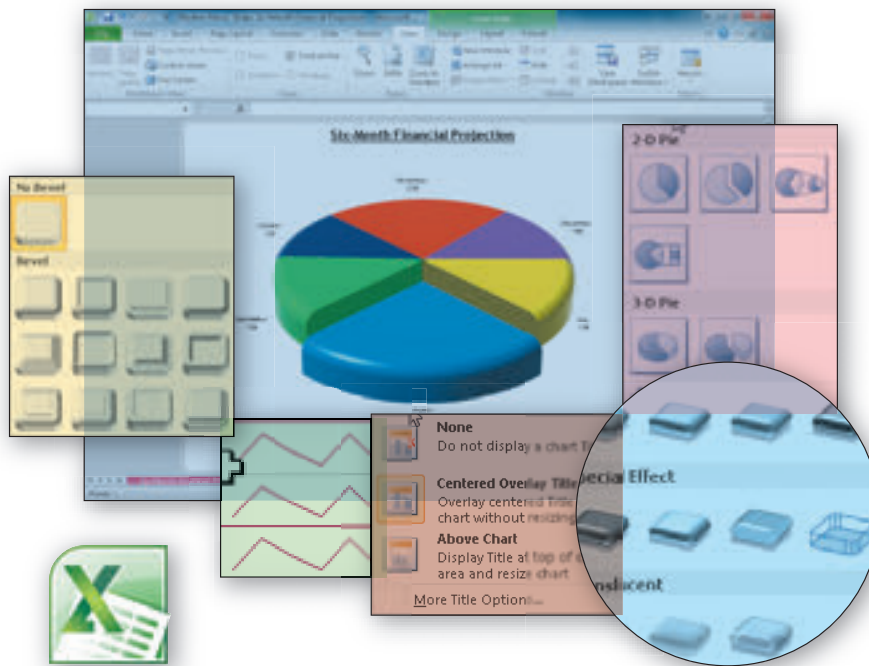# 3 What-If Analysis, Charting, and Working with Large Worksheets

Objectives

You will have mastered the material in this chapter when you can:

- Rotate text in a cell
- Create a series of month names
- Copy, paste, insert, and delete cells
- Format numbers using format symbols
- Freeze and unfreeze rows and columns
- Show and format the system date
- Use absolute and mixed cell references in a formula
- Use the IF function to perform a logical test

- Create Sparkline charts
- Use the Format Painter button to format cells
- Create a 3-D Pie chart on a separate chart sheet
- Rearrange worksheet tabs
- Change the worksheet view
- Answer what-if questions
- Goal seek to answer what-if questions

3 | What-If Analysis, Charting, and Working with Large Worksheets

Introduction

Worksheets normally are much larger than those created in the previous chapters, often extending beyond the size of the Excel window. Because you cannot see the entire worksheet on the screen at one time, working with a large worksheet sometimes can be frustrating. This chapter introduces several Excel commands that allow you to control what is displayed on the screen so that you can view critical parts of a large worksheet at one time. One command allows you to freeze rows and columns so that Excel always displays them on the screen. Another command splits the worksheet into separate window-panes so that you can view different parts of a worksheet on the screen at one time.

When you set up a worksheet, you should use cell references in formulas whenever possible, rather than constant values. The use of a cell reference allows you to change a value in multiple formulas by changing the value in a single cell. The cell references in a formula are called assumptions. Assumptions are values in cells that you can change to determine new values for formulas. This chapter emphasizes the use of assumptions and shows how to use Excel to answer what-if questions, such as what happens to the six-month operating income if you decrease the marketing expenses assumption by 3 percent? Being able to analyze quickly the effect of changing values in a worksheet is an important skill in making business decisions.

This chapter also introduces you to techniques that will enhance your ability to create worksheets and draw charts. From your work in Chapter 1, you are aware of how easily you can create charts. This chapter covers additional charting techniques that allow you to convey a message in a dramatic pictorial fashion, such as Sparkline charts and an exploded 3-D pie chart. This chapter also covers other methods for entering values in cells, such as allowing Excel to enter values for you based on a pattern of values that you create, and formatting these values. In addition, you will learn how to use absolute cell references and how to use the IF function to assign a value to a cell based on a logical test.

Project — Financial Projection Worksheet with What-If Analysis and Chart

The project in the chapter follows proper design guidelines and uses Excel to create the worksheet and pie chart shown in Figures 3–1a and 3–1b. Modern Music Shops operates several stores that sell and service musical instruments. Each June and December, the director of finance and accounting submits a plan to the management team to show projected monthly sales revenues, costs of goods sold, gross margin, expenses, and operating income for the next six months. The director requires an easy-to-read worksheet that shows financial projections for the next six months. The worksheet should allow for quick analysis if projections for certain numbers change, such as the percentage of expenses allocated to marketing. In addition, a 3-D pie chart is required that shows the projected operating income contribution for each of the six months.
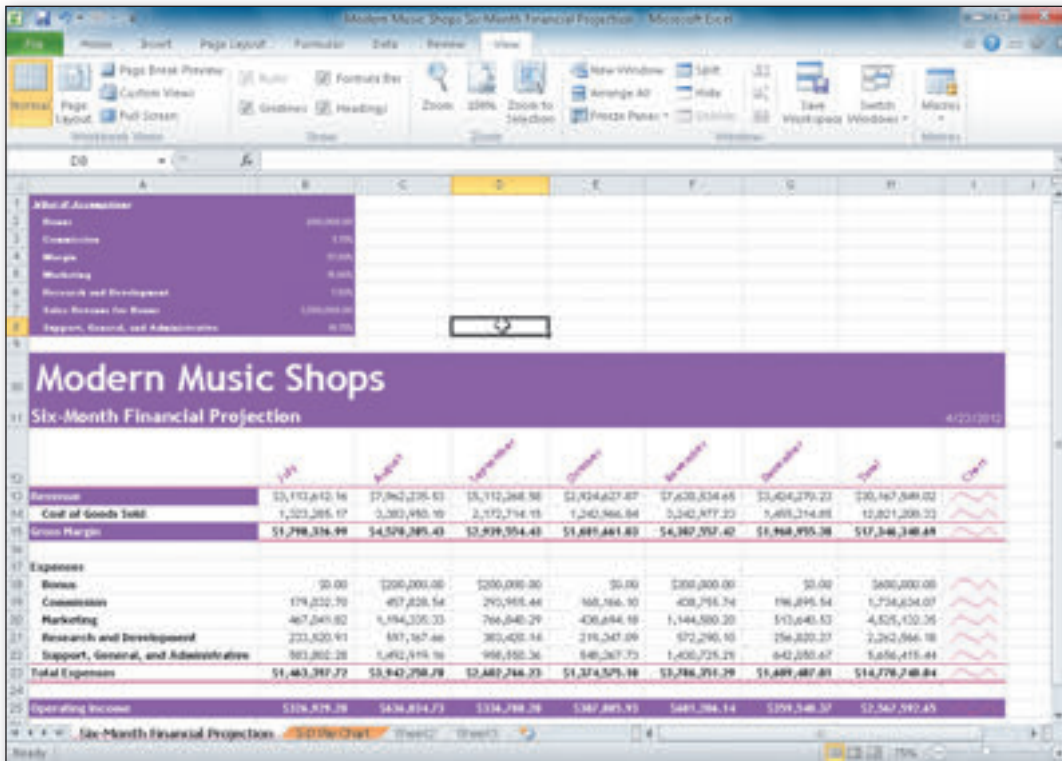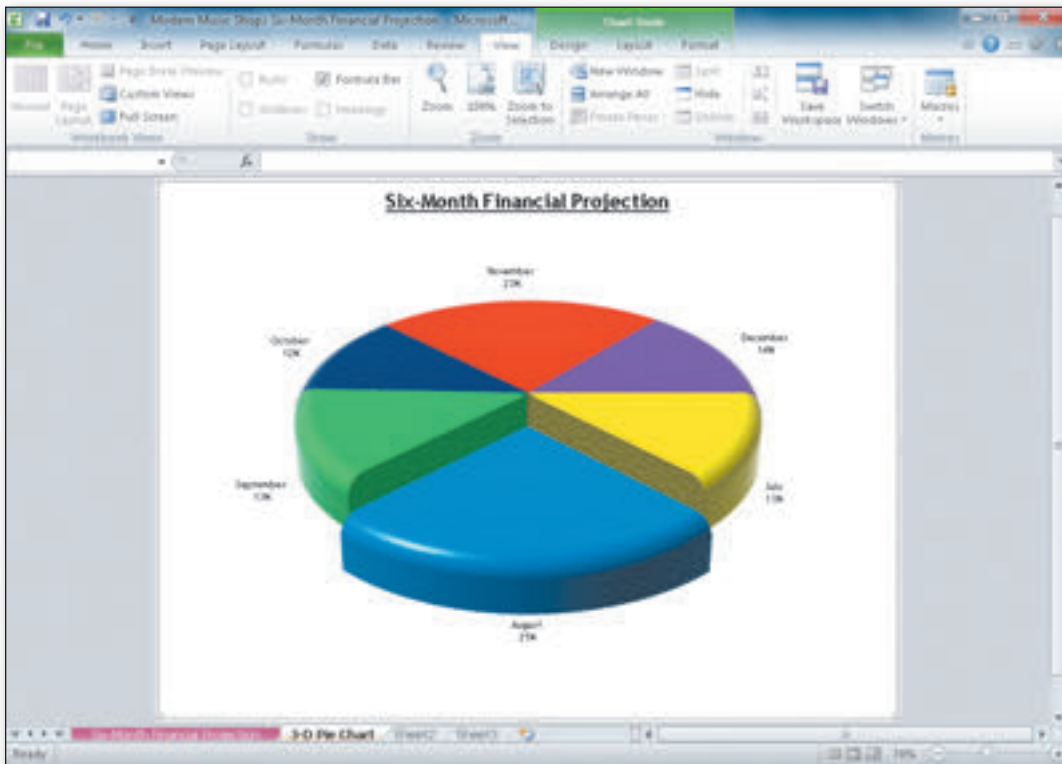
Figure 3 – 1 (a) Worksheet

Figure 3 – 1 (b) 3-D Pie Chart

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Correctness
Studies have shown that more than 25 percent of all business worksheets have errors. You can ensure correctness in your formulas by carefully checking them using Range Finder. The Formula Auditing group on the Formulas tab on the Ribbon also can be helpful when verifying formulas.

The requirements document for the Modern Music Shops Six-Month Financial Projection worksheet is shown in Figure 3–2. It includes the needs, source of data, summary of calculations, chart requirements, and other facts about its development.

REQUEST FOR NEW WORKBOOK

Date Submitted:	April 9, 2017
Submitted By:	Marcus Plek
Worksheet Title:	Modern Music Shops Six-Month Financial Projection
Needs:	The needs are [1] a worksheet (shown in Figure 3–1 on page EX 132) that shows Modern Music Shops' projected monthly sales, cost of goods sold, gross margin, expenses, and operating income for a six-month period, and [2] a 3-D Pie chart (Figure 3–1 on page EX 132) that shows the projected contribution of each month's operating income to the six-month period operating income.
Source of Data:	The data supplied by the Finance department includes projections of the monthly sales and expenses (Table 3–1 on page EX 143) that are based on prior years. All the remaining numbers in the worksheet are determined from these 3 numbers using formulas.
Calculations:	The following calculations must be made for each month: 1. Cost of Goods Sold = Revenue − Revenue × Margin 2. Gross Margin = Revenue − Cost of Goods Sold 3. Bonus Expense = $200,000.00 if the Revenue exceeds the Revenue for bonus, otherwise Bonus Expense = 0 4. Commission Expense = Commission Assumption × Revenue 5. Marketing Expense = Marketing Assumption × Revenue 6. Research and Development = Research and Development Assumption × Revenue 7. Support, General, and Administrative Expense = Support, General, and Administrative Assumption × Revenue 8. Total Expenses = Sum of Expenses 9. Operating Income = Gross Margin − Total Expenses
Chart Requirements:	Show Sparkline charts for Revenue and each half that item noted in the calculations area above. A 3-D Pie chart is required on a separate sheet (Figure 3–1) to show the contribution of each month's operating income to the six-month period operating income. The chart should also emphasize the month with the greatest operating income.

Approvals

Approval Status:	X Approved
	Rejected
Approved By:	Farah Qadir, CFO
Date:	April 11, 2017
Assigned To:	T. Quasney, Spreadsheet Specialist

Figure 3–2

Overview

As you read this chapter, you will learn how to create the worksheet shown in Figure 3–1 by performing these general tasks:

- Create a series of month names
- Use absolute cell references in a formula
- Use the IF function to perform a logical test
- Create Sparkline charts in a range of cells
- Use the Format Painter button to format cells
- Create a 3-D pie chart on a separate chart sheet
- Answer what-if questions
- Manipulate large worksheets

BTW

Excel's Usefulness
Just a short time ago, a what-if question of any complexity could be answered only by using a large, expensive computer programmed by highly paid computer professionals, and generating a result could take days. Excel gives the noncomputer professional the ability to get complex business-related questions answered instantaneously and economically.

Plan Ahead
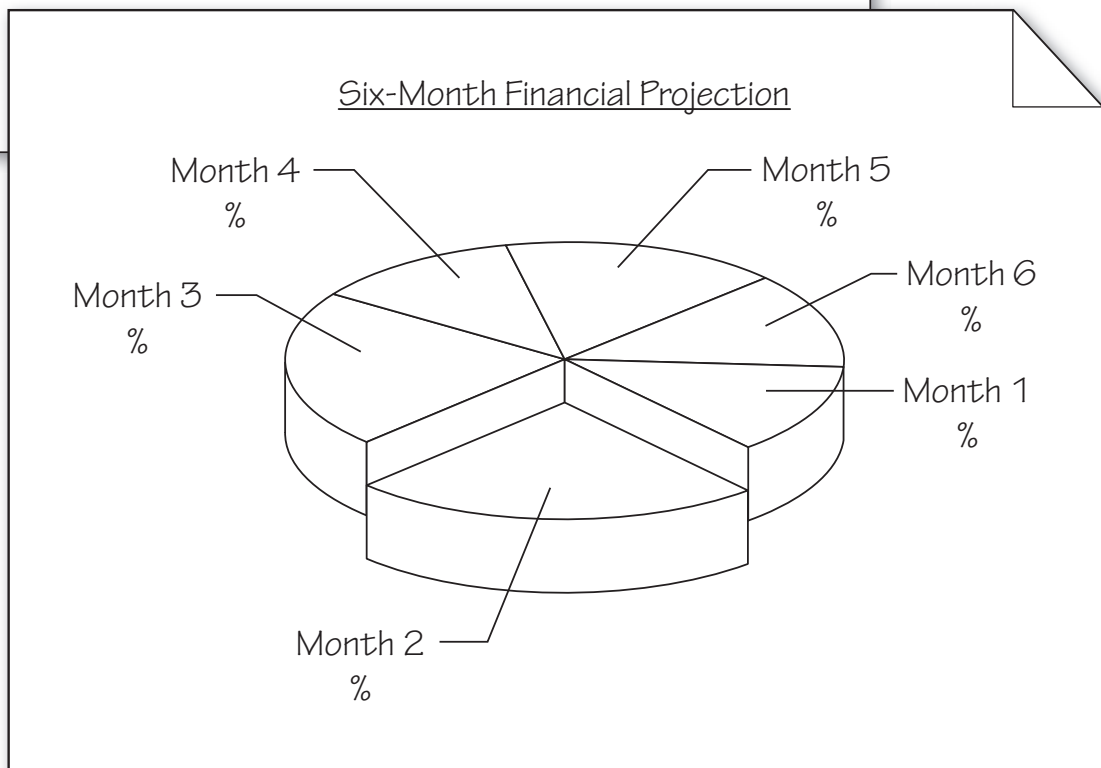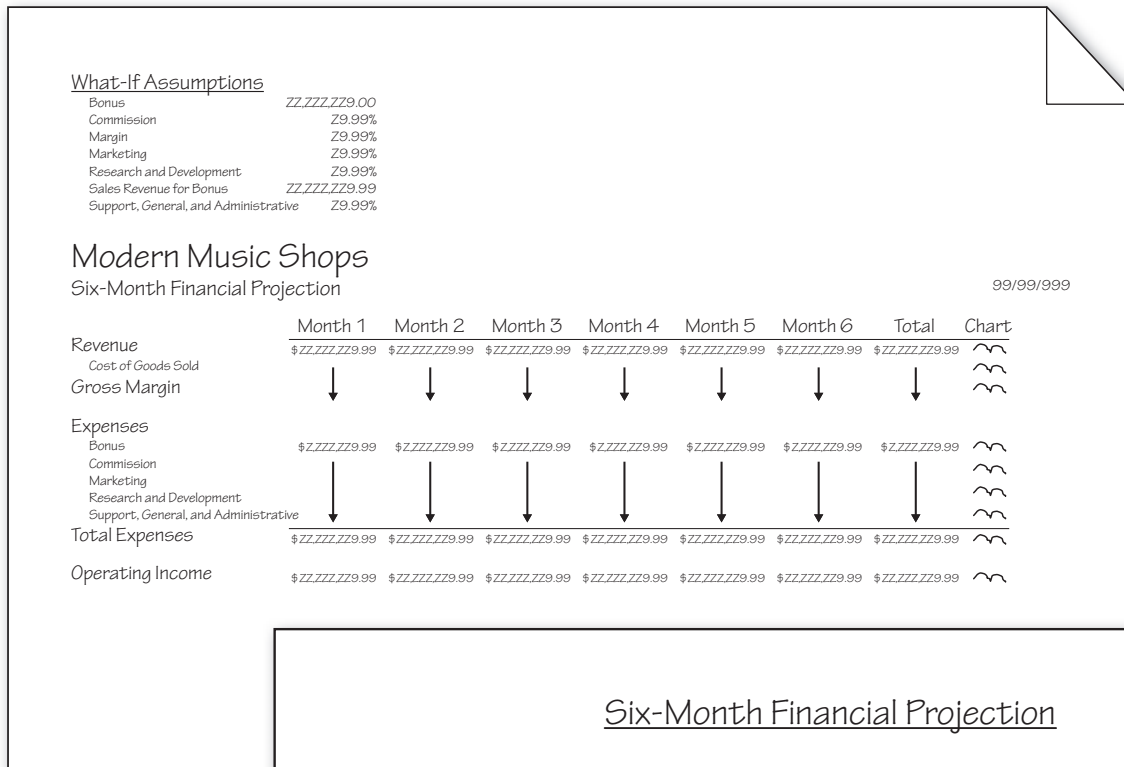
General Project Decisions

While creating an Excel worksheet, you need to make several decisions that will determine the appearance and characteristics of the finished worksheet. As you create the worksheet required to meet the requirements shown in Figure 3–2, you should follow these general guidelines:

1. **Plan the layout of the worksheet.** Worksheets that include financial data associated with time frames typically include dates, such as months, quarters, or years, as column headers. What-if assumptions should not clutter the worksheet, but placing them in an easily located portion of the worksheet allows for quicker creation of new projections.

2. **Determine the necessary formulas and functions needed.** Often, financial calculations rely on strict definitions and commonly accepted formulas for performing the calculations. Look for such situations and always use the accepted formulas. When using a what-if section on a worksheet, make certain to create formulas that use the what-if criteria. When a requirement necessitates a calculation only under a certain condition, a function can check for the condition and make the calculation when necessary.

3. **Specify how to best utilize Sparkline charts.** Sparkline charts allow worksheet users quickly to visualize information in a small chart within a cell. The use of multiple Sparkline charts in the worksheet will provide the user with a visual comparison of the various data items for each month. The user, therefore, can see trends for each line item over time and also compare relationships among various line items.

4. **Identify how to format various elements of the worksheet.** Format separate parts of a worksheet, such as what-if assumptions, in a manner that indicates that they are separate from the main area of the worksheet. Other financial items, such as sales revenue and expenses, are distinct categories of financial data and should be separated visually. Totals and subtotals should stand out to draw the reader's attention.

5. **Specify how charts should convey necessary information.** As you have learned, different chart types convey different messages and are appropriate in different situations. For example, a 3-D pie chart is a good way to compare visually a small set of numbers. Often one or two slices of a pie chart displays as exploded, meaning that the slice appears pulled away from the cart, in order to emphasize the slice to the user. Format chart data points so that the worksheet user's eye is drawn to important information.

6. **Perform what-if analysis and goal seeking using the best techniques.** What-if analysis allows you quickly to answer questions regarding various predictions. A what-if area of a worksheet allows users of the worksheet efficiently to ask questions. Goal seeking allows you automatically to modify values in a what-if area of a worksheet based on a goal that you have for another cell in the worksheet.

When necessary, more specific details concerning the above guidelines are presented at appropriate points in the chapter. The chapter also will identify the actions you perform and decisions made regarding these guidelines during the creation of the worksheet shown in Figure 3–1 on page EX 139.

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Using a sketch of the worksheet can help you visualize its design. The sketch of the worksheet consists of titles, column and row headings, location of data values, calculations, and a rough idea of the desired formatting (Figure 3–3a). The sketch of the 3-D pie chart shows the expected contribution of each month's operating income to the six-month operating income (Figure 3–3b). The assumptions will be entered at the top of the worksheet (Figure 3–3a). The projected monthly sales revenue will be entered in row 13 of the worksheet. The projected monthly sales revenue and the assumptions shown in Table 3–1 will be used to calculate the remaining numbers in the worksheet.

Figure 3–3 (a) Worksheet Sketch

What-If Assumptions

Bonus	ZZ,ZZZ,ZZ9.00
Commission	Z9.99%
Margin	Z9.99%
Marketing	Z9.99%
Research and Development	Z9.99%
Sales Revenue for Bonus	ZZ,ZZZ,ZZ9.99
Support, General, and Administrative	Z9.99%

Modern Music Shops
Six-Month Financial Projection   99/99/999

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Total	Chart
Revenue	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	∼
Cost of Goods Sold								∼
Gross Margin	↓	↓	↓	↓	↓	↓	↓	∼
Expenses								
Bonus	$Z,ZZZ,ZZ9.99	$Z,ZZZ,ZZ9.99	$Z,ZZZ,ZZ9.99	$Z,ZZZ,ZZ9.99	$Z,ZZZ,ZZ9.99	$Z,ZZZ,ZZ9.99	$Z,ZZZ,ZZ9.99	∼
Commission								∼
Marketing								∼
Research and Development								∼
Support, General, and Administrative	↓	↓	↓	↓	↓	↓	↓	∼
Total Expenses	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	∼
Operating Income	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	$ZZ,ZZZ,ZZ9.99	∼

Six-Month Financial Projection

Month 4 %
Month 5 %
Month 3 %
Month 6 %
Month 1 %
Month 2 %

Figure 3–3 (b) 3-D Pie Chart Sketch

With a solid understanding of the requirements document, an understanding of the necessary decisions, and a sketch of the worksheet, the next step is to use Excel to create the worksheet.

Table 3–1 Modern Music Shops Six-Month Financial Projections Data and What-If Assumptions	
Projected Monthly Total Sales Revenues	
July	$3,113,612.16
August	7,962,235.53
September	5,112,268.58
October	2,924,627.87
November	7,630,534.65
December	3,424,270.23
What-If Assumptions	
Bonus	$200,000.00
Commission	5.75%
Margin	57.50%
Marketing	15.00%
Research and Development	7.50%
Sales Revenue for Bonus	$3,500,000.00
Support, General, and Administrative	18.75%

To Start Excel

If you are using a computer to step through the project in this chapter and you want your screens to match the figures in this book, you should change your screen's resolution to 1024 × 768. For information about how to change a computer's resolution, refer to the Introduction to Office 2010 and Windows 7 chapter at the beginning of this book.

The following steps, which assume Windows 7 is running, start Excel based on a typical installation. You may need to ask your instructor how to start Excel for your computer. For a detailed example of the procedure summarized below, refer to the Office 2010 and Windows 7 chapter at the beginning of this book.

1. Click the Start button on the Windows 7 taskbar to display the Start menu.

2. Type `Microsoft Excel` as the search text in the 'Search programs and files' text box, and watch the search results appear on the Start menu.

3. Click Microsoft Excel 2010 in the search results on the Start menu to start Excel and display a new blank workbook in the Excel window.

4. If the Excel window is not maximized, click the Maximize button next to the Close button on its title bar to maximize the window.

For an introduction to Windows 7 and instruction about how to perform basic Windows 7 tasks, read the Office 2010 and Windows 7 chapter at the beginning of this book, where you can learn how to resize windows, change screen resolution, create folders, move and rename files, use Windows Help, and much more.

For an introduction to Office 2010 and instruction about how to perform basic tasks in Office 2010 programs, read the Office 2010 and Windows 7 chapter at the beginning of this book, where you can learn how to start a program, use the Ribbon, save a file, open a file, quit a program, use Help, and much more.

To Enter the Worksheet Titles, Change Document Properties, Apply a Theme, and Save the Workbook

The worksheet contains two titles, initially in cells A8 and A9. In the previous chapters, titles were centered across the worksheet. With large worksheets that extend beyond the size of a window, it is best to enter titles left-aligned as shown in the sketch of the worksheet in Figure 3–3a because the worksheet prints with the title on the first page if the worksheet requires multiple pages, and the user more easily finds the worksheet title when necessary. The following steps enter the worksheet titles, change the workbook theme to Opulent, change document properties, and then save the workbook.

1 Select cell A8 and then type **Modern Music Shops** as the worksheet title.

2 Select cell A9 and then type **Six-Month Financial Projection** as the worksheet subtitle and then press the ENTER key to enter the worksheet subtitle.

3 Change the document properties as specified by your instructor.

4 Apply the Opulent theme to the workbook.

5 With a USB flash drive connected to one of the computer's USB ports, click the Save button on the Quick Access Toolbar to display the Save As dialog box.

6 Type **Modern Music Shops Six-Month Financial Projection** in the File name text box to change the file name. Do not press the ENTER key after typing the file name because you do not want to close the dialog box at this time.

7 Navigate to the desired save location (in this case, the Excel folder in the CIS 101 folder [or your class folder] on the USB flash drive).

8 Click the Save button (Save As dialog box) to save the document in the selected folder on the selected drive with the entered file name.

The Ribbon and Screen Resolution
Excel may change how the groups and buttons within the groups appear on the Ribbon, depending on the computer's screen resolution. Thus, your Ribbon may look different from the ones in this book if you are using a screen resolution other than 1024 x 768.

Rotating Text and Using the Fill Handle to Create a Series

The data on the worksheet, including month names and the What-If Assumptions section, now can be added to the worksheet.

BTWs
For a complete list of the BTWs found in the margins of this book, visit the Excel 2010 BTW Web page (scsite.com/ex2010/btw).

Plan Ahead

Plan the layout of the worksheet.
Excel allows you to rotate text in a cell. Rotated text often provides a strong visual appeal. Rotated text also allows you to fit more text into a smaller column width. Chapters 1 and 2 used the fill handle to copy a cell or a range of cells to adjacent cells. The fill handle also allows creation of a series of numbers, dates, or month names automatically. Using the fill handle in this way eliminates the need to type in such data, saving time and eliminating typographical errors.

To Rotate Text and Use the Fill Handle to Create a Series of Month Names

The design of the worksheet calls specifically for only six months of data. Because there always will be only six months of data in the worksheet, the months should be placed across the top of the worksheet as column headings rather than as row headings. The data for the worksheet includes more data items regarding each month than there are months, and, possibly, more expense categories could be added in the future. A proper layout, therefore, includes placing each month as column headings.

When you first enter text, its angle is zero degrees (0°), and it reads from left to right in a cell. Excel allows you to rotate text in a cell counterclockwise by entering a number between 1° and 90°.

The following steps enter the month name, July, in cell B10; format cell B10 (including rotating the text); and then use the fill handle to enter the remaining month names in the range C10:G10.

1

- If necessary, select the Home tab and then select cell B10 because this cell will include the first month name in the series of month names.

- Type **July** as the cell entry and then click the Enter box.

- Click the Format Cells: Alignment Dialog Box Launcher (Home tab | Alignment group) to display the Format Cells dialog box (Figure 3–4).
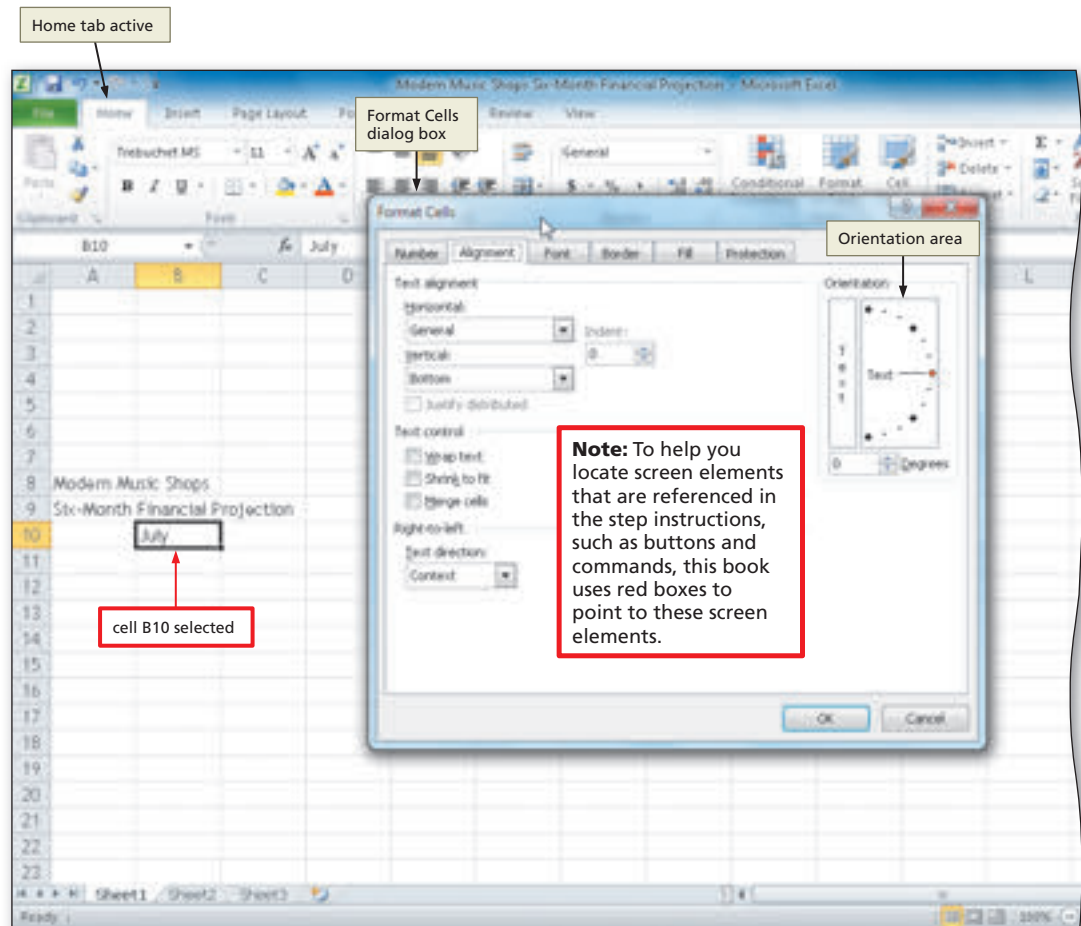
Figure 3–4

2

- Click the 45° point in the Orientation area (Format Cells dialog box) to move the Text hand in the Orientation area to the 45° point and to display a new orientation in the Degrees box (Figure 3–5).
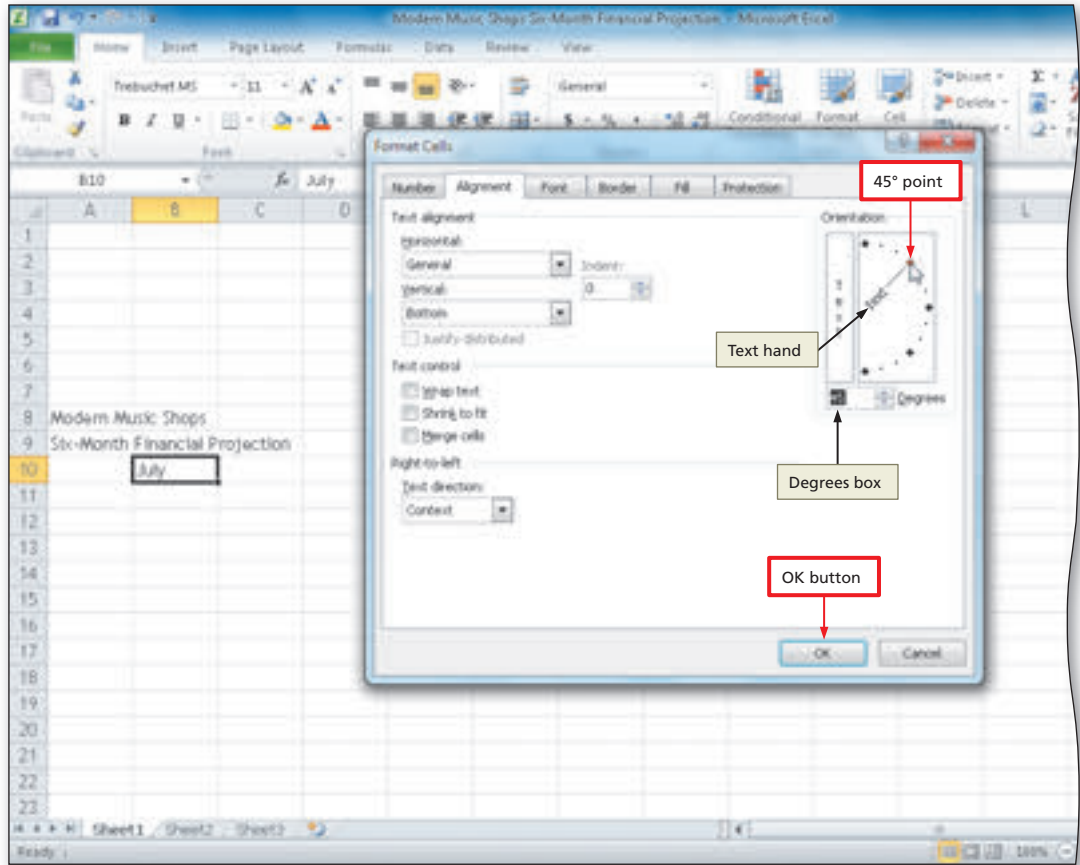
Figure 3–5

3

- Click the OK button to rotate the text in the active cell and automatically increase the height of the current row to best fit the rotated text.

- Point to the fill handle on the lower-right corner of cell B10 to display the crosshair mouse pointer in preparation of filling the month series (Figure 3–6).

Figure 3–6

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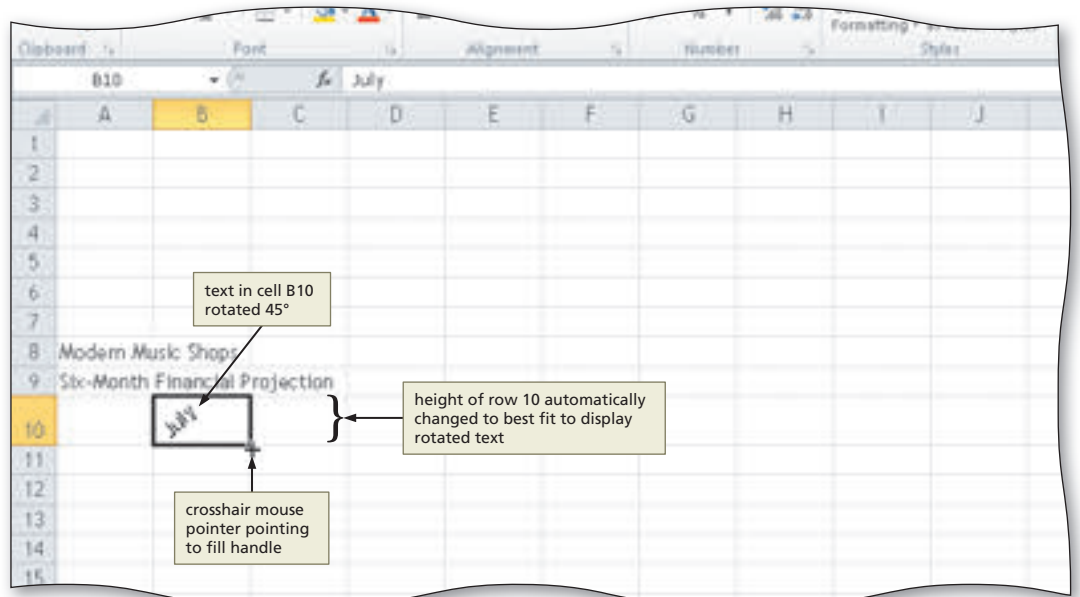
4

- Drag the fill handle to the right to select the range to fill, C10:G10 in this case. Do not release the mouse button (Figure 3–7).
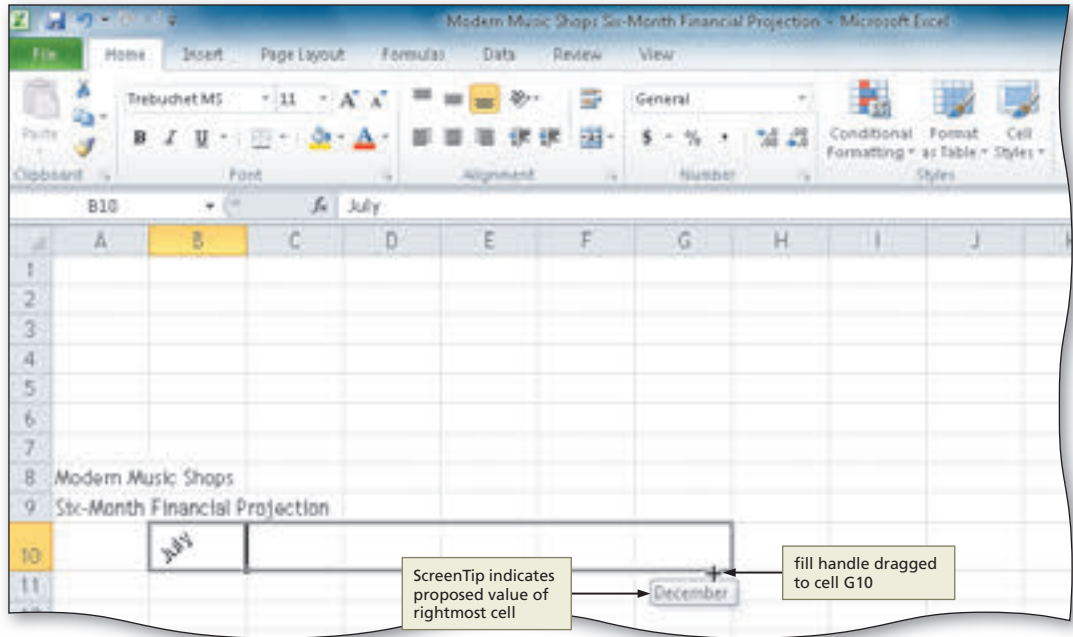
Figure 3–7

5

- Release the mouse button to create a month name series in the selected range and copy the format of the selected cell to the selected range.

- Click the Auto Fill Options button below the lower-right corner of the fill area to display the Auto Fill Options menu (Figure 3–8).
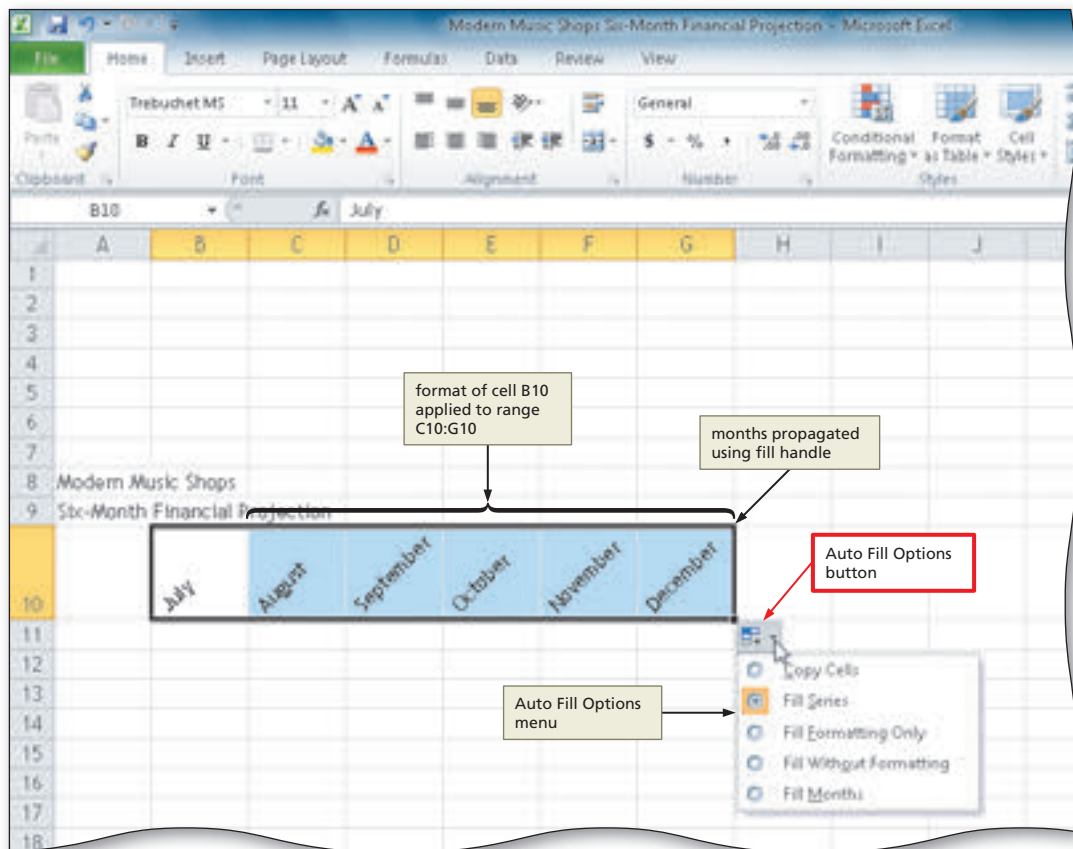
Q&A

What if I do not want to copy the format of cell B10 during the auto fill operation?

In addition to creating a series of values, dragging the fill handle instructs Excel to copy the format of cell B10 to the range C10:G10. With some fill operations, you may not want to copy the formats of the source cell or range to the destination cell or range. If this is the case, click the Auto Fill Options button after the range fills and then select the option you desire on the Auto Fill Options menu (Figure 3–8).

Figure 3–8

6

- Click the Auto Fill Options button to hide the Auto Fill Options menu.

- Select cell H10, type **Total,** and then press the RIGHT ARROW key to enter a column heading.

- Type Chart in cell I10 and then press the RIGHT ARROW key to enter a column heading.

Q&A

Why is the word Total automatically formatted with a 45° rotation?

Excel tries to save you time by automatically recognizing the adjacent cell format in cell G10 and applying it to cell H10. Such behavior also occurs when typing the column heading in cell I10.

Other Ways
1. Enter start month in cell, apply formatting, right-drag fill handle in direction to fill, click Fill Months on shortcut menu   2. Enter start month in cell, apply formatting, select range, click Fill button (Home tab | Editing group), click Series, click AutoFill

BTW

Rotating Text in a Cell
In Excel, you use the Alignment sheet of the Format Cells dialog box, as shown in Figure 3–5 on page 146, to position data in a cell by centering, left-aligning, or right-aligning; indenting; aligning at the top, bottom, or center; and rotating. If you enter 90 in the Degrees box in the Orientation area, the text will appear vertically and read from bottom to top in the cell.

