CHAPTER 3

Enter Data

So you've created a new database or opened an existing database in Excel. Now you'll likely want to add or change records and values in the database. Copying and moving data, filling a closely related series of data across many worksheet cells, entering data with a data form, referring to groups of cells using named ranges, formatting data, protecting data, inserting functions and formulas, validating data, and importing data are all important skills to master with your Excel database. This chapter teaches you these skills.

3.1 Copy and Move Data

Just about every software application provides the ability to copy or move data from one location to another. Excel lets you copy or move not only data in individual worksheet cells, but entire worksheet rows and columns, and even entire worksheets. This allows you to enter repeating data into an Excel database much quicker than entering it manually.

Quick Start

To copy or move data, do the following:

1. Select the worksheet cells that you want to copy or move.
2. To copy the selected worksheet cells, click Home ➤ (Clipboard) Copy (in Excel 2007) or click Edit ➤ Copy (in Excel 2003). To move the selected worksheet cells, click Home ➤ (Clipboard) Cut (in Excel 2007) or click Edit ➤ Cut (in Excel 2003).
3. Choose the destination for the selected worksheet cells.
4. In Excel 2007, click Home ➤ (Clipboard) Paste, and click a paste option such as Paste Special. In Excel 2003, click Edit ➤ Paste or Edit ➤ Paste Special.

How To

Table 3-1 shows different ways of selecting worksheet cells that you want to copy or cut and paste.

Table 3-1. *How to Select Worksheet Cells*

What to Select	How to Select
Text in a single worksheet cell	Either double-click the cell and select the text in the worksheet cell, or select the worksheet cell and select the text in the Formula Bar
A single worksheet cell	Click that worksheet cell
Multiple worksheet cells that are next to each other	Either click the first worksheet cell and drag to the last worksheet cell; or click the first worksheet cell, press and hold the Shift key, click the last worksheet cell, and then release the Shift key
Multiple worksheet cells that are not next to each other	Press and hold the Ctrl key, and click or drag all of the worksheet cells that you want to select
All cells on a worksheet	Click the Select All button in the worksheet's upper corner at the intersection of the row and column headings
All worksheet cells in a single row or column	Click the row heading or column heading
All worksheet cells in multiple rows or columns that are next to each other	Click the first row heading or column heading and drag to the last row heading or column heading; or click the first row heading or column heading, press and hold the Shift key, click the last row heading or column heading, and then release the Shift key
All worksheet cells in multiple rows or columns that are not next to each other	Press and hold the Ctrl key, and click or drag all of the row headings or column headings that you want to select

To copy the selected worksheet cells, do the following:

1. Click Home ➤ (Clipboard) Copy (in Excel 2007) or click Edit ➤ Copy (in Excel 2003). To move the selected worksheet cells, click Home ➤ (Clipboard) Cut (in Excel 2007) or click Edit ➤ Cut (in Excel 2003).
2. Select the destination for the selected worksheet cells.
3. To paste the copied worksheet cells, choose one of the following:
   - In Excel 2007, click Home ➤ (Clipboard) Paste to paste the selected worksheet cells along with any text formatting, formulas, and comments; to paste the selected worksheet cells in a special way, click Paste ➤ Paste Special.
   - In Excel 2003, click Edit ➤ Paste to paste the selected worksheet cells along with any text formatting, formulas, and comments. To paste the selected worksheet cells in a special way (e.g., to paste only the data and not any underlying text formatting or formulas), click Edit ➤ Paste Special, and complete the Paste Special dialog box.

To copy or move one or more entire worksheets, do the following:

1. Select the worksheet tab of the worksheet that you want to move or copy. To select multiple worksheets, press and hold the Ctrl key, select the worksheets, and release the Ctrl key.
2. In Excel 2007, right-click one of the selected worksheet tabs and click Move or Copy. In Excel 2003, click Edit ➤ Move or Copy Sheet.

3. In the To Book list, select the workbook you want to copy or move the selected worksheets to.
4. In the Before Sheet list, select the worksheet that you want to move your selected worksheets in front of.
5. Select the Create a Copy check box to copy the worksheets; or clear the Create a Copy check box to move the worksheets.
6. Click OK.

Try It

In this exercise, you will practice copying and pasting multiple worksheet cells and multiple rows and columns on worksheets. You will also practice copying and moving entire worksheets.

First, practice copying multiple worksheet cells:

1. Start Excel.
2. Click Office Button ➤ Open (in Excel 2007) or File ➤ Open (in Excel 2003).
3. Browse to and select the ExcelDB_Ch03_01-09.xls file, and click Open.
4. Click the SalesData worksheet tab, click cell B3, press and hold the Ctrl key, drag the mouse over cells B3 through D3, and release the mouse button.
5. With the Ctrl key still held, drag the mouse over cells B6 through D6, B9 through D9, and B10 through D10, releasing the mouse button between groups of cells.
6. In Excel 2007, click Home ➤ (Clipboard) Copy. In Excel 2003, click Edit ➤ Copy.
7. Click the Scratchpad worksheet tab, click cell A1, and in Excel 2007, click Home ➤ (Clipboard) Paste. In Excel 2003, click Edit ➤ Paste.

The selected cells are pasted to cells A1 through C4.
Next, practice copying multiple worksheet rows and columns as follows:

1. Click the SalesData worksheet tab, press the Esc key to deselect the previously selected cells, click the row header for row 4, press and hold the Ctrl key, and click the row headers for rows 7, 10, and 11.
2. In Excel 2007, click Home ➤ (Clipboard) Copy. In Excel 2003, click Edit ➤ Copy.
3. Click the Scratchpad worksheet tab, click cell A6, and in Excel 2007, click Home ➤ (Clipboard) Paste. In Excel 2003, click Edit ➤ Paste. The selected cells are pasted to cells A6 through H9.
4. On the SalesData worksheet, press the Esc key to deselect the previously selected cells, click the column header for column C, press and hold the Ctrl key, and click the column headers for columns D, E, G, and H.

5. In Excel 2007, click Home ➤ (Clipboard) Copy. In Excel 2003, click Edit ➤ Copy.
6. Click the Scratchpad worksheet tab, click cell J1, and then in Excel 2007, click Home ➤ (Clipboard) Paste. In Excel 2003, click Edit ➤ Paste.

The selected cells are pasted to cells J1 through N11.
Now, practice copying and moving worksheets:

1. Right-click the SalesData worksheet tab, and click Move or Copy.
2. In the Before Sheet list, select Move to End, and click OK. The SalesData worksheet is moved to the end of the worksheet tabs.
3. Right-click the SalesData worksheet tab again, and click Move or Copy.
4. In the Before Sheet list, select the Create a Copy check box, and click OK. A copy of the SalesData worksheet named SalesData (2) is created and moved to the beginning of the worksheet tabs.

3.2 Fill Data

You can use Excel's Fill menu command or Auto Fill Options button to copy or fill values across rows or down columns. This technique is helpful for quickly entering identical or closely related values in an Excel database.

Quick Start

To copy or fill data values, do the following:

1. Select the cells containing the values that you want to copy or fill.
2. Select the cells into which you want to copy the values or fill a series of closely related values.
3. Click Home ➤ (Editing) Fill (for Excel 2007) or click Edit ➤ Fill (for Excel 2003), and select one of the Fill submenu commands in order to specify a copy or fill method. Or drag the fill handle (the small box in the lowest right corner of the selected worksheet cells) to the worksheet cells for which you want to copy the selected values, and then release the mouse button; then click the Auto Fill Options button that appears, and specify a copy or fill method, as shown in Figure 3-1.

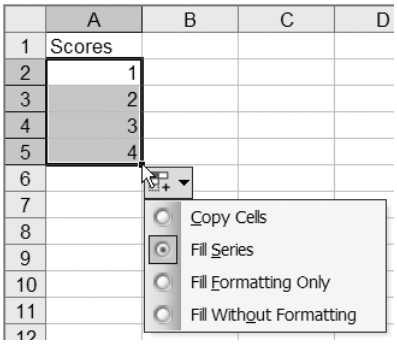


Figure 3-1. *Dragging the fill handle in Excel, clicking the Auto Fill Options button that appears, and specifying a copy or fill method*

How To

Select the worksheet cells that you want to copy or fill in, using one of the ways shown previously in Table 3-1.

■ **Note** Excel's fill features do not always work when multiple selected worksheet cells are not next to each other. You'll need to experiment to determine whether Excel will be able to fill based on the proximity of multiple worksheet cells that you select.

To copy or fill values, select the worksheet cells into which you want to copy the values or fill a series of closely related values. Click Home ➤ (Editing) Fill (for Excel 2007) or click Edit ➤ Fill (for Excel 2003), and select one of the Fill submenu commands in order to specify a copy or fill method. Or drag the fill handle (the small box in the lowest right corner of the selected worksheet cells) to the worksheet cells for which you want to copy the selected values, and then release the mouse button; then click the Auto Fill Options button that appears, and specify a copy or fill method.

You can use the Series dialog box (in Excel 2007, click Home ➤ (Editing) Fill ➤ Series; in Excel 2003, click Edit ➤ Fill ➤ Series) for greater control over the copy or fill method:

1. Select a Series In area option to fill the values by rows or by columns: select the Rows option to copy or fill the values across the selected rows, or the Columns option to copy or fill the values down the selected columns.
2. Select a Type area option to fill the data in an additive or multiplicative manner: select the Linear option to add the value in the Step Value box to the first starting data value and then to subsequent values, or select the Growth option to multiply the value in the Step Value box by the first starting data value and then multiply each subsequent value.
3. Select the Date option to fill date-based values, and then select an option in the Date Unit area to specify the date increment to use as the data fill value; you can increment by Day, Weekday, Month, or Year.
4. Select AutoFill to have Excel automatically guess and create a fill pattern.
5. Select the Trend check box if there is more than one starting value and you want Excel to create the fill trend.
6. In the Step Value box, type a value by which you want to increase the values.
7. In the Stop Value box, type a value by which you want to stop increasing the values.

You can fill values across worksheets by doing the following:

1. Select the worksheet that contains the data, and select the worksheets to which you want to copy the values.
2. Select the worksheet cells that contain the data you want to copy.
3. In Excel 2007, click Home ➤ (Editing) Fill ➤ Across Worksheets. In Excel 2003, click Edit ➤ Fill ➤ Across Worksheets.

Try It

In this exercise, you will practice filling data in a variety of ways. If the workbook from section 3.1 is not already open, do the following to open it:

1. Start Excel.
2. Click Office Button ➤ Open (in Excel 2007) or File ➤ Open (in Excel 2003).
3. Browse to and select the ExcelDB_Ch03_01-09.xls file, and click Open.
4. Click the DataFills worksheet tab.

Practice filling worksheet cells by month by clicking cell A2, dragging the fill handle (the small box in the lower right corner of cell A2) to cell A13, and then releasing the mouse button. The months January through December appear.

Practice filling worksheet cells by weekday:

1. Click cell B2, drag the fill handle to cell B11, and then release the mouse button.
2. Click the Auto Fill Options button, and click Fill Weekdays. The days Monday through Friday appear twice.

Practice filling worksheet cells by copying the same value repeatedly:

1. Click cell C2, press and hold the Shift key, and click cell C11.
2. In Excel 2007, click Home ➤ (Editing) Fill ➤ Down. In Excel 2003, click Edit ➤ Fill ➤ Down.

The number 1 appears ten times.
Practice filling worksheet cells by an additive series of one per subsequent cell:

1. Click cell D2, drag the fill handle to cell D12, and then release the mouse button.
2. Click the Auto Fill Options button, and click Fill Series. The numbers 10 through 20 appear.

