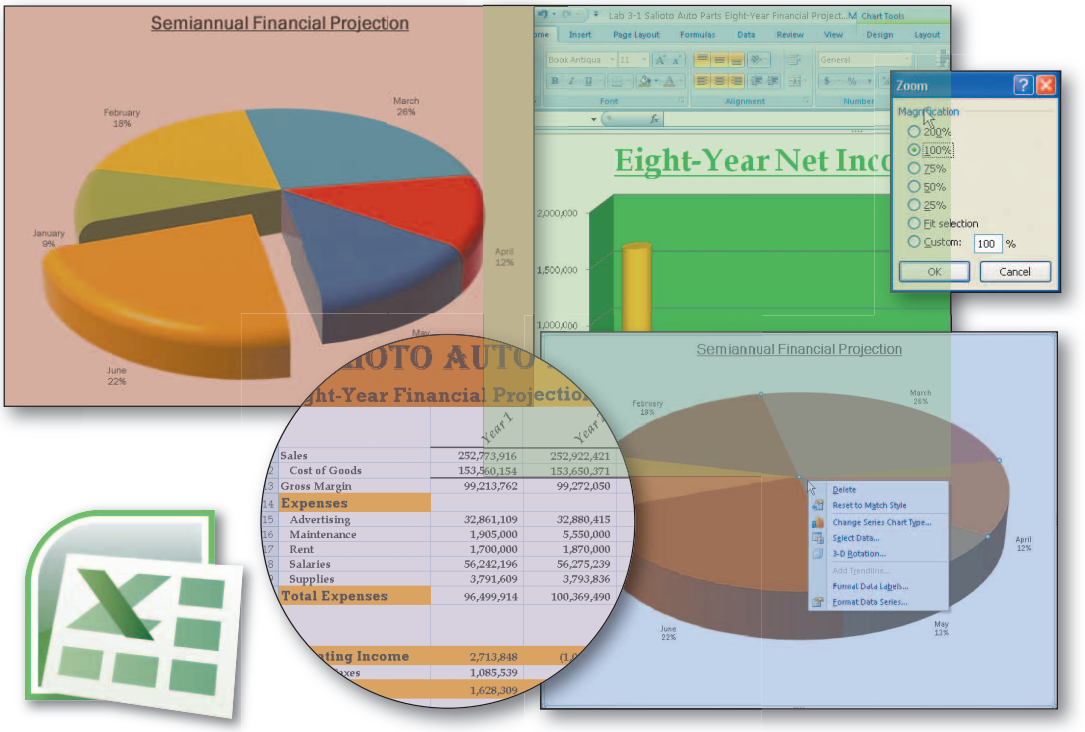
3 What-If Analysis, Charting, and Working with Large Worksheets



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 titles
- Show and format the system date
- Use absolute cell references in a formula
- Use the IF function to perform a logical test
- Use the Format Painter button to format cells
- Create a 3-D Pie chart on a separate chart sheet
- Color and 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 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 displays on the screen so you can view critical parts of a large worksheet at one time. One command lets you freeze the row and column titles so Excel always displays them on the screen. Another command splits the worksheet into separate window panes so you can view different parts of a worksheet on the screen at one time. Hiding the Ribbon will allow a larger portion of the worksheet to be visible.

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 semi-annual operating income if you decrease the marketing expenses assumption by 2%? 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 your message in a dramatic pictorial fashion such as 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.

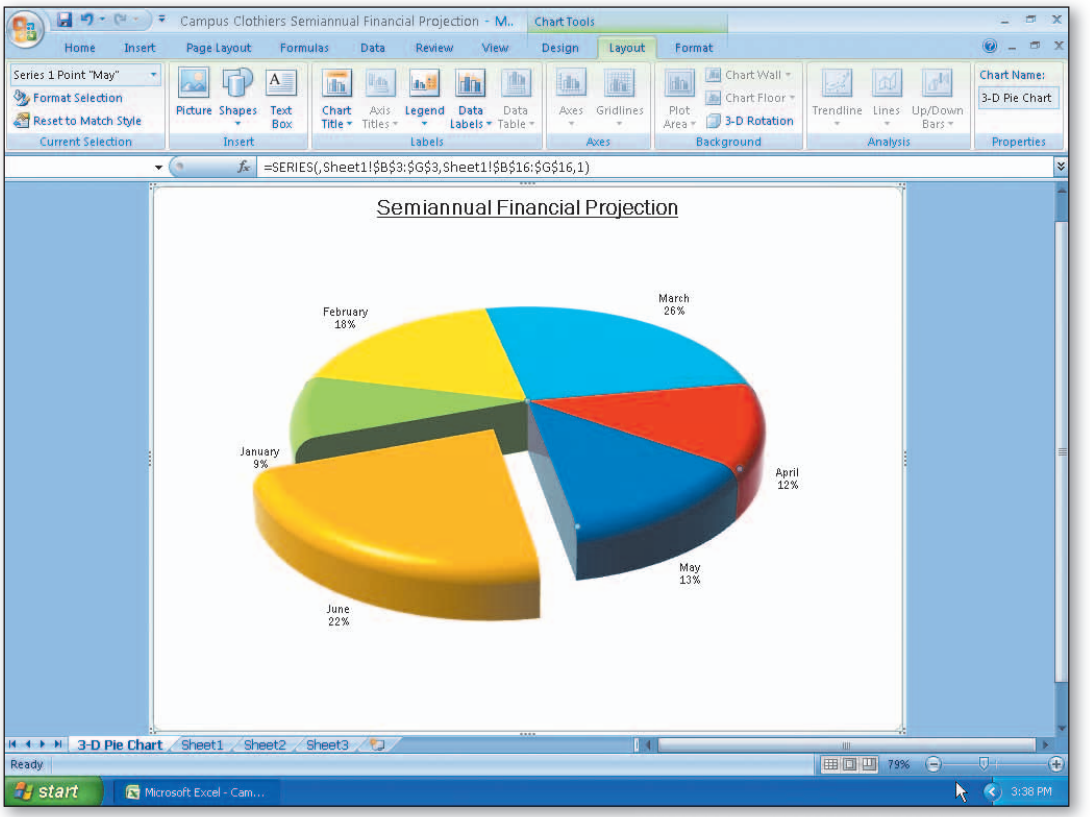
Project — Financial Projection Worksheet with What-If Analysis and Chart

The project in the chapter follows proper design guidelines and uses Excel to create the worksheet and pie chart shown in Figure 3–1. Campus Clothiers manufactures and sells customized clothing to college students on campuses around the country. Each June and December, the director of finance and accounting submits a plan to the management team to show projected monthly revenues, costs of goods, 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.

J28

	A	B	C	D	E	F	G	H
1	**Campus Clothiers**							
2	**Semiannual Projected Gross Margin, Expenses, and Operating Income**							
3		January	February	March	April	May	June	Total
4	Sales	$3,383,909.82	$6,880,576.15	$9,742,702.37	$4,818,493.53	$4,566,722.63	$8,527,504.39	$37,919,908.89
5	**Cost of Goods Sold**	1,319,724.83	2,683,424.70	3,799,653.92	1,879,212.48	1,781,021.83	3,325,726.71	14,788,764.47
6	Gross Margin	**$2,064,184.99**	**$4,197,151.45**	**$5,943,048.45**	**$2,939,281.05**	**$2,785,700.80**	**$5,201,777.68**	**$23,131,144.42**
7								
8	Expenses							
9	**Bonus**	$0.00	$100,000.00	$100,000.00	$100,000.00	$0.00	$100,000.00	$400,000.00
10	**Commission**	109,977.07	223,618.72	316,637.83	156,601.04	148,418.49	277,143.89	1,232,397.04
11	**Marketing**	304,551.88	619,251.85	876,843.21	433,664.42	411,005.04	767,475.40	3,412,791.80
12	**Research and Development**	194,574.81	395,633.13	560,205.39	277,063.38	262,586.55	490,331.50	2,180,394.76
13	**Support, General, and Administrative**	575,264.67	1,169,697.95	1,656,259.40	819,143.90	776,342.85	1,449,675.75	6,446,384.51
14	Total Expenses	**$1,184,368.44**	**$2,508,201.65**	**$3,509,945.83**	**$1,786,472.74**	**$1,598,352.92**	**$3,084,626.54**	**$13,671,968.11**
15								
16	Operating Income	$879,816.55	$1,688,949.80	$2,433,102.62	$1,152,808.32	$1,187,347.88	$2,117,151.14	$9,459,176.31
17								
18	*What-If Assumptions*							
19	**Bonus**	$100,000.00						
20	**Commission**	3.25%						
21	**Margin**	61.00%						
22	**Marketing**	9.00%						
23	**Research and Development**	5.75%						
24	**Revenue for Bonus**	$4,750,000.00						
25	**Support, General, and Administrative**	17.00%						
26								

(a) Worksheet



(b) 3-D Pie Chart

Figure 3–1

BTW

Correctness

Studies have shown that more than 25 percent of all business worksheets have errors. If you are not careful entering data and formulas, then your worksheet is prone to 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 Campus Clothiers Semiannual 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:	October 27, 2008
Submitted By:	Norm Armand
Worksheet Title:	Campus Clothiers Semiannual Projected Gross Margin, Expenses, and Operating Income
Needs:	The needs are: (1) a worksheet (Figure 3-3a) that shows Campus Clothiers's projected monthly sales, cost of goods, gross margin, expenses, and operating income for a six-month period; and (2) a 3-D Pie chart (Figure 3-3b) 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) that are based on prior years. All the remaining numbers in the worksheet are determined from these 13 numbers using formulas.
Calculations:	The following calculations must be made for each month: 1. Cost of Goods = Sales – Sales * Margin 2. Gross Margin = Sales – Cost of Goods 3. Bonus Expense = $100,000.00 if the Sales exceeds the Revenue for Bonus; otherwise Bonus Expense = 0 4. Commission Expense = Commission Assumption * Sales 5. Marketing Expense = Marketing Assumption * Sales 6. Research and Development = Research and Development Assumption * Sales 7. Support, General, and Administrative Expense = Support, General, and Administrative Assumption * Sales 8. Total Expenses = Sum of Expenses 9. Operating Income = Gross Margin – Total Expenses
Chart Requirements:	A 3-D Pie chart is required on a separate sheet (Figure 3-3b) 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:	Shauna Hendricks, CFO	
Date:	November 1, 2008	
Assigned To:	J. Quasney, Spreadsheet Specialist	

Figure 3–2

BTW

Excel's Usefulness

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

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
- 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

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. The requirements state that six months are necessary in the worksheet. It is therefore sensible to place the months across columns so that the financial headings can be placed in rows. The what-if assumptions should not clutter the worksheet, but they should be placed in an easily located portion of the worksheet.
2. Determine the necessary formulas and functions needed. Except for the monthly sales numbers, the remaining numbers in the main portion of the worksheet are calculated based on the numbers in the what-if portion of the worksheet. The formulas are stated in the requirements document (Figure 3–2). The Bonus expense is included only if a certain condition is met. A function can check for the condition and include the bonus when necessary.
3. Identify how to format various elements of the worksheet. Sales and Expenses are two distinct categories of financial data and should be separated visually. Gross Margin and Total Expenses should stand out because they are subtotals. The Operating Income is the key piece of information being calculated in the worksheet and, therefore, should be formatted in such a manner as to draw the reader's attention. The what-if assumptions should be formatted in a manner which indicates that they are separate from the main area of the worksheet.
4. Specify how the chart should convey necessary information. The requirements document indicates that the chart should be a 3-D Pie chart and emphasize the month with the greatest operating income. A 3-D Pie chart is a good way to compare visually a small set of numbers. The month, which is emphasized, also should appear closer to the reader in order to draw the reader's attention.
5. Perform what-if analysis and goal seeking using the best techniques. What-if analysis allows you quickly to answer questions regarding various predictions. In Campus Clothiers Semiannual Financial Projection worksheet, the only cells that you should change when performing what-if analysis are those in the what-if portion of the worksheet. All other values in the worksheet, except for the projected sales, are calculated. Goal seeking allows you automatically to modify values in the what-if area of the worksheet based on a goal that you have for another cell in the worksheet.

(continued)

Plan Ahead

(continued)

In addition, using a sketch of the worksheet can help you visualize its design. The sketch of the worksheet (Figure 3-3a) consists of titles, column and row headings, location of data values, calculations, and a rough idea of the desired formatting. The sketch of the 3-D Pie chart (Figure 3–3b) shows the expected contribution of each month's operating income to the semiannual operating income. The projected monthly sales will be entered in row 4 of the worksheet. The assumptions will be entered below the operating income (Figure 3–3a). The projected monthly sales and the assumptions will be used to calculate the remaining numbers 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 163.

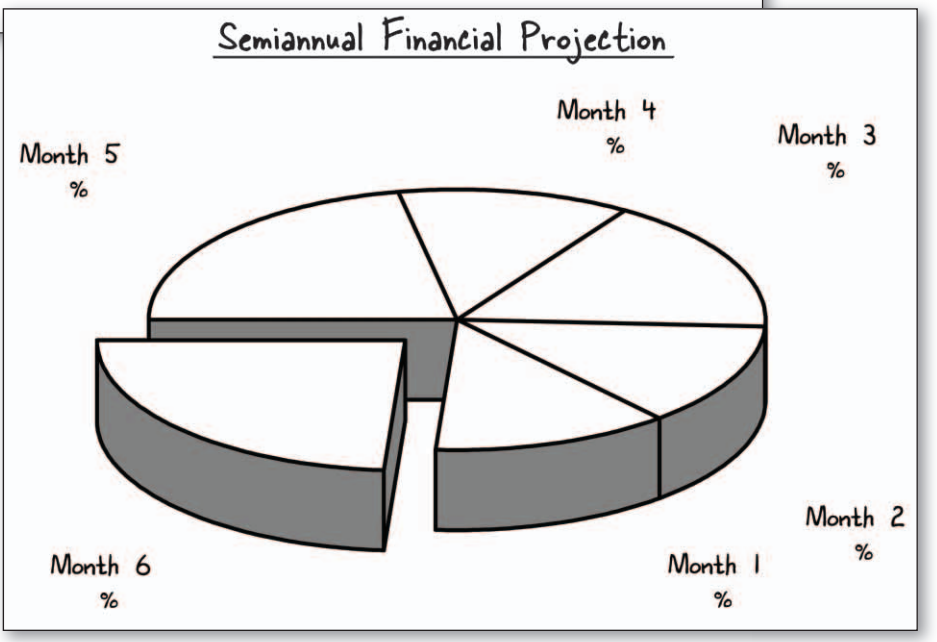
Campus Clothiers

Semiannual Projected Gross Margin, Expenses, and Operating Income

99/99/9999

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Total
Sales	$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
What-If Assumptions							
Bonus	ZZ,ZZZ,ZZ9.00						
Commission	Z9.99%						
Margin	Z9.99%						
Marketing	Z9.99%						
Research and Development	Z9.99%						
Revenue for Bonus	ZZ,ZZZ,ZZ9.99						
Support, General, and Administrative	Z9.99%						

(a) Worksheet



(b) 3-D Pie Chart

Figure 3–3

With a good 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 Campus Clothiers Semiannual Financial Projections Data and What-If Assumptions

Projected Monthly Total Net Revenues	
January	$3,383,909.82
February	6,880,576.15
March	9,742,702.37
April	4,818,493.53
May	4,566,722.63
June	8,527,504.39
What-If Assumptions	
Bonus	$100,000.00
Commission	3.25%
Margin	61.00%
Marketing	9.00%
Research and Development	5.75%
Revenue for Bonus	$4,750,000.00
Support, General, and Administrative	17.00%

To Start Excel

If you are using a computer to step through the project in this chapter and you want your screen to match the figures in this book, you should change your computer's resolution to 1024 × 768. For information about how to change a computer's resolution, see page APP 36 in Appendix E.

The following steps, which assume Windows is running, start Excel based on a typical installation of Microsoft Office on your computer. You may need to ask your instructor how to start Excel for your computer.

1. Click the Start button on the Windows taskbar to display the Start menu.
2. Point to All Programs on the Start menu and then point to Microsoft Office in the All Programs submenu.
3. Click Microsoft Office Excel 2007 on the Microsoft Office submenu.
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.
5. If the worksheet window in Excel is not maximized, click the Maximize button next to the Close button on its title bar to maximize the worksheet window within Excel.

BTW

The Startup Submenu

Any application on the Startup submenu starts automatically when you turn your computer on. To add Excel to the Startup submenu, do the following: (1) Click the Start button on the Windows taskbar, point to All Programs on the Start menu, and then point to Microsoft Office on the All Programs submenu; (2) Right-drag Microsoft Office Excel 2007 from the Microsoft Office submenu to the Startup submenu; (3) When the shortcut menu appears, click Copy Here. The next time you turn your computer on, Excel will start automatically.

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

The worksheet contains two titles, one in cell A1 and another in cell A2. 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 in the upper-left corner as shown in the sketch of the worksheet in Figure 3–3a. The following steps enter the worksheet titles and save the workbook.

1. Click cell A1 and then enter `Campus Clothiers` as the worksheet title.
2. Click cell A2 and then enter `Semiannual Projected Gross Margin, Expenses, and Operating Income` as the worksheet subtitle and then press the ENTER key.
3. Click the Office Button, click Prepare on the Office Button menu, and then click Properties.
4. Update the document properties with your name and any other relevant information.
5. Click the Close button in the Document Properties pane.
6. Apply the Trek theme to the worksheet by clicking the Themes button on the Page Layout tab on the Ribbon and then return to the Home tab on the Ribbon.
7. With a USB flash drive connected to one of the computer's USB ports, click the Save button on the Quick Access Toolbar.
8. When Excel displays the Save As dialog box, type `Campus Clothiers Semiannual Financial Projection` in the File name text box.
9. If necessary, click UDISK 2.0 (E:) in the Save in list (your USB flash drive may have a different name and letter). Click the Save button in the Save As dialog box to save the workbook.

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, 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.

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.

Plan Ahead

Plan the layout of the worksheet.
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. There are more data items regarding each month than there are months, and it is possible that more expense categories could be added in the future. A proper layout, therefore, includes placing the data items for each month as row headings. The What-If Assumptions section should be placed in an area of the worksheet that is easily accessible, yet does not impair the view of the main section of the worksheet. As shown in Figure 3–3a, the What-If Assumptions should be placed below the calculations in the worksheet.

When you first enter text, its angle is zero degrees (0°), and it reads from left to right in a cell. Text in a cell can be rotated counterclockwise by entering a number between 1° and 90° in the Alignment sheet in the Format Cells dialog box.

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

Chapters 1 and 2 used the fill handle to copy a cell or a range of cells to adjacent cells. The fill handle also can be used to create a series of numbers, dates, or month names automatically. The following steps enter the month name, January, in cell B3; format cell B3 (including rotating the text); and then use the fill handle to enter the remaining month names in the range C3:G3.

1

- Select cell B3.
- Type `January` as the cell entry and then click the Enter box.
- Click the Format Cells: Alignment Dialog Box Launcher on the Ribbon to display the Format Cells dialog box (Figure 3-4).

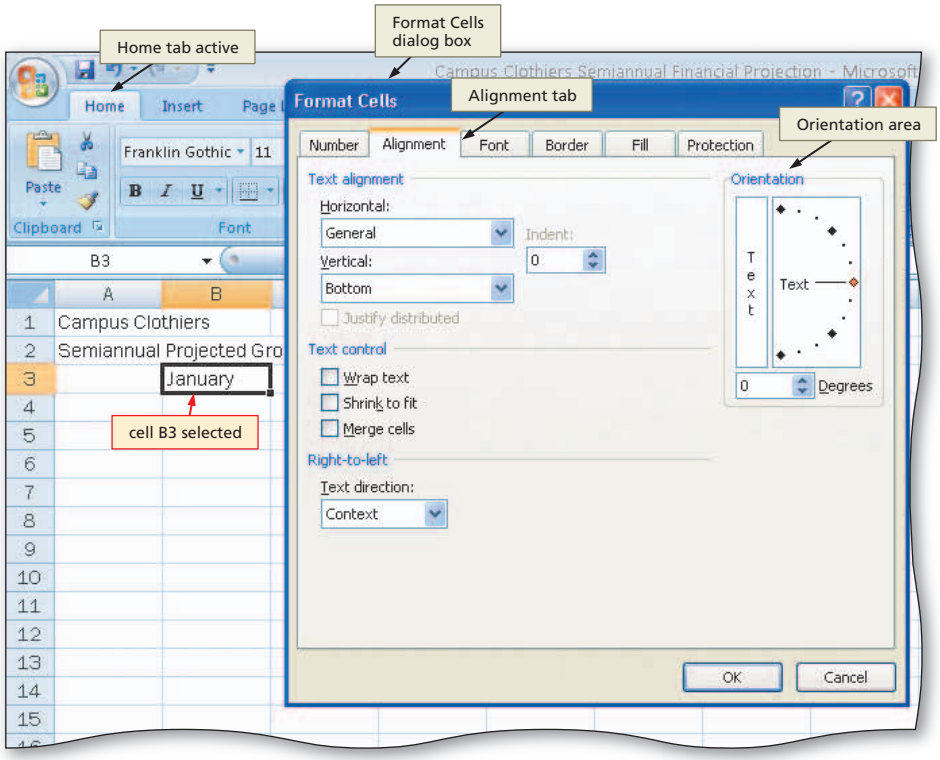


Figure 3–4

2

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

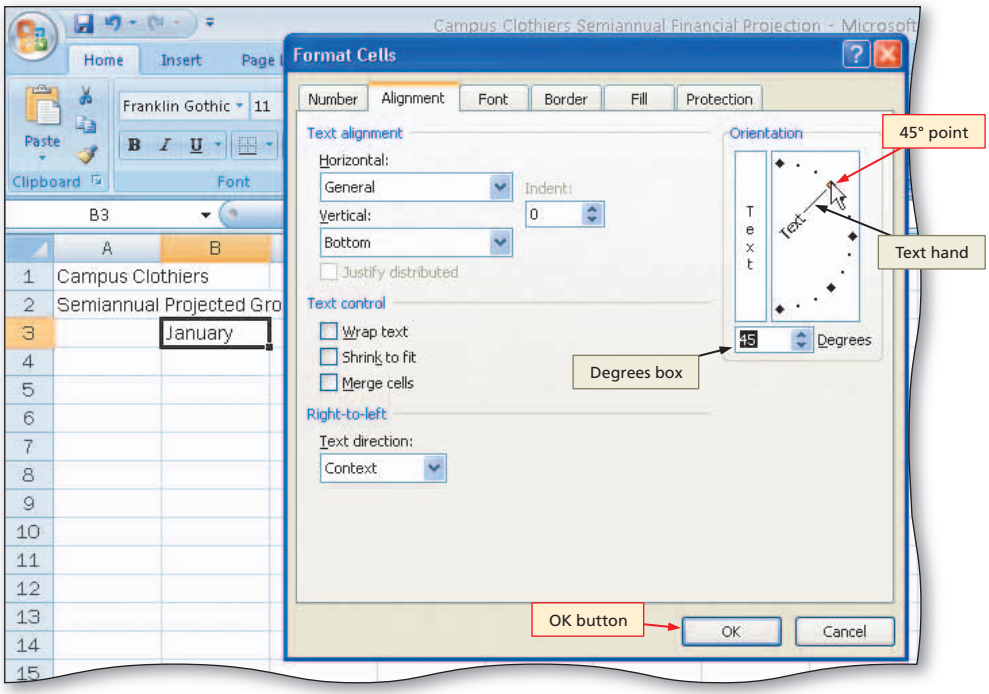


Figure 3–5

3

- Click the OK button to rotate the text in cell B3 at a 45° angle and automatically increase the height of row 3 to best fit the rotated text (Figure 3–6).
- Point to the fill handle on the lower-right corner of cell B3.

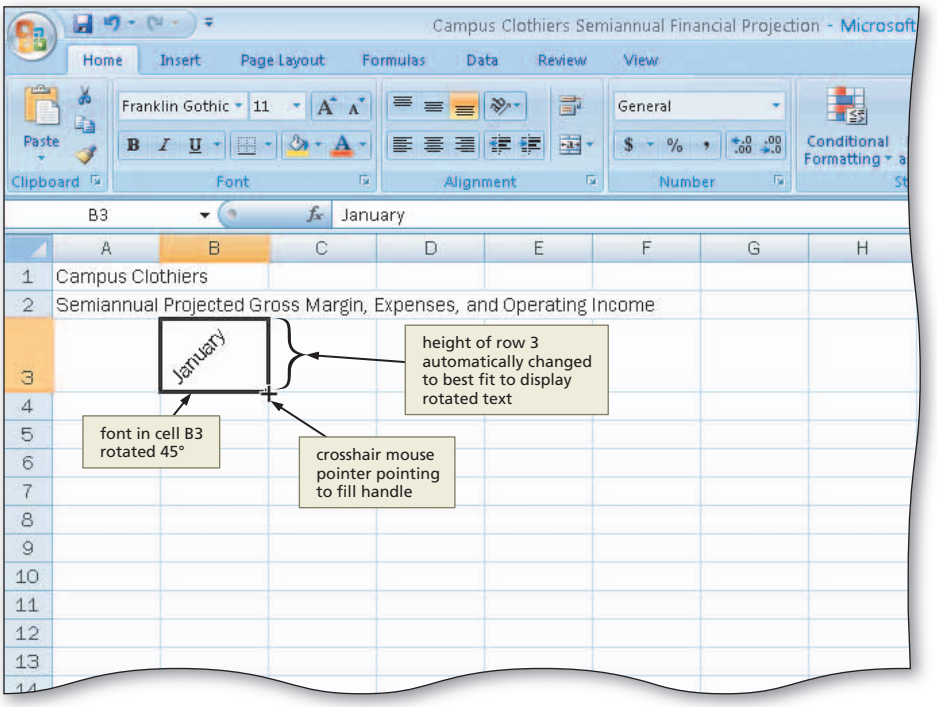


Figure 3–6

4

- Drag the fill handle to the right to select the range C3:G3. Do not release the mouse button (Figure 3–7).

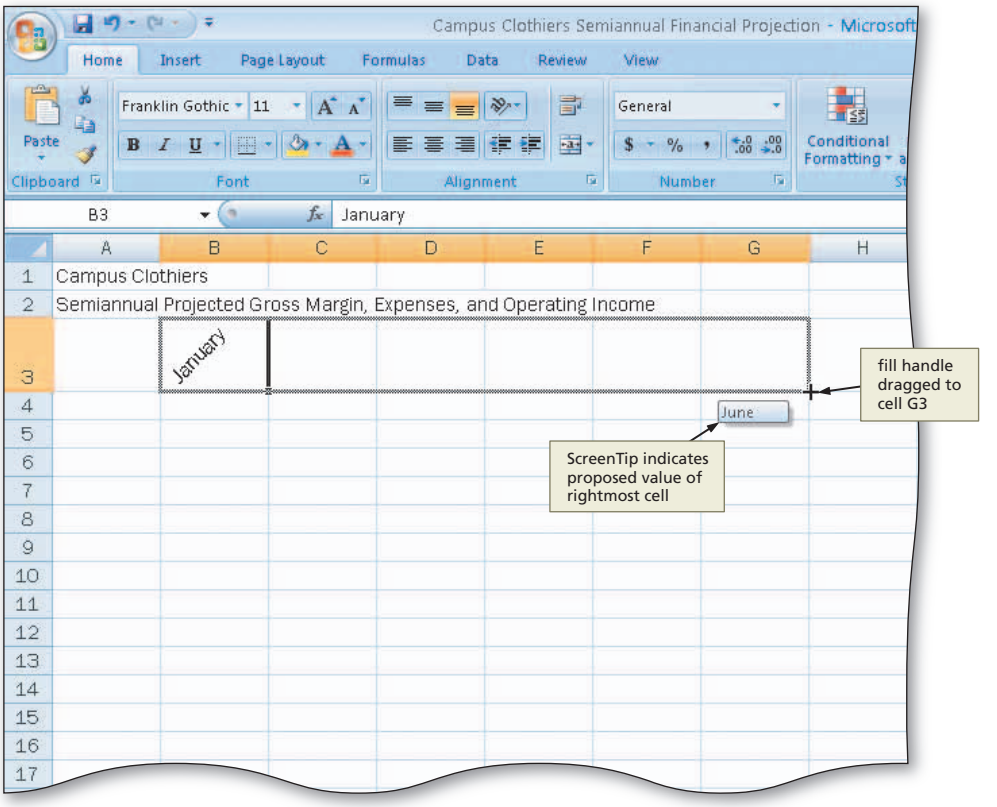


Figure 3–7

5

- Release the mouse button to create a month name series January through June in the range B3:G3 and copy the format in cell B3 to the range C3:G3.
- 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 B3 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 B3 to the range C3:G3. 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 (Figure 3–8) and then select the option you desire on the Auto Fill Options menu.

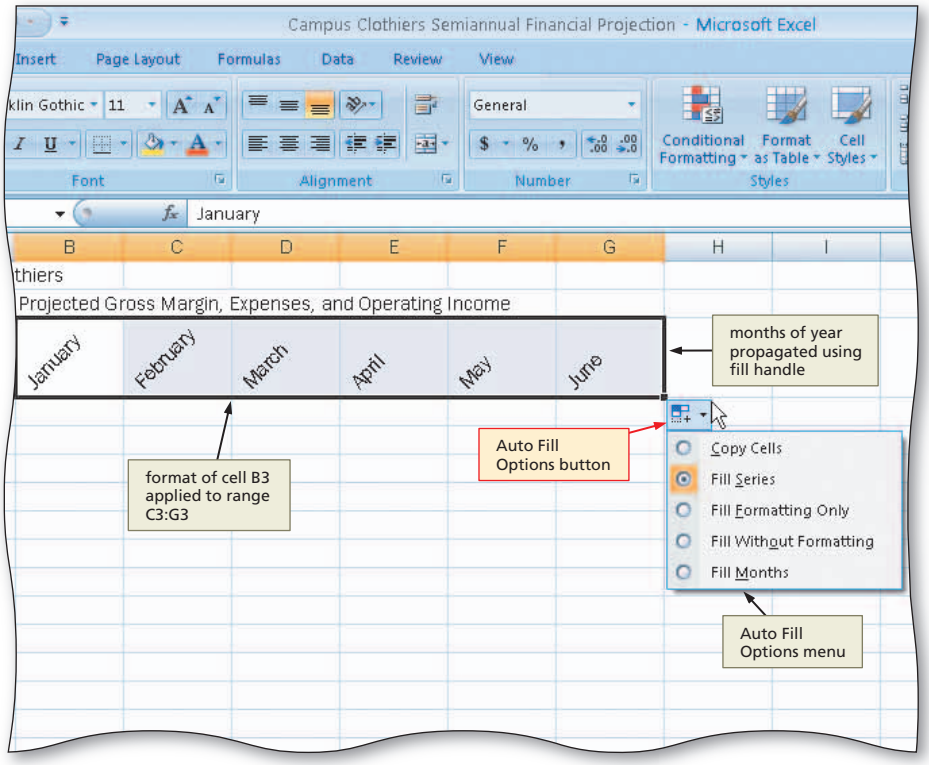


Figure 3–8

6

- Click the Auto Fill Options button to hide the Auto Fill Options menu.
- Click cell H3, type `Total`, and then press the RIGHT ARROW key.

Q&A Why is the word Total automatically formatted with the Heading 3 cell style and 45° rotation?

Excel tries to save you time by automatically recognizing the adjacent cell format in cell G3 and applying it to cell H3. The Heading 3 cell style in cell G3 causes this action to occur.

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 on Home tab on Ribbon, click Series, click AutoFill

Using the Auto Fill Options Menu

As shown in Figure 3–8, Fill Series is the default option that Excel uses to fill the 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.

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.

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 G3 in Step 4, Excel continues to increment the months and logically will repeat January, February, 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. 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	2:00	3:00, 4:00, 5:00
2	Qtr3	Qtr4, Qtr1, Qtr2
3	Quarter 1	Quarter 2, Quarter 3, Quarter 4
4	5-Jan, 5-Mar	5-May, 5-Jul, 5-Sep
5	2007, 2008	2009, 2010, 2011
6	1, 2	3, 4, 5
7	430, 410	390, 370, 350
8	Sun	Mon, Tue, Wed
9	Sunday, Tuesday	Thursday, Saturday, Monday
10	4th Section	5th Section, 6th Section, 7th Section
11	−205, −208	−211, −214, −217

To Increase Column Widths and Enter Row Titles

In Chapter 2, the column widths were increased 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 and then enter the row titles in column A down to What-If Assumptions in cell A18.

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.
- Drag the mouse pointer to the right until the ScreenTip displays, Width: 35.00 (322 pixels). Do not release the mouse button (Figure 3–9).

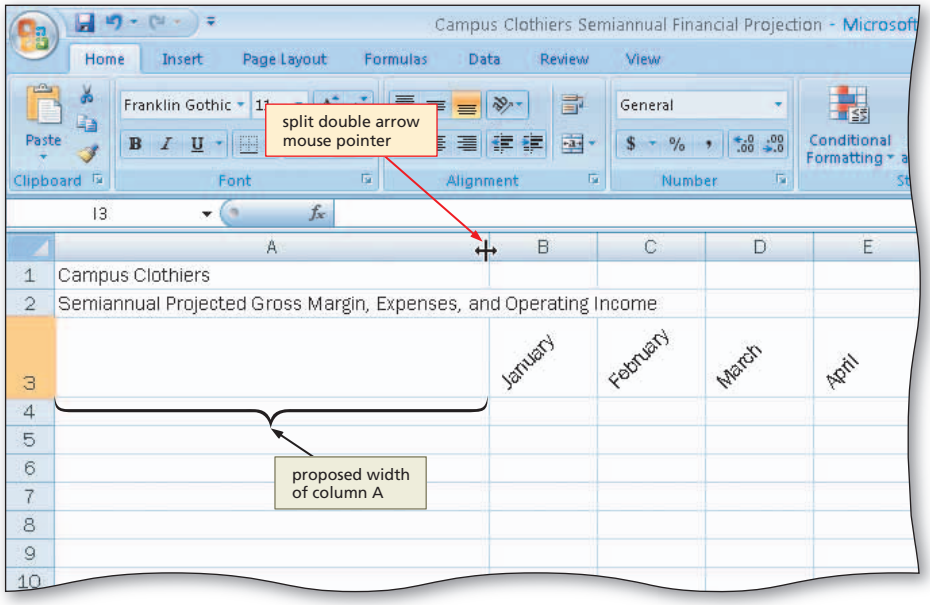


Figure 3–9

2

- Release the mouse button to change the width of column A.
- Click column heading B and then drag through column heading G to select columns B through G.
- Move the mouse pointer to the boundary between column headings B and C and then drag the mouse to the right until the ScreenTip displays, Width: 14.00 (133 pixels). Do not release the mouse button (Figure 3–10).

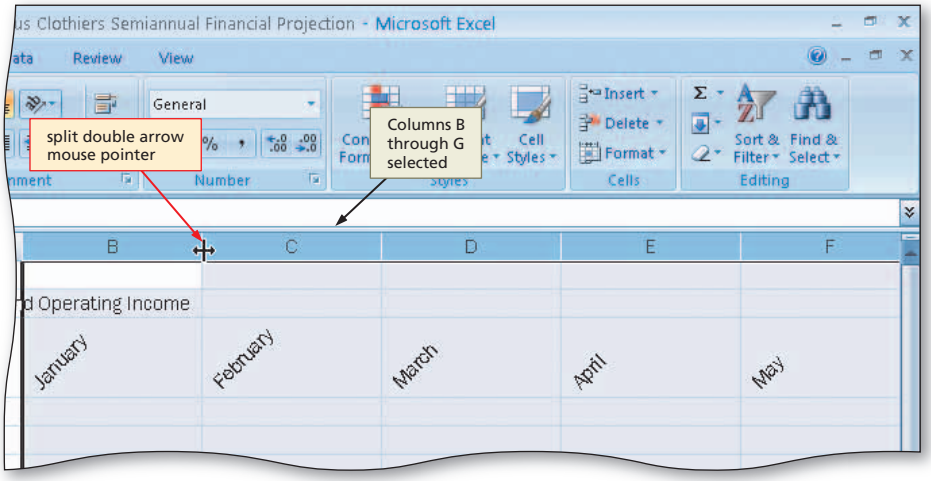


Figure 3–10

3

- Release the mouse button to change the width of columns B through G.
- Use the technique described in Step 1 to increase the width of column H to 15.00.
- Enter the row titles in the range A4:A18 as shown in Figure 3–11, but without the indents.
- Click cell A5 and then click the Increase Indent button on the Ribbon.
- Select the range A9:A13 and then click the Increase Indent button on the Ribbon.
- Click cell A19 to finish entering the row titles (Figure 3–11).

Q&A

What happens when I click the Increase Indent button?

The Increase Indent button 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.

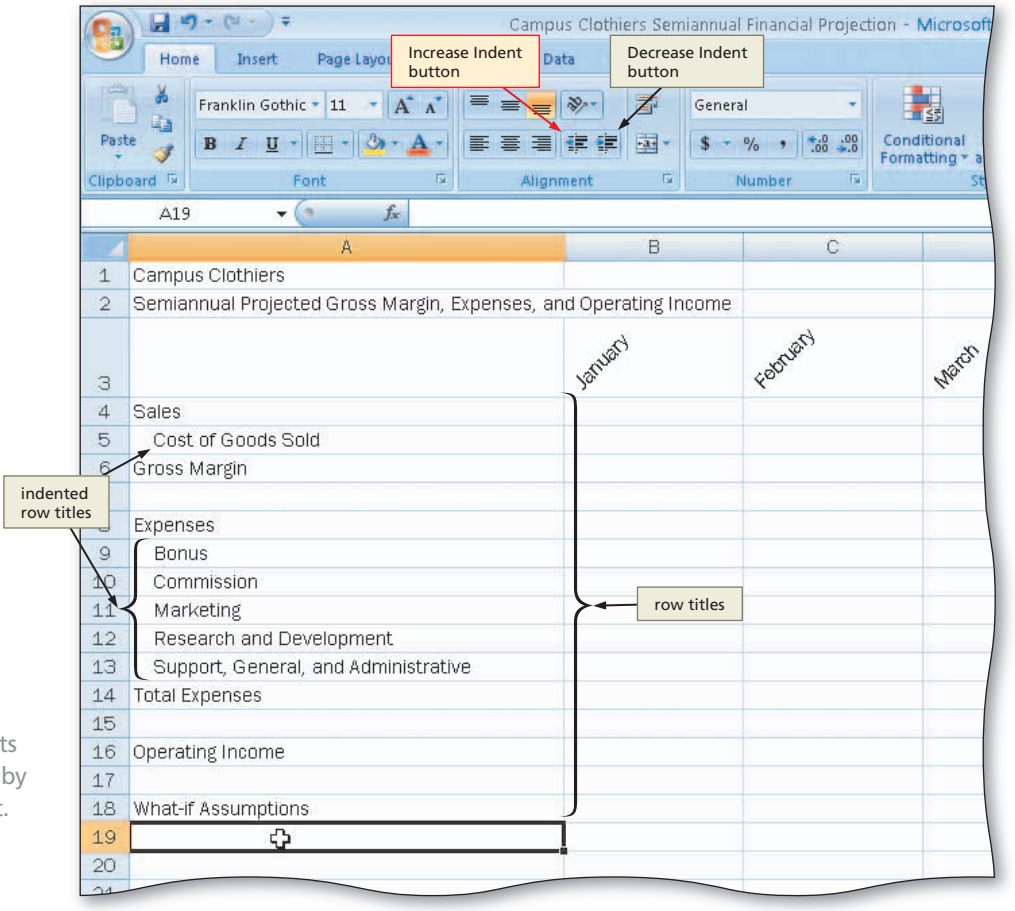


Figure 3–11

Other Ways

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

BTW

Fitting Entries in a Cell

An alternative to increasing the column widths or row heights is to shrink the characters in the cell to fit the current width of the column. To shrink to fit, click Format Cells: Alignment Dialog Box Button Launcher on the Ribbon, and click Shrink to fit in the Text control area. After shrinking entries to fit in a cell, consider using the Zoom slider on the status bar to make the entries more readable.

