Microsoft Excel (2007)
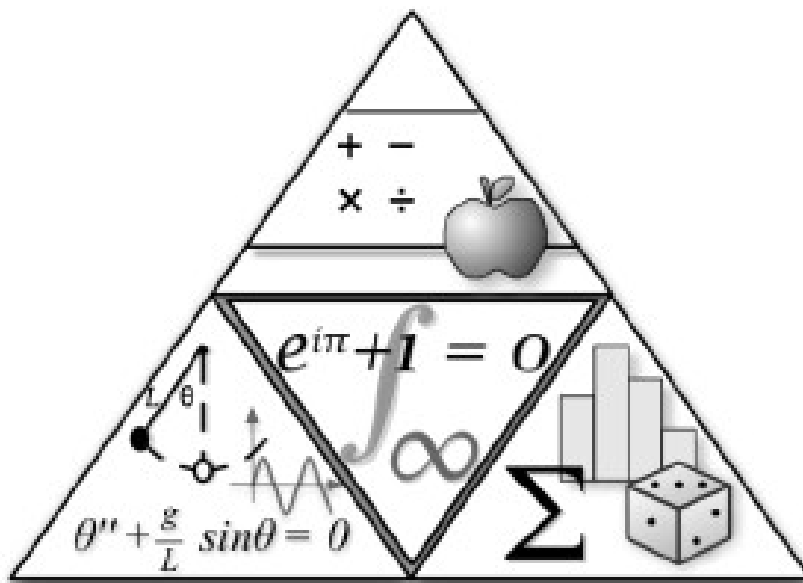
Complete Tutorial
With Picture

Arithmetic Operation
Statistics Formulas
Business Functions
Presentation with Graph

$$e^{i\pi} + 1 = 0$$

$$\theta'' + \frac{g}{L}\sin\theta = 0$$

Designed by: **Shakeel Armaan**

Microsoft Excel

4

Excel Tutorial 1
Getting Started with Excel

Objectives

- Understand the use of spreadsheets and Excel
- Learn the parts of the Excel window
- Scroll through a worksheet and navigate between worksheets
- Create and save a workbook file
- Enter text, numbers, and dates into a worksheet
- Resize, insert, and remove columns and rows
- Select and move cell ranges
- Insert formulas and functions
- Insert, delete, move, and rename worksheets
- Work with editing tools
- Preview and print a workbook

Introducing Excel

- **Microsoft Office Excel 2007** (or **Excel**) is a computer program used to enter, analyze, and present quantitative data
- A **spreadsheet** is a collection of text and numbers laid out in a rectangular grid.
  - ➤ Often used in business for budgeting, inventory management, and decision making
- **What-if analysis** lets you change one or more values in a spreadsheet and then assess the effect those changes have on the calculated values

Introducing Excel

Spreadsheet data in Excel

Exploring Excel

Exploring Excel

Description of the Excel window elements	
Feature	**Description**
Office Button	A button that provides access to work book-level features and program settings
Quick Access Toolbar	A collection of buttons that provide one-click access to commonly used commands, such as Save, Undo and Repeat
Title bar	A bar that displays the name of the active workbook and the Excel program name
Ribbon	The main set of commands organized by task into tabs and groups
Column headings	The letters that appear along the top of the worksheet window to identify the different columns in the worksheet
Workbook window	A window that displays an Excel workbook
Vertical scroll bar	A scroll bar used to scroll vertically through the workbook window
Horizontal scroll bar	A scroll bar used to scroll horizontally through the workbook window
Zoom controls	Controls for magnifying and shrinking the content displayed in the active workbook window
View shortcuts	Buttons used to change how the worksheet content is displayed – Normal, Page Layout, or Page Brea Preview view
Sheet tabs	Tabs that display the names of the worksheets in the workbook
Sheet tab scrolling buttons	Buttons to scroll the list of sheet tabs in the workbook
Row headings	The numbers that appear along the left of the worksheet window to identify the different rows in the worksheet
Select All button	A button used to select all of the cells in the active worksheet
Active Cell	The cell currently selected in the active worksheet
Name box	A box that displays the cell reference of the active cell
Formula bar	A bar that displays the value or formula entered in the active cell

Navigating a Worksheet

- Excel provides several ways to navigate a worksheet

Excel navigation keys	
Press	**To move the active cell**
↑,↓,←,→	Up, down, left or right one cell
Home	To column A of the current row
Ctrl+Home	To cell A1
Ctrl+End	To the last cell in the worksheet that contains data
Enter	Down on row or to the start of the next row of data
Shift+Enter	Up one row
Tab	One column to the right
Shift+Tab	One column to the left
Page Up, Page Down	Up or down the screen
Ctrl+Page Up, Ctrl+Page Down	To the previous or next sheet in the workbook

Planning a Workbook

- Before you begin to enter data into a workbook, you should develop a plan
 - ➢ **Planning analysis sheet**

Planning Analysis Sheet

Planning Analysis Sheet
Auther :   Amanda Dunn
Date :   01/02/2010
What problems do I want to solve?
- I need to have contact information for each RipCity Digital customer.
- I need to track how many DVDs I create for my customers.
- I need to record how much I charge my customers for my service.
- I need to determine how much revenue RipCity Digital is generating.

What data do I need?
- Each customer's name and contact information
- The date each customer order was placed
- The number of DVDs created for each customer
- The cost of creating each DVD

What calculations do I need to enter?
- The total change for each order
- The total number of DVDs I create for all orders
- The total revenue generated from all orders

What from should may solutions take?
- The customer orders should be placed in a grid with each now containing data on a different on a different customer
- Information about each customer should be placed in separate columns.
- The last column should contain the total charge for each customer.
- The last now should contain the total number of DVDs created and the total revenue from all customer orders.

Entering Text, Numbers, and Dates in Cells

- The **formula bar** displays the content of the active cell
- **Text data** is a combination of letters, numbers, and some symbols
- **Number data** is any numerical value that can be used in a mathematical calculation
- **Date** and **time data** are commonly recognized formats for date and time values

Entering Multiple Lines of Text within a Cell

- Click the cell in which you want to enter the text
- Type the first line of text
- For each additional line of text, press the Alt+Enter keys (that is, hold down the Alt key as you press the Enter key), and then type the text

Two lines of text entered within a cell
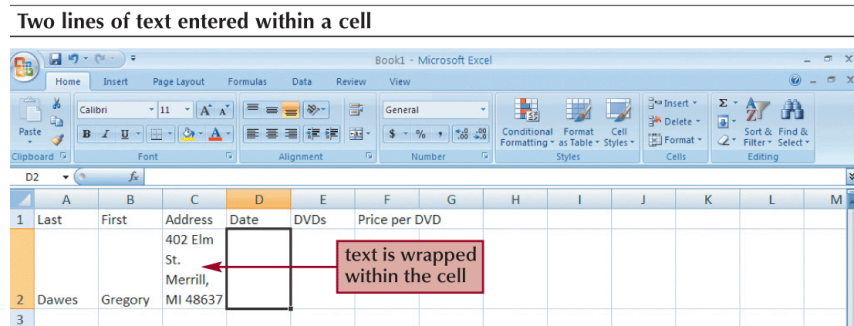
Changing Column Width and Row Height

- A **pixel** is a single point on a computer monitor or printout
- The default column width is 8.38 standard-sized characters
- Row heights are expressed in points or pixels, where a **point** is 1/72 of an inch
- **Autofitting** eliminates any empty space by matching the column to the width of its longest cell entry or the row to the height of its tallest cell entry

Changing the Column Width and Row Height

- Drag the right border of the column heading left to decrease the column width or right to increase the column width
- Drag the bottom border of the row heading up to decrease the row height or down to increase the row height
  Or
- Double-click the right border of a column heading or the bottom border of a row heading to AutoFit the column or row to the cell contents (or select one or more columns or rows, click the Home tab on the Ribbon, click the Format button in the Cells group, and then click AutoFit Column Width or AutoFit Row Height)
  Or
- Select one or more columns or rows
- Click the Home tab on the Ribbon, click the Format button in the Cells group, and then click Column Width or Row Height
- Enter the column width or row height you want, and then click the OK button

Inserting a Column or Row

- Select the column(s) or row(s) where you want to insert the new column(s) or row(s); Excel will insert the same number of columns or rows as you select
- In the Cells group on the Home tab, click the Insert button (or right-click a column or row heading or selected column and row headings, and then click Insert on the shortcut menu)

Inserting a Column or Row

New column inserted in the worksheet

1-16   New row inserted in the worksheet

Deleting and Clearing a Row or Column

- **Clearing** data from a worksheet removes the data but leaves the blank cells
- **Deleting** data from the worksheet removes both the data and the cells

Working with Cells and Cell Ranges

- A group of cells is called a **cell range** or **range**
- An **adjacent range** is a single rectangular block of cells
- A **nonadjacent range** consists of two or more distinct adjacent ranges
- A **range reference** indicates the location and size of a cell range

Selecting Cell Ranges

To select an adjacent range:
- Click the cell in the upper-left corner of the adjacent range, drag the pointer to the cell in the lower-right corner of the adjacent range, and then release the mouse button
  or
- Click the cell in the upper-left corner of the adjacent range, press the Shift key as you click the cell in the lower-right corner of the adjacent range, and then release the Shift key
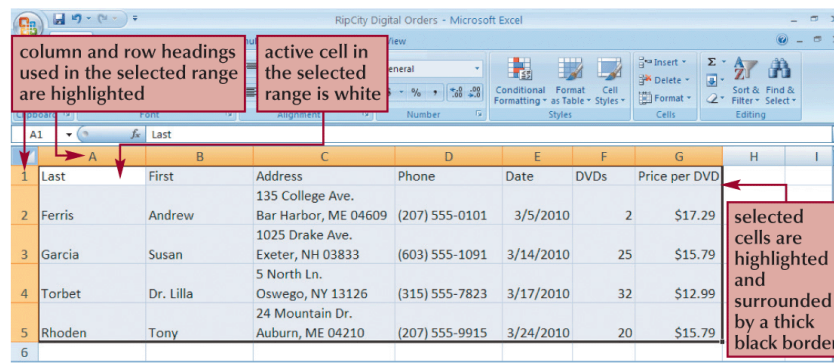
To select a nonadjacent range of cells:
- Select a cell or an adjacent range, press the Ctrl key as you select each additional cell or adjacent range, and then release the Ctrl key