Practice filling worksheet cells by an additive series of 100 per subsequent cell:

1. Click cell E2, press and hold the Shift key, and click cell E11.
2. In Excel 2007, click Home ➤ (Editing) Fill ➤ Series. In Excel 2003, click Edit ➤ Fill ➤ Series.
3. In the Step Value box, type **100**, and click OK. The numbers 100 through 1,000 appear.

Practice filling worksheet cells by an additive series of 500 per subsequent cell, not to exceed 4,000:

1. Click cell F2, press and hold the Shift key, and click cell F11.
2. In Excel 2007, click Home ➤ (Editing) Fill ➤ Series. In Excel 2003, click Edit ➤ Fill ➤ Series.
3. In the Step Value box, type **500**, and in the Stop Value box, type **4000**.
4. Click OK. The numbers 1,000 through 4,000 appear in cells F2 through F8 only. This is because once the number 4,000 is reached, Excel stops filling values in the remaining worksheet cells.

3.3 Enter Data with a Data Form

A *data form* is a simple, convenient way to enter one complete record on a worksheet without scrolling back and forth among records and fields. Many databases use data forms to facilitate entering records, and Excel is no exception.

Use a data form when a simple form with a list of field names and boxes in which to enter values is fine for your needs, or you have no more than 32 data fields in each record and you want all of the fields to fit on the screen at one time.

Quick Start

To create and use a data form, do the following:

1. Make sure data field names appear at the top of each worksheet column.
2. Select the data field names.
3. In Excel 2007, add the Form command to the Quick Access Toolbar, and then click the Form command. In Excel 2003, click Data ➤ Form.

■ **Note** For instructions on how to add the Form command to the Quick Access Toolbar, see the instructions in the sidebar in this section.

---

4. Follow the onscreen instructions to create the data form.
5. Use the data form controls to add, delete, restore, or find data records.

How To

To create the form, do the following:

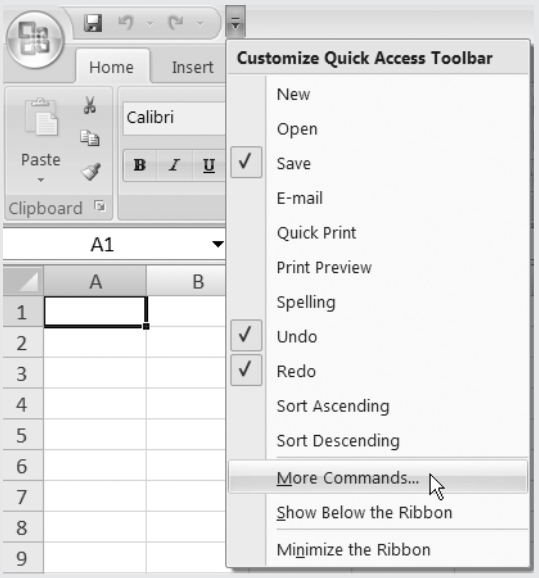
1. Before you can use it, the list of data records must have data field names at the top of each column.
2. Select the field names and any existing records under the data field names.
3. In Excel 2007, add the Form command to the Quick Access Toolbar, and then click the Form command. In Excel 2003, click Data ➤ Form. The form is shown in Figure 3-2.

Figure 3-2. *The Excel data form*

4. Follow the onscreen instructions to create the data form.

ADD THE FORM COMMAND TO THE QUICK ACCESS TOOLBAR

1. On the Quick Access Toolbar (by default, this toolbar is next to the Office Button), click Customize Quick Access Toolbar ➤ More Commands, as shown in the figure.



2. In the Choose Commands From list, select All Commands.
3. In the list below the Choose Commands From list, select Form.
4. Click Add.
5. Click OK. The Form command appears on the Quick Access Toolbar.

To add a data record using the data form, do the following:

1. Click the New button.
2. Type the data into the data field boxes.
3. Click the New button again.

To delete a data record using the data form, do the following:

1. Use the Find Prev, Find Next, or Criteria buttons to locate the data record that you want to delete.
2. Click the Delete button, and click OK.

To find specific data records using the data form, do the following:

1. Click the Criteria button.
2. Type text in any of the data field boxes for which you want to find matching data records.
3. Click the Find Next or Find Prev buttons to move back and forth through any matching data records.
4. To return to all of the data records, click the Criteria button, click the Clear button, and click the Form button.

■ **Tip** To restore a data record that is currently being changed back to its original data values using the data form, click the Restore button.

Try It

In this exercise, you will practice displaying a data form and entering and searching for data using the data form. If the practice workbook is not open from the previous exercise, do the following to open it:

1. Start Excel.
2. Click Office Button ➤ Open (in Excel 2007) or File ➤ Open (in Excel 2003).
3. Browse to and select the ExcelDB_Ch03_01-09.xls file, and click Open.

Display the data form:

1. Click the Contacts worksheet tab.
2. Select cells A1 through G1, and in Excel 2007, add the Form command to the Quick Access Toolbar, click the Form command, and click OK. In Excel 2003, click Data ➤ Form, and click OK.

■ **Note** For instructions on how to add the Form command to the Quick Access Toolbar, see the sidebar previously in this section.

Add data records to the worksheet using the data form, and move among the data records:

1. Type data in the First Name, Last Name, Street Address, City, State, Postal Code, and Home Phone boxes, pressing the Tab key after you type data in each box.
2. When you are finished typing data in each of the boxes, press the Enter key or click the New button.

3. Repeat steps 1 and 2 at least three times.
4. Click the Find Prev and Find Next buttons to move among the data records.

Find matching records using the data form:

1. Click the Criteria button.
2. In the City box, type a field value that matches one or more of the existing records.
3. Click Find Next to move to the first matching data record.
4. To clear the criteria, click the Criteria button, click Clear, and then click Form.
5. When you are done using the data form, click Close.

3.4 Define, Create, or Apply a Name

It can be difficult to remember worksheet cells by their row-and-column addresses. Names provide a more convenient and easier to remember way to refer to cells, especially in worksheet formulas. You can also use names as a shortcut for referring to a worksheet formula itself or a series of text characters.

The concept of names is uncommon in many database management systems. You will most likely use names very often for their convenience.

Quick Start

To define a name, do the following:

1. Select a single cell or a group of cells that you want to name. You can use the Shift key and the arrow keys or a mouse to quickly select cells that are next to each other. You can use the Ctrl key and a mouse to select cells that are not next to each other.
2. Do one of the following:
   - In Excel 2007 or Excel 2003, click the Name Box as shown in Figure 3-3, type a name for the group of cells, and press Enter.

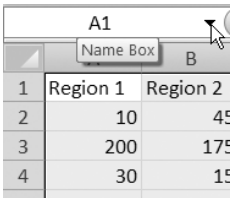


Figure 3-3. *The Excel Name Box*

   - Or in Excel 2007, click Formulas ➤ (Defined Names) Define Name. Type a name in the Name Box, and click OK.
   - Or in Excel 2003, click Insert ➤ Name ➤ Define, type a name in the Names in Workbook box, and click OK.

How To

To define a name for a group of one or more worksheet cells, a formula, or a series of text characters, do the following:

1. In Excel 2007, click Formulas ➤ (Defined Names) Define Name. In Excel 2003, click Insert ➤ Name ➤ Define.
2. In the Name Box, type a name that conveniently describes the cells, formula, or string of text characters.
3. In Excel 2007, in the Scope list, select a scope to which the name applies; for example, at the workbook level or at an individual worksheet level.
4. There are three different ways of defining a name in the Refers To box:
   - To define a name for a group of one or more worksheet cells, select the target worksheet cells, or type the target worksheet cells' reference.
   - To define a name for a formula, type the formula.
   - To define a name for a string of text characters, type the text string.
5. Click OK. The name is defined.

In Excel 2003 only, to instruct Excel to allow use of names in formulas, based on one or more row or column names for one or more data records in the same worksheet, do the following:

■ **Note** In Excel 2007, the ability to instruct Excel to allow the use of names in formulas, based on one or more row or column names for one or more data records in the same worksheet, has been removed for technical reasons.

---

1. Click Insert ➤ Name ➤ Label.
2. In the Add Label Range box, type or select one or more worksheet cells on one worksheet that contain the row or column names for one or more data records.
3. Select the Row Labels option if the selected worksheet cells contain a unique data record name for each data record, or select the Column Labels option if the selected worksheet cells contain a unique data field name for each data record.
4. Click OK. The label range is added.

■ **Note** In Excel 2003 only, to use worksheet label names instead of worksheet cell references in a worksheet's formulas, you must first click Tools ➤ Options, select the Accept Labels in Formulas check box on the Calculation tab, and click OK.

To define names based on one or more row or column names for one or more data records in one or more worksheets, do the following:

1. Select the group of worksheet cells that contain the records' field names, the record names if any, and the records' values if any.
2. In Excel 2007, click Formulas ➤ (Defined Names) Create from Selection. In Excel 2003, click Insert ➤ Name ➤ Create.
3. Select one or more of these check boxes:
   - Top Row, if you want to create a name for each data record field name as it appears in the top row of the selected worksheet cells.
   - Left Column, if you want to create a name for each data record name as the record appears in the left column of the selected worksheet cells.
   - Bottom Row, if you want to create a name for each data record field name as it appears in the bottom row of the selected worksheet cells.
   - Right Column, if you want to create a name for each data record name as it appears in the right column of the selected worksheet cells.
4. Click OK. A name is defined for each data record field name and data record name based on the check boxes selected.

To determine what one or more names refer to, do the following:

1. In Excel 2007, click Formulas ➤ (Defined Names) Name Manager. In Excel 2003, click Insert ➤ Name ➤ Define.
2. Click the target name in the list of names, and look at the contents of the Refers To box.
3. Select a blank area in the workbook that spans at least two blank columns. Click a worksheet cell in these two blank columns that represents the upper left corner of where the list will start.
4. In Excel 2007, click Formulas ➤ (Defined Names) Use in Formula ➤ Paste Names. In Excel 2003, click Insert ➤ Name ➤ Paste.
5. Click Paste List to list all of the names in the workbook and their definitions in the two selected blank columns.

To replace worksheet cell references in an individual worksheet's formulas with their defined names, if any, do the following:

1. Select the worksheet cells that contain formulas in which you want to replace worksheet cell references with names, or select a single worksheet cell to replace the references with names in all formulas on the worksheet.
2. In Excel 2007, click Formulas ➤ (Defined Names) Define Name ➤ Apply Names. In Excel 2003, click Insert ➤ Name ➤ Apply.
3. In the Apply Names box, click one or more names to replace any formulas that refer to the names' underlying cell references, and click OK.

Tip

To define a name for a collection of two or more worksheet cells spanning two or more contiguous worksheets, use the following syntax, referred to as a *3-D reference*:

```
='BeginningSheetName:EndingSheetName'!CellReference
```

For example, to define a name that refers to cells C2 through E5 on three contiguous worksheets named Sheet1, Sheet2, and Sheet3, use the following 3-D reference:

```
='Sheet1:Sheet3'!C2:E5
```

Note that the worksheet cells must be in the same location on all of the referenced worksheets, and the worksheet tabs must all be touching each other. For example, you cannot use a 3-D reference to define a name that refers collectively to cells C2 through E5 on Sheet1, cells A1 through B4 on Sheet2, and cells F6 through G11 on Sheet 3.