Copying a Range of Cells to a Nonadjacent Destination Area

As shown in the sketch of the worksheet (Figure 3–3a on page EX 166), 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 A21 (Margin) and A24 (Revenue for Bonus). Hence, the What-If Assumptions table row titles can be created by copying the range A9:A13 to the range A19:A23 and then inserting two rows for the additional entries in cells A21 and A24. The source area (range A9:A13) is not adjacent to the destination area (range A19:A23). 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 on the Home tab on the Ribbon. You can use these two buttons to copy a source area to an adjacent or 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 graphic items from an Office document and then paste them into any Office document. The Copy command on the Edit menu or shortcut menu works the same as the Copy button. The Paste button copies the item from the Office Clipboard to the destination area.

To Copy a Range of Cells to a Nonadjacent Destination Area

The following steps use the Copy and Paste buttons to copy the range A9:A13 to the nonadjacent range A19:A23.

1

- Select the range A9:A13 and then click the Copy button on the Home tab on the Ribbon to copy the values and formats of the range A9:A13 to the Office Clipboard.
- Click cell A19, 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 A19:A23) before clicking the Paste button. Excel needs to know only the upper-left cell of the destination area. In the case of a single column range, such as A19:A23, the top cell of the destination area (cell A19) also is the upper-left cell of the destination area.

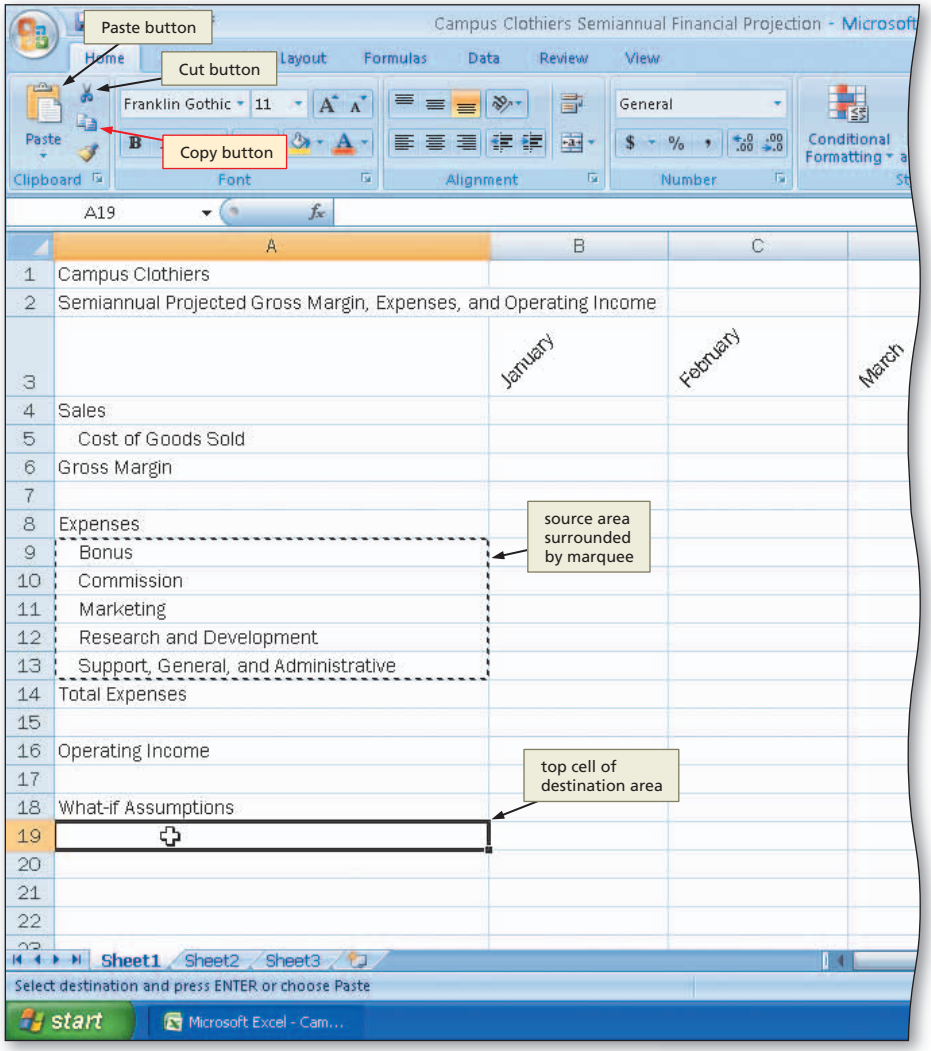


Figure 3–12

2

- Click the Paste button on the Ribbon to copy the values and formats of the last item placed on the Office Clipboard (range A9:A13) to the destination area A19:A23.
- Scroll down so row 5 appears at the top of the window (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 on the Ribbon.

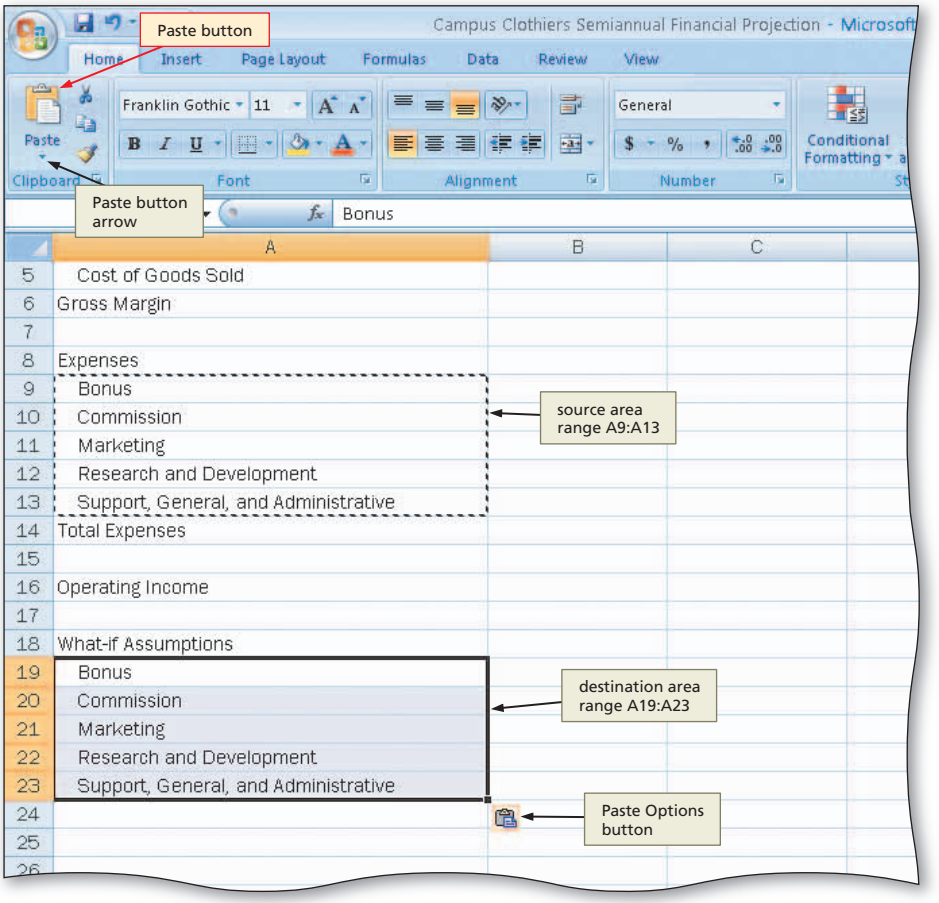


Figure 3–13

Other Ways

1. Right-click source area, click Copy on shortcut menu, right-click destination area, click Paste 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 the Paste button is clicked, 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 menu, Excel modifies the most recent paste operation based on your selection. Table 3–4 summarizes the options available on the Paste Options menu.

Table 3–4 Options Available on the Paste Options Menu

Paste Option	Description
Keep Source Formatting	Copy contents and format of source area. This option is the default.
Match Destination Formatting	Copy contents of source area, but not the format.
Values and Number Formatting	Copy contents and format of source area for numbers or formulas, but use format of destination area for text.
Keep Source Column Widths	Copy contents and format of source area. Change destination column widths to source column widths.
Formatting Only	Copy format of source area, but not the contents.
Link Cells	Copy contents and format and link cells so that a change to the cells in source area updates the corresponding cells in destination area.

The Paste button on the Ribbon (Figure 3–13) includes an arrow, which displays a list of advanced paste options (Paste, Paste Special, and Paste Hyperlink). These options will be discussed when they are used.

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**.

Using Cut and Paste to Move Cells

Another way to move cells is to select them, click the Cut button on the Ribbon (Figure 3–12 on page EX 175) to remove them from the worksheet and copy them to the Office Clipboard, select the destination area, and then click the Paste button on the Ribbon or press the ENTER key. You also can use the Cut command on the shortcut menu, instead of the Cut button.

BTW

Move It or Copy It

You may hear someone say, "Move it or copy it, it's all the same." No, it is not the same! When you move a cell, the data in the original location is cleared and the format is reset to the default. When you copy a cell, the data and format of the copy area remain intact. In short, you should copy cells to duplicate entries and move cells to rearrange entries.

BTW

Cutting

When you cut a cell or range of cells using the Cut command or Cut button, 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 clicking the Paste button or pressing the ENTER key. When you complete the paste, Excel clears the cell entry and its formats from the source area.

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

The Insert command on the shortcut menu allows you to insert rows between rows that already contain data. According to the sketch of the worksheet in Figure 3–3a on page EX 166, 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 Revenue for Bonus assumption. The following steps accomplish the task of inserting the new rows into the worksheet.

BTW

Inserting Multiple Rows

If you want to insert multiple rows, you have two choices. First, you can insert a single row by using the Insert command on the shortcut menu and then repeatedly press F4 to keep inserting rows. Alternatively, you can select any number of existing rows before inserting new rows. 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.

1

- Right-click row heading 21, the row below where you want to insert a row, to display the shortcut menu and the Mini toolbar (Figure 3–14).

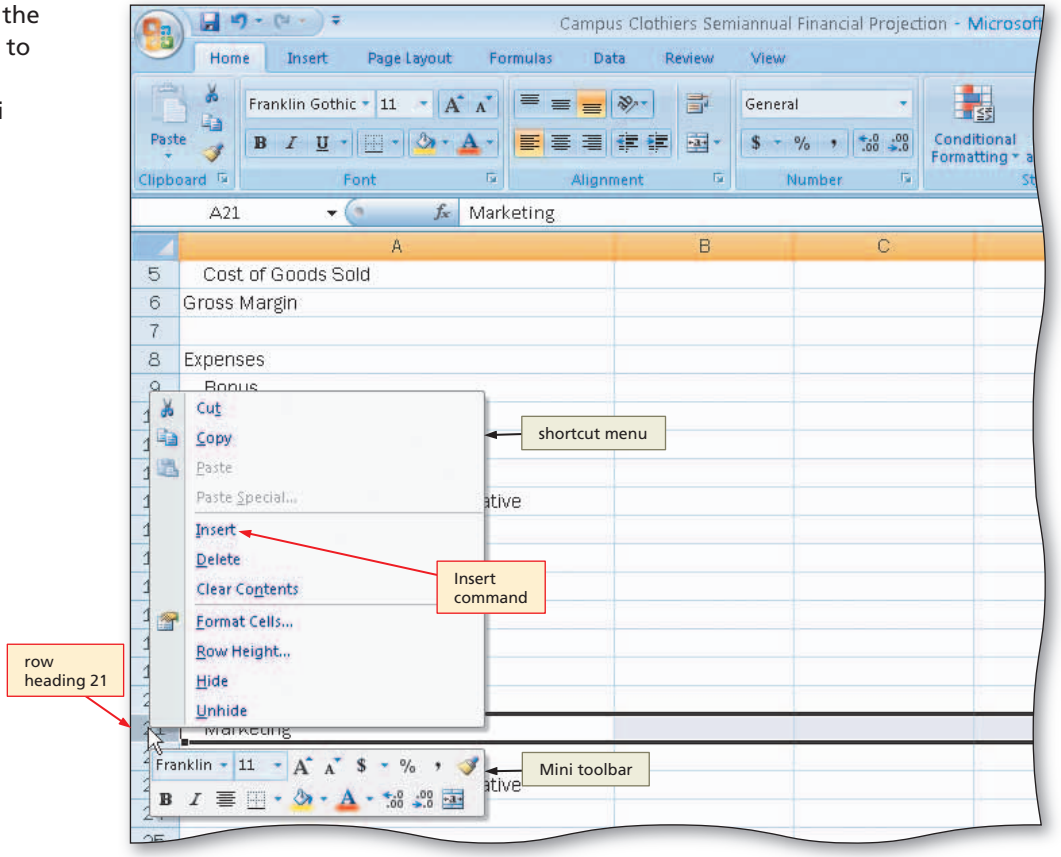


Figure 3–14

2

- Click Insert on the shortcut menu to insert a new row in the worksheet by shifting the selected row 21 and all rows below it down one row.
- Click cell A21 in the new row and then enter `Margin` as the 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 by clicking the Insert Options button that appears immediately above the inserted row. Following the insertion of a row, the Insert Options button lets you 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.

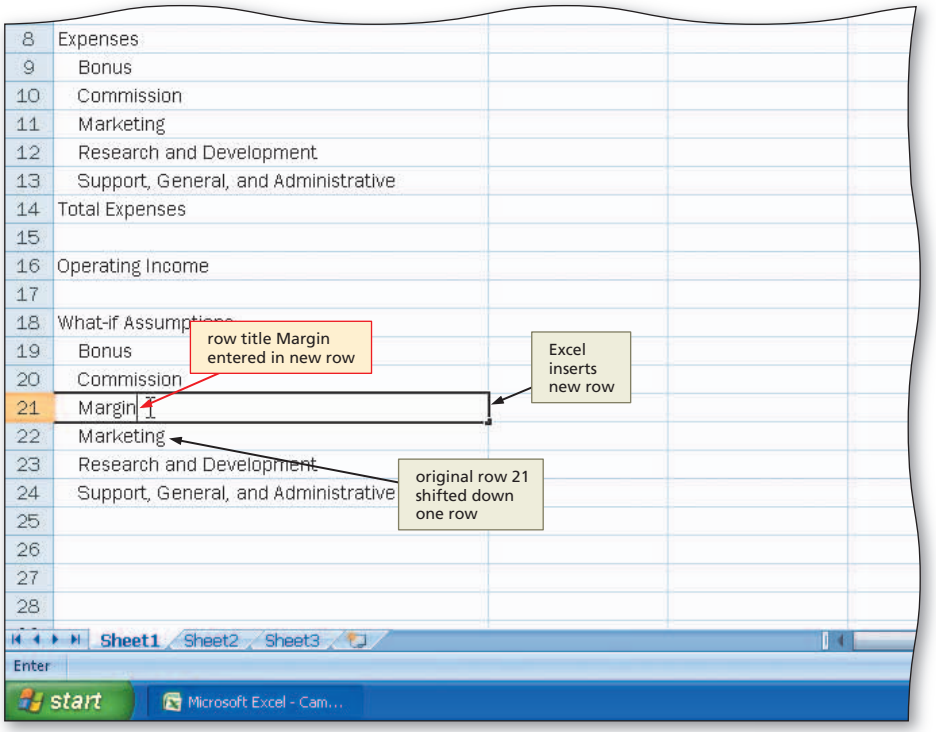


Figure 3–15

3

- Right-click row heading 24 and then click Insert on the shortcut menu to insert a new row in the worksheet.
- Click cell A24 in the new row and then enter `Revenue for Bonus` as the row title (Figure 3–16).

Q&A What would happen if cells in the shifted rows are included in formulas?

If the rows that are shifted down include cell references in formulas located in the worksheet, Excel automatically adjusts 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 21 before the insert, then the cell reference in the formula is adjusted to row 22 after the insert.

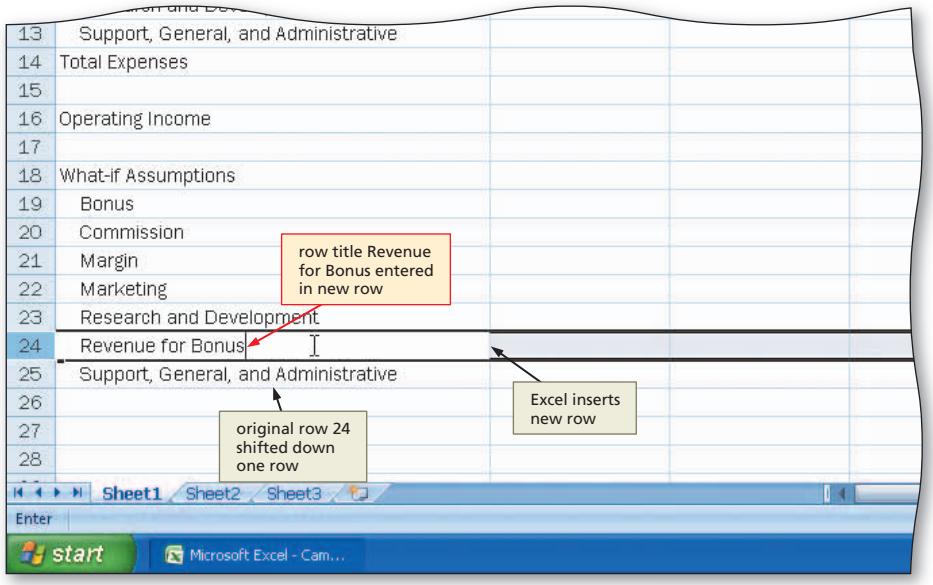


Figure 3–16

Other Ways

1. On Home tab on Ribbon, click Insert, click Insert Sheet Rows
2. Press CTRL+SHIFT+PLUS SIGN, click Entire Row, click OK button

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 tab on the Ribbon and then click Insert Sheet Rows in the Insert gallery or 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.

BTW **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. You also can copy and insert by holding down the CTRL+SHIFT keys while you drag the selection to the desired gridline.

Inserting Single Cells or a Range of Cells

The Insert command on the shortcut menu or the Cells command on the Insert gallery of the Insert button on the Ribbon 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 may be lined up with its associated cells. To ensure that the values in the worksheet do not get out of order, it is recommended 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.

BTW **The Insert Options Button**
When you insert columns or rows, Excel only displays the Insert Options button if formats are assigned to the leftmost column or top row of the selection.

Deleting Columns and Rows

BTW

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

The Delete button on the Ribbon 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, which was described earlier in Chapter 1 on page EX 66, 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. It 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.

Deleting Individual Cells or a Range of Cells

Although Excel allows you to delete an individual cell or range of cells, you should be aware that if you shift a cell or range of cells on the worksheet, it no longer may be lined up with its associated cells. For this reason, it is recommended that you delete only entire rows or entire columns.

Entering Numbers with Format Symbols

The next step in creating the Semiannual Financial Projection worksheet is to enter the what-if assumptions values in the range B19:B25. 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
,	83,341	83,341	Comma (0)
	1,675.8	1,675.80	Comma (2)
$	$278	$278	Currency (0)
	$3818.54	$3,818.54	Currency (2)
	$45,612.3	$45,612.30	Currency (2)
%	23%	23%	Percent (0)
	97.50%	97.50%	Percent (2)
	39.833%	39.83%	Percent (2)

To Enter Numbers with Format Symbols

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

1

- Enter `100,000.00` in cell B19, `3.25%` in cell B20, `61.00%` in cell B21, `9.00%` in cell B22, `5.75%` in cell B23, `4,750,000.00` in cell B24, and `17.00%` in cell B25 to display the entries using a format based on the format symbols entered with the numbers (Figure 3–17).

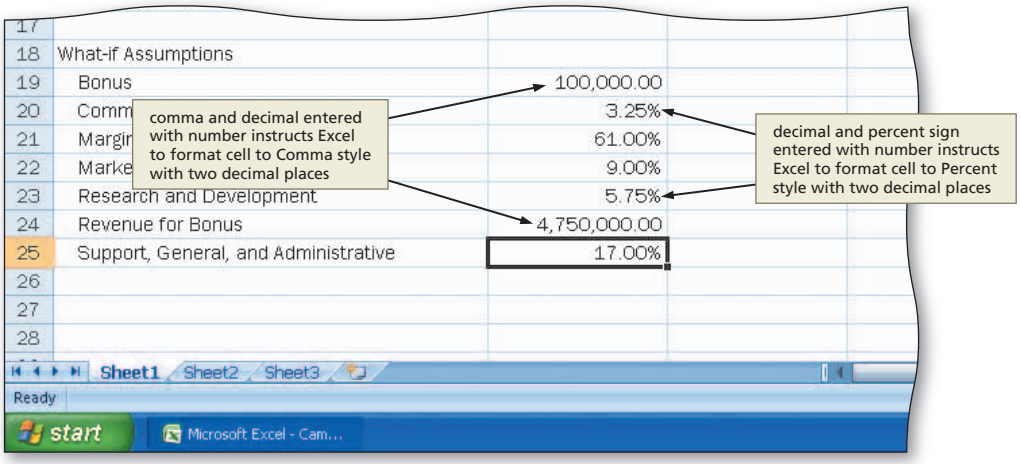


Figure 3–17

Other Ways

1. Right-click range, click Format Cells on shortcut menu, click Number tab, click category in Category list, [select desired format], click OK button
2. Press CTRL+1, click Number tab, click category in Category list, [select desired format], click OK button

Freezing Worksheet 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 3 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.

BTW

Freezing Titles

If you want to freeze only column headings, select the appropriate cell in column A before you click the Freeze Panes button on the View tab on the Ribbon. If you only want to freeze row titles, then select the appropriate cell in row 1. To freeze both column headings and row titles, select the cell that is the intersection of the column and row titles before you click the Freeze Panes button on the View tab on the Ribbon.

To Freeze Column and Row Titles

The following steps use the Freeze Panes button on the View tab on the Ribbon to freeze the worksheet title and column titles in rows 1, 2, and 3, and the row titles in column A.

1

- Press CTRL+HOME to select cell A1 and ensure that Excel displays row 1 and column A on the screen.
- Select cell B4.
- Click the View tab on the Ribbon and then click the Freeze Panes button on the Ribbon to display the Freeze Panes gallery (Figure 3–18).

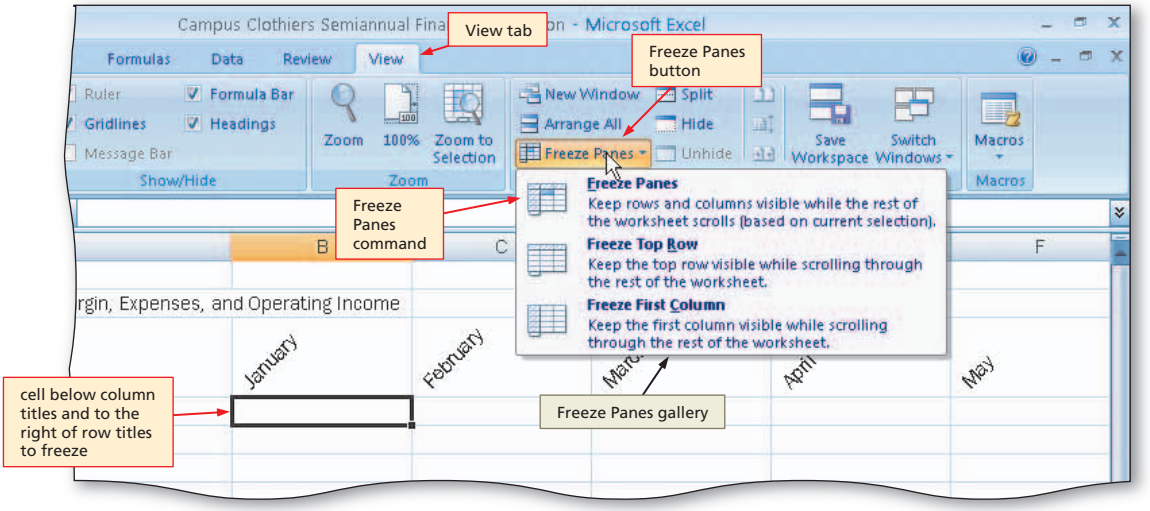


Figure 3–18

Q&A Why is cell A1 selected first?

Before freezing the titles, it is important that Excel displays cell A1 in the upper-left corner of the screen. For example, if cell B4 was selected without first selecting cell A1 to ensure Excel displays the upper-left corner of the screen, then Excel would freeze the titles and also hide rows 1 and 2. Excel thus would not be able to display rows 1 and 2 until they are unfrozen.

2

- Click Freeze Panes in the Freeze Panes gallery to freeze column A and rows 1 through 3 (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 3, indicating the split between the frozen column titles in rows 1 through 3 and the rest of the worksheet (Figure 3–19).

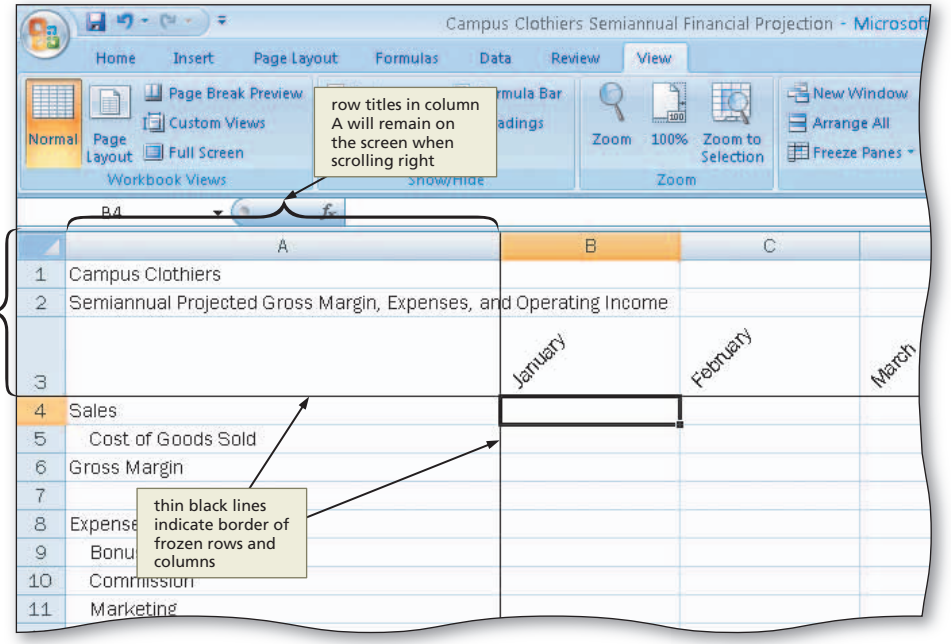


Figure 3–19

Other Ways

1. Press ALT+W, F

To Enter the Projected Monthly Sales

The following steps enter the projected monthly sales, listed earlier in Table 3–1 on page EX 167, in row 4 and compute the projected semiannual sales in cell H4.

1. If necessary, click the Home tab on the Ribbon.
2. Enter `3383909.82` in cell B4, `6880576.15` in cell C4, `9742702.37` in cell D4, `4818493.53` in cell E4, `4566722.63` in cell F4, and `8527504.39` in cell G4.
3. Click cell H4 and then click the Sum button on the Ribbon twice to total the semiannual sales in cell H4 (Figure 3–20).

BTW

Your Age in Days
How many days have you been alive? Enter today's date (e.g., 12/5/2008) in cell A1. Next, enter your birth date (e.g., 6/22/1986) in cell A2. Select cell A3 and enter the formula =A1 - A2. Format cell A3 to the General style using the Number Dialog Box Launcher. Cell A3 will display your age in days.

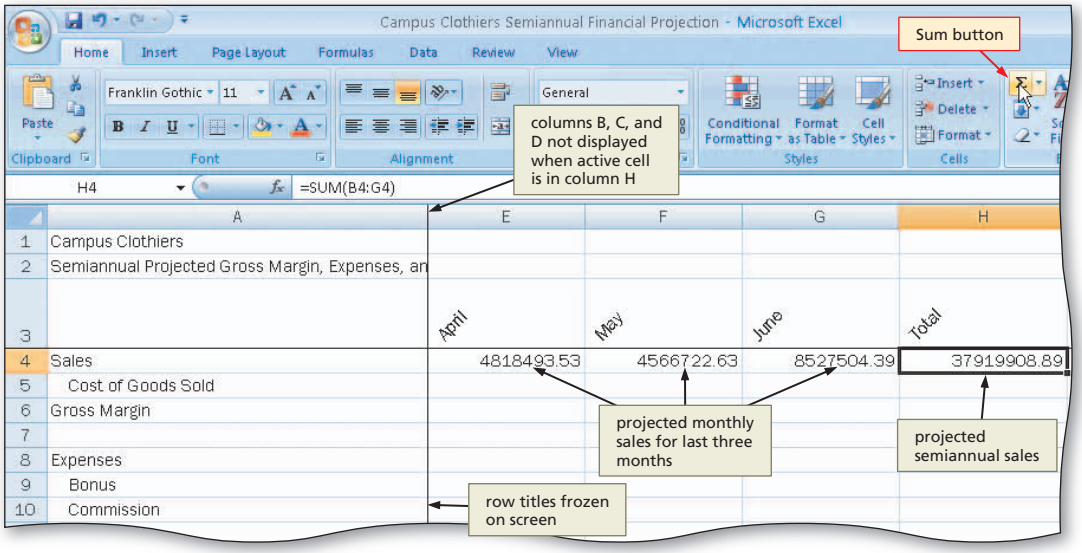


Figure 3–20

Displaying a System Date

The sketch of the worksheet in Figure 3–3a on page EX 166 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 14 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.

Excel automatically formats this number 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.

BTW

Updating the System Date and Time
If the system date and time appear in an active worksheet, Excel will not update the date and time in the cell until you enter data in another cell or complete some other activity, such as undoing a previous activity or pressing function key F9.

To Enter and Format the System Date

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

1

- Click cell H2 and then click the Insert Function box in the formula bar.
- When Excel displays the Insert Function dialog box, click the 'Or select a category' box arrow, and then select Date & Time in the list.
- Scroll down in the Select a function list and then click NOW (Figure 3–21).

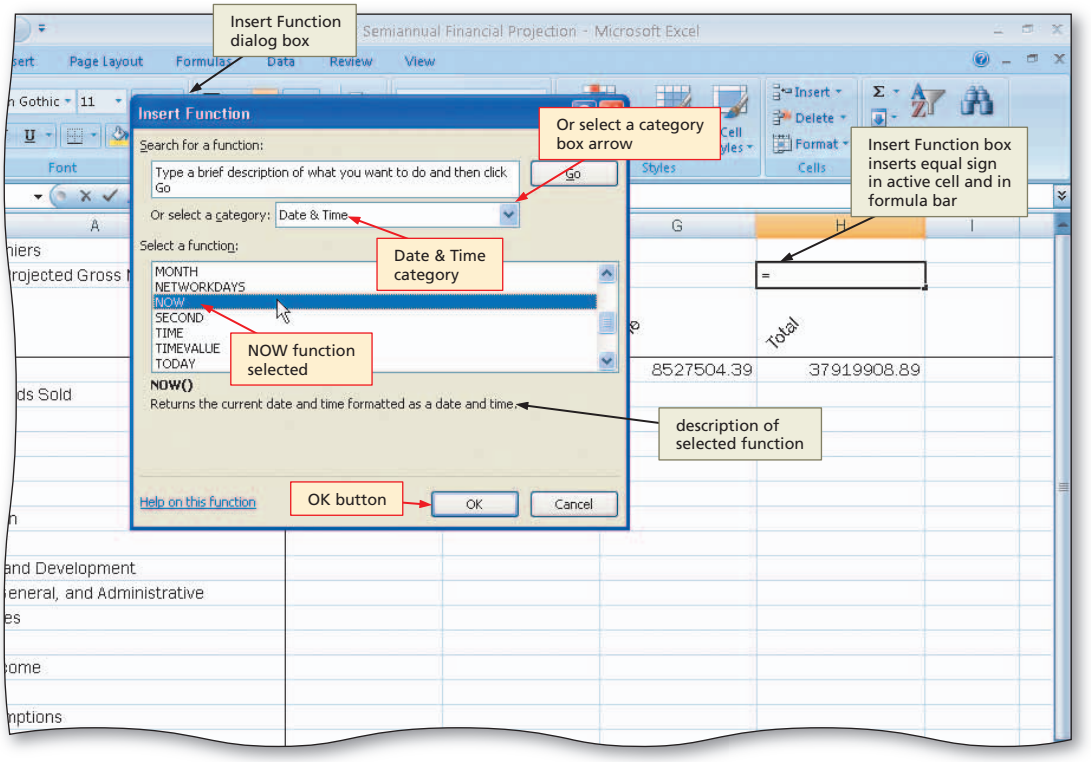


Figure 3–21

2

- Click the OK button.
- When Excel displays the Function Arguments dialog box, click the OK button to display the system date and time in cell H2, using the default date and time format mm/dd/yyyy hh:mm.
- Right-click cell H2 to display the shortcut menu (Figure 3–22).

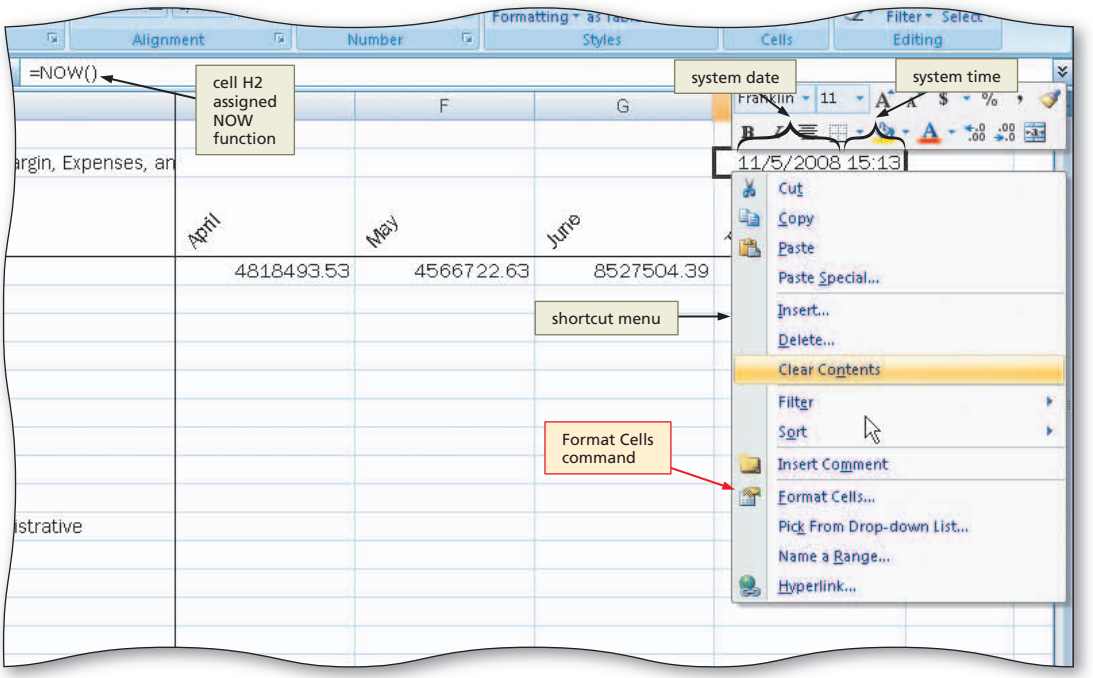


Figure 3–22

3

- Click Format Cells on the shortcut menu.
- When Excel displays the Format Cells dialog box, if necessary, click the Number tab.
- Click Date in the Category list. Scroll down in the Type list and then click 3/14/2001 to display a sample of the data in the active cell (H2) using the selected format in the Sample area (Figure 3–23).

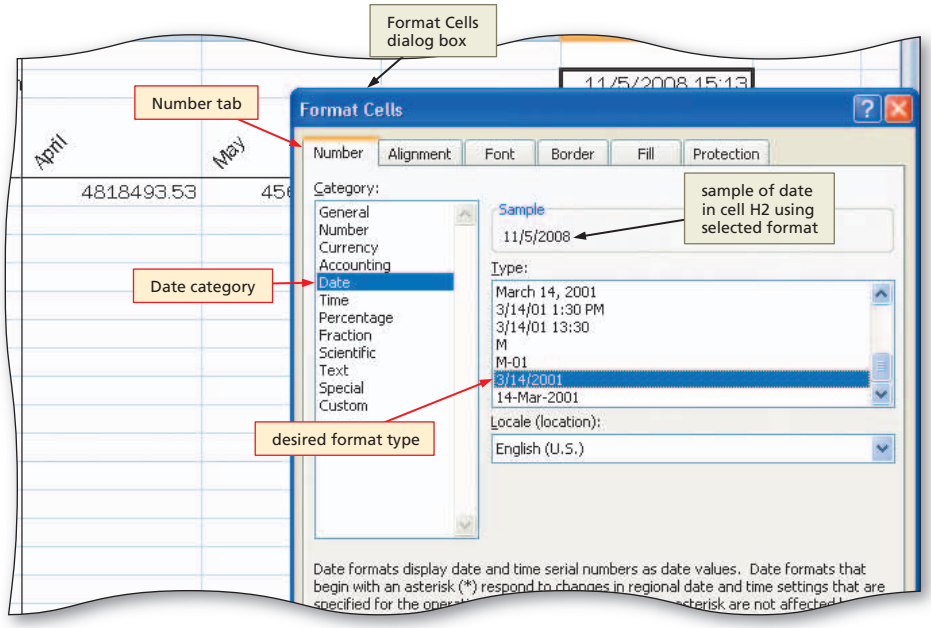


Figure 3–23

4

- Click the OK button in the Format Cells dialog box to display the system date in the form mm/dd/yyyy (Figure 3–24).

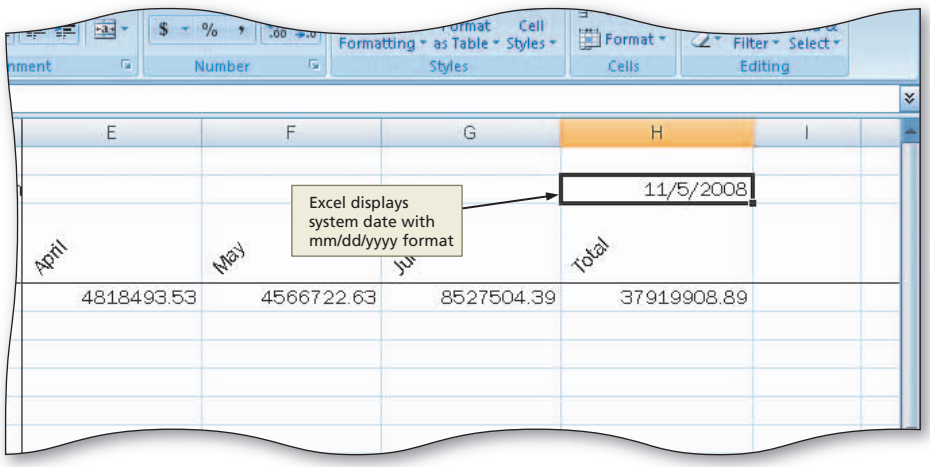


Figure 3–24

Q&A

How does Excel format a date?

In Figure 3–24, the date is displayed right-aligned in the cell because 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 6:00 PM on December 28, 2007 and the cell containing the NOW function is assigned the General format, then Excel displays the following number in the cell:

39444.75

Number of days since December 31, 1899

time of day is 6:00 PM (portion of day complete)

The whole number portion of the number (39444) represents the number of days since December 31, 1899. The decimal portion of the number (.75) represents 6:00 PM as the time of day, at which point 3/4 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. On Formulas tab on Ribbon, click Date & Time, click NOW
2. Press CTRL+SEMICOLON (not a volatile date)
3. Press CTRL+SHIFT+# to format date to day-month-year

Absolute versus Relative Addressing

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

Plan Ahead

Determine necessary formulas and functions needed.
The next step is to enter the formulas that calculate the following values for January: cost of goods sold (cell B5), gross margin (cell B6), expenses (range B9:B13), total expenses (cell B14), and the operating income (cell B16). The formulas are based on the projected monthly sales in cell B4 and the assumptions in the range B19:B25.

The formulas for each column (month) are the same, except for the reference to the projected monthly sales in row 4, which varies according to the month (B4 for January, C4 for February, and so on). Thus, the formulas for January can be entered in column B and then copied to columns C through G. Table 3–6 shows the formulas for determining the January costs of goods, gross margin, expenses, total expenses, and operating income in column B.

If the formulas are entered as shown in Table 3–6 in column B for January and then copied to columns C through G (February through June) in the worksheet, Excel will adjust the cell references for each column automatically. Thus, after the copy, the February Commission expense in cell C10 would be =C4 * C20. While the cell reference C4 (February Sales) is correct, the cell reference C20 references an empty cell. The formula for cell C7 should read =C4 * B20, rather than =C4 * C20, because B20 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.

