy cell **J4** to cell **K4** and edit the label to say **Not In Back Office**.

**2.** Click cell **K5**. In the Function Library group, click the **Logical** button.

**3.** Select **NOT** from the list of logical formulas.

**4.** In the Function Arguments dialog box, type **J5** and press **Enter**.

**5.** Copy cell **K5** to cells **K6** through **K11**. Notice that the values in K5 through K11 are the opposite of the values in column J.

**6.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 13 – Use the IFERROR Function

**GET READY. USE the workbook from the previous exercise and make sure the Performance worksheet is active.**

**1.** Select cell **E11** and click to place the insertion point after the = in the formula bar to edit the formula. You add the IFERROR formula to correct the formula error that gave the #N/A result in a previous exercise.

**2.** Type **IFERROR (** before VLOOKUP. Leave the existing formula intact. Press **End** to take you to the end of the formula.

*Notice that we write function names such as IFERROR and VLOOKUP in all uppercase. These names are not case sensitive, but Microsoft always writes them in uppercase in the function lists and Help system because doing so makes reading functions much easier. Thus, it is best to get in the habit of using function names in uppercase.*

**3.** At the end of the original formula, type **,0)**. As shown in Figure 10-18, the complete formula is =IFERROR(VLOOKUP(B11,Bonus,2,True),0). Be sure to include the closing parenthesis and the preceding comma or Excel returns an error that the formula is incorrect.

**4.** Press **Enter**. The #N/A error message is replaced by 0. If you select cell **E11** and click the **Insert Function** button next to the formula bar, the original VLOOKUP formula appears in the Value box (first argument) in the IFERROR formula. As illustrated in Figure 10-19, that argument returned a #N/A error. The Value\_if\_error box contains the 0 that replaces the error message.

**5.** Click cell **F11** and edit the formula to include the IFERROR function
**=IFERROR (VLOOKUP(B11,Bonus,3),0)**.

**6.** Copy the formulas in **E11:F11** to **E5** through **F10**. The workbook doesn’t look like it changes, but you should verify that this worked by changing B6 to 0 (as shown in Figure 10-20).

**7.** Click **Undo** to reverse the change to cell B6 and return the worksheet to the proper values.

**8.** SAVE the workbook.

**PAUSE. CLOSE the workbook and LEAVE Excel open for the next exercise.**

## Step-by-Step 14 – Convert Text to Columns

**LAUNCH Excel if necessary.**

**1.** Open the ***10 Fabrikam Alarm Codes*** workbook. Figure 10-21 shows what the file looks like before you convert the rows to column and Figure 10-22 shows the same data after the conversion.

**2.** Select cells **A2:A8**. Click the **DATA** tab and in the Data Tools group, click **Text to Columns**.

**3.** The Convert Text to Columns Wizard opens with Delimited selected as the default, because Excel recognizes that the data in the selected range is separated with commas. Click **Next** to move to the next step in the wizard.

**4.** Select **Comma** as the delimiter. If other delimiters are checked, deselect them

**5.** Click **Next**, and then click **Finish**.

**6.** Data is separated into seven columns. To help identify the columns, type the text in row 1 and increase the column widths so you can see the cell contents (see Figure 10-22).

**7.** SAVE the workbook as ***10 Fabrikam Alarm Codes Solution***.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 15 – Use the LEFT Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **H1**, type **Ext**, and in I1, type **Floor** to label the columns.

**2.** Select cell **H2**.

**3.** Click the **FORMULAS** tab. In the Function Library group, click **Text** and choose **LEFT**. The Function Arguments dialog box opens.

**4.** In the Text box, click **A2** and press **Tab**.

**5.** In the Num\_chars box, type **3** and press **Tab**. The preview of the result shows *425* (see Figure 10-23).

**6.** Click **OK** and double-click on the fill handle in the bottom right of cell H2 to **copy** the formula in H2 from **H3** to **H8**.