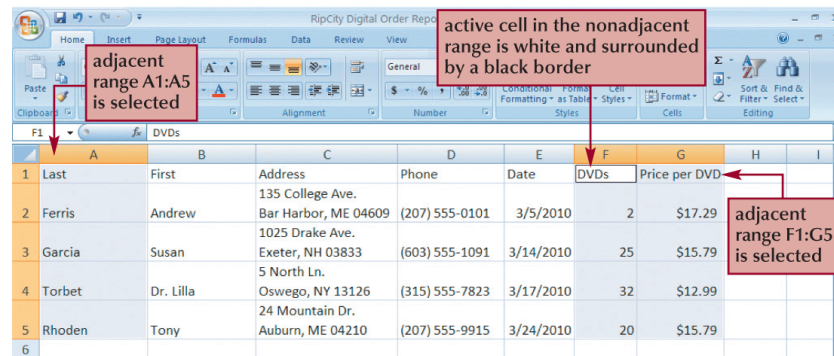**To select all the cells in a worksheet:**
- Click the Select All button located at the intersection of the row and column headings (or press the Ctrl+A keys)

Selecting Cell Ranges

Adjacent range A1:G5 selected ◀

- column and row headings used in the selected range are highlighted
- active cell in the selected range is white
- selected cells are highlighted and surrounded by a thick black border

Nonadjacent range A1:A5;F1:G5 selected ◀

- adjacent range A1:A5 is selected
- active cell in the nonadjacent range is white and surrounded by a black border
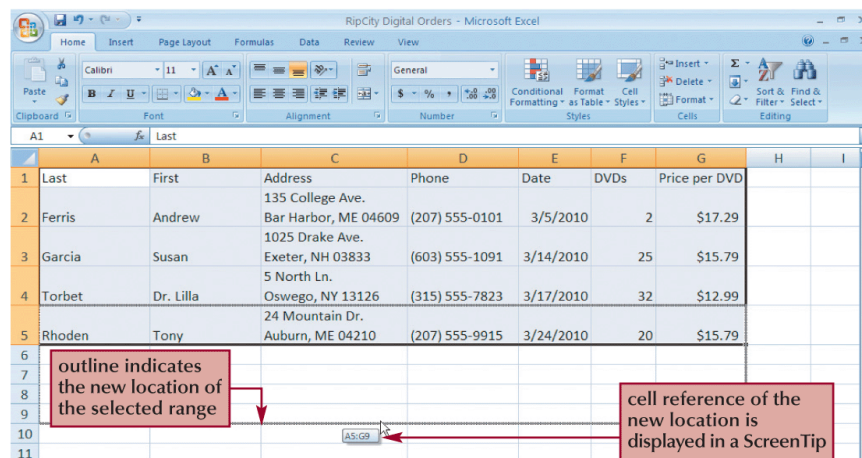- adjacent range F1:G5 is selected

Moving or Copying a Cell or Range

- Select the cell or range you want to move or copy
- Move the mouse pointer over the border of the selection until the pointer changes shape
- To move the range, click the border and drag the selection to a new location (or, to copy the range, hold down the Ctrl key and drag the selection to a new location)
  Or
- Select the cell or range you want to move or copy
- In the Clipboard group on the Home tab, click the Cut button or the Copy button (or right-click the selection, and then click Cut or Copy on the shortcut menu)
- Select the cell or upper-left cell of the range where you want to move or copy the content
- In the Clipboard group, click the Paste button (or right-click the selection, and then click Paste on the shortcut menu)
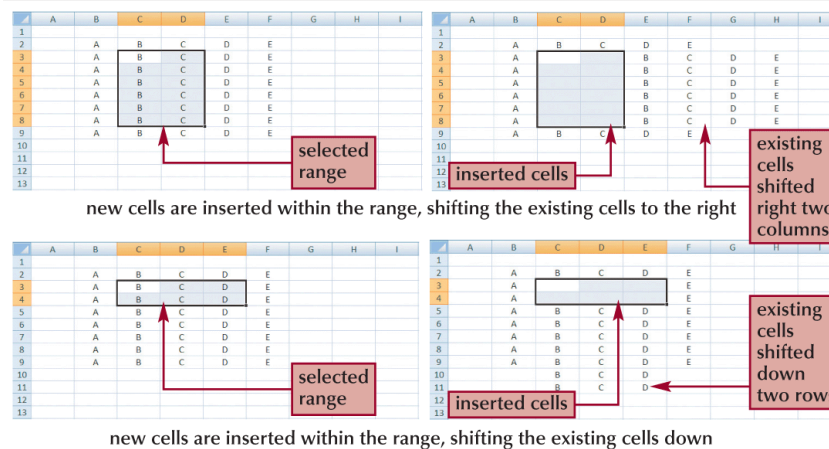
Moving or Copying a Cell or Range

Selected range being moved ◀

- outline indicates the new location of the selected range
- cell reference of the new location is displayed in a ScreenTip

Inserting and Deleting a Cell Range

Cells inserted within a cell range

new cells are inserted within the range, shifting the existing cells to the right

selected range

inserted cells

existing cells shifted right two columns

new cells are inserted within the range, shifting the existing cells down

selected range

inserted cells

existing cells shifted down two rows

Inserting or Deleting a Cell Range

- Select a range that matches the range you want to insert or delete
- In the Cells group on the Home tab, click the Insert button or the Delete button
  or
- Select the range that matches the range you want to insert or delete
- In the Cells group, click the Insert button arrow and then click the Insert Cells button or click the Delete button arrow and then click the Delete Cells command (or right-click the selected range, and then click Insert or Delete on the shortcut menu)
- Click the option button for the direction in which you want to shift the cells, columns, or rows
- Click the OK button

Entering a Formula

- A **formula** is an expression that returns a value
- A formula is written using **operators** that combine different values, returning a single value that is then displayed in the cell
  - ➢ The most commonly used operators are **arithmetic operators**
- The **order of precedence** is a set of predefined rules used to determine the sequence in which operators are applied in a calculation

Entering a Formula

Arithmetic operators			
Operation	**Arithmetic Operator**	**Example**	**Description**
Addition	+	=10+A1	Adds 10 to the value in cell A1
		=B1+B2+B3	Adds the values in cells B1, B2 and B3
Subtraction	-	=C9+B2	Subtracts the value in cell B2 from the value in cell C9
		=1-D2	Subtracts the value in cell D2 from 1
Multiplication	*	=C9*B9	Multiplies the values in cells C9 and B9
		=E5*0.06	Multiplies the value in cell E5 by 0.06
Division	/	C9/B9	Divides the value in cell C9 by the value in cell B9
		=D15/12	Divides the value in cell D15 by 12
Exponentiation	^	=B5^3	Raises the value of cell B5 to the third power
		=3^B5	Raises 3 to the value in cell B5

Entering a Formula

Order of precedence rules		
Formula (A1=50, B1=10, C1=5)	**Order of Precedence Rule**	**Result**
=A1+B1*C1	Multiplication before addition	100
=(A1+B1)*C1	Expression inside parentheses executed before expression outside	300
=A1/B1-C1	Division before subtraction	0
=A1/(B1=C1)	Expression inside parentheses executed before expression outside	10
=A1/B1*C1	Two operators at same precedence level, leftmost operator evaluated first	25
=A1/(B1*C1)	Expression inside parentheses executed before expression outside	1

Entering a Formula

- Click the cell in which you want the formula results to appear
- Type = and an expression that calculates a value using cell references and arithmetic operators
  Press the Enter key or press the Tab key to complete the formula

Entering a Formula

Formula references color coded

Copying and Pasting Formulas

- With formulas, however, Excel adjusts the formula's cell references to reflect the new location of the formula in the worksheet

Formula copied and pasted

Introducing Functions

- A **function** is a named operation that returns a value
- For example, to add the values in the range A1:A10, you could enter the following long formula:
  =A1+A2+A3+A4+A5+A6+A7+A8+A9+A10
  Or, you could use the SUM function to accomplish the same thing:
  =SUM(A1:A10)

Entering a Function

SUM function being entered

Entering Functions with AutoSum

- The **AutoSum** button quickly inserts Excel functions that summarize all the values in a column or row using a single statistic
  - Sum of the values in the column or row
  - Average value in the column or row
  - Total count of numeric values in the column or row
  - Minimum value in the column or row
  - Maximum value in the column or row

Entering Functions with AutoSum

SUM function entered with AutoSum

Inserting and Deleting a Worksheet

- To insert a new worksheet into the workbook, right-click a sheet tab, click Insert on the shortcut menu, select a sheet type, and then click the OK button
- You can delete a worksheet from a workbook in two ways:
  - You can right-click the sheet tab of the worksheet you want to delete, and then click Delete on the shortcut menu
  - You can also click the Delete button arrow in the Cells group on the Home tab, and then click Delete Sheet

Renaming a Worksheet

- To rename a worksheet, you double-click the sheet tab to select the sheet name, type a new name for the sheet, and then press the Enter key
- Sheet names cannot exceed 31 characters in length, including blank spaces
- The width of the sheet tab adjusts to the length of the name you enter

Moving and Copying a Worksheet

- You can change the placement of the worksheets in a workbook
- To reposition a worksheet, you click and drag the sheet tab to a new location relative to other worksheets in the workbook
- To copy a worksheet, just press the Ctrl key as you drag and drop the sheet tab