Table 3–6 Formulas for Determining Cost of Goods, Margin, Expenses, Total Expenses, and Operating Income for January

Cell	Row Title	Formula	Comment
B5	Cost of Goods Sold	=B4 * (1 − B21)	Sales times (1 minus Margin %)
B6	Gross Margin	= B4 − B5	Sales minus Cost of Goods
B9	Bonus	=IF(B4 >= B24, B19, 0)	Bonus equals value in B19 or 0
B10	Commission	=B4 * B20	Sales times Commission %
B11	Marketing	=B4 * B22	Sales times Marketing %
B12	Research and Development	=B4 * B23	Sales times Research and Development %
B13	Support, General, and Administrative	=B4 * B25	Sales times Support, General, and Administrative %
B14	Total Expenses	=SUM(B9:B13)	Sum of January Expenses
B16	Operating Income	=B6 − B14	Gross Margin minus Total Expense

BTW

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.

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$20 is an absolute cell reference, while B20 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$20 instructs Excel to keep the cell reference B20 constant (absolute) in the formula as it copies it to the destination area. A formula using the **relative cell reference** B20 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**. Table 3–7 gives some additional examples of absolute, relative, and mixed cell references.

Table 3–7 Examples of Absolute, Relative, and Mixed Cell References

Cell Reference	Type of Reference	Meaning
$B$20	Absolute cell reference	Both column and row references remain the same when you copy this cell, because the cell references are absolute.
B$20	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.
$B20	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.
B20	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.

To Enter a Formula Containing Absolute Cell References

The following steps enter the cost of goods formula = B4*(1 − $B$21) in cell B5 using Point mode. To enter an absolute cell reference, you can type the dollar sign ($) 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 to absolute.

1

- Press CTRL+HOME and then click cell B5.
- Type = (equal sign), click cell B4, type `*(1-b21` and then press F4 to change b21 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 B4 will be copied across columns, rather than down rows. So, the formula entered in cell B4 in Step 1 could have been entered as =B4*(1-$B21), rather than =B4*(1-$B$21). That is, the formula could have included the mixed cell reference $B21, rather than the absolute cell reference $B$21. 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 rows. To change the absolute cell reference to a mixed cell reference, continue to press the F4 key until you get the desired cell reference.

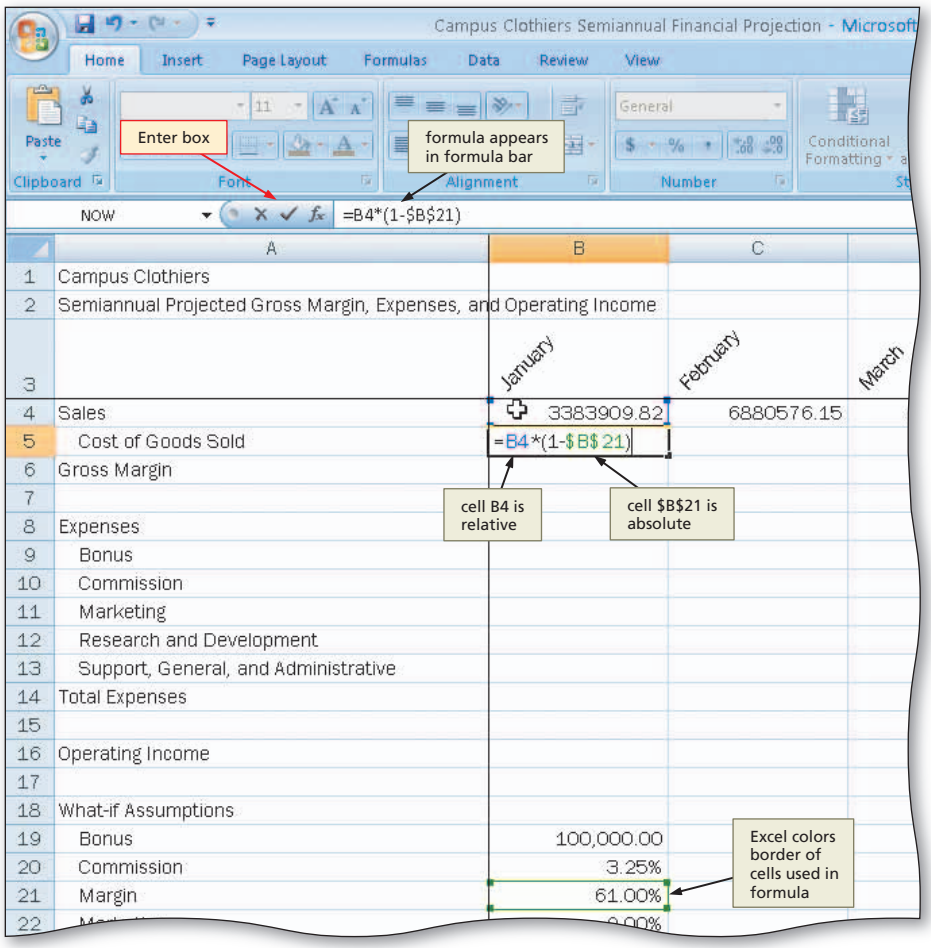


Figure 3–25

2

- Click the Enter box in the formula bar to display the result, 1319724.83, in cell B5, instead of the formula (Figure 3–26).

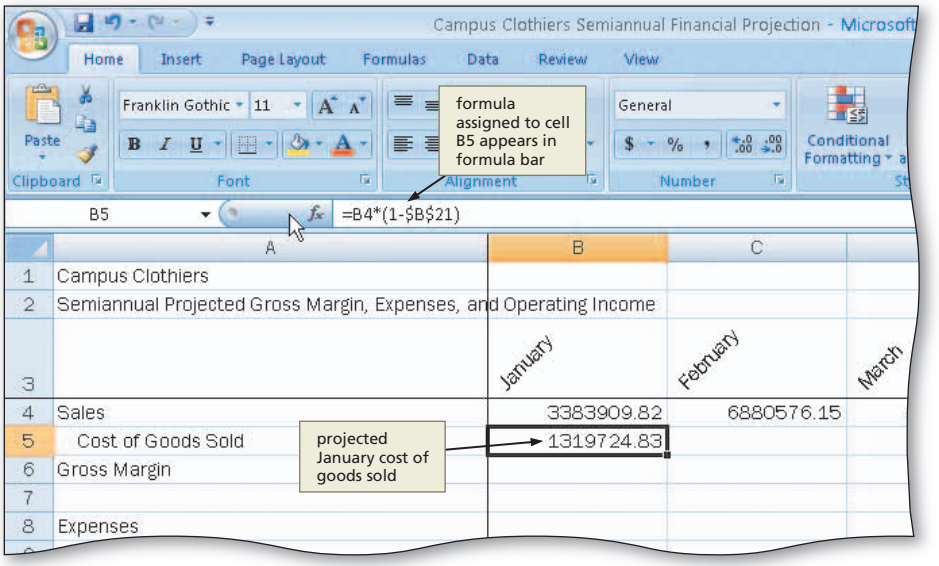


Figure 3–26

3

- Click cell B6, type = (equal sign), click cell B4, type – (minus sign) and then click cell B5.
- Click the Enter box in the formula bar to display the gross margin for January, 2064184.99, in cell B6 (Figure 3-27).

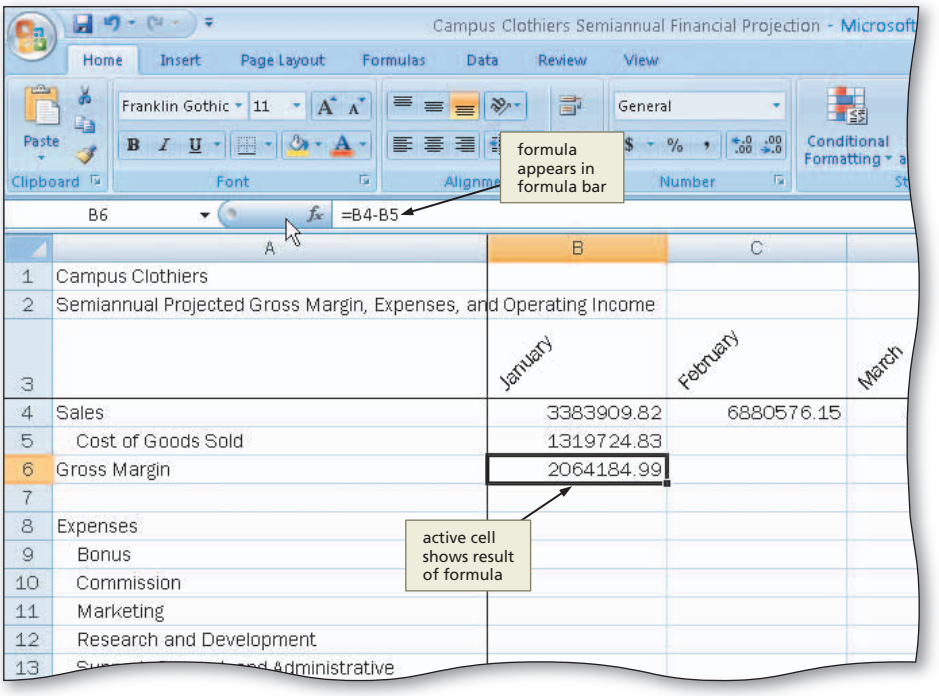


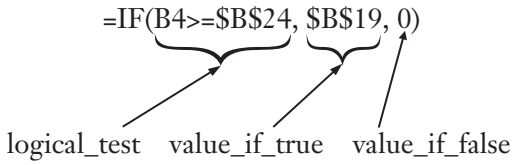
Figure 3–27

Making Decisions — The IF Function

According to the Request for New Workbook in Figure 3–2 on page EX 164, if the projected January sales in cell B4 is greater than or equal to the revenue for bonus in cell B24 (4,750,000.00), then the January bonus value in cell B9 is equal to the bonus value in cell B19 (100,000.00); otherwise, cell B9 is equal to 0. One way to assign the January bonus value in cell B9 is to check to see if the sales in cell B4 equal or exceed the revenue for bonus amount in cell B24 and, if so, then to enter 100,000.00 in cell B9. You can use this manual process for all six months by checking the values for the corresponding month.

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 B9 must include a formula or function that displays 100,000.00 or 0.00 (zero), depending on whether the projected January sales in cell B4 is greater than, equal to, or less than the revenue for bonus value in cell B24.

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 B9 can be assigned the following IF function:



The IF function instructs Excel that, if the projected January sales in cell B4 is greater than or equal to the revenue for bonus value in cell B24, then Excel should display the value 100000 in cell B19, in cell B9. If the projected January sales in cell B4 is less than the revenue for bonus value in cell B24, then Excel displays a 0 (zero) in cell B9.

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(H7 = 0, J6 ^ H4, L9 + D3)
<	Less than	=IF(C34 * W3 < K7, $K$6, L33 - 5)
>	Greater than	=IF(MIN(K8:K12) > 75, 1, 0)
>=	Greater than or equal to	=IF(P8 >= $H$6, J7 / V4, 7.5)
<=	Less than or equal to	=IF(G7 - G2 <= 23, L$9, 35 / Q2)
<>	Not equal to	=IF(B1 <> 0, ''No","Yes")

BTW

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(B3>C3, D3<C5), "OK", "Not OK") and =IF(OR(C3>G5, D2<X3), "OK", "Not OK") and =IF(NOT(A6<H7), "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 A6<H7 must be false for the value_if_true OK to be assigned to the cell.

To Enter an IF Function

The following steps assign the IF function =IF(B4>=$B$24,$B$19,0) to cell B9. This IF function determines whether or not the worksheet assigns a bonus for January.

1

- Click cell B9. Type `=if(b4>=$b$24,$b$19,0)` in the cell (Figure 3–28).

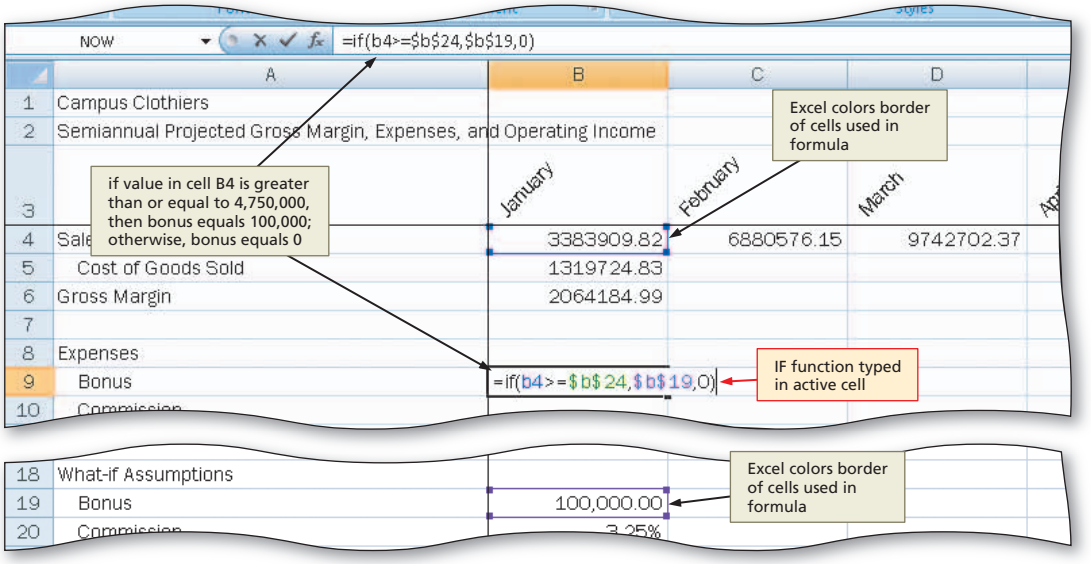


Figure 3–28

2

- Click the Enter box in the formula bar to display 0 in cell B9 (Figure 3–29), because the value in cell B4 (3383909.82) is less than the value in cell B24 (4,750,000) (Figure 3-29).

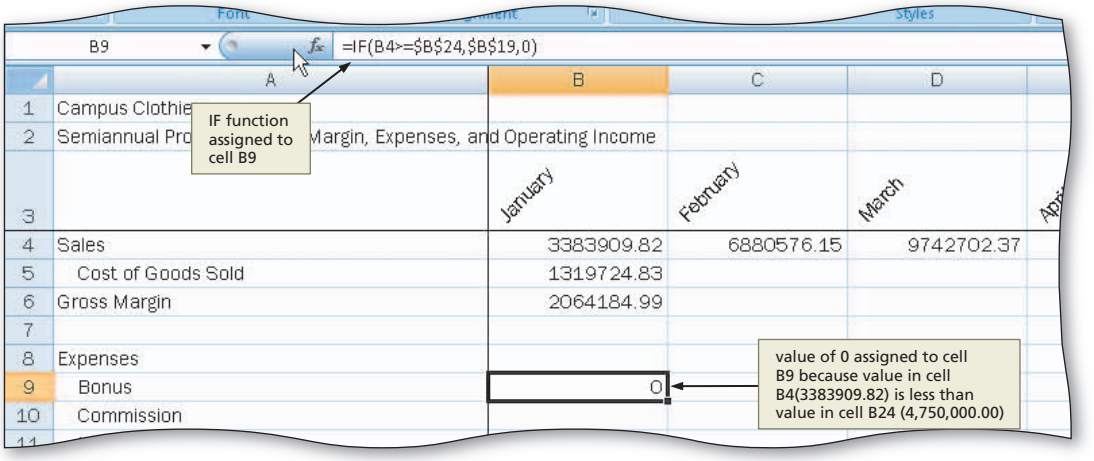


Figure 3–29

Q&A

Why does the value 0 display in cell B9?

The value that Excel displays in cell B9 depends on the values assigned to cells B4, B19, and B24. For example, if the value for January sales in cell B4 is reduced below 4,750,000.00, then the IF function in cell B9 will cause Excel to display a 0. If you change the bonus in cell B19 from 100,000.00 to another number and the value in cell B4 is greater than or equal to the value in cell B24, it will change the results in cell B9 as well. Finally, increasing the revenue for bonus in cell B24 so that it is greater than the value in cell B4 will change the result in cell B9.

Other Ways

1. On Formulas tab on Ribbon, click Logical button, click IF
2. Click Insert Function box in formula bar, click Logical in 'Or select a category list', click IF in drop-down list, click OK button

To Enter the Remaining January Formulas

The January commission expense in cell B10 is equal to the sales in cell B4 times the commission assumption in cell B20 (3.25%). The January marketing expense in cell B11 is equal to the projected January sales in cell B4 times the marketing assumption in cell B22 (9.00%). Similar formulas determine the remaining January expenses in cells B12 and B13.

The total expenses value in cell B14 is equal to the sum of the expenses in the range B9:B13. The operating income in cell B16 is equal to the gross margin in cell B6 minus the total expenses in cell B14. The formulas are short, and therefore, they are typed in the following steps, rather than entered using Point mode.

1. Click cell B10. Type `=b4*$b$20` and then press the DOWN ARROW key. Type `=b4*$b$22` and then press the DOWN ARROW key. Type `=b4*$b$23` and then press the DOWN ARROW key. Type `=b4*$b$25` and then press the DOWN ARROW key.
2. With cell B14 selected, click the Sum button on the Home tab on the Ribbon twice. Click cell B16. Type `=b6-b14` and then press the ENTER key (Figure 3–30a).
3. Press CTRL+ACCENT MARK (`) to instruct Excel to display the formulas version of the worksheet (Figure 3–30b).
4. When you are finished viewing the formulas version, press CTRL+ACCENT MARK (`) to instruct Excel to display the values version of the worksheet.

Q&A

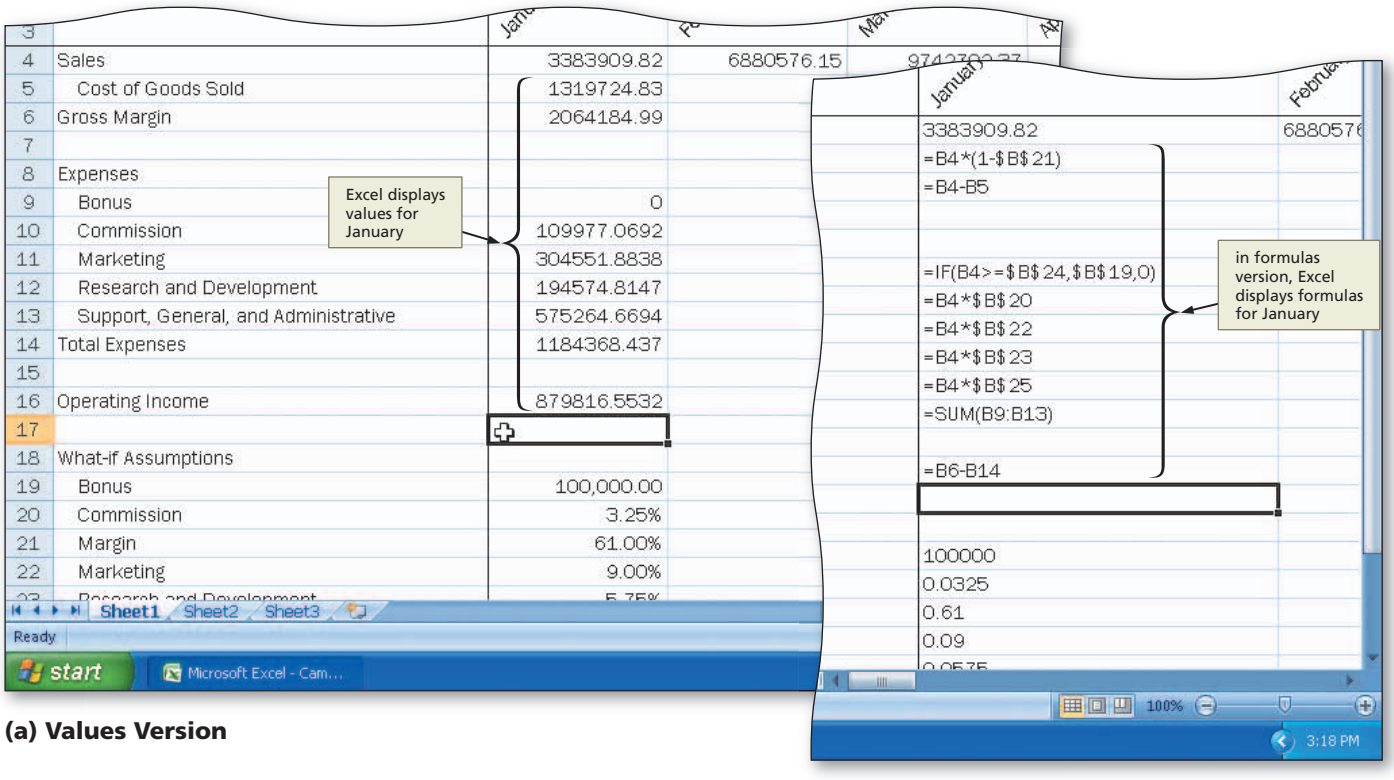
Why should I view the formulas version of the worksheet?

Viewing the formulas version (Figure 3–30b) of the worksheet allows you to check the formulas assigned to the range B5:B16. Recall that formulas were entered in lowercase. You can see that Excel converts all the formulas from lowercase to uppercase.

BTW

Replacing a Formula with a Constant

You can replace a formula with its result so it remains constant. Do the following: (1) Click the cell with the formula; (2) press F2 or click in the formula bar; (3) press F9 to display the value in the formula bar; and (4) press the ENTER key.



4	Sales	3383909.82
5	Cost of Goods Sold	1319724.83
6	Gross Margin	2064184.99
7		
8	Expenses	
9	Bonus	0
10	Commission	109977.0692
11	Marketing	304551.8838
12	Research and Development	194574.8147
13	Support, General, and Administrative	575264.6694
14	Total Expenses	1184368.437
15		
16	Operating Income	879816.5532
17		
18	What-if Assumptions	
19	Bonus	100,000.00
20	Commission	3.25%
21	Margin	61.00%
22	Marketing	9.00%

3383909.82	
=B4*(1-$B$21)	
=B4-B5	
=IF(B4>=$B$24,$B$19,0)	
=B4*$B$20	
=B4*$B$22	
=B4*$B$23	
=B4*$B$25	
=SUM(B9:B13)	
=B6-B14	
100000	
0.0325	
0.61	
0.09	

(a) Values Version

(b) Formulas Version

Figure 3–30

To Copy Formulas with Absolute Cell References Using the Fill Handle

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

1. Select the range B5:B16 and then point to the fill handle in the lower-right corner of cell B16 (Figure 3–31).

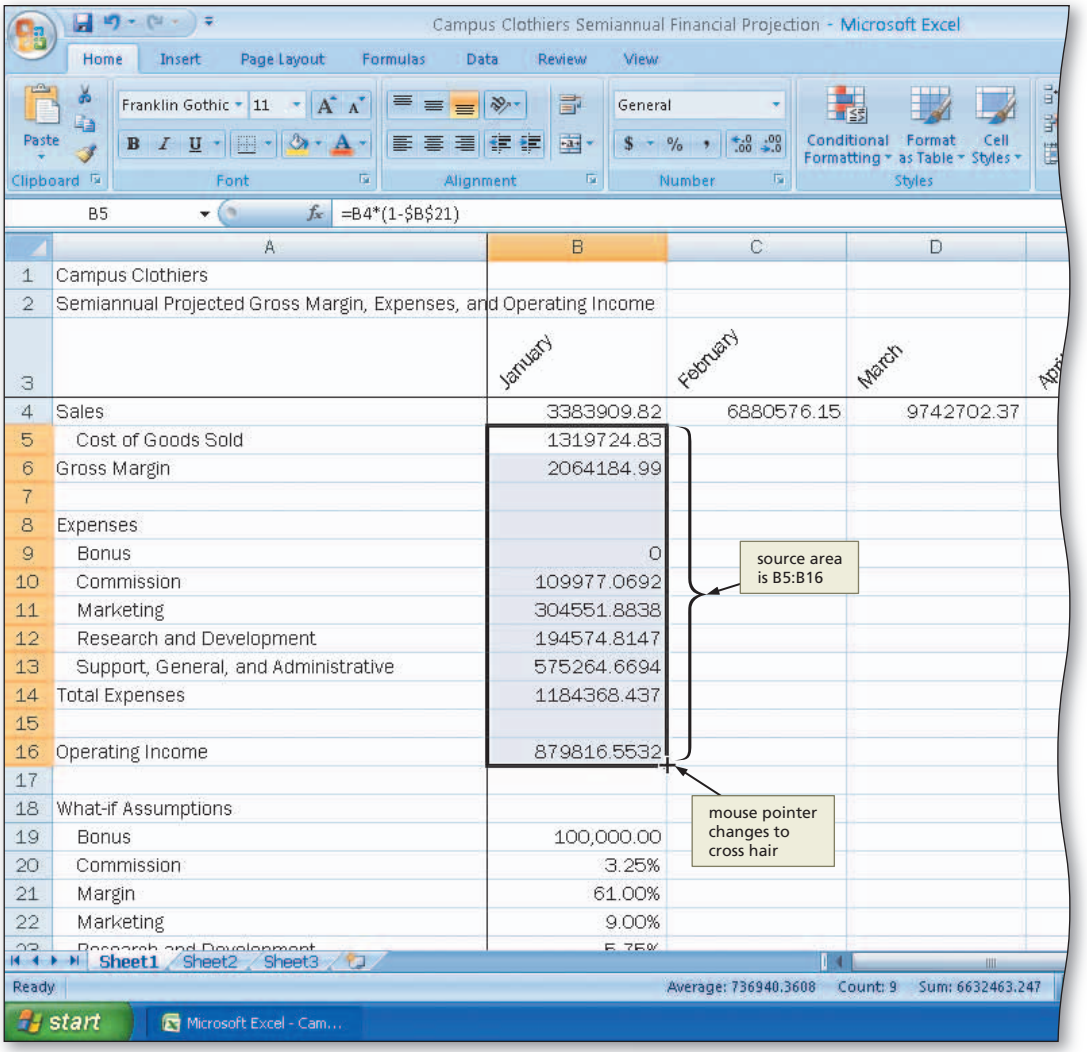


Figure 3–31

2

- Drag the fill handle to the right to select the destination area C5:G16 to copy the formulas from the source area (B5:B16) to the destination area (C5:G16) and display the calculated amounts and Auto Fill Options button (Figure 3–32).

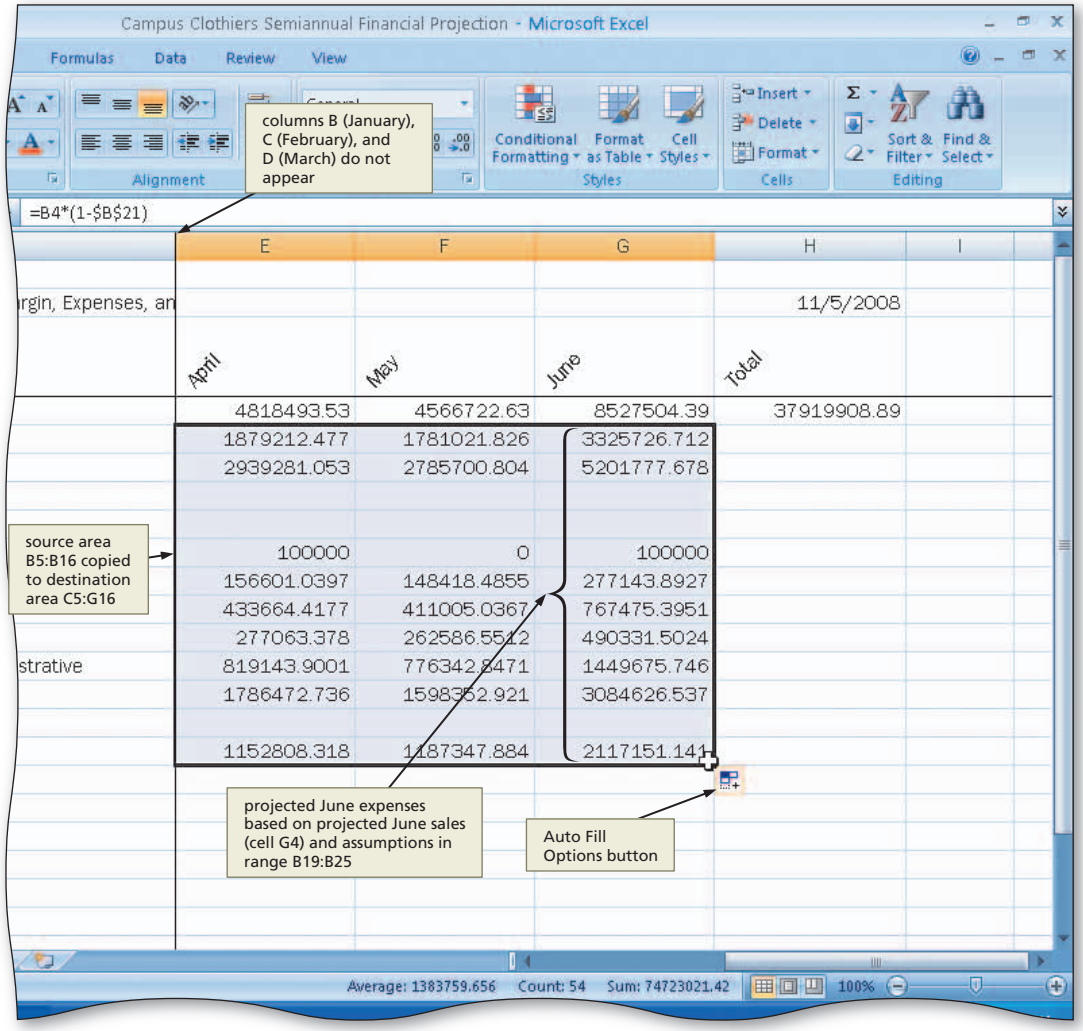


Figure 3–32

Q&A What happens to the formulas after the copy is made?

Because the formulas in the range B5:B16 use absolute cell references, the formulas still refer to the current values in the Assumptions table when the formulas are copied to the range C5:G16.

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

As shown in Figure 3–32, as the fill handle is dragged to the right, columns B, C, and D no longer appear on the screen. Column A, however, remains on the screen, because the row titles were frozen earlier in this chapter.

BTW

Error Messages

When Excel cannot calculate a formula, it displays an error message in a cell. These error messages always begin with a number sign (#). The more commonly occurring error messages are: #DIV/0! (tries to divide by zero); #NAME? (uses a name Excel does not recognize); #N/A (refers to a value not available); #NULL! (specifies an invalid intersection of two areas); #NUM! (uses a number incorrectly); #REF (refers to a cell that is not valid); #VALUE! (uses an incorrect argument or operand); and ##### (cell not wide enough to display entire entry).

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 H5:H16, Excel will display 0s as the sum of empty rows in cells H7, H8, and H15.

1. Select the range H5:H6. Hold down the CTRL key and select the range H9:H14 and cell H16 as shown in Figure 3–33.
2. Click the Sum button on the Ribbon to display the row totals in column H (Figure 3–33).

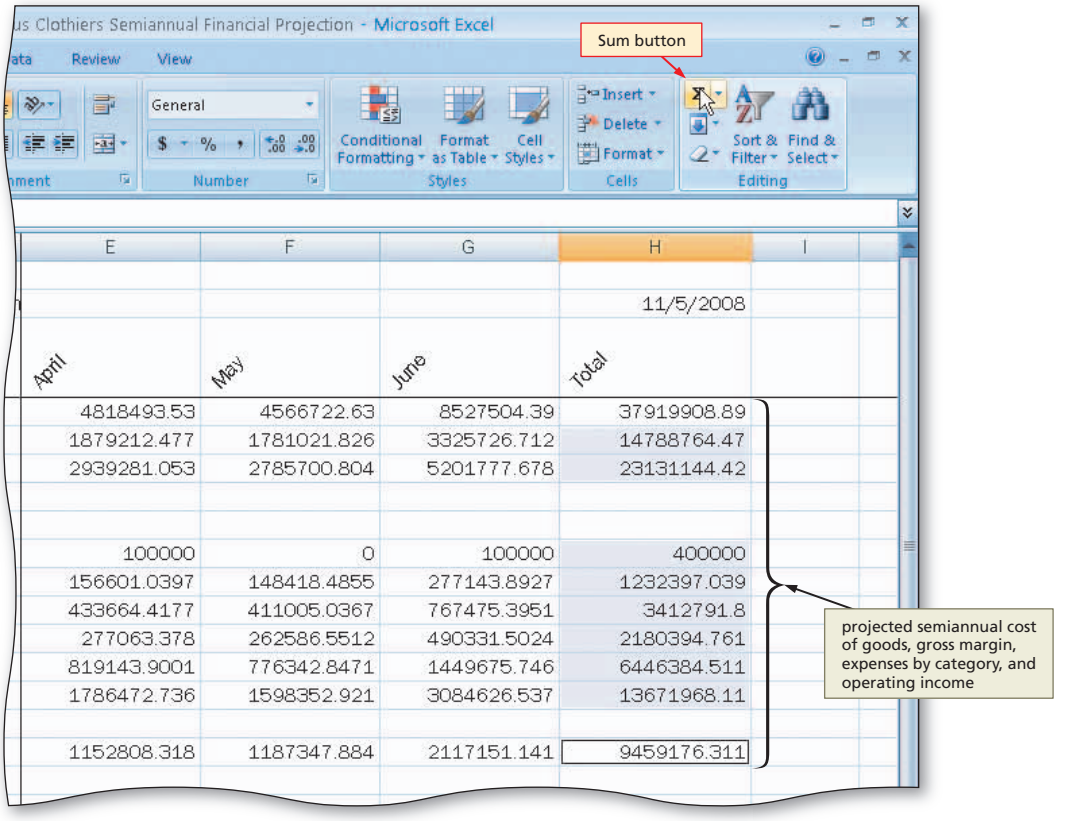


Figure 3–33

BTW

Toggle Commands

Many of the commands on the Ribbon, in the galleries, and the shortcut keys function as a toggle. For example, if you click the Freeze Panes command on the Freeze Panes gallery, the command changes to Unfreeze Panes the next time you view the gallery. These types of commands work like an on-off switch, or toggle.

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 and save the workbook using its current file name, Campus Clothiers Semiannual Financial Projection.

1. Press CTRL+HOME to select cell B4 and view the upper-left corner of the screen.
2. Click the View tab on the Ribbon and then click the Freeze Panes button on the Ribbon to display the Freeze Panes gallery (Figure 3–34).
3. Click Unfreeze Panes in the Freeze Panes gallery to unfreeze the titles.

4 Click the Home tab on the Ribbon and then click the Save button on the Quick Access Toolbar.

Q&A Why does pressing CTRL+HOME select cell B4?

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 B4. When the titles are unfrozen, then pressing CTRL+HOME selects cell A1.

BTW

Work Days

Assume that you have two dates: one in cell F3 and the other in cell F4. The date in cell F3 is your starting date and the date in cell F4 is the ending date. To calculate the work days between the two dates (excludes weekends), use the following formula: =NETWORKDAYS(F3, F4). For this function to work, make sure the Analysis ToolPak add-in is installed. You can install it on the Add-Ins page of the Excel Options dialog box.

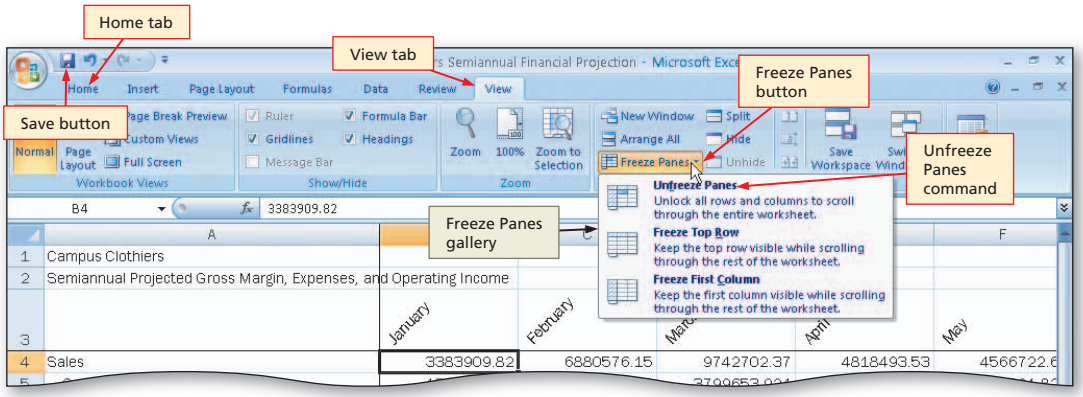


Figure 3–34

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 person to vote. Assume the following in this example: (1) the nested IF function is assigned to cell K12, which instructs Excel to display one of three messages in the cell; (2) cell H12 contains a person's age; and (3) cell I12 contains a Y or N, based on whether the person is registered to vote.

=IF(H12>=18, IF(I12="Y","Registered","Eligible and Not Registered"),"Not Eligible to Register")

The nested IF function instructs Excel to display one, and only one, of the following three messages in cell K12: (1) Registered; or (2) Eligible and Not Registered; or (3) Not Eligible to Register.

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.

Formatting the Worksheet

The worksheet created thus far shows the financial projections for the six-month period, from January to June. Its appearance is uninteresting, however, even though some minimal formatting (formatting assumptions numbers, changing the column widths, and formatting the date) 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.

Plan Ahead

Identify how to format various elements of the worksheet.
The worksheet will be formatted in the following manner so it appears as shown in Figure 3–35: (1) format the numbers; (2) format the worksheet title, column titles, row titles, and operating income row; and (3) format the 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. The assumptions table should be diminished in its formatting so it does not distract from the main calculations and data in the worksheet. Assigning the data in the assumptions table a font size of 8-point would set it apart from other data formatted with a font size of 11-point.

BTW

Selecting Nonadjacent Ranges
One of the more difficult tasks to learn is selecting nonadjacent ranges. To complete this task, do not hold down the CTRL key when you select the first range because Excel will consider the current active cell to be the first selection. Once the first range is selected, hold down the CTRL key and drag through the nonadjacent ranges. If a desired range is not visible in the window, use the scroll arrows to view the range. It is not necessary to hold down the CTRL key while you scroll.

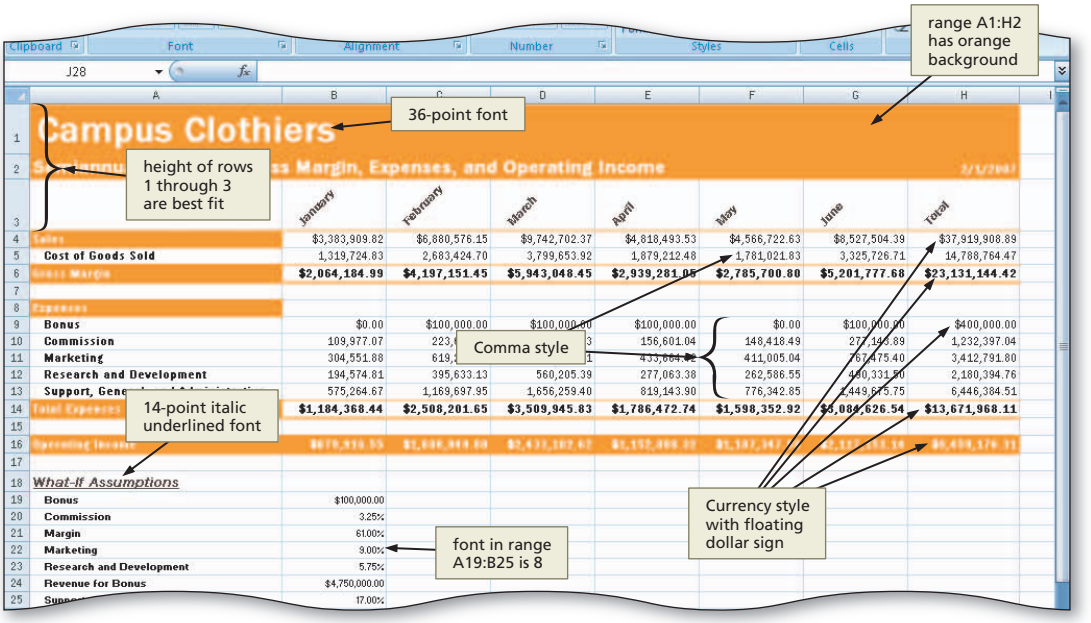


Figure 3–35

To Assign Formats to Nonadjacent Ranges

The numbers in the range B4:H16 are to be formatted as follows:

1. Assign the Currency style with a floating dollar sign to rows 4, 6, 9, 14, and 16.
2. Assign a Comma style to rows 5 and 10 through 13.