*The result of this exercise on the LEFT function and the following exercises on the RIGHT and MID functions are shown in Figure 10-24 in the MOAC text.*

**7.** Select cell **I2**, click the **Recently Used** button, and select **LEFT** .

**8.** In the Text box, type **A2**, press **Tab**, and in the Num\_chars box, type **1**. Click **OK**.

**9.** Copy the formula in I2 from **I3** to **I8**.

**10.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 16 – Use the RIGHT Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **J1**, and then type **Birthday**. In cell K1, type **EmpID** to label the columns.

**2.** Select cell **J2**.

**3.** Click the **FORMULAS** tab and in the Function Library group, click **Text** and choose **RIGHT**. The Function Arguments dialog box opens.

**4.** In the Text box, click **E2** and press **Tab**.

**5.** In the Num\_chars box, type **3** and press **Tab**. The preview of the result shows *apr*.

**6.** Click **OK** and copy the formula in J2 from **J3** to **J8**.

**7.** Select cell **K2**, type **=RIGHT(A2,5)**, and press **Enter**.

**8.** Copy the formula in K2 from **K3** to **K8**.

**9.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 17 – Use the MID Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **L1**, and then type **empcat1**, and in cell M1, type **empcat2** to label the columns.

**2.** Select cell **L2**.

**3.** Click the **FORMULAS** tab and in the Function Library group, click **Text** and choose **MID**. The Function Arguments dialog box opens.

**4.** In the Text box, click **A2** and press **Tab**.

**5.** The starting point of the empcat1 value is the fourth character of (425oonp15210), so
type a **4** in the Start\_num text box.

**6.** In the Num\_chars box, type **2**. The preview of the result shows *oo*.

**7.** Click **OK** and copy the formula in L2 from **L3** to **L8**.

**8.** Select cell **M2**, and type **=MID(A2,6,2)**, and press **Enter**.

**9.** Copy the formula in M2 from **M3** to **M8**.

**10.** SAVE the workbook. The worksheet should look like Figure 10-24.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 18 – Use the TRIM Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **N1**, type **first**, and in cell O1, type **last** to label the columns.

**2.** Click cell **N2**.

**3.** Click the **FOR MULAS** tab and in the Function Library group, click **Text** and choose **TRIM**. The Function Arguments dialog box opens.

**4.** In the Text box, click **B2**. If you look closely, you see that the original value of cell B2 is “david” with a space before the first name.

**5.** Click **OK** and copy the formula in N2 from **N3** to **N8**.

**6.** Select cell **O2**, type **=TRIM(C2)**, and press **Enter**.

**7.** Copy the formula in O2 from **O3** to **O8**.

**8.** SAVE the workbook. The results of the next few exercises appear in Figure 10-25.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 19 – Use the PROPER Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **A11**, and then type **First**. In cell B11, type **Last**, and in cell C11, type **Birthday** to label the columns.

**2.** Select cell **A12**.

**3.** Click the **FOR MULAS** tab and in the Function Library group, click **Text** and choose **PROPER**. The Function Arguments dialog box opens.

**4.** In the Text box, click **N2**. You see that *david* is converted to *David*.

**5.** Click **OK** and copy the formula in A12 from **A12** through **B18** (both First and Last name columns).

**6.** Select cell **C12**, type **=PRO PER (J2)**, and press **Enter**.

**7.** Copy the formula in C12 from **C13** to **C18**.

**8.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 20 – Use the UPPER Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **D11**, type **EmpCat1**, and in cell E11, type **EmpCat2** to label the columns.

**2.** Click cell **D12**.

**3.** Click the **FOR MULAS** tab and in the Function Library group, click **Text** and choose **UPPER**. The Function Arguments dialog box opens.

**4.** In the Text box, click **L2**. You see that *oo* is converted to *OO*.

**5.** Click **OK** and copy the formula in D12 from **D12** through **E18** (both EmpCat1 and EmpCat2 columns).

**6.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 21 – Use the LOWER Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **F11** and type **oCode1**. In cell G11, type **oCode2** to label the columns.