Editing Your Work

- To edit the cell contents, you can work in **editing mode**
- You can enter editing mode in several ways:
  - double-clicking the cell
  - selecting the cell and pressing the F2 key
  - selecting the cell and clicking anywhere within the formula bar

Editing Your Work

Using Find and Replace

- You can use the **Find** command to locate numbers and text in the workbook and the **Replace** command to overwrite them
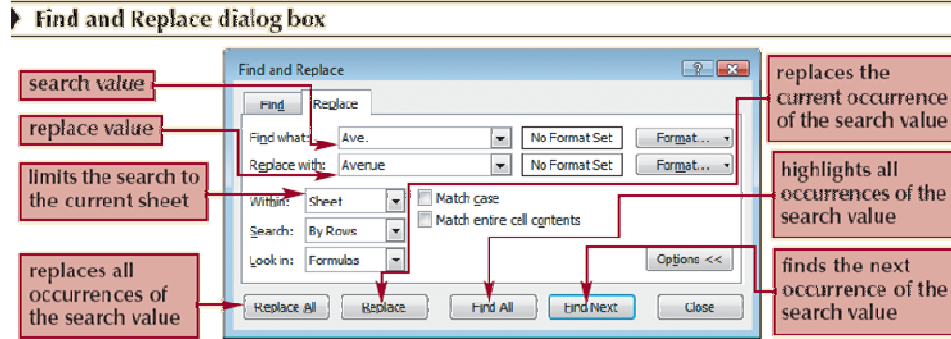
Using the Spelling Checker

- The **spelling checker** verifies the words in the active worksheet against the program's dictionary
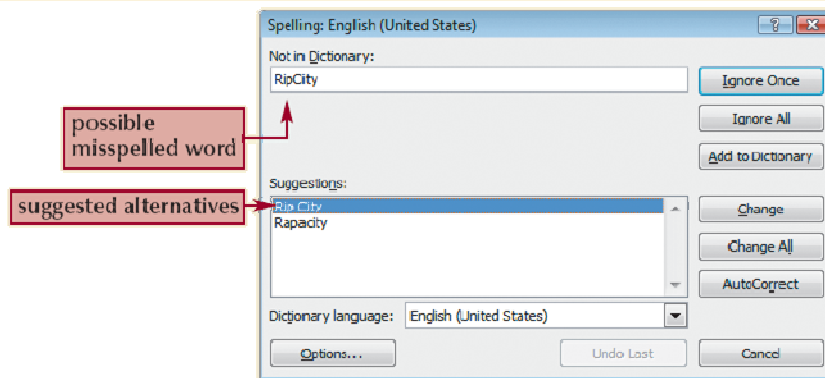
Changing Worksheet Views

- You can view a worksheet in three ways:
  - ➤ **Normal view** simply shows the contents of the worksheet
  - ➤ **Page Layout view** shows how the worksheet will appear on the page or pages sent to the printer
  - ➤ **Page Break Preview** displays the location of the different page breaks within the worksheet

Changing Worksheet Views

Changing Worksheet Views

Worksheet displayed in Page Break Preview

Working with Portrait and Landscape Orientation

- In **portrait orientation**, the page is taller than it is wide
- In **landscape orientation**, the page is wider than it is tall
- By default, Excel displays pages in portrait orientation

Working with Portrait and Landscape Orientation

- To change the page orientation:
  - ➢ Click the **Page Layout** tab on the Ribbon
  - ➢ In the Page Setup group, click the **Orientation** button, and then click **Landscape**
  - ➢ The page orientation switches to landscape

Printing the Workbook

- You can print the contents of your workbook by using the Print command on the Office Button
- The Print command provides three options:
  - ➢ You can open the Print dialog box from which you can specify the printer settings, including which printer to use, which worksheets to include in the printout, and the number of copies to print
  - ➢ You can perform a Quick Print using the print options currently set in the Print dialog box
  - ➢ Finally, you can preview the workbook before you send it to the printer

Viewing and Printing Worksheet Formulas

- You can view the formulas in a workbook by switching to **formula view**, a view of the workbook contents that displays formulas instead of the resulting values
- To change the worksheet to formula view, press the **Ctrl+`** keys
- **Scaling** a printout reduces the width and the height of the printout to fit the number of pages you specify by shrinking the text size as needed

Viewing and Printing Worksheet Formulas

Worksheet in formula view

	D		G	H
1	text and numbers remain unchanged	underlying date values displayed rather than the formatted dates	formulas displayed instead of the resulting values	
2				
3				
4				
5	Phone	Date	DVDs	Price per DVD	Charge
6	(207) 555-0101	40242	2	18.29	=F6*G6
7	(603) 555-1091	40251	25	15.79	=F7*G7
8	(315) 555-7823	40254	32	12.99	=F8*G8
9	(207) 555-9915	40261	20	15.79	=F9*G9
10		TOTAL	=SUM(F6:F9)		=SUM(H6:H9)
11					
12					

Viewing and Printing Worksheet Formulas

Printout scaled to one page ◄

printout width and height set to a single page

text size reduced to fit the worksheet on one page

zoom level set to 50%

Excel Tutorial 2
Formatting a Workbook

Objectives
- Format text, numbers, and dates
- Change font colors and fill colors
- Merge a range into a single cell
- Apply a built-in cell style
- Select a different theme
- Apply a built-in table style
- Add conditional formats to tables with highlight rules and data bars
- Hide worksheet rows
- Insert print titles, set print areas, and insert page breaks
- Enter headers and footers

Formatting Workbooks
- **Formatting** is the process of changing a workbook's appearance by defining the fonts, styles, colors, and decorative features
- A **theme** is a collection of formatting that specifies the fonts, colors, and graphical effects used throughout the workbook
- As you work, **Live Preview** shows the effects of formatting options on the workbook's appearance before you apply them

Formatting Text
- The appearance of text is determined by its **typeface**, which is the specific design used for the characters
  - **Font**
    - **Serif fonts**
    - **Sans serif fonts**
    - **Theme font**
    - **Non-theme font**
  - **Font Style**
  - **Font Size**
    - Measured in **points**

Font list   Figu
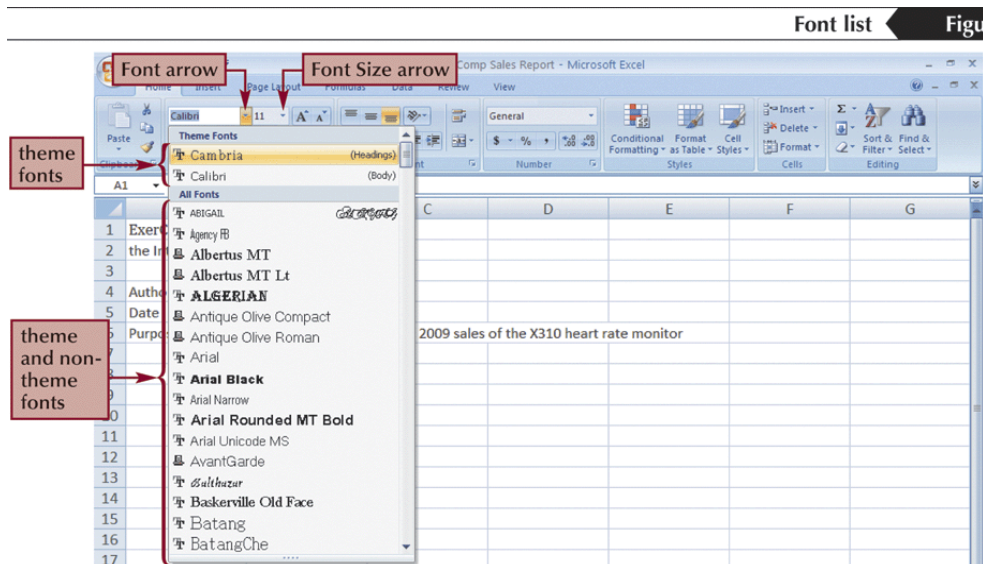
Working with Color

- **Theme colors** are the 12 colors that belong to the workbook's theme
- **Standard** and **custom colors**
- Apply a color by selecting a cell or range of cells, clicking the Font Color or Fill Color button arrow, and then selecting an appropriate color
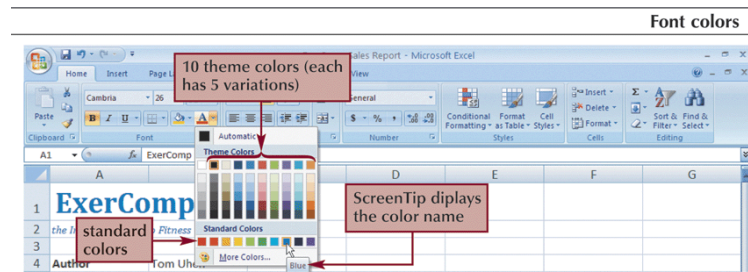
Formatting Text Selections

- The **Mini toolbar** appears when you select text and contains buttons for commonly used text formats
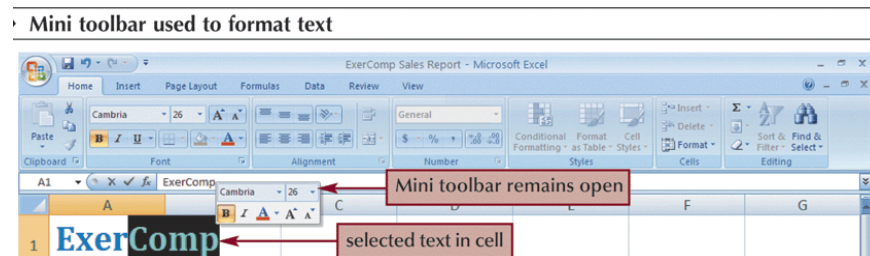
Setting a Background Image