To assign a Currency style with a floating dollar sign, use the Format Cells dialog box rather than the Accounting Style button on the Ribbon, which assigns a fixed dollar sign. Also use the Format Cells dialog box to assign the Comma style, because the Comma Style button on the Ribbon 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 B9 in Figure 3–35), 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. The following steps assign formats to the numbers in rows 4 through 16.

1

- Select the range B4:H4.
- While holding down the CTRL key, select the nonadjacent ranges B6:H6, B9:H9, B14:H14, and B16:H16, and then release the CTRL key.
- Click the Format Cells: Number Dialog Box Launcher on the Ribbon to display the Format Cells dialog box (Figure 3–36).

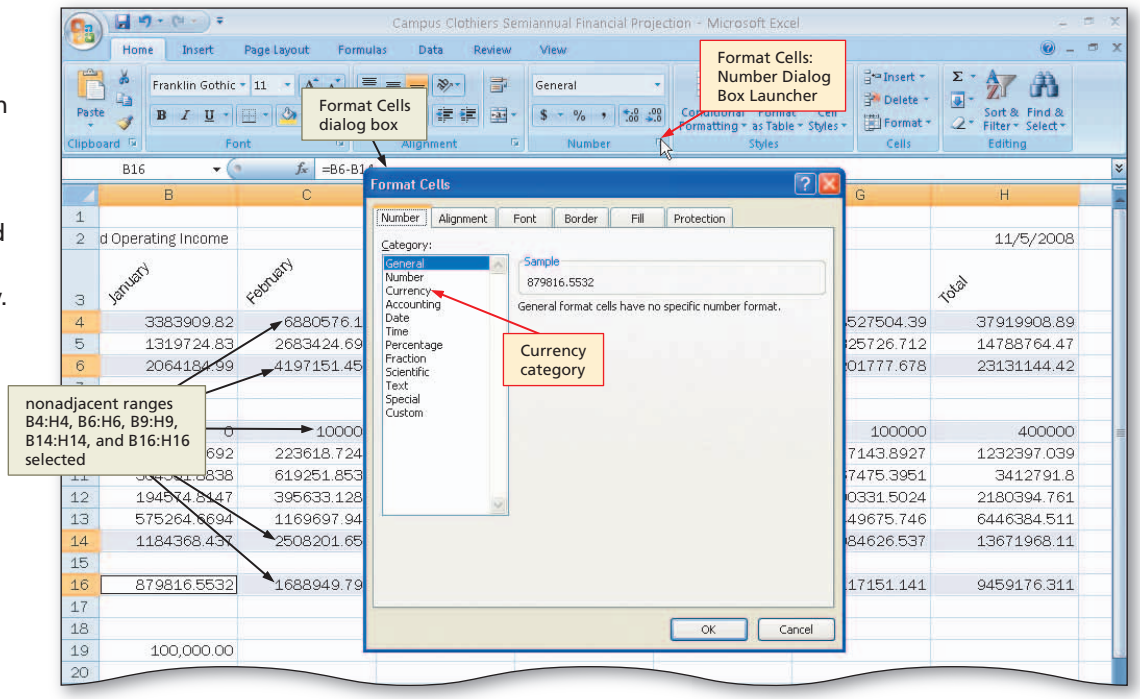


Figure 3–36

2

- Click Currency in the Category list, select 2 in the Decimal places box, click $ in the Symbol list to ensure a dollar sign shows, and click the black font color ($1,234.10) in the Negative numbers list (Figure 3–37).

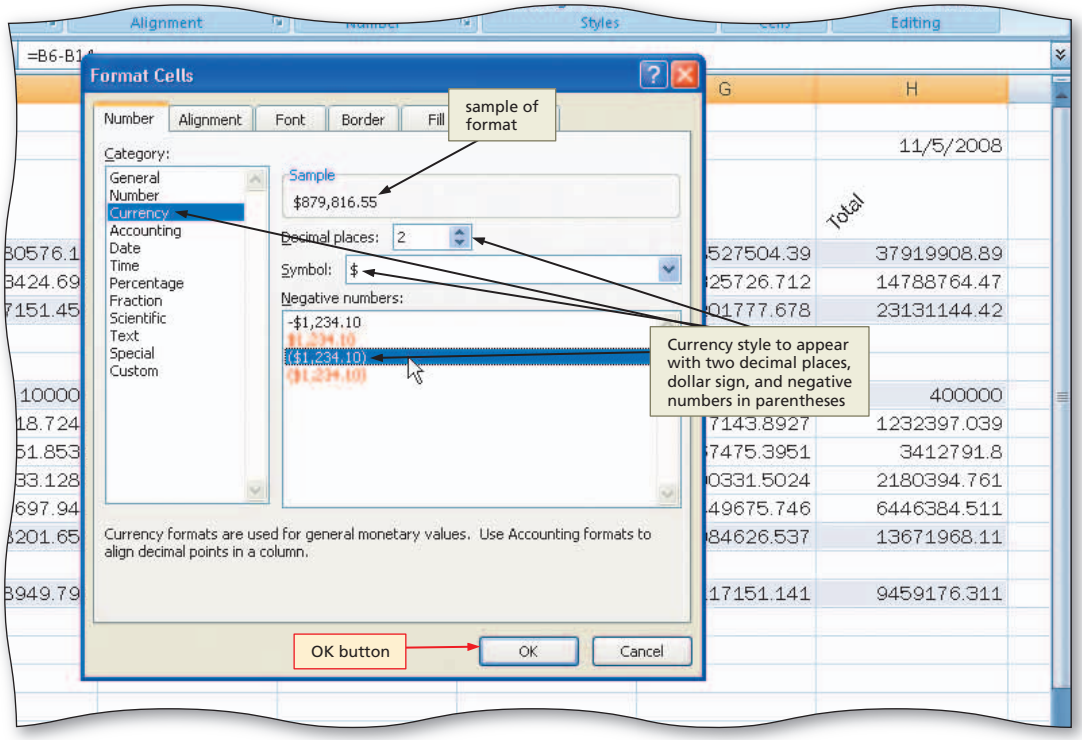


Figure 3–37

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. However, you must select a format for negative numbers, and you must be consistent if you are choosing different formats in a column, otherwise the decimal points may not line up.

3

- Click the OK button.
- Select the range B5:H5.
- While holding down the CTRL key, select the range B10:H13, and then release the CTRL key.
- Click the Format Cells: Number Dialog Box Launcher on the Ribbon to display the Format Cells dialog box.
- When Excel displays the Format Cells dialog box, click Currency in the Category list, select 2 in the Decimal places box, click None in the Symbol list so a dollar sign does not show, and click the black font color (1,234.10) in the Negative numbers list (Figure 3–38).

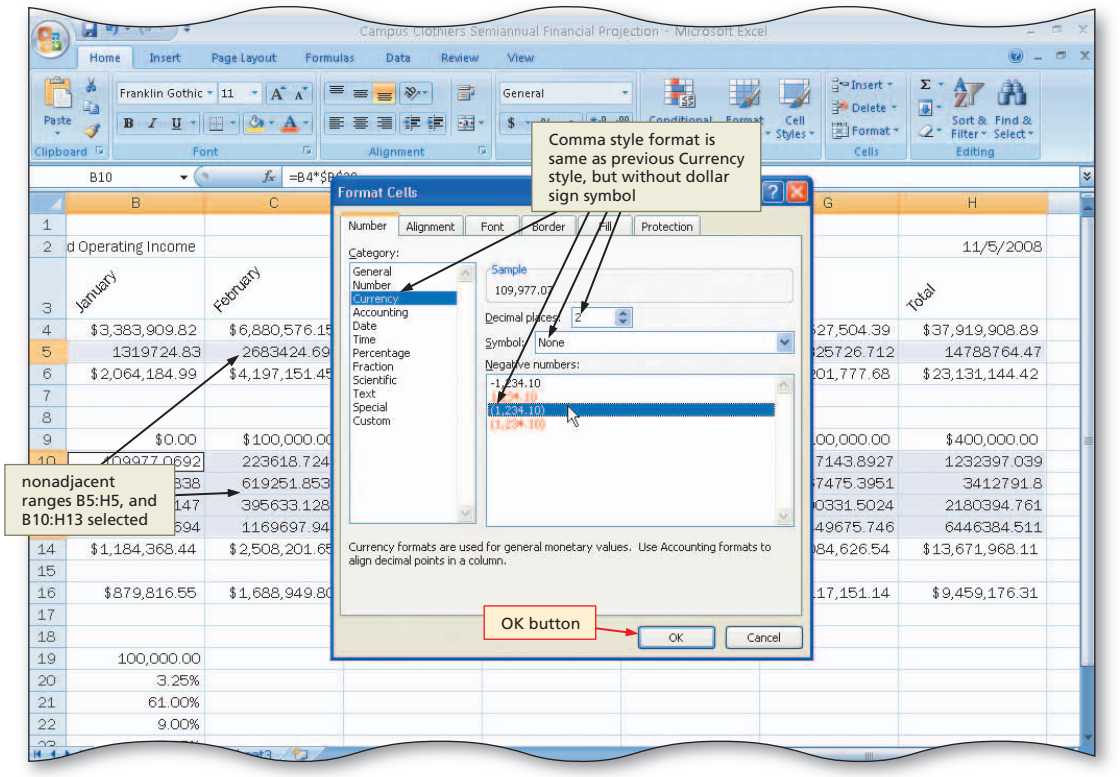


Figure 3–38

4

- Click the OK button.
- Press CTRL+HOME to select cell A1 to display the formatted numbers as shown in Figure 3–39.

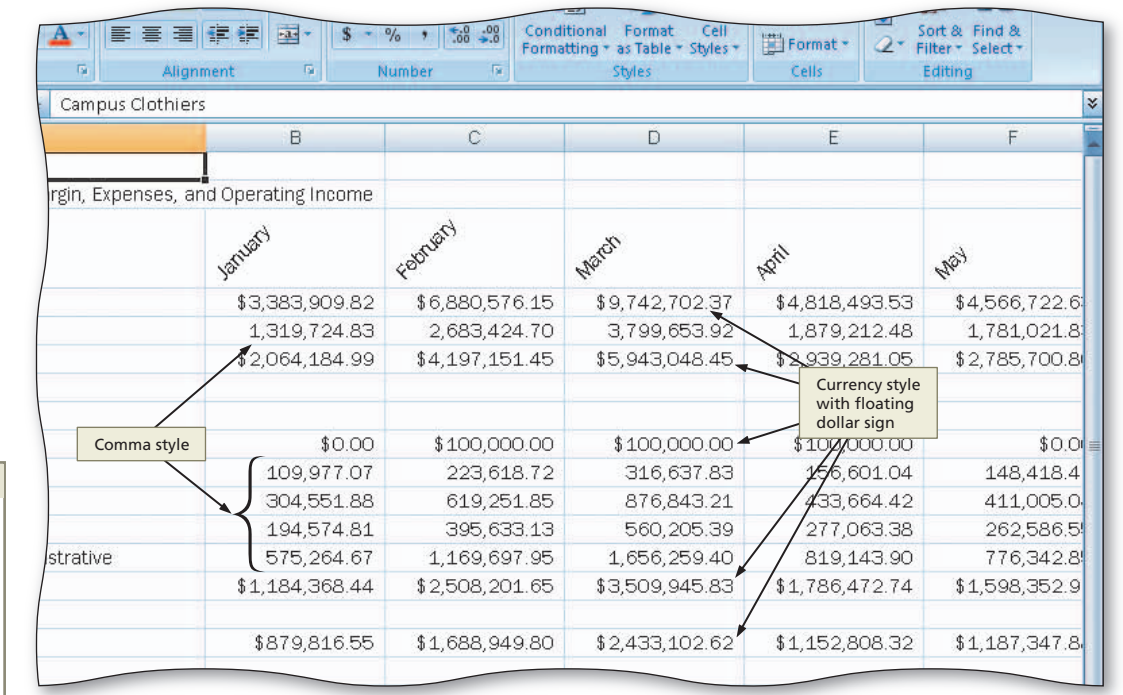


Figure 3–39

Other Ways

1. Right-click range, click Format Cells on shortcut menu, click Number tab, click category in Category list, select format, click OK button
2. Press CTRL+1, click Number tab, click category in Category list, select format, click OK button

To Format the Worksheet Titles

The following steps emphasize the worksheet titles in cells A1 and A2 by changing the font type, size, and color. The steps also format all of the row headers in column A with a Bold font style.

1

- Click the column A heading to select column A.
- Click the Bold button on the Ribbon to bold all of the data in column A (Figure 3–40).

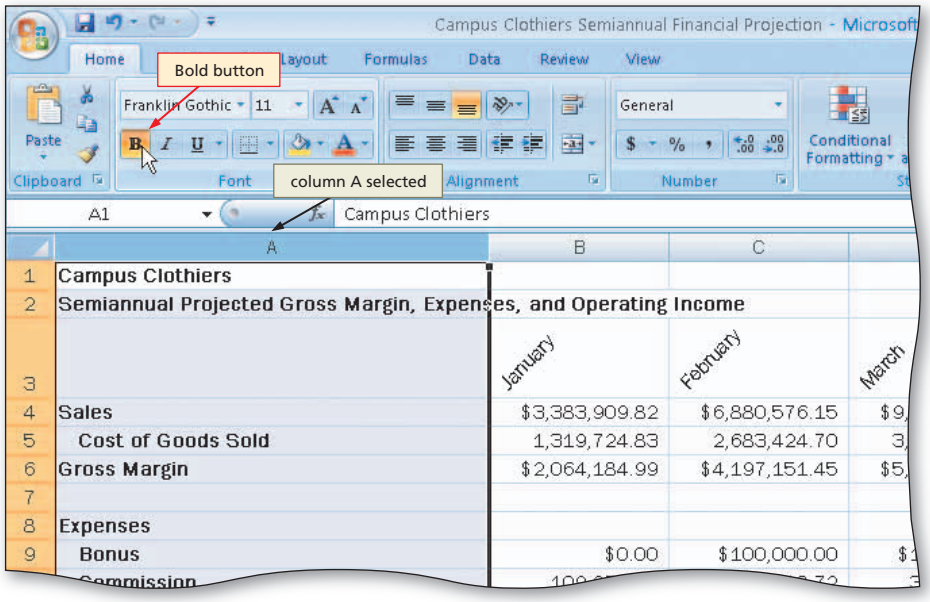


Figure 3–40

2

- Click cell A1 to select it. Click the Font Size box arrow on the Ribbon, and then click 36 in the Font Size list.
- Click cell A2, click the Font Size box arrow, and then click 18 in the Font Size list (Figure 3–41).

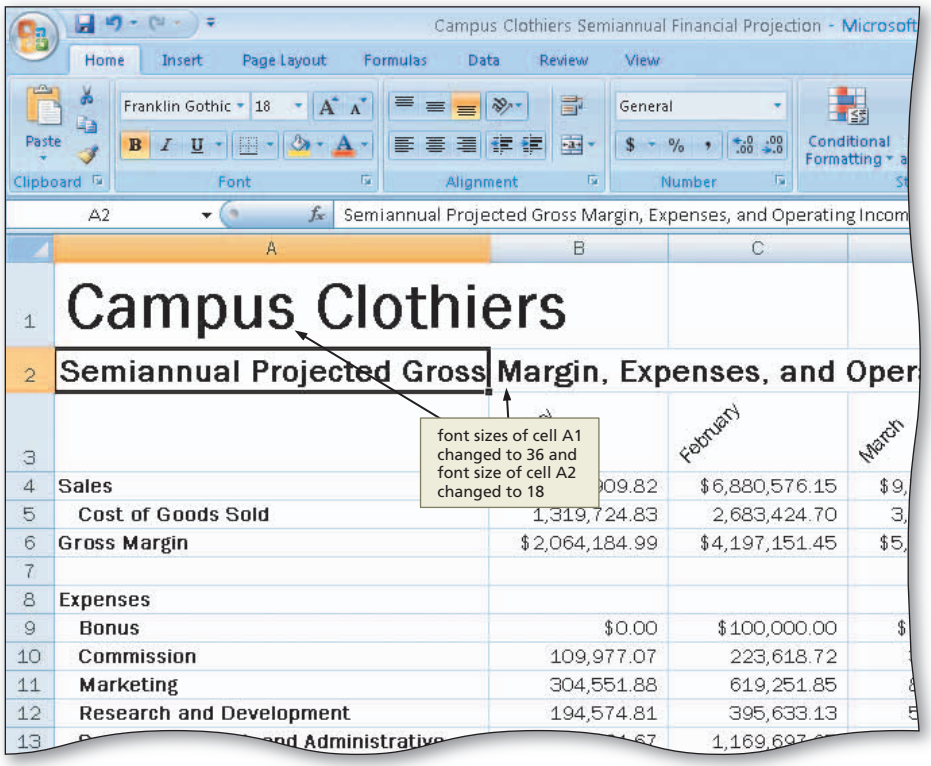


Figure 3–41

3

- Select the range A1:H2 and then click the Fill Color button arrow on the Ribbon.
- Click Orange, Accent 1 (column 5, row 1) on the Fill Color palette.
- Click the Font Color button arrow on the Ribbon and then select White, Background 1 (column 1, row 1) on the Font Color palette (Figure 3–42).

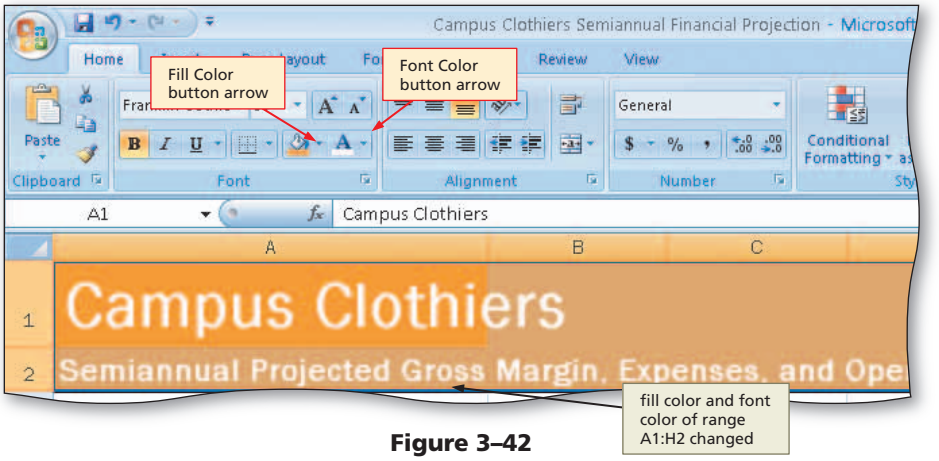


Figure 3–42

Other Ways

1. Right-click range, click Format Cells on shortcut menu, click Fill tab to color background (or click Font tab to color font), click OK button
2. Press CTRL+1, click Fill tab 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 3 and the totals in rows 4, 14, and 16. The following steps format the heading in row 3 with the Heading 3 cell style and the totals in rows 4, 14, and 16 with the Total cell style. Cell A4 also is formatted.

1. Select the range A3:H3 and apply the Heading 3 cell style.
2. Select the range A6:H6 and while holding down the CTRL key, select the ranges A14:H14 and A16:H16.
3. Apply the Total cell style.
4. Click cell A4, click the Fill Color button arrow on the Ribbon, and then click the Orange, Accent 1 color (column 5, row 1) on the Fill Color palette.
5. Click the Font Color button arrow on the Ribbon, and then click the White, Background 1 color (column 1, row 1) on the Font Color palette (Figure 3–43).

BTW

The Fill and Font Color Button

You may have noticed that the color bar at the bottom of the Fill Color and Font Color buttons on the Home tab on the Ribbon (Figure 3-42) changes to the most recently selected color. To apply this same color to a cell background or text, select a cell and then click the Fill Color button to use the color as a background or click the Font Color button to use the color as a font color.

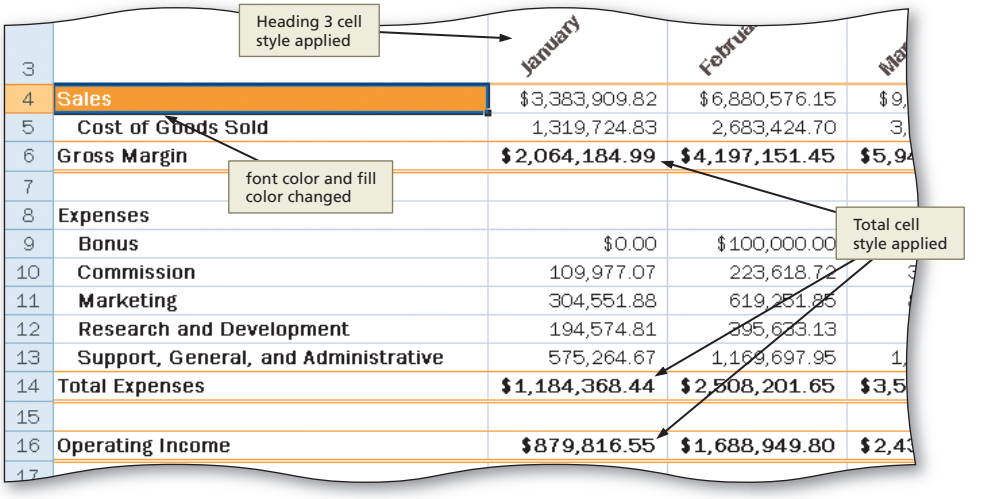


Figure 3–43

Copying a Cell's Format Using the Format Painter Button

Using the Format Painter button on the Ribbon, you can format a cell quickly by copying a cell's format to another cell or a range of cells.

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

The following steps format cells A6, A14, and the range A16:H16 using the Format Painter button.

1

- Select cell A4.
- Click the Format Painter button on the Ribbon 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 3–44).

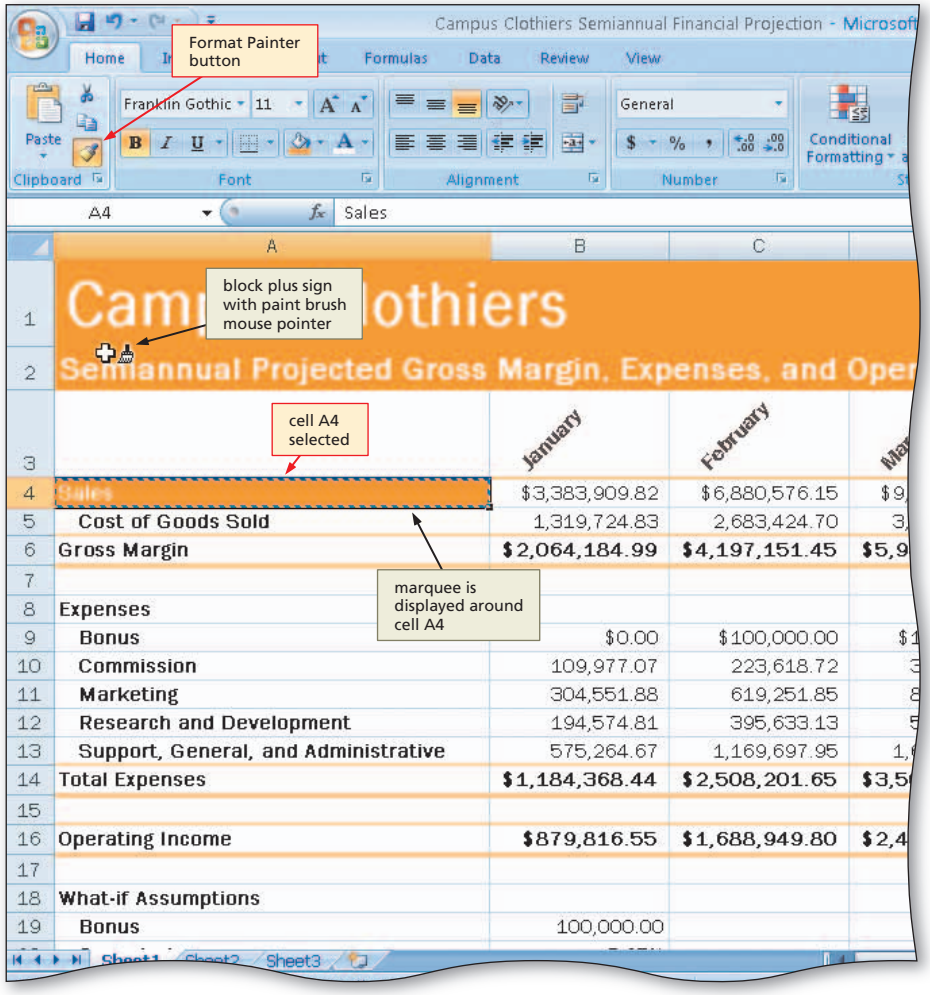


Figure 3–44

2

- Click cell A6 to assign the format of cell A4 to cell A6 (Figure 3–45).

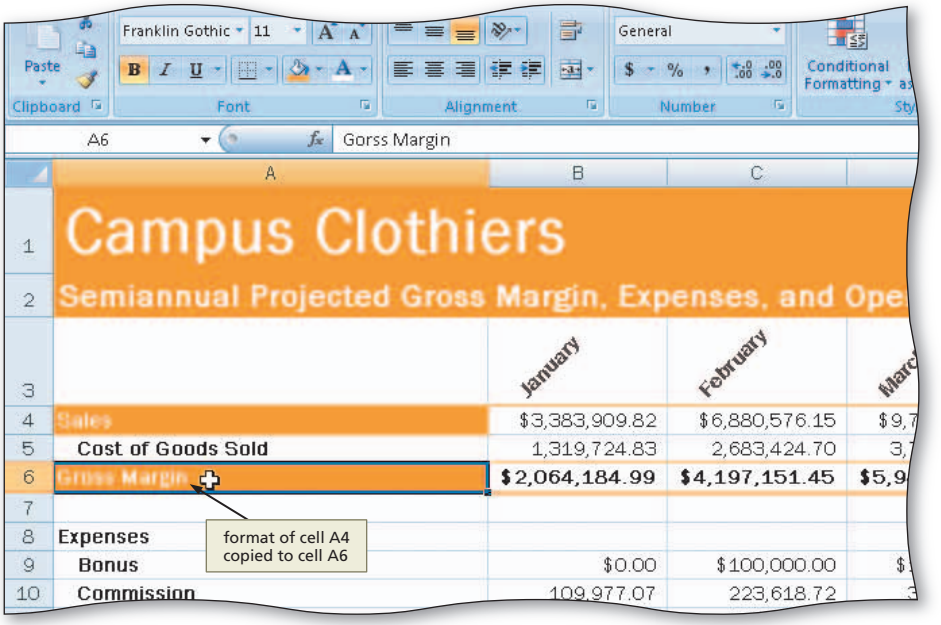


Figure 3–45

3

- With cell A6 selected, click the Format Painter button on the Ribbon and then click cell A14.
- With cell A14 selected, click the Format Painter button on the Ribbon and then click cell A16.
- Select the range B16:H16, click the Fill Color button on the Ribbon, and then click the Orange, Accent 1 color (column 5, row 1) on the Fill Color palette.
- Click the Font Color button on the Ribbon, and then click the Background 1 color (column 1, row 1) on the Font Color palette (Figure 3–46).
- Apply the Currency style to the range B16:G16.

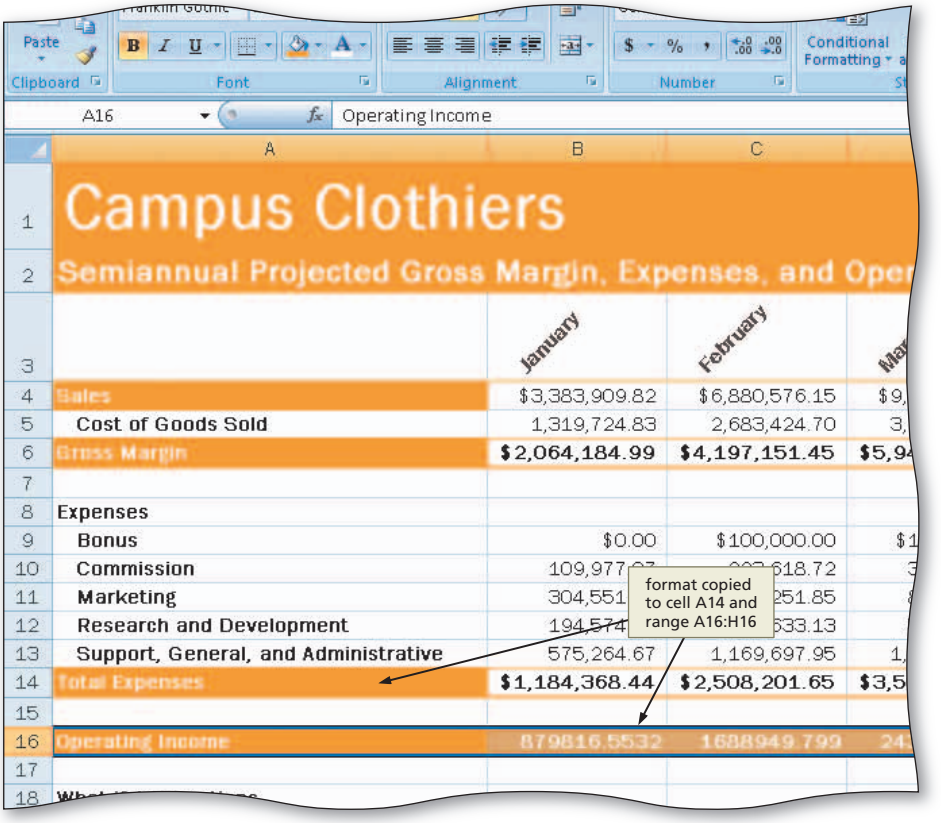


Figure 3–46

Other Ways

1. Click Copy button, select cell, click Paste button, click Paste Special command on Paste menu, click Formats, click OK button
2. Double-click Format Painter button

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 A18:B25. The specifications in Figure 3–35 on page EX 196 require a 14-point italic underlined font for the title in cell A18 and 8-point font in the range A19:B25. The following steps format the What-If Assumptions table.

1. Scroll down to view rows 18 through 25 and then click cell A18.
2. Click the Font Size box arrow on the Ribbon and then click 14 in the Font Size list. Click the Italic button and then click the Underline button on the Ribbon.
3. Select the range A19:B25, click the Font Size button on the Ribbon, and then click 8 in the Font Size list.
4. Click cell D25 to deselect the range A19:B25 and display the What-If Assumptions table as shown in Figure 3–47.
5. Click the Save button on the Quick Access Toolbar.

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 A18 in Figure 3–47. 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.

BTW **Painting a Format to Nonadjacent Ranges**

Double-click the Format Painter button on the Home tab on the Ribbon and then drag through the nonadjacent ranges to paint the formats to the ranges. Click the Format Painter button to deactivate it.

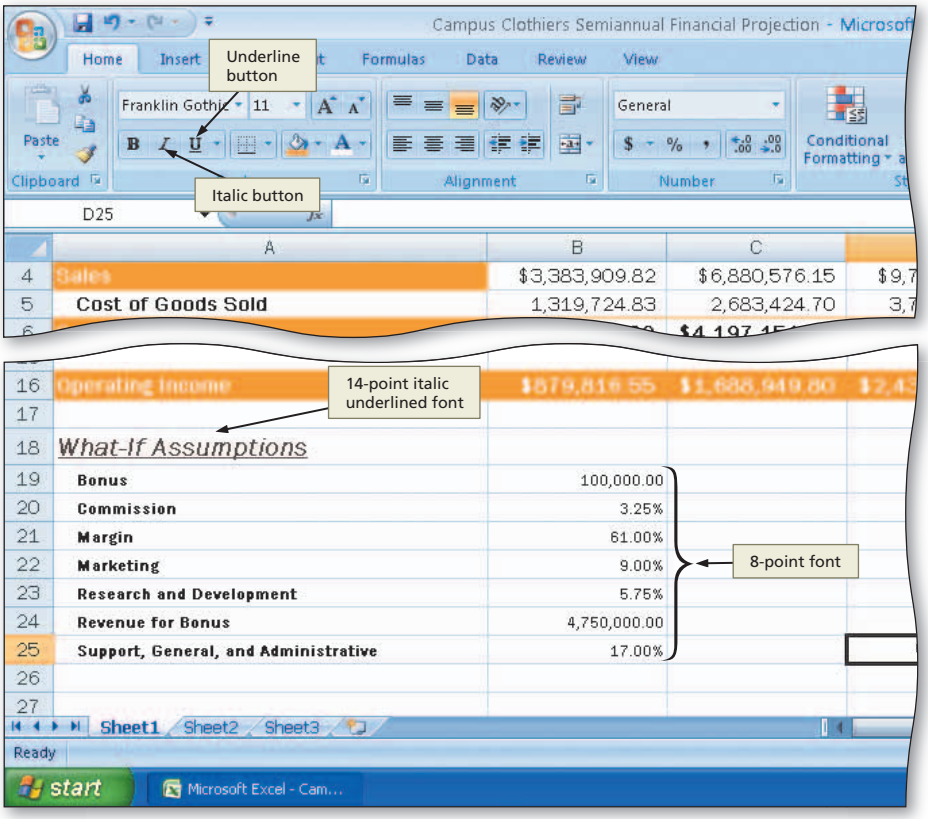


Figure 3–47

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 3–48. 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%).

Plan Ahead

Specify how the chart should convey necessary information.
The 3-D Pie chart in Figure 3–48 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.

Unlike the 3-D Column chart created in Chapter 1, the 3-D Pie chart shown in Figure 3–48 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 B3:G3 (month names) and B16:G16 (monthly operating incomes). The month names in the range B3:G3 will identify the slices of the Pie chart; these entries are called **category names**. The range B16:G16 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 166 also calls for emphasizing the month of June by offsetting its slice from the main portion. A Pie chart with one or more slices offset is called an **exploded Pie chart**.

BTW **Charts**
You are aware that, when you change a value on which a chart is dependent, Excel immediately redraws the chart based on the new value. Did you know that, with bar charts, you can drag the bar in the chart in one direction or another to change the corresponding value in the worksheet, as well?

BTW **Certification**
The Microsoft Certified Application Specialist (MCAS) program provides an opportunity for you to obtain a valuable industry credential – proof that you have the Excel 2007 skills required by employers. For more information, see Appendix F or visit the Excel 2007 Certification Web page (scsite.com/ex2007/cert).

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.

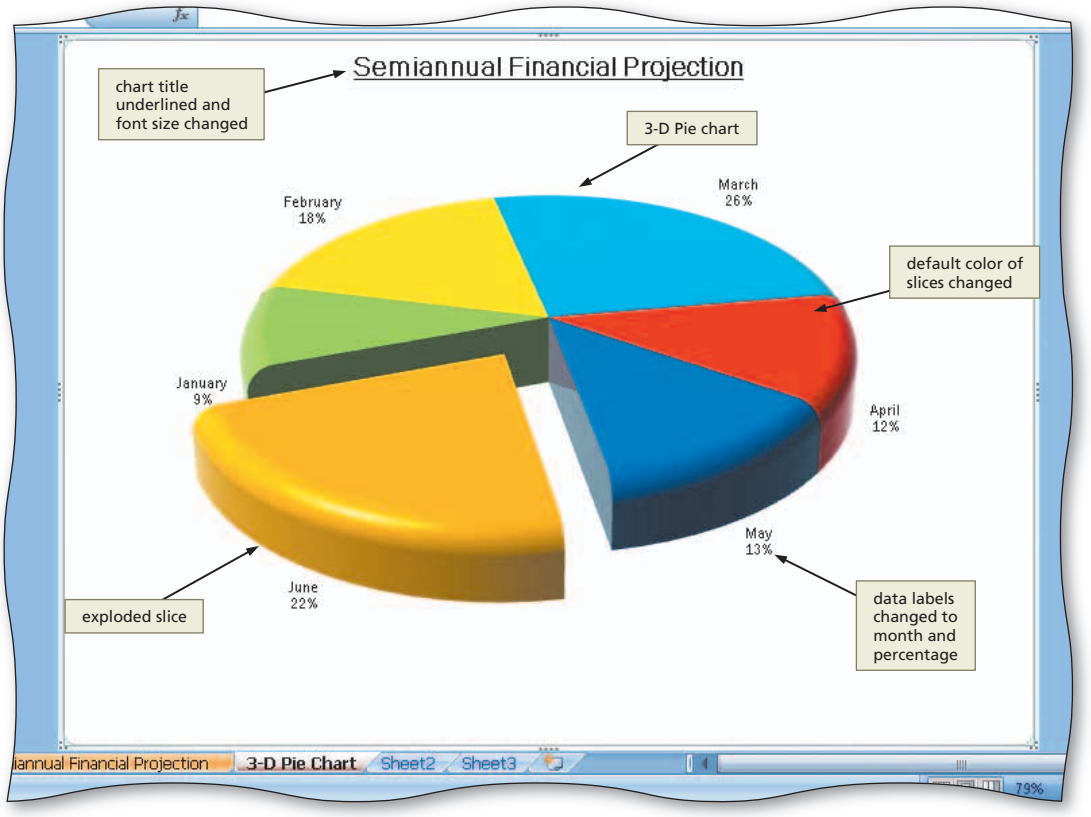


Figure 3–48

As shown in Figure 3–48, 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.

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 B3:G3.
- While holding down the CTRL key, select the range B16:G16.
- Click the Insert tab on the Ribbon.
- Click the Pie button on the Ribbon to display the Pie gallery (Figure 3–49).

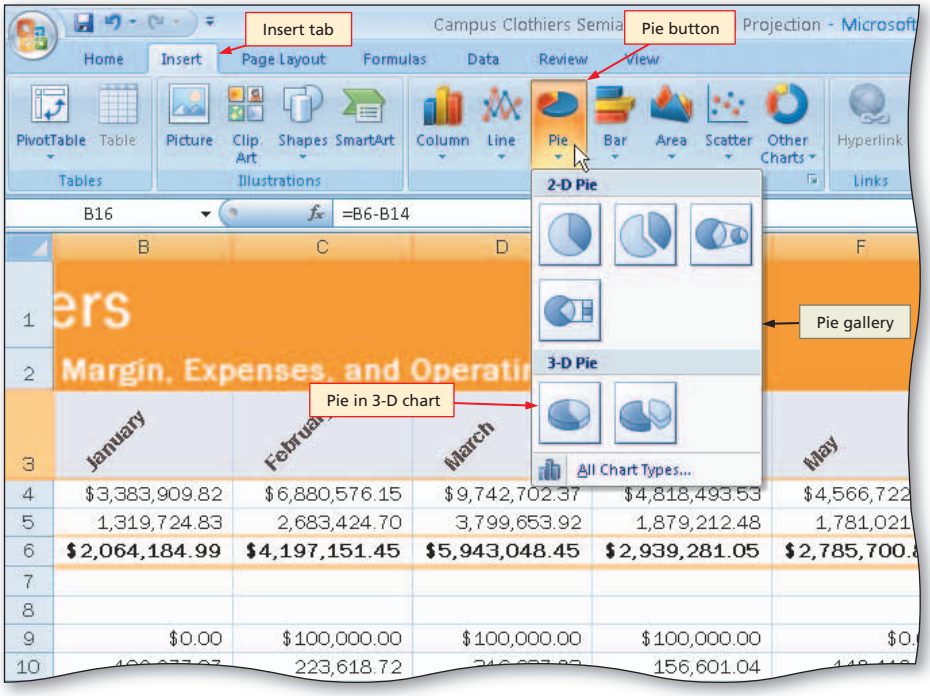


Figure 3–49

2

- Click Pie in 3-D chart in the Pie gallery.
- When Excel draws the chart, click the Move Chart button on the Ribbon to display the Move Chart dialog box (Figure 3–50).