Try It

In this exercise, you will practice defining names and labels for a group of worksheet cells and two series of text characters. You will also practice adding two label ranges. You will then refer to these names and label ranges in a series of worksheet formulas. You will also list the names and their definitions in the workbook. If the practice workbook is not open from the previous exercise, open it:

1. Start Excel.
2. Click Office Button ➤ Open (in Excel 2007) or File ➤ Open (in Excel 2003).
3. Browse to and select the ExcelDB_Ch03_01-09.xls file, and click Open.

Define three named ranges:

1. Click the DefinedRanges worksheet tab, select cells A1 through D13, and in Excel 2007, click Formulas ➤ (Defined Names) Define Name. In Excel 2003, click Insert ➤ Name ➤ Define.
2. In the Name box, type **SalesData**, and click OK. The SalesData named range is defined.
3. Select cells B2 through B13, and in Excel 2007, click Formulas ➤ (Defined Names) Define Name. In Excel 2003, click Insert ➤ Name ➤ Define.
4. In the Name box, type **Ordered**, and click OK. The Ordered named range is defined.
5. Select cells D2 through D13, and in Excel 2007, click Formulas ➤ (Defined Names) Define Name. In Excel 2003, click Insert ➤ Name ➤ Define.
6. In the Name box, type **OnHand**. The OnHand named range is defined.

In Excel 2007 only, create two additional sets of named ranges:

1. Select cells A2 through D13, and then click Formulas ➤ (Defined Names) Create from Selection.
2. With only the Left Column check box selected, click OK. Names for rows 2 through 13 are created.

3. Select cells B1 through D13, and then click ➤ (Defined Names) Create from Selection.
4. With only the Top Row check box selected, click OK. Names for columns B through D are created.

In Excel 2003 only, create two label ranges as follows:

1. Select cells A2 through A13, and click Insert ➤ Name ➤ Label.
2. With the Row Labels option selected, click Add. Names for rows 2 through 13 are created.
3. Select cells B1 through D1, select the Column Labels option, and click Add. Names for columns B through D are created.
4. Click OK.

For Excel 2007 or Excel 2003, you can create formulas based on these names and labels as follows:

1. In cell E2 type **=January Quantity-January In_Stock** (for Excel 2007) or **=January Quantity-January In Stock** (for Excel 2003), and press the Enter key. The difference between cell B2 (the value 150, which is the intersection of the January row and the Quantity column) and cell D2 (the value 145, which is the intersection of the January row and the In Stock column) appears, which is the number 5.

■ **Note** In Excel 2003 only, to use worksheet label names instead of worksheet cell references in a worksheet's formulas, you must first click Tools ➤ Options, select the Accept Labels in Formulas check box on the Calculation tab, and click OK.

---

2. For Excel 2003, in cell E2, drag the fill handle (the small black box in the lower right corner of the cell) to cell E13, and release the mouse button.
3. For Excel 2003, click the individual cells E3, E4, and so on, down to cell E13 to see the fill that Excel completed based on the formula defined in cell E2.

■ **Note** In Excel 2007, you cannot drag the fill handle to AutoFill subsequent month names in this context. To work around this, you can type **=February Quantity-February In_Stock** in cell E3, **=March Quantity-March In_Stock** in cell E4, and so on down through cell E13.

Next, for Excel 2007 or Excel 2003, enter functions with cell references that will be replaced with defined names:

1. In cell B14, type **=SUM(B2:B13)**, and press the Enter key.
2. In cell D14, type **=SUM(D2:D13)**, and press the Enter key.
3. In Excel 2007, click Formulas ➤ (Defined Names) Define Name ➤ Apply Names. In Excel 2003, click Insert ➤ Name ➤ Apply.

4. In the Apply Names box, deselect all selected items, select Ordered and OnHand, and click OK.

5. Click the individual worksheet cells B14 and D14 to see that the cell references are replaced by names.

6. In cell E16, in Excel 2007, type **=SUM(SalesData Quantity)-SUM(SalesData In_Stock)**, and press the Enter key. In Excel 2003, type **=SUM(SalesData Quantity)-SUM(SalesData In Stock)**, and press the Enter key. The difference between the sum of the Quantity column in the SalesData named range and the sum of the In Stock column in the SalesData named range is displayed, which is the value 130.

7. In cell E17, type **=SUM(Ordered)-SUM(OnHand)**, and press the Enter key. Notice that the value of cell E17 is the same value as cell E16.

List the names in the workbook and their definitions:

1. Click cell G1, and in Excel 2007, click Formulas ➤ (Defined Names) Use in Formula ➤ Paste Names. In Excel 2003, click Insert ➤ Name ➤ Paste.

2. Click Paste List. In Excel 2007, the list of names and their corresponding definitions appear in cells G1 through H18. In Excel 2003, the list of names and their corresponding definitions appear in cells G1 through H3.

3.5 Format Data

Many database management systems provide robust access to data but not many robust features for displaying data in different visual formats. Excel provides a wide variety of options for presenting data visually in various formats.

Use Excel's data formatting options when you want to highlight specific values, change how values are displayed, or otherwise change the visual display of data in worksheets for easier data recognition visually, faster data analysis, and greater data precision.

Quick Start

To format a worksheet's values or the formatting of the worksheet's rows and columns, do the following:

1. Select the worksheet cells, rows, or columns containing the data values for which you want to change formatting.

2. Do one of these:

   - In Excel 2007, click Home, and click one of the menu commands in the Font, Alignment, Number, Styles, or Cells areas to format individual worksheet cells, rows, or columns, and follow the onscreen directions accordingly.

   - In Excel 2003, on the Format menu, click or point to one of the menu commands or submenus to format individual worksheet cells, rows, or columns, and follow the onscreen directions accordingly.

How To

There are different ways of formatting data.

To change the number formatting in specific worksheet cells, do the following:

1. Select the worksheet cells to change. (See Table 3-1 earlier in this chapter for directions on selecting cells.)
2. In Excel 2007, click Home ➤ (Number) Format Cells: Number. In Excel 2003, click Format ➤ Cells.
3. On the Number tab, in the Category list, select a number category.
4. Depending on the number category selected, set the controls to specify the number of decimal places, the thousands separator symbol, the currency symbol, how to represent negative numbers, and so on.
5. Click OK. The number formatting is changed for the selected worksheet cells.

To change the text alignment in specific worksheet cells (horizontally, vertically, etc.), do the following:

1. Select the worksheet cells to change.
2. In Excel 2007, click Home ➤ (Cells) Format ➤ Format Cells. In Excel 2003, click Format ➤ Cells.
3. On the Alignment tab, as shown in Figure 3-4, in the Text Alignment area, if you choose the Horizontal list, do the following:

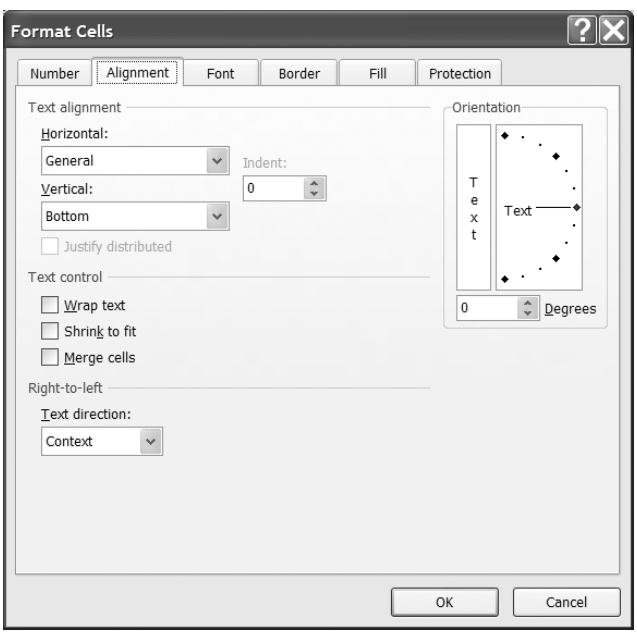


Figure 3-4. *The Format Cells dialog box's Alignment tab*

- Select General to let Excel decide how to position the data in the cells.
- Select Left (Indent) to indent data from the left sides of the cells. Also, use the Indent box's up and down buttons to specify how far you want to indent the data. (Type zero (0) in the Indent box to position the data near the left sides of the cells.)
- Select Center to position data in the center of the cells.
- Select Right (Indent) to indent data from the right sides of the cells. Also, use the Indent box's up and down buttons to specify how far you want to indent the data. (Type zero (0) in the Indent box to position the data near the right sides of the cells.)
- Select Fill to duplicate data values within cells to fill the entire cells' widths.
- Select Justify to position data equally from both sides of the cells.
- Select Center Across Selection to position data in the centers of the cells based on the selected cells' widths.
- Select Distributed (Indent) to indent data from both sides of the cells. Also, use the Indent box's up and down buttons to specify how far you want to indent the data on both sides.
- Select Distributed (Indent), as well as select the Justify Distributed check box, to indent data equally from both sides of the cells.

4. On the Alignment tab, in the Text Alignment area's Vertical list, select from the following options:
   - Top, to position the data near the top edges of the cells.
   - Center, to position the data in the center of the cells.
   - Bottom, to position the data near the bottom edges of the cells.
   - Justify or Distributed, to position the data equally from the top and bottom edges of the cells.
5. In the Text Control area, select one or more of the following:
   - The Wrap Text check box, to wrap text vertically in the cells.
   - The Shrink to Fit Text check box, to reduce the font size such that all data is displayed in each cell without resizing the cells.
   - The Merge Cells check box, to create one cell from the selected cells.
6. In the Right-to-Left area, in the Text Direction list, select the following:
   - Context, to set a left-to-right or right-to-left reading order that is consistent with the language of the first character typed into each cell.
   - Left-to-Right, to set a left-to-right reading order for the cells.
   - Right-to-Left, to set a right-to-left reading order for the cells.

7. In the Orientation area, in the Degrees box, click the up and down buttons to click a degree point, or drag the indicator to the angle you want. To display text vertically from top to bottom, click the vertical Text box.
8. Click OK. Excel applies the selected alignment options to the selected worksheet cells.

To change the font style, size, or color in specific worksheet cells, do the following:

1. Select the worksheet cells to change.
2. In Excel 2007, click Home ➤ (Font) Format Cells: Font. In Excel 2003, click Format ➤ Cells.
3. Go to the Font tab, and do the following:
   a. In the Font list, select the font name.
   b. In the Font Style list, select a special font style if desired, such as italic, bold, or italic and bold.
   c. In the Size list, select the font size in points.
   d. In the Underline list, select the underline style if desired, such as single underline or double underline.
   e. In the Color list, select the text color.
   f. Select the Normal Font check box to automatically select a standard font (such as Arial) in the Font list.
   g. In the Effects area, select one or more text effect check boxes if desired, such as Strikethrough, Superscript, or Subscript.
4. Click OK. Excel applies the selected font style, size, and color options to the selected worksheet cells.

To change specific worksheet cells' border styles or colors, do the following:

1. Select the worksheet cells to change.
2. In Excel 2007, click Home ➤ (Cells) Format ➤ Format Cells. In Excel 2003, click Format ➤ Cells.
3. Go to the Border tab, and do the following:
   a. In the Presets area, click the None, Outline, or Inside button to preselect a series of buttons in the Border area as desired to remove border lines, add border lines around the outer edge of the selected worksheet cells, or add border lines to the inner portions of the selected worksheet cells, respectively.
   b. In the Border area, click one or more of the eight buttons as desired to further customize the border lines to be added or removed from the selected worksheet cells.
   c. Go to the Line area, and in the Style box, click the desired border line style. In the Color list, select the desired border line color.
4. Click OK. Excel applies the selected border styles and color options to the selected worksheet cells.