BTW

The Mighty Fill Handle
If you drag the fill handle to the left or up, Excel will decrement the series rather than increment the series. To copy a word, such as January or Monday, which Excel might interpret as the start of a series, hold down the CTRL key while you drag the fill handle to a destination area. If you drag the fill handle back into the middle of a cell, Excel erases the contents of the cell.

Using the Auto Fill Options Menu

As shown in Figure 3–8 on the previous page, Fill Series is the default option that Excel uses to fill an area, which means it fills the destination area with a series, using the same formatting as the source area. If you choose another option on the Auto Fill Options menu, then Excel immediately changes the contents of the destination range. Following the use of the fill handle, the Auto Fill Options button remains active until you begin the next Excel operation. Table 3–2 summarizes the options on the Auto Fill Options menu.

Table 3–2 Options Available on the Auto Fill Options Menu	
Auto Fill Option	**Description**
Copy Cells	Fill destination area with contents using format of source area. Do not create a series.
Fill Series	Fill destination area with series using format of source area. This option is the default.
Fill Formatting Only	Fill destination area using format of source area. No content is copied unless fill is series.
Fill Without Formatting	Fill destination area with contents, without the formatting of source area.
Fill Months	Fill destination area with series of months using format of source area. Same as Fill Series and shows as an option only if source area contains a month.

You can use the fill handle to create a series longer than the one shown in Figure 3–8. If you drag the fill handle past cell G10 in Step 4, Excel continues to increment the months and logically will repeat July, August, and so on, if you extend the range far enough to the right.

You can create several different types of series using the fill handle. Table 3–3 illustrates several examples. Notice in examples 4 through 7, 9, and 11 that, if you use the fill handle to create a series of numbers or nonsequential months, you must enter the first item in the series in one cell and the second item in the series in an adjacent cell. Excel still creates the series, however, if the first two items are in a range and the cells between the items are empty. Next, select both cells and drag the fill handle through the destination area.

Table 3–3 Examples of Series Using the Fill Handle		
Example	**Contents of Cell(s) Copied Using the Fill Handle**	**Next Three Values of Extended Series**
1	4:00	5:00, 6:00, 7:00
2	Qtr2	Qtr3, Qtr4, Qtr1
3	Quarter 1	Quarter 2, Quarter 3, Quarter 4
4	22-Jul, 22-Sep	22-Nov, 22-Jan, 22-Mar
5	2012, 2013	2014, 2015, 2016
6	1, 2	3, 4, 5
7	625, 600	575, 550, 525
8	Mon	Tue, Wed, Thu
9	Sunday, Tuesday	Thursday, Saturday, Monday
10	4th Section	5th Section, 6th Section, 7th Section
11	−205, −208	−211, −214, −217

BTW

Custom Fill Sequences
You can create your own custom lists for use with the fill handle. For example, if you often type in the same list of products or names into Excel, you can create a custom fill sequence. You then can type the first product or name and then use the fill handle automatically to fill in the remaining products or names. To create a custom fill sequence, open the Excel Options dialog box by clicking the Options button in the Backstage view. Click the Advanced tab (Excel Options dialog box) and then click the Edit Custom Lists button (Excel Options dialog box).

To Increase Column Widths

In Chapter 2, you increased column widths after the values were entered into the worksheet. Sometimes, you may want to increase the column widths before you enter the values and, if necessary, adjust them later. The following steps increase the column widths.

1

- Move the mouse pointer to the boundary between column heading A and column heading B so that the mouse pointer changes to a split double arrow in preparation of adjusting the column widths.

- Drag the mouse pointer to the right until the ScreenTip displays the desired column width, Width: 36.00 (293 pixels) in this case. Do not release the mouse button (Figure 3–9).

Figure 3–9

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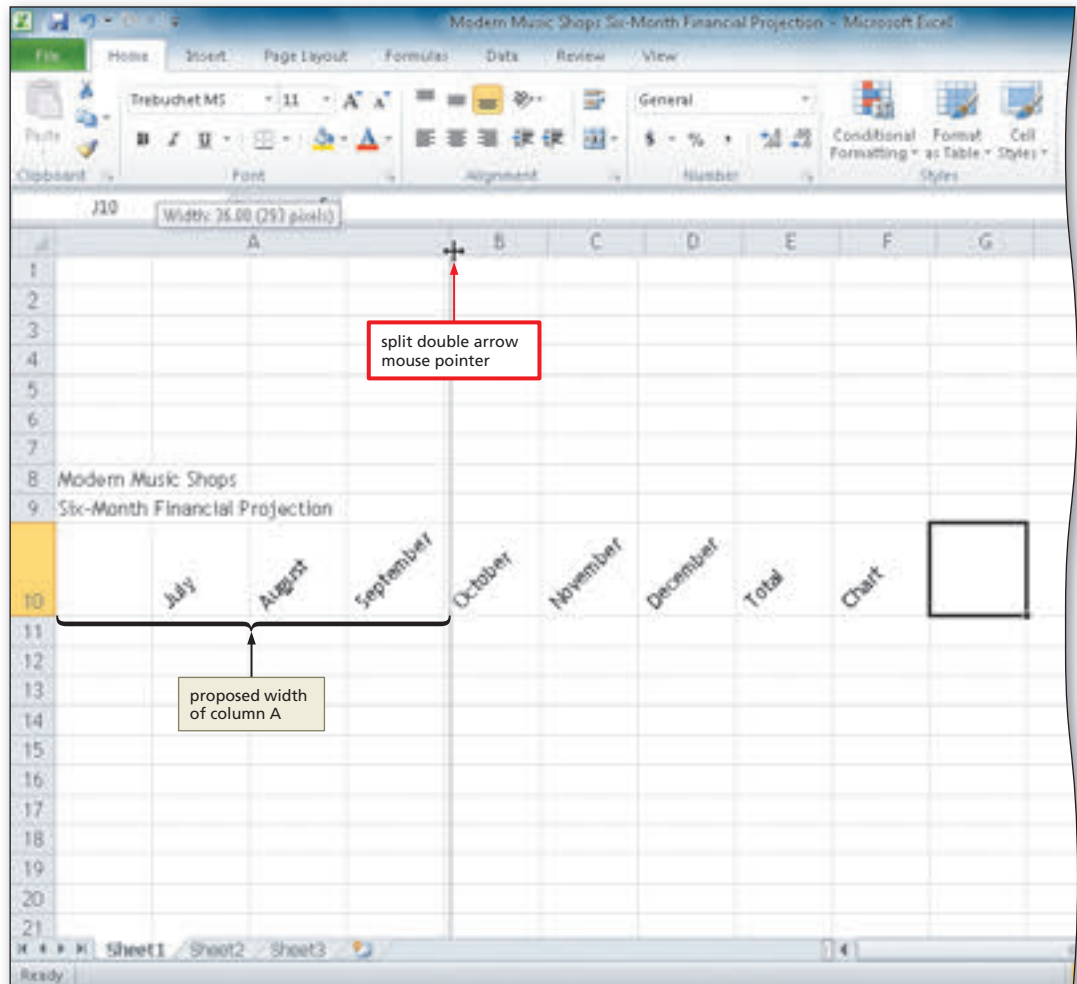
2

- Release the mouse button to change the width of the column.

- Click column heading B to select the column and then drag through column heading G to select the range in which to change the widths.

- Move the mouse pointer to the boundary between column headings B and C in preparation of resizing column B, and then drag the mouse to the right until the ScreenTip displays the desired width, Width: 14.88 (124 pixels) in this case. Do not release the mouse button (Figure 3–10).
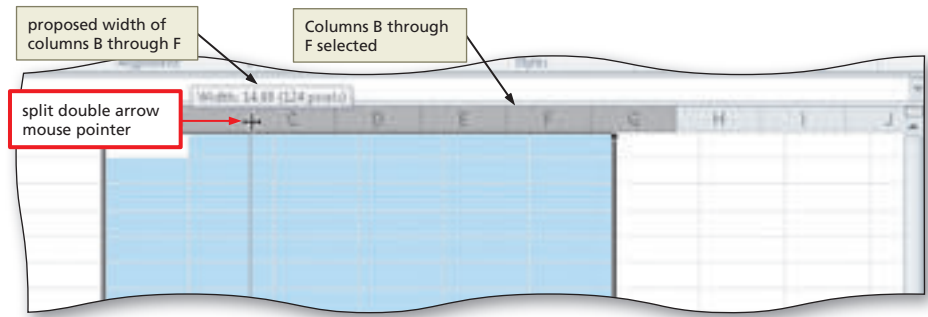
Figure 3–10

3

- Release the mouse button to change the width of the selected columns.

- If necessary, scroll the worksheet so that column H is visible and then use the technique described in Step 1 to increase the width of column H to 16.00.

To Enter Row Titles

Excel allows you to indent text in cells. Often, indentation sets off titles, such as row titles, from other titles to create a hierarchy, such as you may find in a table of contents in a book. The following steps enter the row titles in column A and indent several of the row titles.

1

- If necessary, scroll the worksheet so that column A and row 23 are visible and then enter the row titles in the range A11:A23 but without the indents (Figure 3–11).

- Select cell A12 and then click the Increase Indent button (Home tab | Alignment group) to increase the indentation of the text in the selected cell.

- Select the range A16:A20 and then click the Increase Indent button (Home tab | Alignment group) to increase the indentation of the text in the selected range (Figure 3–11).
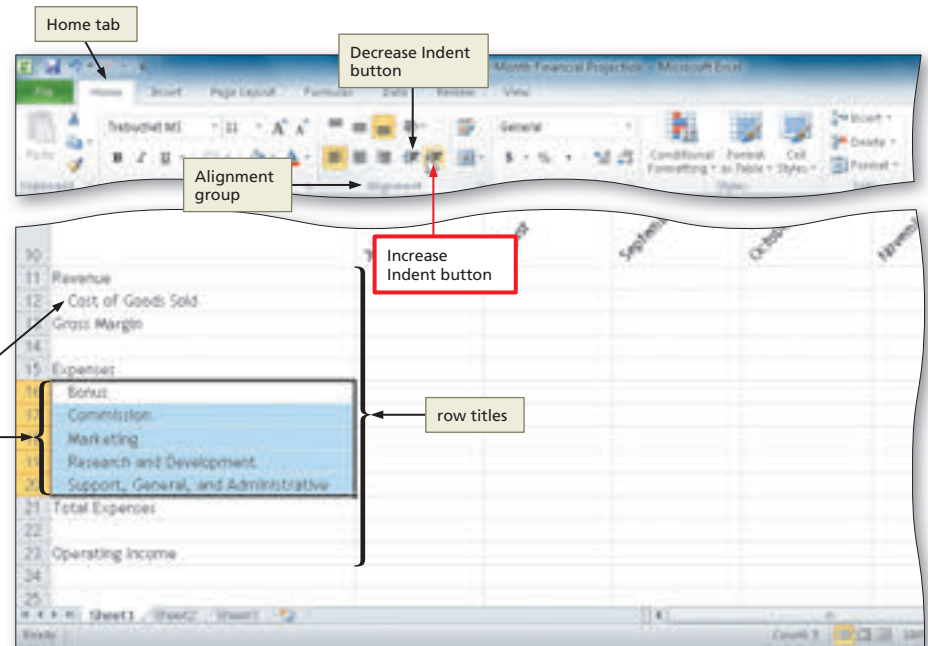
Figure 3–11

2

- Select cell A1 to finish entering the row titles and deselect the current cell.

Q&A

What happens when I click the Increase Indent button?

The Increase Indent button (Home tab | Alignment group) indents the contents of a cell to the right by three spaces each time you click it. The Decrease Indent button decreases the indent by three spaces each time you click it.

Other Ways

1. To indent, right-click range, click Format Cells on shortcut menu, click Alignment tab (Format Cells dialog box), click Left (Indent) in Horizontal list, type number of spaces to indent in Indent text box, click OK button (Format Cells dialog box)

Copying a Range of Cells to a Nonadjacent Destination Area

The What-If Assumptions section should be placed in an area of the worksheet that is accessible easily yet does not impair the view of the main section of the worksheet. As shown in Figure 3–3a on page EX 142, the What-If Assumptions should be placed above the calculations in the worksheet. Additionally, the row titles in the Expenses area are the same as the row titles in the What-If Assumptions table, with the exception of the two additional entries in cells A4 (Margin) and A7 (Sales Revenue for Bonus). Hence, the What-If Assumptions table row titles can be created by copying the range A16:A20 to the range A2:A6 and then inserting two rows for the additional entries in cells A4 and A7. The source area (range A16:A20) is not adjacent to the destination area (range A2:A6). The first two chapters used the fill handle to copy a source area to an adjacent destination area. To copy a source area to a nonadjacent destination area, however, you cannot use the fill handle.

A more versatile method of copying a source area is to use the Copy button and Paste button (Home tab | Clipboard group). You can use these two buttons to copy a source area to an adjacent or nonadjacent destination area.

To Copy a Range of Cells to a Nonadjacent Destination Area

The Copy button copies the contents and format of the source area to the **Office Clipboard**, a reserved place in the computer's memory that allows you to collect text and graphics from an Office document and then paste them into almost any other type of document. The Paste button copies the item from the Office Clipboard to the destination area.

The following steps enter the what-if area row heading and use the Copy and Paste buttons to copy the range A16:A20 to the nonadjacent range A2:A6.

1

- With cell A1 selected, type **What-If Assumptions** as the new row title.

- Select the range A16:A20 and then click the Copy button (Home tab | Clipboard group) to copy the values and formats of the selected range, A16:A20 in this case, to the Office Clipboard.

- Select cell A2, the top cell in the destination area (Figure 3–12).
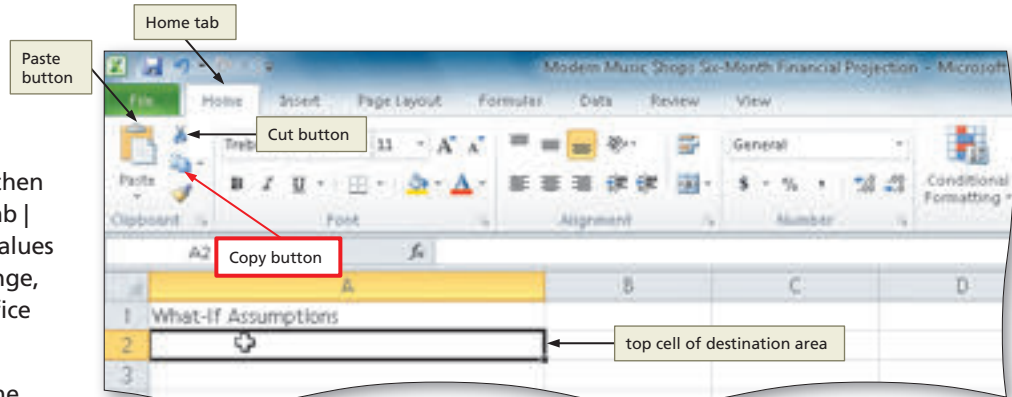
Q&A

Why do I not need to select the entire destination area?

You are not required to select the entire destination area (range A2:A6) before clicking the Paste button (Home tab | Clipboard group). Excel needs to know only the upper-left cell of the destination area. In the case of a single column range, such as A2:A6, the top cell of the destination area (cell A2) also is the upper-left cell of the destination area.

Figure 3–12

Property of Cengage Learning
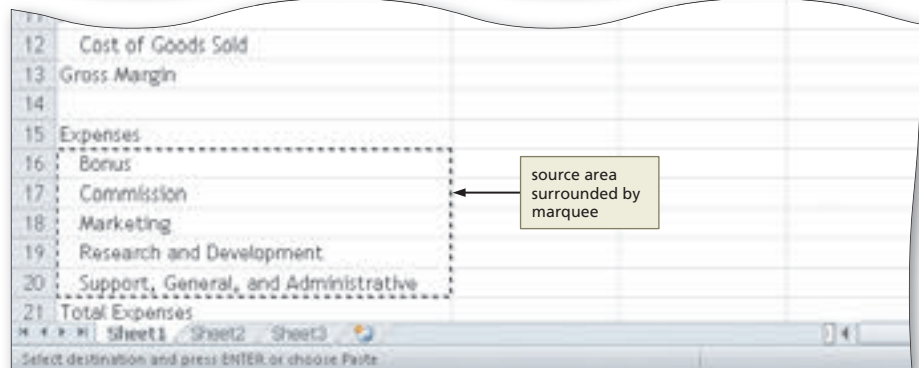
2

- Click the Paste button (Home tab | Clipboard group) to copy the values and formats of the last item placed on the Office Clipboard, range A16:A20 in this case, to the destination area, A2:A6 in this case (Figure 3–13).

Q&A

What if data already existed in the destination area?

When you complete a copy, the values and formats in the destination area are replaced with the values and formats of the source area. Any data contained in the destination area prior to the copy and paste is lost. If you accidentally delete valuable data, immediately click the Undo button on the Quick Access Toolbar.

3

- Press the ESC key to remove the marquee from the source area and disable the Paste button (Home tab | Clipboard group).

Figure 3–13

Other Ways

1. Right-click source area, click Copy on shortcut menu, right-click destination area, click Paste icon on shortcut menu

2. Select source area and point on border of range; while holding down CTRL key, drag source area to destination area

3. Select source area, press CTRL+C, select destination area, press CTRL+V

Using the Paste Options Menu

After you click the Paste button, Excel immediately displays the Paste Options button, as shown in Figure 3–13. If you click the Paste Options button arrow and select an option on the Paste Options gallery, Excel modifies the most recent paste operation based on your selection. Table 3–4 summarizes the options available on the Paste Options gallery. When the Paste Options button is visible, you can use shortcut keys to access the paste commands available in the Paste Options gallery. Additionally, you can use combinations of the options in the Paste Options gallery to customize your paste operation. That is, after clicking one of the icons in the Paste Options gallery, you can open the gallery again to further adjust your paste operation. The Paste button (Home tab | Clipboard group) includes an arrow that, when clicked, displays the same options as does the Paste Options button arrow.

Table 3–4 Options Available in the Paste Options Gallery			
Paste Option Icon	**Paste Option**	**Shortcut Key**	**Description**
	Paste	CTRL+P	Copy contents and format of source area. This option is the default.
	Formulas	CTRL+F	Copy formulas from the source area, but not the contents and format.
	Formulas & Number Formatting	CTRL+O	Copy formulas and format for numbers and formulas of source area, but not the contents.
	Keep Source Formatting	CTRL+K	Copy contents, format, and styles of source area.
	No Borders	CTRL+B	Copy contents and format of source area, but not any borders.
	Keep Source Column Widths	CTRL+W	Copy contents and format of source area. Change destination column widths to source column widths.
	Transpose	CTRL+T	Copy the contents and format of the source area, but transpose, or swap, the rows and columns.
	Values	CTRL+V	Copy contents of source area, but not the formatting for formulas.
	Values & Number Formatting	CTRL+A	Copy contents and format of source area for numbers or formulas, but use format of destination area for text.
	Values & Source Formatting	CTRL+E	Copy contents and formatting of source area, but not the formula.
	Formatting	CTRL+R	Copy format of source area, but not the contents.
	Paste Link	CTRL+N	Copy contents and format and link cells so that a change to the cells in source area updates the corresponding cells in destination area.
	Picture	CTRL+U	Copy an image of the source area as a picture.
	Linked Pictures	CTRL+I	Copy an image of the source area as a picture so that a change to the cells in source area updates the picture in destination area.

An alternative to clicking the Paste button is to press the ENTER key. The ENTER key completes the paste operation, removes the marquee from the source area, and disables the Paste button so that you cannot paste the copied source area to other destination areas. The ENTER key was not used in the previous set of steps so that the capabilities of the Paste Options button could be discussed. The Paste Options button does not appear on the screen when you use the ENTER key to complete the paste operation.

Using Drag and Drop to Move or Copy Cells

You also can use the mouse to move or copy cells. First, you select the source area and point to the border of the cell or range. You know you are pointing to the border of the cell or range when the mouse pointer changes to a block arrow. To move the selected cell or cells, drag the selection to the destination area. To copy a selection, hold down the CTRL key while dragging the selection to the destination area. You know Excel is in copy mode when a small plus sign appears next to the block arrow mouse pointer. Be sure to release the mouse button before you release the CTRL key. Using the mouse to move or copy cells is called **drag and drop**.

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Cutting
When you cut a cell or range of cells using the Cut command on a shortcut menu or Cut button (Home tab | Clipboard group), Excel copies the cells to the Office Clipboard, but does not remove the cells from the source area until you paste the cells in the destination area by either clicking the Paste button (Home tab | Clipboard group) or pressing the ENTER key. When you complete the paste, Excel clears the cell's or range of cell's entries and their formats from the source area.

Using Cut and Paste to Move Cells

Another way to move cells is to select them, click the Cut button (Home tab | Clipboard group) (Figure 3–12 on page EX 151) to remove them from the worksheet and copy them to the Office Clipboard, select the destination area, and then click the Paste button (Home tab | Clipboard group) or press the ENTER key. You also can use the Cut command on the shortcut menu, instead of the Cut button.

Inserting and Deleting Cells in a Worksheet

At any time while the worksheet is on the screen, you can insert cells to enter new data or delete cells to remove unwanted data. You can insert or delete individual cells; a range of cells, rows, columns; or entire worksheets.

To Insert a Row

According to the sketch of the worksheet in Figure 3–3a on page EX 142, two rows must be inserted in the What-If Assumptions table, one between Commission and Marketing for the Margin assumption and another between Research and Development and Support, General, and Administrative for the Sales Revenue for Bonus assumption. The following steps insert the new rows into the worksheet.

1

- Right-click row heading 4, the row below where you want to insert a row, to display the shortcut menu and the Mini toolbar (Figure 3–14).
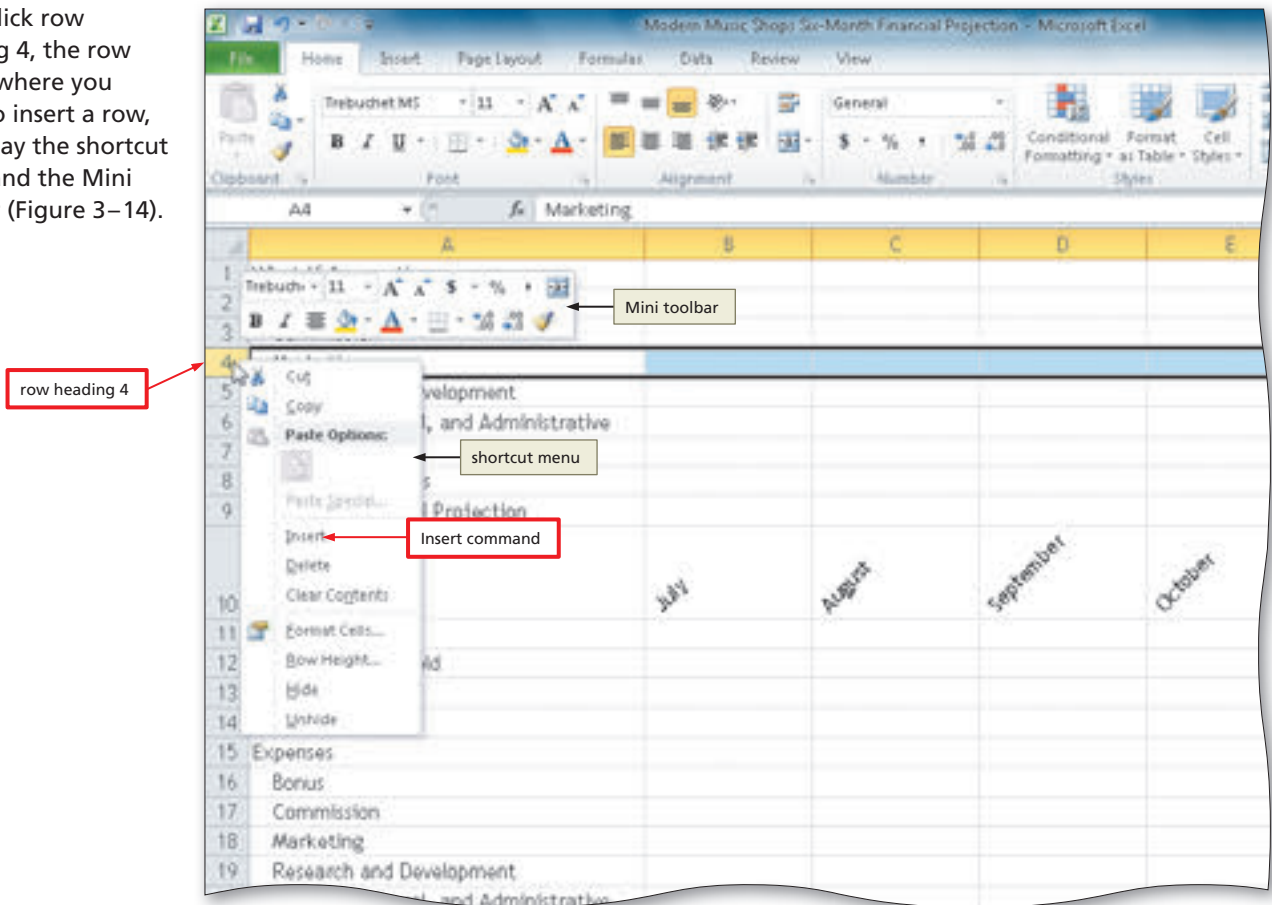
Figure 3–14

2

- Click Insert on the shortcut menu to insert a new row in the worksheet by shifting the selected row and all rows below it down one row.

- Select cell A4 in the new row and then enter **Margin** to enter a new row title (Figure 3–15).

Q&A

What is the resulting format of the new row?

The cells in the new row inherit the formats of the cells in the row above them. You can change this behavior by clicking the Insert Options button that appears immediately below the inserted row. Following the insertion of a row, the Insert Options button allows you to select from the following options: (1) 'Format Same As Above'; (2) 'Format Same As Below'; and (3) Clear Formatting. The 'Format Same as Above' option is the default. The Insert Options button remains active until you begin the next Excel operation. Excel does not display the Insert Options button if the initial row does not contain any formatted data.
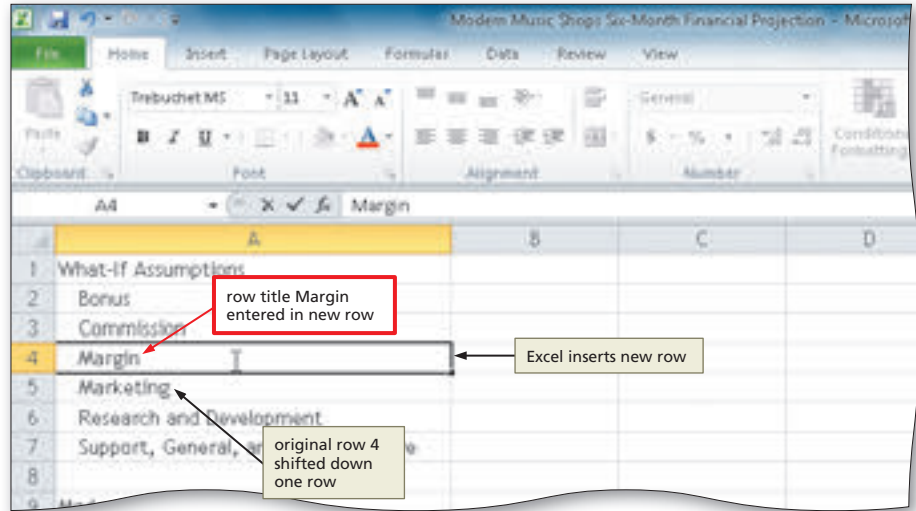
Figure 3–15

3

- Right-click row heading 7 to display a shortcut menu and then click Insert on the shortcut menu to insert a new row in the worksheet.

- Select cell A7 in the new row and then enter **Sales Revenue for Bonus** to enter a new row title (Figure 3–16).

Q&A

What would happen if cells in the shifted rows were included in formulas?

If the rows that shift down include cell references in formulas located in the worksheet, Excel automatically would adjust the cell references in the formulas to their new locations. Thus, in Step 2, if a formula in the worksheet references a cell in row 7 before the insert, then Excel adjusts the cell reference in the formula to row 8 after the insert.
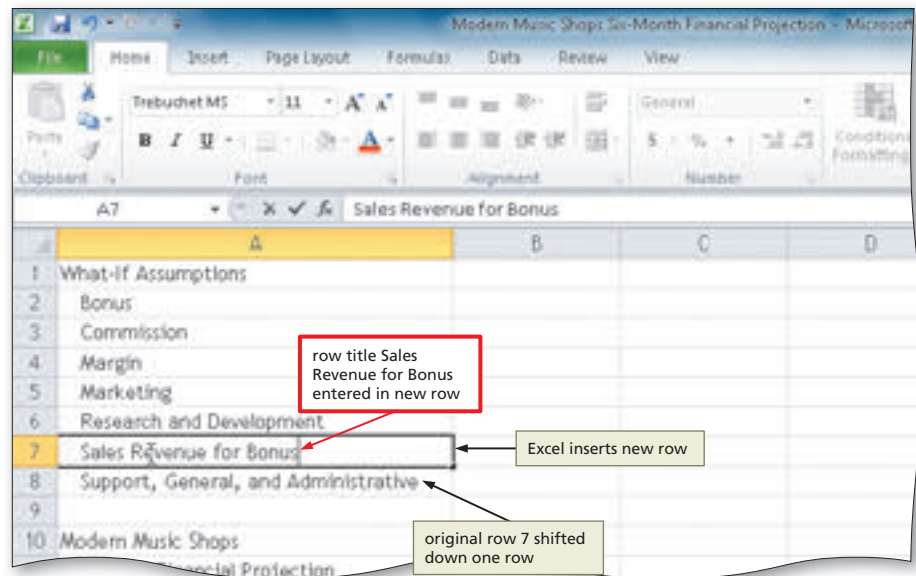
Figure 3–16

Other Ways

1. Insert (Home tab | Cells group), click Insert Sheet Rows

2. Press CTRL + SHIFT + PLUS SIGN, click Entire row, click OK button

Inserting Multiple Rows

If you want to insert multiple rows, you have two choices. You can insert a single row by using the Insert command on the shortcut menu and then repeatedly press F4 to continue inserting rows. Alternatively, you can select any number of existing rows to choose the number of rows that you want to insert. For instance, if you want to insert five rows, select five existing rows in the worksheet, right-click the rows, and then click Insert on the shortcut menu.

Dragging Ranges

You can move and insert a selected cell or range between existing cells by holding down the SHIFT key while you drag the selection to the gridline where you want to insert the selected cell or range. You also can copy and insert by holding down the CTRL+SHIFT keys while you drag the selection to the desired gridline.

Ranges and Undo

The incorrect use of copying, deleting, inserting, and moving ranges of cells have the potential to render a worksheet useless. Carefully review the results of these actions before continuing on to the next task. If you are not sure the result of the action is correct, click the Undo button on the Quick Access Toolbar.

Inserting Columns

You insert columns into a worksheet in the same way you insert rows. To insert columns, select one or more columns immediately to the right of where you want Excel to insert the new column or columns. Select the number of columns you want to insert. Next, click the Insert button arrow (Home tab | Cells group) and then click Insert Sheet Columns in the Insert list or right-click the selected column(s), then click Insert on the shortcut menu. The Insert command on the shortcut menu requires that you select an entire column (or columns) to insert a column (or columns). Following the insertion of a column, Excel displays the Insert Options button, which allows you to modify the insertion in a fashion similar to that discussed earlier when inserting rows.

Inserting Single Cells or a Range of Cells

The Insert command on the shortcut menu or the Insert Cells command on the Insert list of the Insert button (Home tab | Cells group) allows you to insert a single cell or a range of cells. You should be aware that if you shift a single cell or a range of cells, however, it no longer lines up with its associated cells. To ensure that the values in the worksheet do not get out of order, spreadsheet experts recommend that you insert only entire rows or entire columns. When you insert a single cell or a range of cells, Excel displays the Insert Options button so that you can change the format of the inserted cell, using options similar to those for inserting rows and columns.

Deleting Columns and Rows

The Delete button (Home tab | Cells group) or the Delete command on the shortcut menu removes cells (including the data and format) from the worksheet. Deleting cells is not the same as clearing cells. The Clear command, described in Chapter 1 on page EX 52, clears the data from the cells, but the cells remain in the worksheet. The Delete command removes the cells from the worksheet and shifts the remaining rows up (when you delete rows) or shifts the remaining columns to the left (when you delete columns). If formulas located in other cells reference cells in the deleted row or column, Excel does not adjust these cell references. Excel displays the error message **#REF!** in those cells to indicate a cell reference error. For example, if cell A7 contains the formula =A4+A5 and you delete row 5, Excel assigns the formula =A4+#REF! to cell A6 (originally cell A7) and displays the error message #REF! in cell A6. Excel also displays an Error Options button when you select the cell containing the error message #REF!, which allows you to select options to determine the nature of the problem.

To Enter Numbers with Format Symbols

The next step in creating the Six-Month Financial Projection worksheet is to enter the what-if assumptions values in the range B2:B8. The numbers in the table can be entered and then formatted as in Chapters 1 and 2, or each one can be entered with format symbols. When a number is entered with a **format symbol**, Excel immediately displays it with the assigned format. Valid format symbols include the dollar sign ($), comma (,), and percent sign (%).

If you enter a whole number, it appears without any decimal places. If you enter a number with one or more decimal places and a format symbol, Excel displays the number with two decimal places. Table 3–5 illustrates several examples of numbers entered with format symbols. The number in parentheses in column 4 indicates the number of decimal places.

Table 3–5 Numbers Entered with Format Symbols			
Format Symbol	Typed in Formula Bar	Displays in Cell	Comparable Format
.	374, 149	374, 149	Comma(0)
	5,833.6	5,833.60	Comma(2)
$	$58917	$58,917	Currency(0)
	$842.51	$842.51	Currency(2)
	$63,574.9	$63,574.90	Currency(2)
%	85%	85%	Percent(0)
	12.80%	12.80%	Percent(2)
	68.4222%	68.2242%	Percent(4)

The following step enters the numbers in the What-If Assumptions table with format symbols.

1

• Enter `200,000.00` in cell B2, `5.75%` in cell B3, `57.50%` in cell B4, `15.00%` in cell B5, `7.50%` in cell B6, `3,500,000.00` in cell B7, and `18.75%` in cell B8 to display the entries using formats based on the format symbols entered with the numbers (Figure 3–17).
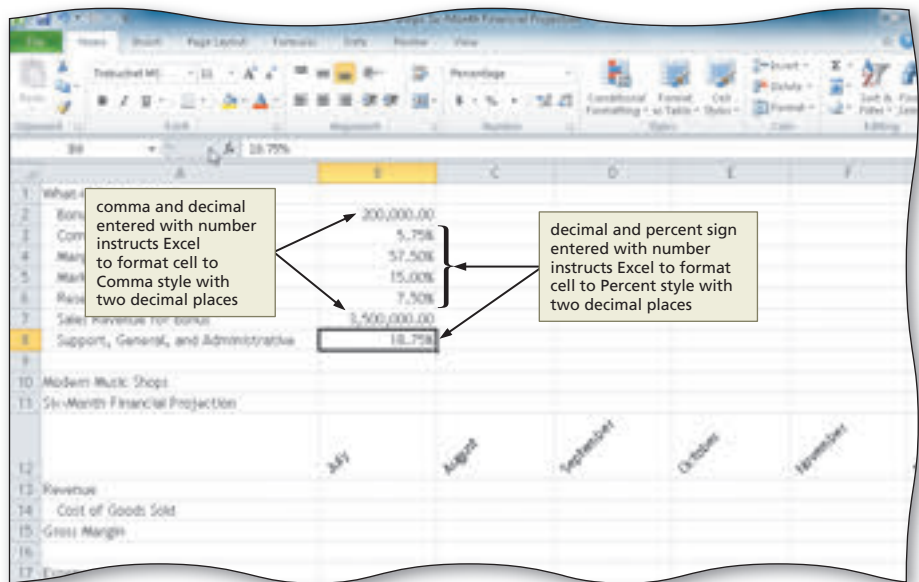
Figure 3–17

Other Ways

1. Right-click range, click Format Cells on shortcut menu, click Number tab (Format Cells dialog box), click category in Category list, [select desired format], click OK button (Format Cells dialog box)

2. Press CTRL + 1, click Number tab (Format Cells dialog box), click category in Category list, [select desired format], click OK button (Format Cells dialog box)

To Freeze Column and Row Titles

Freezing worksheet titles is a useful technique for viewing large worksheets that extend beyond the window. Normally, when you scroll down or to the right, the column titles in row 12 and the row titles in column A that define the numbers no longer appear on the screen. This makes it difficult to remember what the numbers in these rows and columns represent. To alleviate this problem, Excel allows you to **freeze the titles**, so that Excel displays the titles on the screen, no matter how far down or to the right you scroll.

The steps on the following page use the Freeze Panes button (View tab | Window group) to freeze the worksheet title and column titles in rows 10, 11, and 12, and the row titles in column A.

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1

- Scroll the worksheet to ensure that Excel displays row 10 as the first row and column A on the screen.

- Select cell B13 to select the cell on which to freeze panes.

- Display the View tab and then click the Freeze Panes button (View tab | Window group) to display the Freeze Panes gallery (Figure 3–18).
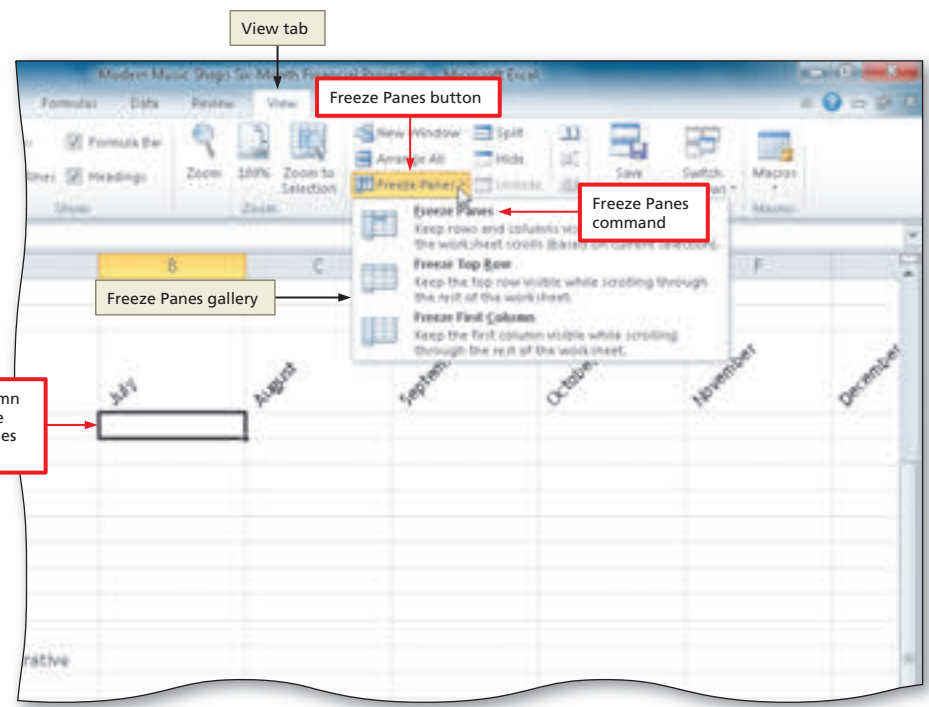
Q&A

Why should I ensure that row 10 is the first row displayed?

Before freezing the titles, it is important that Excel display the first row that you want frozen as the first row displayed. For example, if cell B13 was selected while displaying row 1, then Excel would freeze the what-if assumptions and only show a few rows of data in the Six-Month Financial Project area of the worksheet. To ensure that you can view as much data as possible, always scroll to a row that maximizes the view of your important data before freezing panes.

Figure 3–18

2

- Click Freeze Panes in the Freeze Panes gallery to freeze rows and columns to the left and above the selected cell, column A and rows 10 through 12 in this case (Figure 3–19).
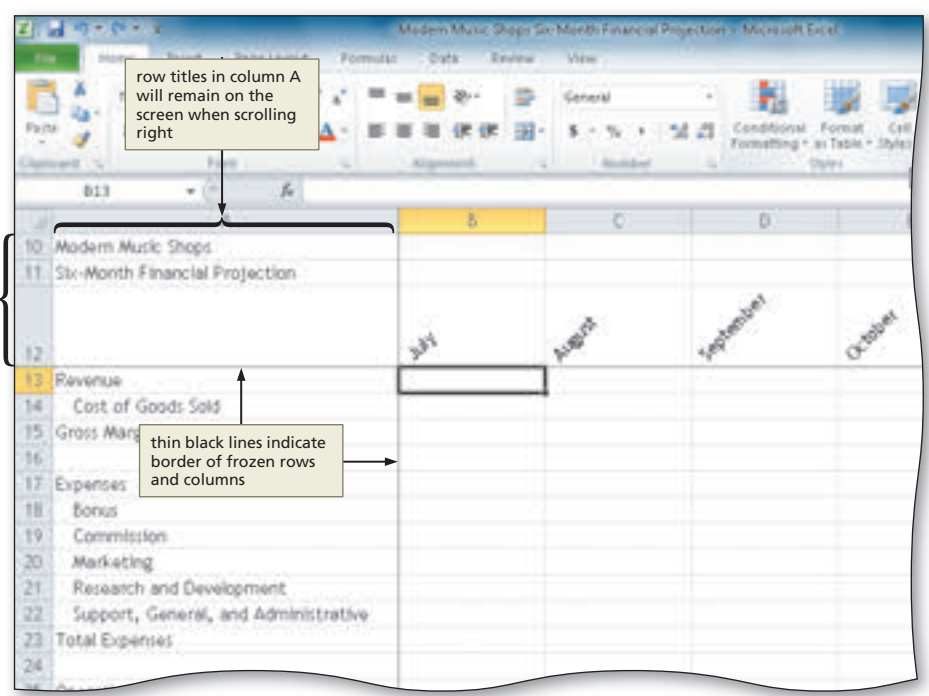
Q&A

What happens after I click the Freeze Panes command?

Excel displays a thin black line on the right side of column A, indicating the split between the frozen row titles in column A and the rest of the worksheet. It also displays a thin black line below row 12, indicating the split between the frozen column titles in rows 10 through 12 and the rest of the worksheet (Figure 3–19).

Figure 3–19

To Enter the Projected Monthly Sales

The following steps enter the projected revenue, listed earlier in Table 3–1 on page EX 143, in row 13 and compute the projected six-month revenue in cell H13.

1 If necessary, display the Home tab.

2 Enter `3113612.16` in cell B13, `7962235.53` in cell C13, `5112268.58` in cell D13, `2924627.87` in cell E13, `7630534.65` in cell F13, and `3424270.23` in cell G13.

3 Select cell H13 and then click the Sum button (Home tab | Editing group) twice to create a sum in the selected cell (Figure 3–20).

Figure 3–20

To Enter and Format the System Date

The sketch of the worksheet in Figure 3–3a on page EX 142 includes a date stamp on the right side of the heading section. A **date stamp** shows the date a workbook, report, or other document was created or the period it represents. In business, a report often is meaningless without a date stamp. For example, if a printout of the worksheet in this chapter were distributed to the company's analysts, the date stamp would show when the six-month projections were made, as well as what period the report represents.