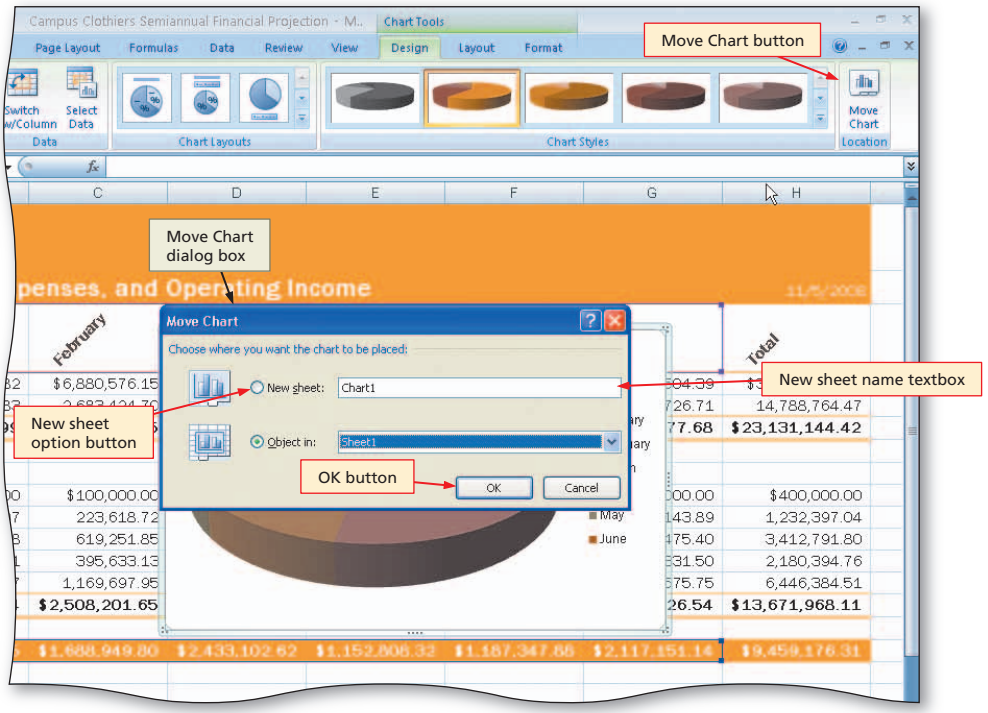


Figure 3–50

3

- Click the New sheet option button and then type `3-D Pie Chart` in the New sheet name textbox.
- Click the OK button to move the chart to a new chart sheet with the name 3-D Pie Chart (Figure 3–51).

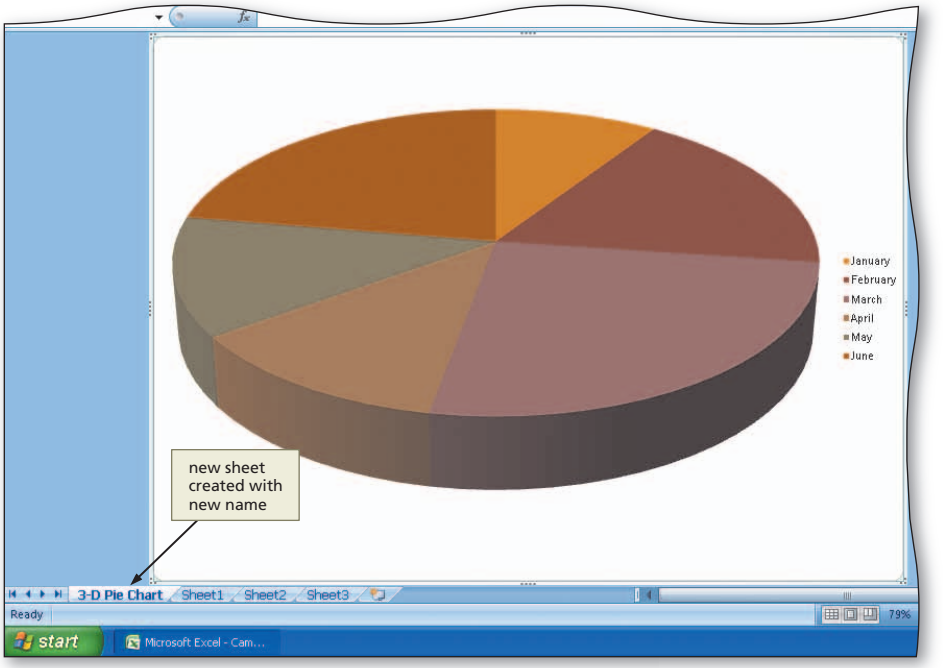


Figure 3–51

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. You can format a selected chart item using the Ribbon or shortcut menu. The following steps insert a chart title, remove the legend, and add data labels.

1

- Click anywhere in the chart area outside the chart.
- Click the Layout tab on the Ribbon and then click the Chart Title button.
- Click the Centered Overlay Title command in the Chart Title gallery.
- Select the text in the chart title and then type `Semiannual Financial Projection` as the new chart title (Figure 3–52).

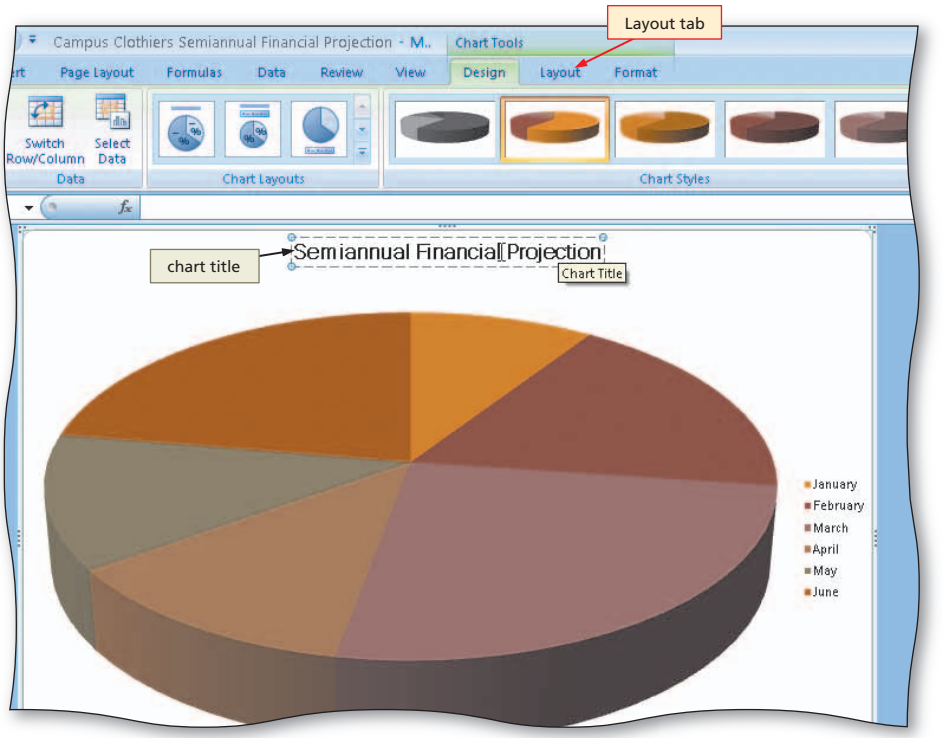


Figure 3–52

2

- Select the text in the new title and then click the Home tab on the Ribbon.
- Click the Underline button to assign an underline font style to the chart title (Figure 3–53).

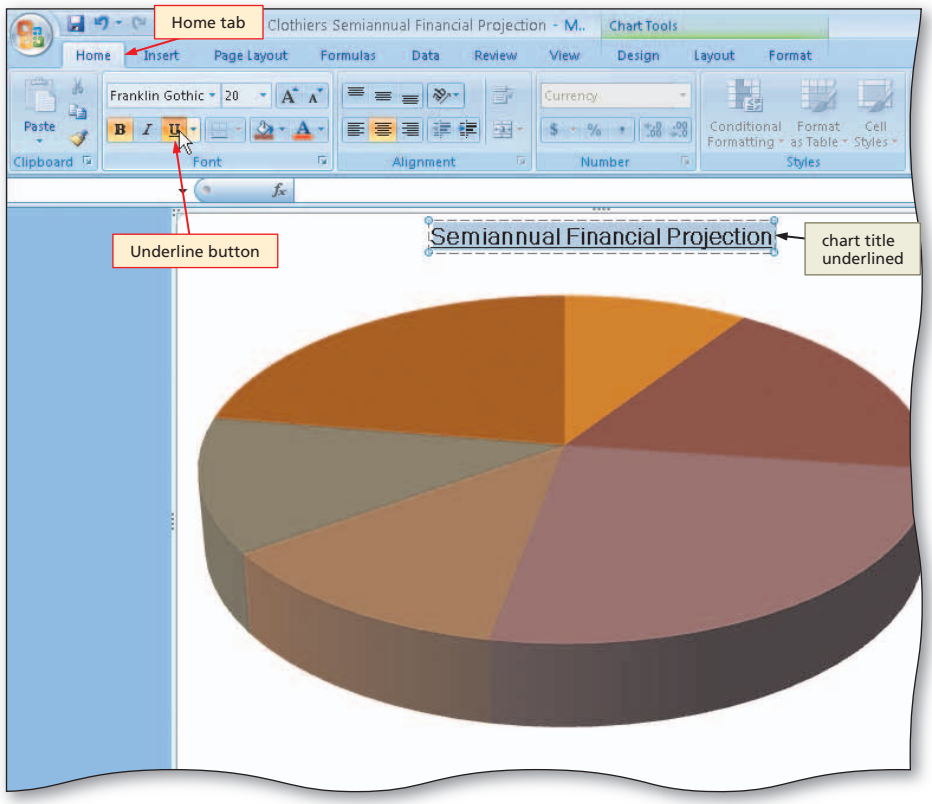


Figure 3–53

3

- Click the Layout tab on the Ribbon and then click the Legend button to display the Legend gallery.
- Point to None in the Legend gallery (Figure 3–54).

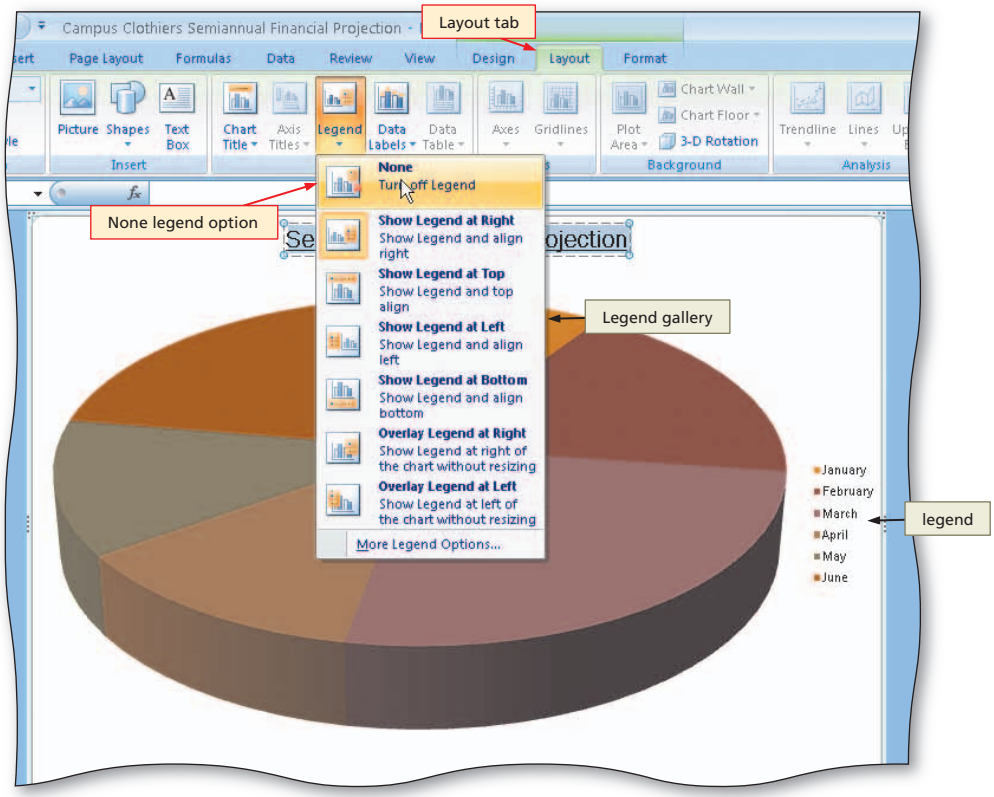


Figure 3–54

4

- Click None to turn off the legend on the chart.
- Click the Data Labels button on the Ribbon and then click Outside End in the Data Labels gallery to display data labels outside the chart at the end of each slice (Figure 3–55).

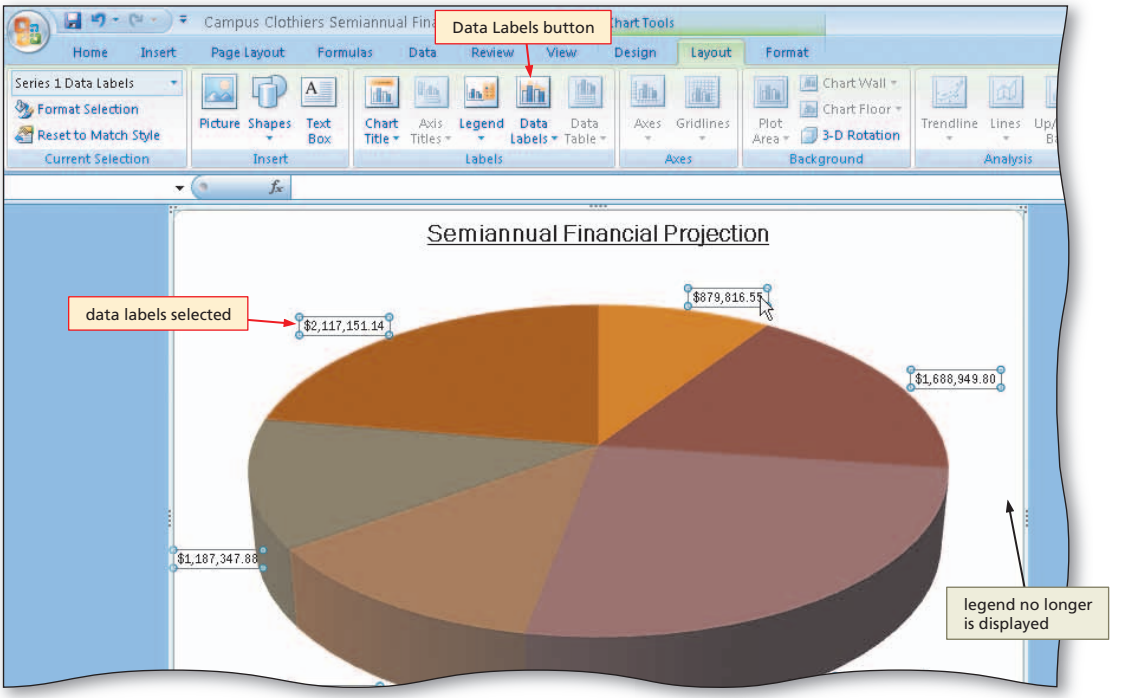


Figure 3–55

5

- If necessary, right-click any data label to select all of the data labels on the chart and to display the 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 and then click the Category Name and Percentage check boxes to select them (Figure 3–56).

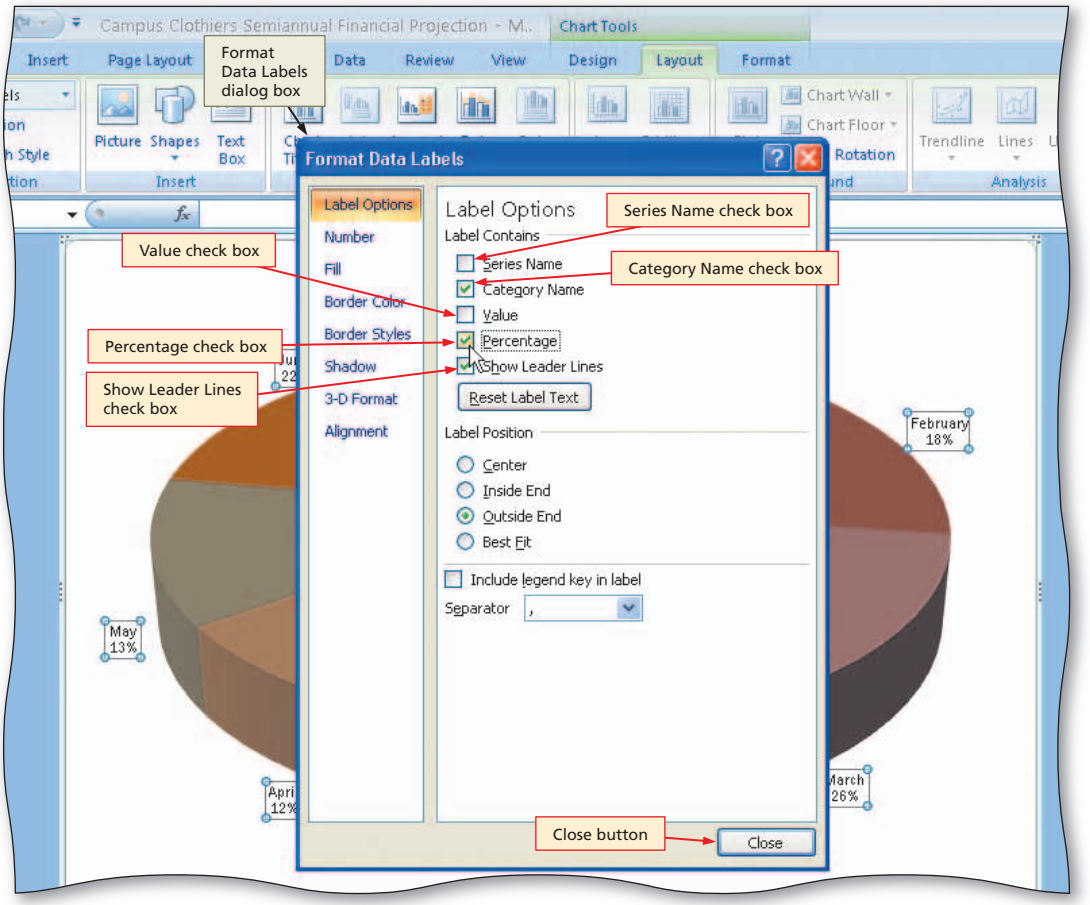


Figure 3–56

6

- Click the Close button to close the Format Data Labels dialog box and display the chart as shown in Figure 3–57.

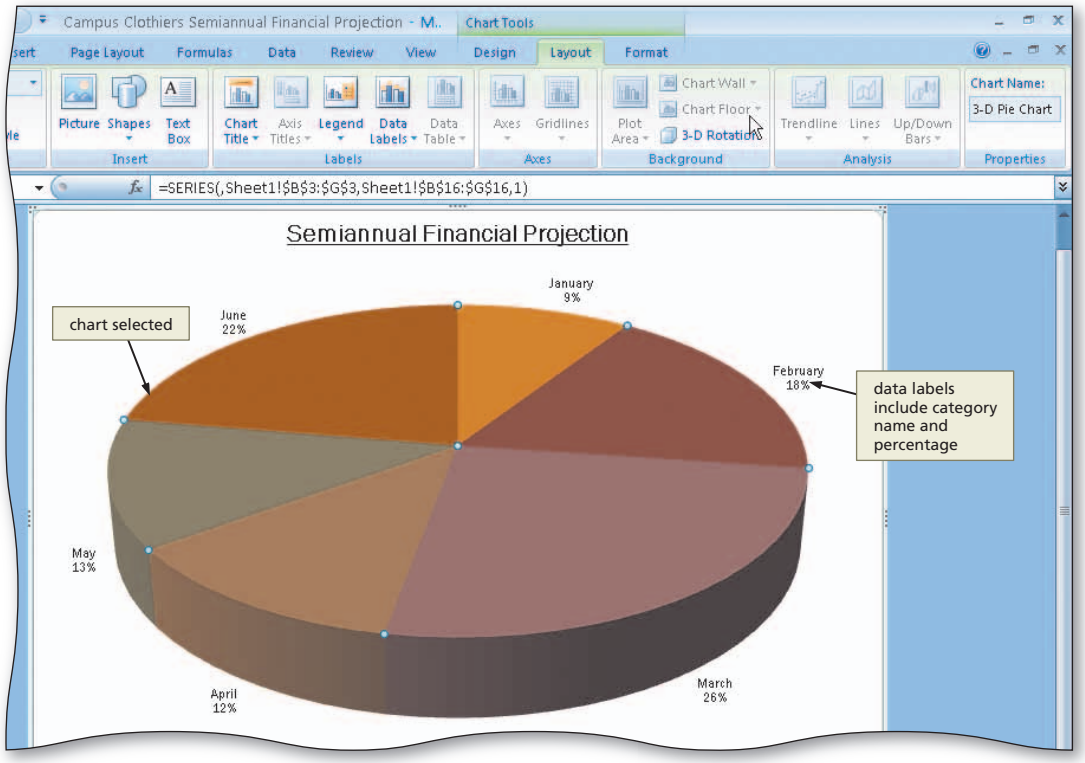


Figure 3–57

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 by using the Format Chart Area dialog box.

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 3–57, the line that divides the January and June 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 June slice, the 3-D Pie chart can be rotated 250° to the right. The following steps show how to rotate the 3-D Pie chart.

1

- Click the 3-D Rotation button on the Ribbon 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 250° (Figure 3–58).

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.

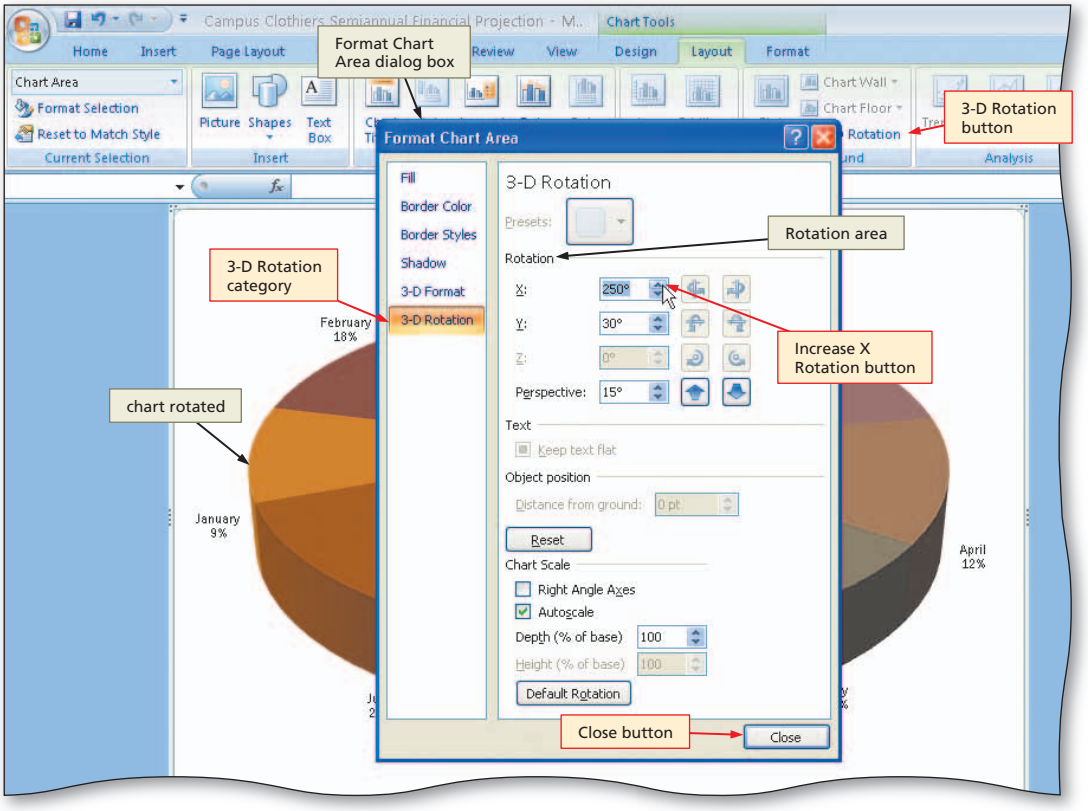


Figure 3–58

2

- Click the Close button in the Format Chart Area dialog box to display the rotated chart (Figure 3–59).

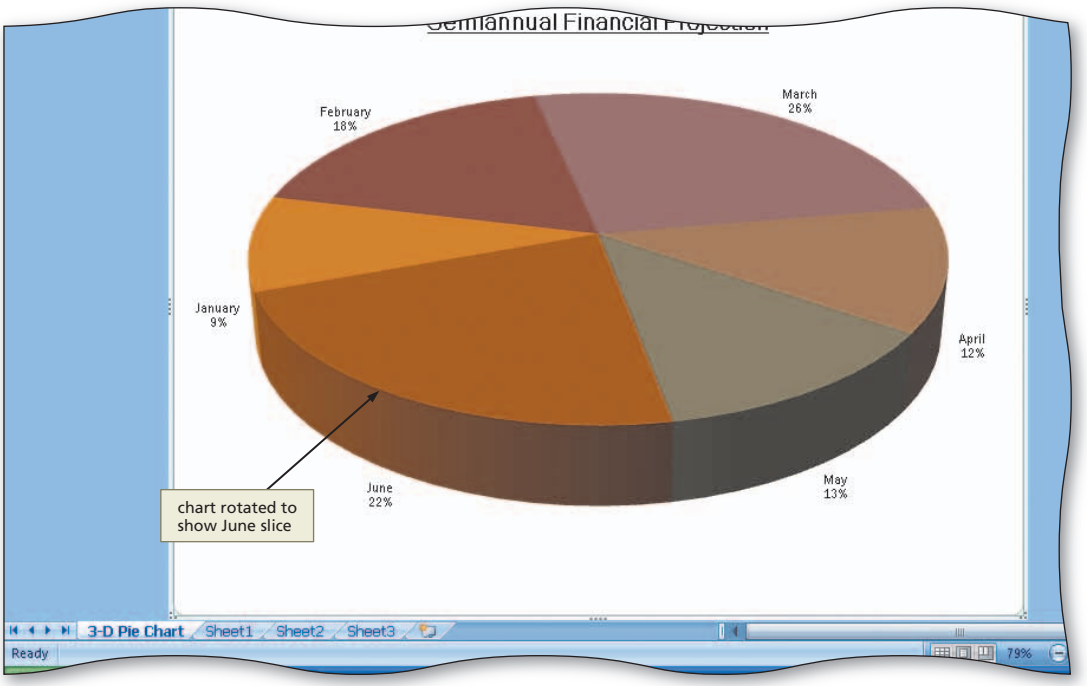


Figure 3–59

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 3–59 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 the shortcut menu (Figure 3–60).

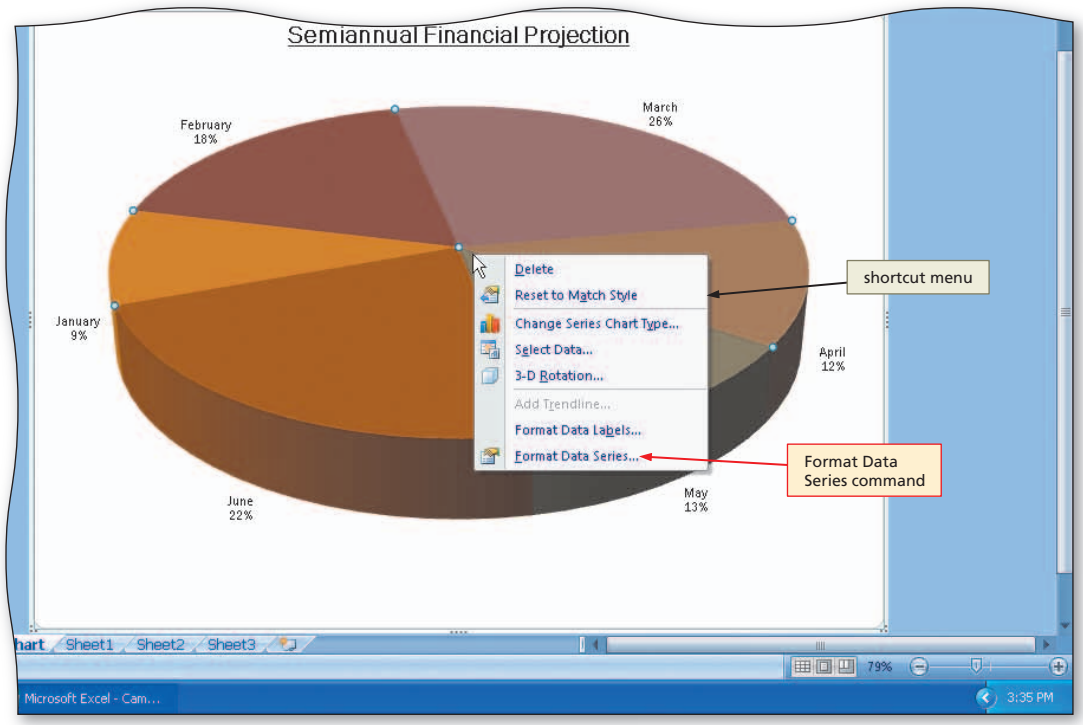


Figure 3–60

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 on the left side of the dialog box.
- Click the Top button in the Bevel area to display the Bevel gallery (Figure 3–61).

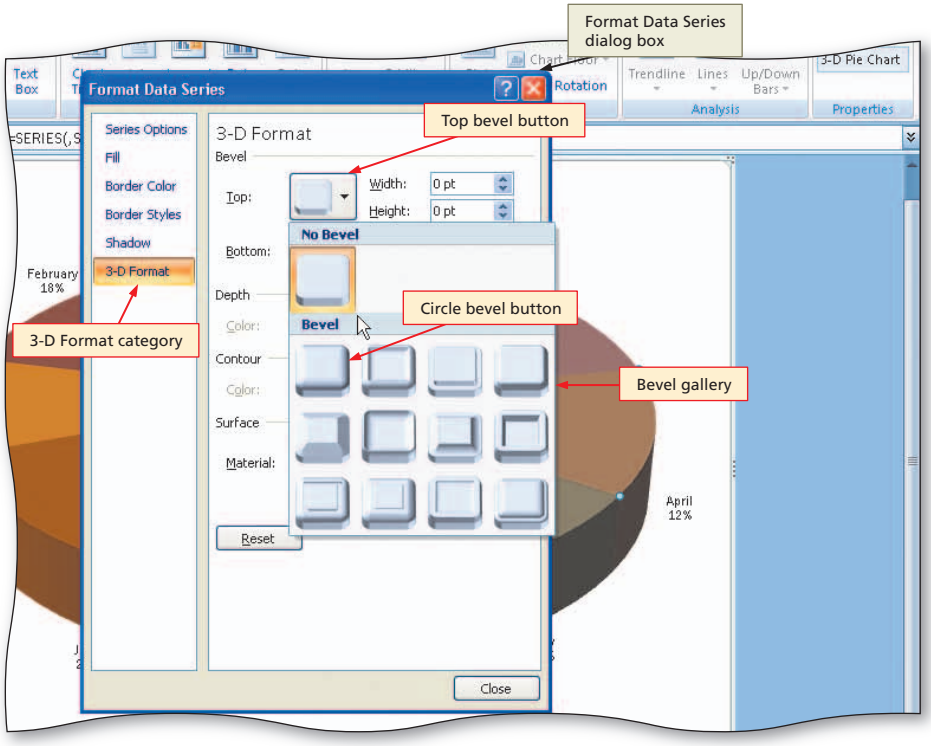


Figure 3–61

3

- Click the Circle bevel button (column 1, row 1) in the Bevel gallery to add a bevel to the chart.
- Type `50 pt` in the top Width box in the Bevel area of the 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 3–62).

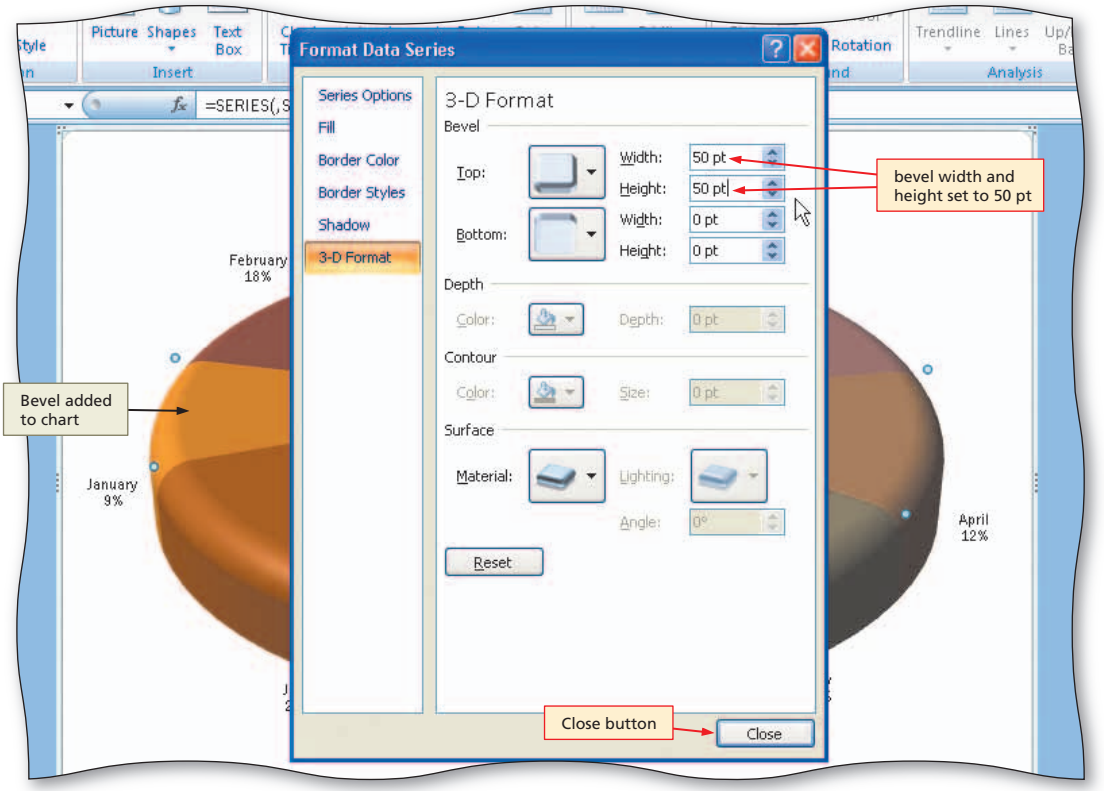


Figure 3–62

4

- Click the Material button in the Surface area of the Format Data Series dialog box and then point to the Soft Edge button (column 2, row 2) in the Material gallery (Figure 3–63).

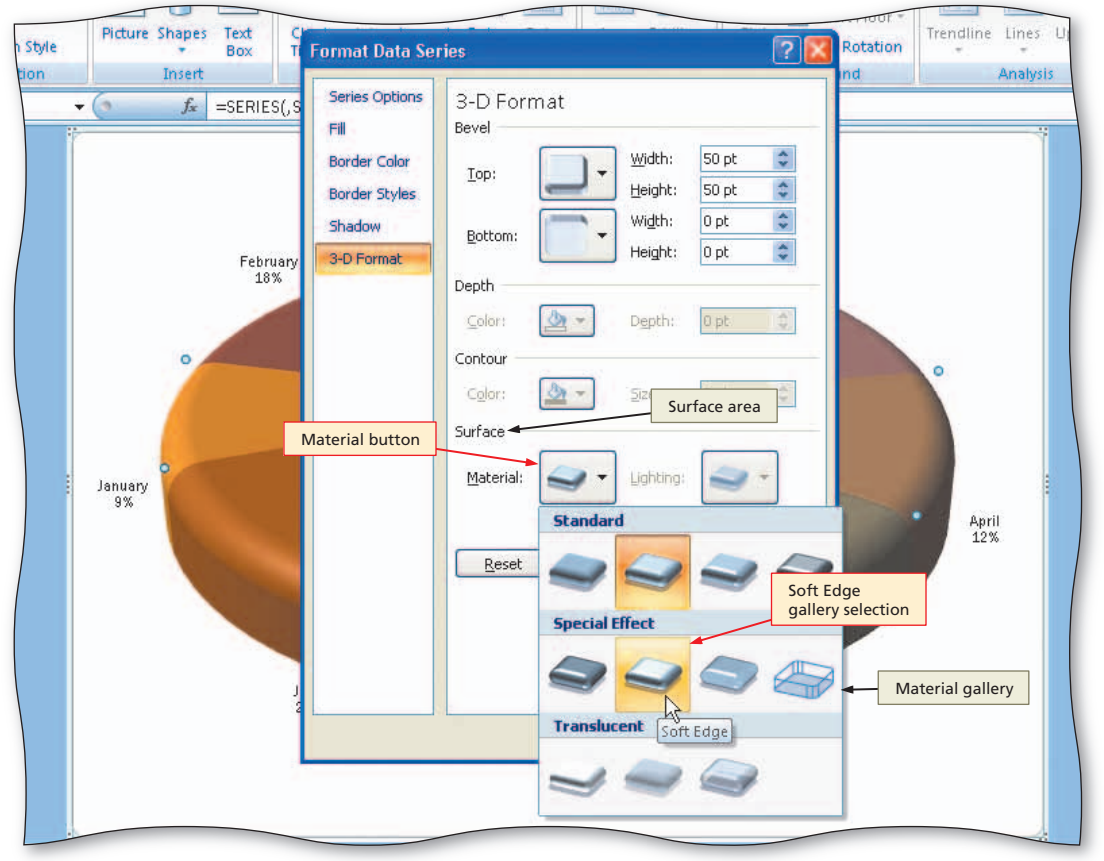


Figure 3–63

5

- Click the Soft Edge button and then click the Close button in the Format Data Series dialog box (Figure 3-64).

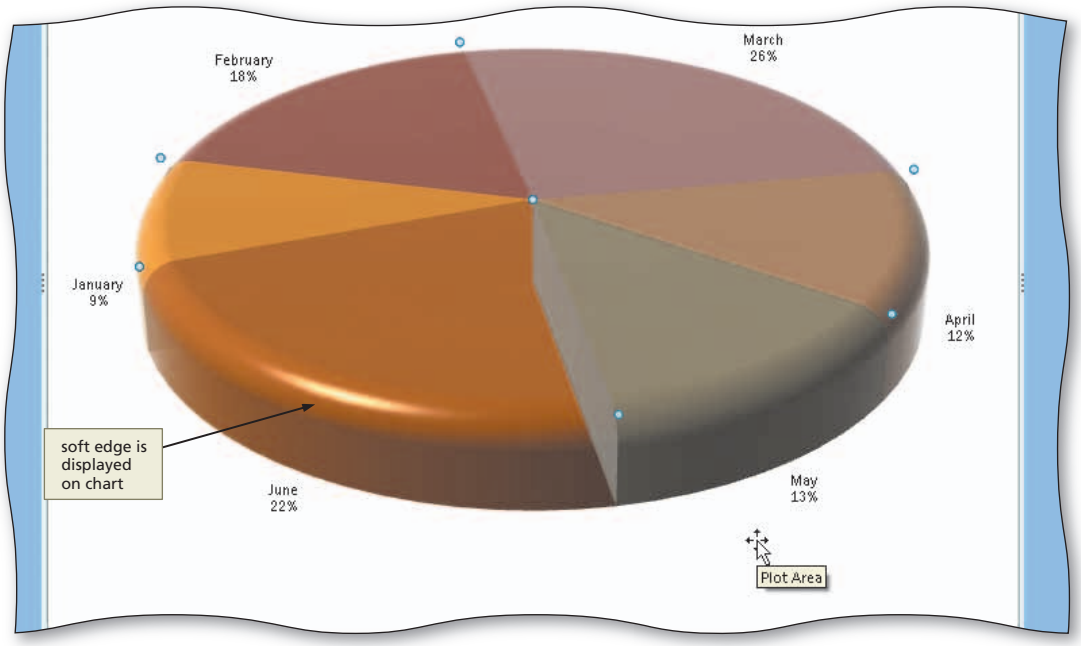


Figure 3–64

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

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

1

- Click the slice labeled June twice (do not double-click) to select only the June slice.
- Right-click the slice labeled June to display the shortcut menu and then point to Format Data Point (Figure 3–65).
- Click Format Data Point.