To change specific worksheet cells' background colors or patterns, do the following:

1. Select the cells to change.
2. In Excel 2007, click Home ➤ (Cells) Format ➤ Format Cells, and then click the Fill tab. In Excel 2003, click Format ➤ Cells, and click the Patterns tab.
3. In the Background Color (in Excel 2007) or Color (in Excel 2003) area, click a color. In the Pattern Color and Pattern Style lists (in Excel 2007) or the Pattern list (in Excel 2003), click a pattern (and pattern style in Excel 2007).
4. Click OK. Excel applies the selected background colors and patterns to the selected worksheet cells.

To change specific worksheet rows' heights or visibility, select the rows to change. In Excel 2007, do the following:

1. To change the selected rows' heights, click Home ➤ (Cells) Format ➤ Row Height, type the rows' new height in the Row Height box, and click OK.
2. To change the selected rows' heights so that they fit the text in the rows' cells, click Home ➤ (Cells) Format ➤ AutoFit Row Height.
3. To hide the selected rows, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Hide Rows.
4. To unhide specific hidden rows, select the rows on either side of the hidden rows, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Unhide Rows.

In Excel 2003, do the following:

1. To change the selected rows' heights, click Format ➤ Row ➤ Height, type the rows' new height in the Row Height box, and click OK.
2. To change the selected rows' heights so that they fit the text in the rows' cells, click Format ➤ Row ➤ AutoFit.
3. To hide the selected rows, click Format ➤ Row ➤ Hide.
4. To unhide specific hidden rows, select the rows on either side of the hidden rows and click Format ➤ Row ➤ Unhide.

To change specific worksheet columns' width or visibility, select the columns to change. In Excel 2007, do the following:

1. To change the selected columns' widths, click Home ➤ (Cells) Format ➤ Column Width, type the columns' new width in the Column Width box, and click OK.
2. To change the selected columns' widths so that they fit the text in the columns' cells, click Home ➤ (Cells) Format ➤ AutoFit Column Width.
3. To hide the selected columns, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Hide Columns.
4. To unhide specific hidden columns, select the columns on either side of the hidden rows, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Unhide Columns.

In Excel 2003, do the following:

1. To change the selected columns' widths, click Format ➤ Column ➤ Width, type the columns' new width in the Column Width box, and click OK.
2. To change the selected columns' widths so that they fit the text in the columns' cells, click Format ➤ Column ➤ AutoFit Selection.
3. To hide the selected columns, click Format ➤ Column ➤ Hide.
4. To unhide specific hidden columns, select the columns on either side of the hidden columns and click Format ➤ Column ➤ Unhide.

To change a worksheet's name, visibility, background color, or tab color, select the worksheet to change.

In Excel 2007, do the following:

1. To change the worksheet's name, click Home ➤ (Cells) Format ➤ Rename Sheet, type the new worksheet name, and press the Enter key.
2. To hide the worksheet, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Hide Sheet.
3. To unhide a specific hidden worksheet, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Unhide Sheet, click the worksheet to unhide, and click OK.
4. To change the worksheet's background picture, click Page Layout ➤ (Page Setup) Background. Browse to and select an image file, and click Insert.
5. To change the worksheet's tab color, click Home ➤ (Cells) Format ➤ Tab Color, click a color, and click OK.

In Excel 2003, do the following:

1. To change the worksheet's name, click Format ➤ Sheet ➤ Rename, type the new worksheet name, and press the Enter key.
2. To hide the worksheet, click Format ➤ Sheet ➤ Hide.
3. To unhide a specific hidden worksheet, click Format ➤ Sheet ➤ Unhide, click the worksheet to unhide, and click OK.
4. To change the worksheet's background picture, click Format ➤ Sheet ➤ Background, browse to and select an image file, and click Insert.
5. To change the worksheet's tab color, click Format ➤ Sheet ➤ Tab Color, click a color, and click OK.

To apply predetermined formatting to one or more worksheet cells, do the following:

1. Select the worksheet cells for which you want to change formatting.
2. In Excel 2007, add the AutoFormat command to the Quick Access Toolbar, and then click the AutoFormat command. In Excel 2003, click Format ➤ AutoFormat.

ADD THE AUTOFORMAT COMMAND TO THE QUICK ACCESS TOOLBAR

1. On the Quick Access Toolbar (by default, this toolbar is next to the Office Button), click Customize Quick Access Toolbar ➤ More Commands.
2. In the Choose Commands From list, select All Commands.
3. In the list below the Choose Commands From list, select AutoFormat.
4. Click Add.
5. Click OK. The AutoFormat command appears on the Quick Access Toolbar.

3. Click a desired format style.
4. If there are any specific formats that you don't want to apply, click the Options button, and in the Formats to Apply area, clear any check boxes corresponding to any desired formats that you don't want to apply. By default, all of the check boxes are selected.

To copy formatting among worksheet cells, do the following:

1. Select the worksheet cells for which you want to copy formatting.
2. In Excel 2007, click Home ➤ (Clipboard) Format Painter. In Excel 2003, on the Standard toolbar, click the Format Painter button.
3. Select the worksheet cells for which you want to paste formatting. The formatting is copied.

Tip

To unhide all columns on a worksheet at the same time, click the Select All button, and then, in Excel 2007, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Unhide Columns; in Excel 2003, click Format ➤ Column ➤ Unhide.

To unhide all rows on a worksheet at the same time, click the Select All button, and then, in Excel 2007, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Unhide Rows; in Excel 2003, click Format ➤ Row ➤ Unhide.

To remove a worksheet's background picture, in Excel 2007, click Page Layout ➤ (Page Setup) Background; in Excel 2003, click Format ➤ Sheet ➤ Delete Background.

Try It

In this exercise, you will practice formatting data by changing number formatting, text alignment, text font, and display behavior for cells, rows, columns, and worksheets.

If the practice workbook is not open from the previous exercise, do the following to open it:

1. Start Excel.
2. Click Office Button ➤ Open (in Excel 2007) or File ➤ Open (in Excel 2003).
3. Browse to and select the ExcelDB_Ch03_01-09.xls file, and click Open.

First, practice formatting data:

1. Click the Formatting worksheet tab, and select cells A2 through A6.
2. In Excel 2007, click Home ➤ (Cells) Format ➤ Format Cells. In Excel 2003, click Format ➤ Cells.
3. Click the Number tab.
4. In the Category list, select Currency.
5. With the number 2 showing in the Decimal Places box, select an appropriate currency symbol in the Symbol list, select an appropriate display format in the Negative Numbers list, and click OK. The data format in cells A2 through A6 is changed.

Practice aligning text:

1. On the Formatting worksheet, select cells B2 through B13.
2. In Excel 2007, click Home ➤ (Cells) Format ➤ Format Cells. In Excel 2003, click Format ➤ Cells.
3. Click the Alignment tab.
4. In the Horizontal list, select Right (Indent).
5. In the Indent box, type **1**, and click OK. The text in cells B2 through B15 is aligned to the right side of each cell with a padding of one character.
6. In Excel 2007, click Home ➤ (Cells) Format ➤ Format Cells. In Excel 2003, click Format ➤ Cells.
7. Click the Alignment tab.
8. Select the Wrap Text check box, and click OK. The height of cells B11 through B13 increases to accommodate the text.
9. In Excel 2007, click Home ➤ (Cells) Format ➤ Format Cells. In Excel 2003, click Format ➤ Cells.
10. Click the Alignment tab.
11. Clear the Wrap Text check box, select the Shrink to Fit check box, and click OK. The font size of the text in cells B11 through B13 and the height of cells B11 through B13 decrease accordingly.

Practice changing font style, size, or color text font:

1. On the Formatting worksheet, select cells C2 through C10.
2. In Excel 2007, click Home ➤ (Cells) Format ➤ Format Cells. In Excel 2003, click Format ➤ Cells.
3. Click the Font tab.
4. In the Font list, select Courier New.

5. In the Color list, select the green color box.
6. Select the Strikethrough box, and click OK. The font in cells C2 through C10 changes accordingly.

Practice changing display behavior for cells:

1. On the Formatting worksheet, select cells D2 through D7.
2. In Excel 2007, click Home ➤ (Cells) Format ➤ Format Cells. In Excel 2003, click Format ➤ Cells.
3. Click the Border tab.
4. In the Presets area, click the None button.
5. Click the Fill tab (in Excel 2007) or Patterns tab (in Excel 2003).
6. In the Background Color list (in Excel 2007) or the Color list (in Excel 2003), click the yellow color box.
7. In the Pattern Style list (in Excel 2007) or the Pattern list (in Excel 2003), click any pattern, and click OK. The display behavior for cells D2 through D7 changes accordingly.

Practice changing display behavior for rows and columns:

1. On the Formatting worksheet, select rows 3 through 6.
2. In Excel 2007, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Hide Rows. Rows 3 through 6 are hidden. In Excel 2003, click Format ➤ Row ➤ Hide. Rows 3 through 6 are hidden.
3. Select columns C and E.
4. In Excel 2007, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Hide Columns. In Excel 2003, click Format ➤ Column ➤ Hide. Columns C and E are hidden.
5. Click the Select All button.
6. In Excel 2007, click Sheet ➤ (Cells) Format ➤ Hide & Unhide ➤ Unhide Rows. In Excel 2003, click Format ➤ Row ➤ Unhide. Rows 3 through 6 are visible.
7. In Excel 2007, click Sheet ➤ (Cells) Format ➤ Hide & Unhide ➤ Unhide Columns. In Excel 2003, click Format ➤ Column ➤ Unhide. Columns C and E are visible.

Practice changing display behavior for worksheets:

1. In Excel 2007, with the Formatting worksheet tab selected, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Hide Sheet. In Excel 2003, click the Formatting worksheet tab, and click Format ➤ Sheet ➤ Hide. The Formatting worksheet is hidden.
2. In Excel 2007, right-click any worksheet tab, click Home ➤ (Cells) Format ➤ Hide & Unhide ➤ Unhide Sheet, click Formatting, and click OK. In Excel 2003, click Format ➤ Sheet ➤ Unhide, click Formatting, and click OK. The Formatting worksheet is visible.
3. In Excel 2007, with the Formatting worksheet tab selected, click Home ➤ (Cells) Format ➤ Tab Color, click the red color box, and click OK. In Excel 2003, click Format ➤ Sheet ➤ Tab Color, click the red color box, and click OK. The Formatting worksheet tab turns red.

3.6 Conditionally Format Data

A *conditional format* is a visual display format, such as cell shading or font color, that Excel automatically applies to cells if a specified condition is true. Many database management systems do not provide robust features for displaying data in different visual formats. Excel provides not only a wide variety of options for presenting data visually in various formats, but also the ability to change data formatting based on each worksheet cell's data value.

Quick Start

Select the worksheet cells to which you want to add conditional formatting.

In Excel 2007, click Home ➤ (Styles) Conditional Formatting, and then do one of the following:

- Click one of the options on the Highlight Cells Rules, Top/Bottom Rules, Data Bars, Color Scales, or Icon Sets menus respectively to highlight cell values. Specifically, you can highlight cell values that are greater than, less than, between, or equal to specific data values. You can also highlight cell values that are in the top, bottom, above average, or below average of a specified data value or percentage of all of the cell values. You can add to the cells some visual data bars whose lengths correspond to lower or higher data values. You can add to the cells some colors whose hues correspond to lower or higher data values. Or you can add to the cells some icons whose pictures correspond to lower or higher data values.
- Click Manage Rules to customize the behavior of any existing conditional formatting rule in the workbook; and click OK when you are done customizing conditional formatting rules.

In Excel 2003, click Format ➤ Conditional Formatting. The Conditional Formatting dialog box appears, as shown in Figure 3-5.