- You can use a picture or image as the background for all the cells in a worksheet
- Click the **Page Layout** tab on the Ribbon
- Click the **Background** button
- Locate the background, and then click the **Insert** button
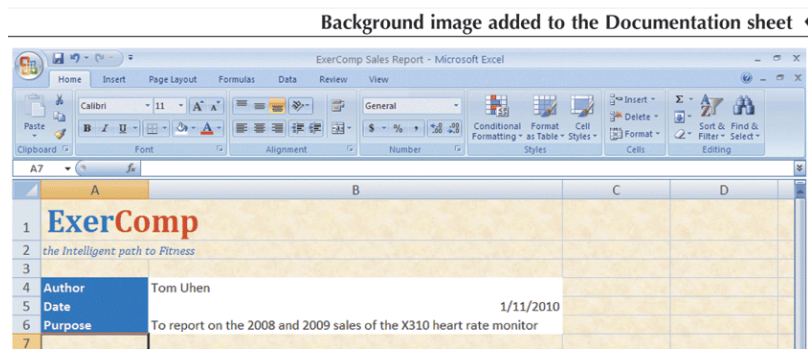
Formatting Data

- By default, values appear in the **General number format**, which, for the most part, displays numbers exactly as you enter them
- The Number group on the Home tab has buttons for formatting the appearance of numbers
- **Comma style** button
- **Decrease Decimal** button
- **Percent Style** button
- **Increase Decimal** button
- **Accounting Number Format** button

Formatting Data

2-8 Worksheet after formatting numbers

Formatting Dates and Times

- Although dates and times in Excel appear as text, they are actually numbers that measure the interval between the specified date and time and January 1, 1900 at 12:00 a.m.
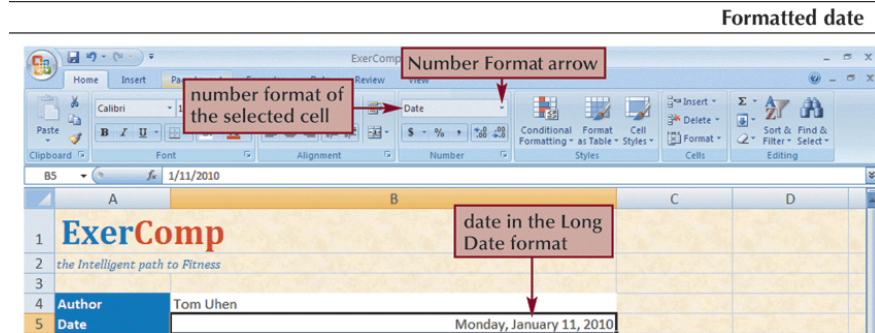
Aligning Cell Content

- In addition to left and right alignments, you can change the vertical and horizontal alignments of cell content to make a worksheet more readable
- Alignment buttons are located on the Home tab

Alignment buttons	
Buttons	**Description**
	Aligns the cell content with the cell's top edge
	Vertically centers the cell content within the cell
	Aligns the cell content with the cell's bottom edge
	Aligns the cell content with the cell's left edge
	Horizontally centers the cell content within the cell
	Aligns the cell content with the cell's right edge
	Decreases the size of the indentation used in the cell
	Increases the size of the indentation used in the cell
	Rotates the cell content to an angle within the cell
	Forces the cell text to wrap within the cell borders
	Merges the selected cells into a single cell

Indenting Cell Content

- You increase the indentation by roughly one character each time you click the Increase Indent button in the Alignment group on the Home tab

Centered and indented text

Merging Cells

- One way to align text over several columns or rows is to **merge**, or combine, several cells into one cell

Merged range with centered text

Rotating Cell Content

- To save space or to provide visual interest to a worksheet, you can rotate the cell contents so that they appear at any angle or orientation
- Select the range
- In the Alignment group, click the **Orientation** button and choose a proper rotation

Rotating Cell Content

Merged and rotated cell text

Adding Cell Borders

- You can add borders to the left, top, right, or bottom of a cell or range, around an entire cell, or around the outside edges of a range using the **Border button arrow**

Borders added to cells

Working with the
Format Cells Dialog Box

- The Format Cells dialog box has six tabs, each focusing on a different set of formatting options

Number tab in the Format Cells dialog box

Border tab in the Format Cells dialog box
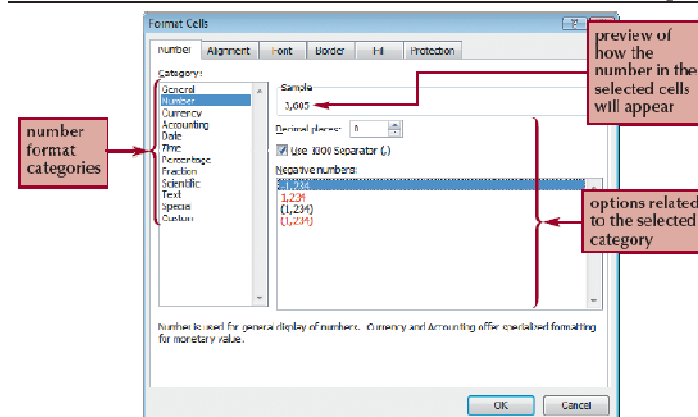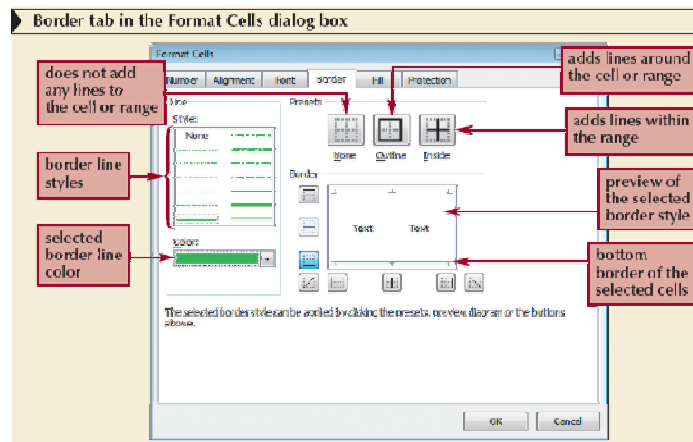
Copying Formats
with the Format Painter

- The **Format Painter** copies the formatting from one cell or range to another cell or range, without duplicating any of the data
- Select the range containing the format you wish to copy
- Click the **Format Painter** button on the Home tab
- Click the cell to which you want to apply the format

Copying Formats with the
Paste Options Button

Copying Formats with Paste Special

Paste Special dialog box

Applying Styles

- A **style** is a collection of formatting
- Select the cell or range to which you want to apply a style
- In the Styles group on the Home tab, click the Cell Styles button
- Point to each style in the Cell Styles gallery to see a Live Preview of that style on the selected cell or range
- Click the style you want to apply to the selected cell or range

Applying Styles
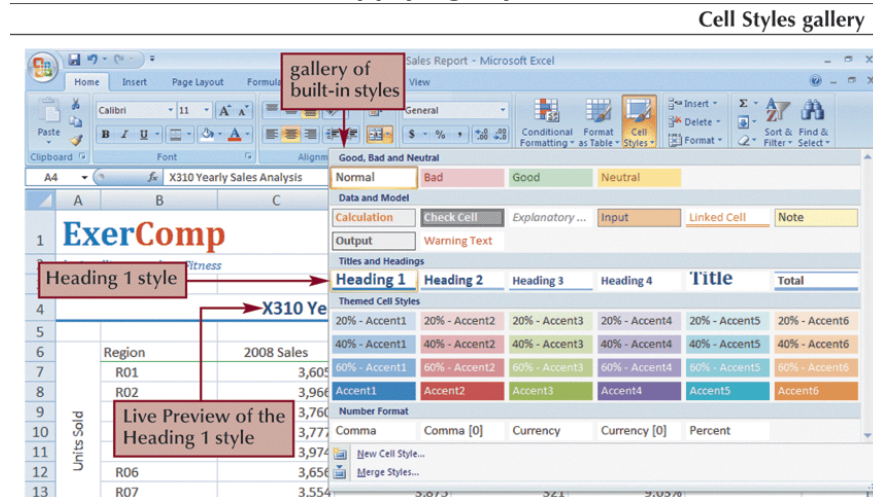
Working with Themes

- The appearance of these fonts, colors, and cell styles depends on the workbook's current theme
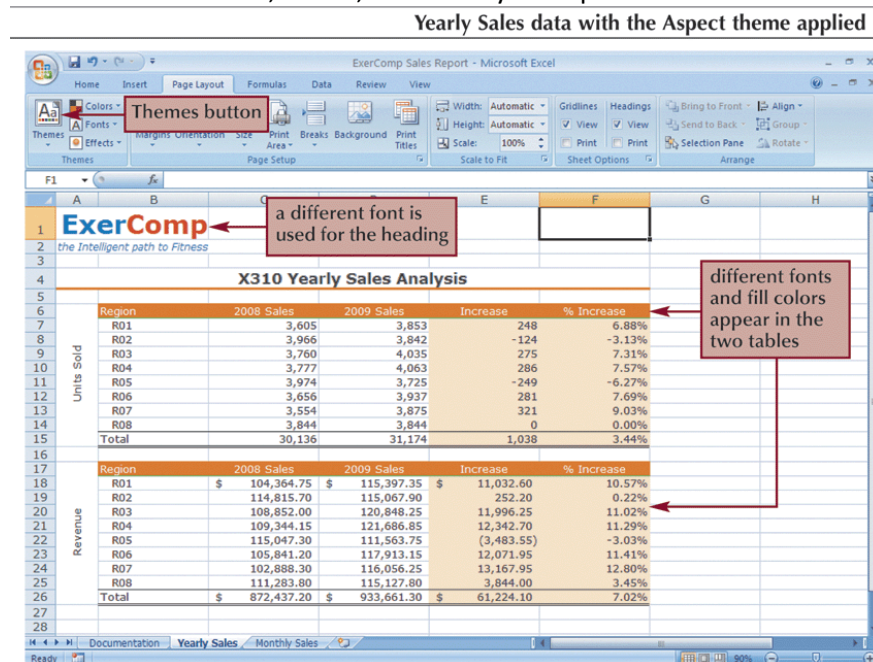
Applying a Table Style
to an Existing Table