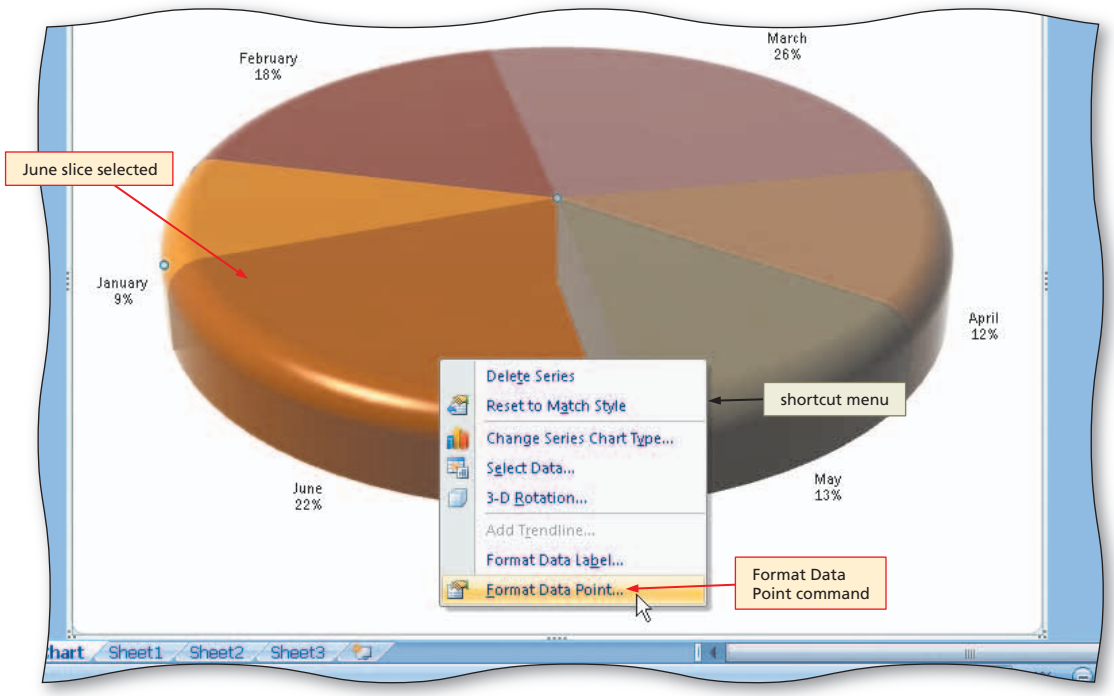


Figure 3–65

2

- When Excel displays the Format Data Point dialog box, drag the Point Explosion slider to the right until the Point Explosion box reads 28% (Figure 3–66).

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.

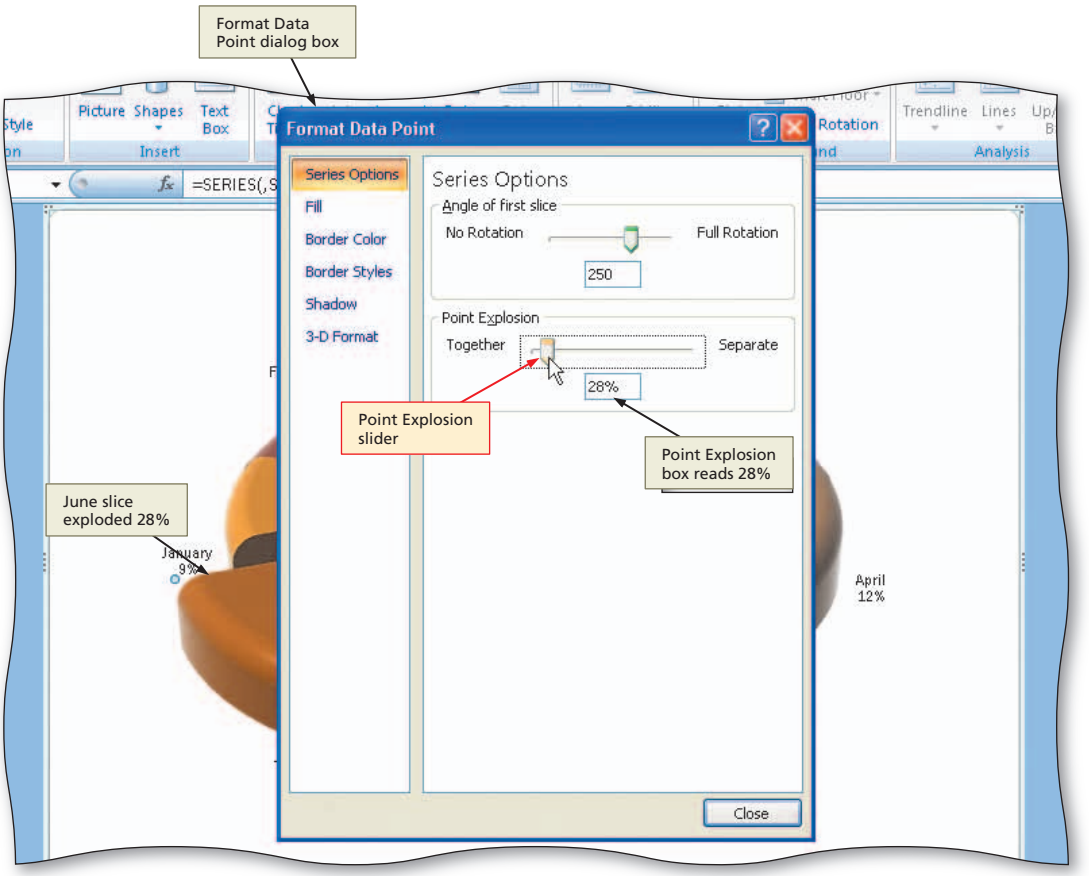


Figure 3–66

3

- Click the Fill category on the left side of the dialog box.
- Click the Solid fill option button and then click the Color button to display the color palette.
- Point to the Orange color in the Standard Colors area (Figure 3–67).

4

- Click the Orange color on the color palette and then click the Close button on the Format Data Point dialog box to change the color of the slice labeled June to orange.

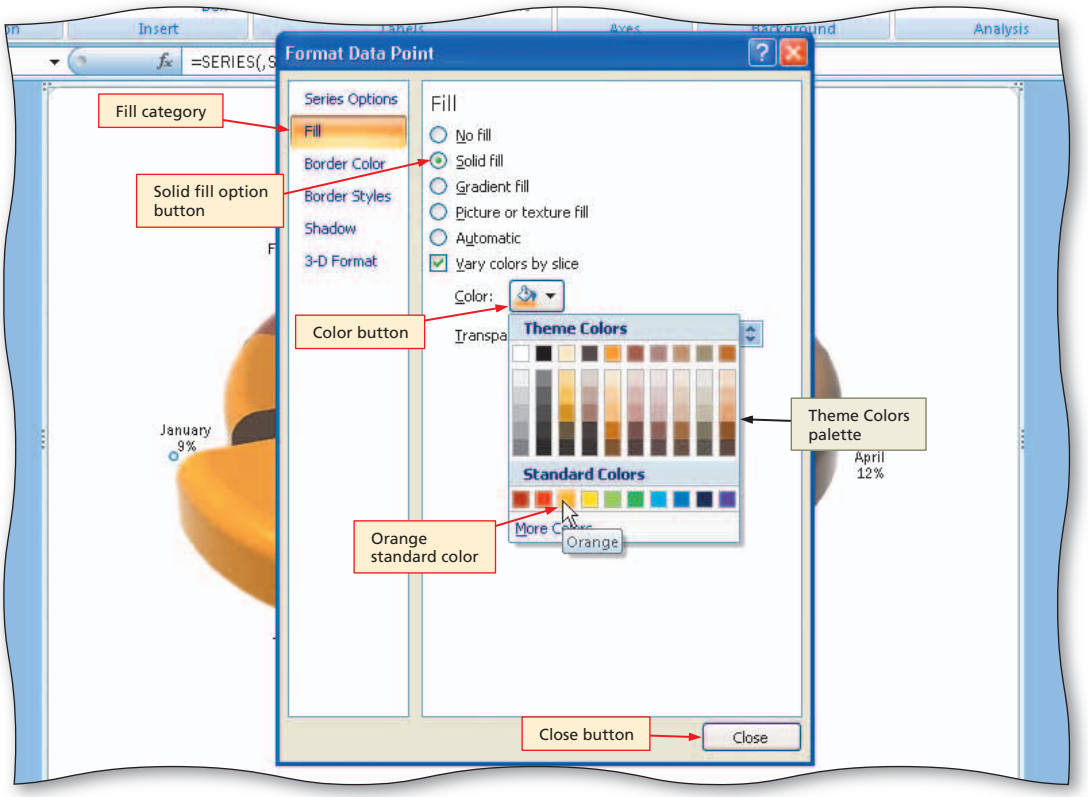


Figure 3–67

To Change the Colors of the Remaining 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 fives chart slices.

1. Click the slice labeled January twice (do not double-click) to select only the January slice.
2. Right-click the slice labeled January to display the shortcut menu and then point to Format Data Point.
3. Click the Fill category on the left side of the dialog box.
4. Click the Solid fill option button and then click the Color button to display the color palette.
5. Click the Green color on the color palette and then click the Close button in the Format Data Point dialog box to change the color of the slice labeled January to green.
6. Repeat steps 1 through 5 for the remaining four slices. Assign the following colors in the Standard Colors area of the color palette to each slice: February – Yellow; March – Light Blue; April – Red; May – Blue. The completed chart appears as shown in Figure 3–68.

BTW

Exploding a 3-D Pie Chart

If you click the 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.

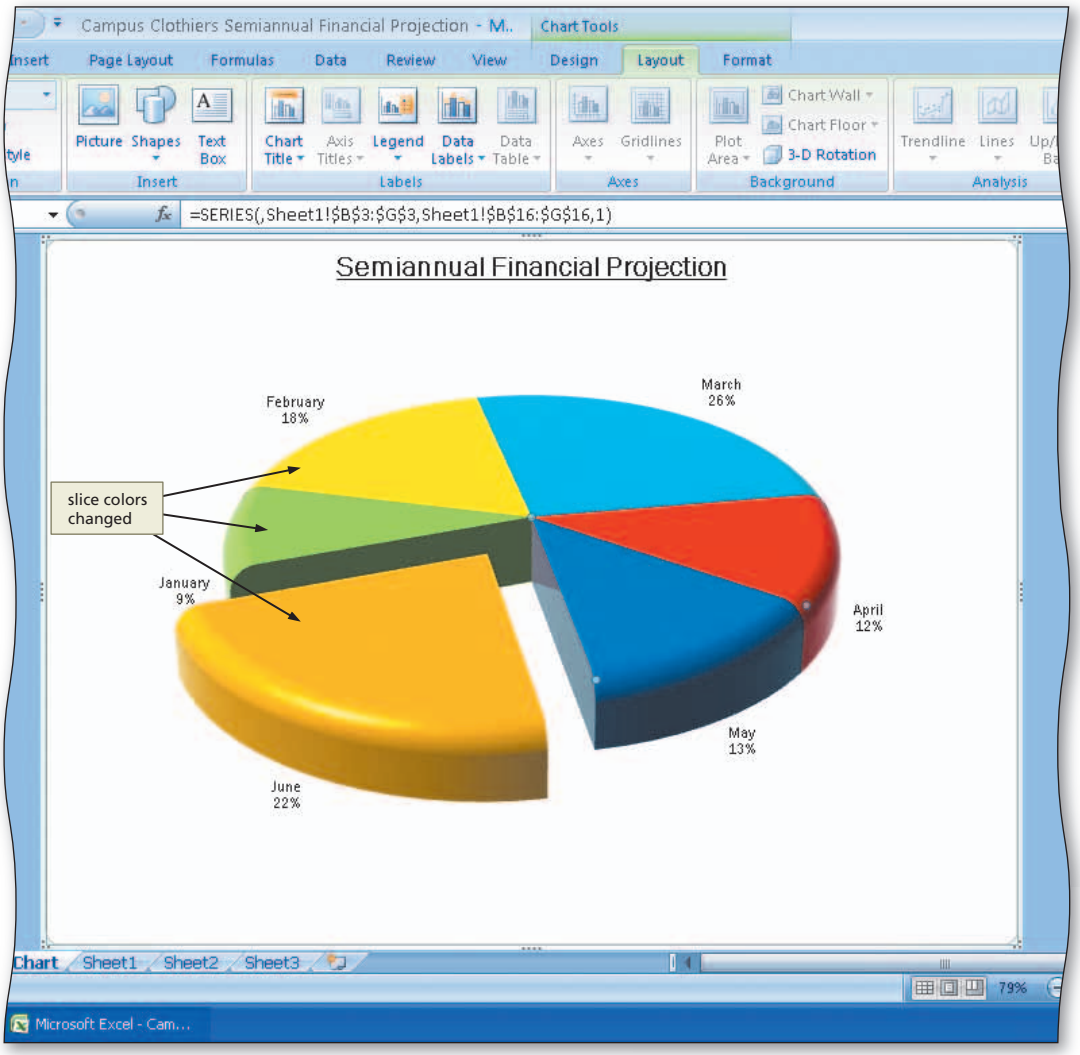


Figure 3–68

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 and Reorder the Sheets and Color Their Tabs

The following steps rename the sheets, color the tabs, and reorder the sheets so the worksheet precedes the chart sheet in the workbook.

1

- Right-click the tab labeled 3-D Pie Chart at the bottom of the screen to display the shortcut menu.
- Point to the Tab Color command to display the color palette (Figure 3–69).

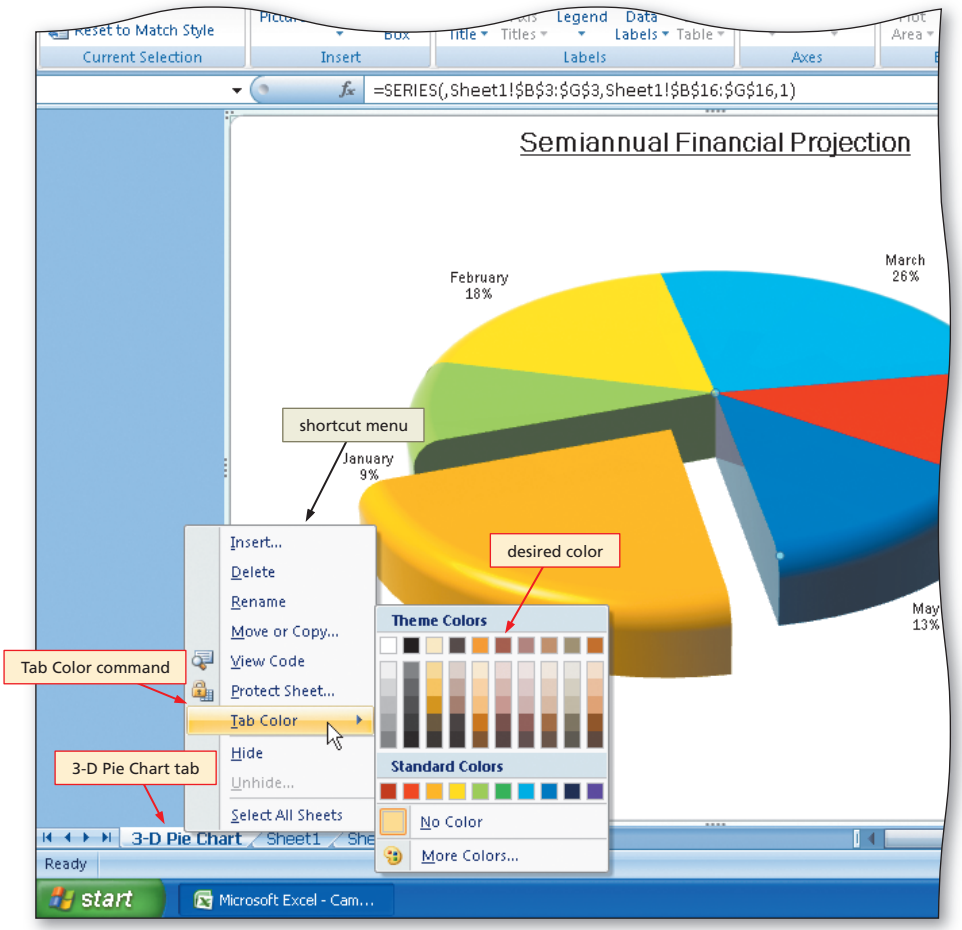


Figure 3–69

2

- Click Brown, Accent 2 (column 6, row 1) in the Theme Colors area to change the color of the tab to brown.
- Double-click the tab labeled Sheet1 at the bottom of the screen.
- Type `Semiannual Financial Projection` as the new sheet name and then press the ENTER key.
- Right-click the tab and then click Tab Color on the shortcut menu.
- Point to the Orange, Accent 1 (column 5, row 1) color in the Theme Colors area of the palette (Figure 3–70).

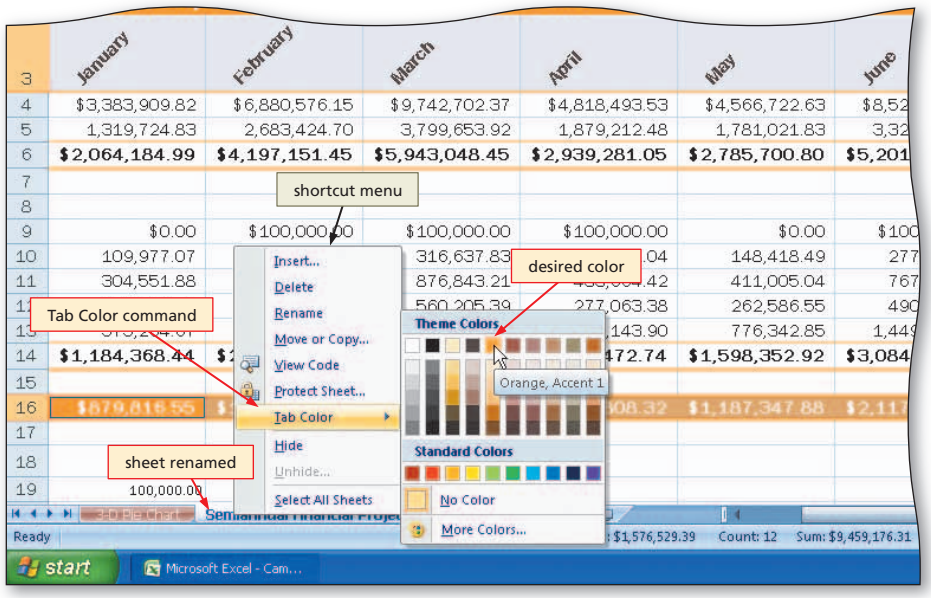


Figure 3–70

3

- Click Orange, Accent 1 (column 5, row 1) in the Theme Colors area to change the color of the tab to orange.
- Drag the Semiannual Financial Projection tab to the left in front of the 3-D Pie Chart tab to rearrange the sequence of the sheets and then click cell E18 (Figure 3–71).

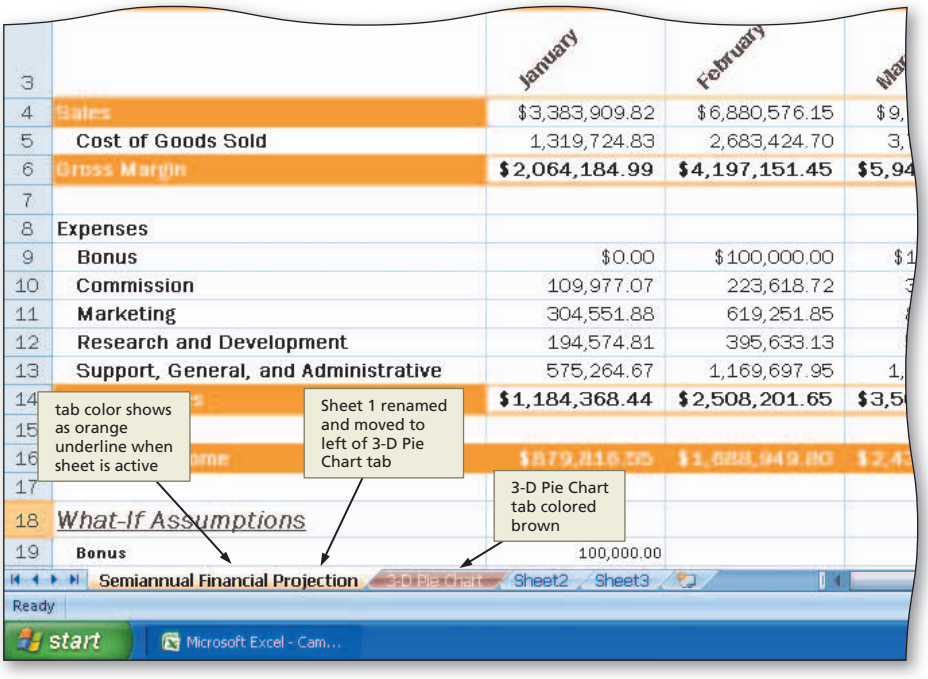


Figure 3–71

Other Ways

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

BTW

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

Checking Spelling, Saving, Previewing, and Printing the Workbook

With the workbook complete, this section checks spelling, saves, previews, and then prints the workbook. Each set of steps concludes with saving the workbook to ensure that the latest changes are saved.

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 the 3-D Pie Chart sheet so that the entire workbook is checked for spelling errors.

BTW

Printing in Black and White
You can speed up the printing process and save ink if you print worksheets with color in black and white. To print a worksheet in black and white on a color printer, do the following: (1) Click the Page Setup Dialog Box Launcher on the Page Layout tab on the Ribbon, click the Sheet tab, and then click 'Black and white' in the Print area. (2) Click the Preview button to see that Excel has removed the colored backgrounds, click the Close button, and then click the OK button. You are now ready to print economically, in black and white.

1. With the Semiannual 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.
2. Click the Review tab on the Ribbon and then click the Spelling button on the Ribbon.
3. Correct any errors and then click the OK button when the spell check is complete.
4. Click the Save button on the Quick Access Toolbar.

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.

BTW

Quick Reference
For a table that lists how to complete the tasks covered in this book using the mouse, Ribbon, shortcut menu, and keyboard, see the Quick Reference Summary at the back of this book, or visit the Excel 2007 Quick Reference Web page (scsite.com/ex2007/qr).

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 the Page Layout tab on the Ribbon and then click the Page Setup Dialog Box Launcher. Click the Page tab and then click Landscape. Click Fit to in the Scaling area.
3. Click the Print Preview button in the Page Setup dialog box. When the preview of the first of the selected sheets appears, click the Next Page button at the top of the Print Preview window to view the next sheet. Click the Previous Page button to redisplay the first sheet.
4. Click the Print button at the top of the Print Preview window. When Excel displays the Print dialog box, click the OK button to print the worksheet and chart (Figure 3–72).
5. Right-click the Semiannual Financial Projection tab. Click Ungroup Sheets on the shortcut menu to deselect the 3-D Pie Chart tab.
6. Click the Save button on the Quick Access Toolbar.

Campus Clothiers

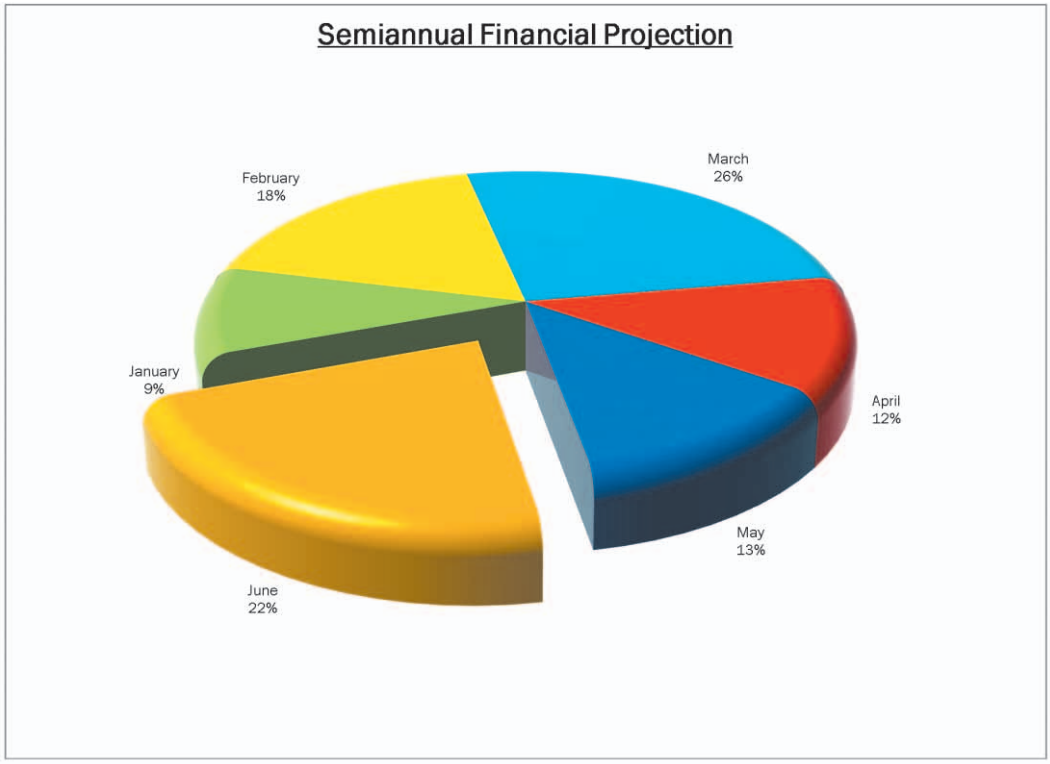
Semiannual Projected Gross Margin, Expenses, and Operating Income 11/5/2008

	January	February	March	April	May	June	Total
Sales	$3,383,909.82	$6,880,576.15	$9,742,702.37	$4,818,493.53	$4,566,722.63	$8,527,504.39	$37,919,908.89
Cost of Goods Sold	1,319,724.83	2,683,424.70	3,799,653.92	1,879,212.48	1,781,021.83	3,325,726.71	14,788,764.47
Gross Margin	$2,064,184.99	$4,197,151.45	$5,943,048.45	$2,939,281.05	$2,785,700.80	$5,201,777.68	$23,131,144.42
Expenses							
Bonus	$0.00	$100,000.00	$100,000.00	$100,000.00	$0.00	$100,000.00	$400,000.00
Commission	109,977.07	223,618.72	316,637.83	156,601.04	148,418.49	277,143.89	1,232,397.04
Marketing	304,551.88	619,251.85	876,843.21	433,664.42	411,005.04	767,475.40	3,412,791.80
Research and Development	194,574.81	395,633.13	560,205.39	277,063.38	262,586.55	490,331.50	2,180,394.76
Support, General, and Administrative	575,264.67	1,169,697.95	1,656,259.40	819,143.90	776,342.85	1,449,675.75	6,446,384.51
Total Expenses	$1,184,368.44	$2,508,201.65	$3,509,945.83	$1,786,472.74	$1,598,352.92	$3,084,626.54	$13,671,968.11
Operating Income	$879,816.55	$1,688,949.80	$2,433,102.62	$1,152,808.32	$1,187,347.88	$2,117,151.14	$9,459,176.31

What-if Assumptions

Bonus	100,000.00
Commission	3.25%
Margin	61.00%
Marketing	9.00%
Research and Development	5.75%
Revenue for Bonus	4,750,000.00
Support, General, and Administrative	17.00%

(a) Worksheet



(b) 3-D Pie Chart

Figure 3–72

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 the worksheet.

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 window panes.

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 on the View tab on the Ribbon. 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.
- Click the View tab on the Ribbon and then click the Zoom button on the Ribbon to display a list of Magnifications in the Zoom dialog box (Figure 3–73).

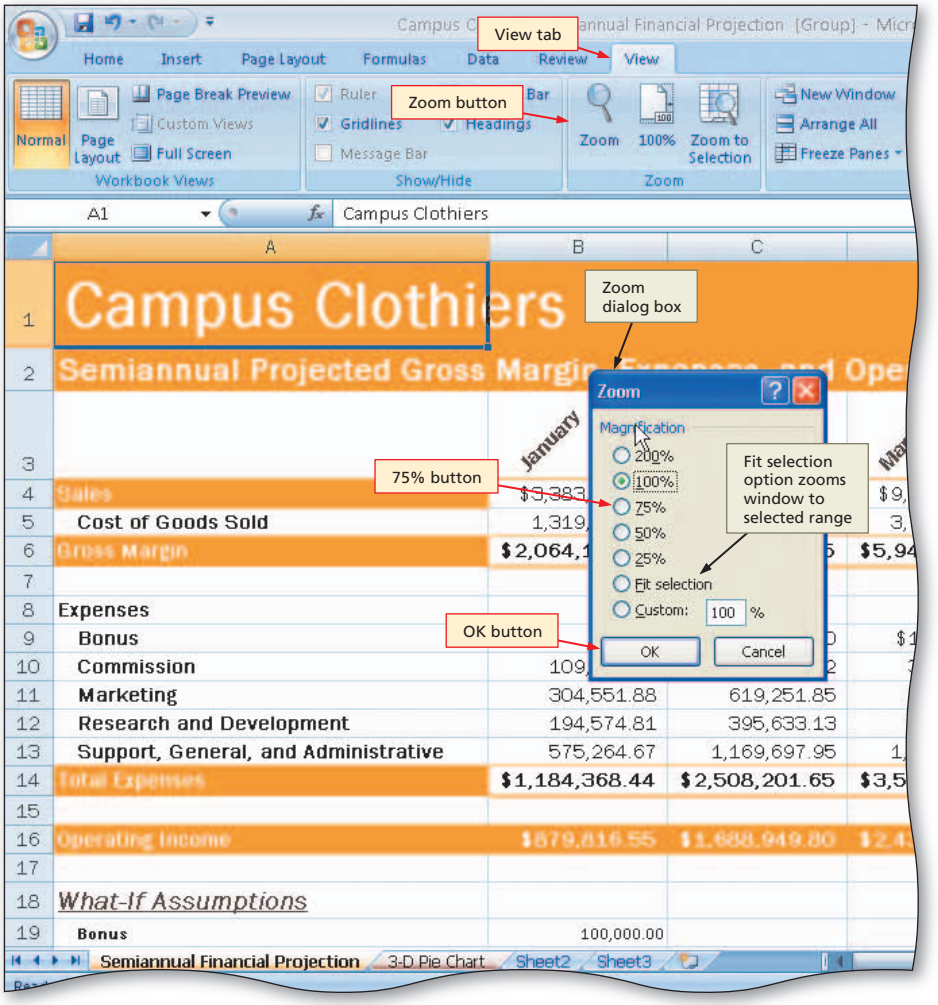


Figure 3–73

2

- Click 75% and then click the OK button to shrink the display of the worksheet to 75% of its normal display (Figure 3–74).

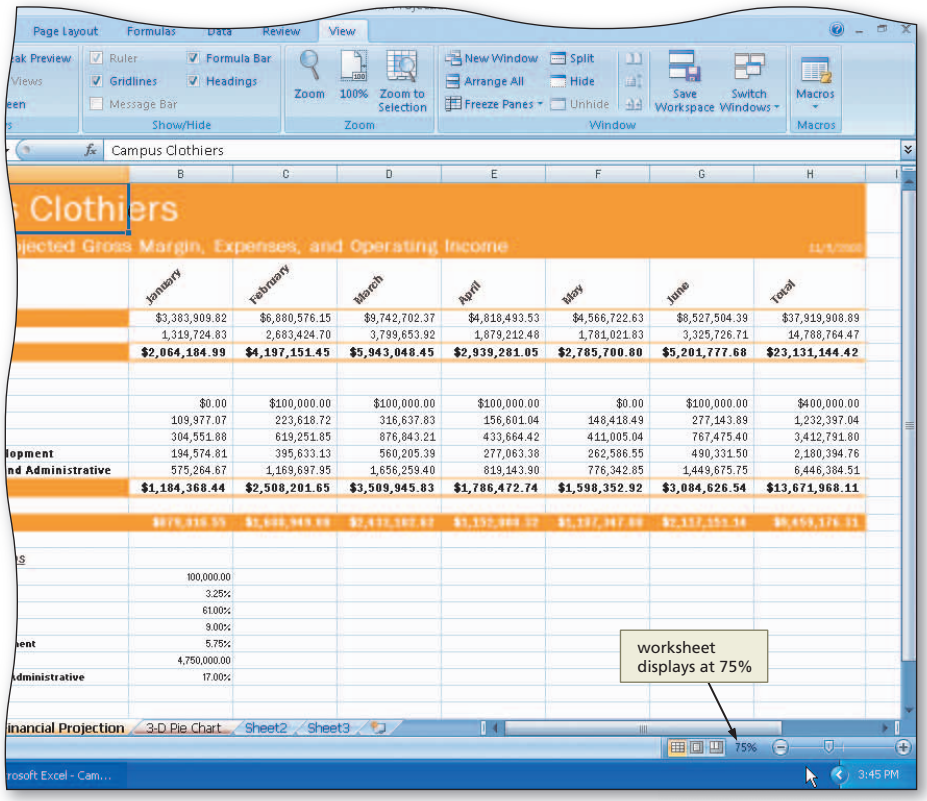


Figure 3–74

3

- Click the Zoom In button on the status bar until the worksheet displays at 100% (Figure 3–75).

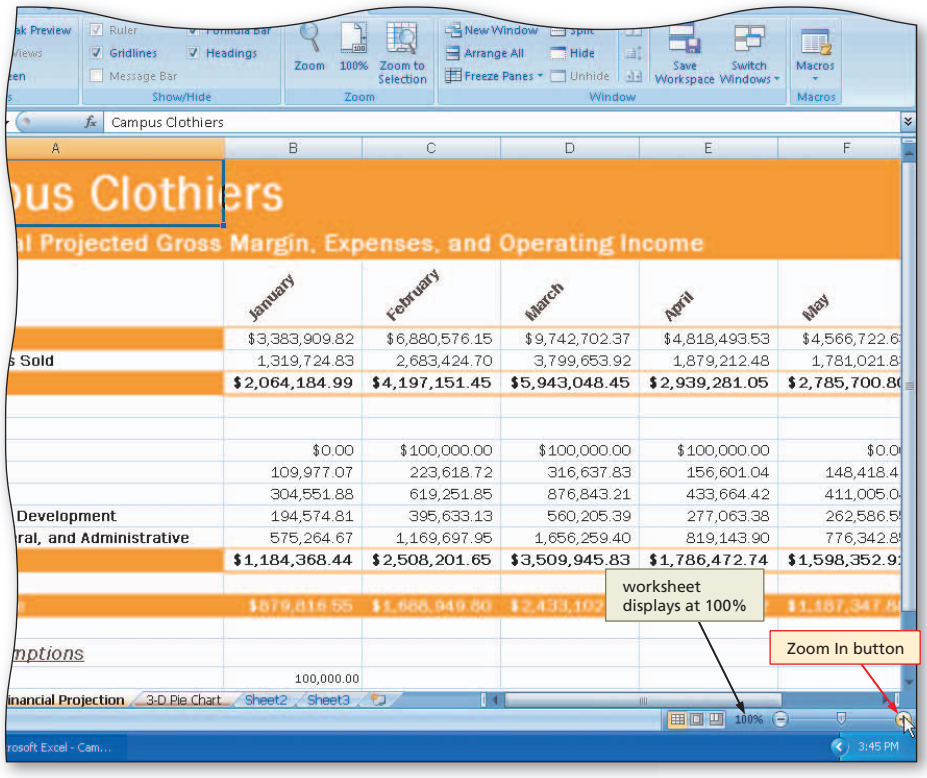


Figure 3–75

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 D7 allows you to view all four corners of the worksheet easily. The following steps split the Excel window into four panes.

1

- Select cell D7, the intersection of the four proposed panes.
- If necessary, click the View tab on the Ribbon and then point to the Split button on the Ribbon (Figure 3–76).

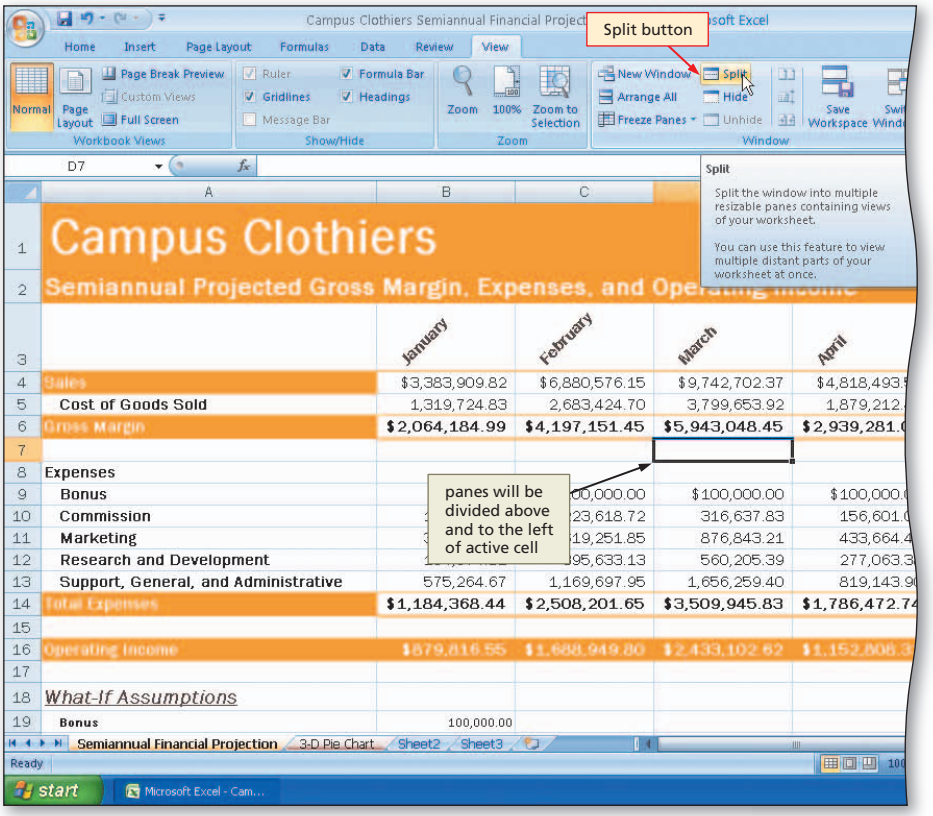


Figure 3–76

2

- Click the Split button to divide the window into four panes.
- Use the scroll arrows to show the four corners of the worksheet at the same time (Figure 3–77).

Q&A

What is shown in the four panes?

The four panes in Figure 3–77 are used to show the following: (1) range A1:C6 in the upper-left pane; (2) range G1:I6 in the upper-right pane; (3) range A14:C26 in the lower-left pane; and (4) range G14:I26 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.

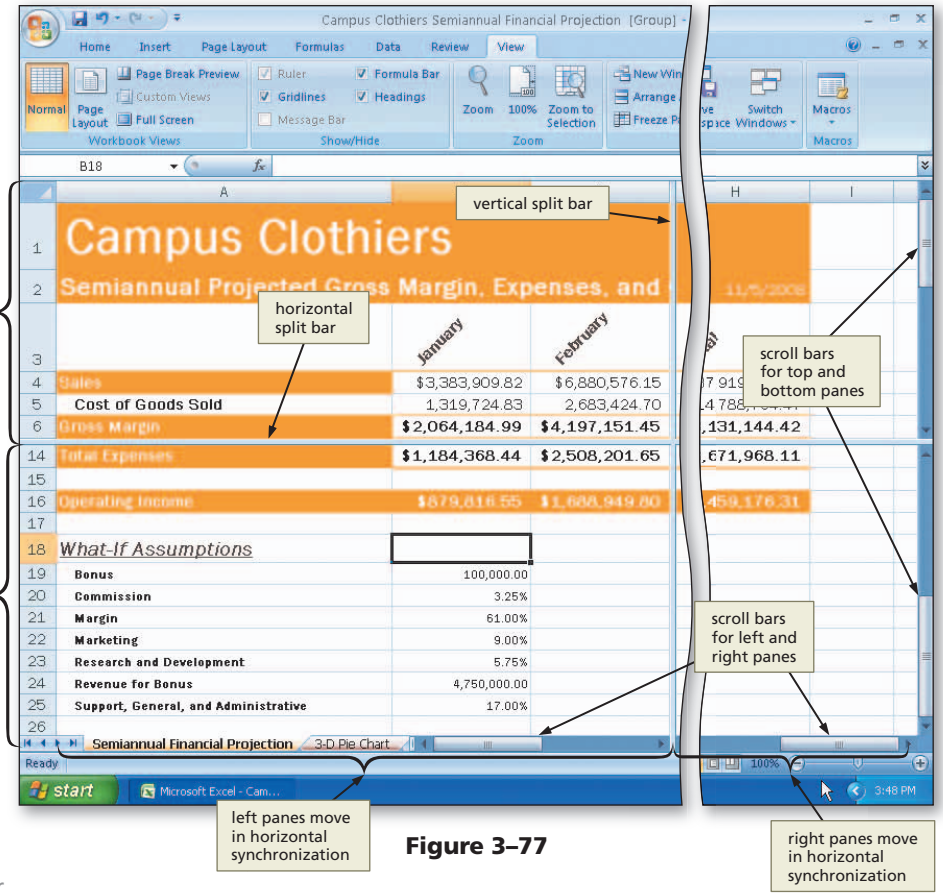


Figure 3–77

Other Ways

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

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.