A simple way to create a date stamp is to use the NOW function to enter the system date tracked by your computer in a cell in the worksheet. The **NOW function** is one of 22 date and time functions available in Excel. When assigned to a cell, the NOW function returns a number that corresponds to the system date and time beginning with December 31, 1899. For example, January 1, 1900 equals 1, January 2, 1900 equals 2, and so on. Noon equals .5. Thus, noon on January 1, 1900 equals 1.5 and 6 P.M. on January 1, 1900 equals 1.75. If the computer's system date is set to the current date, which normally it is, then the date stamp is equivalent to the current date.

The steps on the following pages enter the NOW function and then change the format from mm/dd/yyyy hh:mm to mm/dd/yyyy.

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1

- Select cell I11 and then click the Insert Function box in the formula bar to display the Insert Function dialog box.

- Click the 'Or select a category' box arrow (Insert Function dialog box) and then select Date & Time in the list to populate the 'Select a function' list with data and time functions.

- Scroll down in the 'Select a function list' and then click NOW to select the required function (Figure 3–21).
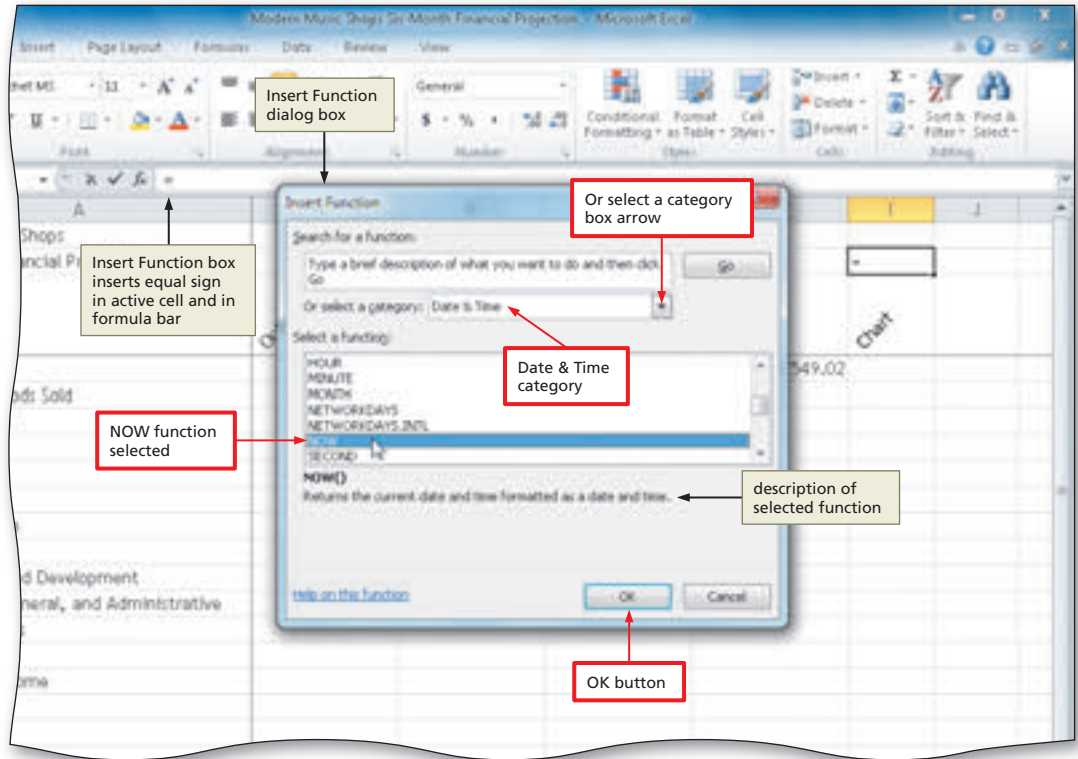
Figure 3–21

2

- Click the OK button (Insert Function dialog box) to close the Insert Function dialog box and display the Function Arguments dialog box.

- Click the OK button (Function Arguments dialog box) to display the system date and time in the selected cell, using the default date and time format mm/dd/yyyy hh:mm.

- Right-click cell I11 to display a shortcut menu and Mini toolbar (Figure 3–22).
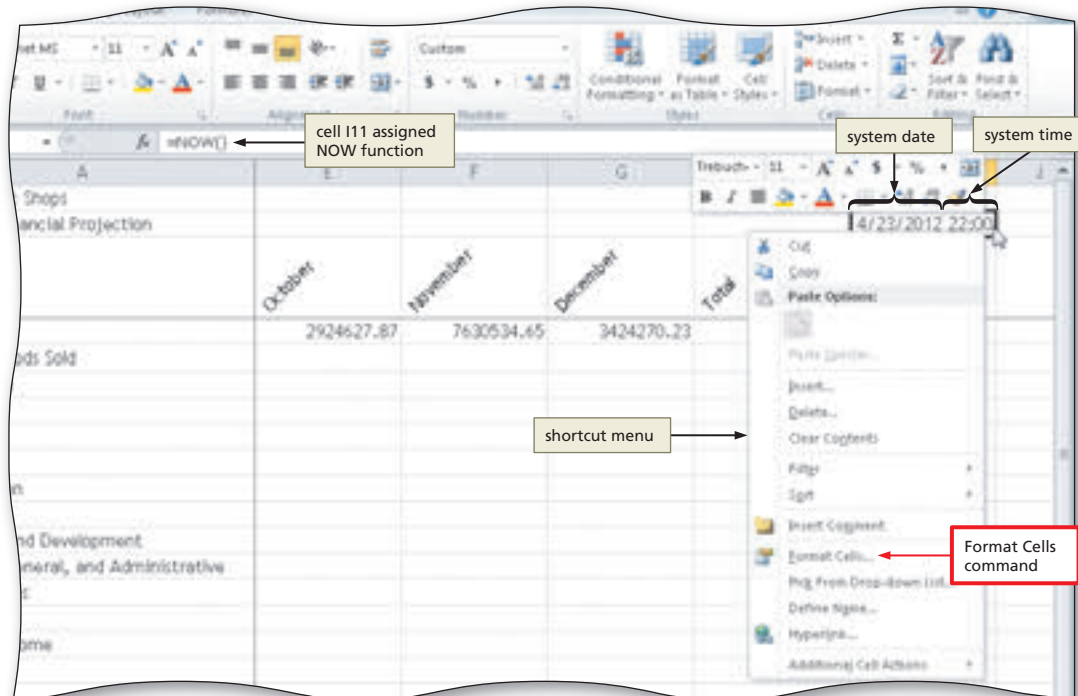
Q&A Why does the date appear with the mm/dd/yyyy hh:mm format?

Excel automatically formats the result of the NOW function as a date, using the date and time format, mm/dd/yyyy hh:mm, where the first mm is the month, dd is the day of the month, yyyy is the year, hh is the hour of the day, and mm is the minutes past the hour.

Figure 3–22

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3

- Click Format Cells on the shortcut menu to display the Format Cells dialog box.

- If necessary, click the Number tab (Format Cells dialog box) to display the Number sheet.

- Click Date in the Category list (Format Cells dialog box) to display the types of date formats in the Type list. Scroll down in the Type list and then click 3/14/2001 to display a sample of the data in the active cell, I11 in this case, using the selected format in the Sample area (Figure 3–23).
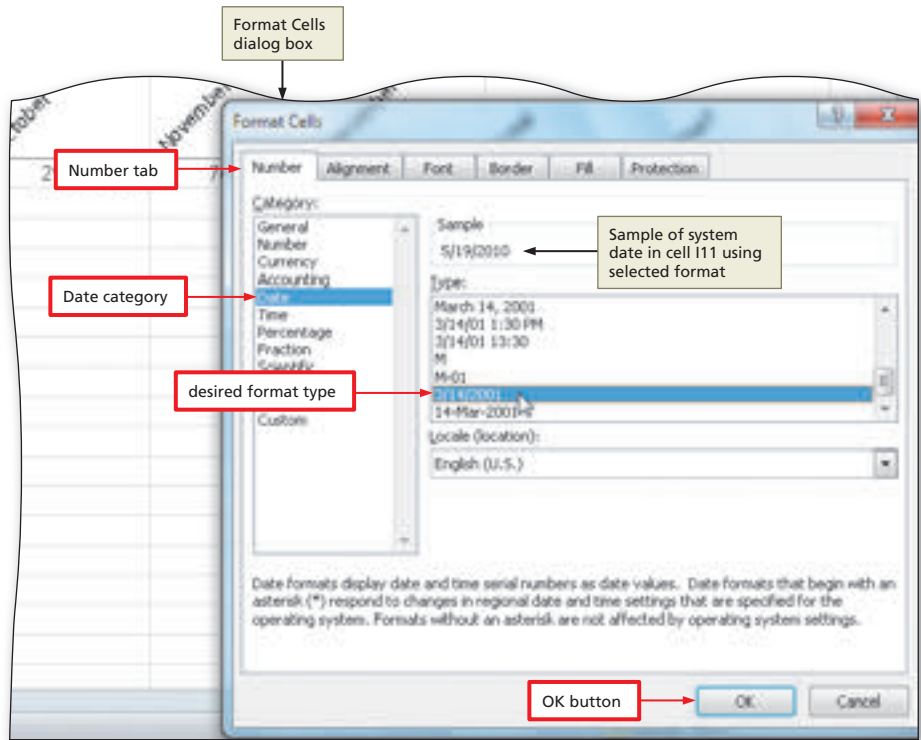
Q&A Why do the dates in the Type box show March 14, 2001 instead of the current date?

The date March 14, 2001 is used as a sample date in the Format cells dialog box.

Figure 3–23

4

- Click the OK button (Format Cells dialog box) to display the system date in the format mm/dd/yyyy.

- Double-click the border between columns I and J to change the width of the column to best fit (Figure 3–24).
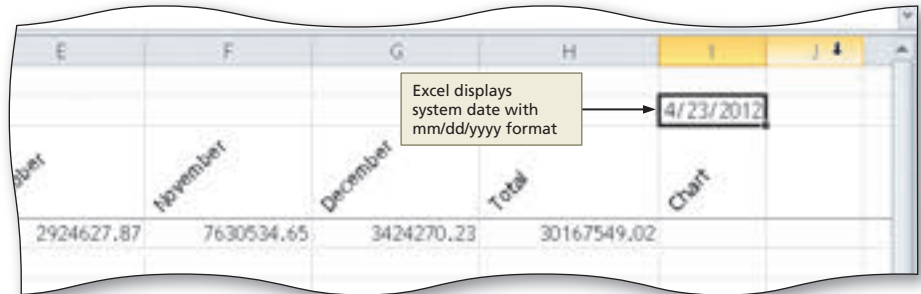
Q&A How does Excel format a date?

In Figure 3–24, the date is displayed right-aligned in the cell because

Figure 3–24

Excel treats a date as a number formatted to display as a date. If you assign the General format (Excel's default format for numbers) to a date in a cell, the date is displayed as a number with two decimal places. For example, if the system time and date is 9:00 AM on November 13, 2012 and the cell containing the NOW function is assigned the General format, then Excel displays the following number in the cell:

41226.375

Number of days since   Time of day is 9:00 AM
December 31, 1899   (Portion of day complete)

The whole number portion of the number (41226) represents the number of days since December 31, 1899. The decimal portion of the number (.375) represents 9:00 AM as the time of day, at which point 37.5% of the day is complete. To assign the General format to a cell, click General in the Category list in the Format Cells dialog box (Figure 3–23).

Other Ways

1. Click Date & Time (Formulas tab | Function Library group), click now

2. Press CTRL+SEMICOLON (not a volatile date)

3. Press CTRL+SHIFT+# to format date to day-month-year

Break Point: If you wish to stop working through the chapter at this point, you can quit Excel now and then resume the project at a later point in time by starting Excel, opening the file called Modern Music Shops Six-Month Financial Projection, and continuing to follow the steps from this location forward.

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Your Age in Days
How many days have you been alive? Enter today's date (e.g., 12/5/2012) in cell A1. Next, enter your birth date (e.g., 6/22/1996) in cell A2. Select cell A3 and enter the formula = A1−A2. Format cell A3 to the General style using the Format Cells dialog box, and cell A3 will display your age in days.

Absolute versus Relative Addressing

The next sections describe the formulas and functions needed to complete the calculations in the worksheet.

As you learned in Chapters 1 and 2, Excel modifies cell references when copying formulas. While copying formulas, however, sometimes you do not want Excel to change cell references. To keep a cell reference constant when copying a formula or function, Excel uses a technique called absolute cell referencing. To specify an absolute cell reference in a formula, enter a dollar sign ($) before any column letters or row numbers you want to keep constant in formulas you plan to copy. For example, $B$4 is an absolute cell reference, whereas B4 is a relative cell reference. Both reference the same cell. The difference becomes apparent when they are copied to a destination area. A formula using the **absolute cell reference** $B$4 instructs Excel to keep the cell reference B4 constant (absolute) in the formula as it copies it to the destination area. A formula using the **relative cell reference** B4 instructs Excel to adjust the cell reference as it copies it to the destination area. A cell reference with only one dollar sign before either the column or the row is called a **mixed cell reference**. When planning formulas, be aware of when you need to use absolute, relative, and mixed cell references. Table 3–6 gives some additional examples of each of these types of cell references.

Table 3–6 Examples of Absolute, Relative, and Mixed Cell References		
Cell Reference	**Type of Reference**	**Meaning**
$B$4	Absolute cell reference	Both column and row references remain the same when you copy this cell, because the cell references are absolute.
B$4	Mixed reference	This cell reference is mixed. The column reference changes when you copy this cell to another column because it is relative. The row reference does not change because it is absolute.
$B4	Mixed reference	This cell reference is mixed. The column reference does not change because it is absolute. The row reference changes when you copy this cell reference to another row because it is relative.
B4	Relative cell reference	Both column and row references are relative. When copied to another cell, both the column and row in the cell reference are adjusted to reflect the new location.

Absolute Referencing
Absolute referencing is one of the more difficult worksheet concepts to understand. One point to keep in mind is that the paste operation is the only operation affected by an absolute cell reference. An absolute cell reference instructs the paste operation to keep the same cell reference as it copies a formula from one cell to another.

The next step is to enter the formulas that calculate the following values for July: cost of goods sold (cell B14), gross margin (cell B15), expenses (range B18:B22), total expenses (cell B23), and the operating income (cell B25). The formulas are based on the projected monthly revenue in cell B13 and the assumptions in the range B2:B8.

To Enter a Formula Containing Absolute Cell References

The formulas for each column (month) are the same, except for the reference to the projected monthly revenue in row 13, which varies according to the month (B13 for July, C13 for August, and so on). Thus, the formulas for July can be entered in column B and then copied to columns C through G. Table 3–7 shows the formulas for determining the July cost of goods sold, gross margin, expenses, total expenses, and operating income in column B.

Table 3–7 Formulas for Determining Cost of Goods Sold, Margin, Expenses, Total Expenses, and Operating Income for July			
Cell	**Row Title**	**Formula**	**Comment**
B14	Cost of Goods Sold	=B13 * (1 – B4)	Revenue times (1 minus Margin %)
B15	Gross Margin	= B13 – B14	Revenue minus Cost of Goods Sold
B18	Bonus	=IF(B13 >= B7, B2, 0)	Bonus equals value in B2 or 0
B19	Commission	=B13 * B3	Revenue times Commission %
B20	Marketing	=B13 * B5	Revenue times Marketing %
B21	Research and Development	=B13 * B6	Revenue times Research and Development %
B22	Support, General, and Administrative	=B13 * B8	Revenue times Support, General, and Administrative %
B23	Total Expenses	=SUM(B18:B22)	Sum of July Expenses
B25	Operating Income	=B15 – B23	Gross Margin minus Total Expenses

As the formulas are entered as shown in Table 3–7 in column B for July and then copied to columns C through G (August through December) in the worksheet, Excel will adjust the cell references for each column automatically. Thus, after the copy, the August Commission expense in cell C19 would be =C13 * C3. While the cell reference C13 (February Revenue) is correct, the cell reference C3 references an empty cell. The formula for cell C7 should read =C13 * B3, rather than =C13 * C3, because B3 references the Commission % value in the What-If Assumptions table. In this instance, a way is needed to keep a cell reference in a formula the same, or constant, when it is copied.

The following steps enter the cost of goods formula = B13*(1 – $B$4) in cell B14 using Point mode. To enter an absolute cell reference, you can type the dollar sign ($) as part of the cell reference or enter it by pressing F4 with the insertion point in or to the right of the cell reference to change it to absolute.

1

- Press CTRL+HOME to select cell B13 and then click cell B14 to show cell B13 and to select the cell in which to enter the first formula.

- Type = (equal sign), select cell B13, type * (1–b4 to continue entering the formula, and then press F4 to change the most recently typed cell reference, in this case cell b4, from a relative cell reference to an absolute cell reference. Type) to complete the formula (Figure 3–25).

Q&A

Is an absolute reference required in this formula?

No, because a mixed cell reference could have been used. The formula in cell B14 will be copied across columns, rather than down rows. So, the formula entered in cell B14 in Step 1 could have been entered as =B13*(1–$B4), rather than =B13*(1–$B$4). That is, the formula could have included the mixed cell reference $B4, rather than the absolute cell reference $B$4. When you copy a formula across columns, the row does not change anyway. The key is to ensure that column B remains constant as you copy the formula across columns. To change the absolute cell reference to a mixed cell reference, continue to press the F4 key until you achieve the desired cell reference.
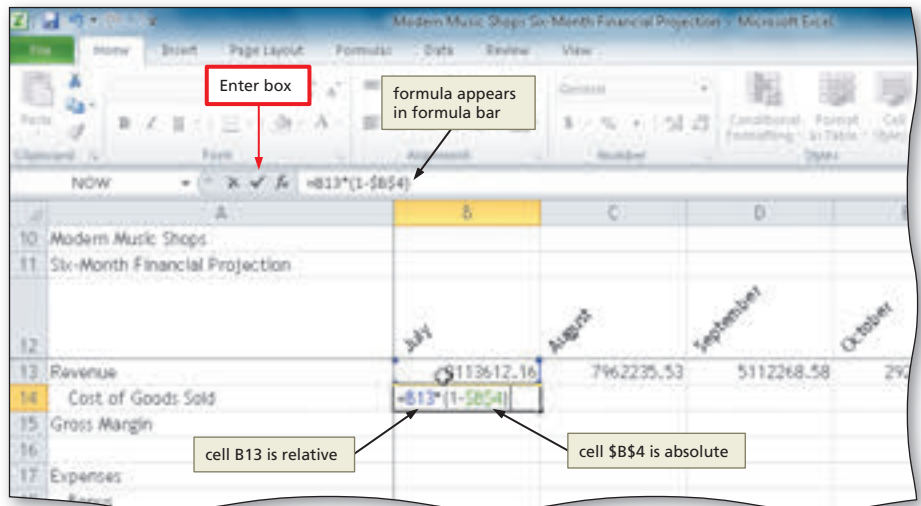
Figure 3–25

2

- Click the Enter box in the formula bar to display the result, 1323285.168, instead of the formula in B14 (Figure 3–26).
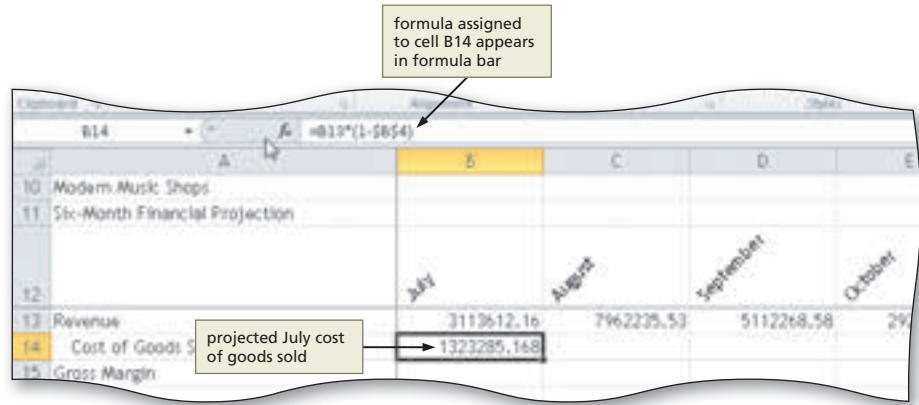
formula assigned to cell B14 appears in formula bar

projected July cost of goods sold

Figure 3–26

3

- Click cell B15 to select the cell in which to enter the next formula, type = (equal sign), click cell B13, type — (minus sign), and then click cell B14 to add a reference to the cell to the formula.

- Click the Enter box in the formula bar to display the result in the selected cell, in this case gross margin for July, 1790326.992, in cell B15 (Figure 3–27).

formula appears in formula bar

active cell shows result of formula
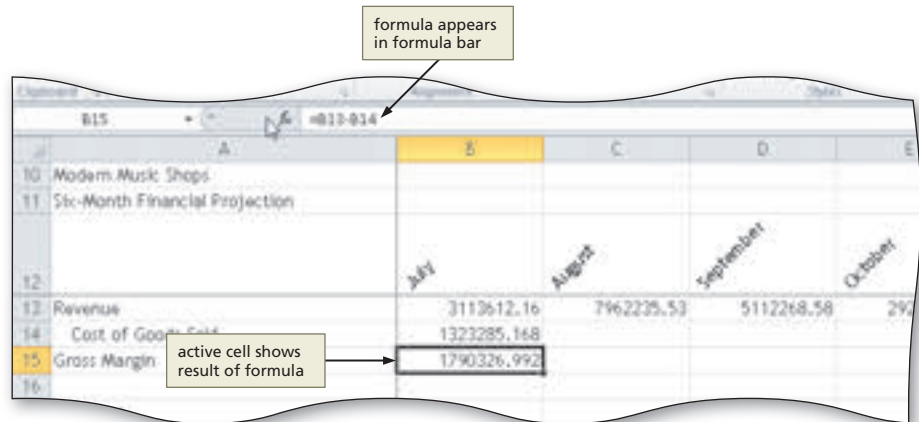
Figure 3–27

Making Decisions — The IF Function

Logical Operators in IF Functions
IF functions can use logical operators, such as AND, OR, and NOT. For example, the three IF functions =IF(AND(A1>C1, B1<C2), "OK", "Not OK") and =IF(OR(K5>J5, C3<K6), "OK", "Not OK") and =IF(NOT(B10<C10), "OK", "Not OK") use logical operators. In the first example, both logical tests must be true for the value_if_true OK to be assigned to the cell. In the second example, one or the other logical tests must be true for the value_if_true OK to be assigned to the cell. In the third example, the logical test B10<C10 must be false for the value_if_true OK to be assigned to the cell.

According to the Request for New Workbook in Figure 3–2 on page EX 140, if the projected July revenue in cell B13 is greater than or equal to the sales revenue for bonus in cell B7 (3,500,000.00), then the July bonus value in cell B18 is equal to the bonus value in cell B2 (200,000.00); otherwise, cell B18 is equal to 0. One way to assign the July bonus value in cell B18 is to check to see if the revenue in cell B13 equals or exceeds the sales revenue for the bonus amount in cell B7 and, if so, then to enter 200,000.00 in cell B18. You can use this manual process for all six months by checking the values for the corresponding months.

Because the data in the worksheet changes each time a report is prepared or the figures are adjusted, however, it is preferable to have Excel assign the monthly bonus to the entries in the appropriate cells automatically. To do so, cell B18 must include a formula or function that displays 200,000.00 or 0.00 (zero), depending on whether the projected July revenue in cell B13 is greater than, equal to, or less than the sales revenue for bonus value in cell B7.

The **IF function** is useful when you want to assign a value to a cell based on a logical test. For example, using the IF function, cell B18 can be assigned the following IF function:

$$=IF(B13>=\$B\$7, \$B\$2, 0)$$

logical_test   value_if_true   value_if_false

The IF function instructs Excel that, if the projected July revenue in cell B13 is greater than or equal to the sales revenue for bonus value in cell B7, then Excel should display the value 200000 in cell B2, in cell B18. If the projected July revenue in cell B13 is less than the sales revenue for bonus value in cell B7, then Excel displays a 0 (zero) in cell B18.

The general form of the IF function is:

=IF(logical_test, value_if_true, value_if_false)

The argument, logical_test, is made up of two expressions and a comparison operator. Each expression can be a cell reference, a number, text, a function, or a formula. Valid comparison operators, their meaning, and examples of their use in IF functions are shown in Table 3–8. The argument, value_if_true, is the value you want Excel to display in the cell when the logical test is true. The argument, value_if_false, is the value you want Excel to display in the cell when the logical test is false.

Table 3–8 Comparison Operators		
Comparison Operator	**Meaning**	**Example**
=	Equal to	=IF(B12 = 200, F3 * H4, E10 + F3)
<	Less than	=IF(G56 * Q56 < D12, $M$10, B9 ^ 5)
>	Greater than	=IF(MIN(A12:A52) > 75, 0, 1)
>=	Greater than or equal to	=IF($T$9 >= B7, P3 - H12, 1000)
<=	Less than or equal to	=IF(C9 * G2 <= 99, $T35, 350 * C9)
<>	Not equal to	=IF(G15 <> 1, "No","Yes")

To Enter an IF Function

The following steps assign the IF function =IF(B13>=$B$7,$B$2,0) to cell B18. This IF function determines whether or not the worksheet assigns a bonus for July.

1

- Click cell B18 to select the cell for the next formula.

- Click the Insert Function box in the formula bar to display the Insert Function dialog box.

- Click the 'Or select a category' box arrow (Insert Function dialog box) and then select Logical in the list to populate the 'Select a function' list with logic functions.

- Click IF in the 'Select a function list' to select the required function (Figure 3–28).

Figure 3–28

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2
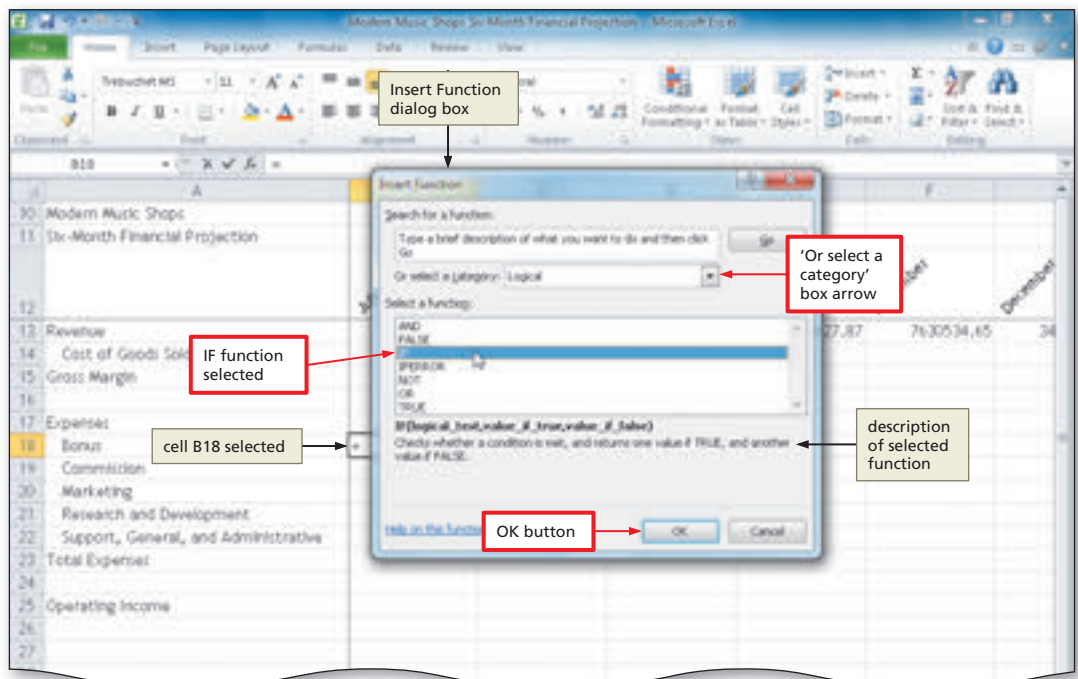
- Click the OK button (Insert Function dialog box) to display the Function Arguments dialog box.

- Type **b13>=b7** in the Logical test box to enter a logical test for the IF function.

- Type **b2** in the Value_if_true box to enter the result of the IF function if the logical test is true.

- Type **0** in the Value_if_false box to enter the result of the IF function if the logical test is false (Figure 3–29).
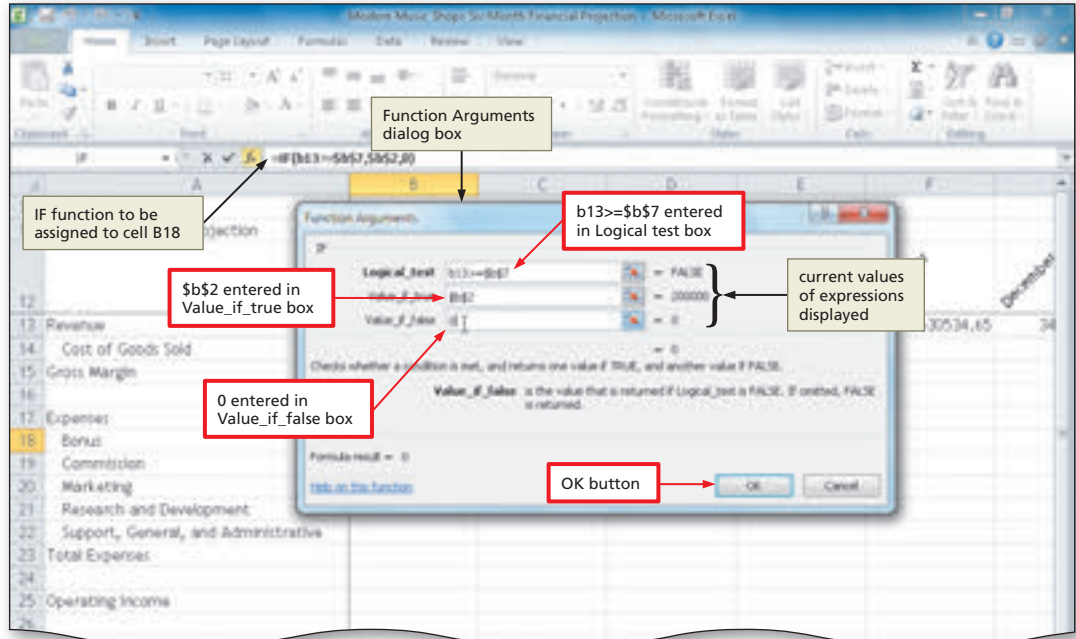
Figure 3–29

3

- Click the OK button (Function Arguments dialog box) to insert the IF function in the selected cell (Figure 3–30).
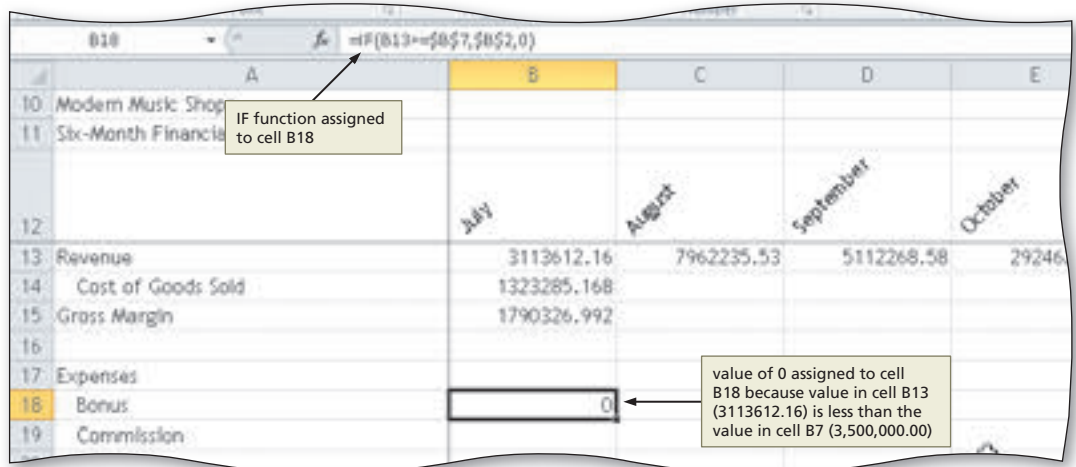
Figure 3–30

Q&A

Why is the value 0 displayed in cell B18?

The value that Excel displays in cell B18 depends on the values assigned to cells B13, B2, and B7. For example, if the value for July revenue in cell B13 is increased above 3,500,000.00, then the IF function in cell B18 will cause Excel to display 200,000.00. If you change the sales revenue for bonus in cell B7 from 3,500,000.00 to another number and the value in cell B13 is greater than or equal to the value in cell B7, it will change the results in cell B18 as well.

Other Ways

1. Click Logical button (Formulas tab | Function Library group), click IF

To Enter the Remaining July Formulas

The July commission expense in cell B19 is equal to the revenue in cell B13 times the commission assumption in cell B3 (5.75%). The July marketing expense in cell B20 is equal to the projected July revenue in cell B13 times the marketing assumption in cell B5 (15.00%). Similar formulas determine the remaining July expenses in cells B21 and B22.

The total expenses value in cell B23 is equal to the sum of the expenses in the range B18:B22. The operating income in cell B25 is equal to the gross margin in cell B15 minus the total expenses in cell B23. The formulas are short, and therefore, they are typed in the following steps, rather than entered using Point mode.

1 Select cell B19. Type `=b13*$b$3` and then press the DOWN ARROW key to enter the formula in the selected cell. Type `=b13*$b$5` and then press the DOWN ARROW key to enter the formula in the selected cell. Type `=b13*$b$6` and then press the DOWN ARROW key to enter the formula in the selected cell. Type `=b13*$b$8` and then press the DOWN ARROW key to enter the formula in the selected cell.

2 With cell B23 selected, click the Sum button (Home tab | Editing group) twice to insert a SUM function in the selected cell. Select cell B25 to prepare to enter the next formula. Type `=b15-b23` and then press the ENTER key to enter the formula in the selected cell.

3 Press CTRL+ACCENT MARK (`) to display the formulas version of the worksheet (Figure 3–31).

4 When you are finished viewing the formulas version, press CTRL+ACCENT MARK (`) to display the values version of the worksheet.

Q&A

Why should I view the formulas version of the worksheet?

Viewing the formulas version (Figure 3–31) of the worksheet allows you to check the formulas assigned to the range B14:B25. Recall that formulas were entered in lowercase. You can see that Excel converts all the formulas from lowercase to uppercase.

Figure 3–31

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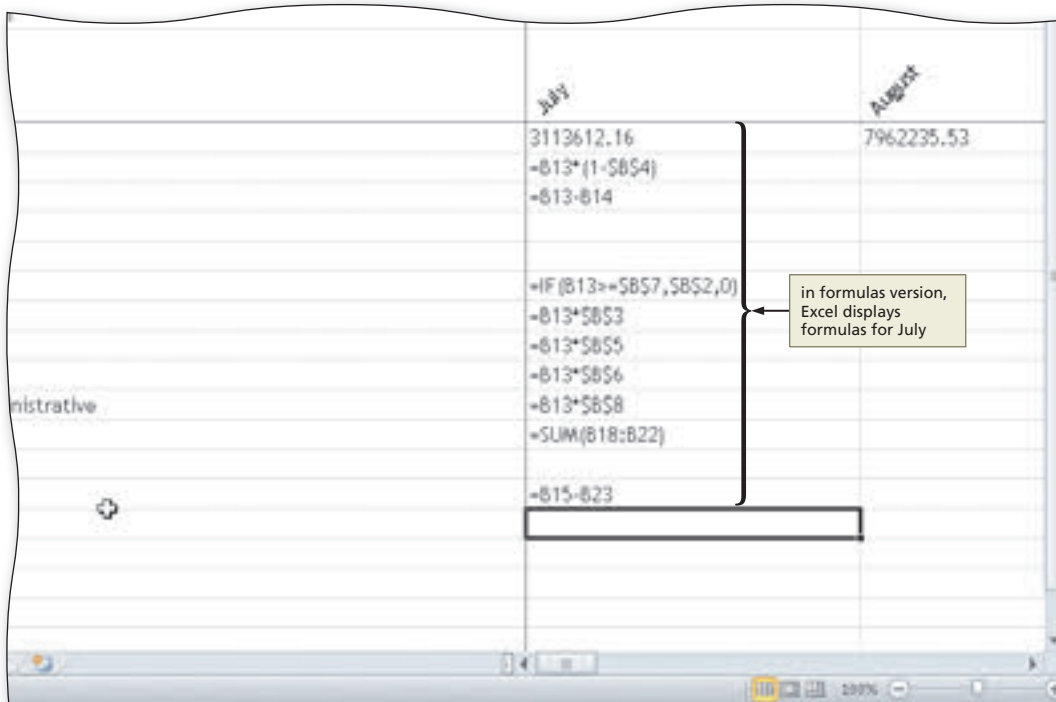
To Copy Formulas with Absolute Cell References Using the Fill Handle

The following steps use the fill handle to copy the July formulas in column B to the other five months in columns C through G.

1
- Select the range B14:B25 and then point to the fill handle in the lower-right corner of the selected cell, B25 in this case, to display the crosshair mouse pointer (Figure 3–32).
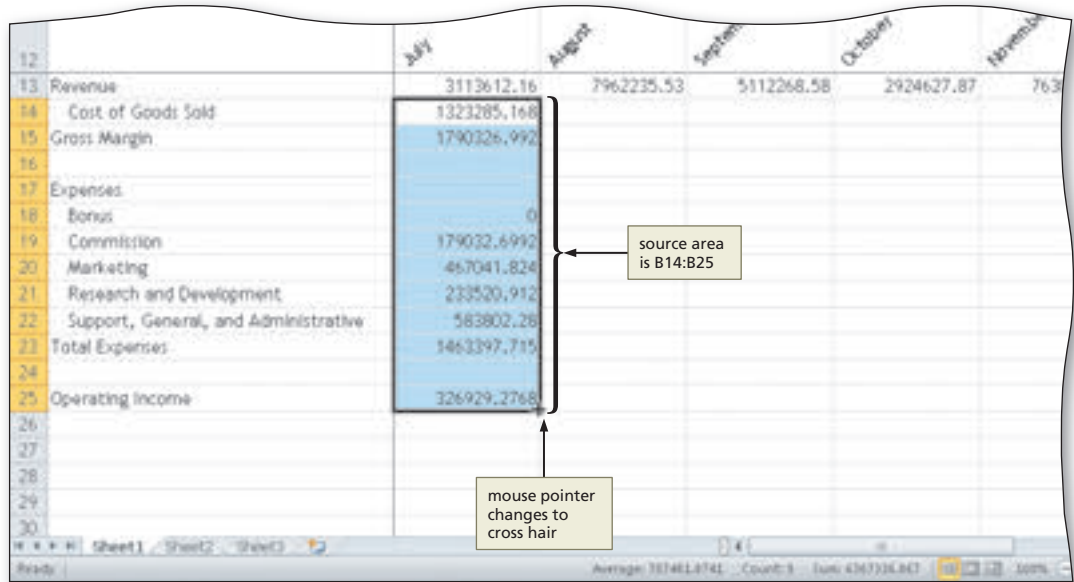
Figure 3–32

2
- Drag the fill handle to the right to copy the formulas from the source area, B14:B25 in this case, to the destination area, C14:G25 in this case, and display the calculated amounts and Auto Fill Options button (Figure 3–33).

Q&A What happens to the formulas after performing the copy operation?

Because the formulas in the range B14:B25 use absolute cell references, the formulas still refer to the current values in the Assumptions table when the formulas are copied to the range C14:G25.
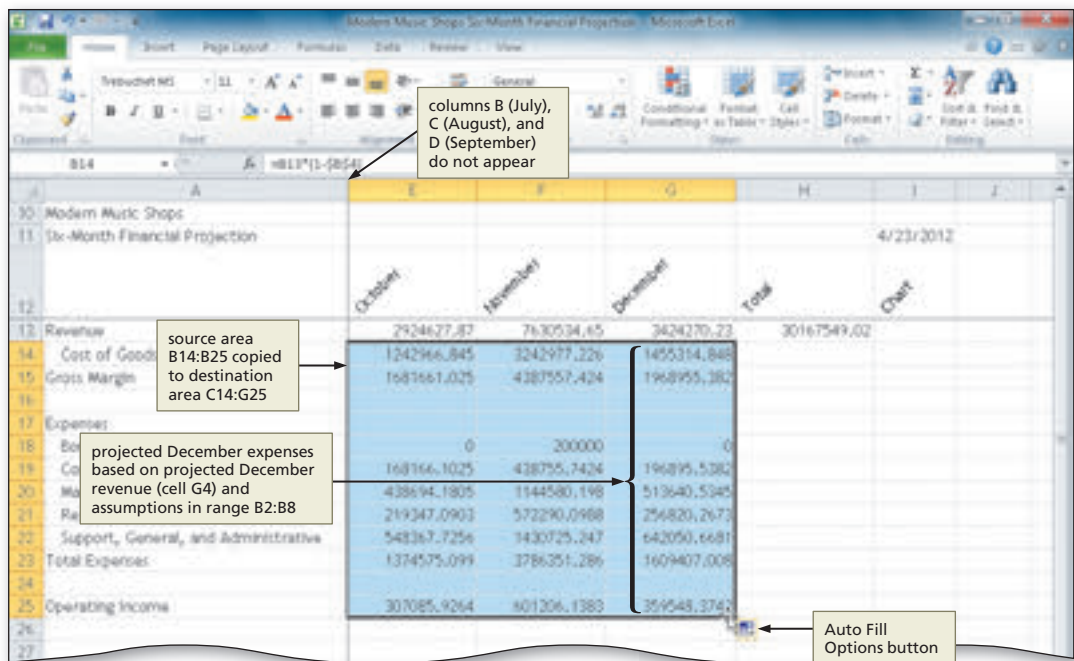
Figure 3–33

Q&A What happened to columns B, C, and D?

As shown in Figure 3–33, as the fill handle is dragged to the right, columns B, C, and D no longer appear on the screen because column A now acts just as the row numbers do in that columns scrolled off of the visible portion of the worksheet disappear behind column A. Column A, however, remains on the screen, because the row titles were frozen earlier in this chapter.

To Determine Row Totals in Nonadjacent Cells

The following steps determine the row totals in column H. To determine the row totals using the Sum button, select only the cells in column H containing numbers in adjacent cells to the left. If, for example, you select the range H14:H25, Excel will display 0s as the sum of empty rows in cells H16, H17, and H24.

1 Select the range H14:H15. While holding down the CTRL key, select the range H18:H23 and cell H25, as shown in Figure 3–34.