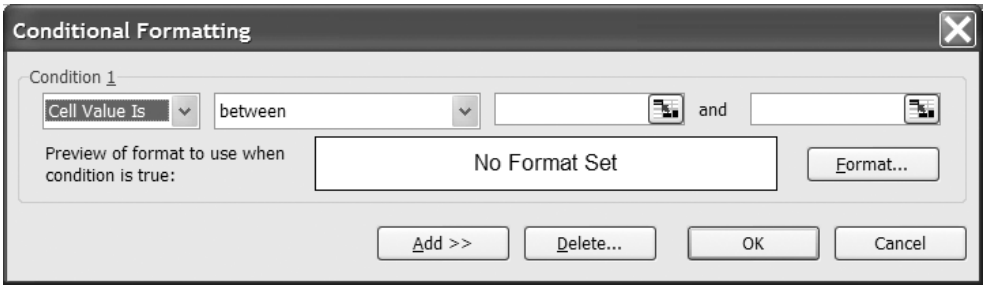


Figure 3-5. *The Excel 2003 Conditional Formatting dialog box*

1. Set the options in the Conditional Formatting dialog box to add the first conditional format rule.
2. Click Add if you want to create additional conditional format rules.
3. When you have finished creating your conditional format rules for the selected worksheet cells, click OK.

How To

To add conditional formatting to one or more worksheet cells, select the cells for which you want to add conditional formatting.

In Excel 2007, click Home ➤ (Styles) Conditional Formatting. Table 3-2 shows the conditional formatting options.

Table 3-2. *Excel 2007 Conditional Formatting Options*

Click	Conditional Formatting Rule
One of the options on the Highlight Cells Rules menu	Highlight cell values that are greater than, less than, between, or equal to specific data values; contain specific text; occur on a specific date; or contain unique or duplicate values. Complete the options in the dialog box that appears, and click OK.
One of the options on the Top/Bottom Rules menu	Highlight cell values that are in the top, bottom, above average, or below average of a specified data value or percentage of all of the cell values. Complete the options in the dialog box that appears, and click OK.
One of the options on the Data Bars menu	Add to the cells some visual data bars whose lengths correspond to lower or higher data values, and then click a data bar color.
One of the options on the Color Scales menu	Add to the cells some colors whose hues correspond to lower or higher data values, and then click a color scale.
One of the options on the Icon Sets menu	Add to the cells some icons whose pictures correspond to lower or higher data values, and then click an icon set.
Manage Rules	Customize the behavior of any existing conditional formatting rule in the workbook, and click OK when you are done customizing conditional formatting rules.

In Excel 2003, do the following:

1. Click Format ➤ Conditional Formatting.
2. In the far left list, you can select Cell Value Is to add a conditional format based on specific values that you type or specific values in one or more worksheet cells. In the list to the right of this list, select Between or Not Between to add a conditional format based on the values that you type (or worksheet cells that you select) for the two boxes to the right of the Between box. Alternatively, you can select Equal To, Not Equal To, Greater Than, Less Than, Greater Than or Equal To, or Less Than or Equal To to add a conditional format based on the value that you type (or worksheet cell that you select) for the box to the right of the Equal To, Not Equal To, Greater Than, Less Than, Greater Than or Equal To, or Less Than or Equal To box.
3. In the far left list, you can select Formula Is to add a conditional format based on the outcome of a formula that you type or select. If you select Formula Is, in the box to the right of this list, type the formula, or click the worksheet cell containing the formula.
4. Click the Format button.

5. Select the desired options on the Font, Border, and Patterns tabs to change the cells' formatting if the condition that you specified earlier evaluates to true, and then click OK. For information on how to select the desired options on these tabs, see section "3.5: Format Data," previously in this chapter.
6. To add up to two more conditional formats, click the Add button, and repeat steps 2 through 5.
7. Click OK.

To change a conditional format in Excel 2007, do the following:

1. Click Home ➤ (Styles) Conditional Formatting ➤ Manage Rules.
2. In the Show Formatting Rules For list, select Current Selection, This Worksheet, or a specific worksheet to which the desired conditional format applies.
3. Click the conditional format in the list of rules.
4. Click Edit Rule.
5. Change the conditional formatting rule, and click OK to apply the changes.

In Excel 2003, do the following:

1. Click Format ➤ Conditional Formatting.
2. Click the Format button for the condition that you want to change.
3. Select the desired options on the Font, Border, and Patterns tabs to change the cells' formatting, and then click OK.
4. Click OK again.

To remove conditional formatting in Excel 2007, do the following:

1. Click Home ➤ (Styles) Conditional Formatting ➤ Manage Rules.
2. In the Show Formatting Rules For list, select Current Selection, This Worksheet, or a specific worksheet to which the desired conditional format applies.
3. Click the conditional format in the list of rules.
4. Click Delete Rule.
5. Click OK.

In Excel 2003, do the following:

1. Click Format ➤ Conditional Formatting.
2. Click Delete.
3. Select one or more check boxes next to the conditions that you want to delete.
4. Click OK, and click OK again.

If more than one conditional format evaluates to true, Excel applies only the format of the first true condition, even if more than one condition evaluates to true.

To find all cells in a workbook that contain conditional formatting, in Excel 2007, click Home ➤ (Editing) Find & Select ➤ Conditional Formatting. In Excel 2003, click Edit ➤ Go To, click the Special button, click the Conditional Formats option, and click OK.

To copy conditional formats to other cells, select the cells that contain the conditional formats that you want to copy.

In Excel 2007, click Home ➤ (Clipboard) Format Painter. Then select the cells to which you want to apply the conditional format.

In Excel 2003, on the Standard toolbar, click Format Painter, and then select the cells to which you want to apply the conditional format.

To remove all formatting, including conditional formats, from one or more selected worksheet cells, select the cells, and in Excel 2007, click Home ➤ (Editing) Clear ➤ Clear Formats. In Excel 2003, click Edit ➤ Clear ➤ Formats.

Try It

In this exercise, you will practice conditionally formatting data that is above, equal to, or below a specified value.

If the practice workbook is not open from the previous exercise, open it first, and then click the ConditionalFormatting worksheet tab.

In Excel 2007, do the following:

1. Select cells B2 through B20, and then click Home ➤ (Styles) Conditional Formatting ➤ Highlight Cells Rules ➤ Less Than.
2. In the left box, type **=AVERAGE($B$2:$B$20)**.
3. In the right box, select Custom Format.
4. On the Fill tab, click the green box, click OK, and click OK again.
5. Click Home ➤ (Styles) Conditional Formatting ➤ Highlight Cells Rules ➤ Greater Than.
6. In the left box, type **=AVERAGE($B$2:$B$20)**.
7. In the right box, select Custom Format.
8. On the Fill tab, click the red box, click OK, and click OK again. The background color of cells B2 through B9 turns green because their data values are less than the average temperature value for all of the temperatures in cells B2 through B20, while the background color of cells B10 through B20 turns red because their data values are greater than the average temperature for all of the temperature value in cells B2 through B20.

In Excel 2003, do the following:

1. Select cells B2 through B20, and then click Format ➤ Conditional Formatting.
2. In the list to the right of the Cell Value Is box, select Less Than.
3. In the box to the right of the Less Than list, type **=AVERAGE($B$2:$B$20)**.
4. Click the Format button.

5. Click the Pattern tab, click the green box, and click OK.
6. Click the Add button.
7. In the list to the right of the Cell Value Is box, select Greater Than.
8. In the box to the right of the Greater Than list, type **=AVERAGE($B$2:$B$20)**.
9. Click the Format button.
10. Click the Pattern tab, click the red box, click OK, and click OK again. The background color of cells B2 through B9 turns green because their data values are less than the average temperature value for all of the temperatures in cells B2 through B20, while the background color of cells B10 through B20 turns red because their data values are greater than the average temperature for all of the temperature values in cells B2 through B20.

To remove the conditional formatting, select cells B2 through B20.
In Excel 2007, do the following:

1. Click Home ➤ (Styles) Conditional Formatting ➤ Manage Rules.
2. In the Show Formatting Rules For list, click This Worksheet.
3. Click the Cell Value > AVERAGE rule, and click Delete Rule.
4. Click the Cell Value < AVERAGE rule, and click Delete Rule.
5. Click OK. The conditional formatting is removed from the selected cells.

In Excel 2003, do the following:

1. Click Format ➤ Conditional Formatting.
2. Click the Delete button.
3. Select the Condition 1 and Condition 2 check boxes.
4. Click OK, and then click OK again. The conditional formatting is removed from the selected cells.

3.7 Protect Data

Excel allows you to protect individual worksheet cells, an entire worksheet, a chart sheet, or an entire workbook with a password. You can also restrict access to specific worksheet cells or an entire worksheet by a user's workgroup login name or network login name. These levels of protection are as good as, or better than, many other database management systems.

Quick Start

To protect individual worksheet cells but not others in a single worksheet, select the cells that you want others to be able to change (locked cells are protected by default when you protect a worksheet) and do the following:

- In Excel 2007, click Home ➤ (Cells) Format, and deselect Lock Cell. Then protect the worksheet.
- In Excel 2003, click Format ➤ Cells, click the Protection tab, clear the Locked check box, and click OK. Then protect the worksheet.

To protect an entire worksheet, do the following:

- In Excel 2007, click Review ➤ (Changes) Protect Sheet. Complete the Protect Sheet dialog box, and then click OK.
- In Excel 2003, click Tools ➤ Protection ➤ Protect Sheet, complete the Protect Sheet dialog box, and then click OK.

To protect an entire workbook, do the following:

- In Excel 2007, click Review ➤ (Changes) Protect Workbook. Select or clear one or more of the commands on the Protect Workbook menu.
- In Excel 2003, click Tools ➤ Protection ➤ Protect Workbook, complete the Protect Workbook dialog box, and then click OK.

To protect and share an entire workbook, do the following:

- In Excel 2007, click Review ➤ (Changes) Protect and ShareWorkbook, complete the Protect Shared Workbook dialog box, and then click OK.
- In Excel 2003, click Tools ➤ Protection ➤ Protect and Share Workbook, complete the Protect Shared Workbook dialog box, and then click OK.

How To

To protect an individual worksheet, do the following:

1. Click the worksheet tab of the worksheet that you want to protect.
2. If you want users to be able to change the contents of some worksheet cells but not others, select the cells that you want your users to be able to change:
   - In Excel 2007, click Home ➤ (Cells) Format, and deselect Lock Cell.
   - In Excel 2003, click Format ➤ Cells, click the Protection tab, clear the Locked check box, and click OK.
3. If you want to hide any formulas from users, select the cells with the formulas that you want to hide:
   - In Excel 2007, click Home ➤ (Cells) Format ➤ Format Cells. Click the Protection tab, select the Hidden check box, and click OK.
   - In Excel 2003, click Format ➤ Cells, click the Protection tab, select the Hidden check box, and click OK.

4. If you want users to be able to change the contents of some graphic objects on the worksheet but not others, press and hold the Ctrl key and click each object you want your users to be able to change, then:
   - In Excel 2007, click (Drawing Tools) Format ➤ (Size) Size and Properties. Click the Properties tab, clear the Locked check box (and if present, clear the Lock Text check box), and click Close.
   - In Excel 2003, click Format ➤ AutoShape (or Object, TextBox, Picture, Control, or WordArt, depending on the type of selected graphic object), click the Protection tab, clear the Locked check box (and if present, clear the Lock Text check box), and click OK.
5. In Excel 2007, click Review ➤ (Changes) Protect Sheet. In Excel 2003, click Tools ➤ Protection ➤ Protect Sheet.
6. Select the Protect Worksheet and Contents of Locked Cells to prevent users from making changes to cells that you locked before protecting the worksheet (unless you allowed a user to edit the locked cells in the Allow Users to Edit Ranges dialog box) as well as prevent users from viewing rows, columns, and formulas that you hid before protecting the worksheet.
7. In the Password to Unprotect Sheet box, type a password for the worksheet.