- You can treat a range of data as a distinct object in a worksheet known as an **Excel table**
- Select the range to which you want to apply the table style
- In the Styles group on the Home tab, click the Format as Table button
- Click a table style in the Table Style gallery

Applying a Table Style
to an Existing Table

Banded rows effect applied manually and with a table style

original table with banded rows

fill color is pink

fill color remains pink, losing the banded rows effect

fill color is changed to white, retaining the banded rows effect

table formatted with a table style retains banded rows after rows are deleted

table formatted manually loses banded rows after rows are deleted

Selecting Table Style Options

- After you apply a table style, you can choose which table elements you want included in the style

Revised table style

selected table elements

table styles show formatting for selected elements

banded rows removed

header row formatted

last column formatted

X310 Monthly Sales Analysis

Introducing Conditional Formats

- A **conditional format** applies formatting only when a cell's value meets a specified condition
- Select the range or ranges to which you want to add data bars.
- In the Styles group on the Home tab, click the Conditional Formatting button, point to Data Bars, and then click a data bar color
  Or
- Select the range in which you want to highlight cells that match a specified rule
- In the Styles group, click the Conditional Formatting button, point to Highlight Cells Rules or Top/Bottom Rules, and then click the appropriate rule
- Select the appropriate options in the dialog box, and then click the OK button

Adding Data Bars

- A **data bar** is a horizontal bar added to the background of a cell to provide a visual indicator of the cell's value
- Select the cell(s)
- In the Styles group on the Home tab, click the **Conditional Formatting** button, point to **Data Bars**, and then click the DataBar option you wish to apply

Adding Data Bars

Figure 2-27   Data bars added to the regional monthly sales data

Hiding Worksheet Data

- Hiding rows, columns, and worksheets is an excellent way to conceal extraneous or distracting information
- In the Cells group on the Home tab, click the **Format** button, point to **Hide & Unhide**, and then click your desired option

Changing the Page Orientation
to Landscape

- Click the **Page Layout** tab on the Ribbon
- In the Page Setup group, click the **Orientation** button, and then click **Landscape**

Defining the Print Area

- By default, all parts of the active worksheet containing text, formulas, or values are printed
- You can select the cells you want to print, and then define them as a **print area**
- Select the range, in the Page Setup group on the Page Layout tab, click the **Print Area** button, and then click **Set Print Area**

Inserting Page Breaks

- Excel prints as much as fits on a page and then inserts a **page break** to continue printing the remaining worksheet content on the next page
- **Manual page breaks** specify exactly where the page breaks occur

Setting and Removing Page Breaks

To set a page break:
- Select the first cell below the row where you want to insert a page break
- In the Page Setup group on the Page Layout tab, click the Breaks button, and then click Insert Page Break

To remove a page break:
- Select any cell below or to the right of the page break you want to remove
- In the Page Setup group on the Page Layout tab, click the Breaks button, and then click Remove Page Break (or click Reset All Page Breaks to remove all the page breaks from the worksheet)

Setting and Removing Page Breaks

Adding Print Titles

- You can repeat information, such as the company name, by specifying which rows or columns in the worksheet act as **print titles**, information that prints on each page
- In the Page Setup group on the Page Layout tab, click the **Print Titles** button
- Click the **Rows to repeat at top** box, move your pointer over the worksheet, and then select the range
- Click the **OK** button

Adding Print Titles

Adding Headers and Footers
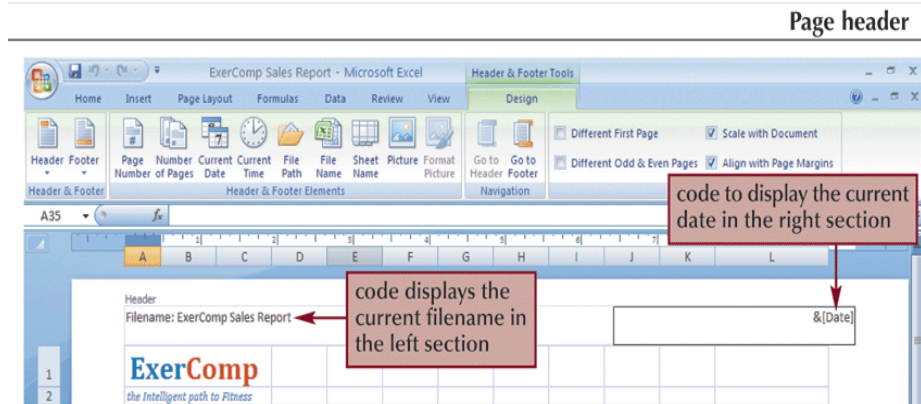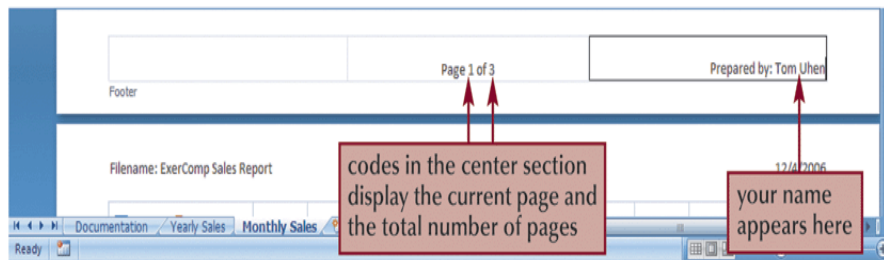
- A **header** is the text printed in the top margin of each page
- A **footer** is the text printed in the bottom margin of each page
- Scroll to the top of the worksheet, and then click the left section of the header directly above cell A1 to display the Header & Footer Tools contextual tab

Adding Headers and Footers

Excel Tutorial 3
Working with Formulas and Functions

Objectives

- Copy formulas
- Build formulas containing relative, absolute, and mixed references
- Review function syntax
- Insert a function with the Insert Function dialog box
- Search for a function
- Type a function directly in a cell
- Use AutoFill to fill in a formula and complete a series
- Enter the IF logical function
- Insert the date with the TODAY function
- Calculate monthly mortgage payments with the PMT financial function

Using Relative References

Formula using a relative reference

original formula with a relative reference

formula copied to a new range (column and row references shift based on cell location)

formula results

Using Absolute References

Formula using an absolute reference

original formula with an absolute reference

formula copied into a new range (column and row references fixed regardless of cell location)

formula results

Using Mixed References

Formulas using mixed references

Entering Relative, Absolute, and Mixed References

- To enter a relative reference, type the cell reference as it appears in the worksheet. For example, enter B2 for cell B2
- To enter an absolute reference, type $ (a dollar sign) before both the row and column references. For example, enter B2
- To enter a mixed reference, type $ before either the row or column reference. For example, enter $B2 or B$2

  or

- Select the cell reference you want to change
- Press the F4 key to cycle the reference from relative to absolute to mixed and then back to relative

Understanding Function Syntax

- Every function has to follow a set of rules, or **syntax**, which specifies how the function should be written

  -- Arguments

Categories of Excel Functions	
Category	Contains functions that
Cube	Retrieve data from multidimensional databases involving online analytical processing or OLAP
Database	Retrieve and analyze data stored in databases
Date & Time	Analyze or create date and time values and time intervals
Engineering	Analyze engineering problems
Financial	Have financial applications
Information	Return information about the format, location, or contents of worksheet cells
Logical	Return logical (true-false) values
Lookup & Reference	Look up and return data matching a set of specified conditions from a range
Math & Trig	Have math and trigonometry applications
Statistical	Provide statistical analyses of a set of data
Text	Return text values or evaluate text

Understanding Function Syntax

Math, Trig and Statistical functions		
Function	**Category**	**Description**
AVERAGE(number1[,number2, number3, …])	Statistical	Calculates the average of a collection of numbers, where *number1, number2* and so forth are either numbers or cell references. Only *number1* is required. For more than one cell reference or to enter numbers directly into the function, use the optional arguments *number2, number3* and so forth.
COUNT (value1 [,value2, value3, …])	Statistical	Counts how many cells in a range contain numbers, where *value1, value2,* and so forth are text, numbers, or cell references. Only *value1* is required. For more than one cell reference or to enter numbers directly into the function, use the optional arguments *value2, value3,* and so forth.
COUNTA(value1 [,value2, value3, …])	Statistical	Counts how many cells are not empty in range *value1, value2* and so forth, or how many numbers are listed within *value1, value2,* and so forth.
INT (number)	Math & Trig	Displays the integer portion of a number, *number*.
MAX (number1[,number2, number3, …])	Statistical	Calculates the maximum value of collection of numbers, where *number1, number2*, and so forth are either numbers or cell references.
MEDIAN (number1[,number2, number3, …])	Statistical	Calculates the median, or middle, value of a collection of numbers, where *number1, number2,* and so forth are either numbers or cell references.
MIN (number1[,number2, number3, …])	Statistical	Calculates the minimum value of a collection of numbers, where *number1, number2,* and so forth are either numbers or cell references.
RAND ()	Math & Trig	Returns a random number between 0 and 1.
ROUND (number, num_digits)	Math & Trig	Rounds a number to a specified number of digits, where *number* is the number you want to round and *num_digits* specifies how many digits to which you want to round the number.
SUM (number1[,number2, number3, …])	Math & Trig	Adds a collection of numbers, where *number1, number2,* and so forth are either numbers or cell references.

Inserting a Function

- Click the Formulas tab on the Ribbon
- To insert a function from a specific category, click the appropriate category button in the Function Library group. To search for a function, click the Insert Function button in the Function Library group, enter a description of the function, and then click the Go button
- Select the appropriate function from the list of functions
- Enter the argument values in the Function Arguments dialog box, and then click the OK button

Inserting a Function

Figure 3-8 Function Arguments dialog box

Tip
You can click the Collapse Dialog Box button to shrink the Function Arguments dialog box to see more of the worksheet, select the range, and then click the Expand Dialog Box button to restore the dialog box.