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.

BTW

Window Panes

If you want to split the window into two panes, rather than four, drag the vertical split box to the far left of the window or horizontal split box to the top of the window (Figure 3-78 on the next page). You also can drag the center of the four panes in any direction to change the size of the panes.

In the workbook created in this chapter, many of the formulas are dependent on the assumptions in the range B19:B25. 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.

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 semiannual operating income in cell H16 *if* the Bonus, Commission, Support, General, and Administrative assumptions in the What-If Assumptions table are changed as follows: Bonus $100,000.00 to $75,000.00; Commission 3.25% to 2.25%; Support, General, and Administrative 17.00% to 14.50%? 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

- Use the vertical scroll bar to move the window so cell A6 is in the upper-left corner of the screen.
- 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 3-78.
- Use the right scroll arrow to view the totals in column H in the right pane.
- Enter `75000` in cell B19, `2.25` in cell B20, and `14.50` in cell B25 (Figure 3–78), which causes the semiannual operating income in cell H16 to increase from $9,459,176.31 to $10,886,373.12.

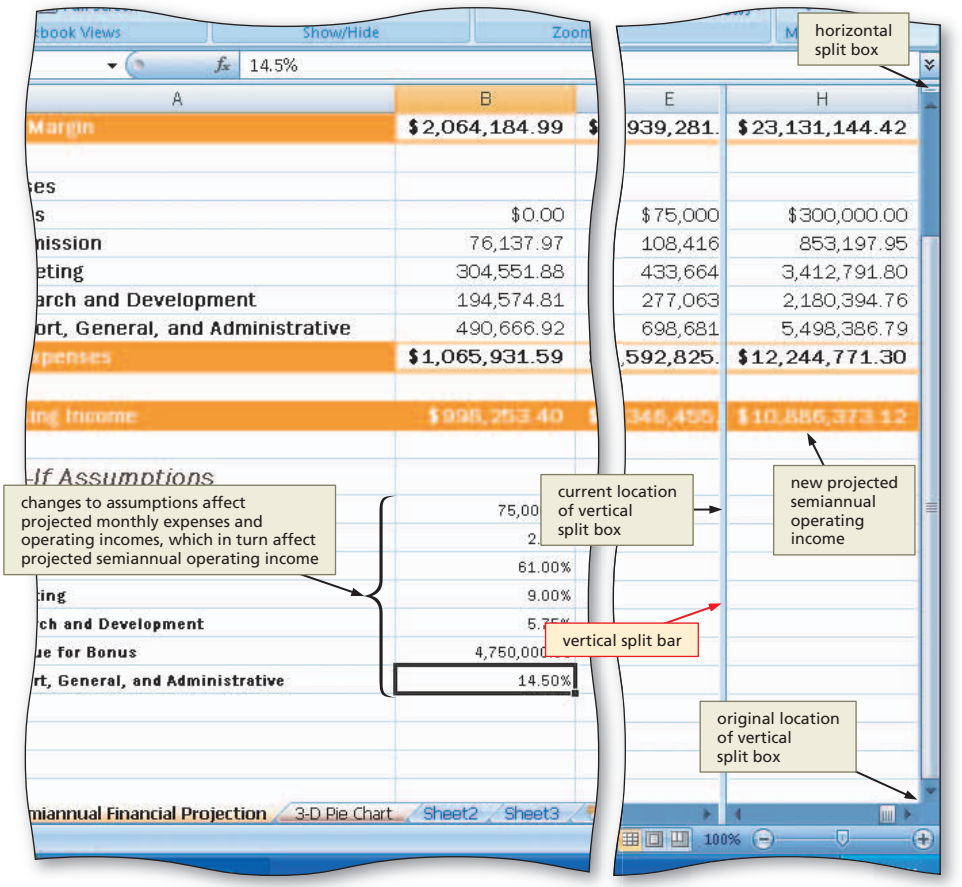


Figure 3–78

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 Campus Clothiers Semiannual Financial Projection workbook. They then show how to use the Goal Seek command on the Data tab on the Ribbon to determine the Support, General, and Administrative percentage in cell B25 that will yield a semi annual operating income of $10,500,000 in cell H16, rather than the original $9,459,176.31.

1

- Close the workbook without saving changes and then reopen it.
- Drag the vertical split box so that the vertical split bar is positioned as shown in Figure 3–79.
- Show column H in the right pane.
- Click cell H16, the cell that contains the semiannual operating income.
- Click the Data tab on the Ribbon and then click the What-If Analysis button on the Ribbon to display the What-If Analysis menu (Figure 3–79).

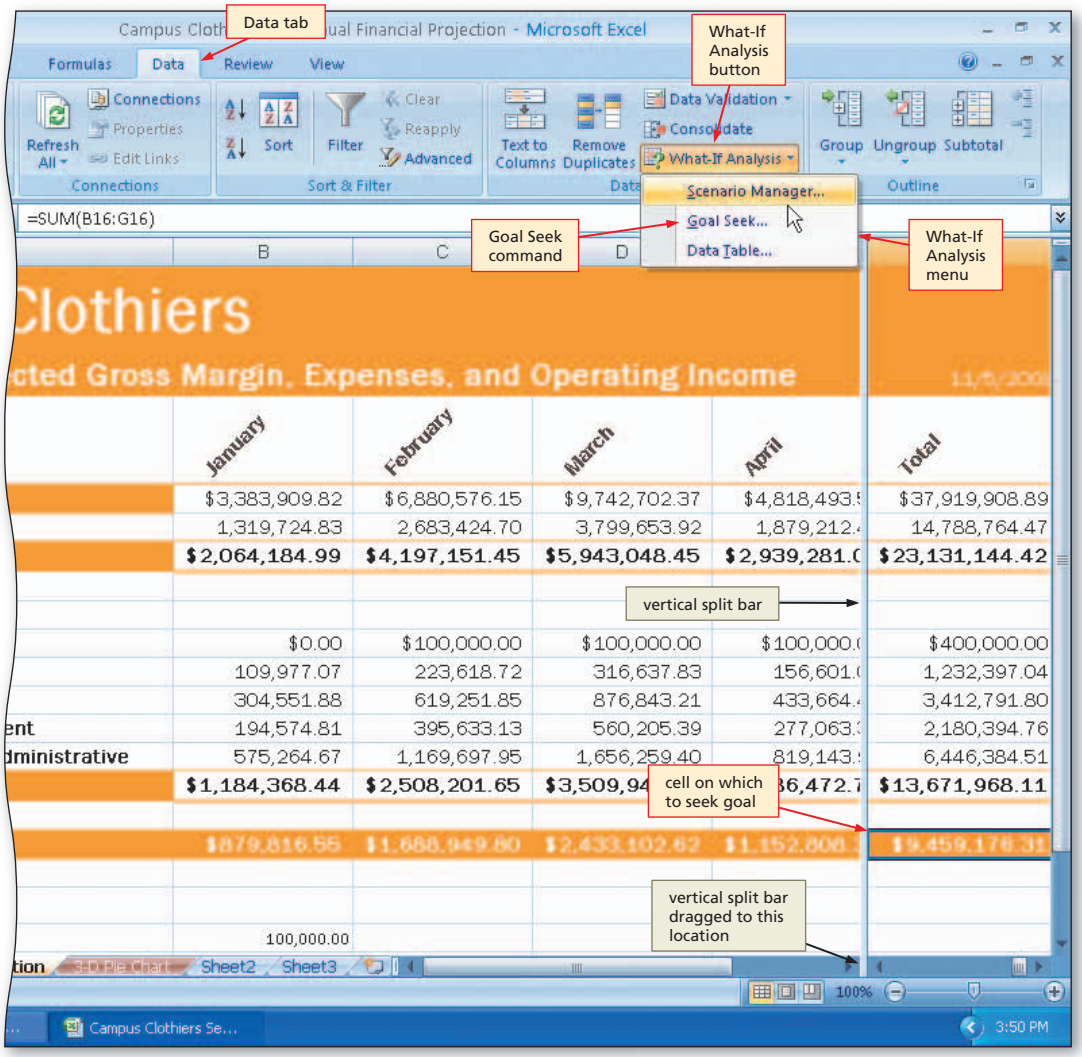


Figure 3–79

2

- Click Goal Seek to display the Goal Seek dialog box with the Set cell box set to the selected cell, H16.
- When Excel displays the Goal Seek dialog box, click the To value text box, type `10500000` and then click the By changing cell box.
- Scroll down so row 4 is at the top of the screen.
- Click cell B25 on the worksheet to assign cell B25 to the By changing cell box (Figure 3–80).

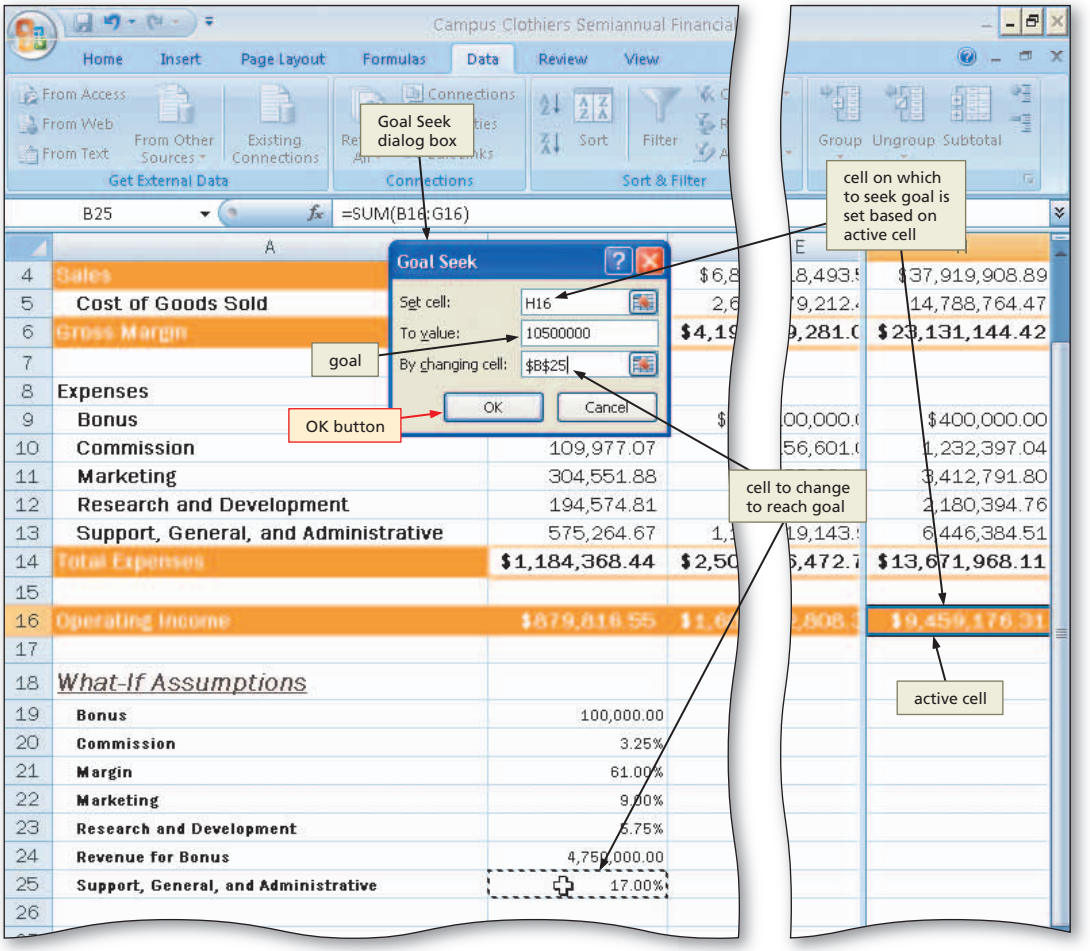


Figure 3–80

3

- Click the OK button to goal seek for the value $10,500,000.00 in cell H16 (Figure 3–81).

Q&A What happens when I click the OK button?

Excel immediately changes cell H16 from $9,459,176.31 to the desired value of $10,500,000.00. More importantly, Excel changes the Support, General, and Administrative assumption in cell B25 from 17.00% to 14.26% (Figure 3–81). 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.

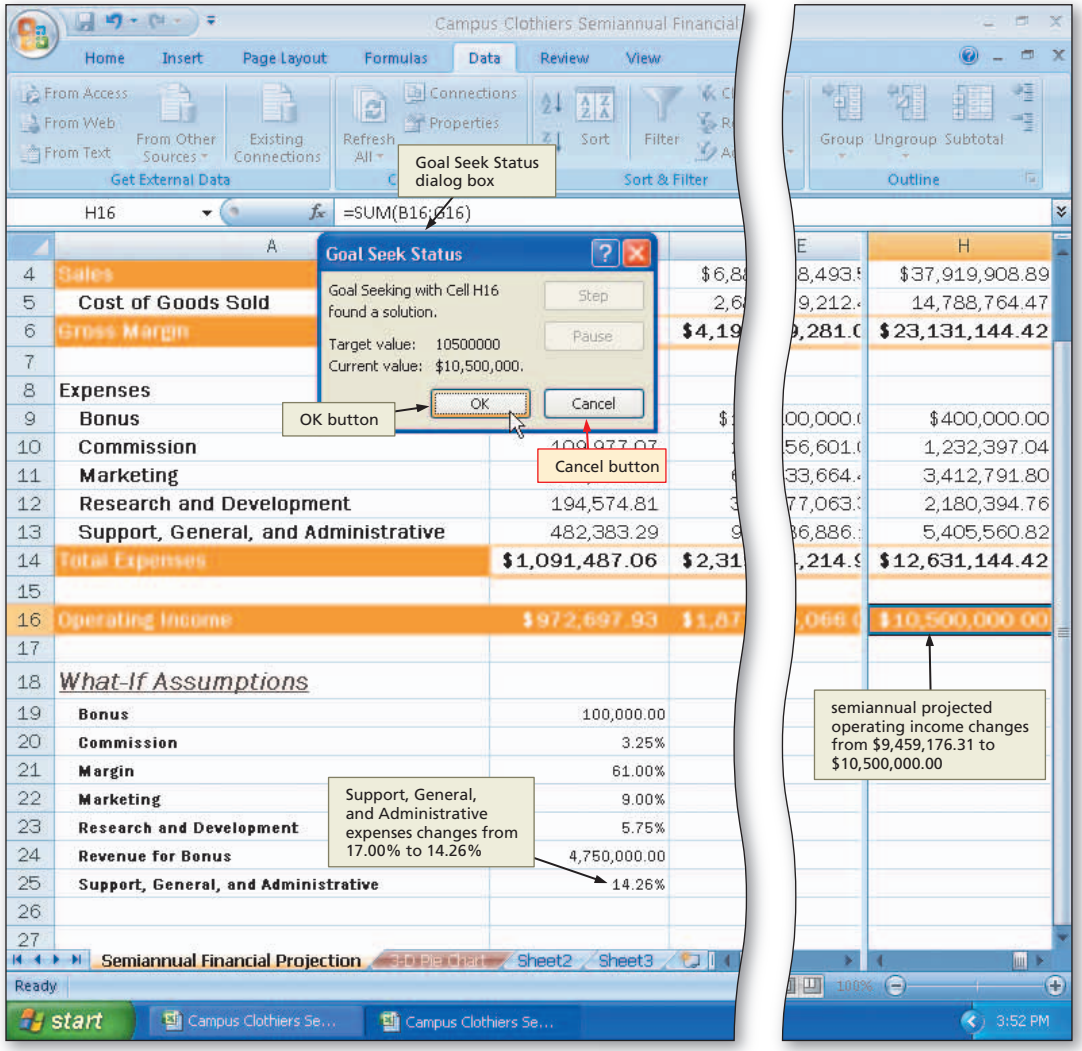


Figure 3–81

4

- Click the Cancel button in the Goal Seek Status dialog box.

Other Ways

1. Press ALT+T, G

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 semiannual operating income in cell H16 to $10,500,000.00, the Support, General, and Administrative percentage in cell B25 must decrease by 2.74% from 17.00% to 14.26%.

You can see from this goal seeking example that the cell to change (cell B25) does not have to be referenced directly in the formula or function. For example, the semiannual operating income in cell H16 is calculated by the function =SUM(B16:G16). Cell B25 is not referenced in this function. Instead, cell B25 is referenced in the formulas in rows 9 through 13, on which the monthly operating incomes in row 16 are based. Excel thus is capable of goal seeking on the semiannual operating income by varying the value for the Support, General, and Administrative assumption.

BTW **Undoing What You Did**

The Undo button is ideal for returning the worksheet to its original state after you have changed the values in a worksheet to answer a what-if question. To view the original worksheet after answering a what-if question, click the Undo button on the Quick Access Toolbar for each value you changed.

To Quit Excel

To quit Excel, complete the following steps.

1. Click the Close button on the title bar.
2. If the Microsoft Excel dialog box is displayed, click the No 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, how to rotate text in a cell, freeze titles, 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 169)
2. Increase Column Widths and Enter Row Titles (EX 173)
3. Copy a Range of Cells to a Nonadjacent Destination Area (EX 175)
4. Insert a Row (EX 177)
5. Enter Numbers with Format Symbols (EX 181)
6. Freeze Column and Row Titles (EX 182)
7. Enter and Format the System Date (EX 184)
8. Enter a Formula Containing Absolute Cell References (EX 187)
9. Enter an IF Function (EX 190)
10. Copy Formulas with Absolute Cell References Using the Fill Handle (EX 192)
11. Assign Formats to Nonadjacent Ranges (EX 196)
12. Format the Worksheet Titles (EX 199)
13. Copy a Cell's Format Using the Format Painter Button (EX 201)
14. Draw a 3-D Pie Chart on a Separate Chart Sheet (EX 205)
15. Insert a Chart Title and Data Labels (EX 206)
16. Rotate the 3-D Pie Chart (EX 209)
17. Apply a 3-D Format to the Pie Chart (EX 211)
18. Explode the 3-D Pie Chart and Change the Color of a Slice (EX 213)
19. Rename and Reorder the Sheets and Color Their Tabs (EX 216)
20. Shrink and Magnify the View of a Worksheet or Chart (EX 220)
21. Split a Window into Panes (EX 222)
22. Analyze Data in a Worksheet by Changing Values (EX 224)
23. Goal Seek (EX 225)

If you have a SAM user profile, you may have access to hands-on instruction, practice, and assessment. Log in to your SAM account (http://sam2007.course.com) to launch any assigned training activities or exams that relate to the skills covered in this chapter.

Learn It Online

Learn It Online is a series of online student exercises that 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/off2007/learn`. When the Office 2007 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: X4 = 25; Y3 = 28; K7 = 110; Z2 = 15; and Q9 = 35. Enter true or false.

a. Y3 < X4 Truth value: _____
b. Q9 = K7 Truth value: _____
c. X4 + 15 * Z2 / 5 <> K7 Truth value: _____
d. K7 / Z2 > X4 − Y3 Truth value: _____
e. Q9 * 2 − 42 < (X4 + Y3 − 8) / 9 Truth value: _____
f. K7 + 300 <= X4 * Z2 + 10 Truth value: _____
g. Q9 + K7 > 2 * (Q9 + 25) Truth value: _____
h. Y3 = 4 * (Q9 / 5) Truth value: _____

Instructions Part 2: Write cell K23 as a relative reference, absolute reference, mixed reference with the row varying, and mixed reference with the column varying.

_____ _____ _____ _____

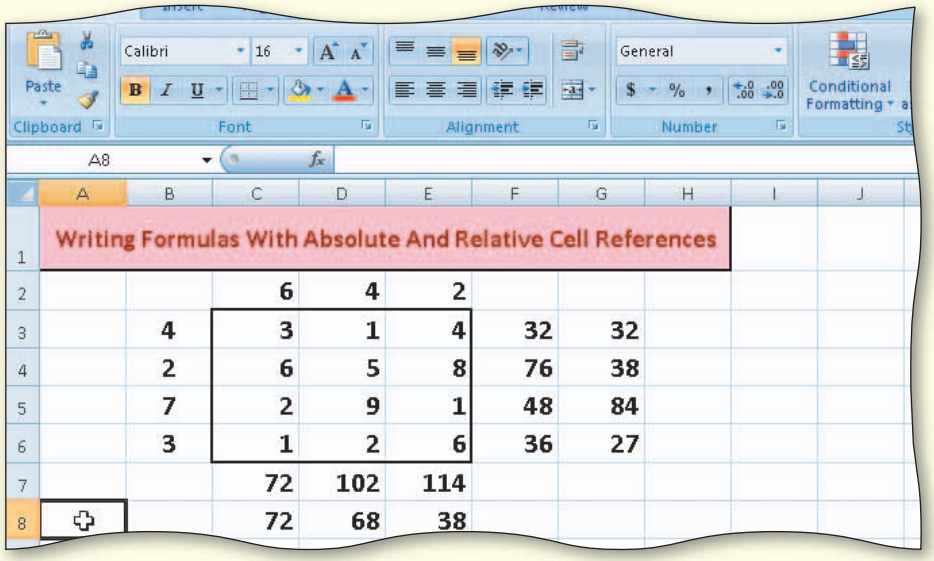
Instructions Part 3: Start Excel. Open the workbook Apply 3-1 Absolute Cell References. See the inside back cover of this book for instructions for downloading the Data Files for Students, or see your instructor for information on accessing the files required in this book. You will recreate the numerical grid pictured in Figure 3–82.

Continued >

Apply Your Knowledge *continued*

Perform the following tasks:

1. Enter a formula in cell C7 that multiplies cell C2 times the sum of cells C3 through C6. Write the formula so that when you copy it to cells D7 and E7, cell C2 remains absolute. Verify your formula by checking it with the values found in cells C7, D7, and E7 in Figure 3–82.
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, cell B3 remains absolute. Verify your formula by checking it with the values found in cells F3, F4, F5, and F6 in Figure 3–82.
3. Enter a formula in cell C8 that multiplies cell C2 times the sum of cells C3 through C6. Write the formula so that when you copy the formula to cells D8 and E8, Excel adjusts all the cell references according to the destination cells. Verify your formula by checking it with the values found in cells C8, D8, and E8 in Figure 3–82.
4. Enter a formula in cell G3 that multiplies cell B3 times the sum of cells C3, D3, and E3. Write the formula so that when you copy the formula to cells G4, G5, and G6, Excel adjusts all the cell references according to the destination cells. Verify your formula by checking it with the values found in cells G3, G4, G5, and G6 in Figure 3–82.
5. Change the document properties, as specified by your instructor. Change the worksheet header with your name, course number, and other information requested by your instructor. Save the workbook using the file name, Apply 3-1 Absolute Cell References Complete, and submit the revised workbook as requested by your instructor.



	A	B	C	D	E	F	G	H	I	J
1	Writing Formulas With Absolute And Relative Cell References									
2			6	4	2					
3		4	3	1	4	32	32			
4		2	6	5	8	76	38			
5		7	2	9	1	48	84			
6		3	1	2	6	36	27			
7			72	102	114					
8			72	68	38					

Figure 3–82

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.

Perform the following tasks:

1. Enter the following IF function in cell C1:
   =IF(B1="CA","West", IF(B1="NJ","East", IF(B1="IL","Midwest","State Error")))

2. Use the fill handle to copy the nested IF function down through cell C7. Enter the following data in the cells in the range B1:B7 and then write down the results that display in cells C1 through C7 for each set. Set 1: B1 = CA; B2 = NY; B3 = NJ; B4 = MI; B5 = IL; B6 = CA; B7 = IL. Set 2: B1= WI; B2 = NJ; B3 = IL; B4 = CA; B5 = NJ; B6 = NY; B7 = CA.

Set 1 Results: _____

Set 2 Results: _____

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 fourteen series through row 16 as shown in Figure 3–83. For example, in column A, select cell A2 and drag the fill handle down to cell A16. In column C, hold down the CTRL key to repeat Monday through cell C16. In column D, select the range D2:D3 and drag the fill handle down to cell D16. Likewise, in columns F and I through K, select the two adjacent cells in rows 2 and 3 before dragging the fill handle down to the corresponding cell in row 16.
2. Select cell D21. 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 I21. 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 I22 to move the contents of cell I21 to cell I22.
4. Select cell I22. 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 M22 to copy the contents of cell I22 to cell M22.
5. Select cell M21. Drag the fill handle in to the center of cell M21 so that the cell is shaded in order to delete the cell contents.
6. Change the document properties, as specified by your instructor. Change the worksheet header with your name, course number, and other information requested by your instructor. Save the workbook using the file name, Extend 3-1 Create Series Complete, and submit the revised workbook as requested by your instructor.

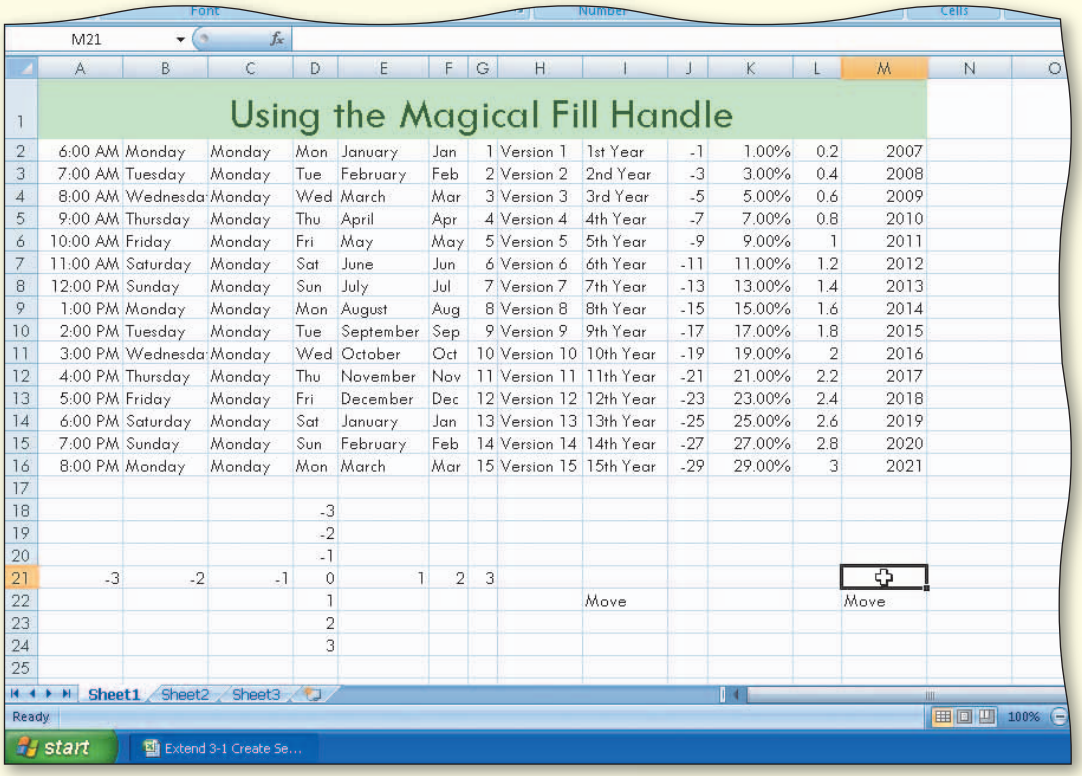


Figure 3–83

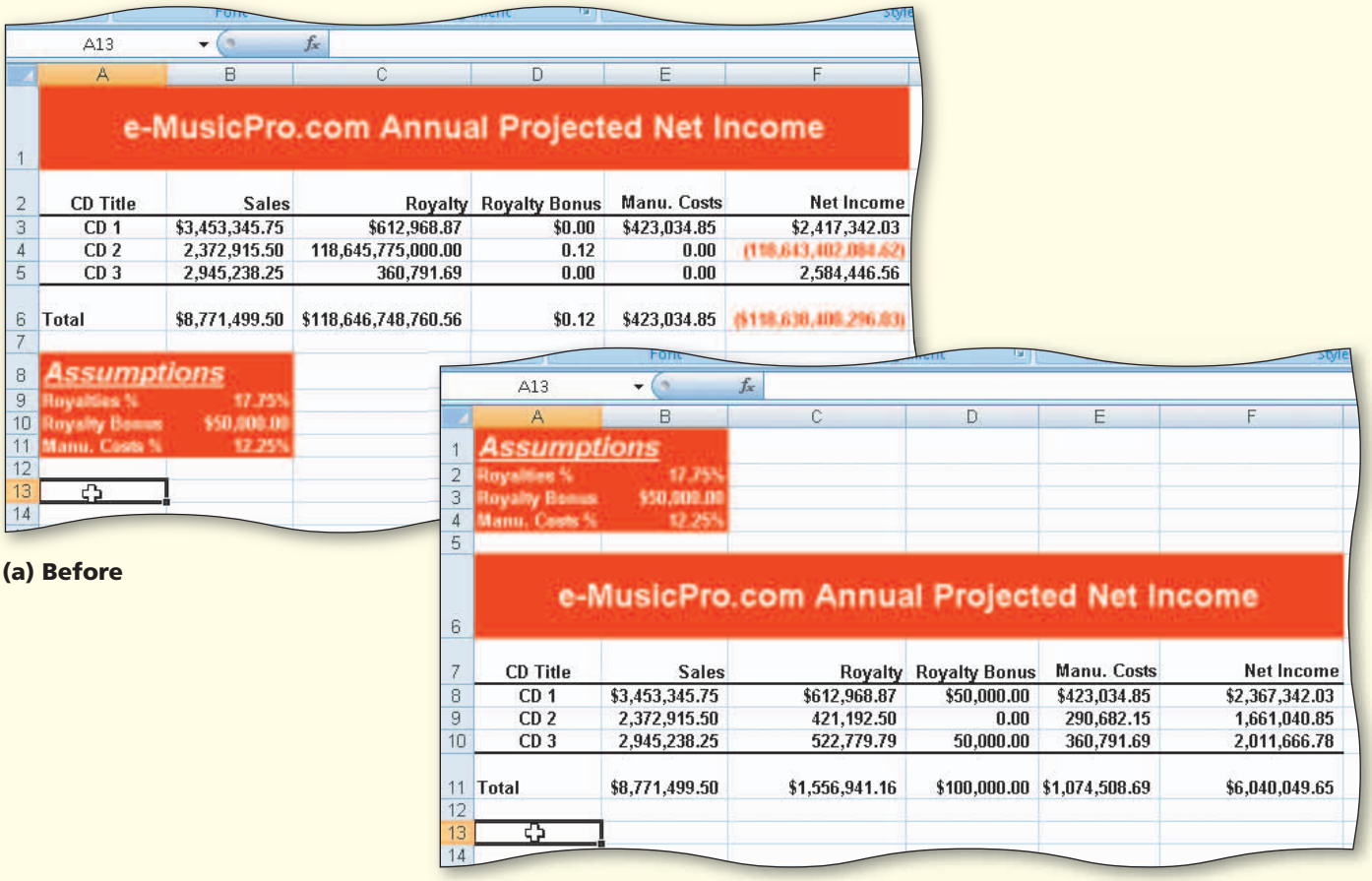
STUDENT ASSIGNMENTS

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 e-MusicPro.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 3–84a) in the worksheet.



(a) Before

	A	B	C	D	E	F
1	e-MusicPro.com Annual Projected Net Income					
2	CD Title	Sales	Royalty	Royalty Bonus	Manu. Costs	Net Income
3	CD 1	$3,453,345.75	$612,968.87	$0.00	$423,034.85	$2,417,342.03
4	CD 2	2,372,915.50	118,645,775,000.00	0.12	0.00	(118,643,402,084.62)
5	CD 3	2,945,238.25	360,791.69	0.00	0.00	2,584,446.56
6	Total	$8,771,499.50	$118,646,748,760.56	$0.12	$423,034.85	($118,638,406,296.03)
7						
8	Assumptions					
9	Royalties %	17.75%				
10	Royalty Bonus	$50,000.00				
11	Manu. Costs %	12.25%				
12						
13						
14						

(b) After

	A	B	C	D	E	F
1	Assumptions					
2	Royalties %	17.75%				
3	Royalty Bonus	$50,000.00				
4	Manu. Costs %	12.25%				
5						
6	e-MusicPro.com Annual Projected Net Income					
7	CD Title	Sales	Royalty	Royalty Bonus	Manu. Costs	Net Income
8	CD 1	$3,453,345.75	$612,968.87	$50,000.00	$423,034.85	$2,367,342.03
9	CD 2	2,372,915.50	421,192.50	0.00	290,682.15	1,661,040.85
10	CD 3	2,945,238.25	522,779.79	50,000.00	360,791.69	2,011,666.78
11	Total	$8,771,499.50	$1,556,941.16	$100,000.00	$1,074,508.69	$6,040,049.65
12						
13						
14						

Figure 3–84

1. The Royalty in cell C3 is computed using the formula =B9*B3 (Royalties % × Sales). Similar formulas are used in cells C4 and C5. The formula in cell C3 was entered and copied to cells C4 and C5. Although the result in cell C3 is correct, the results in cells C4 and C5 are incorrect. Edit the formula in cell C3 by changing cell B9 to an absolute cell reference. Copy the corrected formula in cell C3 to cells C4 and C5. After completing the copy, click the Auto Fill Options button arrow that displays below and to the right of cell C5 and choose Fill Without Formatting.
2. The Royalty Bonus amounts in cells D3, D4, and D5 are computed using the IF function. The Royalty Bonus should equal the amount in cell B10 ($50,000) if the corresponding Sales in column B is greater than or equal to $2,750,000. If the corresponding Sales in column B is less than $2,750,000, then the Royalty Bonus is zero ($0). The IF function in cell D3 was entered and

copied to cells D4 and D5. The current IF functions in cells D3, D4, and D5 are incorrect. Edit and correct the IF function in cell D3. Copy the corrected formula in cell D3 to cells D4 and D5. After completing the copy, click the Auto Fill Options button arrow that displays below and to the right of cell D5 and choose Fill Without Formatting.

3. The Manufacturing Costs in cell E3 is computed using the formula =B11*B3 (Manu. Costs % x Sales). The formula in cell E3 was entered and copied to cells E4 and E5. Although the result in cell E3 is correct, the results in cells E4 and E5 are incorrect. Edit and correct the formula in cell E3 by changing cell B11 to an absolute cell reference. Copy the corrected formula in cell E3 to cells E4 and E5. After completing the copy, click the Auto Fill Options button arrow that displays below and to the right of cell E5 and choose Fill Without Formatting.
4. Change the design of the worksheet by moving the Assumptions table in the range A8:B11 to the range A1:B4 as shown in Figure 3–84b. To complete the move, insert five rows above row 1 and then drag the Assumptions table to the range A1:B4. Use Figure 3–84b 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. Change the document properties, as specified by your instructor. Change the worksheet header with your name, course number, and other information requested by your instructor. Save the workbook using the file name, Make It Right 3-1 e-MusicPro.com Annual Projected Net Income Complete, and submit the revised workbook as requested 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: Eight-Year Financial Projection

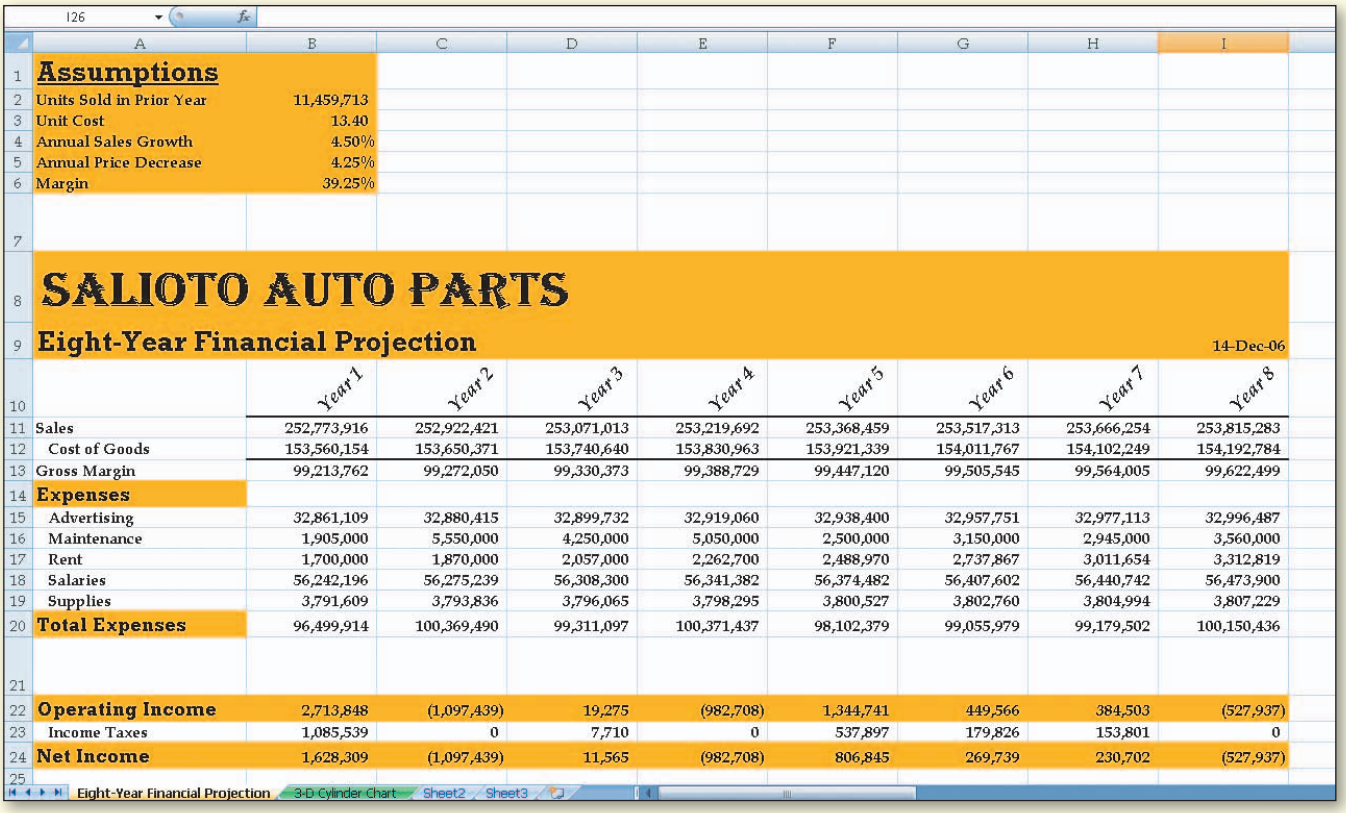
Problem: Your supervisor in the Finance department at Salioto Auto Parts has asked you to create a worksheet that will project the annual gross margin, expenses, total expenses, operating income, income taxes, and net income for the next ten years based on the assumptions in Table 3–9. The desired worksheet is shown in Figure 3–85. In Part 1 you will create the worksheet. In Part 2 you will create a chart to present the data, shown in Figure 3–86. In part 3 you will use Goal Seek to analyze three different sales scenarios.