2 Click the Sum button (Home tab | Editing group) to display the row totals in the selected ranges (Figure 3–34).
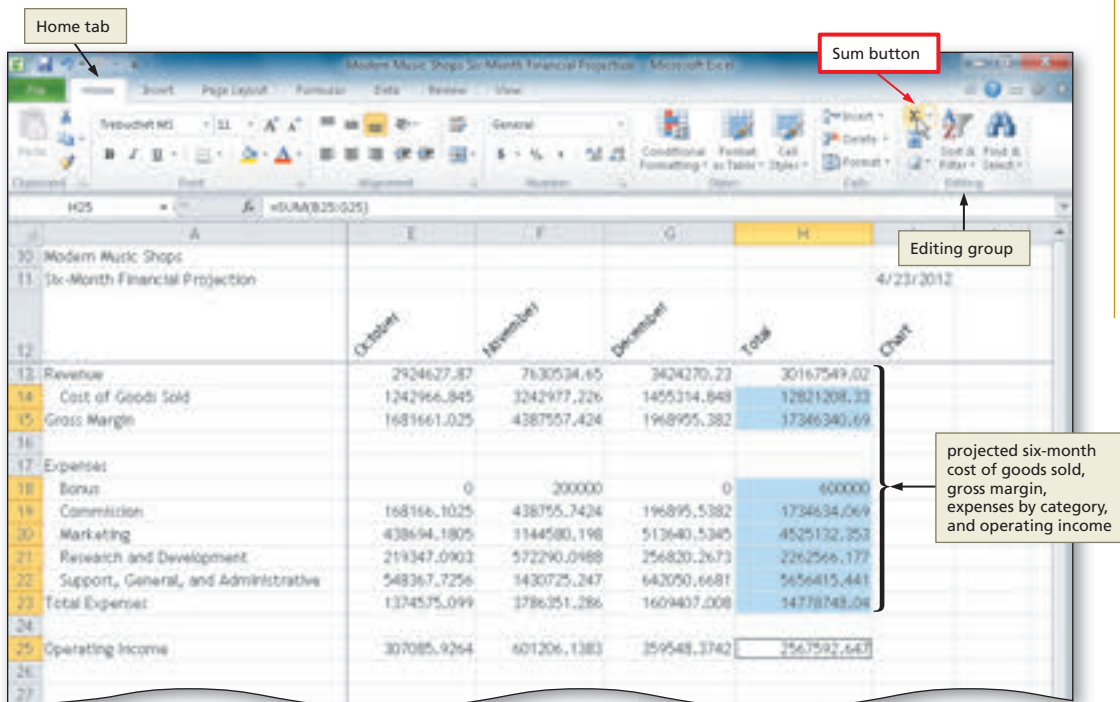
Figure 3–34

To Unfreeze the Worksheet Titles and Save the Workbook

All the text, data, and formulas have been entered into the worksheet. The following steps unfreeze the titles to allow you to work with the worksheet without frozen rows and columns, and save the workbook using its current file name, Modern Music Shops Six-Month Financial Projection.

1 Press CTRL+HOME to select cell B13 and view the upper-left corner of the screen.

2 Display the View tab and then click the Freeze Panes button (View tab | Window group) to display the Freeze Panes gallery.

3 Click Unfreeze Panes in the Freeze Panes gallery to unfreeze the frozen columns and rows.

4 Display the Home tab and then click the Save button on the Quick Access Toolbar to save the workbook.

Q&A Why does pressing CTRL+HOME select cell B13?

When the titles are frozen and you press CTRL+HOME, Excel selects the upper-left cell of the unfrozen section of the worksheet. For example, in Step 1 of the previous steps, Excel selected cell B13. When the titles are unfrozen, pressing CTRL+HOME selects cell A1.

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Nested Forms of the IF Function

A **nested IF function** is one in which the action to be taken for the true or false case includes yet another IF function. The second IF function is considered to be nested, or layered, within the first. Study the nested IF function below, which determines the eligibility of a student to go on a field trip. The school permits the student to attend the field trip if the student's age is at least 14 and the student has provided a signed permission form. Assume the following in this example: (1) the nested IF function is assigned to cell L9, which instructs Excel to display one of three messages in the cell; (2) cell L7 contains a student's age; and (3) cell L8 contains a Y or N, based on whether the person provided a signed permission form.

Using IFERROR
Similar to the IF function, the IFERROR function checks a formula for correctness. For example, =IFERROR(formula, "Error Message") examines the formula argument. If an error appears (such as #N/A), Excel displays the Error Message text in the cell instead of the Excel #N/A error.

=IF(L7>=14, IF(L8="Y","Allowed","Can Travel, but No Permission"),"Too Young to Travel")

The nested IF function instructs Excel to display one, and only one, of the following three messages in cell L9: (1) Allowed; or (2) Can Travel, but No Permission; or (3) Too Young to Travel.

You can nest IF functions as deep as you want, but after you get beyond a nest of three IF functions, the logic becomes difficult to follow and alternative solutions, such as the use of multiple cells and simple IF functions, should be considered.

Adding and Formatting Sparkline Charts

Sometimes you may want to condense a range of data into a small chart in order to show a trend or variation in the range. Excel's standard charts may be too large or extensive for your needs. An Excel **Sparkline chart** provides a simple way to show trends and variations in a range of data within a single cell. Excel includes three types of Sparkline charts: Line, Column, and Win/Loss. Because they exist in only one cell, you should use Sparkline charts to convey succinct, eye-catching summaries of the data they represent.

To Add a Sparkline Chart to the Worksheet

Each of the rows of monthly data, including those containing formulas, provides useful information easily summarized by a Line Sparkline chart. A Line Sparkline chart is a good choice because it shows trends over the six-month period for each row of data.

The following steps add a Line Sparkline chart to cell I13 and then use the fill handle to create Line Sparkline charts in the range I14:I25 that represent the monthly data in rows 13 through 25.

1
- Scroll the worksheet so that both columns B and I are displayed on the screen.

- Select cell I13 to prepare to insert a Sparkline chart in the cell.

- Display the Insert tab and then click Line (Insert tab | Sparklines group) to display the Create Sparklines dialog box (Figure 3–35).
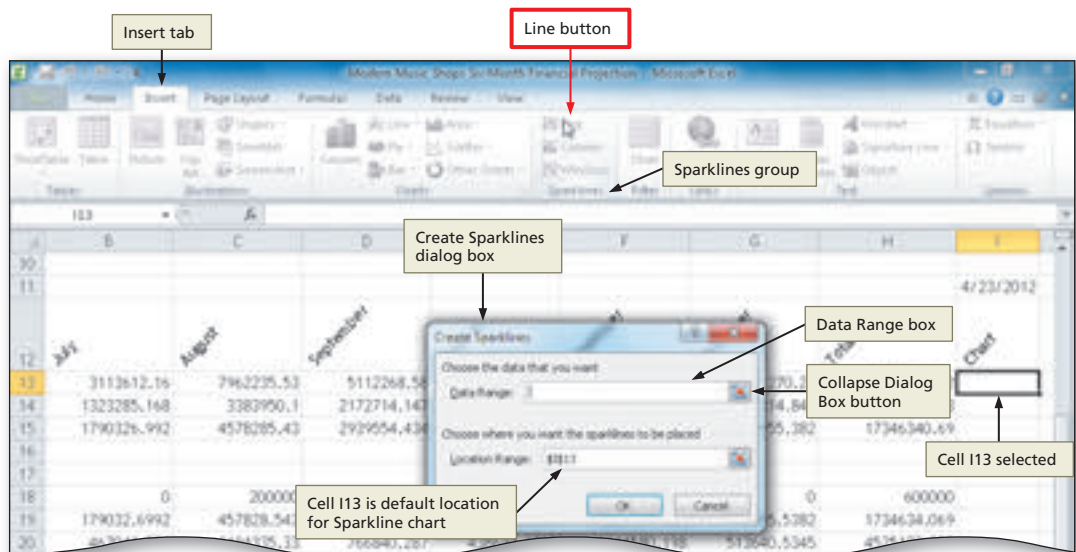

Figure 3–35

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2

- Drag through the range B13:G13 to select the range. Do not release the mouse (Figure 3–36).

Q&A

What happened to the Create Sparklines dialog box?

When a dialog box includes a Collapse Dialog Box button (Figure 3–35), selecting cells or a range collapses the dialog box so that only the current text box is displayed. Once the selection is made, the dialog box expands back to its original size. You also can click the Collapse Dialog Box button to make your selection and then click the Expand Dialog Box button (Figure 3–36) to expand the dialog box.
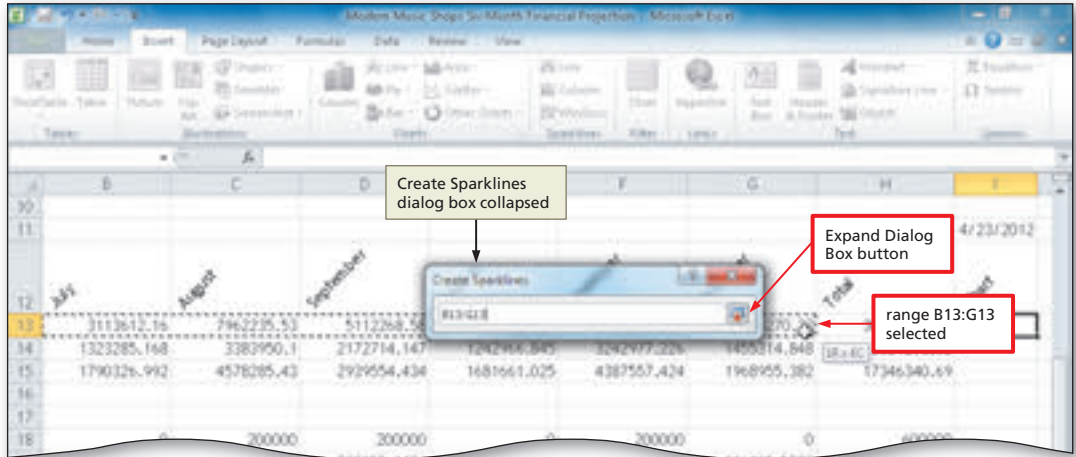
Figure 3–36

3

- Release the mouse button to insert the selected range, B13:G13 in this case, in the Data Range text box.

- Click the OK button (Create Sparklines dialog box) to insert a Line Sparkline chart in the selected cell and display the Sparkline Tools contextual tab (Figure 3–37).
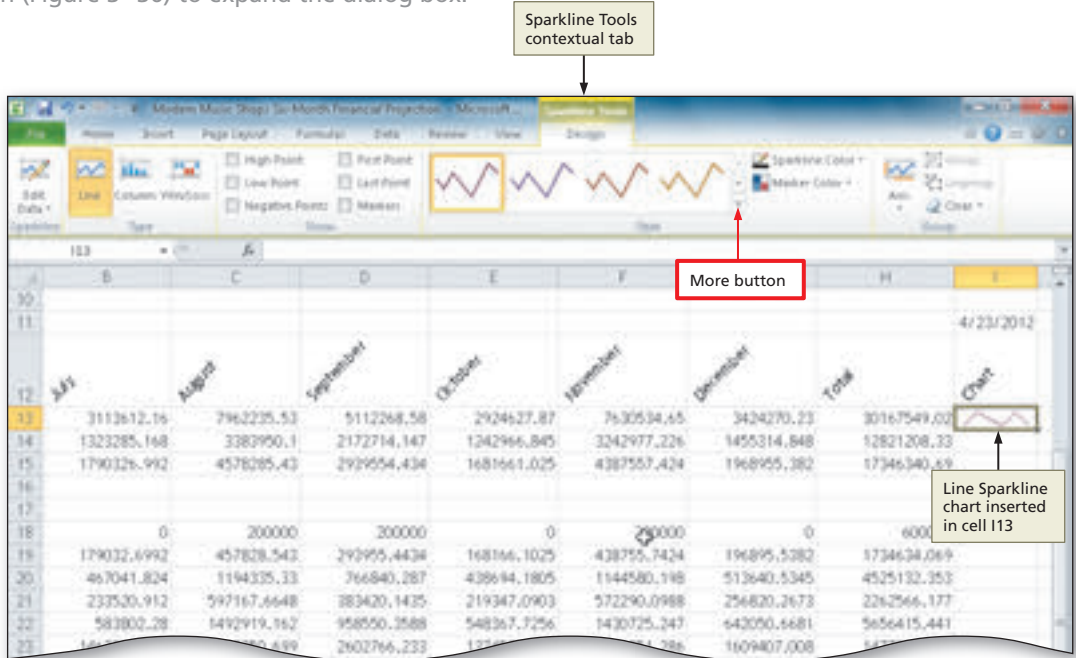
Figure 3–37

To Format and Copy the Sparkline Chart

Just as with standard charts, Excel provides formatting options for Sparkline charts. Sparkline chart formatting is restricted greatly as compared to standard charts. As shown in Figure 3–37, the Show group (Sparkline Tools Design tab) allows you to highlight various points in the chart. Markers provide a point on the chart for each cell represented in the chart. The Style group (Sparkline Tools Design tab) allows you to specify the style and color for the parts of a Sparkline chart.

The steps on the following page format the Sparkline chart in cell I13 using the Style 13 Sparkline chart style.

1

• Click the More button (Sparkline Tools Design tab | Style group) to display the Style gallery (Figure 3–38).

Sparkline Style Accent 1, (no dark or light) Sparkline style

Sparkline Style gallery
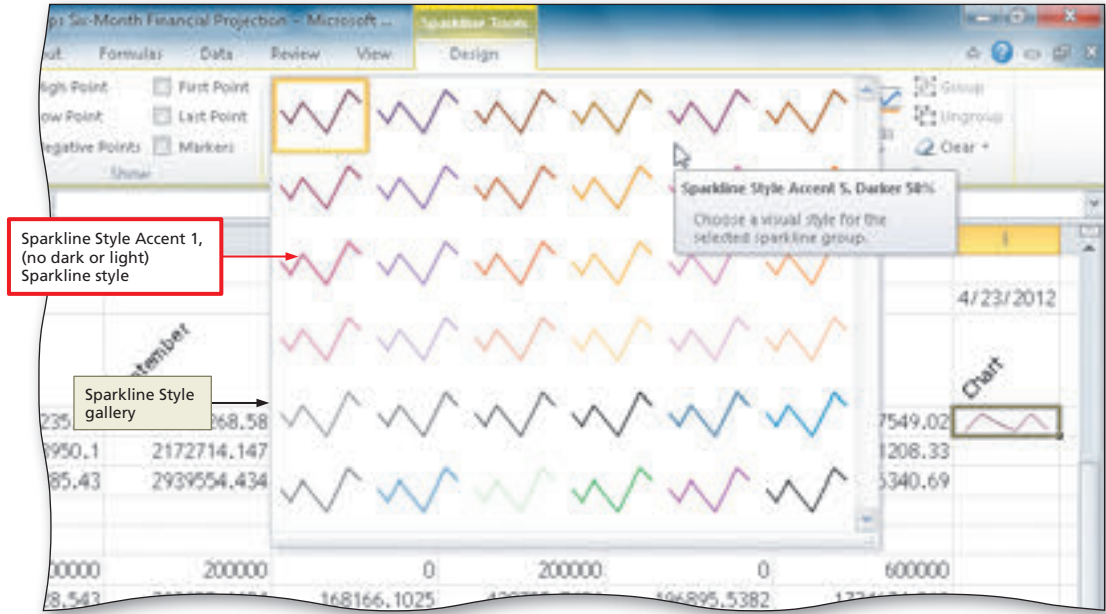
Figure 3–38

2

• Click Sparkline Style Accent 1, (no dark or light) in the Styles gallery to apply the style to the Sparkline chart in the selected cell, I13 in this case.

• Point to the fill handle in cell I13 and then drag through cell I25 to copy the Line Sparkline chart.

• Select cell I27 (Figure 3–39).

Q&A

Why do Sparkline charts not appear in cells I16, I17, and I24?

Excel does not draw Sparkline charts if the range for the Sparkline chart contains no data. In this case the ranges B16:G16, B17:G17, and B24:G24 do not contain data, so Excel draws no Sparkline chart. If you add data to cells in those ranges, then Excel automatically would draw Line Sparkline charts for the rows to which you added data because the Sparkline charts were defined for cells I16, I17, and I24 by the drag operation.

Line Sparkline chart copied to range I14:I25
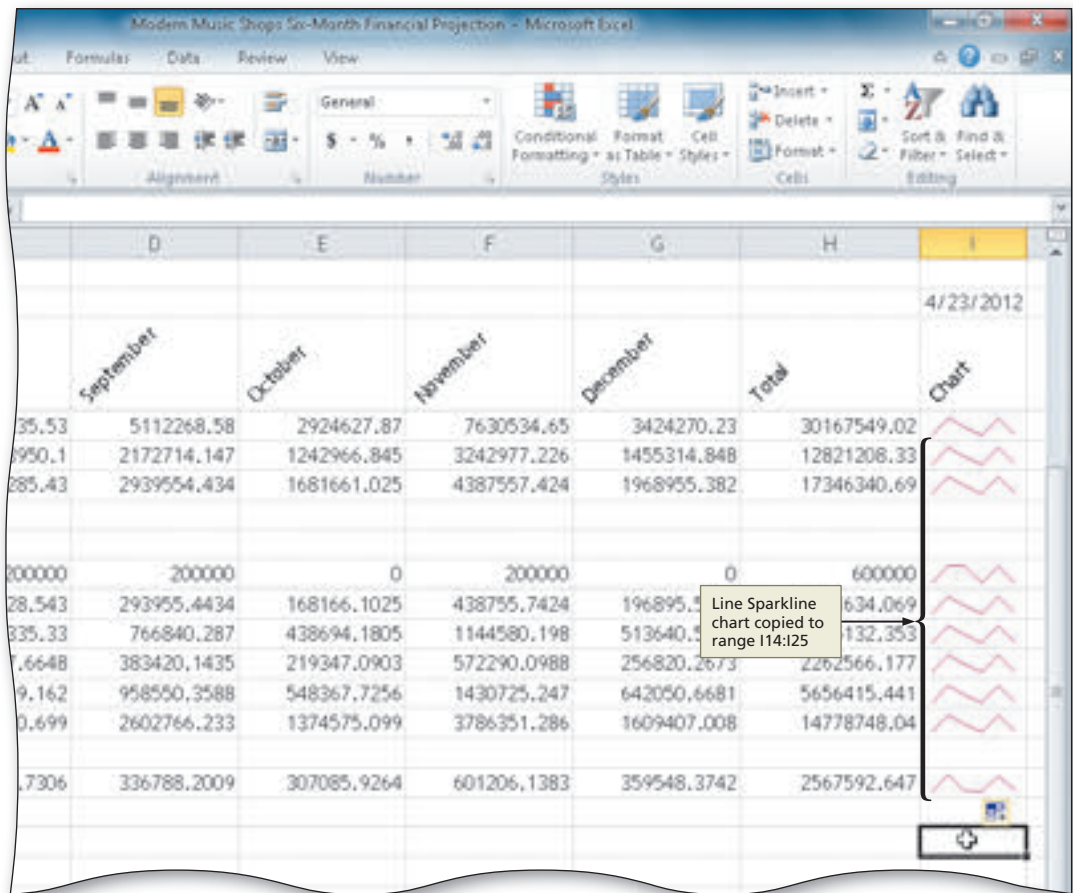
Figure 3–39

Formatting the Worksheet

The worksheet created thus far shows the financial projections for the six-month period, from July to December. Its appearance is uninteresting, however, even though some minimal formatting (formatting assumptions numbers, changing the column widths, formatting the date, and formatting the Sparkline chart) was performed earlier. This section will complete the formatting of the worksheet to make the numbers easier to read and to emphasize the titles, assumptions, categories, and totals as shown in Figure 3–40.

Identify how to format various elements of the worksheet.

A worksheet, such as the one presented in this chapter, should be formatted in the following manner: (1) format the numbers; (2) format the worksheet title, column titles, row titles, and total rows; and (3) format an assumptions table. Numbers in heading rows and total rows should be formatted with a currency symbol. Other dollar amounts should be formatted with a Comma style. An assumptions table should be diminished in its formatting so that it does not distract from the main calculations and data in the worksheet. Assigning the data in an assumptions table a smaller font size would set it apart from other data formatted with a larger font size.

Plan Ahead
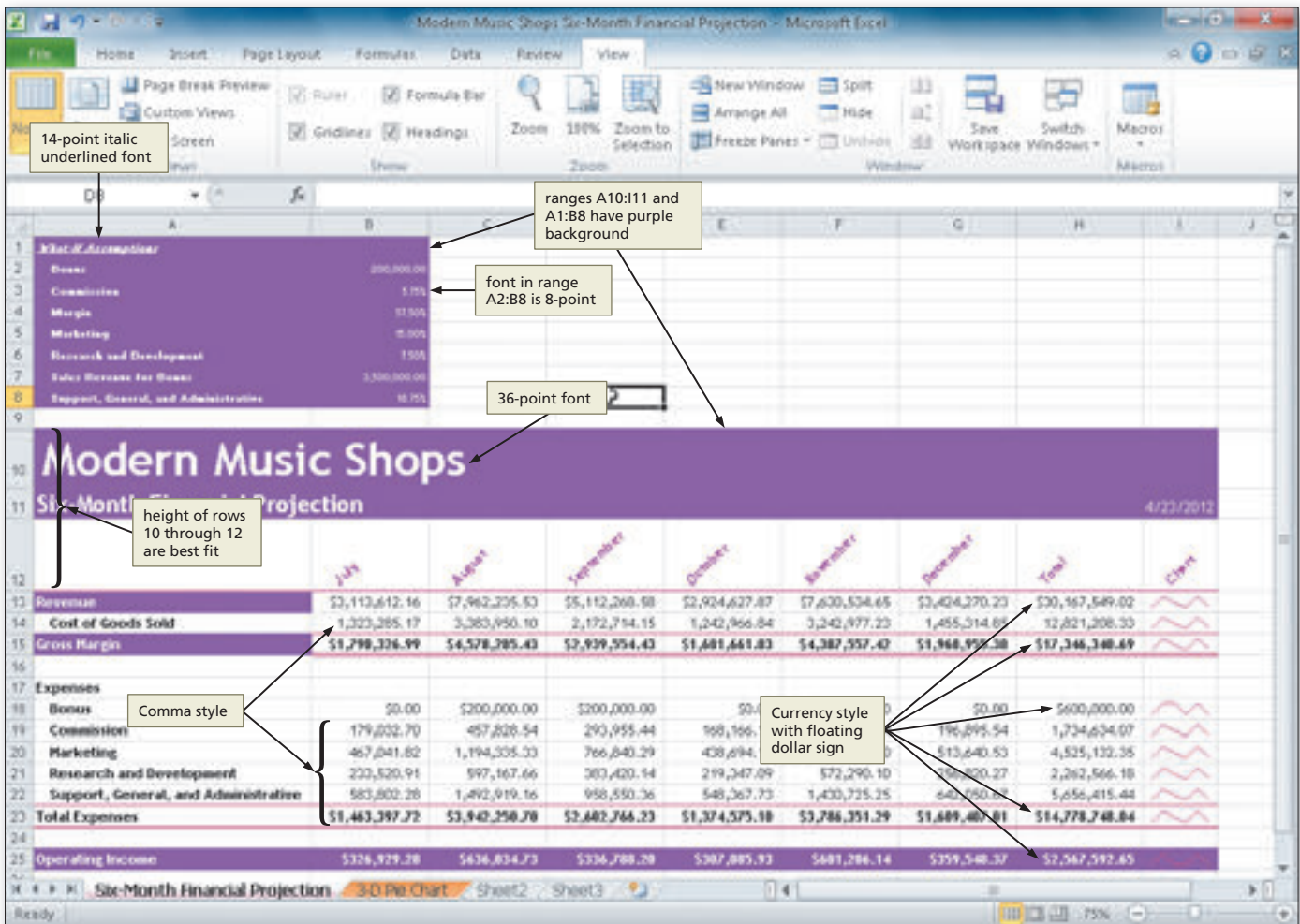
Figure 3–40

To Assign Formats to Nonadjacent Ranges

The numbers in the range B13:H25 are to be formatted as follows:

1. Assign the Currency style with a floating dollar sign to rows 13, 15, 18, 23, and 25.

2. Assign a Comma style to rows 14 and 19 through 22.

The following steps assign formats to the numbers in rows 13 through 25.

1

- Select the range B13:H13 as the first range to format.

- While holding down the CTRL key, select the nonadjacent ranges B15:H15, B18:H18, B23:H23, and B25:H25, and then release the CTRL key to select nonadjacent ranges.

- Click the Format Cells: Number Dialog Box Launcher (Home tab | Number group) to display the Format Cells dialog box.

- Click Currency in the Category list (Format Cells dialog box), if necessary select 2 in the Decimal places box, if necessary click $ in the Symbol list to ensure a dollar sign shows in the cells to be formatted, and click the black font color ($1,234.10) in the Negative numbers list to prepare the desired Currency style for the selected ranges (Figure 3–41).
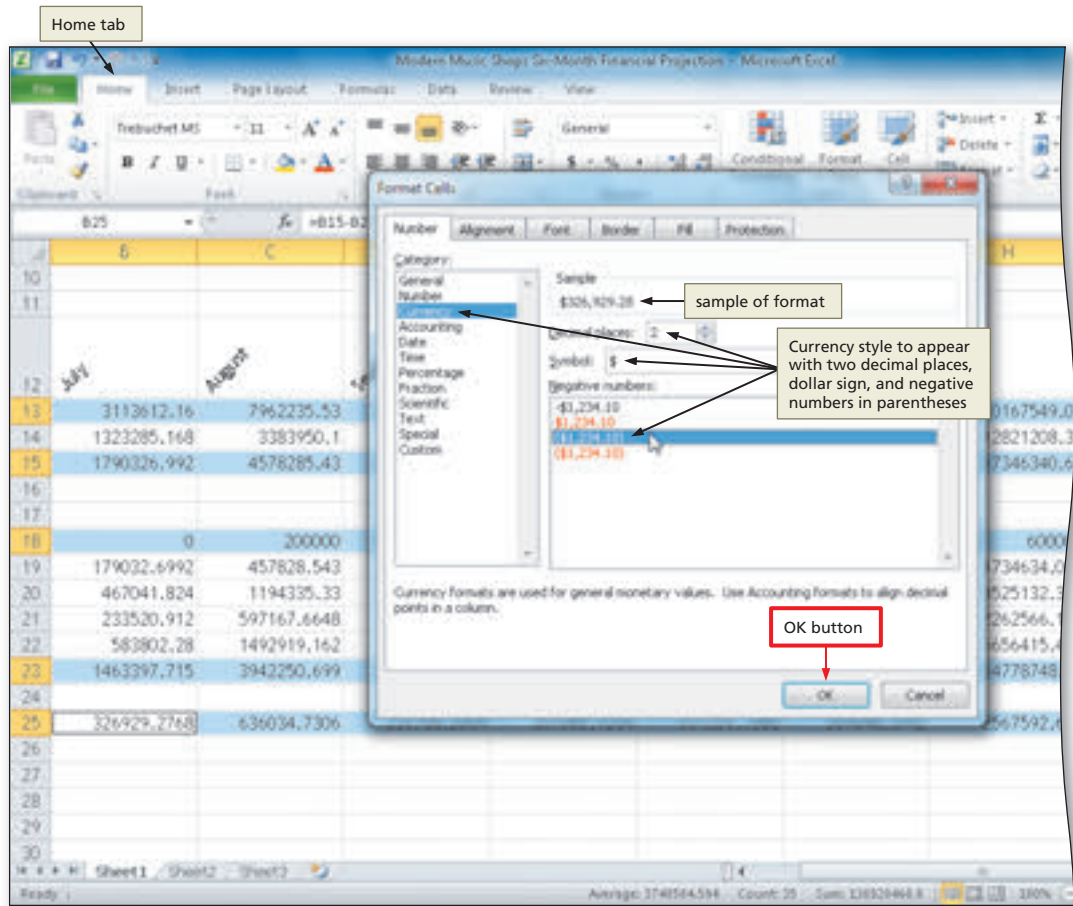
Figure 3–41

Q&A Why was the particular style chosen for the negative numbers?

In accounting, negative numbers often are shown with parentheses surrounding the value rather than with a negative sign preceding the value. Thus, the format (1,234.10) in the Negative numbers list was clicked. The data being used in this chapter contains no negative numbers. You must select a format for negative numbers, however, and you must be consistent if you are choosing different formats in a column; otherwise, the decimal points may not line up.

Q&A Why is the Format Cells dialog box used to create the format for the ranges in this step?

The requirements for this worksheet call for a floating dollar sign. To assign a Currency style with a floating dollar sign, use the Format Cells dialog box rather than the Accounting Style button (Home tab | Number group), which assigns a fixed dollar sign.

2

- Click the OK button (Format Cells dialog box) to close the Format Cells dialog box and apply the desired format to the selected ranges.

- Select the range B14:H14 as the next range to format.

- While holding down the CTRL key, select the range B19:H22, and then release the CTRL key to select nonadjacent ranges.

- Click the Format Cells: Number Dialog Box Launcher (Home tab | Number group) to display the Format Cells dialog box.
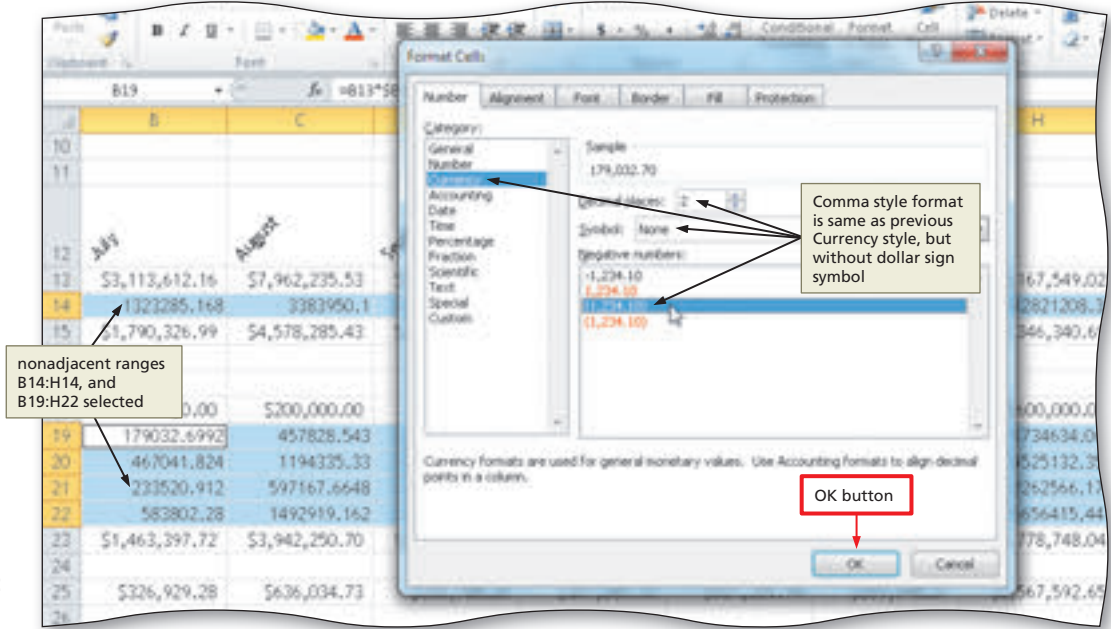
Figure 3–42

- Click Currency in the Category list (Format Cells dialog box), if necessary select 2 in the Decimal places box, click None in the Symbol list so a dollar sign does not show in the cells to be formatted, and click the black font color (1,234.10) in the Negative numbers list (Figure 3–42).

3

- Click the OK button (Format Cells dialog box) to close the Format Cells dialog box and apply the desired format to the selected ranges.

- Select cell B27 to select an empty cell and display the formatted numbers as shown in Figure 3–43.
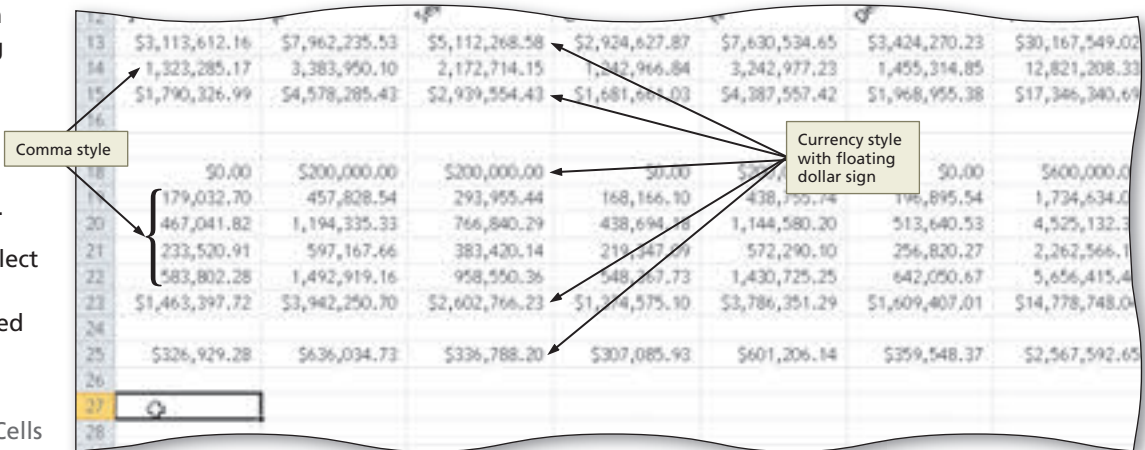
Figure 3–43

Q&A Why is the Format Cells dialog box used to create the style for the ranges in Steps 2 and 3?

The Format Cells dialog box is used to assign the Comma style, because the Comma Style button (Home tab | Number group) assigns a format that displays a dash (–) when a cell has a value of 0. The specifications for this worksheet call for displaying a value of 0 as 0.00 (see cell B18 in Figure 3–40) rather than as a dash. To create a Comma style using the Format Cells dialog box, you can assign a Currency style with no dollar sign.

Other Ways

1. Right-click range, click Format Cells on shortcut menu, click Number tab (Format Cells dialog box), click category in Category list, select format, click OK button (Format Cells dialog box)

2. Press CTRL+1, click Number tab (Format Cells dialog box), click category in Category list, select format, click OK button (Format Cells dialog box)

To Format the Worksheet Titles

The following steps emphasize the worksheet titles in cells A10 and A11 by changing the font, size, and color. The steps also format all of the row headers in column A with a bold font style.

1

- Press CTRL+HOME to select cell A1 and then click the column A heading to select the column.

- Click the Bold button (Home tab | Font group) to bold all of the data in the selected column.

- Select cell A10, click the Font Size box arrow (Home tab | Font group), and then click 36 in the Font Size list to increase the font size of the selected cell.

- Select cell A11, click the Font Size box arrow, and then click 18 in the Font Size list to increase the font size of the selected cell (Figure 3–44).
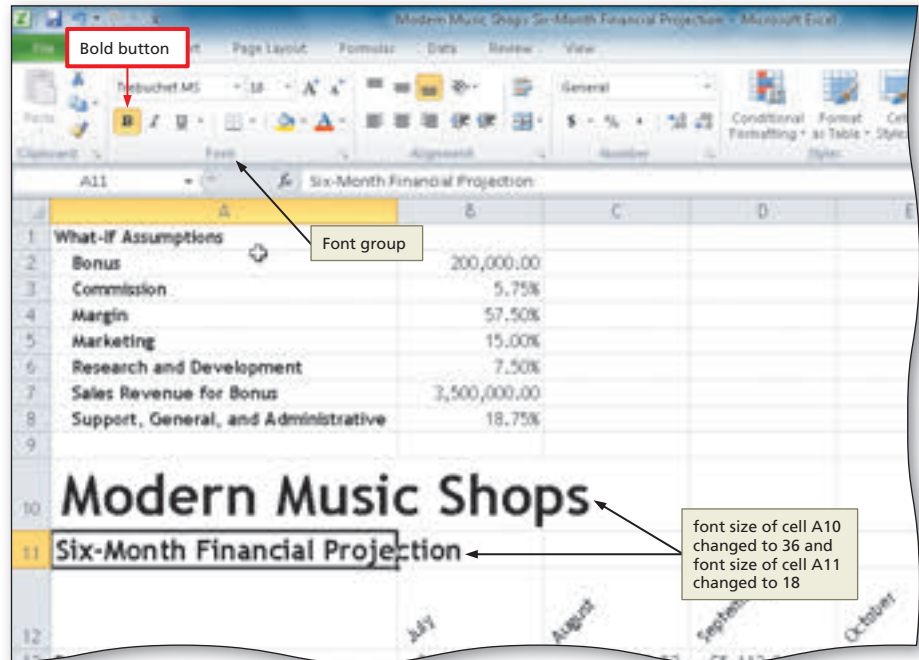
Figure 3–44

2

- Select the range A10:I11 and then click the Fill Color button arrow (Home tab | Font group) to display the Fill Color gallery.

- Click Purple, Accent 2, Darker 25% (column 6, row 5) in the Fill Color gallery to add a background color to the selected range.

- Click the Font Color button arrow (Home tab | Font group) and then select White, Background 1 (column 1, row 1) in the Font Color gallery to change the font color of the selected range (Figure 3–45).

Figure 3–45

Other Ways
1. Right-click range, click Format Cells on shortcut menu, click Fill tab (Format Cells dialog box) to color background (or click Font tab to color font), click OK button 2. Press CTRL+1, click Fill tab (Format Cells dialog box) to color background (or click Font tab to color font), click OK button

To Assign Cell Styles to Nonadjacent Rows and Colors to a Cell

The next step to improving the appearance of the worksheet is to format the heading in row 12 and the totals in rows 15, 23, and 25. The following steps format the heading in row 13 with the Heading 3 cell style and the totals in rows 15, 23, and 25 with the Total cell style. Cell A13 also is formatted with a background color and font color.

1 Select the range A12:I12 and apply the Heading 3 cell style.

2 Select the range A15:I15 and while holding down the CTRL key, select the ranges A23:I23 and A25:I25.

3 Apply the Total cell style to the selected nonadjacent ranges.

4 Select cell A13, click the Fill Color button arrow (Home tab | Font group), and then click the Purple, Accent 2, Darker 25% color (column 6, row 5) in the Fill Color gallery.

5 Click the Font Color button arrow (Home tab | Font group) and then click the White, Background 1 color (column 1, row 1) in the Font Color gallery (Figure 3–46).

Figure 3–46

To Copy a Cell's Format Using the Format Painter Button

Using the Format Painter, you can format a cell quickly by copying a cell's format to another cell or a range of cells. The following steps format cells A15 and the range A25:I25 using the Format Painter.

1

- If necessary, click cell A13 to select a source cell for the format to paint.

- Double-click the Format Painter button (Home tab | Clipboard group) and then move the mouse pointer onto the worksheet to cause the mouse pointer to change to a block plus sign with a paintbrush (Figure 3–47).
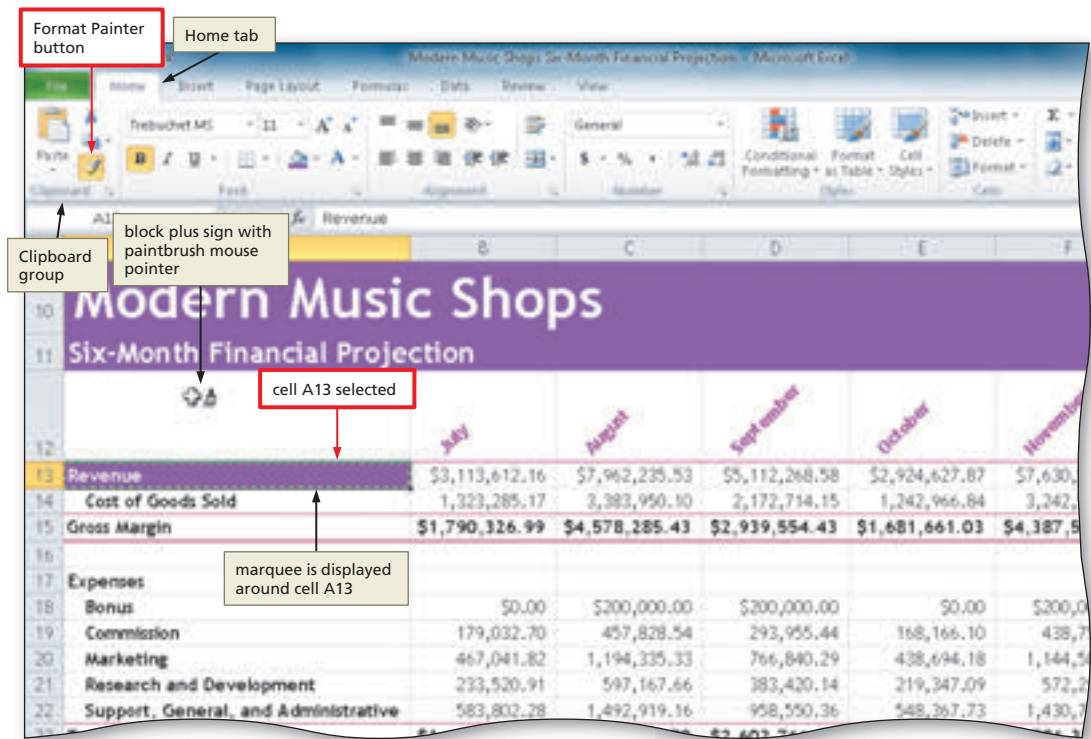
Figure 3–47

2

- Click cell A15 to assign the format of the source cell, A13 in this case, to the destination cell, A15 in this case (Figure 3–48).

Figure 3–48

Property of Cengage Learning
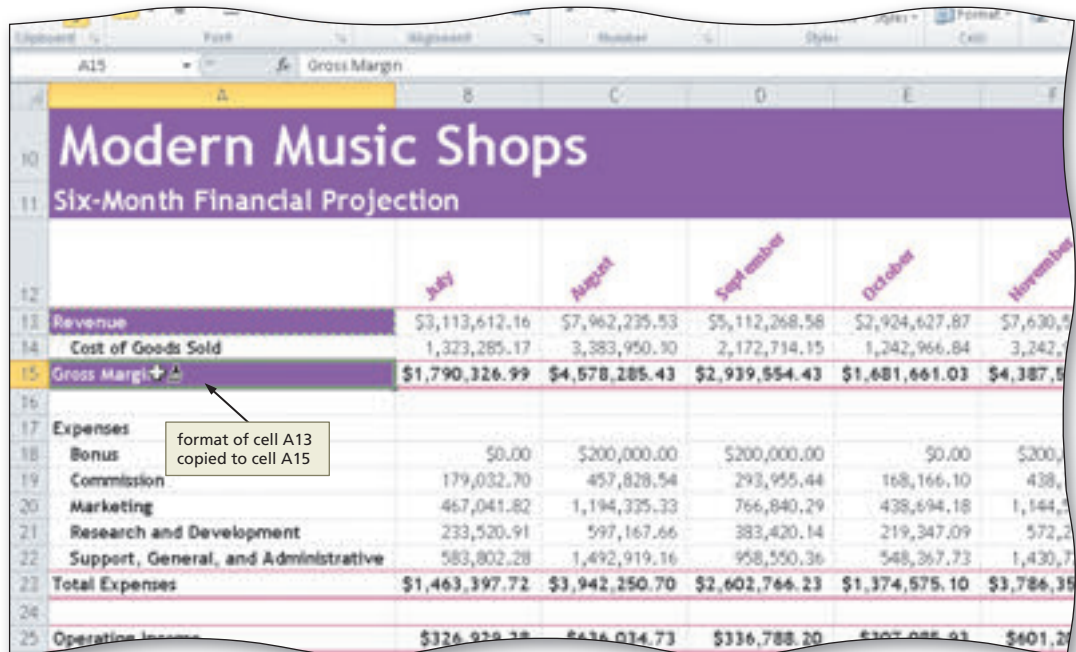
3

- With the mouse pointer still a block plus sign with a paintbrush, drag through the range A25:I25 to assign the format of the source cell, A13 in this case, to the destination range, A25:I25 in this case.

- Press the ESC key to stop the format painter.