Inserting a Function

Figure 3-10 Insert Function dialog box

Tip
You can also open the Insert Function dialog box by clicking the Insert Function button on the formula bar.

Typing a Function

- As you begin to type a function name within a formula, a list of functions that begin with the letters you typed appears

Working with AutoFill

- **AutoFill** copies content and formats from a cell or range into an adjacent cell or range
- Select the cell or range that contains the formula or formulas you want to copy
- Drag the fill handle in the direction you want to copy the formula(s) and then release the mouse button
- To copy only the formats or only the formulas, click the AutoFill Options button and select the appropriate option
  Or
- Select the cell or range that contains the formula or formulas you want to copy
- In the Editing group on the Home tab, click the Fill button
- Select the appropriate fill direction and fill type (or click Series, enter the desired fill series options, and then click the OK button)
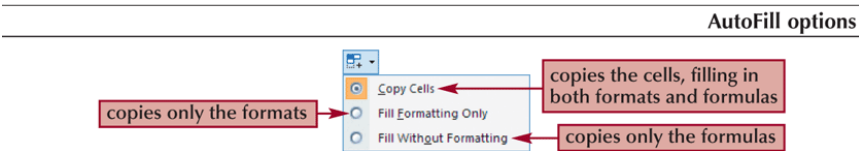
Working with AutoFill

Using the AutoFill Options Button

- By default, AutoFill copies both the formulas and the formats of the original range to the selected range
- You can specify what is copied by using the AutoFill Options button that appears after you release the mouse button

Filling a Series

- AutoFill can also be used to create a series of numbers, dates, or text based on a pattern

Filling a Series

AutoFill applied to different series		
Type	**Initial Entry**	**Extended Series**
Values	1, 2, 3	4, 5, 6, ….
	2, 4, 6	8, 10, 12, ….
Dates Times	Jan	Feb, Mar, Apr,….
	January	February, March, April, ….
	15-Jan, 15-Feb	15-Mar, 15-Apr, 15-May, ….
	12/30/2010	12/31/2010, 1/1/2011, 1/2/2011, ….
	12/31/2010, 1/31/2011	2/28/2011, 3/31/2011, 4/30/2011, ….
	Mon	Tue, Wed, Thu, ….
	Monday	Tuesday, Wednesday, Thursday, ….
	11:00 AM	12:00PM, 1:00PM, 2:00PM, ….
Patterned Text	1st period	2nd period, 3rd period, 4th period, ….
	Region 1	Region 2, Region 3, Region 4, ….
	Quarter 3	Quarter 4, Quarter 1, Quarter 2, ….
	Qtr 3	Qtr4, Qtr1, Qtr2, ….

Creating a Series with AutoFill

- Enter the first few values of the series into a range
- Select the range, and then drag the fill handle of the selected range over the cells you want to fill
  Or
- Enter the first few values of the series into a range
- Select the entire range into which you want to extend the series
- In the Editing group on the Home tab, click the Fill button, and then click Down, Right, Up, Left, Series, or Justify to set the direction you want to extend the series

Working with Logical Functions

- A **logical function** is a function that works with values that are either true or false
- The **IF function** is a logical function that returns one value if the statement is true and returns a different value if the statement is false
- IF(*logical_test*, *value_if_true*, [*value_if_false*])

Working with Logical Functions

- A **comparison operator** is a symbol that indicates the relationship between two values

Comparison operators		
Operator	**Statement**	**Tests Whether**
=	A1 = B1	The value in cell A1 *is equal to* the value *in cell* B1
>	A1 > B1	The value in cell A1 *is greater than* the value *in cell* B1
<	A1 < B1	The value in cell A1 *is less than* the value *in cell* B1
>=	A1 >= B1	The value in cell A1 *is greater than or equal to* the value *in cell* B1
<=	A1 <= B1	The value in cell A1 *is less than or equal to* the value *in cell* B1
<>	A1 <> B1	The value in cell A1 *is not equal to* the value *in cell* B1

Working with Logical Functions

- =IF(A1="YES", "DONE", "RESTART")
- =IF(A1="MAXIMUM", MAX(B1:B10), MIN(B1:B10))
- =IF(D33>0, K10, 0)

Working with Logical Functions

Function arguments for the IF function

Working with Date Functions

Date Functions	
Function	**Description**
DATE (*year, month, day*)	Creates a date value for the date represented by the *year*, *month* and *day* arguments
DAY (*day*)	Extracts the day of the month from the *date* value
MONTH (*date*)	Extracts the month number from the *date* value where 1=January, 2=February, and s forth
YEAR(*date*)	Extracts the year number from the *date* value
WEEKDAY (*date,[return_type]*)	Calculates the day of the week from the *date* value, where 1=Sunday, 2=Monday, and so forth; to choose a different numbering scheme, set the optional *return_type* value to "1" (1=Sunday, 2=Monday, …) "2" (1=Monday, 2=Tuesday, …), or "3" (0=Monday, 1=Tuesday, …)
NOW ( )	Displays the current date and time
TODAY ( )	Displays the current date

Working with Financial Functions

Financial functions for loans and investments	
Function	**Description**
FV *(rate, nper, pmt,[pv=0][type=0])*	Returns the future value of an investment, where rate is the interest rate per period, *nper* is the total number of periods, *pmt* is the payment in each period, *pv* is the present value of the investment, and type indicates whether payments should be made at the end of the period (0) or the beginning of the period (1)
PMT (rate, nper, pv, [fv=0][type=0])	Calculates the payments required each period on a loan or investment
IPMT (rate, per, nper, pv [fv=0][type=0])	Calculates the amount of a loan payment devoted to paying the loan interest, where *per* is the number of the payment period

PPMT (rate, per, nper, pv [fv=0][type=0])	Calculates the amount of a loan payment devoted to paying off the principal of a loan, where *per* is the number of the payment period
PV (rate, nper, pmt, [fv=0][type=0])	Calculates the present value of a loan or investment based on periodic, constant payments
NPER (rate, pmt, pv, [fv=0][type=0])	Calculates the number of periods required to pay off a loan or investment
RATE (nper, pmt, pv, [fv=0][type=0])	Calculates the interest rate of a loan or investment based on periodic, constant payments

Using the PMT Function to Determine a Monthly Loan Payment

- For loan or investment calculations, you need to know the following information:
  - ➢ The annual interest rate
  - ➢ The payment period, or how often payments are due and interest is compounded
  - ➢ The length of the loan in terms of the number of payment periods
  - ➢ The amount being borrowed or invested
- PMT(*rate*, *nper*, *pv*, [*fv*=0] [*type*=0])

Using the PMT Function to Determine a Monthly Loan Payment

Function Arguments dialog box for the PMT function

Using the PMT Function to Determine a Monthly Loan Payment

Monthly payment for a $160,000 loan

# Excel Tutorial 4
Working with Charts and Graphics

Objectives

- Create an embedded chart
- Work with chart titles and legends
- Create and format a pie chart
- Work with 3D charts
- Create and format a column chart
- Create and format a line chart
- Use custom formatting with chart axes
- Work with tick marks and scale values
- Create and format a combined chart
- Insert and format a graphic shape
- Create a chart sheet

Creating Charts

- A **chart**, or **graph**, is a visual representation of a set of data
- Select the data source with the range of data you want to chart
- In the Charts group on the Insert tab, click a chart type, and then click a chart subtype in the Chart gallery
- In the Location group on the Chart Tools Design tab, click the Move Chart button to place the chart in a chart sheet or embed it into a worksheet

Creating Charts

Ajita's proposed summary report
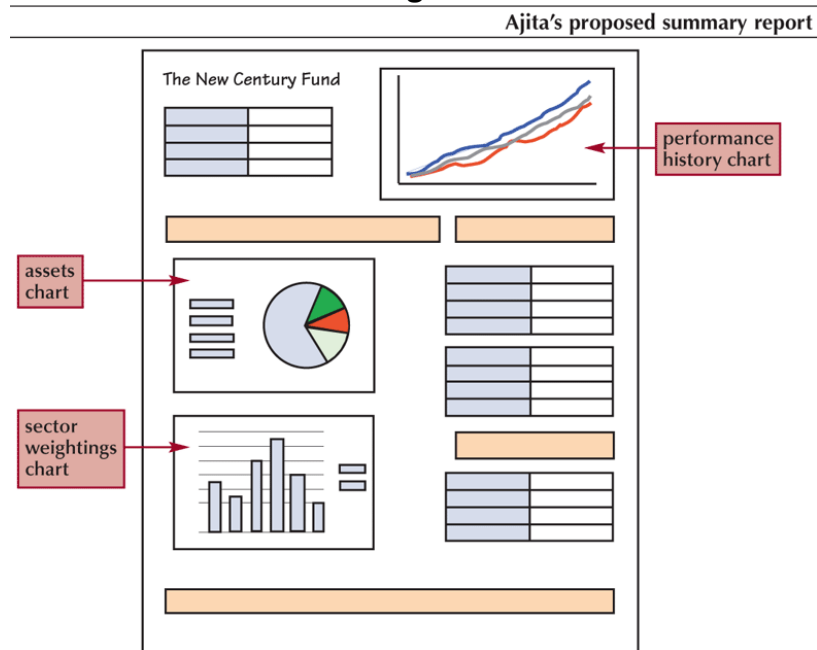
Selecting a Data Source

- The **data source** is the range that contains the data you want to display in the chart
- ➢ **Data series**
- ➢ **Series name**
- ➢ **Series values**
- ➢ **Category values**