■ **Caution** Although a password is not required, if you don't type a password, any user will be able to unprotect the worksheet and change any protected items on the worksheet. Also, type a password that you can easily remember. If you forget the password, there is no way to change the protected items on the worksheet.

---

8. In the Allow All Users of This Worksheet To list, select the check boxes next to the items that you want users to be able to change, as shown in Table 3-3.

Table 3-3. *Check Boxes for the Protect Sheet Dialog Box's Allow All Users of This Workbook To List*

Check Box	Description
Select Locked Cells	Select cells that were locked before the worksheet was protected
Select Unlocked Cells	Press the Tab key to move among the worksheet's unlocked cells
Format Cells	Change the options in the Format Cells and Conditional Formatting dialog boxes
Format Columns	Click Home ➤ Cells ➤ Format and format columns (in Excel 2007) or click Format ➤ Column and issue any of the Column submenu commands (in Excel 2003)
Format Rows	Click Home ➤ Cells ➤ Format and format rows (in Excel 2007) or click Format ➤ Row and issue any of the Row submenu commands (in Excel 2003)
Insert Columns	Click Home ➤ Cells ➤ Insert ➤ Insert Cells or Insert Sheet Columns (in Excel 2007) or click Insert ➤ Columns (in Excel 2003)

continued

Table 3-3. *Continued*

Check Box	Description
Insert Rows	Click Home ➤ Cells ➤ Insert ➤ Insert Cells or Insert Sheet Rows (in Excel 2007) or click Insert ➤ Rows (in Excel 2003)
Insert Hyperlinks	Click Insert ➤ Links ➤ Hyperlink (in Excel 2007) or click Insert ➤ Hyperlink (in Excel 2003)
Delete Columns	Select one or more columns and click Home ➤ Cells ➤ Delete ➤ Delete Cells or Delete Sheet Columns (in Excel 2007), or click Edit ➤ Delete (in Excel 2003), or right-click the column and then click Delete
Delete Rows	Select one or more rows and click Home ➤ Cells ➤ Delete ➤ Delete Cells or Delete Sheet Rows (in Excel 2007), or click Edit ➤ Delete (in Excel 2003), or right-click and click Delete
Sort	Click Data ➤ Sort & Filter ➤ Sort, or click any of the commands on the Home ➤ Editing ➤ Sort & Filter menu (in Excel 2007); or in Excel 2003, click Data ➤ Sort or, on the Standard toolbar, click the Sort Ascending and Sort Descending buttons
Use AutoFilter	Use the drop-down arrows to change the filter on one or more autofiltered cells
Use PivotTable reports	Format, change the layout, refresh, or otherwise change PivotTable reports and create new PivotTable reports
Edit Objects	Make changes to graphic objects that you did not lock before you protected a worksheet; make changes to embedded charts; and add and delete comments
Edit Scenarios	View hidden scenarios, make changes to scenarios to which you have prevented changes, and delete scenarios

■ **Note** If you run an Excel macro that tries to perform an action that's protected on the worksheet, the macro stops running, and a message appears.

9. Click OK.
10. Retype the password if asked, and click OK.

To protect an individual chart sheet (a special type of worksheet that contains only a chart), do the following:

1. In Excel 2007, click Review ➤ (Changes) Protect Sheet. In Excel 2003, click Tools ➤ Protection ➤ Protect Sheet.
2. In the Protect Worksheet area, select one or both of these check boxes:
   - Contents, to prevent users from making changes to chart items such as data series, axes, and legends
   - Objects, to prevent users from making changes to locked graphic objects

3. In the Password box, type a password for the chart sheet, and click OK.

To give specific users access to protected worksheet cells on a computer with Microsoft Windows 2000 or later installed and connected to a computer network, do the following:

1. Select the worksheet tab of the worksheet in which you want to allow specific users access to protected worksheet cells.
2. Unprotect the worksheet if it is protected. In Excel 2007, click Review ➤ (Changes) Unprotect Sheet. Type the worksheet's password, and click OK. In Excel 2003, click Tools ➤ Protection ➤ Unprotect Sheet, type the worksheet's password, and click OK.
3. In Excel 2007, click Review ➤ (Changes) Allow Users to Edit Ranges. In Excel 2003, click Tools ➤ Protection ➤ Allow Users to Edit Ranges.
4. Click New.
5. In the Title box, type a title for the group of one or more cells for which you're granting access.
6. In the Refers to Cells box, type an equal sign (=), and then type a cell reference or select the group of one or more cells.
7. In the Range Password box, type a password to access the selected group of one or more cells.
8. Click Permissions, and then click Add.
9. Select the users to whom you want to give access. (Press and hold the Ctrl key to select multiple users.)
10. Click OK two times, and retype the password.
11. Repeat steps 4 through 10 for each group of cells for which you want to give access to specific users.
12. Click the Protect Sheet button.
13. With the Protect Worksheet and Contents of Locked Cells check box selected, type a password for the worksheet, click OK, retype the password, and click OK.

To protect an entire workbook, do the following:

1. In Excel 2007, click Review ➤ (Changes) Protect Workbook ➤ Protect Structure and Windows. In Excel 2003, click Tools ➤ Protection ➤ Protect Workbook.
2. Select either of the following check boxes in the Protect Workbook For area:
   - Structure, to ensure that the workbook's worksheets can't be moved, deleted, hidden, unhidden, or renamed, and ensure that new worksheets can't be inserted.
   - Windows, to ensure that windows are in the same position and are the same size whenever the workbook is opened.
3. In the Password box, type a password to prevent others from removing workbook protection, click OK, retype the password, and click OK.

You can protect a shared workbook (a workbook that is set up to allow multiple users on a computer network to view and make changes at the same time). If the workbook is already shared, first unshare the workbook, and then have all users save and close the shared workbook.

In Excel 2007, click Review ➤ (Changes) Share Workbook, and then click the Editing tab. In Excel 2003, click Tools ➤ Share Workbook, and then click the Editing tab.

Make sure that you are the only person listed in the Who Has This Workbook Open Now list. Clear the Allow Changes by More Than One User at the Same Time check box.

■ **Note** If the Allow Changes by More Than One User at the Same Time check box is not available, you must unprotect the workbook before clearing the check box. In Excel 2007, click OK, click Review ➤ (Changes) Unprotect Shared Workbook. Type the password, and click OK. Then click Review ➤ (Changes) Share Workbook, and click the Editing tab. In Excel 2003, click OK, click Tools ➤ Protection ➤ Unprotect Shared Workbook, type the password, and click OK. Then click Tools ➤ Share Workbook, and click the Editing tab.

---

1. Click OK. When prompted about the effects on other users, click Yes.
2. Set other types of protection if you want, according to the previous procedures in this section.
3. In Excel 2007, click Review ➤ (Changes) Protect Shared Workbook. In Excel 2003, click Tools ➤ Protection ➤ Protect and Share Workbook.
4. Select the Sharing with Track Changes check box.
5. In the Password box, type a password to prevent others from turning off the workbook's change history or remove the workbook from shared use, click OK, retype the password, and click OK.
6. If prompted, save the workbook.

To protect a workbook file from viewing or editing, do the following:

1. In Excel 2007, click Office Button ➤ Save As. In Excel 2003, click File ➤ Save As.
2. Click Tools ➤ General Options.
3. Do either of these:
   - In the Password to Open box, type a password to require others to type a password before they can view the workbook.
   - In the Password to Modify box, type a password to require others to type a password before they can save changes to the workbook.
4. Click OK. If prompted, retype your passwords.
5. Click Save.
6. If prompted, click Yes to replace the existing workbook.

Although you can use the procedures in the previous section to hide data and protect worksheets and passwords, these steps are not intended to be failsafe ways to protect secure or confidential information. Given enough time and skill, others can obtain and modify all of the data in a workbook, as long as they are able to access it. To help ensure that your data is protected, you can restrict others from accessing confidential information by storing workbooks in locations that you make available only to authorized users.

If you write computer programming code and attach it to a workbook, you can protect the code. In Excel 2007, show the Developer menu if it is not already visible by clicking Office Button ➤ Excel Options, clicking Popular, selecting the Show Developer Tab in the Ribbon check box, and clicking OK, as shown in Figure 3-6. Then click Developer ➤ (Code) Visual Basic. In the Visual Basic Editor, click Tools ➤ (*your project name*) Properties, select the desired options in the Project Properties dialog box's Protection tab, and then click OK.

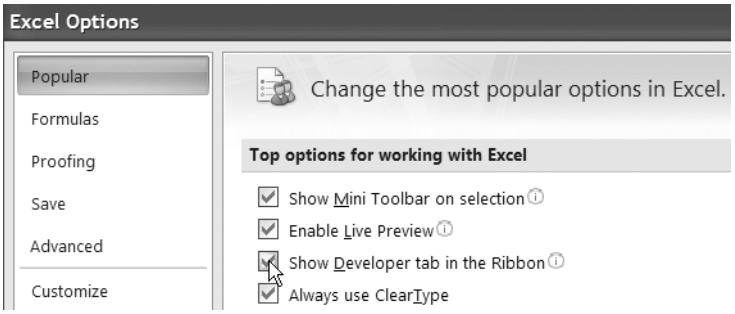


Figure 3-6. *Selecting the Show Developer Tab in the Ribbon check box in Excel 2007*

In Excel 2003, click Tools ➤ Macro ➤ Visual Basic Editor, then in the Visual Basic Editor, click Tools ➤ (*your project name)* Properties, select the desired options in the Project Properties dialog box's Protection tab, and then click OK.

Try It

In this exercise, you will practice protecting individual worksheet cells and other items in a worksheet, you will practice protecting an entire worksheet, and you will practice protecting the structure of an entire workbook.

If the practice workbook is not open from the previous exercise, open it first.

Practice protecting individual worksheet cells by clicking the ProtectData worksheet tab. Make sure that all of the worksheet cells on the ProtectData worksheet will be locked by default when the worksheet is protected.

To protect it, click the Select All button (the button in the upper left corner of the worksheet at the intersection of the row and column headings).

In Excel 2007, click Home ➤ (Cells) Format, and select Lock Cell if it is not already selected. In Excel 2003, click Format ➤ Cells, click the Protection tab, select the Locked check box, and then click OK.

Now unlock some cells so that they can be edited when the worksheet is protected. Select cells E4 through E6 and E8 through E10.

In Excel 2007, click Home ➤ (Cells) Format, and deselect Lock Cell. In Excel 2003, click Format ➤ Cells, click the Protection tab, clear the Locked check box, and then click OK.

Practice protecting other items in a worksheet.

In Excel 2007, click WordArt, and then click (Drawing Tools) Format ➤ (Size) Size and Properties. Click the Properties tab, clear the Locked and Lock Text check boxes, and click Close. In Excel 2003, right-click WordArt, click Format WordArt, click the Protection tab, clear the Locked check box, and click OK.

In Excel 2007, click a blank area of the chart, click (Chart Tools) Format ➤ (Size) Size and Properties. Click the Properties tab, make sure the Locked check box is selected, and click Close. In Excel 2003, right-click a blank area of the chart, click Format Chart Area, click the Properties tab, make sure the Locked check box is selected, and click OK.