- Apply the Currency style to the range B25:H25 to cause the cells in the range to appear with a floating dollar sign and two decimal places and then scroll the worksheet so that column A is displayed (Figure 3–49).
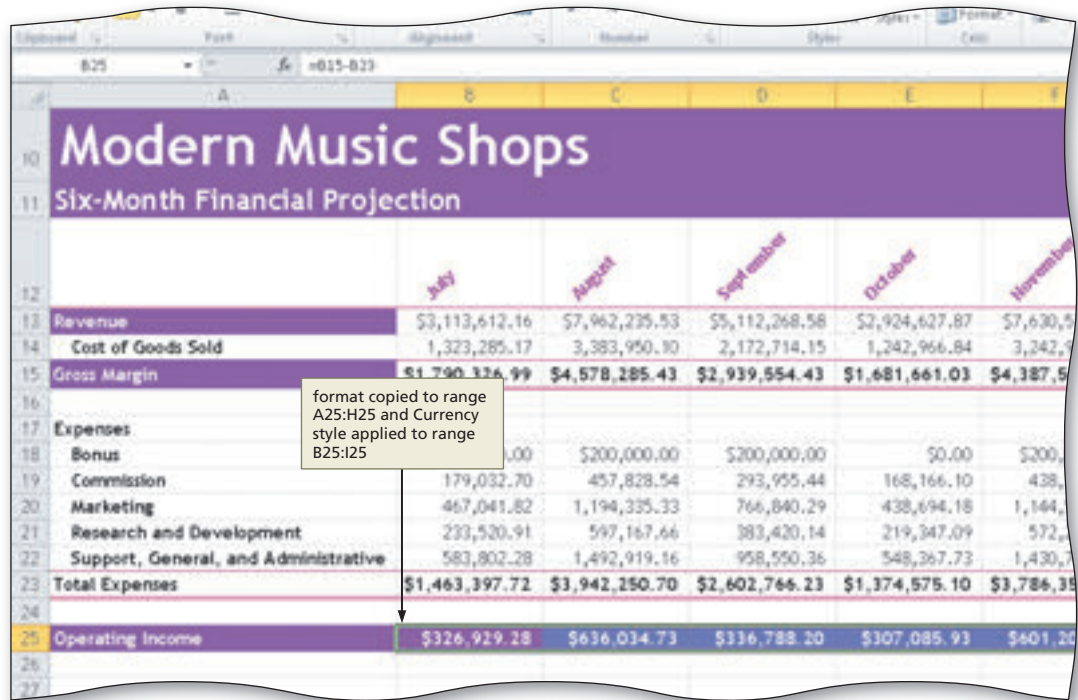

format copied to range A25:H25 and Currency style applied to range B25:I25

Figure 3–49

Q&A

Why does the Currency style need to be reapplied to the range B25:H25?

Sometimes, the use of the format painter results in unintended outcomes. In this case, the changing of the background fill color and font color for the range B25:H25 resulted in the loss of the Currency style because the format being copied did not included the Currency style. Reapplying the Currency style to the range results in the proper number style, fill color, and font color.

Other Ways

1. Click Copy button (Home tab | Clipboard group), select cell, click Paste button arrow (Home tab | Clipboard group), click Formatting icon on Paste gallery

2. Right-click cell, click Copy, right-click cell, click Formatting icon on shortcut menu

To Format the What-If Assumptions Table and Save the Workbook

The last step to improving the appearance of the worksheet is to format the What-If Assumptions table in the range A1:B8. The specifications in Figure 3–40 on page EX 173 require an 8-point italic underlined font for the title in cell A1 and 8-point font in the range A2:B8. The following steps format the What-If Assumptions table.

1 Press CTRL+HOME to select cell A1.

2 Click the Font Size button arrow (Home tab | Font group) and then click 8 in the Font Size list to decrease the font size of the selected cell.

3 Click the Italic button (Home tab | Font Group) and then click the Underline button (Home tab | Font group) to italicize and underline the text in the selected cell.

4 Select the range A2:B8, click the Font Size button arrow (Home tab | Font group) and then click 8 in the Font Size list to apply a smaller font size to the selected range.

5 Select the range A1:B8 and then click the Fill Color button (Home tab | Font group) to apply the most recently used background color to the selected range.

BTW

Painting a Format to Nonadjacent Ranges
Double-click the Format Painter button (Home tab | Clipboard group) and then drag through the nonadjacent ranges to paint the formats to the ranges. Click the Format Painter button (Home tab | Clipboard group) to deactivate it.

6 Click the Font Color button (Home tab | Font group) to apply the most recently used font color to the selected range.

7 Click cell D8 to deselect the range A2:B8 and display the What-If Assumptions table, as shown in Figure 3–50.

8 Save the workbook.

Q&A

What happens when I click the Italic and Underline buttons?

Recall that when you assign the italic font style to a cell, Excel slants the characters slightly to the right, as shown in cell A1 in Figure 3–50. The **underline** format underlines only the characters in the cell, rather than the entire cell, as is the case when you assign a cell a bottom border.

Figure 3–50

Adding a 3-D Pie Chart to the Workbook

The next step in the chapter is to draw the 3-D Pie chart on a separate sheet in the workbook, as shown in Figure 3–51. Use a **pie chart** to show the relationship or proportion of parts to a whole. Each slice (or wedge) of the pie shows what percent that slice contributes to the total (100%).

The 3-D Pie chart in Figure 3–51 shows the contribution of each month's projected operating income to the six-month projected operating income. The 3-D Pie chart makes it easy to evaluate the contribution of one month in comparison to the other months.

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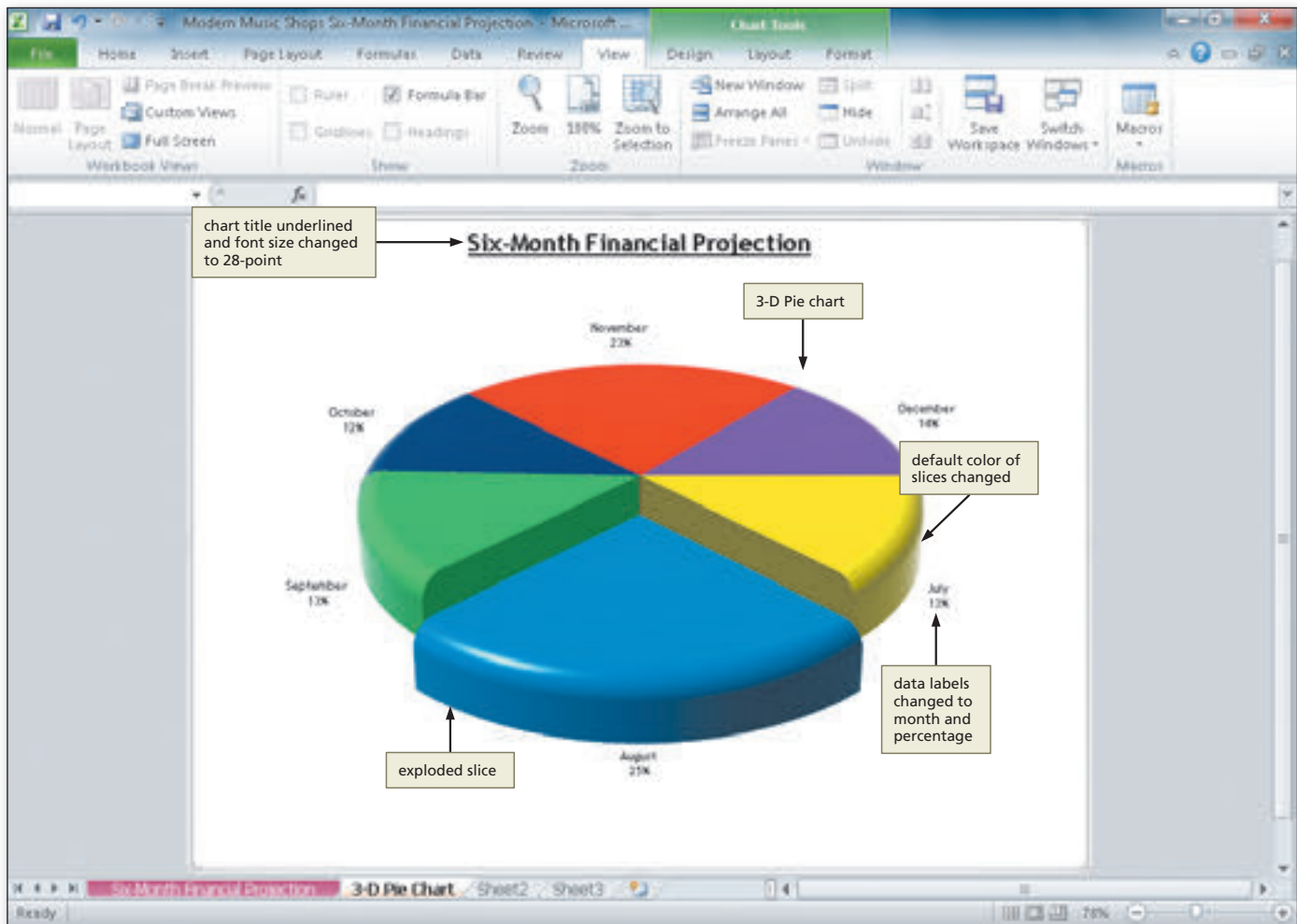
Figure 3–51

Unlike the 3-D Column chart created in Chapter 1, the 3-D Pie chart shown in Figure 3–51 is not embedded in the worksheet. Instead, the Pie chart resides on a separate sheet, called a **chart sheet**, which contains only the chart.

In this worksheet, the ranges to chart are the nonadjacent ranges B12:G12 (month names) and B25:G25 (monthly operating incomes). The month names in the range B12:G12 will identify the slices of the Pie chart; these entries are called **category names**. The range B25:G25 contains the data that determines the size of the slices in the pie; these entries are called the **data series**. Because six months are being charted, the 3-D Pie chart contains six slices.

The sketch of the 3-D Pie chart in Figure 3–3b on page EX 142 also calls for emphasizing the month of August by offsetting its slice from the main portion. A Pie chart with one or more slices offset is called an **exploded Pie chart**.

As shown in Figure 3–51, the default 3-D Pie chart also has been enhanced by rotating it, changing the colors of the slices, adding a bevel, and modifying the chart title and labels that identify the slices.

BTW

Chart Items
When you rest the mouse pointer over a chart item, such as a legend, bar, or axis, Excel displays a chart tip containing the name of the item.

To Draw a 3-D Pie Chart on a Separate Chart Sheet

The following steps draw the 3-D Pie chart on a separate chart sheet.

1

- Select the range B12:G12 to identify the range of the category name of the 3-D Pie Chart.

- If necessary, scroll the worksheet so that row 25 is displayed, and while holding down the CTRL key, select the range B25:G25.

- Display the Insert tab.

- Click the Pie button (Insert tab | Charts group) to display the Pie gallery (Figure 3–52).
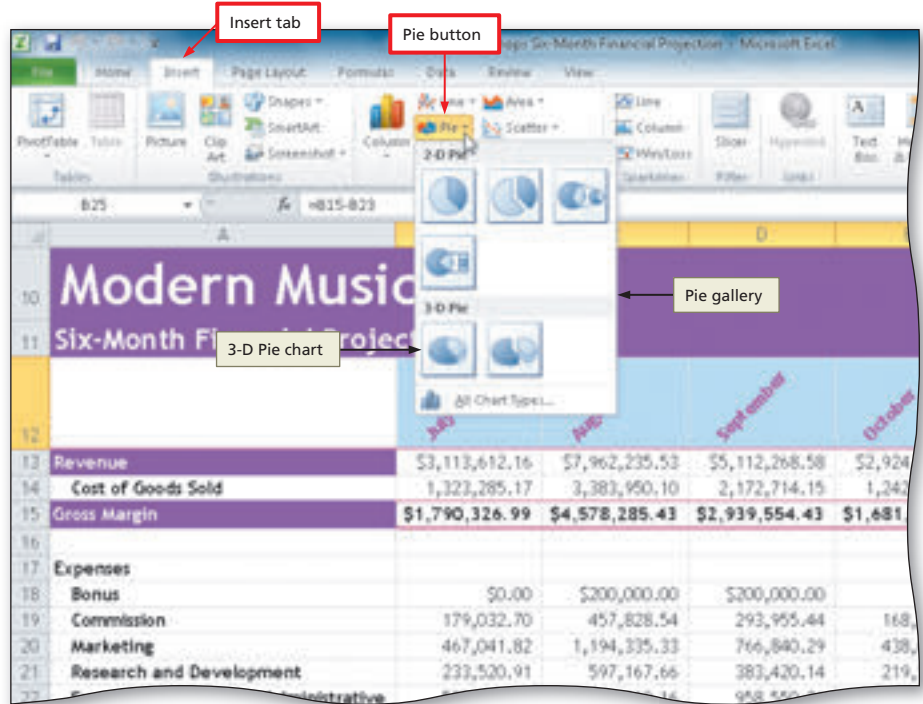
Figure 3–52

2

- Click Pie in 3-D chart in the Pie gallery to select the desired chart type.

- When Excel draws the chart, click the Move Chart button (Chart Tools Design tab | Location group) to display the Move Chart dialog box (Figure 3–53).
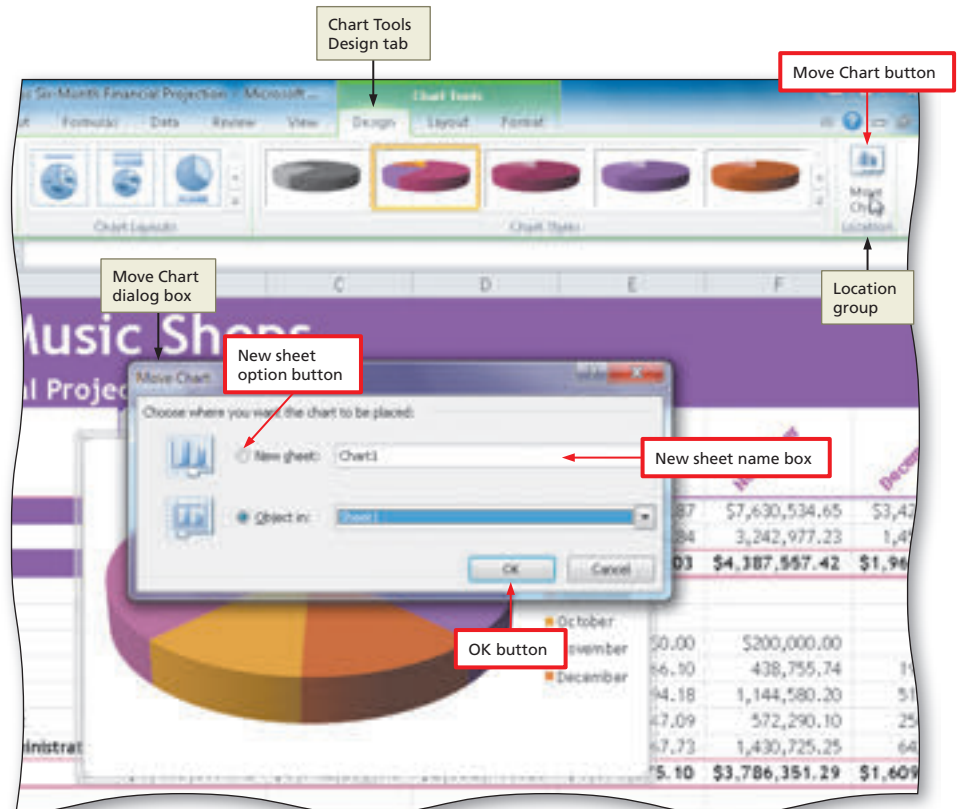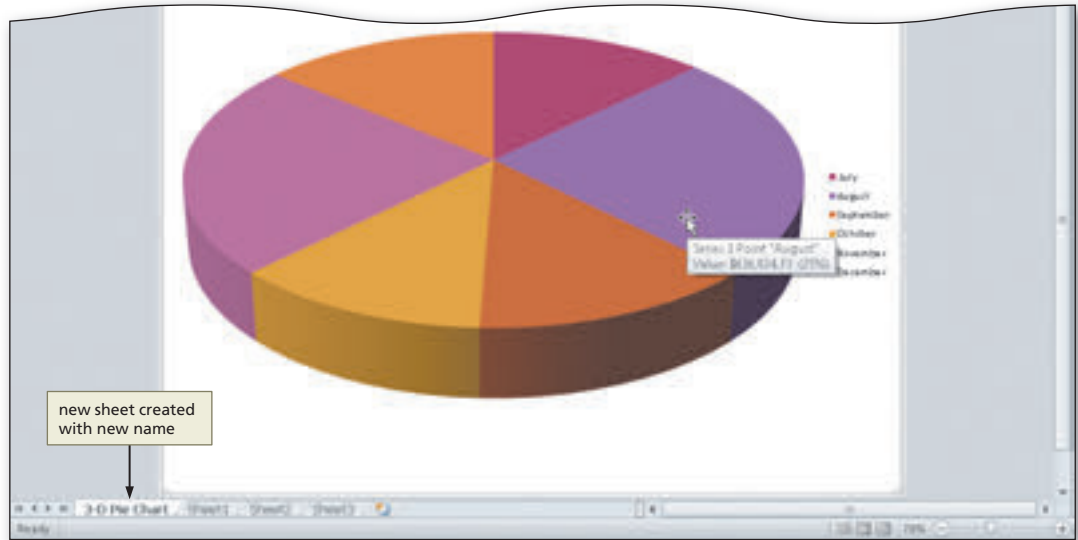
Figure 3–53

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3

- Click New sheet (Move Chart dialog box) and then type `3-D Pie Chart` in the 'New sheet name' text box to enter a sheet tab name for the chart sheet.

- Click the OK button (Move Chart dialog box) to move the chart to a new chart sheet with a new sheet name, 3-D Pie Chart in this case (Figure 3–54).


new sheet created with new name

Figure 3–54

Other Ways
1. Select range to chart, press F11

To Insert a Chart Title and Data Labels

The next step is to insert a chart title and labels that identify the slices. Before you can format a chart item, such as the chart title or data labels, you must select it. The following steps insert a chart title, remove the legend, and add data labels.

1

- Click anywhere in the chart area outside the chart to select the chart.

- Display the Chart Tools Layout tab and then click the Chart Title button (Chart Tools Layout tab | Labels group) to display the Chart Title gallery.

- Click the Centered Overlay Title command in the Chart Title gallery to add a chart title centered on top of the chart.

- Select the text in the chart title and then type `Six-Month Financial Projection` to add a new chart title (Figure 3–55).

Chart Tools Layout tab

Labels group

chart title

Figure 3–55

Property of Cengage Learning
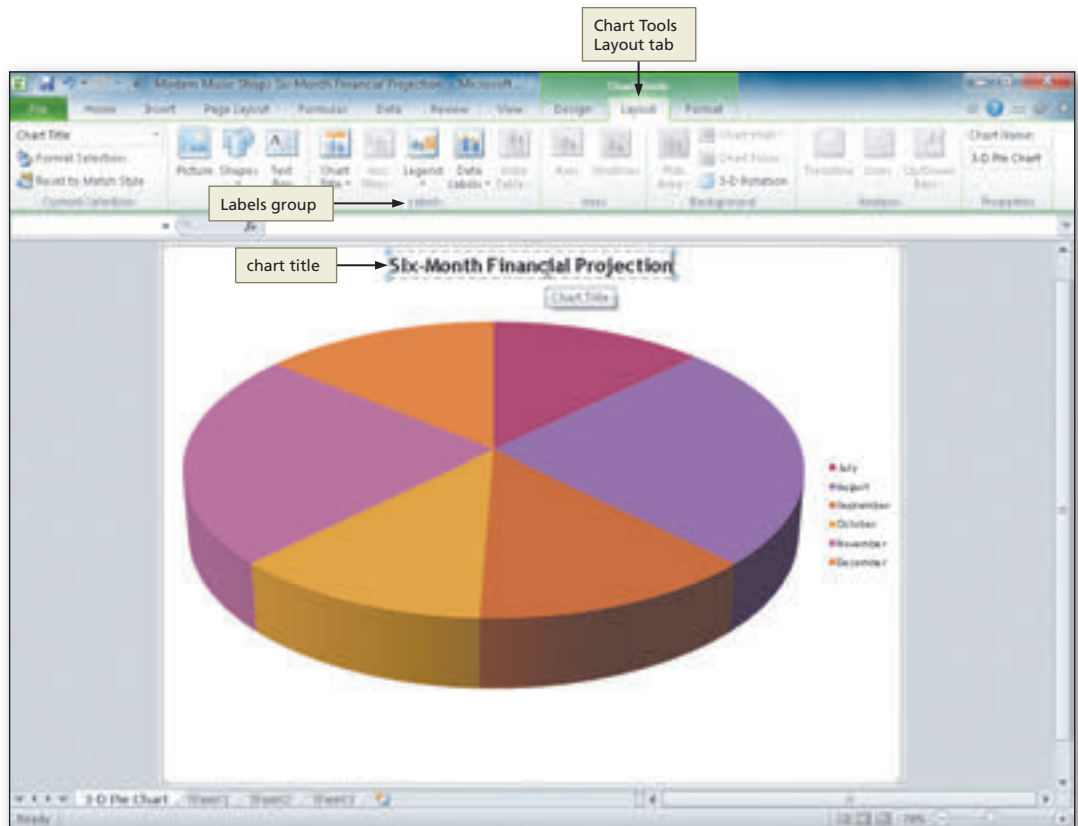
2

- Select the text in the new title and then display the Home tab.

- Click the Underline button (Home tab | Font group) to assign an underline font style to the chart title (Figure 3–56).
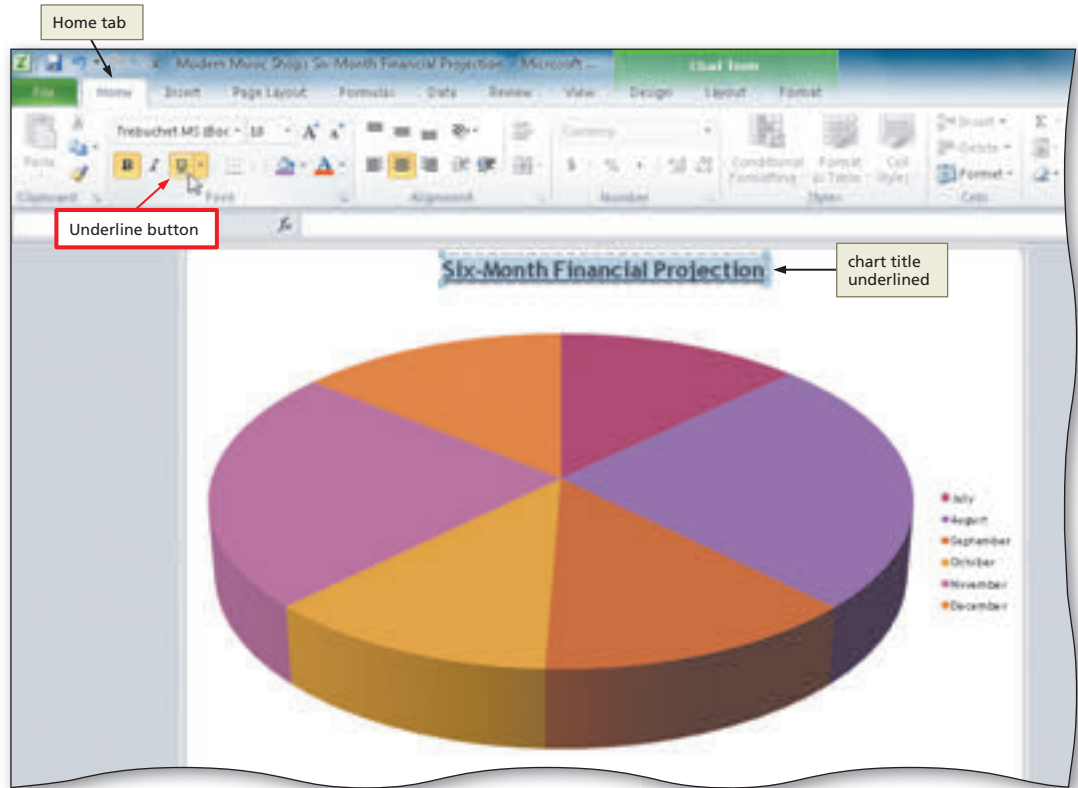

Figure 3–56

3

- Display the Chart Tools Layout tab and then click the Legend button (Chart Tools Layout tab | Labels group) to display the Legend gallery (Figure 3–57).
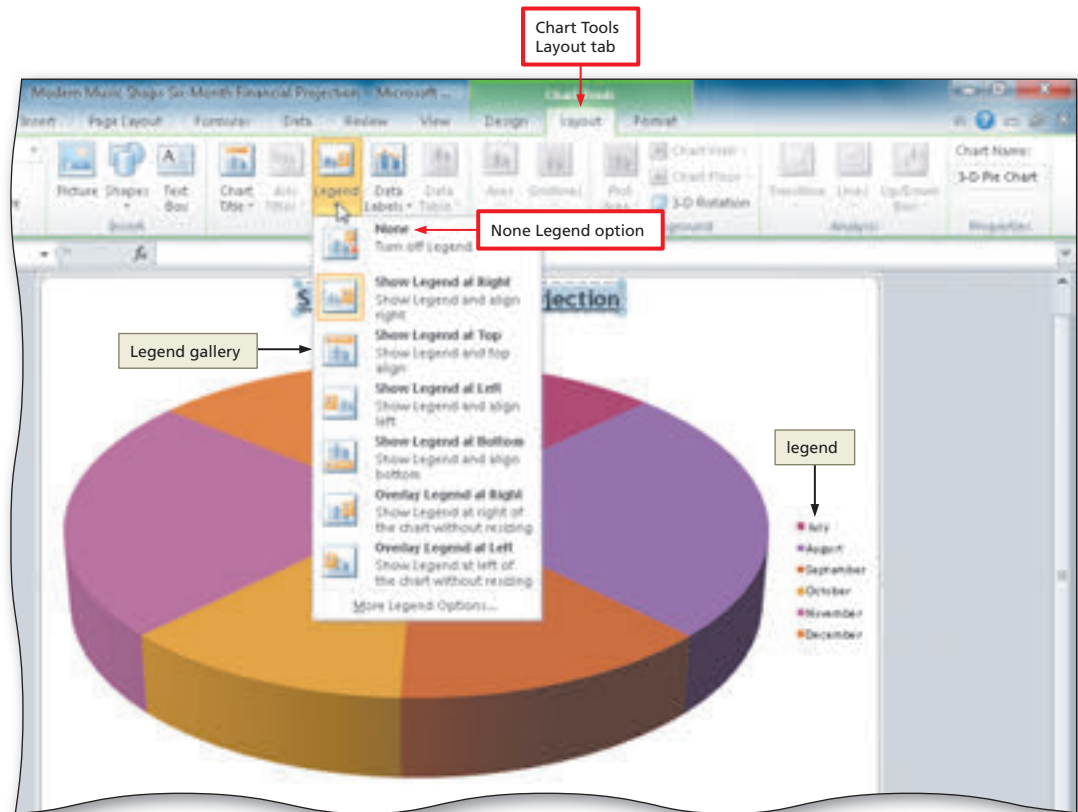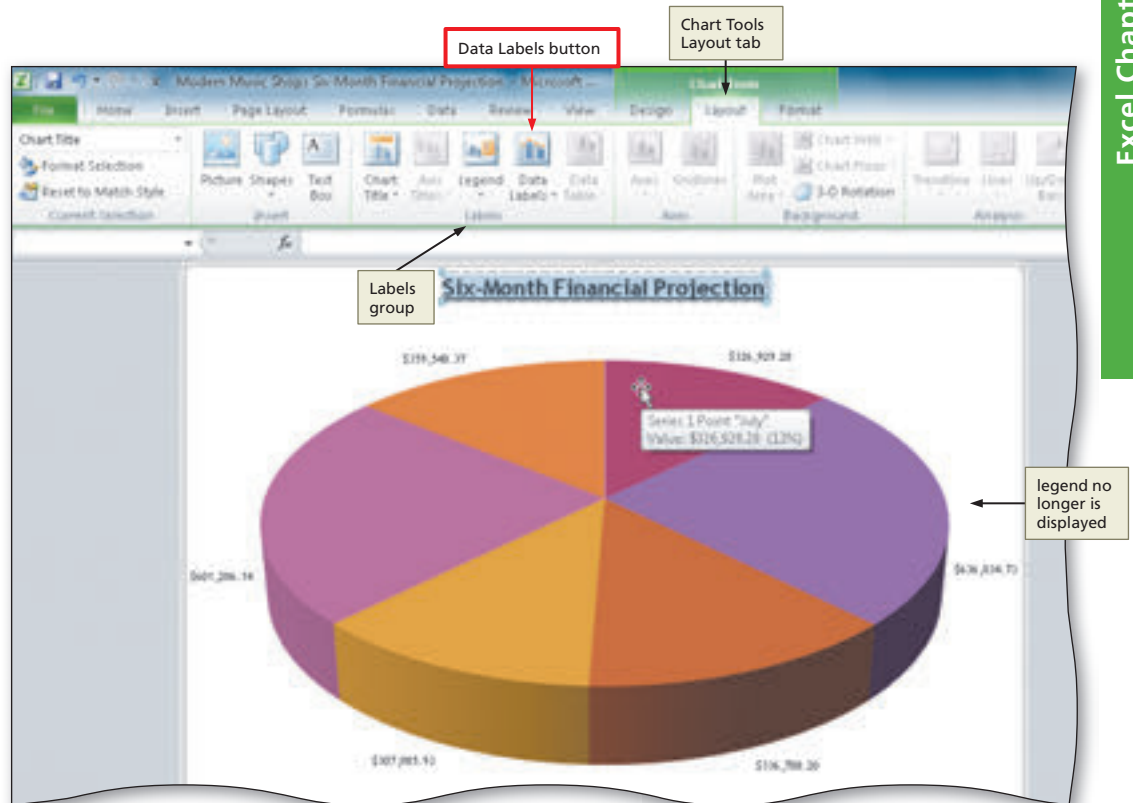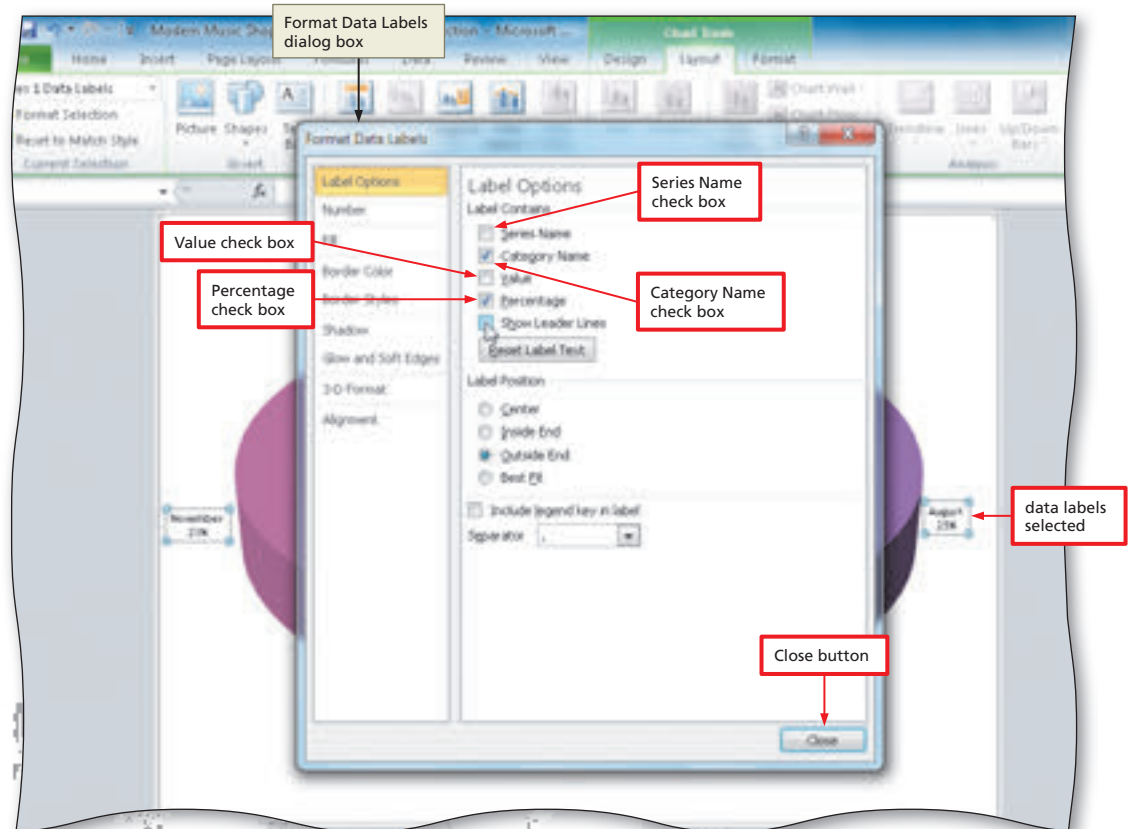

Figure 3–57

4

- Click the None Legend option in the Legend gallery to turn off the legend on the chart.

- Click the Data Labels button (Layout tab | Labels group) and then click Outside End in the Data Labels gallery to display data labels outside the chart at the end of each slice (Figure 3–58).

Figure 3–58

5

- If necessary, right-click any data label to select all of the data labels on the chart and to display a shortcut menu.

- Click the Format Data Labels command on the shortcut menu to display the Format Data Labels dialog box.

- If necessary, click the Series Name, Value, and Show Leader Lines check boxes to deselect them (Format Data Labels dialog box) and then click the Category Name and Percentage check boxes to cause the data labels to be displayed with category names and percent values, rather than currency values (Figure 3–59).

Figure 3–59

6

● Click the Close button
to close the Format
Data Labels dialog box
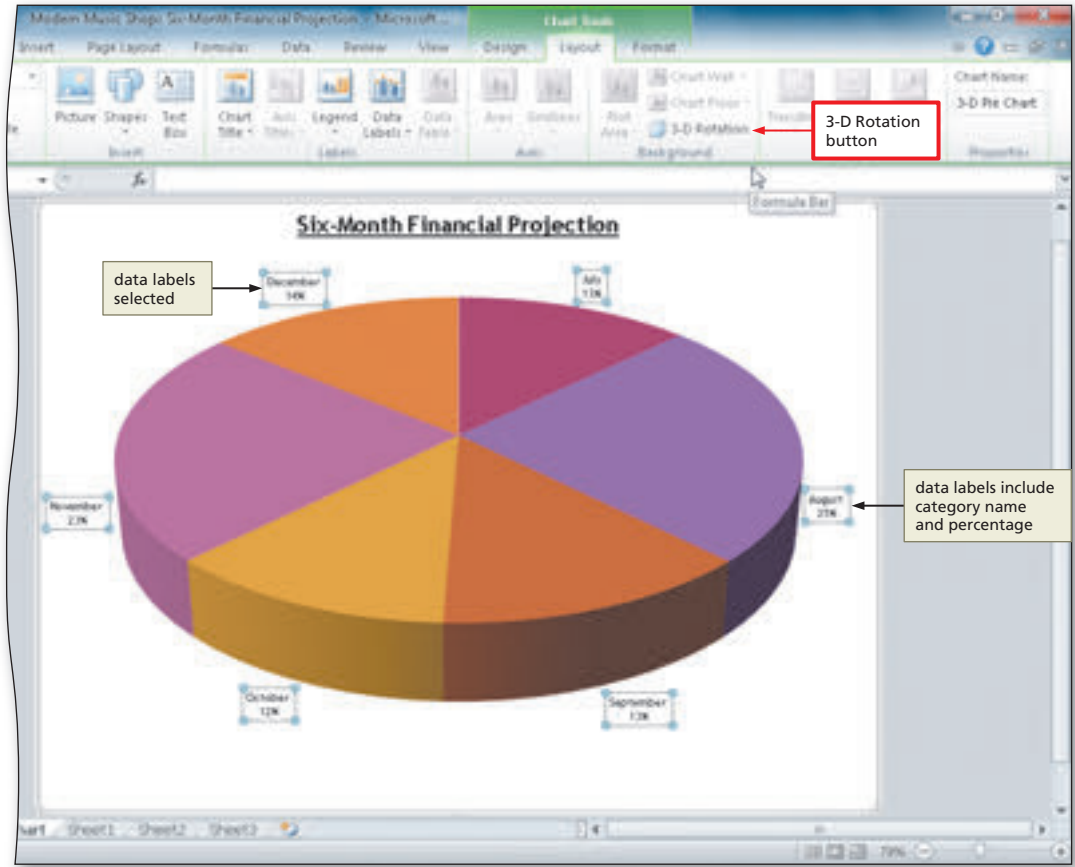and display the chart
(Figure 3–60).

Figure 3–60

To Rotate the 3-D Pie Chart

With a three-dimensional chart, you can change the view to better show the section of the chart you are trying
to emphasize. Excel allows you to control the rotation angle, elevation, perspective, height, and angle of the axes.

When Excel initially draws a Pie chart, it always positions the chart so that one of the dividing lines between
two slices is a straight line pointing to 12 o'clock (or 0°). As shown in Figure 3–60, the line that divides the
December and July slices currently is set to 0°. This line defines the rotation angle of the 3-D Pie chart.

To obtain a better view of the offset August slice, the largest slice, the 3-D Pie chart can be rotated 90° to
the left. The following steps rotate the 3-D Pie chart.

1

• Click the 3-D Rotation button (Chart Tools Layout tab | Background group) to display the Format Chart Area dialog box.

• Click the Increase X Rotation button in the Rotation area of the Format Chart Area dialog box until the X rotation is at 90° to rotate the chart (Figure 3–61).

Q&A

What happens as I click the Increase X Rotation button?

Excel rotates the chart 10° in a clockwise direction each time you click the Increase X Rotation button. The Y box in the Rotation area allows you to control the tilt, or elevation, of the chart. You can tilt the chart towards or away from your view in order to enhance the view of the chart.
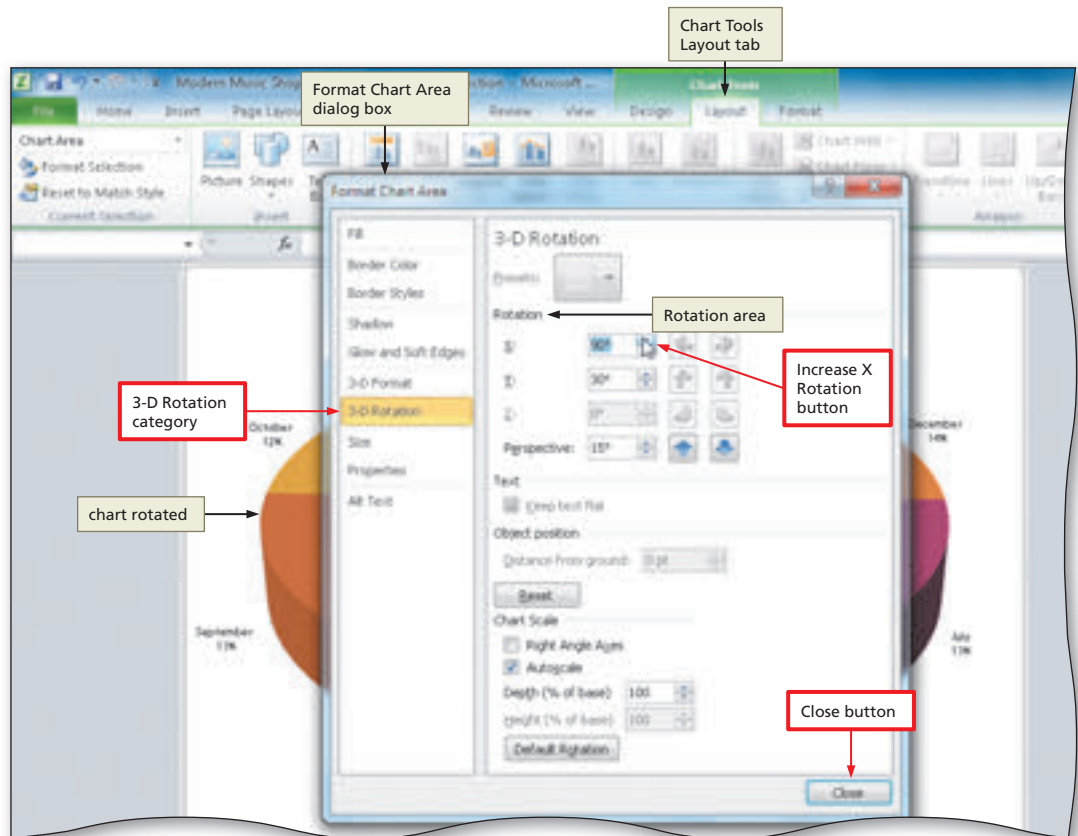
Figure 3–61

2

• Click the Close button (Format Chart Area dialog box) to close the dialog box and display the rotated chart (Figure 3–62).

Figure 3–62

Property of Cengage Learning
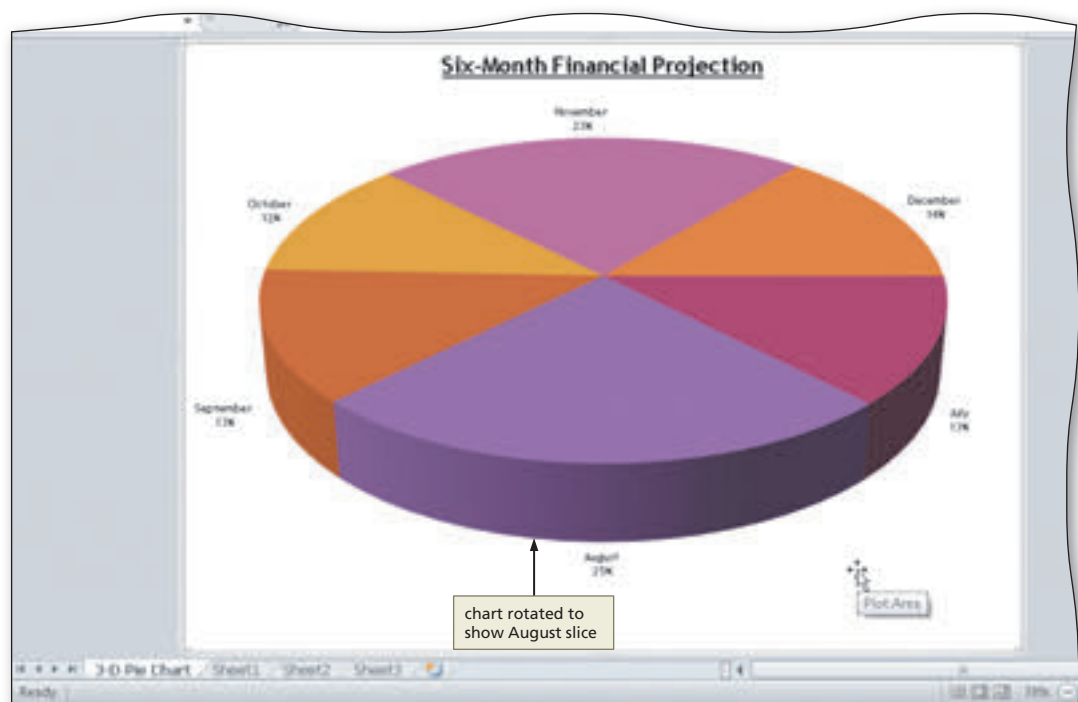
To Apply a 3-D Format to the Pie Chart

Excel allows you to apply dramatic 3-D visual effects to charts. The chart shown in Figure 3–62 could be enhanced with a bevel along the top edge. A bevel is a curve that is applied to soften the appearance of a straight edge. Excel also allows you to change the appearance of the material from which the surface of the chart appears to be constructed. The following steps apply a bevel to the chart and change the surface of the chart to a softer-looking material.