Table 3–9 Salioto Auto Parts Financial Projection Assumptions

Units Sold in Prior Year	11,459,713
Unit Cost	$13.40
Annual Sales Growth	4.50%
Annual Price Decrease	4.25%
Margin	39.25%

Continued >

In the Lab *continued*



	A	B	C	D	E	F	G	H	I
1	**Assumptions**								
2	Units Sold in Prior Year	11,459,713							
3	Unit Cost	13.40							
4	Annual Sales Growth	4.50%							
5	Annual Price Decrease	4.25%							
6	Margin	39.25%							
7									
8	**SALIOTO AUTO PARTS**								
9	**Eight-Year Financial Projection**								14-Dec-06
10		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
11	Sales	252,773,916	252,922,421	253,071,013	253,219,692	253,368,459	253,517,313	253,666,254	253,815,283
12	Cost of Goods	153,560,154	153,650,371	153,740,640	153,830,963	153,921,339	154,011,767	154,102,249	154,192,784
13	Gross Margin	99,213,762	99,272,050	99,330,373	99,388,729	99,447,120	99,505,545	99,564,005	99,622,499
14	**Expenses**								
15	Advertising	32,861,109	32,880,415	32,899,732	32,919,060	32,938,400	32,957,751	32,977,113	32,996,487
16	Maintenance	1,905,000	5,550,000	4,250,000	5,050,000	2,500,000	3,150,000	2,945,000	3,560,000
17	Rent	1,700,000	1,870,000	2,057,000	2,262,700	2,488,970	2,737,867	3,011,654	3,312,819
18	Salaries	56,242,196	56,275,239	56,308,300	56,341,382	56,374,482	56,407,602	56,440,742	56,473,900
19	Supplies	3,791,609	3,793,836	3,796,065	3,798,295	3,800,527	3,802,760	3,804,994	3,807,229
20	**Total Expenses**	96,499,914	100,369,490	99,311,097	100,371,437	98,102,379	99,055,979	99,179,502	100,150,436
21									
22	**Operating Income**	2,713,848	(1,097,439)	19,275	(982,708)	1,344,741	449,566	384,503	(527,937)
23	Income Taxes	1,085,539	0	7,710	0	537,897	179,826	153,801	0
24	**Net Income**	1,628,309	(1,097,439)	11,565	(982,708)	806,845	269,739	230,702	(527,937)
25									

Eight-Year Financial Projection | 3-D Cylinder Chart | Sheet2 | Sheet3

Figure 3–85

Instructions Part 1:

1. Start Excel. Apply the Apex theme to the worksheet by using the Themes button on the Page Layout tab on the Ribbon. Bold the entire worksheet by selecting the entire worksheet and using the Bold button on the Home tab on the Ribbon.
2. Enter the worksheet title Salioto Auto Parts in cell A8 and the subtitle Eight-Year Financial Projection in cell A9. Format the worksheet title in cell A8 to 36-point Algerian (or a similar font). Format the worksheet subtitle in cell A9 to 20-point Rockwell (or a similar font). Enter the system date in cell F9 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 I = 15.00 characters. Change the heights of rows 7, 10, and 21 to 42.00 points.
4. Enter the eight column titles Year 1 through Year 8 in the range B10:I10 by entering Year 1 in cell B10 and then dragging cell B10's fill handle through the range C10:I10. Format cell B10 as follows: (a) increase the font size to 14; (b) center and italicize; and (c) rotate its contents 45°. Use the Format Painter button to copy the format assigned to cell B10 to the range C10:I10.
5. Enter the row titles in the range A11:A24. Change the font in cells A14, A20, A22, and A24 to 14-point Rockwell (or a similar font). Add thick bottom borders to the ranges B10:I10 and B12:I12.
6. Enter the table title Assumptions in cell A1. Enter the assumptions in Table 3-9 in the range A2:B6. Use format symbols when entering the numbers. Change the font size of the table title to 14-point Rockwell and underline it.
7. Select the range B11:I24 and then click the Format Cells: Number Dialog Box Launcher on the Home tab on the Ribbon to display the Format Cells dialog box. Use the Number category in the Format Cells dialog box to assign the Comma style with no decimal places and negative numbers enclosed in parentheses to the range B11:I24.

8. Complete the following entries:
   a. Year 1 Sales (cell B11) = Units Sold in Prior Year * (Unit Cost / (1 − Margin)) or =B2 * (B3 / (1 − B6))
   b. Year 2 Sales (cell C11) = Year 1 Sales * (1 + Annual Sales Growth) * (1 − Annual Price Decrease) or =B11 * (1 + $B$4) * (1 − $B$5)
   c. Copy cell C11 to the range D11:I11.
   d. Year 1 Cost of Goods (cell B12) = Year 1 Sales − (Year 1 Sales * Margin) or =B11 * (1 − $B$6)
   e. Copy cell B12 to the range C12:I12.
   f. Gross Margin (cell B13) = Year 1 Sales − Year 1 Cost of Goods or =B11 − B12
   g. Copy cell B13 to the range C13:I13.
   h. Year 1 Advertising (cell B15) = 500 + 13% * Year 1 Sales or =500 + 13% * B11
   i. Copy cell B15 to the range C15:I15.
   j. Maintenance (row 16): Year 1 = 1,905,000; Year 2 = 5,550,000; Year 3 = 4,250,000; Year 4 = 5,050,000; Year 5 = 2,500,000; Year 6 = 3,150,000; Year 7 = 2,945,000; and Year 8 = 3,560.000.
   k. Year 1 Rent (cell B17) = 1,700,000
   l. Year 2 Rent (cell C17) = Year 1 Rent + 10% * Year 1 Rent or =B17 * (1 + 10%)
   m. Copy cell C17 to the range D17:I17.
   n. Year 1 Salaries (cell B18) = 22.25% * Year 1 Sales or =22.25% * B11
   o. Copy cell B18 to the range C18:I18.
   p. Year 1 Supplies (cell B19) = 1.5% * Year 1 Sales or =1.5% * B11
   q. Copy cell B19 to the range C19:I19.
   r. Year 1 Total Expenses (cell B20) or =SUM(B15:B19)
   s. Copy cell B20 to the range C20:I20.
   t. Year 1 Operating Income (cell B22) = Year 1 Gross Margin − Year 1 Total Expenses or =B13 − B20
   u. Copy cell B22 to the range C22:I22.
   v. Year 1 Income Taxes (cell B23): If Year 1 Operating Income is less than 0, then Year 1 Income Taxes equal 0; otherwise Year 1 Income Taxes equal 40% * Year 1 Operating Income or =IF(B22 < 0, 0, 40% * B22)
   w. Copy cell B23 to the range C23:I23.
   x. Year 1 Net Income (cell B24) = Year 1 Operating Income − Year 1 Income Taxes or =B22 − B23
   y. Copy cell B24 to the range C24:I24.
9. Change the background colors as shown in Figure 3-85. Use orange (column 3 under Standard Colors) 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 requested by your instructor. Save the workbook using the file name, Lab3-1 Salioto Auto Parts Eight-Year Financial Projection.
12. Preview the worksheet. Use the Page Setup button 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 requested by your instructor.

Instructions Part 2:

1. Start Excel. Open the workbook Lab 3-1 Salioto Auto Parts Eight-Year Financial Projection.
2. Use the nonadjacent ranges B10:I10 and B24:I24 to create a 3-D Cylinder chart. Draw the chart by clicking the Column button on the Insert tab on the Ribbon. 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 on the Ribbon to move the chart to a new sheet.

Continued >

In the Lab *continued*

3. Select the legend on the right side of the chart and delete it. Add the chart title by clicking the Layout tab on the Ribbon, then clicking the Chart Title button. Click Above Chart in the Chart Title gallery. Format the chart title as shown in Figure 3–86.
4. To change the color of the cylinders, click one of the cylinders and use the Shape Fill button on the Format tab on the Ribbon. To change the color of the wall, click the wall behind the cylinders and use the Shape Fill button on the Format tab on the Ribbon. Use the same procedure to change the color of the base of the wall.
5. Rename the sheet tabs Eight-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 3–86.
6. Click the Eight-Year Financial Projection tab to display the worksheet. Save the workbook using the same file name (Lab 3-1 Salioto Auto Parts Eight-Year Financial Projection) as defined in Part 1. Submit the workbook as requested by your instructor.

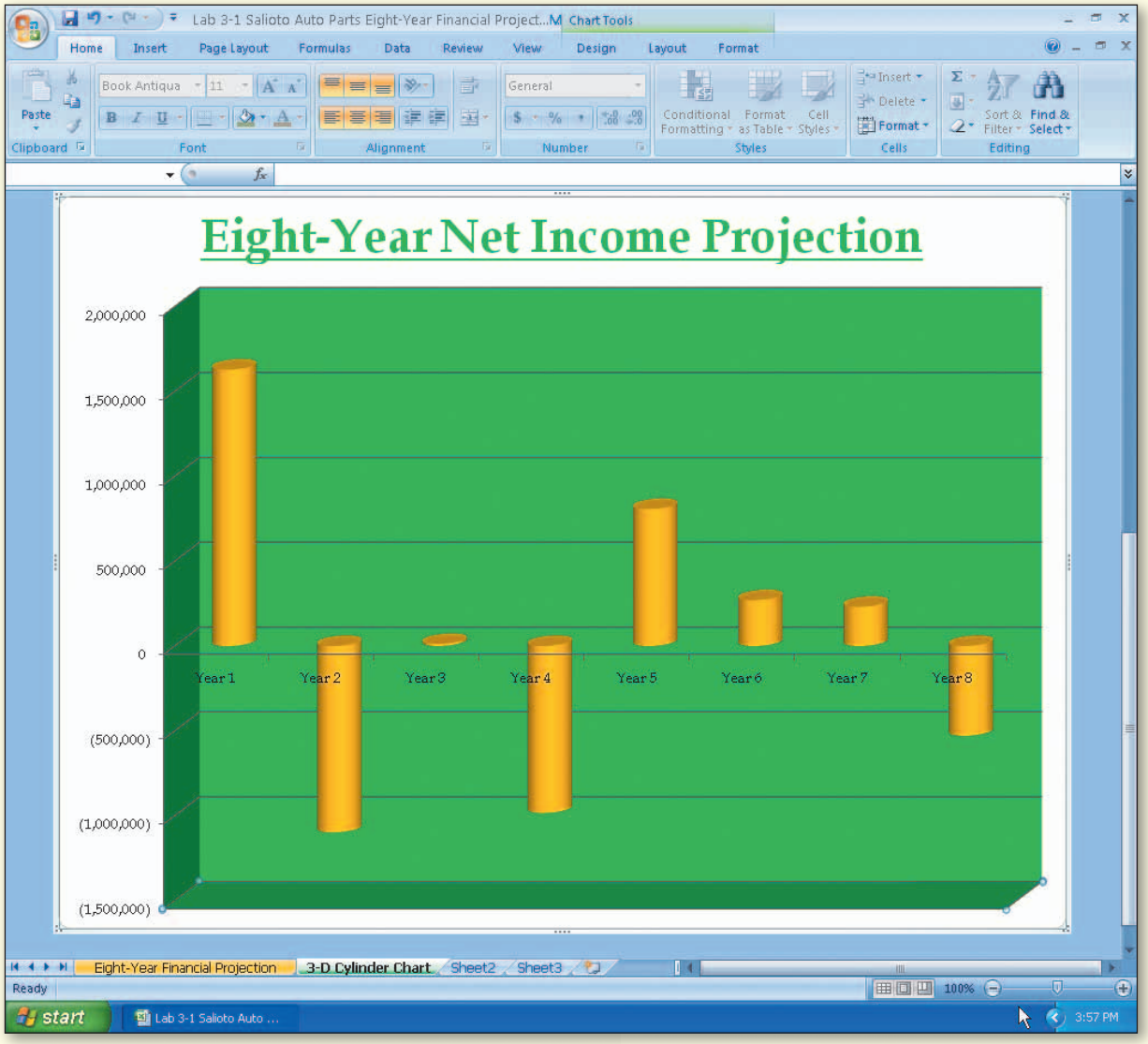


Figure 3–86

Instructions Part 3:

1. Start Excel. Open the workbook Lab 3-1 Salioto Auto Parts Eight-Year Financial Projection. 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 B4) and annual price decrease (cell B5) on the net incomes in row 24. 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 Salioto Auto Parts Data to Analyze and Results

Case	Annual Sales Growth	Annual Price Decrease	Year 8 Resulting Net Income in Cell I24
1	7.45%	5.25%	174,568
2	12.75%	−3.00%	6,677,903
3	−7.25%	1.65%	(3,552,156)

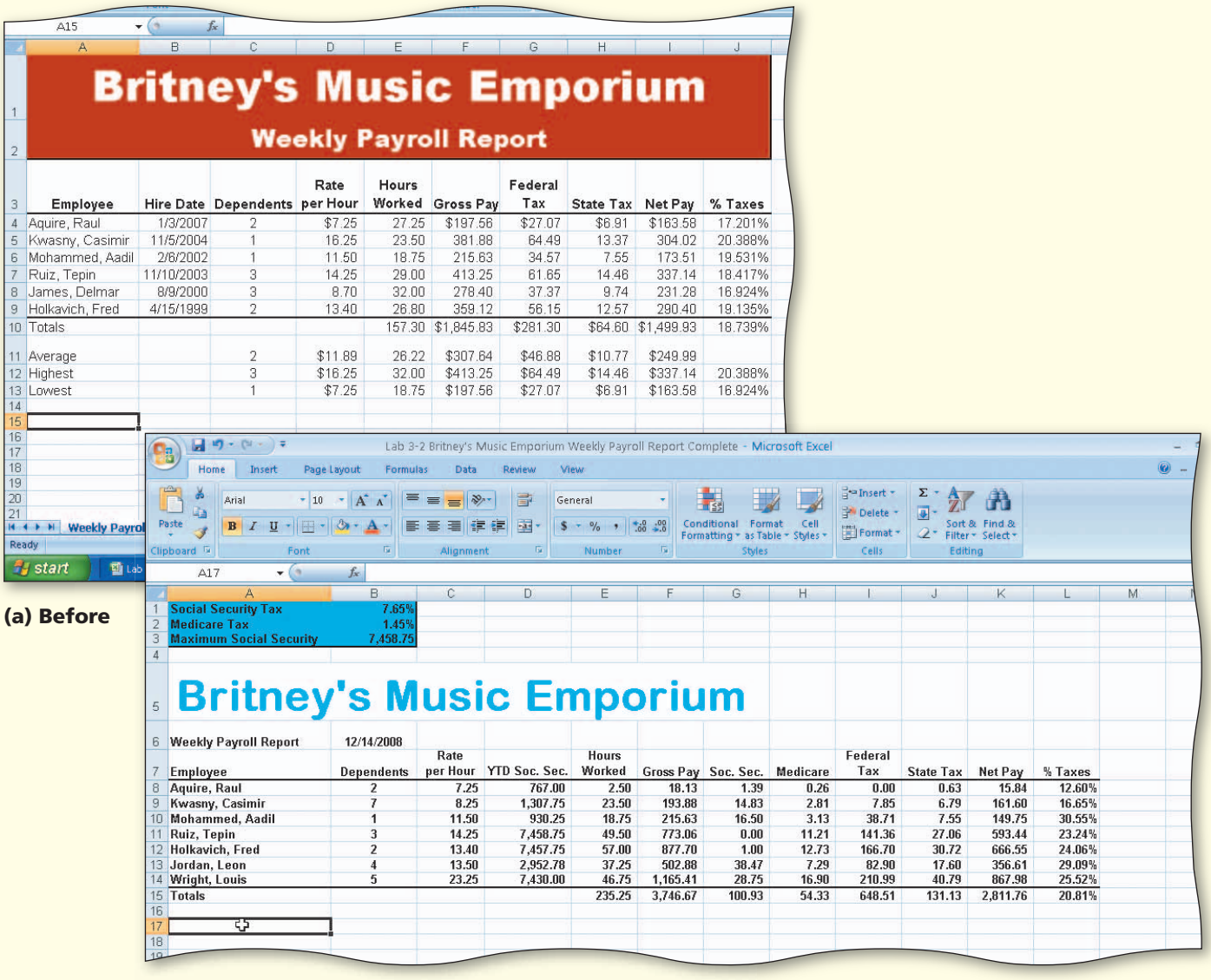
2. Close the workbook without saving it, and then reopen it. Use the What-If Analysis button on the Data tab on the Ribbon to goal seek. Determine a margin (cell B6) that would result in a Year 8 net income of $2,000,000 (cell I24). You should end up with a margin of 40.68% in cell B6. Submit the workbook 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.

In the Lab

Lab 2: Modifying a Weekly Payroll Worksheet

Problem: As a summer intern at Britney's Music Emporium, you have been asked to modify the weekly payroll report shown in Figure 3–87a. The workbook, Lab 3-2 Britney's Music Emporium Weekly Payroll 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 time-and-a-half for hours worked greater than 40; (3) adding calculations to charge no federal tax in certain situations; (4) adding Social Security and Medicare deductions; (5) adding and deleting employees; and (6) changing employee information. The final payroll report is shown in Figure 3–87b.



(a) Before

(b) After

Figure 3–87

Instructions Part 1:

1. Start Excel. Open the workbook, Lab 3-2 Britney's Music Emporium Weekly Payroll Report.
2. Select the worksheet by clicking the Select All button. Click the Clear button on the Home tab on the Ribbon 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; rows 6 and 7 = 25.50. One at a time, select cells D7, E7, and G7. For each cell, press the F2 key and then the ENTER key to display the column headings on multiple rows. Center the range B7:J7.

6. Delete column B by right-clicking the column heading and clicking Delete on the shortcut menu.
7. Insert a new column between columns C and D. Change the column widths as follows: A = 25.00; D = 13.00; and E through K = 9.71. Enter the new column D title **YTD Soc. Sec.** in cell D7.
8. Insert two new columns between columns F and G. Enter the new column G title **Soc. Sec.** in cell G7. Enter the new column H title **Medicare** in cell H7.
9. Enhance the worksheet title in cell A5 by using a 36-point light blue Arial Rounded MT Bold (or a similar font) font style as shown in Figure 3–87b.
10. Assign the NOW function to cell B6 and format it to the 3/14/2001 style.
11. Delete employee James, Delmar (row 12). Change Raul Aquire's (row 8) hours worked to 2.5. Change Casimir Kwasny's (row 9) number of dependents to 7 and rate per hour to $8.25. Change Tepin Ruiz's (row 11) hours worked to 49.5 and Fred Holkavich's (row 12) hours worked to 57.
12. Freeze column A and rows 1 through 7 by selecting cell B8, clicking the Freeze Panes button on the View tab on the Ribbon, and then clicking Freeze Panes on the Freeze Panes menu.
13. In column D, enter the YTD Soc. Sec. values listed in Table 3–11.
14. Insert two new rows immediately above the Totals row. Add the new employee data as listed in Table 3–12.

Table 3–11 The Britney Music Emporium's YTD Social Security Values

Employee	YTD Soc. Sec.
Aquire, Raul	767.00
Kwasny, Casimir	1307.75
Mohammed, Aadil	930.25
Ruiz, Tepin	7458.75
Holkavich, Fred	7457.75

Table 3–12 The Britney Music Emporium's New Employee Data

Employee	Dependents	Rate per Hour	YTD Soc. Sec.	Hours Worked
Jordan, Leon	4	13.50	2952.78	37.25
Wright, Louis	5	23.25	7430.00	46.75

15. Center the range B6:B14. 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 C8:K15. Assign a Percent style and two decimal places to the range L8:L15. Draw a thick bottom border in the ranges A7:L7 and A14:L14.
16. As shown in Figure 3–87b, enter and format the Social Security (7.65% with a maximum of $7,458.75) and Medicare tax (1.45%) information in the range A1:B3. Use format symbols where applicable.
17. Change the formulas to determine the gross pay in column F and the federal tax in column I as follows:
    a. In cell F8, enter an IF function that applies the following logic and then copy it to the range F9:F14. If Hours Worked <= 40, then Rate per Hour * Hours Worked, otherwise Rate per Hour * Hours Worked + 0.5 * Rate per Hour * (Hours Worked − 40) or =IF(E8 <= 40, C8 * E8, C8 * E8 + 0.5 * C8 *(E8 − 40))
    b. In cell I8, enter the IF function that applies the following logic and then copy it to the range I9:I14. If (Gross Pay – Dependents * 22.09 > 0, then 20% * (Gross Pay – Dependents * 22.09), otherwise 0 or =IF(F8 – B8 * 22.09 > 0, 20% * (F8 – B8 * 22.09), 0)

Continued >

In the Lab *continued*

18. An employee pays Social Security tax only if his or her YTD Soc. Sec. in column D is less than the Maximum Social Security value in cell B3. Use the following logic to determine the Social Security tax for Raul Aquire in cell G8 and then copy it to the range G9:G14.

    Soc. Sec. (cell G8): If Social Security Tax * Gross Pay + YTD Soc. Sec. > Maximum Social Security, then Maximum Social Security − YTD Soc. Sec., otherwise Social Security Tax * Gross Pay or =IF($B$1 * F8 + D8 >= $B$3, $B$3 − D8, $B$1 * F8)

19. In cell H8, enter the following formula and then copy it to the range H9:H14:

    Medicare (cell H8) = Medicare Tax * Gross Pay or =$B$2 * F8

20. In cell K8, enter the following formula and copy it to the range K9:K14:

    Net Pay (K8) = Gross Pay − (Soc. Sec. + Medicare + Federal Tax + State Tax) or =F8 − (G8 + H8 + I8 + J8)

21. In cell L8, enter the following formula and copy it to the range L9:L14:

    % Taxes (cell L8) = (Soc. Sec. + Medicare + Federal Tax + State Tax) / Gross Pay or = (G8 + H8 + I8 + J8) / F8

22. Use the Range Finder (double-click cell) to verify the new totals as shown in row 15 in Figure 3-87b. Unfreeze the worksheet by clicking the Freeze Panes button on the View tab on the Ribbon, and then clicking Unfreeze Panes on the Freeze Panes menu.

23. Preview the worksheet. Use the Page Setup button to change the orientation to landscape and fit the report on one page.

24. Change the document properties, as specified by your instructor. Change the worksheet header with your name, course number, and other information requested by your instructor. Save the workbook using the file name Lab 3-2 Britney's Music Emporium Weekly Payroll Report Complete.

25. Use the Zoom button on the View tab on the Ribbon 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.

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

27. Submit the workbook as requested by your instructor.

Instructions Part 2: Start Excel. Open Lab 3-2 Britney's Music Emporium Weekly Payroll Report Complete. Using the numbers in Table 3–13, analyze the effect of changing the Medicare tax in cell B2. The first case should result in a total Medicare tax in cell H15 of $106.78. The second case should result in a total Medicare tax of $166.73. Close the workbook without saving changes. Submit the results of the what-if analysis as requested by your instructor.

Table 3–13 The Britney Music Emporium's Medicare Tax Cases

Case	Medicare Tax
1	2.85%
2	4.45%

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

1. Start Excel. Open Lab 3-2 Britney's Music Emporium Weekly Payroll Report Complete. Select cell F8. Write down the formula that Excel displays in the formula bar. Select the range C8:C14. Point to the border surrounding the range and drag the selection to the range D17:D23. Click cell F8, 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 C8:C14 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 F8? Click cell F8 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 C8:C14 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 does Excel display in the formula bar when you click cell G8? 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.

In the Lab

Lab 3: Analysis of Indirect Expense Allocations

Problem: Your classmate works part time as a consultant for RockieView Resort and Spa. She has asked you to assist her in creating an indirect expense allocation worksheet (Figure 3–88) that will help the resort and spa administration better evaluate the profit centers described in Table 3–14 on the next page.

D23

RockieView Resort & Spa

Analysis of Indirect Expenses 14-Dec-08

	Banquet Room	Business Center	Children's Game Room	Conference Rooms	Gift Shop	Lounge	Restaurant	Spa	Total
Total Net Revenue	$345,819.00	$192,190.00	$52,750.00	$212,300.00	$112,100.00	$622,350.00	$615,350.00	$92,900.00	$2,245,759.00
Cost of Sales	19,750.00	16,235.00	12,900.00	55,250.00	42,100.00	115,400.00	175,000.00	42,150.00	478,785.00
Direct Expenses	9,245.00	9,245.00	7,250.00	19,300.00	37,400.00	101,000.00	115,600.00	24,800.00	323,840.00
Indirect Expenses									
Administrative	$10,394.16	$5,776.59	$1,585.49	$6,381.03	$3,369.35	$18,705.76	$18,495.36	$2,792.26	$67,500.00
Depreciation	16,414.60	1,367.88	2,227.70	9,770.60	2,071.37	11,724.72	10,474.08	4,299.06	58,350.00
Energy	6,513.67	3,620.00	993.57	3,998.78	2,111.46	11,722.28	11,590.43	1,749.82	42,300.00
Insurance	3,347.62	278.97	454.32	1,992.63	422.44	2,391.16	2,136.10	876.76	11,900.00
Maintenance	7,637.64	636.47	1,036.54	4,546.22	963.80	5,455.46	4,873.54	2,000.33	27,150.00
Marketing	8,203.69	4,559.23	1,251.36	5,036.29	2,659.29	14,763.69	14,597.64	2,203.82	53,275.00
Total Indirect Expense	52,511.39	16,239.13	7,548.98	31,725.53	11,597.70	64,763.06	62,167.15	13,922.06	260,475.00
Net Income	$264,312.61	$150,470.87	$25,051.02	$106,024.47	$21,002.30	$341,186.94	$262,582.85	$12,027.94	$1,182,659.00
Square Footage	10,500	875	1,425	6,250	1,325	7,500	6,700	2,750	37,325

Planned Indirect Expenses	
Administrative	67,500
Depreciation	58,350
Energy	42,300
Insurance	11,900
Maintenance	27,150
Marketing	53,275

Analysis of Indirect Expenses | Sheet2 | Sheet3

Ready 70%

Figure 3–88

Continued >

In the Lab *continued*

Table 3–14 RockieView Resort and Spa Worksheet Data

	Banquet Room	Business Center	Children's Game Room	Conference Rooms	Gift Shop	Lounge	Restaurant	Spa
Total Net Revenue	345819	192190	52750	212300	112100	622350	615350	92900
Cost of Sales	19750	16235	12900	55250	42100	115400	175000	42150
Direct Expenses	9245	9245	7250	19300	37400	101000	115600	24800
Square Footage	10500	875	1425	6250	1325	7500	6700	2750

Instructions Part 1: Do the following to create the worksheet shown in Figure 3–88.

1. Apply the Solstice theme to the worksheet. Bold the entire worksheet by selecting the entire worksheet and using the Bold button on the Ribbon.
2. Change the following column widths: A = 28.00; B through I = 13.00; J = 14.00.
3. Enter the worksheet titles in cells A1 and A2 and the system date in cell J2. Format the date to the 14-Mar-01 style.
4. Enter the column titles, row titles, and the first three rows of numbers in Table 3–14 in rows 3 through 6. Center and italicize the column headings in the range B3:J3. Add a thick bottom border to the range B3:J3. Sum the individual rows 4, 5, and 6 in the range J4:J6.
5. Enter the Square Footage row in Table 3–14 with the comma format symbol in row 16. Sum row 16 in cell J16. Use the Format Painter button to format cell J16. Change the height of row 16 to 39.00. Vertically center the range A16:J16 through the use of the Format Cells dialog box.
6. Enter the remaining row titles in the range A7:A17 as shown in Figure 3–88. Increase the font size in cells A7, A14, and A15 to 16-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 3–88 with format symbols.
8. The planned indirect expenses in the range B18:B23 are to be prorated across the profit center as follows: Administrative (row 8), Energy (row 10), and Marketing (row 13) on the basis of Total Net Revenue (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. Banquet Room Administrative (cell B8) = Administrative Expenses * Banquet Room Total Net Revenue / Resort Total Net Revenue or =$B$18 * B4 / $J$4
   b. Banquet Room Depreciation (cell B9) = Depreciation Expenses * Banquet Room Square Footage / Total Square Footage or =$B$19 * B16 / $J$16
   c. Banquet Room Energy (cell B10) = Energy Expenses * Banquet Room Total Net Revenue / Resort Total Net Revenue or =$B$20 * B4 / $J$4
   d. Banquet Room Insurance (cell B11) = Insurance Expenses * Banquet Room Square Feet / Total Square Footage or =$B$21 * B16 / $J$16
   e. Banquet Room Maintenance (cell B12) = Maintenance Expenses * Banquet Room Square Footage / Total Square Footage or =$B$22 * B16 / $J$16
   f. Banquet Room Marketing (cell B13) = Marketing Expenses * Banquet Room Total Net Revenue / Resort Total Net Revenue or =$B$23 * B4 / $J$4
   g. Banquet Room Total Indirect Expenses (cell B14) = SUM(B8:B13)
   h. Banquet Room Net Income (cell B15) = Total Net Revenue − (Cost of Sales + Direct Expenses + Total Indirect Expenses) or =B4 − (B5 + B6 + B14)
   i. Copy the range B8:B15 to the range C8:I15.
   j. Sum the individual rows 8 through 15 in the range J8:J15.

9. Add a thick bottom border to the range B13:J13. Assign the Currency style with two decimal places and show negative numbers in parentheses to the following ranges: B4:J4; B8:J8; and B14:J15. Assign the Comma style with two decimal places and show negative numbers in parentheses to the following ranges: B5:J6 and B9:J13.
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 blue and the font color white for the ranges A1:J2; A7; A15:J15; and A17:B23 as shown in Figure 3–88.
12. Rename the Sheet1 sheet, Analysis of Indirect Expenses, and color its tab blue.
13. 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 requested by your instructor. Save the workbook using the file name, Lab 3-3 RockieView Resort and Spa Indirect Expenses Allocations.
14. Preview the worksheet. Use the Page Setup button to change the orientation to landscape and fit the report on one page. Preview the formulas version (CTRL+`) of the worksheet in landscape orientation using the Fit to option button in the Page Setup dialog box. Press CTRL+` to show the values version of the worksheet. Save the workbook again.
15. 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 3-3 RockieView Resort and Spa Indirect Expenses Allocations. Draw a 3-D Pie chart (Figure 3–89) 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 J8:J13 (data series). Show labels that include category names and percentages. Do not show the legend or leader lines. Format the 3-D Pie chart as shown in Figure 3–89. Rename the chart sheet 3-D Pie Chart and color the tab red. Move the chart tab to the right of the worksheet tab. Save the workbook using the file name, Lab 3-3 RockieView Resort and Spa Indirect Expenses Allocations. Submit the workbook as requested by your instructor.

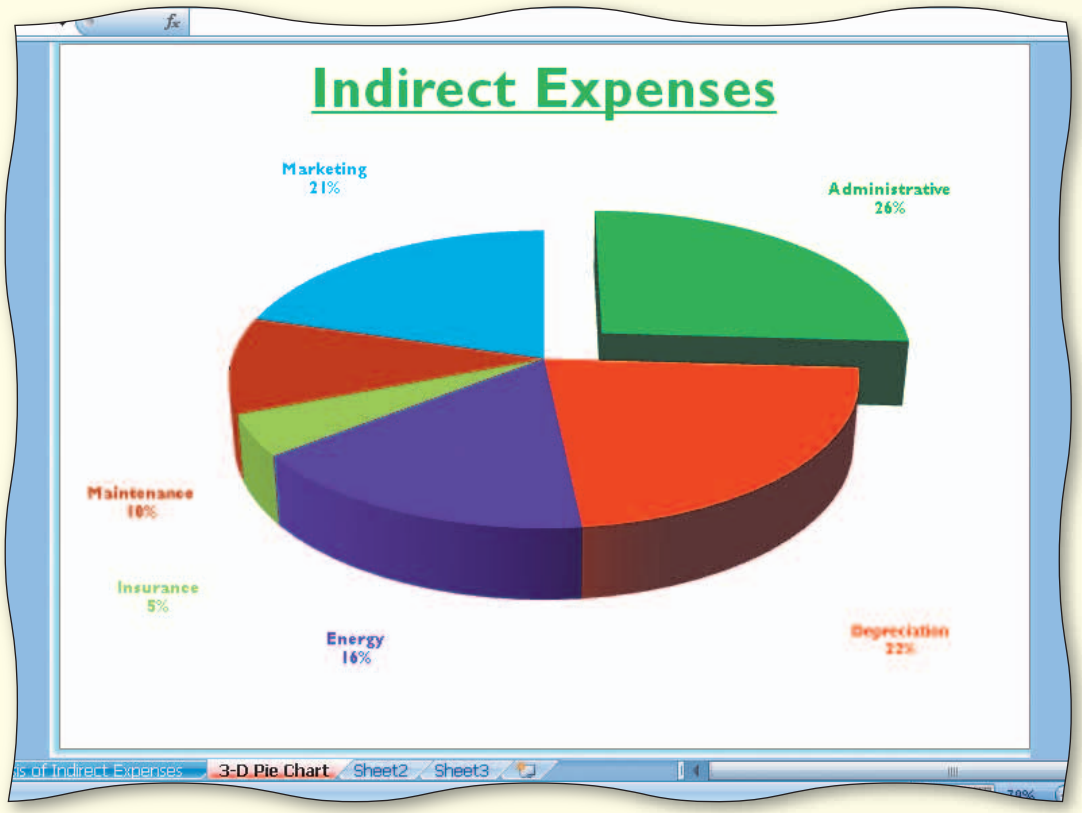


Figure 3–89

Continued >

In the Lab *continued*

Instructions Part 3: Start Excel. Open Lab 3-3 RockieView Resort and Spa Indirect Expenses Allocations.

1. Using the numbers in Table 3–15, analyze the effect of changing the planned indirect expenses in the range B18:B23 on the net incomes for each profit center. You should end with the following totals in cell J15: Case 1 = $892,684.00 and Case 2 = $869,634.00. Submit the workbook or results for each case as requested by your instructor.

Table 3–15 RockieView Resort and Spa Indirect Expense Allocations What-If Data

	Case 1	Case 2
Administrative	234000	210000
Depreciation	123500	152000
Energy	67750	48000
Insurance	26200	53000
Maintenance	42000	38000
Marketing	57000	72500

2. Use the What-If Analysis button on the Data tab on the Ribbon to goal seek. Determine a planned indirect Administrative expense (cell B18) that would result in a total net income of $1,200,000 (cell J15). You should end up with a planned indirect Administrative expense of $50,159 in cell B18. Submit the workbook with the new values or the results of the goal seek as requested by your instructor.

Cases and Places

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

• Easier •• More Difficult

• 1: Five-Year Sales Projections

You have been asked to develop a worksheet for Millennium Steel that shows annual growth for the next five years based on the prior year's sales and growth data. Include an embedded exploded 3-D Pie chart that shows the contribution of each year to the total gross margin. The data and general layout of the worksheet, including the totals, are shown in Table 3–16.

Table 3–16 Millennium Steel Sales Data and General Layout

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Sales	Formula A →					—
Cost of Goods	Formula B →					—
Gross Margin	Formula C →					—
Assumptions						
Prior Year's Sales	35234500					
Annual Growth Rate	−1.75%	12.35%	5.00%	−1.25%	8.75%	
Annual Cost Rate	41.25%	44.00%	33.00%	43.75%	34.25%	
Premium	2.90%	3.10%	4.95%	2.50%	4.50%	

Enter the formulas shown in Table 3–17 in the locations shown in Table 3–16. Copy formulas A, B, and C to the remaining years. The gross margin for the five years should equal $118,986,982.

Table 3–17 Millennium Steel Sales Projection Formulas

Formula A = Prior Year's Sales * (1 + Annual Growth Rate)
Formula B = IF(Annual Growth Rate < 0, Sales * (Annual Cost Rate + Premium), Sales * Annual Cost Rate)
Formula C = Sales − Cost of Goods

Use the concepts and techniques developed in the first three projects to create and format the worksheet and embedded 3-D Pie chart.

Use the Goal Seek command to determine the Year 1 annual growth rate that will generate a total gross margin of $125,000,000. You should end up with a Year 1 annual growth rate of 2.35%. Submit the workbook and results of the goal seek as requested by your instructor.

• 2: Bimonthly Projected Earnings and Expenditures

The *Chesterton Trib* is a small newspaper that publishes stories of local interest. Revenues are earned from subscriptions and the sale of advertising space. A fixed percentage of the Net Revenue is spent on marketing, payroll, commissions (advertising sales only), production costs, and reportorial expenses. The editor has summarized the paper's expenditures over the past year and the anticipated income from subscriptions and advertising on a bimonthly basis as shown in Table 3–18.

With the data, you have been asked to prepare a worksheet for the next shareholder's meeting showing total revenues, total expenditures, and operating incomes for each bimonthly period. Include a 3-D Cylinder chart on a separate sheet that compares the six bimonthly operating incomes. Use the concepts and techniques presented in this project to create and format the worksheet and chart.

Table 3–18 Chesterton Trib Bimonthly Projected Earnings and Expenditures

Revenue	February	April	June	August	October	December
Subscriptions	12178.30	8391.50	15714.50	16340.10	12567.25	12800.15
Advertising	4130.20	6425.00	4123.15	5023.30	7015.75	9273.20
Assumptions						
Marketing	15.60%					
Payroll	21.50%					
Commissions on Advertising	3.25%					
Production Costs	12.50%					
Reportorial Expenses	5.00%					

One shareholder lobbied to reduce marketing expenditures by 3% and payroll costs by 5%. Perform a what-if-analysis reflecting the proposed changes in expenditure assumptions. The reduction in expenditures should result in a total operating income of $59,696.91 or an increase of $9,118.59. Submit the workbook and results of the what-if analysis as requested by your instructor.

•• 3: Projected Used-Truck Savings

Cousin Abe and Aunt Esther own a paint company. Their good friend Billie Bob is retiring after 35 years of delivering the morning newspaper. Billie Bob has offered them the opportunity to take his place next year. The job requires, however, that they own a truck. They need to save enough money over the next six months to buy a $10,000 used truck.

They have job orders at their paint company for the next six months: $22,150 in July, $22,480 in August, $32,900 in September, $31,200 in October, $45,301 in November, and $32,190 in December. Each month, they spend 34.55% of the job order income on material, 3.00% on rollers and brushes, 4.75% on their retirement account, and 39.5% on food and clothing. The remaining profits (orders − total expenses) will be put aside for the used truck. Aunt Esther's retired parents have agreed to provide a bonus of $250 whenever the monthly profit exceeds $2,000. Use the concepts and techniques presented in this project to create and format the worksheet.

Cousin Abe has asked you to create a worksheet that shows orders, expenses, profits, bonuses, and savings for the next six months, and totals for each category. Aunt Esther would like to save for another used truck for $17,000. She has asked you to (a) perform a what-if analysis to determine the effect on the savings by reducing the percentage spent on material to 25% (answer total savings = $16,084.49), and (b) with the original assumptions, goal seek to determine what percentage of profits to spend on food and clothing if $15,000 is needed for the used truck (answer = 29.165%). Submit the workbook and results of the what-if analysis as requested by your instructor.

•• 4: College Expense and Resource Projections

Make It Personal

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 3–19 that shows the projected expenses and resources for four years of college. Use the formulas listed in Table 3–20 and the concepts and techniques presented in this project to create the worksheet.

Table 3–19 College Expense and Resource Projections

Expenses	Freshman	Sophomore	Junior	Senior	Total
Room & Board	$6,125.00	Formula A	→	→	—
Tuition & Books	8,750.00	Formula A	→	→	—
Clothes	750.00	Formula A	→	→	—
Entertainment	1,025.00	Formula A	→	→	—
Miscellaneous	675.00	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	20.00%				
Job	10.00%				
Loans	30.00%				
Scholarships	30.00%				
Annual Rate Increase	7.50%				

Table 3–20 College Expense and Resource Projections 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%; and (c) with the original assumptions, goal seek to determine what the Annual Rate Increase would be for the total expenses to be $100,000. Submit the workbook and results of the what-if analysis as requested by your instructor.

•• 5: Cost of Storing Radio Isotopes

Working Together

A government agency plans to conduct experiments that will result in some radioactive waste. Although the isotopes will break apart into atoms of other elements over time, agency watchdogs are concerned about containment costs while the material still is radioactive. The agency director has asked your group to prepare a worksheet showing the amount of radioactive material remaining, containment costs, estimated agency appropriations, and the percentage of appropriations that will be spent on containment every year for the next decade. The director has outlined the desired worksheet as shown in Table 3–21 on the next page.

Continued >

Cases and Places *continued*

These formulas have been supplied:

Formula A: Amount Remaining = Original Amount × 0.5(Number of Years Stored / Half-Life)

Formula B: Containment Costs = Containment Cost Per Kilogram × Total Amount Remaining

Formula C: Estimated Appropriations = Appropriations × (1 + Estimated Yearly Increase) (Number of Years Stored / Half-Life)

Formula D: Percentage Spent on Containment = Containment Costs / Estimated Appropriations

The director has asked your group to include a function that prints "Acceptable" below the percentage spent on containment whenever the percentage is less than 1%, otherwise print "Not Acceptable."

Have each member of your team submit a sketch of the proposed worksheet and then implement the best one. Use the concepts and techniques presented in this project to create and format the worksheet. Submit the sketches and workbook as requested by your instructor.

Table 3–21 Cost of Storing Radioactive Isotopes

	Number of Years Stored				
Number of Years Stored	1	2	3	.....	10
Amount of Isotope X Remaining (in kg)	Formula A →				
Amount of Isotope Y Remaining (in kg)	Formula A →				
Total Remaining (in kg)	—	—	—	.....	—
Containment Costs	Formula B →				
Estimated Appropriations	Formula C →				
Percentage Spent on Containment	Formula D →				
	Message →				

Assumptions	
Original Amount of Isotope X Remaining (in kg)	650
Half-Life of Isotope X (in years)	1
Containment Cost per Kilogram	1000
Estimated Yearly Increase	10.00%
Original Amount of Isotope Y Remaining (in kg)	3000
Half-Life of Isotope Y (in years)	0.45
Appropriations	6000000