Practice protecting an entire worksheet, and then attempt to edit individual data values and objects on the worksheet:

1. In Excel 2007, click Review ➤ (Changes) Protect Sheet. In Excel 2003, click Tools ➤ Protection ➤ Protect Sheet.
2. With the Protect Worksheet and Contents of Locked Cells check box selected, in the Password to Unprotect Sheet box, type **test**.
3. Clear the Select Locked Cells check box, and make sure the Select Unlocked Cells check box is selected. Also, make sure that all of the other check boxes below the Select Unlocked Cells check box are cleared.
4. Click OK.
5. In the Reenter Password to Proceed, type **test**, and click OK.

■ **Note** Notice that you now cannot select any cells other than cells E4 through E6 and E8 through E10. Notice that you can still select any of the cells E4 through E6 and E8 through E10 and change those cells' values.

Notice that you now cannot select the chart, but you can select and change the contents of the WordArt.

Notice also that many of the commands on insert- and format-related menus, for example, are not available.

---

6. Unprotect the worksheet. In Excel 2007, click Review ➤ (Changes) Unprotect Sheet. Type **test** in the Password box, and click OK. In Excel 2003, click Tools ➤ Protection ➤ Unprotect Sheet, type **test** in the Password box, and click OK.

■ **Note** Notice that you can now select and change any cell, the chart, and the WordArt on the worksheet.

Practice protecting an entire workbook's structure. In Excel 2007, click Review ➤ (Changes) Protect Workbook ➤ Protect Structure and Windows. Make sure the Structure check box is selected, type **test** in the Password box, click OK, type **test** again, and click OK. In Excel 2003, click Tools ➤ Protection ➤ Protect Workbook, make sure the Structure check box is selected, type **test** in the Password box, click OK, type **test** again, and click OK.

Notice that in Excel 2007, the Home ➤ (Cells) Insert ➤ Insert Sheet command is not available. In Excel 2003, the Insert ➤ Worksheet command and many of the commands on the Format ➤ Sheet menu are not available. Also notice that many of the commands are not available when you right-click any worksheet tab in the workbook.

To unprotect the workbook, in Excel 2007, click Review ➤ (Changes) Protect Workbook, and clear the Protect Structure and Windows command. Type **test** in the Password box, and click OK. Notice that the Home ➤ (Cells) Insert ➤ Insert Sheet command is now available. In Excel 2003, click Tools ➤ Protection ➤ Unprotect Workbook, type **test** in the Password box, and click OK. Notice that the Insert ➤ Worksheet command and that most of the commands on the Format ➤ Sheet menu are now available. Also notice for both Excel 2007 and Excel 2003 that all of the commands are available when you right-click any worksheet tab in the workbook.

3.8 Insert a Formula or Function

In Excel, a *formula* is an equation that performs a calculation and returns the result into the worksheet cell containing the formula. A formula begins with an equals sign (=) and is followed by a series of numbers, mathematical symbols, and cell references. For example, the formula =A1+A2 returns the sum of the data values in cells A1 and A2.

In Excel, a *function* is a formula with zero or more predefined input values (called *arguments* or *parameters*) to produce as output the result of a calculation based on those input values. For example the formula =SUM(A1,A2) returns the sum of the data values in cells A1 and A2.

Some database management systems don't provide formulas; most database management systems provide functions; and some database management systems provide advanced functions called *stored procedures*. In Excel, formulas and functions are simple to understand, easy to insert, and can be fast to run.

Quick Start

To insert a formula into a worksheet cell, press the F2 key or click the Formula Bar, type the formula, and press the Enter key.

To insert a function into a worksheet cell in Excel 2007, click Formulas ➤ (Function Library) Insert Function. Complete the Insert Function dialog box, click OK, complete the Function Arguments dialog box as necessary, and click OK again. In Excel 2003, click Insert ➤ Function, complete the Insert Function dialog box, click OK, complete the Function Arguments dialog box as necessary, and click OK again.

How To

To insert a formula into a worksheet cell, do the following:

1. Click the worksheet cell into which you want to insert the formula.
2. Press the F2 key or click the Formula Bar, as shown in Figure 3-7.
3. Type the formula. To add a cell reference to a formula, type the cell reference or select the corresponding cells.

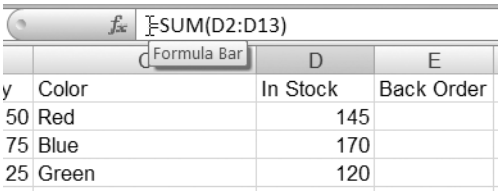


Figure 3-7. *The Excel Formula Bar*

4. Press the Enter key.

To insert a function, do the following:

1. Click the worksheet cell into which you want to insert the function.
2. In Excel 2007, click Formulas ➤ (Function Library) Insert Function. Or, next to the Formula Bar, click the Insert Function button. In Excel 2003, click Insert ➤ Function or, next to the Formula Bar, click the Insert Function button.
3. In the Insert Function dialog box, in the Search For a Function box, type the function's name or a brief description of the function, and then click the Go button. Or, in the Or Select a Category list, select a category of functions that contains the function for which you're looking.
4. In the Select a Function list, select the function for which you're looking.
5. Click OK.
6. Complete the options in the Function Arguments dialog box, if any, and click OK.

■ **Tip** If you need help with a function, click the Help on This Function link in the Insert Function or Function Arguments dialog boxes.

If you know a function's name, you do not have to use the Insert Function dialog box. You can simply do the following:

1. Select the desired worksheet cell.
2. Type an equals sign.
3. Type the function's name.
4. Type an opening parenthesis.
5. Type values for any function arguments separated by commas.
6. Type a closing parenthesis.
7. Press the Enter key.

Try It

In this exercise, you will practice inserting formulas and functions into worksheet cells. If the practice workbook is not open from the previous exercise, start Excel, click Office Button ➤ Open (in Excel 2007) or File ➤ Open (in Excel 2003). Browse to and select the ExcelDB_Ch03_01-09.xls file, and click Open.

1. Click the FunctionsFormulas worksheet tab.
2. In cell D2, type **=B2+B10**, and press the Enter key. The sum of the data values in B2 and B10 is displayed in cell D2.
3. Click cell E2, type =, click cell B15, type -, click cell B7, and press the Enter key. The difference of the data values in B15 and B7 is displayed in cell E2.
4. Click cell F2 and, in Excel 2007, click Formulas ➤ (Function Library) Insert Function. In Excel 2003, click Insert ➤ Function.
5. In the Search For a Function box, type **Add cells' values**, and click the Go button.
6. In the Select a Function list, click SUM, and click OK.
7. Clear the contents of the Number1 box, select the Number1 box, select cells B2 through B16, and click OK. The sum of the data values in cells B2 through B16 is displayed in cell F2.
8. Click cell G2 and click the Insert Function button.
9. In the Or Select a Category list, select Statistical.
10. In the Select a Function list, click AVERAGE, and click OK.
11. Clear the contents of the Number1 box, type **B2:B16** in it, and click OK. The average of the data values in cells B2 through B16 is displayed in cell G2.
12. Click cell H2, type **=MAX(**, select cells B2 through B16, then type **)**, and press the Enter key. The highest data value for the data values in cells B2 through B16 is displayed in cell H2.
13. Click cell I2, type **=MIN(B2:B16)**, and press the Enter key. The lowest data value for the data values in cells B2 through B16 is displayed in cell I2.
14. Click cell J2, type **=IF(AVERAGE(B2:B16)>1000, "Average > 1000", "Average < 1000")**, and press the Enter key. The text *Average > 1000* is displayed in cell J2 because the average of the data values in cells B2 through B16 is greater than 1,000.

3.9 Validate Data

To help ensure that users enter only expected data values into worksheet cells, Excel can compare data values to rules that you can define for specific cells. If those rules are broken, Excel can alert users that their data values are not acceptable and request users to enter acceptable data values. In some database management systems, creating these data validation rules takes a lot of knowledge and effort. Creating these rules in Excel is very straightforward and fast.

Quick Start

To create a data validation rule, do the following:

1. Select one or more worksheet cells to which the data validation rule will apply.
2. In Excel 2007, click Data ➤ (Data Tools) Data Validation. In Excel 2003, click Data ➤ Validation.
3. In the Data Validation dialog box, complete the Settings tab, and optionally the Input Message and Error Alert tabs, and then click OK. The data validation rule is created.

How To

To apply a data validation rule to one or more worksheet cells, do the following:

1. Select the worksheet cells for which you want to apply a data validation rule.
2. In Excel 2007, click Data ➤ (Data Tools) Data Validation. In Excel 2003, click Data ➤ Validation.
3. On the Settings tab, in the Validation Criteria area, select one of the items in the Allow list, as shown in Table 3-4.

Table 3-4. *Items in the Allow List*

Allow List Item	Restricts
Any Value	Any values
Whole Number	Only whole numbers (numbers without fractions)
Decimal	Only numbers with decimal symbols
List	Only a data value from a predefined list of data values
Date	Only date values
Time	Only time values
Text length	Only a specific number of alphanumeric characters
Custom	Data values conforming to a specific formula's results

4. In the Allow list, if you select Whole Number, Decimal, Date, Time, or Text Length, select one of the items in Table 3-5 from the Data list.

Table 3-5. *Items in the Data List*

Items in the Data List	Description
Between or Not Between	A value between or not between the values in the Minimum and Maximum boxes
Equal or Not Equal	A value equal or not equal to the value in the Value box or Length box
Greater Than or Greater Than or Equal To	A value greater than or greater than or equal to the value in the Minimum box
Less Than or Less Than or Equal To	A value less than or less than or equal to the value in the Maximum box

5. In the Allow list, if you select List, then in the Source box, type the list of allowed values separated by commas, or select the worksheet cells containing the list or allowed values.
6. In the Allow list, if you select Custom, then in the Formula box, type or select the formula by whose result you want to restrict the allowed data values in the selected worksheet cells.

■ **Note** If you select Custom in the Allow list, in the Formula box, enter a formula that calculates a logical value. If the formula in the Formula box evaluates to true, then data values can be entered in the selected worksheet cells without displaying an error. If the formula in the Formula box evaluates to false, then an error appears whenever any data values are entered in the selected worksheet cells. For example, if you type **=AND(AVERAGE(H2:H11)>60)** in the Formula box, data values can only be entered into the selected worksheet cells if the formula in the Formula box evaluates to true (in this case, the average of the data values in cells H2 through H11 is greater than 60).

---

7. Select the Ignore Blank check box to not validate a selected cell containing no data against the data validation rule.
8. In the Allow list, if you select List, select the In-Cell Dropdown check box to allow others to select a data value from the list that appears when you click one of the selected worksheet cells.
9. On the Input Message tab, select the Show Input Message When Cell Is Selected check box if you want to display a dialog box whenever someone selects one of the worksheet cells for which the corresponding data validation rule applies. Also, in the When Cell Is Selected, Show This Input Message area, do the following:
    a. In the Title box, type a title for the dialog box that appears when others select one of the selected worksheet cells.
    b. In the Input message box, type the message that you want others to see in the dialog box when others select one of the selected worksheet cells.
10. On the Error Alert tab, select the Show Error Alert After Invalid Data Is Entered check box if you want to display a dialog box whenever someone types or enters a data value that violates the data validation rule for which one of the worksheet cells applies. Also, in the When User Enters Invalid Data, Show This Error Alert area, do the following:
    a. In the Style list, select Stop, Warning, or Information to display a stop icon, warning icon, or information icon in the dialog box that appears when someone types or enters a data value that violates the data validation rule.
    b. In the Title box, type a title for the dialog box that appears when someone types or enters a data value that violates the data validation rule.
    c. In the Error message box, type the message that appears in the dialog box when someone types or enters a data value that violates the data validation rule.
11. Click OK.