1

• Right-click the chart to display a shortcut menu and Mini toolbar (Figure 3–63).

Figure 3–63

2

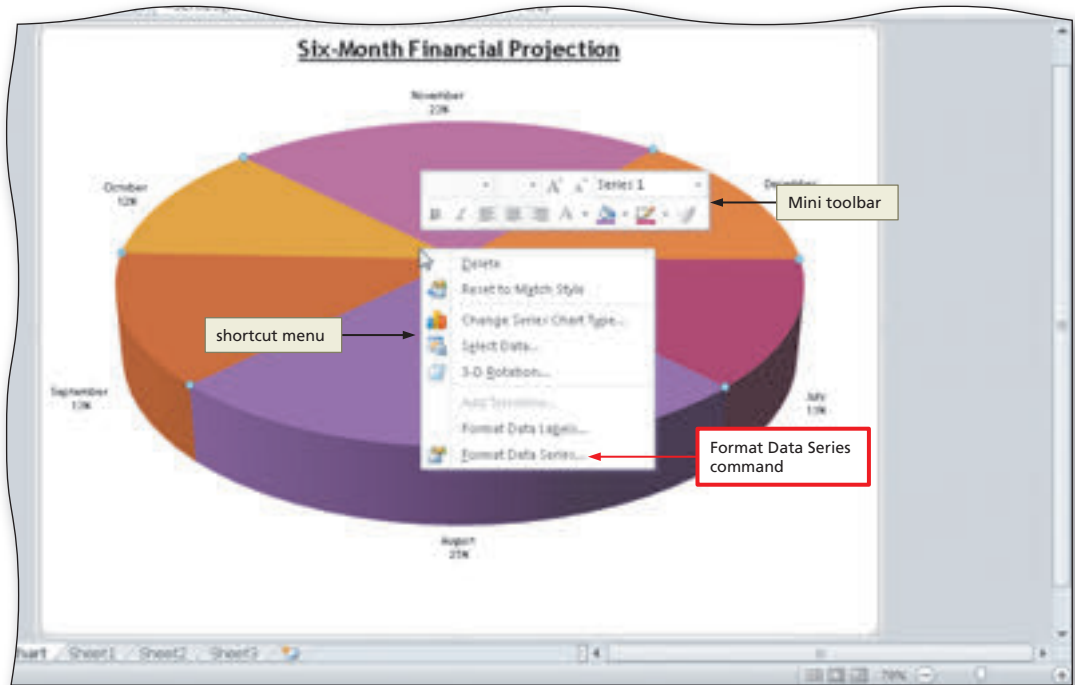• Click the Format Data Series command on the shortcut menu to display the Format Data Series dialog box and then click the 3-D Format category (Format Data Series dialog box) on the left side of the dialog box to display the 3-D Format panel.

• Click the Top button (Format Data Series dialog box) in the Bevel area to display the Bevel gallery (Figure 3–64).
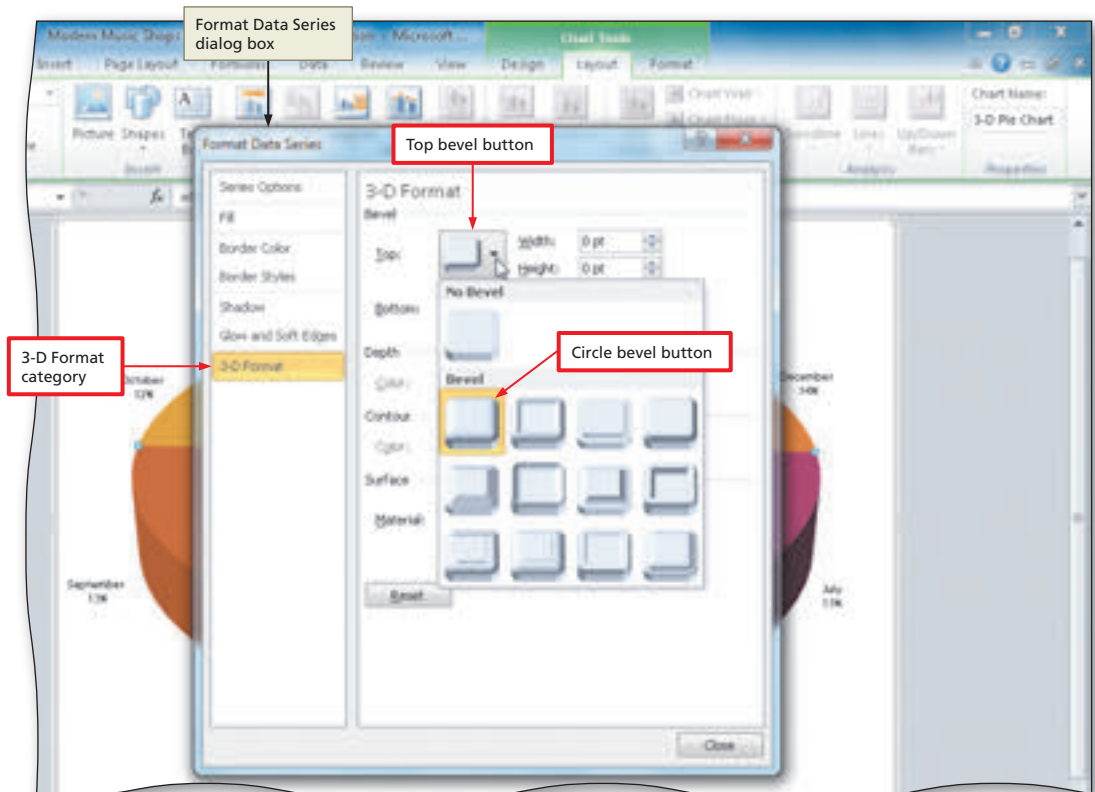

Figure 3–64

Property of Cengage Learning

3

- Click the Circle bevel button (column 1, row 1) in the Bevel gallery (Format Data Series dialog box) to add a bevel to the chart.

- Type **50 pt** in the uppermost Width box in the Bevel area (Format Data Series dialog box) and then type **50 pt** in the uppermost Height box in the Bevel area of the dialog box to increase the width and height of the bevel on the chart (Figure 3–65).
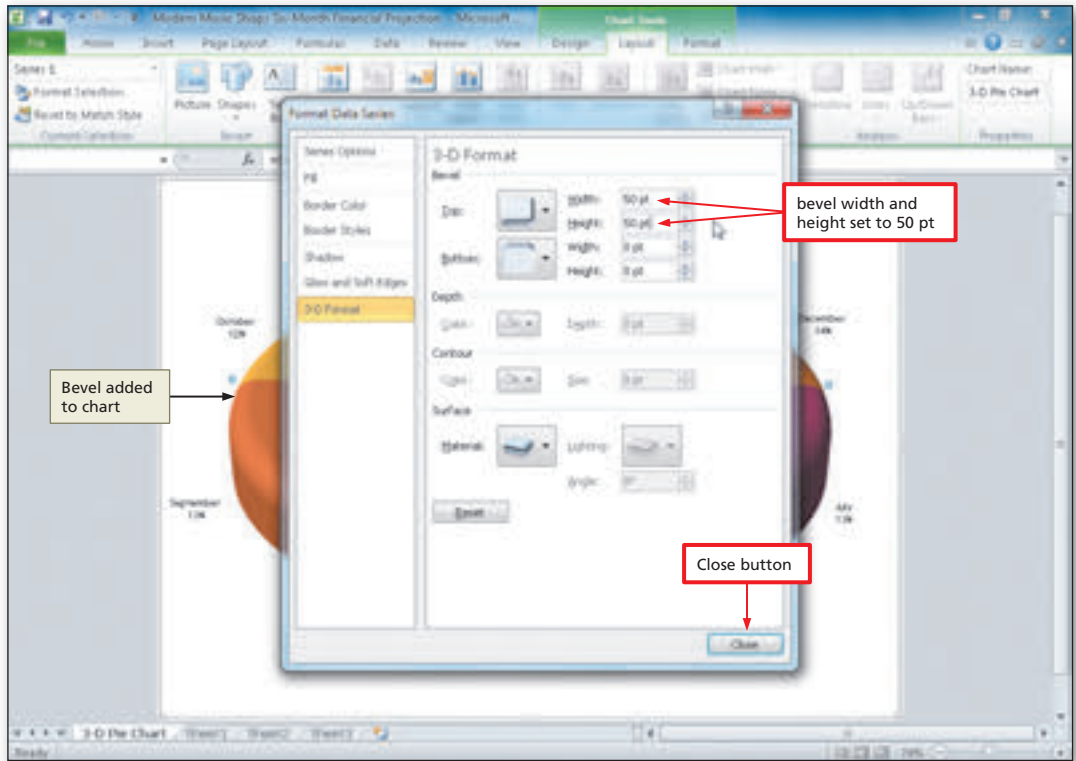
Figure 3–65

4

- Click the Material button in the Surface area (Format Data Series dialog box) to display the Material gallery (Figure 3–66).

Figure 3–66

Property of Cengage Learning
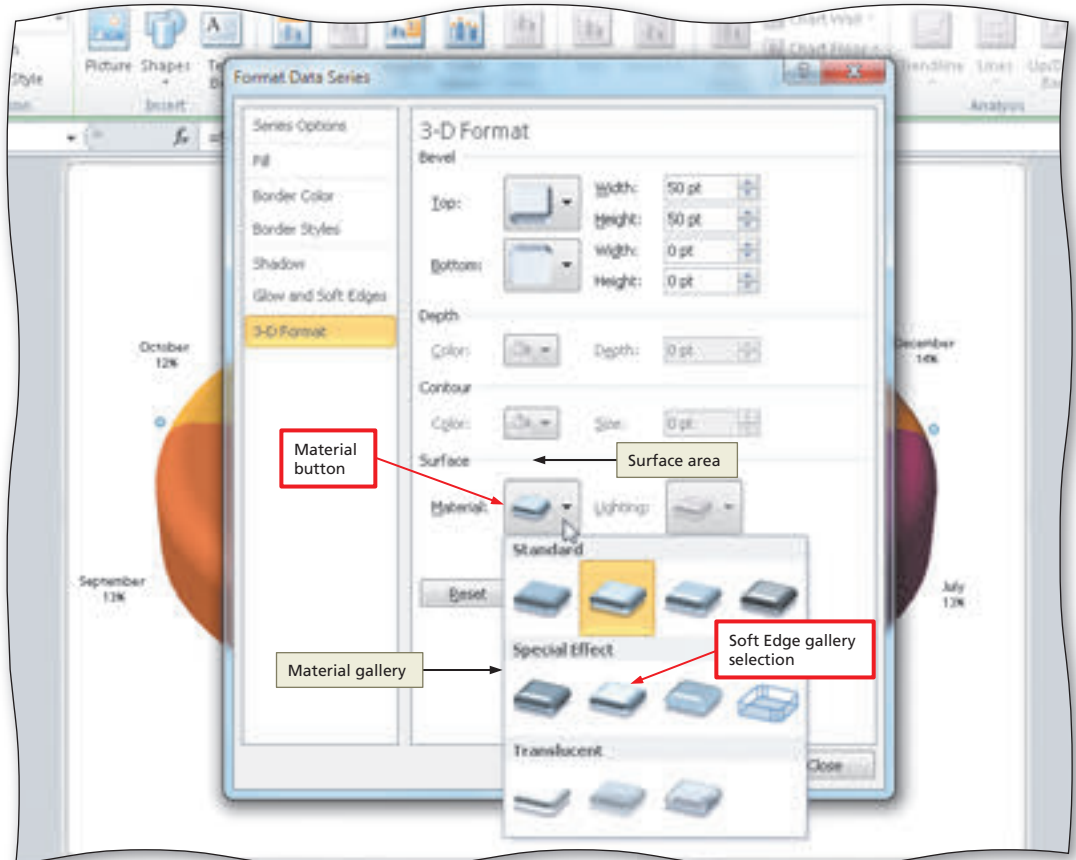
5

- Click the Soft Edge button (column 2, row 2) in the Material gallery and then click the Close button (Format Data Series dialog box) to apply the desired material and close the Format Data Series dialog box (Figure 3–67).
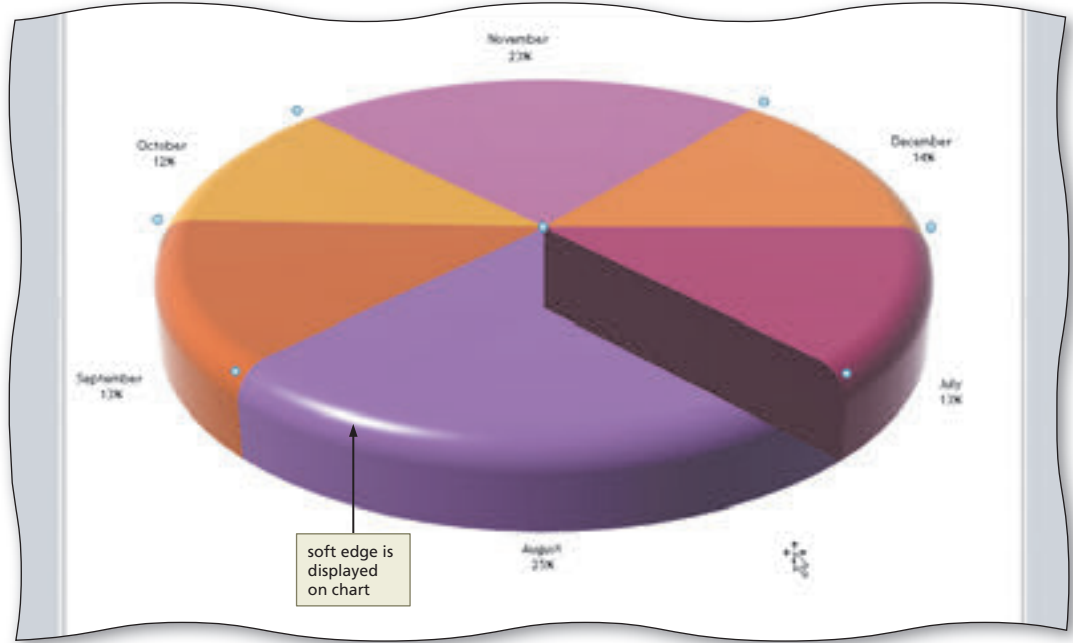
Figure 3–67

To Explode the 3-D Pie Chart and Change the Color of a Slice

The next step is to emphasize the slice representing August by offsetting, or exploding, it from the rest of the slices so that it stands out. The following steps explode the largest slice of the 3-D Pie chart and then change its color.

1

- Click the slice labeled August twice (do not double-click) to select only one slice of the 3-D Pie chart, the August slice in this case.

- Right-click the slice labeled August to display a shortcut menu and Mini toolbar (Figure 3–68).

Figure 3–68

Property of Cengage Learning

2

- Click Format Data Point on the shortcut menu to display the Format Data Point dialog box.

- Drag the Point Explosion slider (Format Data Point dialog box) to the right until the Point Explosion box reads 28% to set how far the slice in the 3-D Pie chart should be offset from the rest of the chart (Figure 3–69).

Q&A

Should I offset more slices?

You can offset as many slices as you want, but remember that the reason for offsetting a slice is to emphasize it. Offsetting multiple slices tends to reduce the impact on the reader and reduces the overall size of the Pie chart.
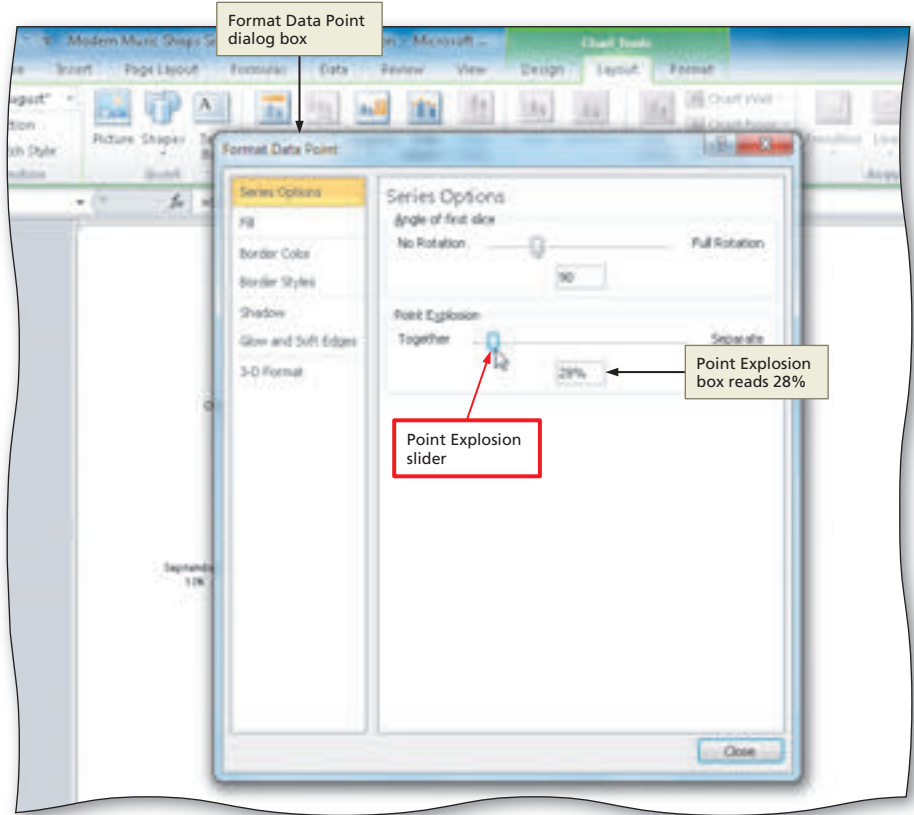
Figure 3–69

3

- Click the Fill category (Format Data Point dialog box) on the left side of the dialog box to display the Fill panel.

- Click Solid fill to display the Fill Color area and then click the Color button to display the Color gallery.

- Click the Blue color in the Standard Colors area of the color gallery and then click the Close button (Format Data Point dialog box) to change the color of the selected slice and close the dialog box (Figure 3–70).
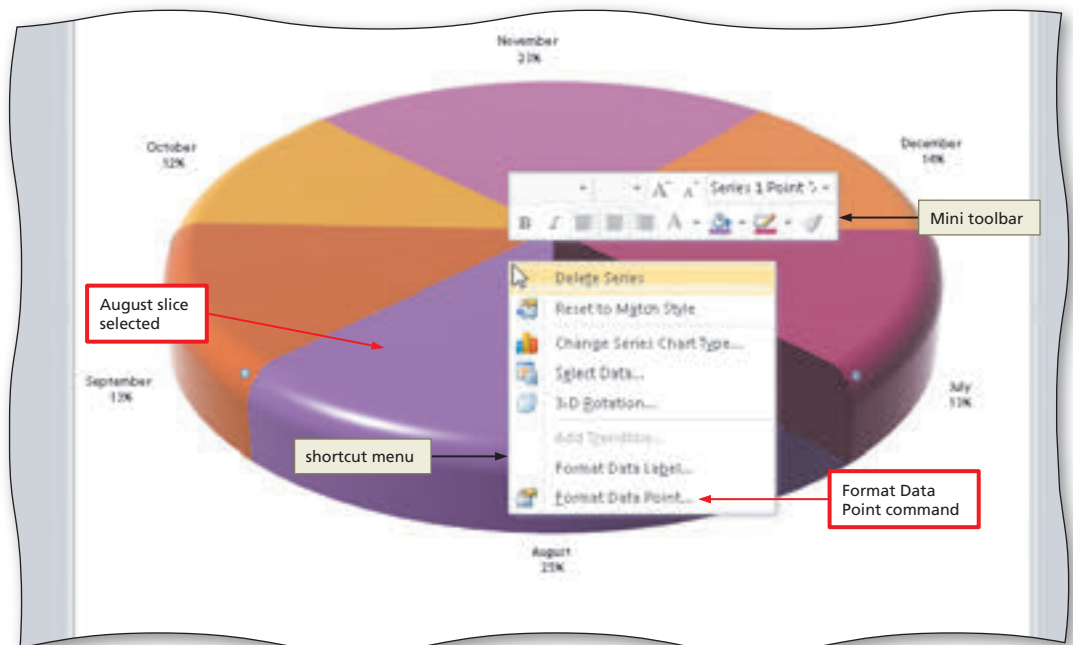

Figure 3–70

Other Ways

1. Right-click slice, click Shape Fill Color button arrow on Mini toolbar, select color

To Change the Colors of the Remaining Slices

Exploding a 3-D Pie Chart
If you click a 3-D Pie chart so that all of the slices are selected, you can drag one of the slices to explode all of the slices.

The colors of the remaining slices also can be changed to enhance the appeal of the chart. The following steps change the color of the remaining five chart slices.

1 Right-click the slice labeled July to select only the July slice, and display a shortcut menu and Mini toolbar.
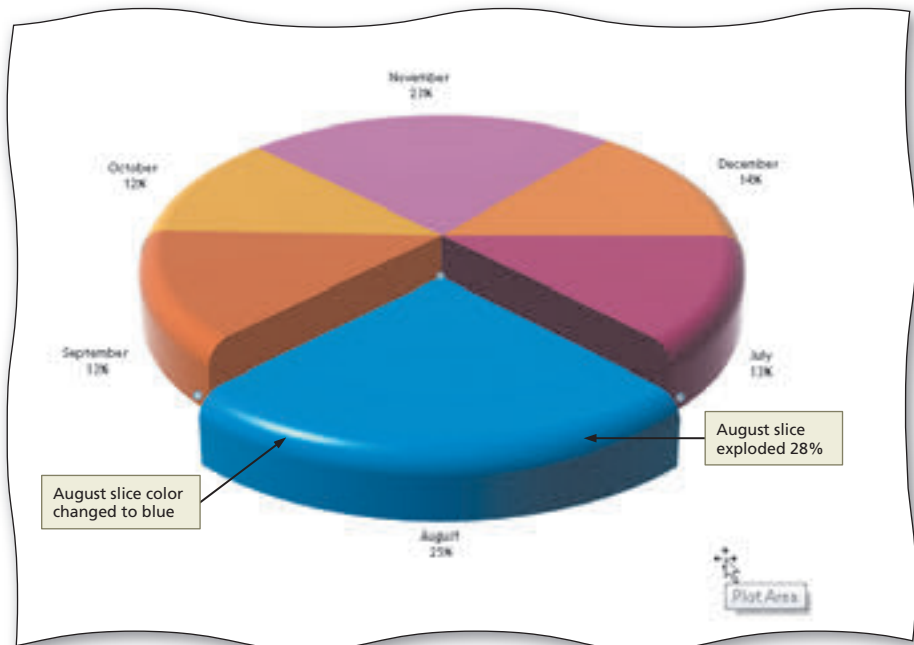
2 Click the Shape Fill button arrow on the Mini toolbar to display the Color gallery.

3 Click the Yellow color in the Standard Colors area in the Color gallery to change the color of the slice.

4 Repeat Steps 1 through 3 for the remaining four slices. Assign the following colors in the Standard Colors area in the color gallery to each slice: September – Green; October – Dark Blue; November – Red; December – Purple.

5 Click anywhere outside the chart to deselect the December slice (Figure 3–71). The completed chart appears as shown in Figure 3–71.
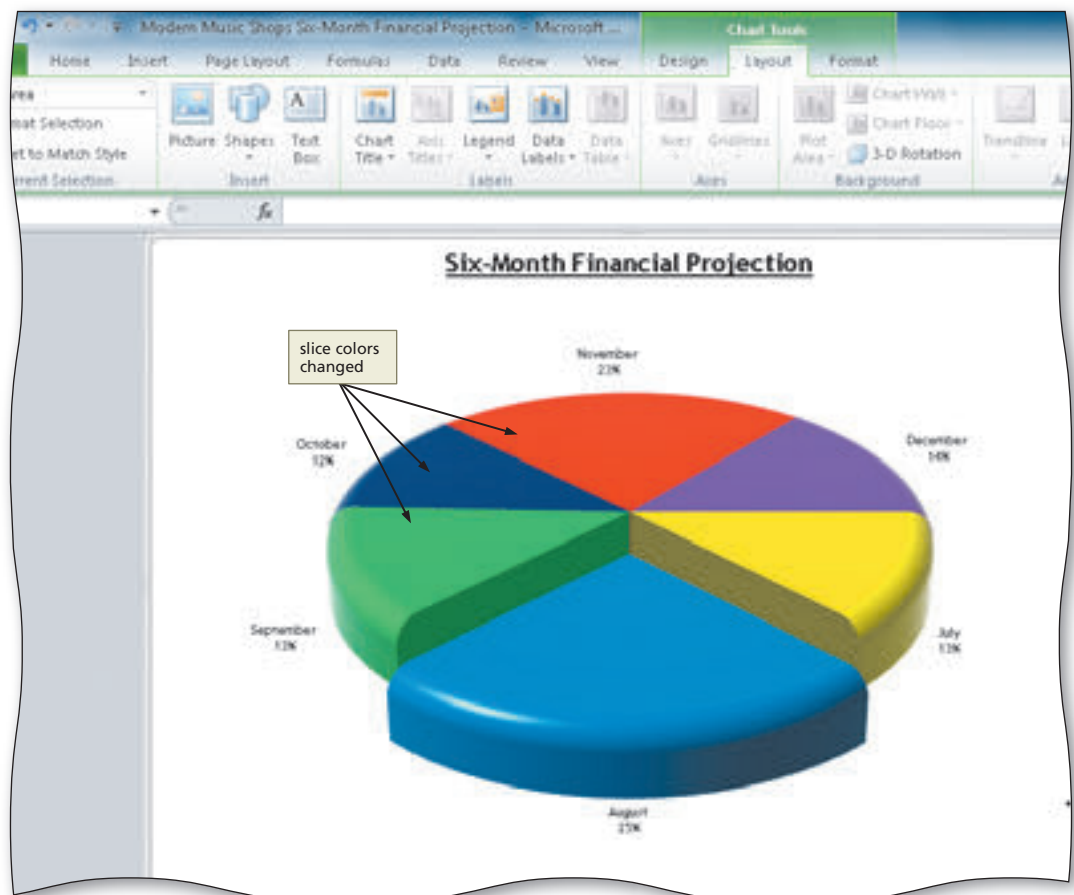
Figure 3–71

Renaming and Reordering the Sheets and Coloring their Tabs

The final step in creating the workbook is to reorder the sheets and modify the tabs at the bottom of the screen.

To Rename the Sheets and Color Their Tabs

The following steps rename the sheets and color the sheet tabs.

1 Change the sheet tab color of the 3-D Pie Chart sheet to Orange, Accent 6 (column 10, row 1).

2 Double-click the tab labeled Sheet1 at the bottom of the screen.

3 Type `Six-Month Financial Projection` as the new sheet name and then press the ENTER key.

4 Change the sheet tab color of the Six-Month Financial Projection sheet to Pink, Accent 1 (column 5, row 1) and then select cell D8 (Figure 3–72).

Figure 3–72

To Reorder the Sheet Tabs

Change the order sheets in a workbook so that they appear with the most important worksheets first. The following steps reorder the sheets so that the worksheet precedes the chart sheet in the workbook.

1

- Drag the Six-Month Financial Projection tab to the left in front of the 3-D Pie Chart tab to rearrange the sequence of the sheets (Figure 3–73).
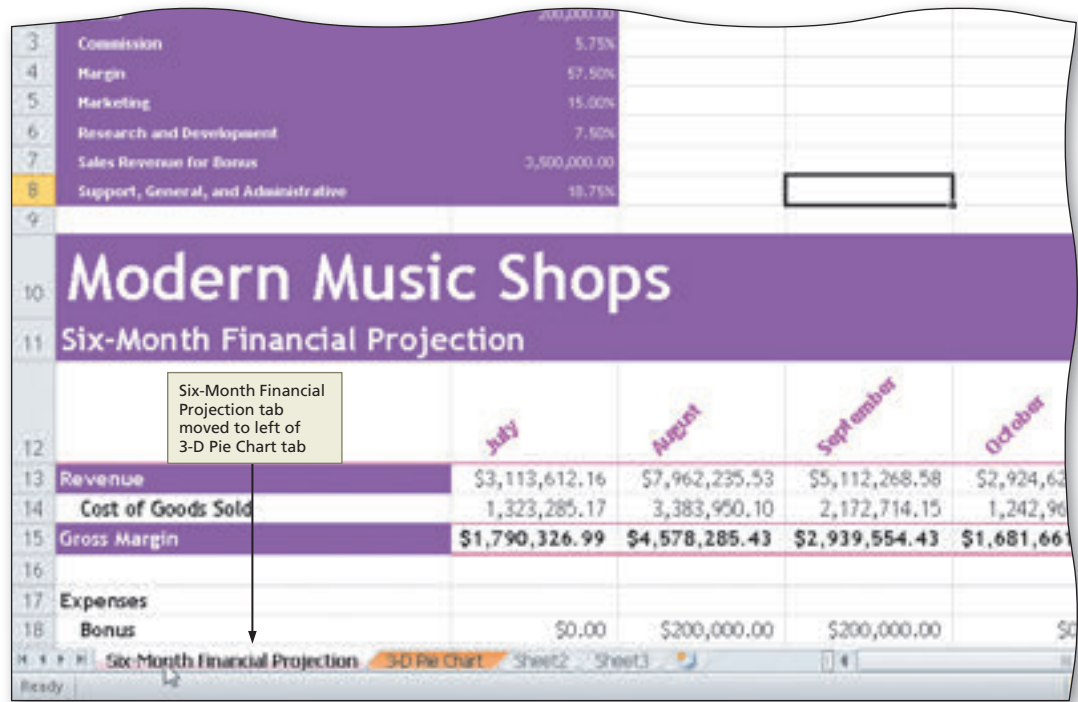
Figure 3–73

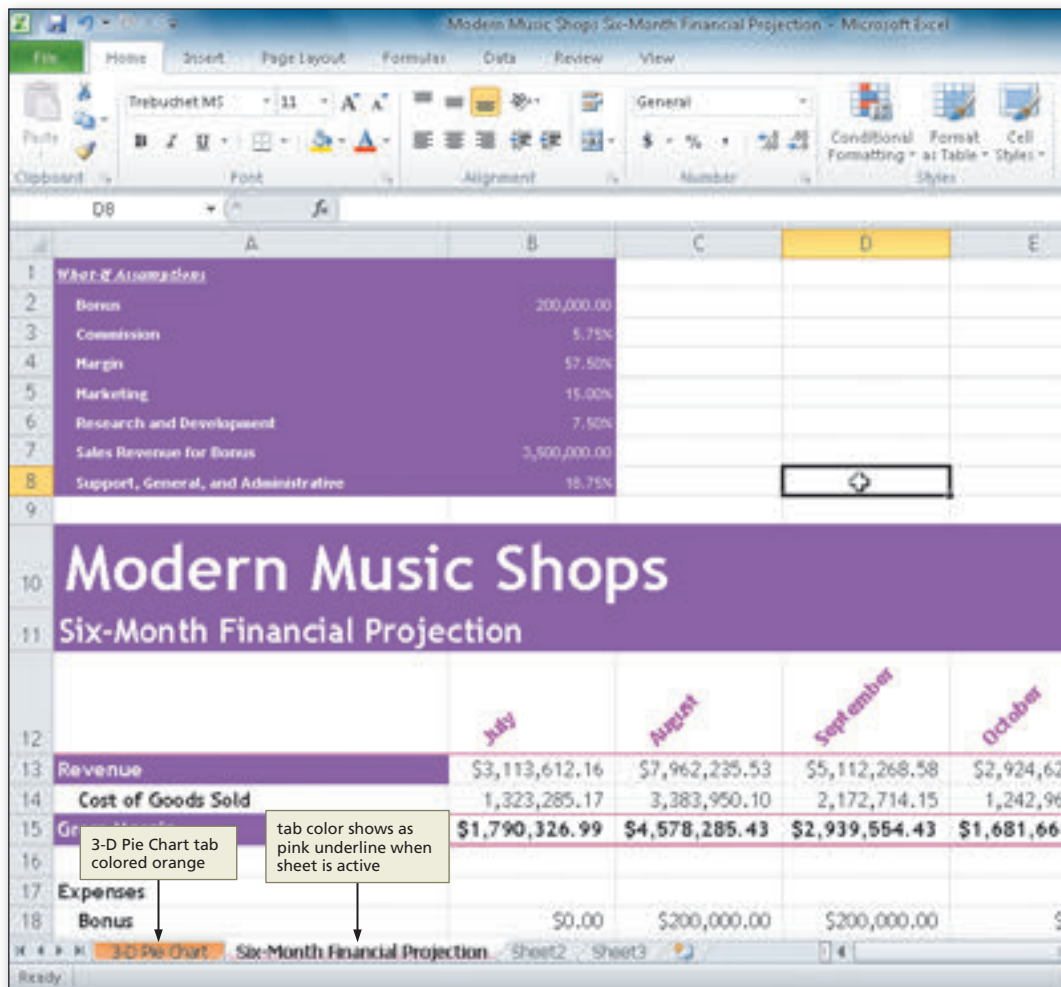**Other Ways**

1. To move sheet, right-click sheet tab, click Move or Copy on shortcut menu

To Check Spelling in Multiple Sheets

By default, the spell checker checks the spelling only in the selected sheets. It will check all the cells in the selected sheets, unless you select a range of two or more cells. Before checking the spelling, the following steps select both sheets in the workbook so that both worksheets in the workbook are checked for spelling errors.

1 With the Six-Month Financial Projection sheet active, press CTRL+HOME to select cell A1. Hold down the CTRL key and then click the 3-D Pie Chart tab to select multiple sheets.

2 Display the Review tab and then click the Spelling button (Review tab | Proofing group) to check spelling in the selected sheets.

3 Correct any errors and then click the OK button (Spelling dialog box or Microsoft Excel dialog box) when the spell check is complete.

4 Save the workbook.

BTW

Checking Spelling Unless you first select a range of cells or an object before starting the spell checker, Excel checks the entire selected worksheet, including all cell values, cell comments, embedded charts, text boxes, buttons, and headers and footers.

To Preview and Print the Workbook

After checking the spelling, the next step is to preview and print the sheets. As with spelling, Excel previews and prints only the selected sheets. In addition, because the worksheet is too wide to print in portrait orientation, the orientation must be changed to landscape. The following steps adjust the orientation and scale, preview the workbook, and then print the workbook.

1 Ready the printer. If both sheets are not selected, hold down the CTRL key and then click the tab of the inactive sheet.

2 Click File on the Ribbon to open the Backstage view.

3 Click the Print tab in the Backstage view to display the Print gallery.

4 If necessary, click the Portrait Orientation button in the Settings area and then select Landscape Orientation to select the desired orientation.

5 If necessary, click the No Scaling button in the Settings area and then select 'Fit Sheet on One Page' to cause the workbook to print on one page.

6 If necessary, click the Printer Status button to display a list of available Printer options and then click the desired printer to change the currently selected printer.

7 Click the Print button in the Print gallery to print the worksheet in landscape orientation on the currently selected printer.

8 When the printer stops, retrieve the printed worksheet (Figure 3–74a and Figure 3–74b on the following page).

9 Right-click the Six-Month Financial Projection tab. Click Ungroup Sheets on the shortcut menu to deselect the 3-D Pie Chart tab.

10 Save the workbook.

Figure 3–74 (a) Worksheet

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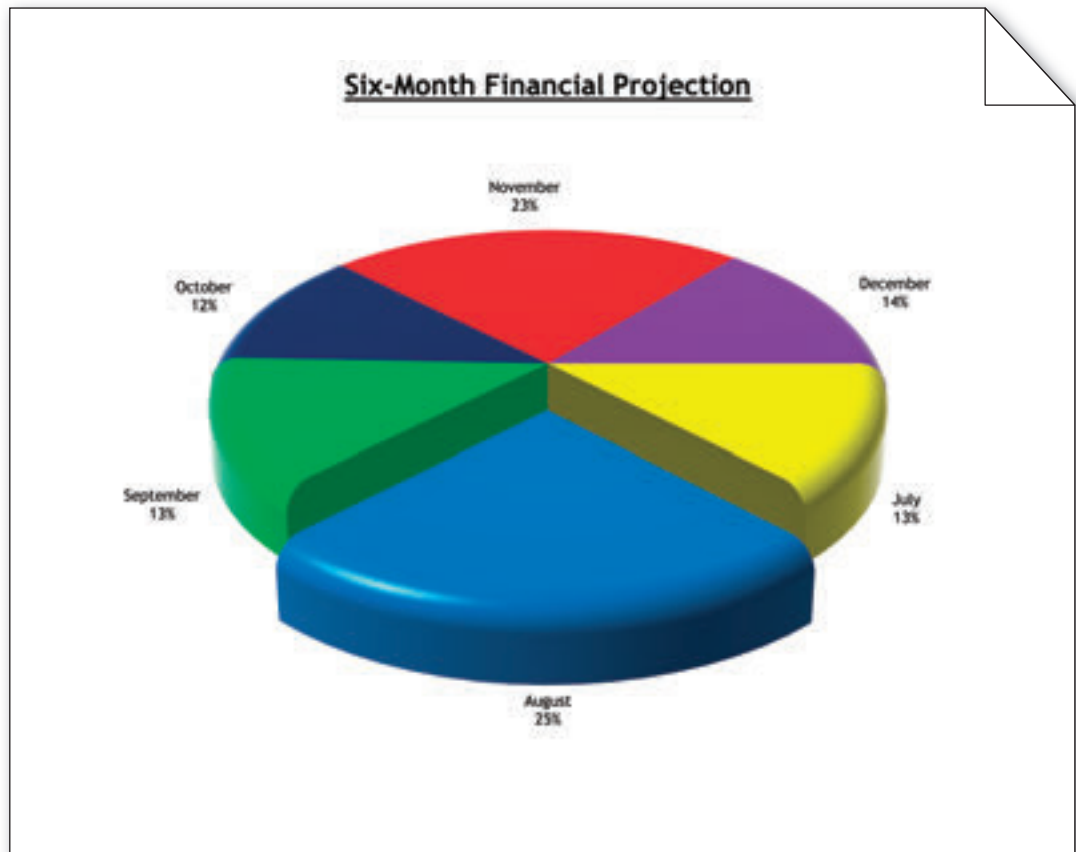
Figure 3–74 (b) 3-D Pie Chart

Changing the View of the Worksheet

With Excel, you easily can change the view of the worksheet. For example, you can magnify or shrink the worksheet on the screen. You also can view different parts of the worksheet through windowpanes.

To Shrink and Magnify the View of a Worksheet or Chart

You can magnify (zoom in) or shrink (zoom out) the appearance of a worksheet or chart by using the Zoom button (View tab | Zoom group). When you magnify a worksheet, Excel enlarges the view of the characters on the screen, but displays fewer columns and rows. Alternatively, when you shrink a worksheet, Excel is able to display more columns and rows. Magnifying or shrinking a worksheet affects only the view; it does not change the window size or printout of the worksheet or chart. The following steps shrink and magnify the view of the worksheet.

1

- If cell A1 is not active, press CTRL + HOME.

- Display the View tab and then click the Zoom button (View tab | Zoom group) to display a list of magnifications in the Zoom dialog box (Figure 3–75).
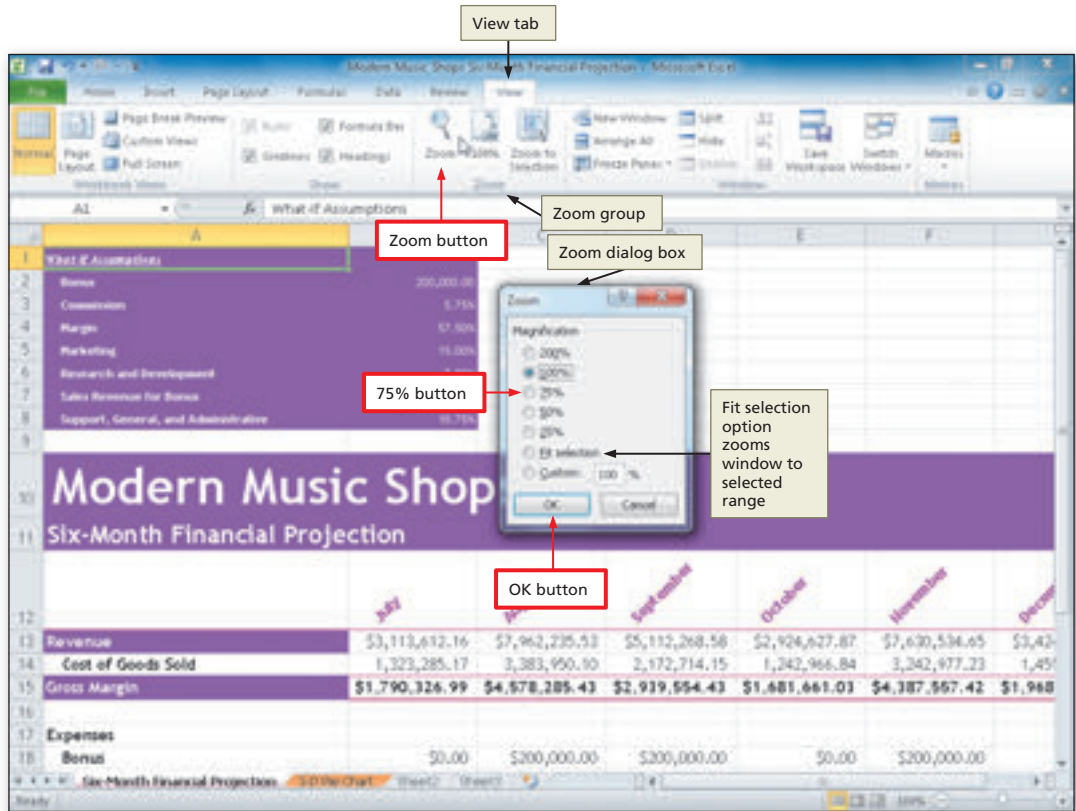
Figure 3–75

2

- Click 75% and then click the OK button (Zoom dialog box) to shrink the display of the worksheet (Figure 3–76).