Data source selected for the assets chart
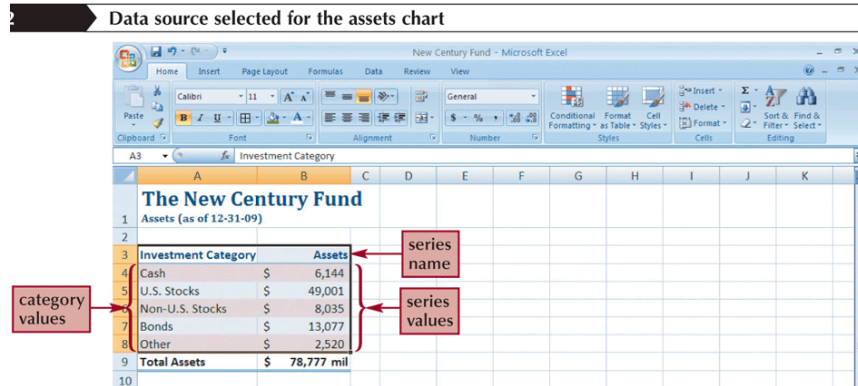
Selecting a Chart Type

Categories of Excel Chart types	
Chart Type	Description
Column	Compares values from different categories. Values are indicated by the height of the columns.
Line	Compares values from different categories. Values are indicated by the height of the line. Often used to show trends and changes over time.
Pie	Compares relative values of different categories to the whole. Values are indicated by the area of the pie slices.
Bar	Compares values from different categories. Values are indicated by the length of the bars.
Area	Compares values from different categories. Similar to the line chart except that areas under the lines contain a fill color.
XY (Scatter)	Show the patterns or relationship between two or more sets of values. Often used in scientific studies and statistical analyses.
Stock	Displays stock market data, including the high, low, opening and closing prices of a stock.
Surface	Compares three sets of values in a three-dimensional chart.
Doughnut	Compares relative values of different categories to the whole. Similar to the pie chart except that it can display multiple sets of data.
Bubble	Shows the patterns or relationship between two or more sets of values. Similar to the XY (Scatter) chart except the size of the data marker is determined by a third value.
Radar	Compares a collection of values from several different data sets.

Selecting a Chart Type

- Click the **Insert** tab on the Ribbon
- In the Charts group, click the **Pie** button

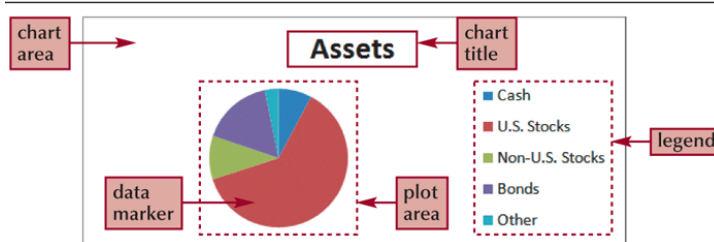Pie chart inserted in the Assets sheet
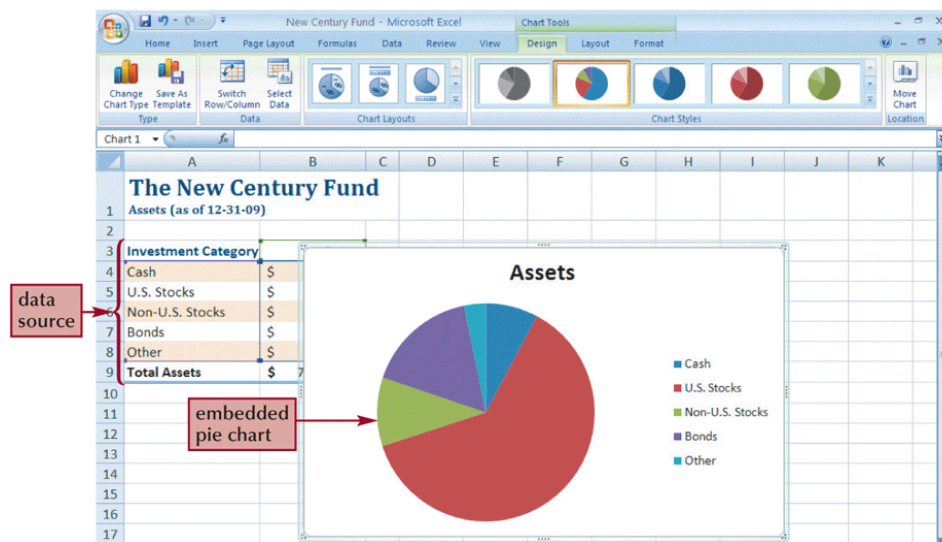
Moving and Resizing Charts

- By default, a chart is inserted as an **embedded chart**, which means the chart is placed in a worksheet next to its data source
- You can also place a chart in a **chart sheet**
- In the Location group on the Chart Tools Design tab, click the **Move Chart** button

Move Chart dialog box

places the chart in a chart sheet

embeds the chart in the selected worksheet
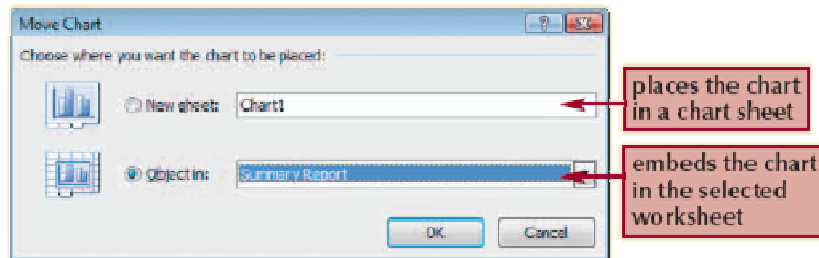
Selecting Chart Elements

Common chart elements

chart area
chart title
legend
data marker
plot area

Choosing a Chart Style and Layout

Choosing a Chart Style and Layout

Pie chart layouts		
Layout	**Name**	**Pie Chart with**
	Layout 1	Chart title, labels and percentages
	Layout 2	Chart title, percentages and legend above the pie
	Layout 3	Legend below the pie
	Layout 4	Label in pie slices
	Layout 5	Chart title and labels in pie slices
	Layout 6	Chart title, percentages and legend to the right of the pie
	Layout 7	Legend to the right of the pie

Working with the Chart Title and Legend

- Click the chart title to select it
- Type the chart title, and then press the **Enter** key
- Click the **Chart Tools Layout** tab on the Ribbon
- In the Labels group, click the **Legend** button, and then click the desired legend position

Working with the Chart Title and Legend

Formatting a Pie Chart

- Click the chart to select it
- In the Labels group on the Chart Tools Layout tab, click the **Data Labels** button, and then click **More Data Label Options**
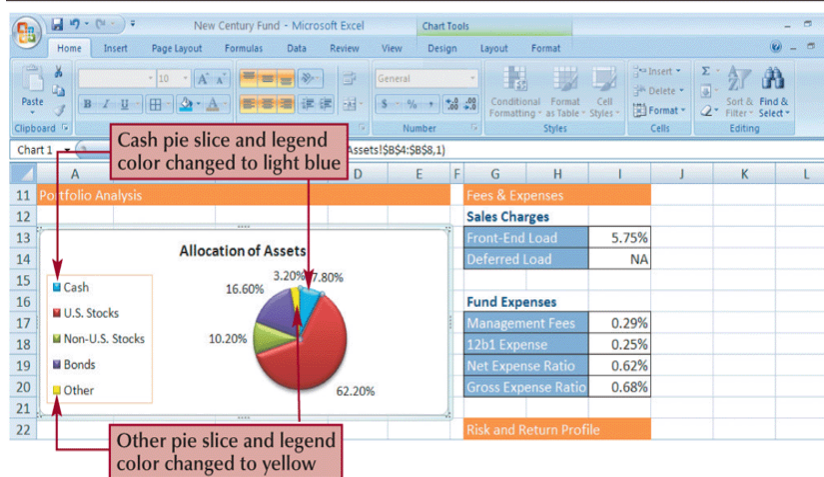

Label Options in the Format Data Labels dialog box
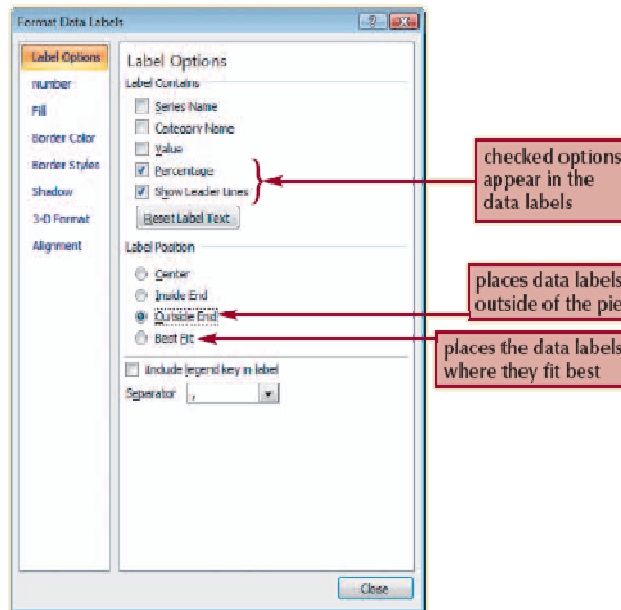
Setting the Pie Slice Colors

- In pie charts with legends, it's best to make the slice colors as distinct as possible to avoid confusion
- Click the pie to select the entire data series, and then click the slice you wish to change
- Change the fill color



Pie slices with new colors

Working with 3D Options

- To increase the 3D effect, you need to rotate the chart
- Click the **Chart Tools Layout** tab on the Ribbon, and then, in the Background group, click the **3-D Rotation** button