In the Data Validation dialog box's Settings tab, you can select the Apply These Changes to All Other Cells with the Same Settings check box when you are changing a validation rule, in order to apply the changes to all other worksheet cells that have the same validation rule defined.

To find all cells in a workbook that match a specific data validation rule, click a worksheet cell that has a known data validation rule for which you want to find matches. In Excel 2007, click Home ➤ (Editing) Find & Select ➤ Go To Special, click the Data Validation option, click the Same option, and click OK. In Excel 2003, click Edit ➤ Go To, click the Special button, click the Data Validation option, click the Same option, and click OK.

To find all cells in a workbook that contain data validation rules, in Excel 2007, click Home ➤ (Editing) Find & Select ➤ Go To Special, click the Data Validation option, click the All option, and click OK. In Excel 2003, click Edit ➤ Go To, click the Special button, click the Data Validation option, click the All option, and click OK.

Try It

In this exercise, you will practice validating data in various worksheet cells against data-entry criteria for whole numbers, dates, times, text string lengths, lists of data values, and formulas. If the practice workbook is not open from the previous exercise, start Excel, click Office Button ➤ Open (in Excel 2007) or File ➤ Open (in Excel 2003). Browse to and select the ExcelDB_Ch03_01-09.xls file, and click Open. Click the ValidateData worksheet tab.

Practice validating data for whole numbers:

1. Select cells A2 and A3, and in Excel 2007, click Data ➤ (Data Tools) Data Validation. In Excel 2003, click Data ➤ Validation.
2. Click the Settings tab.
3. In the Allow list, select Whole Number.
4. In the Data list, select Between.
5. In the Minimum box, type **0**.
6. In the Maximum box, type **10**.
7. Click the Input Message tab.
8. With the Show Input Message When Cell Is Selected check box selected, in the Title box, type **Whole Numbers Only**.
9. In the Input Message box, type **Enter a whole number between 0 and 10**.
10. Click the Error Alert tab.
11. With the Show Error Alert After Invalid Data Is Entered check box selected, in the Title box, type **Invalid Number**.
12. In the Error Message box, type **Only whole numbers between 0 and 10 are allowed**, and click OK.
13. Click cell A2, type **7**, and press the Enter key.

14. Click cell A3, type 15, and press the Enter key. An error message appears because the data value is not between 0 and 10.
15. Click Retry, type **2**, and press the Enter key.

Next, practice validating data for dates:

1. Select cells B2 and B3, and in Excel 2007, click Data ➤ (Data Tools) Data Validation. In Excel 2003, click Data ➤ Validation.
2. Click the Settings tab.
3. In the Allow list, select Date.
4. In the Data list, select Greater Than or Equal To.
5. In the Start Date box, type **01/01/2006**, and click OK.
6. Click cell B2, type **12/04/2006**, and press the Enter key.
7. Click cell B3, type **10/09/2004**, and press the Enter key. An error message appears because the data value is not greater than or equal to the date 01/01/2006.
8. Click Retry, type **10/09/2007**, and press the Enter key.

Practice validating data for times:

1. Select cells C2 and C3, and in Excel 2007, click Data ➤ (Data Tools) Data Validation. In Excel 2003, click Data ➤ Validation.
2. Click the Settings tab.
3. In the Allow list, select Time.
4. In the Data list, select Less Than.
5. In the End Time box, type **14:00**, and click OK.
6. Click cell C2, type **8:35**, and press the Enter key.
7. Click cell C3, type **8:35 PM**, and press the Enter key. An error message appears because the data value is not earlier than 2:00 PM.
8. Click Retry, type **8:35 AM**, and press the Enter key.

Next, practice validating data for text string lengths:

1. Select cells D2 and D3, and in Excel 2007, click Data ➤ (Data Tools) Data Validation. In Excel 2003, click Data ➤ Validation.
2. Click the Settings tab.
3. In the Allow list, select Text Length.
4. In the Data list, select Not Equal To.

5. In the Length box, type **5**.
6. Click the Input Message tab.
7. With the Show Input Message When Cell Is Selected check box selected, in the Title box, type **Text Length Restricted**.
8. In the Input Message box, type **Do not enter any text strings containing five characters**.
9. Click the Error Alert tab.
10. With the Show Error Alert After Invalid Data Is Entered check box selected, in the Title box, type **Invalid Text String Length**.
11. In the Error Message box, type **Only text strings with lengths other than five are allowed**, and click OK.
12. Click cell D2, type **Banana**, and press the Enter key.
13. Click cell D3, type **Fruit**, and press the Enter key. An error message appears because the text string length is five characters in length.
14. Click Retry, type **Orange**, and press the Enter key.

Practice validating data for lists of data values:

1. Select cells E2 and E3, and in Excel 2007, click Data ➤ (Data Tools) Data Validation. In Excel 2003, click Data ➤ Validation.
2. Click the Settings tab.
3. In the Allow list, select List.
4. With the Ignore Blank and In-Cell Dropdown check boxes selected, in the Source box, type **Low,Medium,High**, and click OK.
5. Click cell E2, click the arrow, and select Low from the list.
6. Click cell E3, type **Mediocre**, and press the Enter key. An error message appears because the text is not one of the values Low, Medium, or High.
7. Click Cancel, click the arrow, and select Medium from the list.
8. In cells J1 through J4, type the words **Red**, **Yellow**, **Blue**, and **Green** respectively.
9. Select cells F2 and F3, and in Excel 2007, click Data ➤ (Data Tools) Data Validation. In Excel 2003, click Data ➤ Validation.
10. Click the Settings tab.
11. In the Allow list, select List.
12. With the Ignore Blank and In-Cell Dropdown check boxes selected, click the Source box, select cells J1 through J4, and click OK.
13. Click cell F2, click the arrow, and select Blue from the list.

14. Click cell F3, type **Purple**, and press the Enter key. An error message appears because the text is not one of the values Red, Yellow, Blue, or Green.
15. Click Cancel, click the arrow, and select Green from the list.

Last, practice validating data for formulas:

1. Select cell G2, and in Excel 2007, click Data ➤ (Data Tools) Data Validation. In Excel 2003, click Data ➤ Validation.
2. Click the Settings tab.
3. In the Allow list, select Custom.
4. Click the Formula box, type **=AND(AVERAGE(H2:H11)>60)**, and click OK.
5. Click cell G2, type some text, and press the Enter key. An error message appears because the average of the values in cells H2 through H11 is not greater than 60.
6. Click Cancel.
7. Select cell G2, and in Excel 2007, click Data ➤ (Data Tools) Data Validation. In Excel 2003, click Data ➤ Validation.
8. Click the Settings tab.
9. Click the Formula box, change the formula to =**AND(AVERAGE(H2:H11)>50)**, and click OK.
10. Click cell G2, type some text, and press the Enter key. No error message appears because the average of the values in cells H2 through H11 is greater than 50.

3.10 Import Data

As an alternative to typing or copying multiple data values into worksheet cells, you can import the data values into an Excel workbook. Importing data values into other database management systems can take a lot of effort, can be error-prone, and may require you to purchase additional expensive software add-ons. Excel can import data from many popular data sources quickly and with very few steps.

Quick Start

To import data values into an Excel workbook, in Excel 2007, click Data, click Get External Data, and then click one of the available commands. In Excel 2003, click Data ➤ Import External Data ➤ Import Data. Follow the onscreen steps to finish importing the data.

How To

To import data values into an Excel workbook, do the following:

1. Click the location in the worksheet into which you want to import the data.

■ **Note** You should choose a blank worksheet into which to import the data to prevent existing data values in the workbook from being overwritten.

---

2. In Excel 2007, click Data, click Get External Data, and then click one of the available commands. In Excel 2003, click Data ➤ Import External Data ➤ Import Data.
3. In Excel 2007, follow the onscreen steps to finish importing the data. In Excel 2003, do one of the following:
   - In the Select Data Source dialog box, browse to and select an available data source, and then click Open.
   - In the Select Data Source dialog box, click New Source. In the Data Connection Wizard, in the What Kind of Data Source Do You Want to Connect To list, choose a type of data source to connect to, and then click Next.
4. Depending on the type of data source that you want to connect to, complete the rest of the steps to finish importing your data.

Tip

If you want to import only a portion of the data values based on criteria that you specify; sort the data values before importing them into Excel; or bring together data values from separate data tables into a single Excel worksheet, you should use Microsoft Query, which is included with Excel. In Excel 2007, click Data ➤ Get External Data ➤ From Other Sources ➤ From Microsoft Query. In Excel 2003, click Data ➤ Import External Data ➤ New Database Query.

For more information about importing data using the Excel 2007 From Microsoft Query and the Excel 2003 New Database Query commands, see Chapter 5.

Try It

In this exercise, you will practice importing data values from the Northwind sample database that is included with Microsoft Access 2003 and Access 2007. To complete this exercise, if you are using Excel 2007, you must have Access 2003 or Access 2007 installed. If you are using Excel 2003, you must have Access 2003 installed. First, if it's not installed already, install the Northwind sample database. If you have Access 2007 installed, do the following in Access 2007:

1. Start Access 2007.
2. Click the Microsoft Office Access Help icon.
3. In the Type Words to Search For box, type **Northwind**, and press Enter.
4. In the Results list, click Northwind 2007. The Microsoft Office Online web site appears.

5. Follow the steps to download the Northwind sample database, and then return to Access 2007.

6. In the Template Categories pane, click either Local Templates or Sample, click the Northwind 2007 icon in the Local Templates or Sample pane, and then complete the items on the far right side of the screen to create an instance of the Northwind 2007 sample database. The Northwind 2007 sample database should appear.

7. Quit Access.

If you have Access 2003 installed, do the following:

1. Start Access 2003.

2. Click Help ➤ Sample Databases ➤ Northwind Sample Database. The Northwind sample database should appear. If you don't see the Northwind Sample Database command, you must install it by running Microsoft Office 2003 Setup.

3. Quit Access.

If the practice workbook is not open from the previous exercise, start Excel, click Office Button ➤ Open (in Excel 2007) or File ➤ Open (in Excel 2003), and browse to and select the ExcelDB_Ch03_01-09.xls file, and click Open.

Click the ImportData worksheet tab, and then in Excel 2007, do the following:

1. Click Data ➤ Get External Data ➤ From Access.

2. Browse to and select either the Access 2007 version of this file, Northwind 2007.accdb, in the location that you created earlier, or the Access 2003 version of the Northwind sample database file, Northwind.mdb (this file is usually installed into the <drive>:\Program Files\Microsoft Office\OFFICE11\SAMPLES directory). Then click Open.

3. In the Select Table dialog box, click the Current Product List table, and then click OK twice. Excel imports the Current Product List table's data values into the worksheet.

In Excel 2003, do the following:

1. Click Data ➤ Import External Data ➤ Import Data.

2. Click the New Source button. The Data Connection Wizard appears.

3. In the What Kind of Data Source Do You Want to Connect To list, select ODBC DSN, and then click Next.

4. In the ODBC data sources list, select MS Access Database, and then click Next.

5. Browse to and select the Northwind.mdb file (for Access 2003, this file is usually installed into the <drive>:\Program Files\Microsoft Office\OFFICE11\SAMPLES directory), and then click OK. The Select Database and Table page appears.

6. With the Connect to a Specific Table check box selected, select the Current Product List table, and then click Finish.

7. Click Open, and then click OK. Excel imports the Current Product List table's data values into the worksheet.