Figure 3–76

Property of Cengage Learning
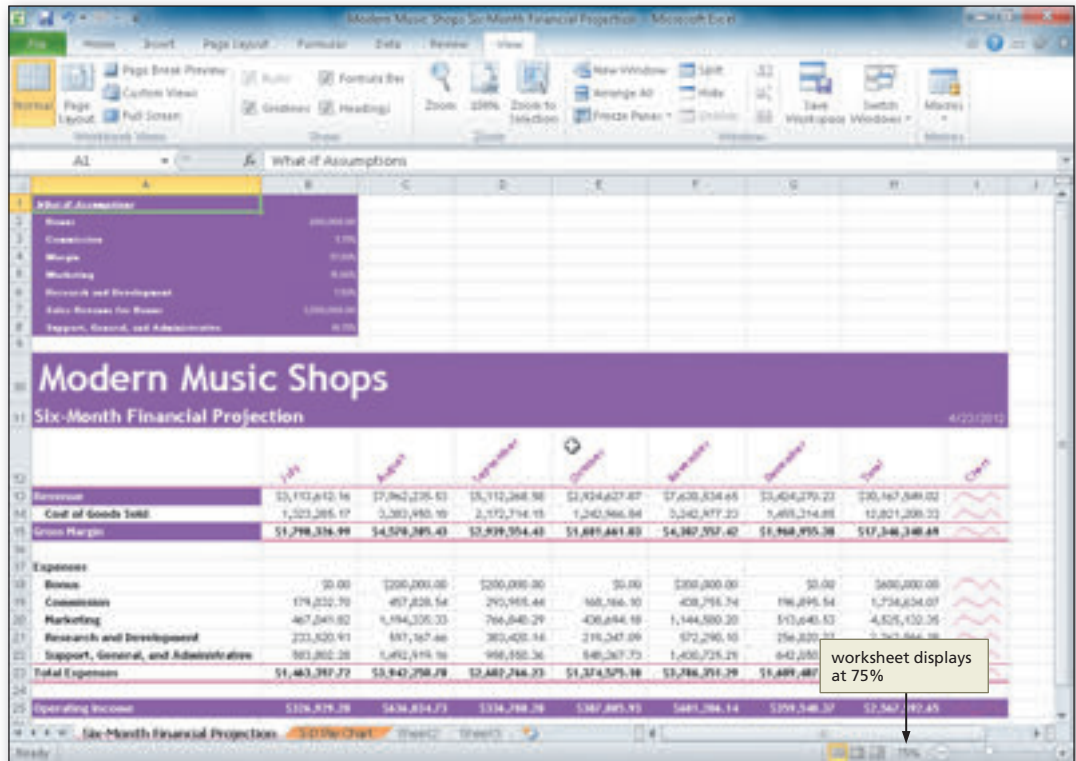
3

- Click the Zoom In button on the status bar until the worksheet is displayed at 100% (Figure 3–77).
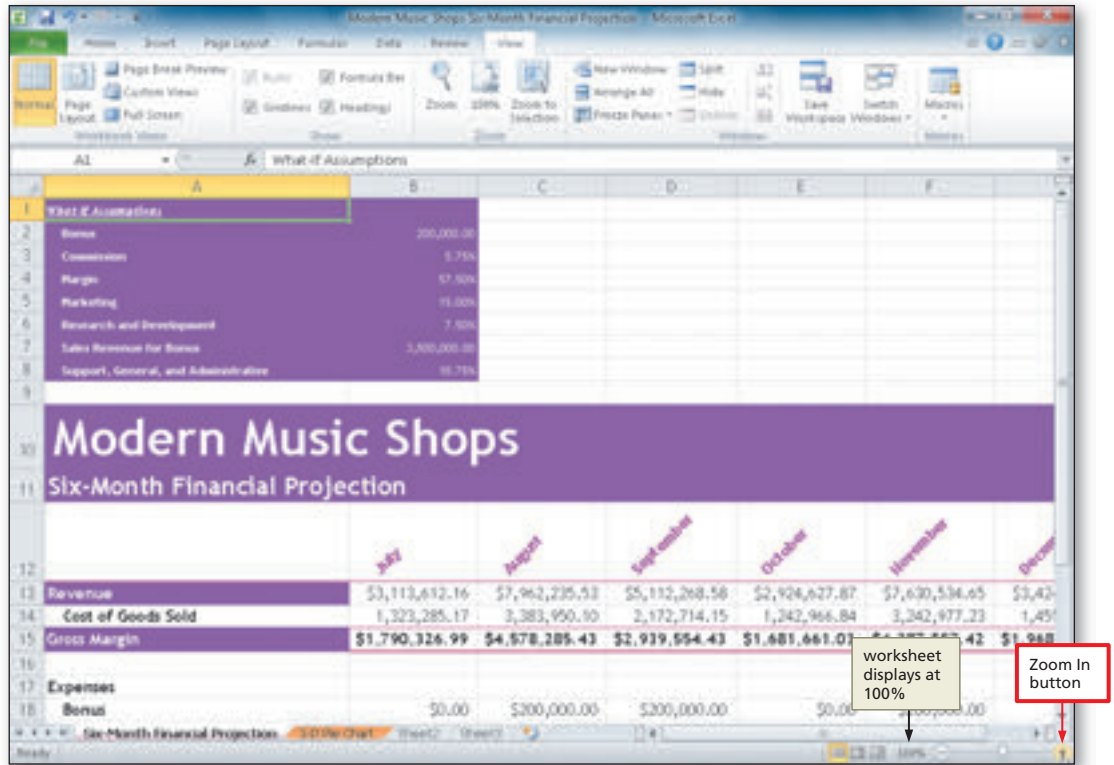
Figure 3–77

To Split a Window into Panes

When working with a large worksheet, you can split the window into two or four panes to view different parts of the worksheet at the same time. Splitting the Excel window into four panes at cell D13 allows you to view all four corners of the worksheet easily. The following steps split the Excel window into four panes.

1

- Select cell D13, the intersection of the four proposed panes, to select the cell at which to split the window.

- If necessary, display the View tab (Figure 3–78).

Figure 3–78

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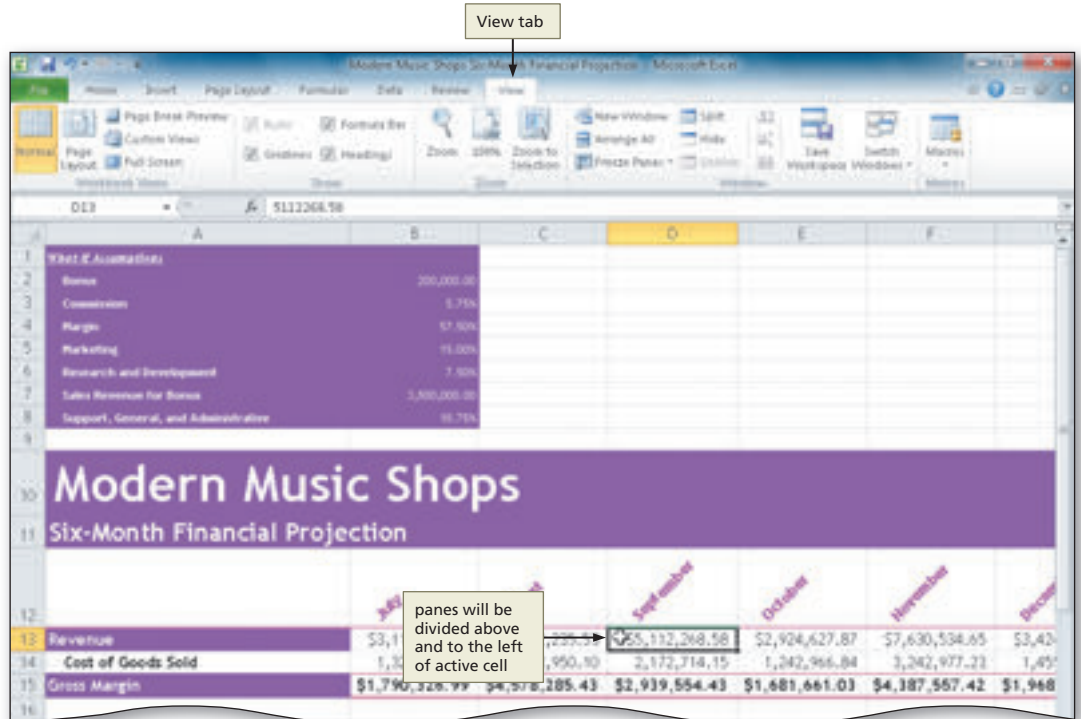
2

- Click the Split button (View tab | Window group) to divide the window into four panes.

- Use the scroll arrows to show the four corners of the worksheet at the same time (Figure 3–79).

Q&A

What is shown in the four panes?

The four panes in Figure 3–79 are used to show the following: (1) range A1:C12 in the upper-left pane; (2) range G1:I12 in the upper-right pane; (3) range A19:C24 in the lower-left pane; and (4) range G19:I24

Figure 3–79
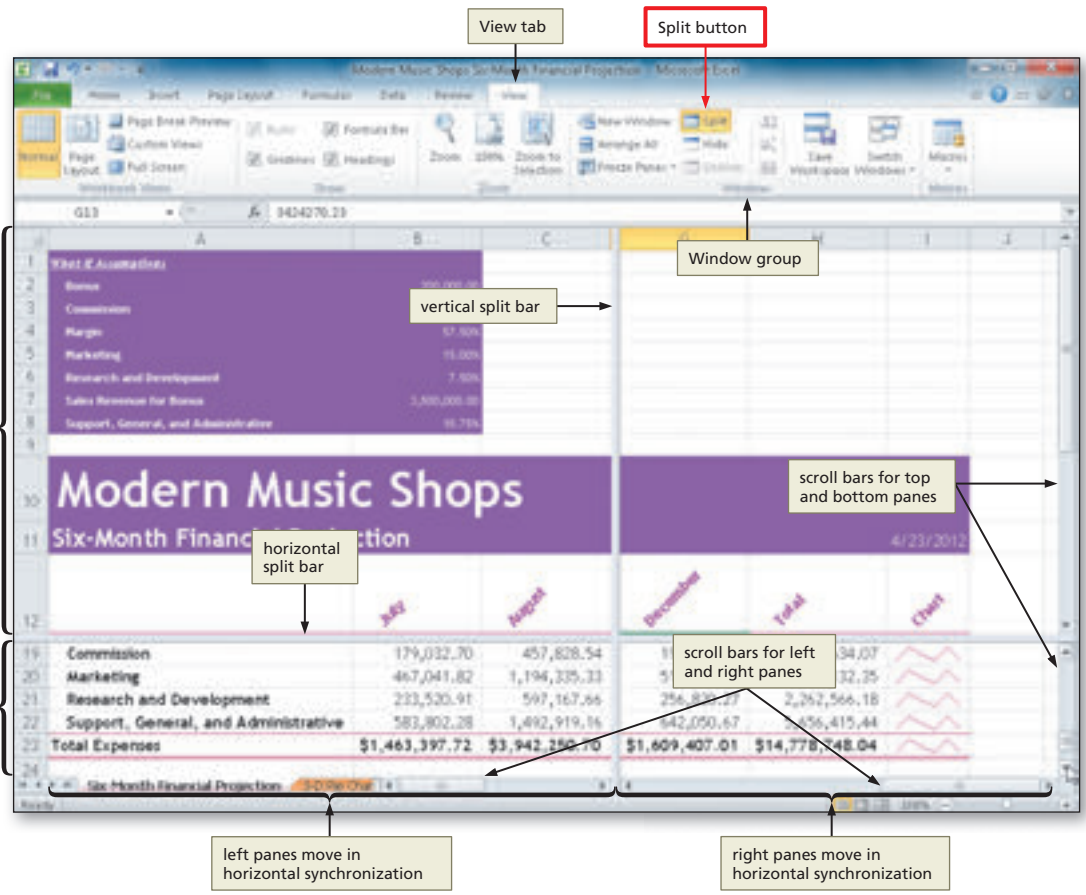
in the lower-right pane. The vertical split bar is the vertical bar going up and down the middle of the window. The horizontal split bar is the horizontal bar going across the middle of the window. If you use the scroll bars below the window and to the right of the window to scroll the window, you will see that the panes split by the horizontal split bar scroll together vertically. The panes split by the vertical split bar scroll together horizontally. To resize the panes, drag either split bar to the desired location in the window.

To Remove the Panes from the Window

1 Position the mouse pointer at the intersection of the horizontal and vertical split bars.

2 When the mouse pointer changes to a four-headed arrow, double-click to remove the four panes from the window.

Other Ways

1. Drag horizontal split box and vertical split box to desired locations

What-If Analysis

The automatic recalculation feature of Excel is a powerful tool that can be used to analyze worksheet data. Using Excel to scrutinize the impact of changing values in cells that are referenced by a formula in another cell is called what-if analysis or **sensitivity analysis**. When new data is entered, Excel not only recalculates all formulas in a worksheet but also redraws any associated charts.

In the workbook created in this chapter, many of the formulas are dependent on the assumptions in the range B2:B8. Thus, if you change any of the assumption values, Excel immediately recalculates all formulas. Excel redraws the 3-D Pie chart as well, because it is based on these numbers.

BTW

Zooming
You can use the Zoom in and Zoom out buttons on the status bar to zoom from 10% to 400% to reduce or enlarge the display of a worksheet.

To Analyze Data in a Worksheet by Changing Values

A what-if question for the worksheet in Chapter 3 might be *what* would happen to the six-month operating income in cell H25 *if* the Bonus, Commission, Support, General, and Administrative assumptions in the What-If Assumptions table were changed as follows: Bonus $200,000.00 to $150,000.00; Commission 5.75% to 4.00%; Support, General, and Administrative 18.75% to 15.75%? To answer a question like this, you need to change only the first, second, and seventh values in the What-If Assumptions table, as shown in the following steps. The steps also divide the window into two vertical panes. Excel instantaneously recalculates the formulas in the worksheet and redraws the 3-D Pie chart to answer the question.

1

- Press CTRL+HOME to select cell A1.

- Drag the vertical split box from the lower-right corner of the screen to the left so that the vertical split bar is positioned as shown in Figure 3–80 to split the screen vertically.

- Drag the horizontal split box from the upper-right corner of the screen down so that the horizontal split bar is positioned as shown in Figure 3–80 to split the screen horizontally.

- Use the scroll arrows in the lower-right pane to view the total operating income in column H in the lower-right pane.
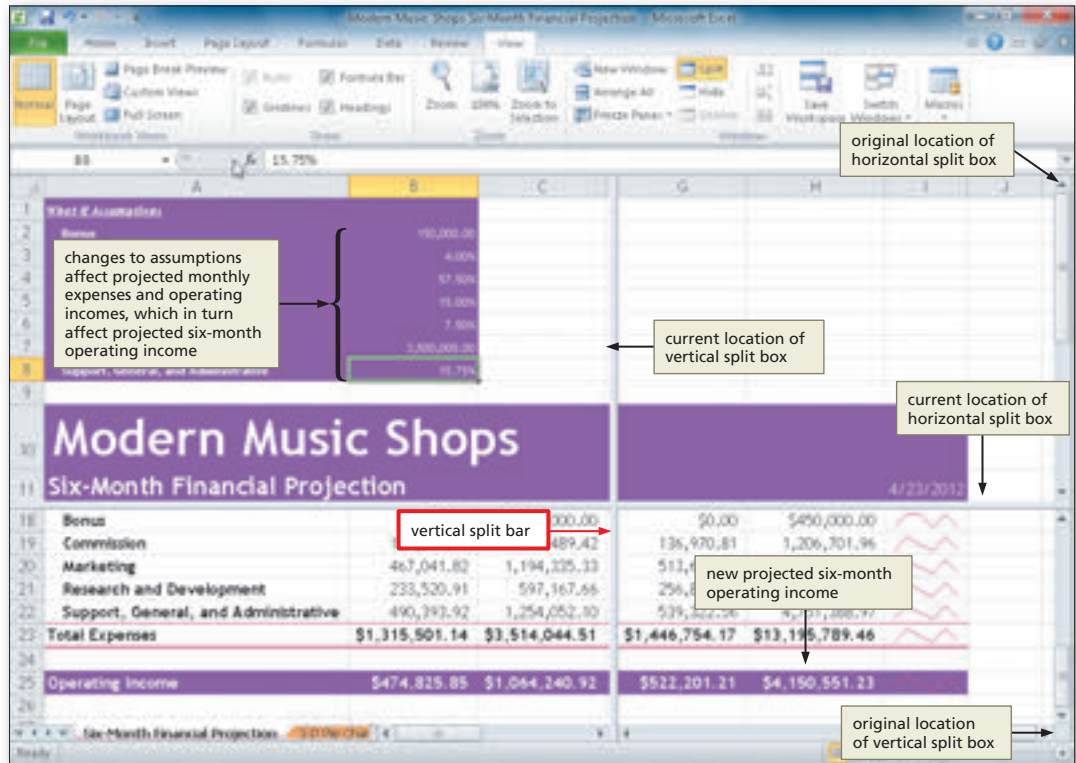
Figure 3–80

- Enter `150000` in cell B2, `4%` in cell B3, and `15.75%` in cell B8 (Figure 3–80), which causes the six-month operating income in cell H25 to increase from $2,567,592.65 to $4,150,551.23.

To Goal Seek

If you know the result you want a formula to produce, you can use **goal seeking** to determine the value of a cell on which the formula depends. The following steps close and reopen the Modern Music Shops Six-Month Financial Projection workbook. They then use the Goal Seek command (Data tab | Data Tools group) to determine the Support, General, and Administrative percentage in cell B8 that will yield a six-month operating income of $3,000,000.00 in cell H25, rather than the original $2,567,592.65.

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1

- Close the workbook without saving the changes and then reopen it.

- Drag the vertical split box from the lower-right corner of the screen to the left so that the vertical split bar is positioned as shown in Figure 3–81 to split the screen vertically.

- Drag the horizontal split box from the upper-right corner of the screen down so that the horizontal split bar is positioned as shown in Figure 3–81 to split the screen horizontally.

- Use the scroll arrows in the lower-right pane to view the total operating income in column H in the lower-right pane.

- Select cell H25, the cell that contains the six-month operating income.

- Display the Data tab and then click the What-If Analysis button (Data tab | Data Tools group) to display the What-If Analysis menu (Figure 3–81).
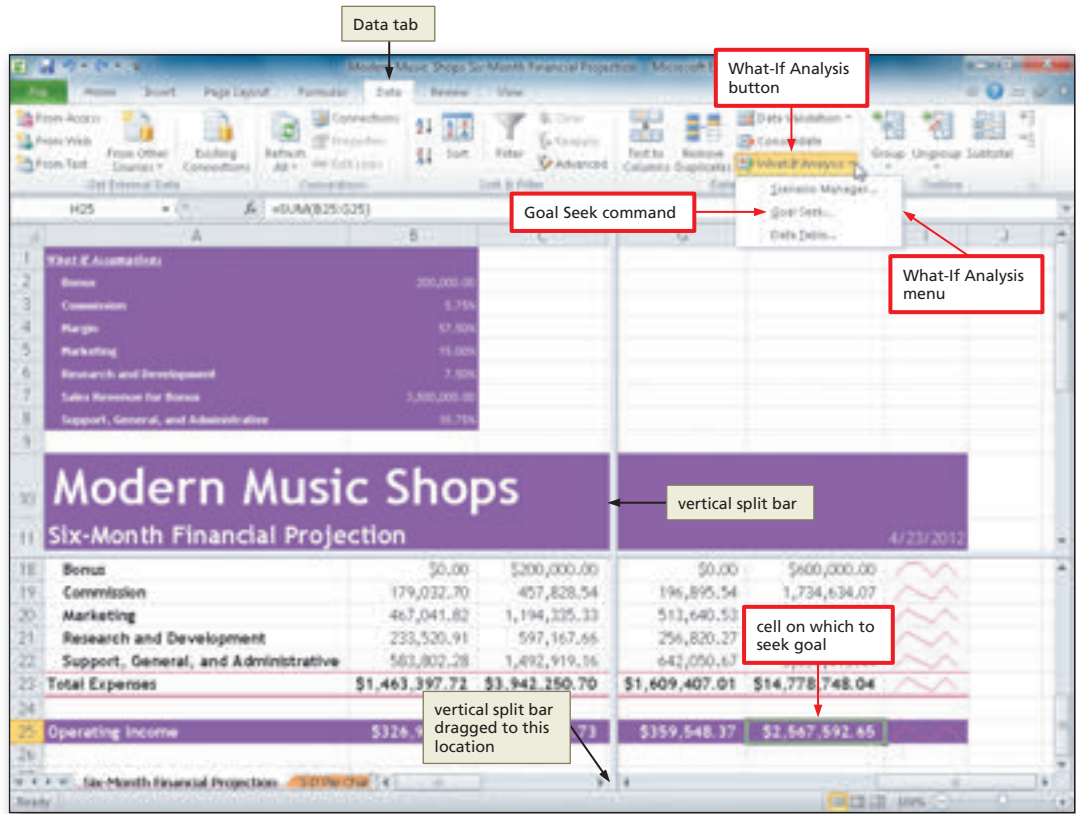
Figure 3–81

2

- Click Goal Seek to display the Goal Seek dialog box with the Set cell box set to the selected cell, H25 in this case.

- When Excel displays the Goal Seek dialog box, click the To value text box, type **3,000,000** and then click the 'By changing cell' box to select the 'By changing cell' box.

- Click cell B8 on the worksheet to assign the current cell, B8 in this case, to the 'By changing cell' box (Figure 3–82).

Figure 3–82

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3
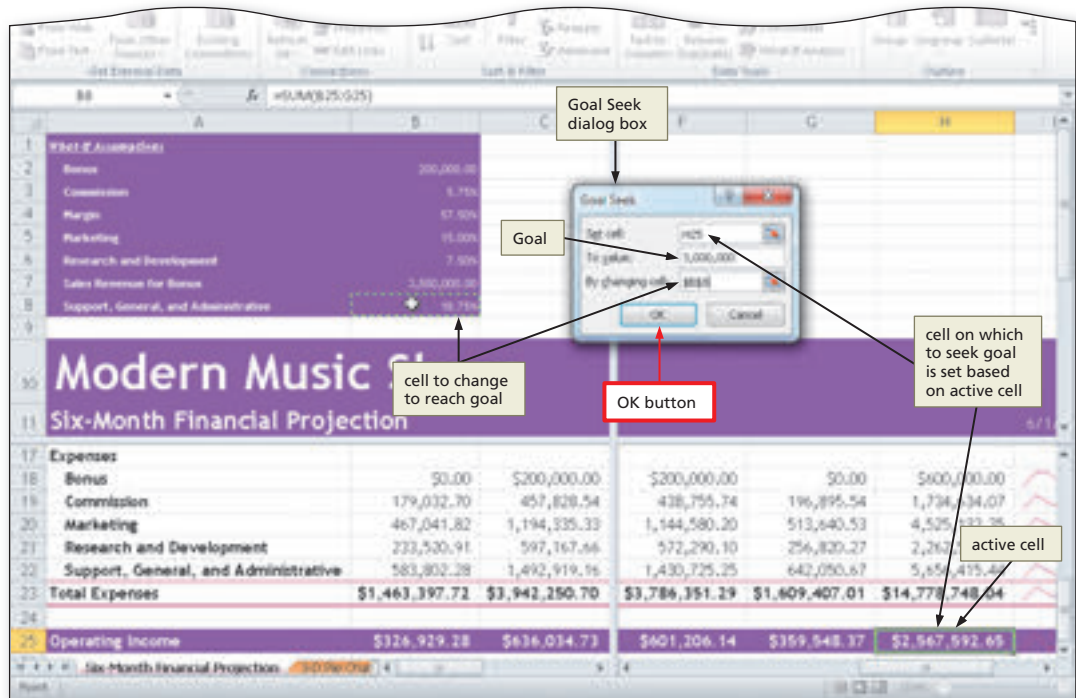
- Click the OK button (Goal Seek dialog box) to goal seek for the sought-after value in the 'To value' box, $3,000,000.00 in cell H25 in this case (Figure 3–83).

Q&A

What happens when I click the OK button?

Excel immediately changes cell H25 from $2,567,592.65 to the desired value of $3,000,000.00. More importantly, Excel changes the Support, General, and Administrative assumption in cell B8 from 18.75% to 17.32% (Figure 3–83). Excel also displays the Goal Seek Status dialog box. If you click the OK button, Excel keeps the new values in the worksheet. If you click the Cancel button, Excel redisplays the original values.

Figure 3–83

4

- Click the Cancel button in the Goal Seek Status dialog box to redisplay the original values in the worksheet.

Goal Seeking

Goal seeking assumes you can change the value of only one cell referenced directly or indirectly to reach a specific goal for a value in another cell. In this example, to change the six-month operating income in cell H25 to $3,000,000.00, the Support, General, and Administrative percentage in cell B8 must decrease by 1.43% from 18.75% to 17.32%.

You can see from this goal seeking example that the cell to change (cell B8) does not have to be referenced directly in the formula or function. For example, the six-month operating income in cell H25 is calculated by the function =SUM(B25:G25). Cell B8 is not referenced in this function. Instead, cell B8 is referenced in the formulas in rows 18 through 22, on which the monthly operating incomes in row 25 are based. Excel thus is capable of goal seeking on the six-month operating income by varying the value for the Support, General, and Administrative assumption.

To Quit Excel

With the workbook complete, the following steps quit Excel.

1 Click the Close button on the upper-right corner of the title bar.

2 If the Microsoft Excel dialog box is displayed, click the Don't Save button.

Chapter Summary

In this chapter you learned how to work with large worksheets that extend beyond the window, how to use the fill handle to create a series, new formatting techniques, about the difference between absolute cell references and relative cell references, how to use the IF function, and how to rotate text in a cell, freeze titles, add Sparkline charts, change the magnification of the worksheet, show different parts of the worksheet at the same time through multiple panes, create a 3-D Pie chart, and improve the appearance of a 3-D Pie chart. This chapter also introduced you to using Excel to do what-if analysis by changing values in cells and goal seeking. The items listed below include all the new Excel skills you have learned in this chapter.

1. Rotate Text and Use the Fill Handle to Create a Series of Month Names (EX 145)
2. Increase Column Widths (EX 149)
3. Enter Row Titles (EX 150)
4. Copy a Range of Cells to a Nonadjacent Destination Area (EX 151)
5. Insert a Row (EX 154)
6. Enter Numbers with Format Symbols (EX 156)
7. Freeze Column and Row Titles (EX 157)
8. Enter and Format the System Date (EX 159)
9. Enter a Formula Containing Absolute Cell References (EX 162)
10. Enter an IF Function (EX 165)
11. Copy Formulas with Absolute Cell References Using the Fill Handle (EX 168)
12. Unfreeze the Worksheet Titles and Save the Workbook (EX 169)
13. Add a Sparkline Chart to the Worksheet (EX 170)
14. Format and Copy the Sparkline Chart (EX 171)
15. Assign Formats to Nonadjacent Ranges (EX 174)
16. Format the Worksheet Titles (EX 176)
17. Copy a Cell's Format Using the Format Painter Button (EX 178)
18. Draw a 3-D Pie Chart on a Separate Chart Sheet (EX 182)
19. Insert a Chart Title and Data Labels (EX 183)
20. Rotate the 3-D Pie Chart (EX 186)
21. Apply a 3-D Format to the Pie Chart (EX 188)
22. Explode the 3-D Pie Chart and Change the Color of a Slice (EX 190)
23. Reorder the Sheet Tabs (EX 194)
24. Check Spelling in Multiple Sheets (EX 194)
25. Shrink and Magnify the View of a Worksheet or Chart (EX 196)
26. Split a Window into Panes (EX 198)
27. Analyze Data in a Worksheet by Changing Values (EX 200)
28. Goal Seek (EX 200)

If you have a SAM 2010 user profile, your instructor may have assigned an autogradable version of this assignment. If so, log into the SAM 2010 Web site at www.cengage.com/sam2010 to download the instruction and start files.

Learn It Online

Test your knowledge of chapter content and key terms.

Instructions: To complete the Learn It Online exercises, start your browser, click the Address bar, and then enter the Web address `scsite.com/ex2010/learn`. When the Excel 2010 Learn It Online page is displayed, click the link for the exercise you want to complete and then read the instructions.

Chapter Reinforcement TF, MC, and SA
A series of true/false, multiple choice, and short answer questions that test your knowledge of the chapter content.

Flash Cards
An interactive learning environment where you identify chapter key terms associated with displayed definitions.

Practice Test
A series of multiple choice questions that test your knowledge of chapter content and key terms.

Who Wants To Be a Computer Genius?
An interactive game that challenges your knowledge of chapter content in the style of a television quiz show.

Wheel of Terms
An interactive game that challenges your knowledge of chapter key terms in the style of the television show *Wheel of Fortune*.

Crossword Puzzle Challenge
A crossword puzzle that challenges your knowledge of key terms presented in the chapter.

Apply Your Knowledge

Reinforce the skills and apply the concepts you learned in this chapter.

Understanding Logical Tests and Absolute Cell Referencing
Instructions Part 1:   Determine the truth value (true or false) of the following logical tests, given the following cell values: B4 = 30; W3 = 100; H5 = 32; L2 = 25; and M8 = 15. Enter true or false.

a. M8 > B4   Truth value: _____

b. W3 = L2   Truth value: _____

c. L2 + 15 * B4 / 10 <> W3   Truth value: _____

d. H5 − L2 < B4 / M8   Truth value: _____

e. (M8 + B4) * 2 <> W3 − (M8 / 3) * 2   Truth value: _____

f. M8 + 300 > B4 * H5 + 10   Truth value: _____

g. H5 * L2 >= 2 * (W3 + 25)   Truth value: _____

h. B4 = 10 * (M8 / 5)   Truth value: _____

Instructions Part 2:   Write cell J49 as a relative reference, absolute reference, mixed reference with the column varying, and mixed reference with the row varying.

_____   _____   _____   _____

Instructions Part 3:   Start Excel. Open the workbook Apply 3-1 Absolute Cell References. See the inside back cover of this book for instructions for downloading the Data Files for Students, or see your instructor for information on accessing the files required in this book. You will re-create the numerical grid pictured in Figure 3–84.

Perform the following tasks:

1. Enter a formula in cell C7 that multiplies the sum of cells C3 through C6 times cell C2. Write the formula so that when you copy it to cells D7 and E7, Excel adjusts all the cell references according to the destination cells. Verify your formula by checking it with the values found in cells C7, D7, and E7 in Figure 3–84.

2. Enter a formula in cell F3 that multiplies cell B3 times the sum of cells C3 through E3. Write the formula so that when you copy the formula to cells F4, F5, and F6, Excel adjusts all the cell references according to the destination cells. Verify your formula by checking it with the values found in cells F3, F4, F5, and F6 in Figure 3–84.

3. Enter a formula in cell C8 that multiplies the sum of cells C3 through C6 times cell C2. Write the formula so that when you copy the formula to cells D8 and E8, cell C2 remains absolute. Verify your formula by checking it with the values found in cells C8, D8, and E8 in Figure 3–84.

4. Enter a formula in cell G3 that multiplies the sum of cells C3, D3, and E3 times cell B3. Write the formula so that when you copy the formula to cells G4, G5, and G6, cell B3 remains absolute. Verify your formula by checking it with the values found in cells G3, G4, G5, and G6 in Figure 3–84.

5. Apply the worksheet name, Cell References, to the sheet tab and apply the Red, Accent 2 theme color to the sheet tab.

6. Change the document properties, as specified by your instructor. Change the worksheet header with your name, course number, and other information as specified by your instructor. Save the workbook using the file name, Apply 3-1 Absolute Cell References Complete, and submit the workbook as requested by your instructor.
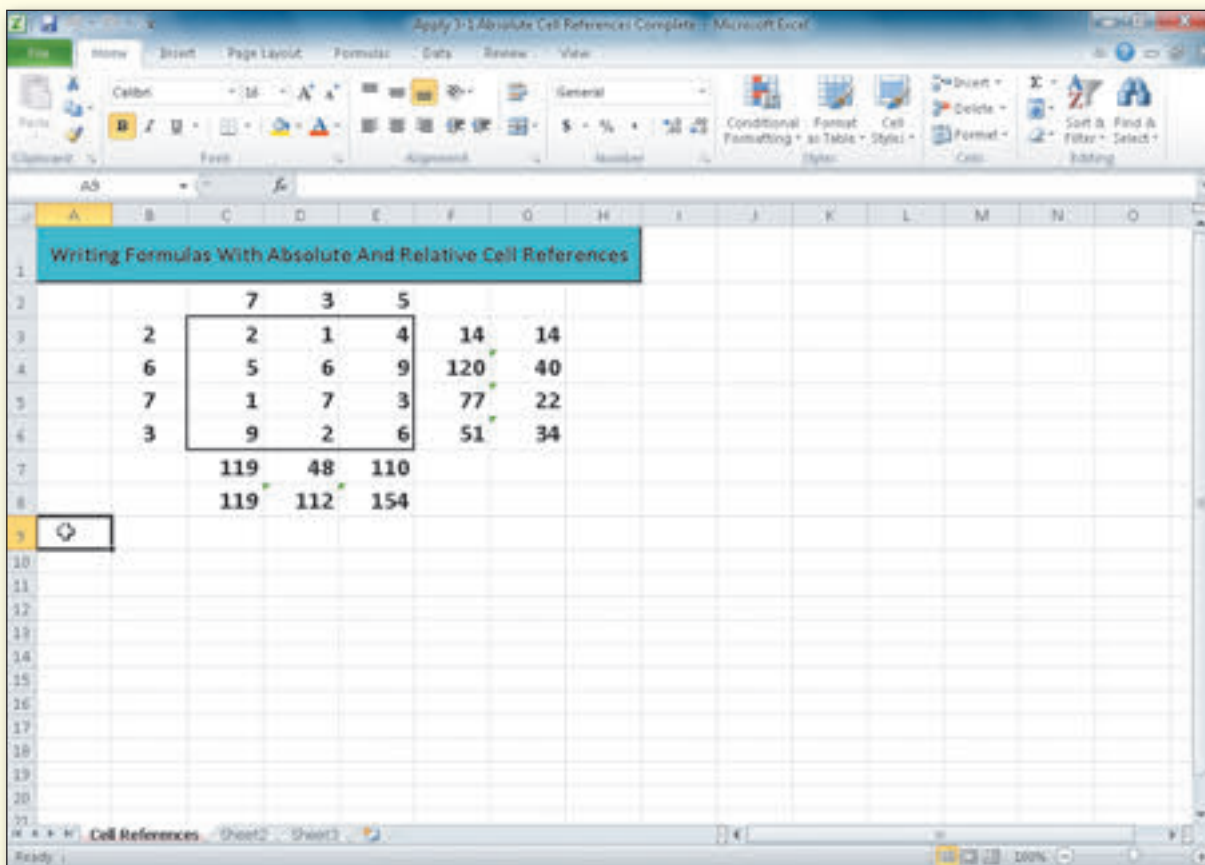
Figure 3–84

Extend Your Knowledge

Extend the skills you learned in this chapter and experiment with new skills. You may need to use Help to complete the assignment.

Nested IF Functions and More About the Fill Handle

Instructions Part 1:   Start Excel. You will use nested IF functions to determine values for sets of data.

1. Using the Insert Function dialog box, enter the following IF function in cell B1:

   IF(A1="TX", "Central", "Time Zone Error")

2. Select cell B1, select the text "Time Zone Error" in the Formula Bar, click the Logical button (Formulas tab | Function Library group), click IF, and enter the following IF function:

   IF(A1="OR", "Pacific", "Time Zone Error")

3. Select cell B1, select "Time Zone Error" in the Formula Bar, click Logical button (Formulas tab | Function Library group), click IF, and enter the following IF function:

   IF(A1="VA", "Eastern", "Time Zone Error")

4. Verify that the formula in cell B1 appears as follows:

   =IF(A1="TX","Central", IF(A1="OR","Pacific", IF(A1="VA","Eastern","Time Zone Error")))

5. Use the fill handle to copy the nested IF function down through cell B6. Enter the following data in the cells in the range A1:A6 and then write down the results that display in cells B1 through B6 for each set. Set 1: A1 = TX; A2 = NY; A3 = OR; A4 = MI; A5 = TX; A6 = VA. Set 2: A1= WI; A2 = OR; A3 = IL; A4 = VA; A5 = NJ; A6 = TX.

Set 1 Results: _____

Set 2 Results: _____

6. Save the workbook using the file name, Extend 3-1 Create Series Complete Part 1, and submit the workbook as specified by your instructor.

Instructions Part 2:   Start Excel. Open the workbook Extend 3-1 Create Series. See the inside back cover of this book for instructions for downloading the Data Files for Students, or see your instructor for information on accessing the files required in this book.

Perform the following tasks:

1. Use the fill handle on one column at a time to propagate the twelve series through row 14, as shown in Figure 3–85. For example, in column A, select cell A2 and drag the fill handle down to cell A14. In column C, hold down the CTRL key to repeat Saturday through cell C14. In column D, select the range D2:D3 and drag the fill handle down to cell D14. Likewise, in columns G through L, select the two adjacent cells in rows 2 and 3 before dragging the fill handle down to the corresponding cell in row 14.

2. Select cell D19. While holding down the CTRL key, one at a time drag the fill handle three cells to the right, to the left, up, and down to generate four series of numbers beginning with zero and incremented by one.

3. Select cell H19. Point to the cell border so that the mouse pointer changes to a plus sign with four arrows. Drag the mouse pointer down to cell H21 to move the contents of cell H19 to cell H21.

4. Select cell H21. Point to the cell border so that the mouse pointer changes to a plus sign with four arrows. While holding down the CTRL key, drag the mouse pointer to cell K21 to copy the contents of cell H21 to cell K21.
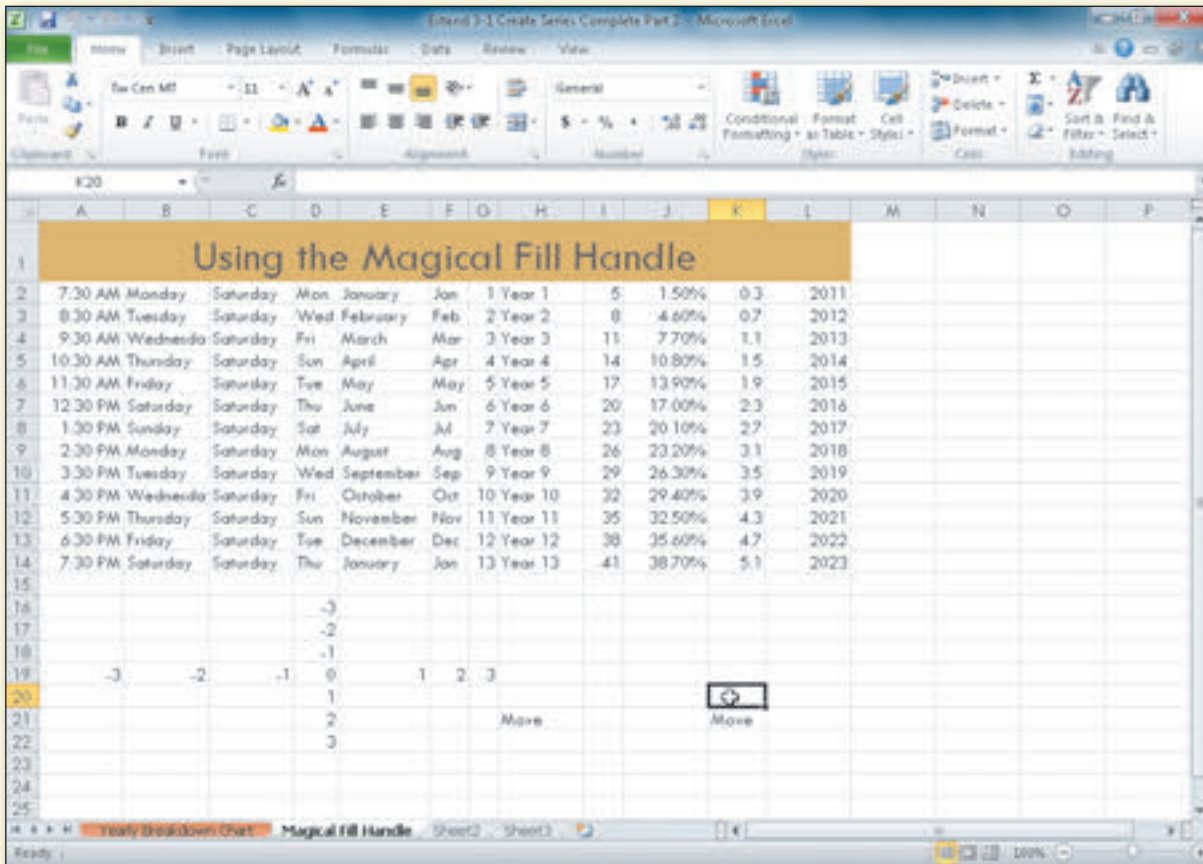
Figure 3–85

5. Select cell K19. Drag the fill handle in to the center of cell K19 so that the cell is shaded and the cell contents are deleted.

6. Apply a worksheet name to the sheet tab and apply a color of your choice to the sheet tab.

7. Select cell range H2:I14, click the Pie button (Insert tab | Charts group) to display the Pie gallery, click Pie in 3-D chart in the Pie gallery, click the Move Chart button (Chart Tools Design tab | Location group), click the New sheet option button (Move Chart dialog box), and then click the OK button (Move Chart dialog box) to move the 3-D Pie chart to a new worksheet.

8. Click the Chart Title button (Chart Tools Layout tab | Labels group), click Above Chart in the Chart Title gallery, select the title, and change the chart title to "Yearly Breakdown".

9. Click the Data Labels button (Chart Tools Layout tab | Labels group), click Outside End in the Data Labels gallery to add data points to the chart.

10. Apply a chart sheet name to the sheet tab and apply a color of your choice to the tab.

11. Change the document properties, as specified by your instructor. Change the worksheet header with your name, course number, and other information as specified by your instructor. Save the workbook using the file name, Extend 3-1 Create Series Complete Part 2, and submit the workbook as specified by your instructor.

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Make It Right

Analyze a workbook and correct all errors and/or improve the design.

Inserting Rows, Moving a Range, and Correcting Formulas in a Worksheet

Instructions: Start Excel. Open the workbook Make It Right 3-1 SpeedyOfficeSupply.com Annual Projected Net Income. See the inside back cover of this book for instructions for downloading the Data Files for Students, or see your instructor for information on accessing the files required for this book. Correct the following design and formula problems (Figure 3–86a) in the worksheet.

Figure 3–86 (a) Before

Figure 3–86 (b) After

1. The Shipping Cost in cell C8 is computed using the formula =B2*B8 (Shipping % × Sales). Similar formulas are used in cells C9, C10, and C11. The formula in cell C8 was entered and copied to cells C9, C10, and C11. Although the result in cell C8 is correct, the results in cells C9, C10, and C11 are incorrect. Edit the formula in cell C8 by changing cell B2 to an absolute cell reference. Copy the corrected formula in cell C8 to cells C9, C10, and C11. After completing the copy, click the Auto Fill Options button arrow that is displayed below and to the right of cell C11 and choose Fill Without Formatting.

2. The Discount amounts in cells D8, D9, D10, and D11 are computed using the IF function. The Discount amount should equal the amount in cell B3*B8 (Discount % × Sales) if the corresponding Sales in column B is greater than or equal to $2,500,000. If the corresponding Sales in column B is less than $2,500,000, then the Discount amount is 5%*B8 (5% × Sales). The IF function in cell D8

was entered and copied to cells D9, D10, and D11. The current IF functions in cells D8, D9, D10, and D11 are incorrect. Edit and correct the IF function in cell D8. Copy the corrected formula in cell D8 to cells D9, D10, and D11. After completing the copy, click the Auto Fill Options button arrow that is displayed below and to the right of cell D11 and choose Fill Without Formatting.

3. The Processing Costs in cell E8 is computed using the formula =B4*B8 (Proc. Costs % × Sales). The formula in cell E8 was entered and copied to cells E9, E10, and E11. Although the result in cell E8 is correct, the results in cells E9, E10, and E11 are incorrect. Edit and correct the formula in cell E8 by changing cell B4 to an absolute cell reference. Copy the corrected formula in cell E8 to cells E9, E10, and E11. After completing the copy, click the Auto Fill Options button arrow that displays below and to the right of cell E11 and choose Fill Without Formatting. Ensure that the range B9:E11 is formatted with the Accounting Number format.