**2.** Click cell **F12**.

**3.** Click the **FOR MULAS** tab and in the Function Library group, click **Text** and choose **LOWER**. The Function Arguments dialog box opens.

**4.** In the Text box, click **F2**. You see that *00O0O0O000* is converted to *00o0o0o000*.

**5.** Click **OK** and copy the formula in F12 from cell **F12** through **G18** (both oCode1 and oCode2 columns).

**6.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 22 – Use the CONCATENATE Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **H11** and type**,** (a comma followed by a space), and in cell I11, type **First Last** to label the columns.

**2.** Click cell **H12**.

**3.** Click the **FORMULAS** tab and in the Function Library group, click **Text** and choose **CONCATENATE**. The Function Arguments dialog box opens.

**4.** In the Text box, click cell **B12** and press **Tab**. Click cell **H11**, press **Tab**, and click **A12**. In the preview area, you see “Ortiz, David.”

**5.** Click **OK** and copy the formula in cell H12 from cell **H13** through cell **H18**. The result is an error (see Figure 10-25). Notice that the string gets longer and longer and Ortiz is in every string.

**6.** In the Formula Bar, click the cell H11 reference and press **F4** (Absolute). Cell H11 should become $H$11.

**7.** Press **Enter** and copy the formula in cell H12 from cell **H13** through cell **H18** again. This time the formula is copied correctly.

**8.** Type a **;** (a semi-colon followed by a space) in H11, and notice that all values in the column now have semi-colons instead of commas.

**9.** Select cell **I12** and type **=CON CATENATE (A12,” “,B12)**. Notice that the second argument is a quote, space, and a quote. This separates the first and last names.

**10.** Press **Enter** and copy the formula in cell I12 from cell **I13** through cell **I18**.

**11.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 23 – Use the FIND Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **J11** and type **APos**, and in cell K11, type **bPos** to label the columns.

**2.** Click cell **J12**.

**3.** Click the **FOR MULAS** tab and in the Function Library group, click **Text** and choose **FIND**. The Function Arguments dialog box opens.

**4.** In the Find\_text box, type **A** and press **Tab**. Notice that the preview shows *“A”* (with quotes) in the row.

**5.** In the Within\_text box, click **E2**. Notice that the result returns a 3 for the function. The first character in the string is a space, the second is an l (lowercase “L”), and the third is a capital A.

**6.** Click **OK** and copy the formula in cell J11 from cell **J12** through cell **J18**.

**7.** Select cell **K12**, type **=FIN D(“b”,E2)**, and press **Enter**. In this case, you are looking for a lowercase b—the argument is case sensitive.

**8.** Copy the formula in cell K12 from cell **K13** to cell **K18**.

**9.** SAVE the workbook.

**PAUSE. LEAVE the workbook open for the next exercise.**

## Step-by-Step 24 – Use the SUBSTITUTE Function

**GET READY. USE the workbook from the previous exercise.**

**1.** Click cell **L11** and type **S1**, and in M11, type **Probationary Level** to label the columns.

**2.** Select cell **L12**.

**3.** Click the **FORMULAS** tab and in the Function Library group, click **Text** and choose **SUBSTITUTE** . The Function Arguments dialog box opens.

**4.** In the Text box, click **E12** and press **Tab**.

**5.** In the Old\_text box, type **NP**. This is a code for employees who are not probationary.

**6.** In the New\_text box, type **Non** and press **Tab**. Because the first value is NP, the result of the formula will be Non.

**7.** Click **OK** and copy the formula in L11 from **L12** through **L18**.

**8.** Select cell **M12** and type **=SUBSTIT UTE (L12,”P”,”Probationary Level “)** and press **Enter**. In this case, you are looking for the letter P and changing the string to Probationary Level with a space at the end because a number will follow.

**9.** Copy the formula in cell M12 from cell **M13** to cell **M18**. See Figure 10-26 to see the worksheet values.

**10.** Press **Ctrl +`** to display the formulas, as shown in Figure 10-27. Press **Ctrl +`** again to switch back to the formula results.

**11.** SAVE the workbook.

**Close Excel.**