4. Change the design of the worksheet by moving the Assumptions table in the range A1:B4 to the range A14:B17, as shown in Figure 3–86b. To complete the move drag the Assumptions table to the range A14:B17. Use Figure 3–86b to verify that Excel automatically adjusted the cell references based on the move. Use the Undo button and Redo button on the Quick Access Toolbar to move the Assumptions table back and forth while the results of the formulas remain the same.

5. Apply a worksheet name to the sheet tab and apply the Orange, Accent 3 color to the sheet tab.

6. Change the document properties, as specified by your instructor. Change the worksheet header with your name, course number, and other information as specified by your instructor. Save the workbook using the file name, Make It Right 3-1 SpeedyOfficeSupply.com Annual Projected Net Income Complete, and submit the revised workbook as specified by your instructor.

In the Lab

Create a workbook using the guidelines, concepts, and skills presented in this chapter. Labs are listed in order of increasing difficulty.

Lab 1: Six-Year Financial Projection

Problem: Your supervisor in the Finance department at Med Supply Online Warehouse has asked you to create a worksheet that will project the annual gross margin, expenses, total expenses, operating income, income taxes, and net income for the next six years based on the assumptions in Table 3–9. The desired worksheet is shown in Figure 3–87 on the following page. In Part 1 you will create the worksheet. In Part 2 you will create a chart to present the data, shown in Figure 3–88 on page EX 213. In Part 3 you will use Goal Seek to analyze three different sales scenarios.

Table 3–9 Med Supply Online Warehouse Financial Projection Assumptions	
Units Sold in Prior Year	1,589,712
Unit Cost	$59.50
Annual Sales Growth	4.50%
Annual Price Decrease	3.80%
Margin	38.80%

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In the Lab *continued*
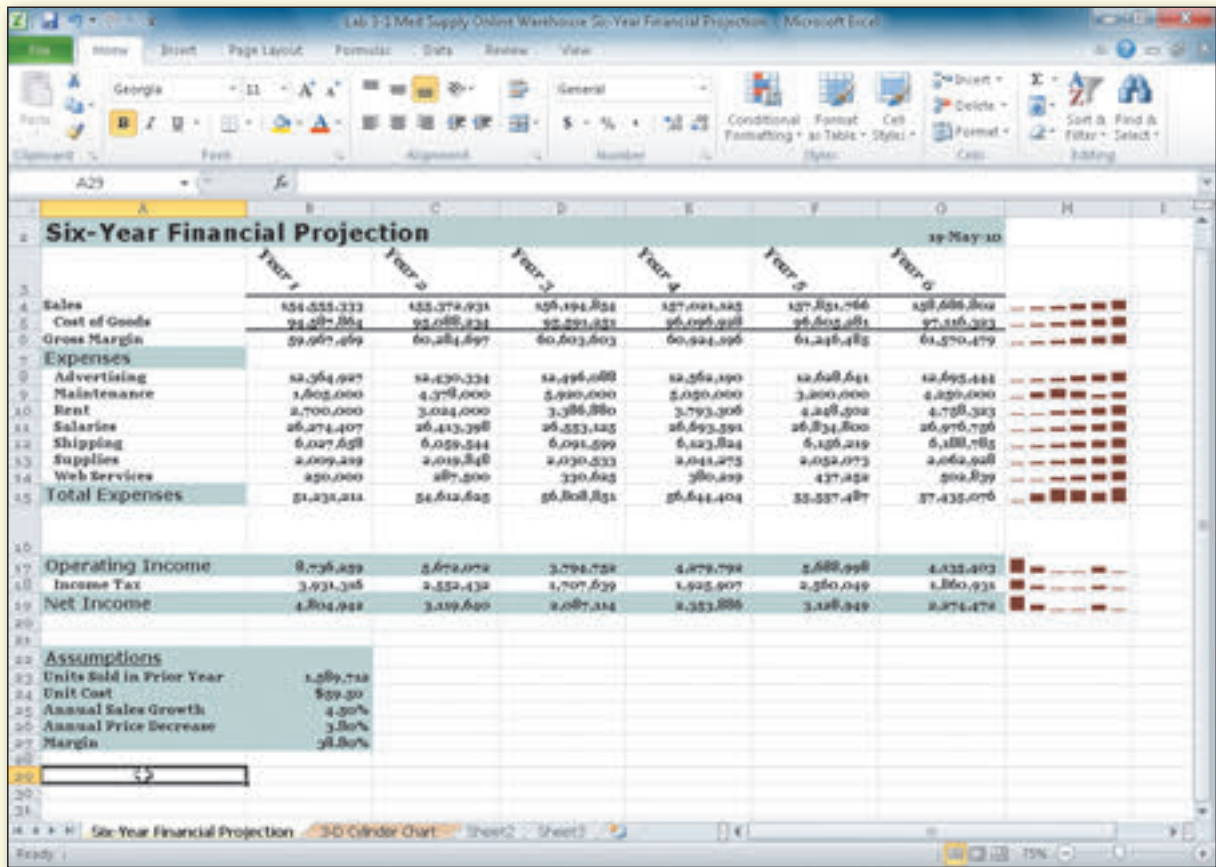
Figure 3–87

Instructions Part 1:

1. Start Excel. Apply the Civic theme to the worksheet by using the Themes button (Page Layout tab | Themes group). Bold the entire worksheet by selecting the entire worksheet and using the Bold button (Home tab | Font group).

2. Enter the worksheet title **Med Supply Online Warehouse** in cell A1 and the subtitle **Six-Year Financial Projection** in cell A2. Format the worksheet title in cell A1 to 36-point Copperplate Gothic Bold (or a similar font). Format the worksheet subtitle in cell A2 to 20-point Verdana (or a similar font). Enter the system date in cell G2 using the NOW function. Format the date to the 14-Mar-01 style.

3. Change the following column widths: A = 25.00 characters; B through H = 15.00 characters. Change the heights of rows 7, 15, 17, 19, and 22 to 18.00 points.

4. Enter the six column titles Year 1 through Year 6 in the range B3:G3 by entering Year 1 in cell B3 and then dragging cell B3's fill handle through the range C3:G3. Format cell B3 as follows: (a) increase the font size to 14; (b) center and italicize it; and (c) angle its contents clockwise. Use the Format Painter button (Home tab | Clipboard group) to copy the format assigned to cell B3 to the range C3:G3.

5. Enter the row titles in the range A4:A19. Change the font in cells A7, A15, A17, and A19 to 14-point Verdana (or a similar font). Add thick bottom borders to the ranges B3:G3 and B5:G5. Use the Increase Indent button (Home tab | Alignment group) to increase the indent of the row titles in cell A5, the range A8:A14, and cell A18.

6. Enter the table title **Assumptions** in cell A22. Enter the assumptions in Table 3–9 on page EX 209 in the range A23:B27. Use format symbols when entering the numbers. Change the font size of the table title in cell A22 to 14-point Verdana and underline it.

7. Select the range B4:G19 and then click the Format Cells: Number Dialog Box Launcher (Home tab | Number group) to display the Format Cells dialog box. Use the Number category (Format Cells dialog box) to assign the Comma style with no decimal places and negative numbers enclosed in parentheses to the range B4:G19.

8. Complete the following entries:

   a. Year 1 Sales (cell B4) = Units Sold in Prior Year * (Unit Cost / (1 – Margin)) or = B23*(B24/(1-B27))

   b. Year 2 Sales (cell C4) = Year 1 Sales * (1 + Annual Sales Growth) * (1 – Annual Price Decrease) or =B4*(1+$B$25)*(1-$B$26)

   c. Copy cell C4 to the range D4:G4.

   d. Year 1 Cost of Goods (cell B5) = Year 1 Sales * (1 – Margin) or =B4 * (1 - $B$27)

   e. Copy cell B5 to the range C5:G5.

   f. Gross Margin (cell B6) = Year 1 Sales - Year 1 Cost of Goods or =B4 – B5

   g. Copy cell B6 to the range C6:G6.

   h. Year 1 Advertising (cell B8) = 500 + 8% * Year 1 Sales or =500+8%*B4

   i. Copy cell B8 to the range C8:G8.

   j. Maintenance (row 9): Year 1 = 1,605,000; Year 2 = 4,378,000; Year 3 = 5,920,000; Year 4 = 5,050,000; Year 5 = 3,200,000; Year 6 = 4,250,000

   k. Year 1 Rent (cell B10) = 2,700,000

   l. Year 2 Rent (cell C10) = Year 1 Rent + (12% * Year 1 Rent) or =B10*(1+12%)

   m. Copy cell C10 to the range D10:G10.

   n. Year 1 Salaries (cell B11) = 17% * Year 1 Sales or =17%*B4

   o. Copy cell B11 to the range C11:G11.

   p. Year 1 Shipping (cell B12) = 3.9% * Year 1 Sales or =3.9%*B4

   q. Copy cell B12 to the range C12:G12.

   r. Year 1 Supplies (cell B13) = 1.3% * Year 1 Sales or =1.3%*B4

   s. Copy cell B13 to the range C13:G13.

   t. Year 1 Web Services (cell B14) = 250,000

   u. Year 2 Web Services (cell C14) = Year 1 Web Services + (15% * Year 1 Web Services) or =B14*(1+15%)

   v. Copy cell C14 to the range D14:G14.

   w. Year 1 Total Expenses (cell B15) = SUM(B8:B14)

   x. Copy cell B15 to the range C15:G15.

   y. Year 1 Operating Income (cell B17) = Year 1 Gross Margin - Year 1 Total Expenses or =B6-B15

   z. Copy cell B17 to the range C17:G17.

In the Lab *continued*

    aa. Year 1 Income Taxes (cell B18): If Year 1 Operating Income is less than 0, then Year 1 Income Taxes equal 0; otherwise Year 1 Income Taxes equal 45% * Year 1 Operating Income or =IF(B17 < 0, 0, 45%*B17)

    bb. Copy cell B18 to the range C18:G18.

    cc. Year 1 Net Income (cell B19) = Year 1 Operating Income – Year 1 Income Taxes or = B17-B18

    dd. Copy cell B19 to the range C19:G19.

    ee. In cell H4, insert a Sparkline Column chart (Insert Tab | Sparklines group) for cell range B4:G4

    ff. Repeat step ee for the ranges H5:H6, H8:H15, and H17:H19

9. Change the background colors as shown in Figure 3–87. Use Teal, Accent 3, Lighter 40% for the background colors.

10. Zoom to: (a) 200%; (b) 75%; (c) 25%; and (d) 100%.

11. Change the document properties, as specified by your instructor. Change the worksheet header with your name, course number, and other information as specified by your instructor. Save the workbook using the file name, Lab 3-1 Med Supply Online Warehouse Six-Year Financial Projection.

12. Preview the worksheet. Use the Orientation button (Page Layout tab | Page Setup group) to fit the printout on one page in landscape orientation. Preview the formulas version (CTRL+`) of the worksheet in landscape orientation using the Fit to option. Press CTRL +` to instruct Excel to display the values version of the worksheet. Save the workbook again and close the workbook.

13. Submit the workbook as specified by your instructor.

Instructions Part 2:

1. Start Excel. Open the workbook Lab 3-1 Med Supply Online Warehouse Six-Year Financial Projection.

2. Use the nonadjacent ranges B3:G3 and B19:G19 to create a 3-D Cylinder chart. Draw the chart by clicking the Column button (Insert tab | Charts group). When the Column gallery is displayed, click the Clustered Cylinder chart type (column 1, row 3). When the chart is displayed, click the Move Chart button to move the chart to a new sheet.

3. Select the legend on the right side of the chart and delete it. Add the chart title by clicking the Chart Titles button (Chart Tools Layout tab | Labels group). Click Above Chart in the Chart Title gallery. Format the chart title as shown in Figure 3–88.

4. To change the color of the cylinders, click one of the cylinders and use the Shape Fill button (Chart Tools Format tab | Shape Styles group). To change the color of the wall, click the wall behind the cylinders and use the Shape Fill button to change the chart wall color. Use the same procedure to change the color of the base of the wall.

5. Rename the sheet tabs Six-Year Financial Projection and 3-D Cylinder Chart. Rearrange the sheets so that the worksheet is leftmost and color their tabs as shown in Figure 3–88.

6. Click the Six-Year Financial Projection tab to display the worksheet. Save the workbook using the same file name (Lab 3-1 Med Supply Online Warehouse Six -Year Financial Projection) as defined in Part 1. Submit the workbook as requested by your instructor.
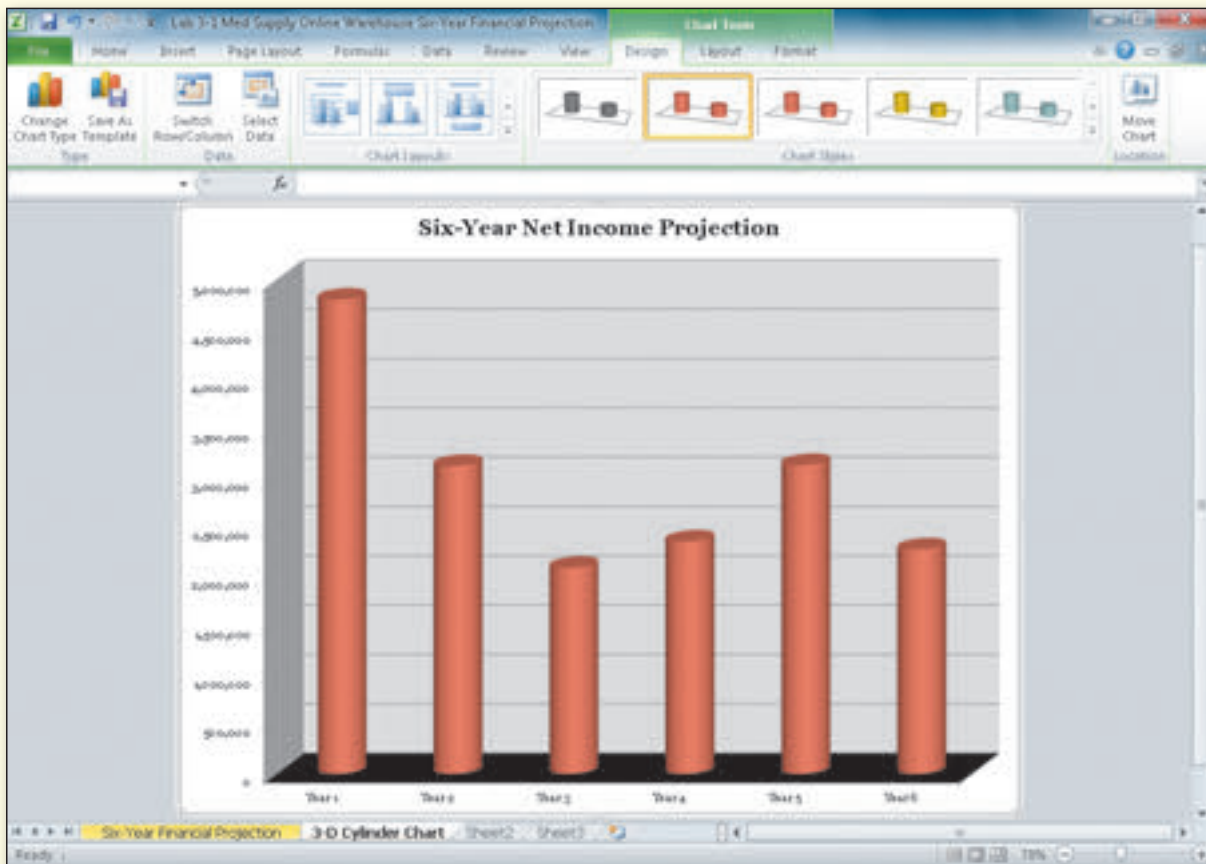
Figure 3–88

Instructions Part 3:

1. Start Excel. Open the workbook Lab 3-1 Med Supply Online Warehouse Six-Year Financial Projection. Do not save the workbook in this part of the In the Lab exercise. Divide the window into two panes by dragging the horizontal split box between rows 6 and 7. Use the scroll bars to show both the top and bottom of the worksheet. Using the numbers in columns 2 and 3 of Table 3–10, analyze the effect of changing the annual sales growth (cell B25) and annual price decrease (cell B26) on the net incomes in row 19. The resulting answers are in column 4 of Table 3–10. Submit the workbook or results of the what-if analysis for each case as requested by your instructor.

Table 3–10 Med Supply Online Warehouse Data to Analyze and Results			
Case	**Annual Sales Growth**	**Annual Price Decrease**	**Year 6 Resulting Net Income in Cell G19**
1	8.45%	5.75%	2,925,008
2	14.75%	23.00%	(2,353,532)
3	25.50%	2.65%	14,668,149

2. Close the workbook without saving it, and then reopen it. Use the What-If Analysis button (Data tab | Data Tools group) to goal seek. Determine a margin (cell B27) that would result in a Year 6 net income of $4,000,000 (cell G19). You should end up with a margin of 40.49% in cell B27. Submit the workbook with the new values or the results of the goal seek as requested by your instructor. Do not save the workbook with the latest changes.

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In the Lab

Lab 2: Analysis of Indirect Expense Allocations

Problem: Your classmate works part time as an advisor for the ReachOut Neighbors not-for-profit group. She has asked you to assist her in creating an indirect expense allocation worksheet (Figure 3–89) that will help the not-for-profit administration better evaluate the branch offices described in Table 3–11.
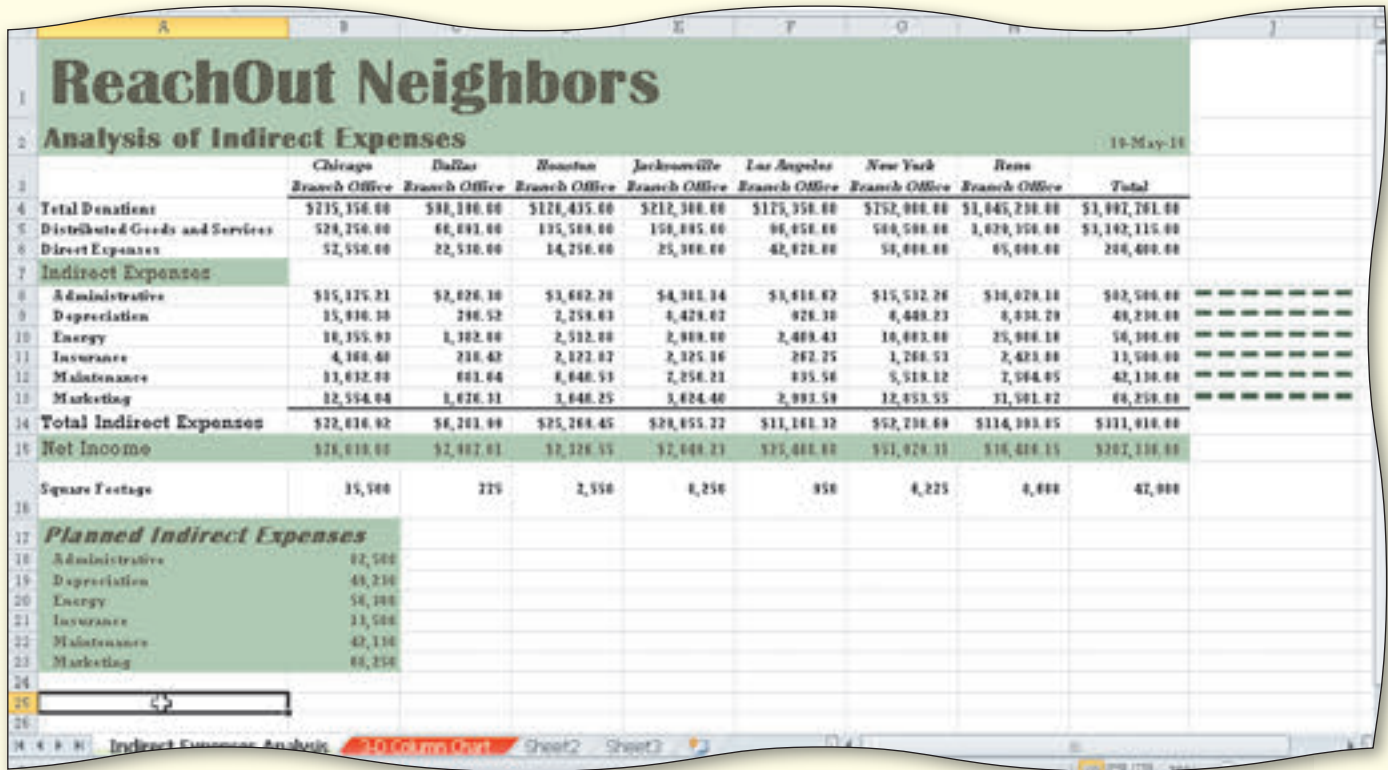
Figure 3–89

Table 3–11 ReachOut Neighbor Worksheet Data							
	Chicago Branch Office	Dallas Branch Office	Houston Branch Office	Jacksonville Branch Office	Los Angeles Branch Office	New York Branch Office	Reno Branch Office
Total Donations	735356	98190	178435	212300	175350	752900	1845230
Distributed Goods and Services	529750	60891	135589	150895	96050	589590	1629350
Direct Expenses	57550	22530	14750	25300	42670	58600	65000
Square Footage	15500	775	7550	8250	950	6275	8600

Instructions Part 1: Do the following to create the worksheet shown in Figure 3–89.

1. Apply the Foundry theme to the worksheet. Bold the entire worksheet by selecting the entire worksheet and using the Bold (Home tab | Font group).

2. Change the following column widths: A = 30.00; B through I = 13.00; J = 20.00.

3. Enter the worksheet titles in cells A1 and A2 and the system date in cell I2. Format the date to the 14-Mar-01 style.

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4. Enter the column titles, row titles, and the first three rows of numbers in Table 3–11 in rows 3 through 6. Add the column heading Total to cell I3. Center and italicize the column headings in the range B3:I3. Add a thick bottom border to the range B3:I3. Sum the individual rows 4, 5, and 6 in the range I4:I6.

5. Enter the Square Footage row as shown in Table 3–11 with the comma format symbol in row 16. Sum row 16 in cell I16. Use the Format Painter button (Home tab | Clipboard group) to format cell I16. Change the height of row 16 to 42.00. Vertically center the range A16:I16 through the use of the Format Cells dialog box.

6. Enter the remaining row titles in the range A7:A17 as shown in Figure 3–89. Increase the font size in cells A7, A14, and A15 to 14 point.

7. Copy the row titles in range A8:A13 to the range A18:A23. Enter the numbers shown in the range B18:B23 of Figure 3–89 with format symbols.

8. The planned indirect expenses in the range B18:B23 are to be prorated across the branch office as follows: Administrative (row 8), Energy (row 10), and Marketing (row 13) on the basis of Total Donations (row 4); Depreciation (row 9), Insurance (row 11), and Maintenance (row 12) on the basis of Square Footage (row 16). Use the following formulas to accomplish the prorating:

   a. Chicago Branch Office Administrative (cell B8) = Administrative Expenses * Chicago Branch Office Total Donations / ReachOut Neighbors Total Donations or =$B$18*B4/$I$4

   b. Chicago Branch Office Depreciation (cell B9) = Depreciation Expenses * Chicago Branch Office Square Footage / Total Square Footage or =$B$19*B16/$I$16

   c. Chicago Branch Office Energy (cell B10) = Energy Expenses * Chicago Branch Office Total Donations / ReachOut Neighbor Total Donations or =$B$20*B4/$I$4

   d. Chicago Branch Office Insurance (cell B11) = Insurance Expenses * Chicago Branch Office Square Footage / Total Square Footage or =$B$21*B16 /$I$16

   e. Chicago Branch Office Maintenance (cell B12) = Maintenance Expenses * Chicago Branch Office Square Footage / Total Square Footage or =$B$22*B16/$I$16

   f. Chicago Branch Office Marketing (cell B13) = Marketing Expenses * Chicago Branch Office Total Donations / ReachOut Neighbor Total Donations or =$B$23*B4/$I$4

   g. Chicago Branch Office Total Indirect Expenses (cell B14) = SUM(B8:B13)

   h. Chicago Branch Office Net Income (cell B15) = Total Donations - (Distributed Goods and Services + Direct Expenses + Total Indirect Expenses) or =B4-(B5+B6+B14)

   i. Copy the range B8:B15 to the range C8:H15.

   j. Sum the individual rows 8 through 15 in the range I8:I15.

9. Add a thick bottom border to the range B13:I13. Assign the Currency style with two decimal places and show negative numbers in parentheses to the following ranges: B4:I4; B8:I8; and B14:I15. Assign the Comma style with two decimal places and show negative numbers in parentheses to the following ranges: B5:I6 and B9:I13.

10. Change the font in cell A1 to 48-point Britannic Bold (or a similar font). Change the font in cell A2 to 22-point Britannic Bold (or a similar font). Change the font in cell A17 to 18-point italic Britannic Bold.

11. Use the background color Green, Accent 1, Lighter 40% and the font color Tan, Background 2, Darker 75% for cell A7 and the ranges A1:I2; A15:I15; and A17:B23 as shown in Figure 3–89.

12. Insert a Sparkline Win/Loss chart for the range B8:H8 in cell J8. Copy the cell J8 to the cell range J9:J13.

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In the Lab *continued*

13. Rename the Sheet1 sheet as Indirect Expenses Analysis and color its tab green.

14. Update the document properties with your name, course number, and name for the workbook. Change the worksheet header with your name, course number, and other information as specified by your instructor. Save the workbook using the file name, Lab 3-2 ReachOut Neighbor Analysis of Indirect Expenses.

15. Preview the worksheet. Use the Orientation button (Page Layout tab | Page Setup group) to fit the printout on one page in landscape orientation using the Fit to option. Preview the formulas version (CTRL+`) of the worksheet in landscape orientation using the Fit to option. Press CTRL+` to instruct Excel to display the values version of the worksheet. Save the workbook again and close the workbook.

16. Divide the window into four panes and show the four corners of the worksheet. Remove the four panes. Close the workbook but do not save the workbook.

Instructions Part 2: Start Excel. Open Lab 3-2 ReachOut Neighbor Analysis of Indirect Expenses. Draw a 3-D Column Chart (Figure 3–90) on a separate sheet that shows the contribution of each category of indirect expense to the total indirect expenses. That is, chart the nonadjacent ranges A8:A13 (category names) and I8:I13 (data series). Show labels that include value of the column. Do not show the legend. Format the 3-D Column Chart as shown in Figure 3–90. Rename the chart sheet 3-D Column Chart and color the sheet tab red. Move the chart tab to the right of the worksheet tab. Save the workbook using the file name, Lab 3-2 ReachOut Neighbor Analysis of Indirect Expenses. Submit the workbook as specified by your instructor.
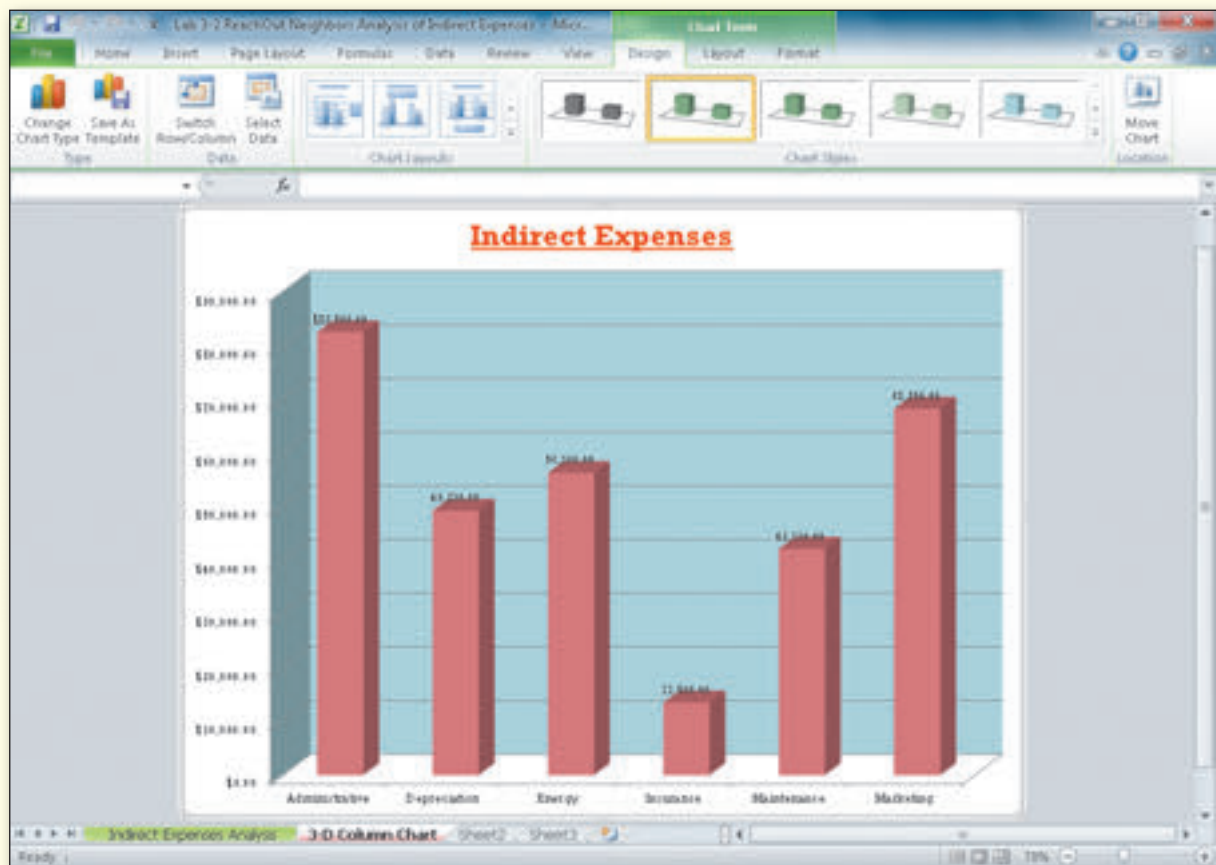

Figure 3–90

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Instructions Part 3: Start Excel. Open Lab 3-2 ReachOut Neighbor Analysis of Indirect Expenses.

1. Using the numbers in Table 3–12, analyze the effect of changing the planned indirect expenses in the range B18:B23 on the pret incomes for each branch office. You should end with the following totals in cell I15: Case 1 = $5,846.00 and Case 2 = $124,346.00. Submit the workbook or results for each case as requested by your instructor.

2. Use the What-If Analysis button (Data tab | Data Tools group) to goal seek. Determine a planned indirect Marketing expense (cell B23) that would result in a total net income of $50,000 (cell I15). You should end up with a planned indirect Marketing expense of $225,586 in cell B23. Submit the workbook with the new values or the results of the goal seek as specified by your instructor.

Table 3–12 ReachOut Neighbor Indirect Expense Allocations What-If Data		
	Case 1	**Case 2**
Administrative	124000	66500
Depreciation	156575	75000
Energy	72525	56000
Insurance	46300	67000
Maintenance	75000	48000
Marketing	39000	82400

In the Lab

Lab 3: Modifying a Weekly Inventory Worksheet

Problem: As a summer intern at Dinah's Candle Depot, you have been asked to modify the weekly inventory report shown in Figure 3–91a on the following page. The workbook, Lab 3-3 Dinah's Weekly Inventory Report, is included with the Data Files for Students. See the inside back cover of this book for instructions for downloading the Data Files for Students, or see your instructor for information on accessing the files required for this book.

The major modifications to the payroll report to be made in this exercise include: (1) reformatting the worksheet; (2) adding computations of quantity to order based on reorder level and weeks to arrive; (3) adding calculations to suggest changes in ordering; (4) adding current and last month sales for inventory items; (5) adding and deleting inventory items; and (6) changing inventory item information. The final inventory report is shown in Figure 3–91b on the following page.

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In the Lab continued

Figure 3–91 (a) Before

Figure 3–91 (b) After

Instructions Part 1:

1. Start Excel. Open the workbook, Lab 3-3 Dinah's Weekly Inventory Report and then save the workbook using the file name Lab 3-3 Dinah's Weekly Inventory Report Complete.

2. Select the worksheet by clicking the Select All button. Click the Clear button (Home tab | Editing group) and then click Clear Formats on the Clear menu to clear the formatting. Bold the entire worksheet.

3. Delete rows 11 through 13 to remove the statistics below the Totals row. Change all the row heights back to the default height (12.75).

4. Insert four rows above row 1 by selecting rows 1 through 4, right-clicking the selection, and clicking Insert on the shortcut menu.

5. Change the row heights as follows: row 5 = 48.00; row 6 = 25.50; and 7 = 38.25. For the range B7:I7, change the format so that the text wraps. Center the range B7:I7.

6. Delete column B by right-clicking the column heading and clicking Delete on the shortcut menu.

7. Insert a new column between columns D and E. Change the column widths as follows: A = 25.00; E = 13.00; and F through I = 9.71. Enter the new column E title `Suggested Reorder` in cell E7.

8. Insert two new columns between columns F and G. Enter the new column G title `Last Month Sales` in cell G7. Enter the new column H title `Current Month Sales` in cell H7.

9. Enhance the worksheet title in cell A5 by using a 36-point purple Cooper Black (or a similar font) font style as shown in Figure 3–91b.

10. Assign the NOW function to cell B6 and format it to the 3/14/2001 style.

11. Delete item Car Air Freshener (row 13). Change Mini Jar Candle's (row 12) cases on hand to 6. Change Large Candle's (row 8) items per case to 8 and cost per case to $131.00. Change Incense Stick's (row 10) sale price per item to $2.00 and Incense Holder's (row 9) sale price per item to $4.75.

12. Freeze column A and rows 1 through 7 by selecting cell B8, clicking the Freeze Panes button (View tab | Window group), and then clicking Freeze Panes on the Freeze Panes gallery.

13. In columns G and H, enter the current month and last month sales values listed in Table 3–13.

14. Insert three new rows immediately above the Totals row. Add the new items data as listed in Table 3–14.

Table 3–13 Dinah's Candle Depot Monthly Sales Values		
Inventory Item	**Last Month Sales**	**Current Month Sales**
Large Candle	851.6	1703.2
Incense Holder	37.5	56.25
Incense Stick	90	100
Candle Topper	390	260
Mini Jar Candle	1208	1208

Table 3–14 Dinah's Candle Depot New Items								
Inventory Item	**Cases On Hand**	**Items Per Case**	**Reorder Level**	**Order Time (Weeks)**	**Last Month Sales**	**Current Month Sales**	**Cost Per Case**	**Sale Price Per Item**
Votive Candle	3	18	4	1	300	450	20	1.5
Taper Candle	2	16	3	2	350	612.5	35	3.5
Candle Warmer	2	5	1	3	638	797.5	100	15.95

15. Center the range B8:F15. Use the Currency category in the Format Cells dialog box to assign a Comma style (no dollar signs) with two decimal places and negative numbers within parentheses to the range G8:K16. Draw a thick bottom border in the ranges A7:K7 and A15:K15.

16. As shown in Figure 3–91b, enter and format the Increase Reorder Amt (2), the Decrease Reorder Amt (1), and the Sales Threshold % (25%) information in the range A1:B3. Use format symbols where applicable.

In the Lab *continued*

17. Remove any Totals in the range B16:F16. Update and add totals as necessary so that totals appear in the range G16:K16.

18. In cell E8, enter an IF function that applies the following logic and then copy it to the range E9:E15. If (Current Month Sales – Last Month Sales) / Current Month Sales >= Sales Threshold %, then Reorder Level + Increase Reorder Amt, otherwise Reorder Level – Decrease Reorder Amt or =IF((H8-G8)/H8 >= $B$3, D8+$B$1,D8-$B$2).

19. In cell L8, insert a Sparkline Line chart for range G8:H8. Copy cell L8 to the range L9:L16.

20. Unfreeze the worksheet by clicking the Freeze Panes button (View tab | Window group), and then clicking Unfreeze Panes on the Freeze Panes gallery.

21. Preview the worksheet. Use the Orientation button (Page Layout tab | Page Setup group) to fit the printout on one page in landscape orientation.

22. Change the document properties, as specified by your instructor. Change the worksheet header, adding your name, course number, and other information as specified by your instructor. Save the workbook.

23. Use the Zoom button (View tab | Zoom group) to change the view of the worksheet. One by one, select all the percents on the Zoom dialog box. When you are done, return the worksheet to 100% magnification.

24. Preview the formulas version (CTRL+`) in landscape orientation. Close the worksheet without saving the latest changes.

25. Submit the workbook as specified by your instructor.

Instructions Part 2: Start Excel. Open Lab 3-3 Dinah's Weekly Inventory Report Complete. Do not save the workbook in this part. Using the numbers in Table 3–15, analyze the effect of changing the Sales Threshold in cell B3. The first case should result in a Suggested Reorder in cell E15 of 0. The second case should result in a Suggested Reorder in cell E15 of 3. Close the workbook without saving changes. Submit the results of the what-if analysis as specified by your instructor.

Table 3–15 The Dinah's Candle Depot's Sales Threshold Cases	
Case	Sales Threshold
1	30%
2	15%

Instructions Part 3: Submit results for this part as requested by your instructor.

1. Start Excel. Open Lab 3-3 Dinah's Weekly Inventory Report Complete. Select cell E8. Write down the formula that Excel displays in the formula bar. Select the range D8:D15. Point to the border surrounding the range and drag the selection to the range E17:E24. Click cell E8, and write down the formula that Excel displays in the formula bar below the one you wrote down earlier. Compare the two formulas. What can you conclude about how Excel responds when you move cells involved in a formula? Click the Undo button on the Quick Access Toolbar.

2. Right-click the range D8:D15 and then click Delete on the shortcut menu. When Excel displays the Delete dialog box, click Shift cells left and then click the OK button. What does Excel display in cell D8? Click cell D8 and then point to the Trace Error button that is displayed to the left of the cell. Write down the ScreenTip that is displayed. Click the Undo button on the Quick Access Toolbar.

3. Right-click the range D8:D15 and then click Insert on the shortcut menu. When Excel displays the Insert dialog box, click 'Shift cells right' and then click the OK button. What does Excel display in the formula bar when you click cell F8? What can you conclude about how Excel responds when you insert cells next to cells involved in a formula? Close the workbook without saving the changes.

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Cases and Places

Apply your creative thinking and problem solving skills to design and implement a solution.

1: Bachelor Degree Expense and Resource Projection

Academic

Attending college with limited resources can be a trying experience. One way to alleviate some of the financial stress is to plan ahead. Develop a worksheet following the general layout in Table 3–16 that shows the projected expenses and resources for four years of college. Use the formulas listed in Table 3–17 and the concepts and techniques presented in this chapter to create the worksheet.

Table 3–16 Bachelor Degree Expense and Resource Projection

Expenses	Freshman	Sophomore	Junior	Senior	Total
Room & Board	$12,550.00	Formula A ———————————————→			—
Tuition & Books	16,450.00	Formula A ———————————————→			—
Clothes	785.00	Formula A ———————————————→			—
Entertainment	1,520.00	Formula A ———————————————→			—
Miscellaneous	936.00	Formula A ———————————————→			—
Total Expenses	—	—	—	—	—

Resources	Freshman	Sophomore	Junior	Senior	Total
Savings	Formula B ———————————————→				
Parents	Formula B ———————————————→				—
Job	Formula B ———————————————→				—
Loans	Formula B ———————————————→				—
Scholarships	Formula B ———————————————→				—
Total Resources	—	—	—	—	—

Assumptions	
Savings	10.00%
Parents	12.00%
Job	11.00%
Loans	35.00%
Scholarships	32.00%
Annual Rate Increase	8.25%

Table 3–17 Bachelor Degree Expense and Resource Projection Formulas

Formula A = Prior Year's Expense * (1 + Annual Rate Increase)
Formula B = Total Expenses for Year * Corresponding Assumption

After creating the worksheet: (a) perform what-if analysis by changing the percents of the resource assumptions; (b) perform a what-if analysis to determine the effect on the resources by increasing the Annual Rate Increase to 9.95% (answer = $149,520.41); and (c) with the original assumptions, goal seek to determine what the Annual Rate Increase would be for the total expenses to be $175,000 (answer = 20.77%). Submit the workbook and results of the what-if analysis as specified by your instructor.

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Cases and Places *continued*

2: Fuel Cost Analysis

Personal

You are thinking about buying a new vehicle, and you want to make sure that you get the most fuel savings you can find. You know that there are hybrid vehicles available and so you decide to research them as well as gas-only cars. Your friends also are interested in the results. Together, you decide to research the fuel costs associated with various types of vehicles. Research the gas mileage for six vehicles: three should run only on gas, and the others should be hybrid vehicles, combining gas and battery power. After you find the gas mileage for each vehicle, you will use formulas to calculate the fuel cost for 1 month, 1 year, and three years. Assume that in a typical month, you will drive 400 miles and that the average price of gas is $2.69 per gallon. Develop a worksheet following the general layout in Table 3–18 that shows the fuel cost analysis. Use the formulas listed in Table 3–19 and the concepts and techniques presented in this chapter to create the worksheet. Add a 3-D line chart showing the cost comparisons as an embedded chart.

Table 3–18 Fuel Cost Analysis				
Vehicle	**Miles Per Gallon**	**1 Month**	**1 Year**	**3 Year**
Ford Expedition	17	Formula A	Formula B	Formula C
Dodge RAM 1500	20	---	---	---
Honda Civic	31	---	---	---
Chevy Silverado Hybrid	21	---	---	---
Ford Fusion Hybrid	41	---	---	---
Honda Civic Hybrid	45	---	---	---
Assumptions				
Distance per Month	400			
Price of Gas	$2.69			

Table 3–19 Fuel Cost Analysis Formulas
Formula A = (Distance per Month / Miles per Gallon)*Price of Gas
Formula B = ((Distance per Month / Miles per Gallon)*Price of Gas)*12
Formula C = ((Distance Per Month / Miles per Gallon)*Price of Gas)*36

3: Quarterly Income Projections

Professional

Notable Web Site Design is one of the largest Web site design and Web site hosting companies in the Midwest. The company generates revenue from Web site design and selling Web site hosting space on their Web servers. A fixed percentage of the total net revenue is spent on administrative, equipment, marketing, payroll, and production expenses. A bonus is expensed if the total net revenue for the quarter exceeds $14,000,000. The company's projected receipts and expenditures for the next four quarters are shown in Table 3–20.

With this data, you have been asked to prepare a worksheet similar to Figure 3–87 on page EX 210 for the next management team meeting. The worksheet should show total net revenues, total expenditures, and operating income for each quarterly period. Include a 3-D Pie chart on a separate sheet that shows the quarterly income contributions to the annual operating income. Use the concepts and techniques presented in this chapter to create and format the worksheet and chart.

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During the meeting, one manager lobbied to reduce marketing expenditures by 1.25% and payroll costs by 2.75%. Perform a what-if analysis reflecting the proposed changes in expenditures. The changes should result in an operating income of $22,425,581 for the year. Using the original assumptions shown in Table 3–20, another manager asked to what extent marketing would have to be reduced to generate an annual operating income of $21,000,000. Marketing would to be reduced from 13.50% by 1.92% to 11.58%.

Submit the workbook and results of the what-if analysis as specified by your instructor.

Table 3–20 Notable Website Design Operating Income Projection by Quarter				
Revenues	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**
Site Design	12,247,999	15,234,813	16,567,102	10,619,201
Web Hosting	1,678,153	5,901,988	4,718,231	1,569,378
Expenditures				
Administrative	10.50%			
Bonus	250,000.00			
Equipment	17.75%			
Marketing	13.50%			
Payroll	22.50%			
Production	6.30%			
Revenue for Bonus	14,000,000.00			

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