Format Chart Area dialog box
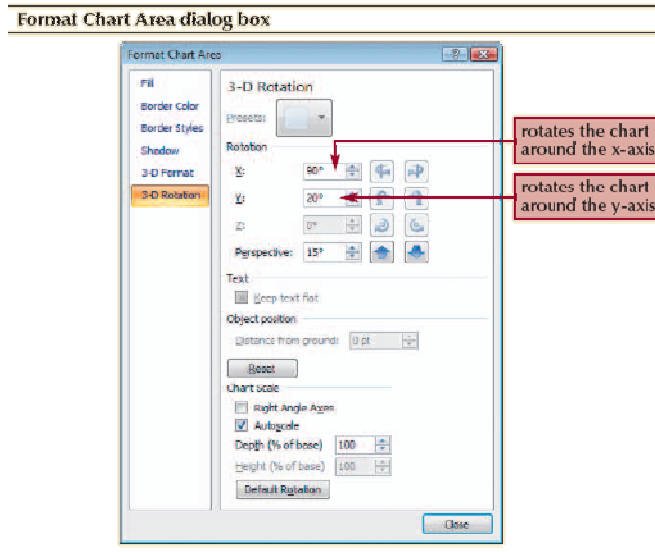
Creating a Column Chart

- A **column chart** displays values in different categories as columns; the height of each column is based on its value
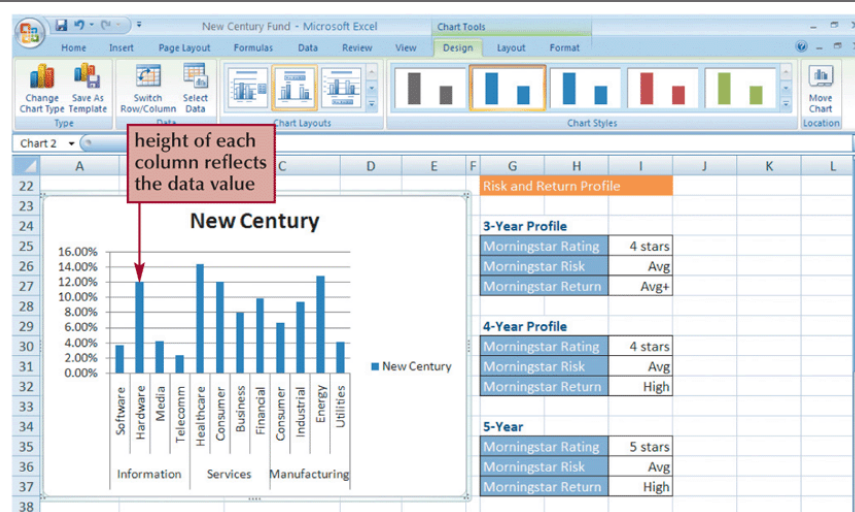- The **bar chart** is a column chart turned on its side, so each bar length is based on its value

Same data displayed as a pie chart and a column chart
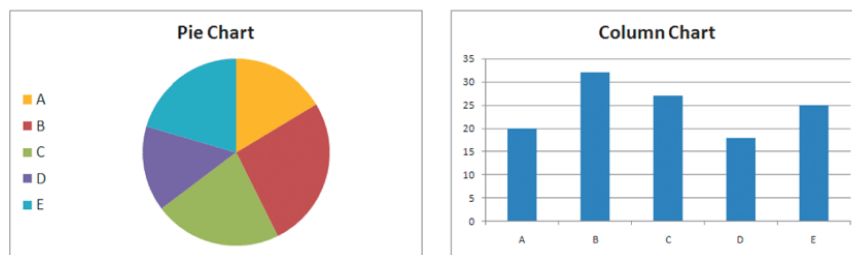
Creating a Column Chart

- Select the range
- Click the **Insert** tab on the Ribbon
- In the Charts group, click the **Column** button and then choose the chart subtype
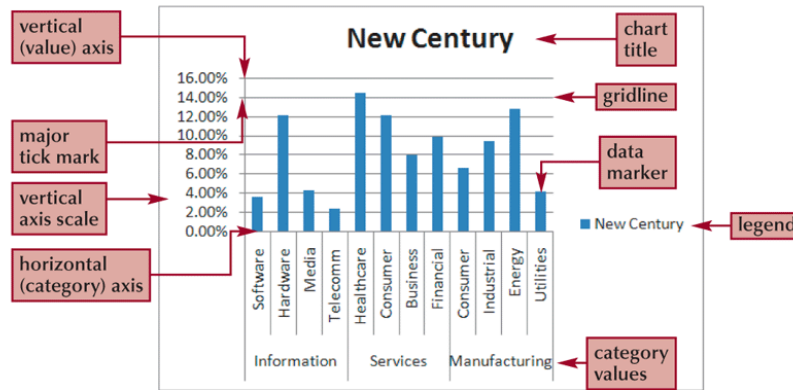

Column chart moved and resized in the Summary Report worksheet

Formatting Column Chart Elements

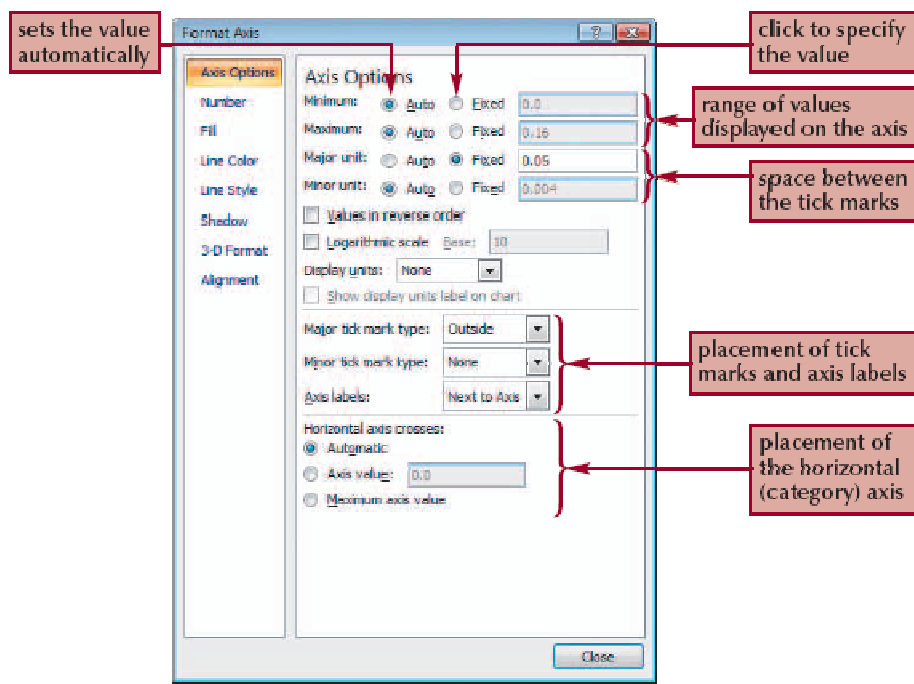- Click the **Chart Tools Layout** tab on the Ribbon

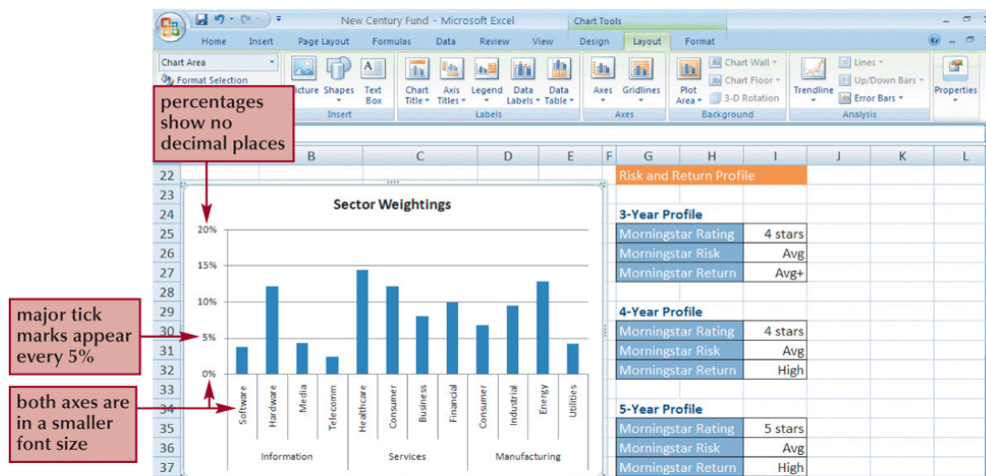Elements of the column chart

Formatting the Chart Axes

Click the **Chart Tools Layout** tab on the Ribbon

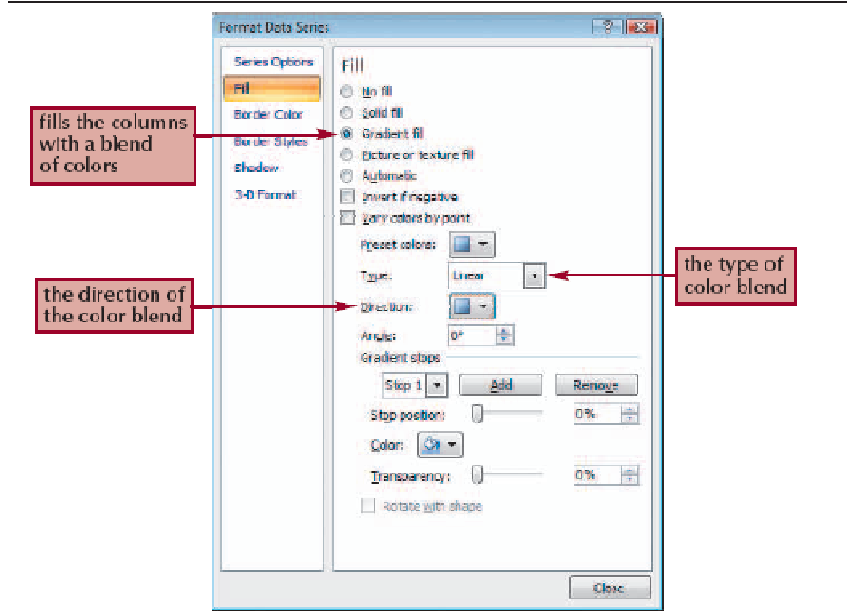Axis Options in the Format Axis dialog box

Formatting the Chart Axes

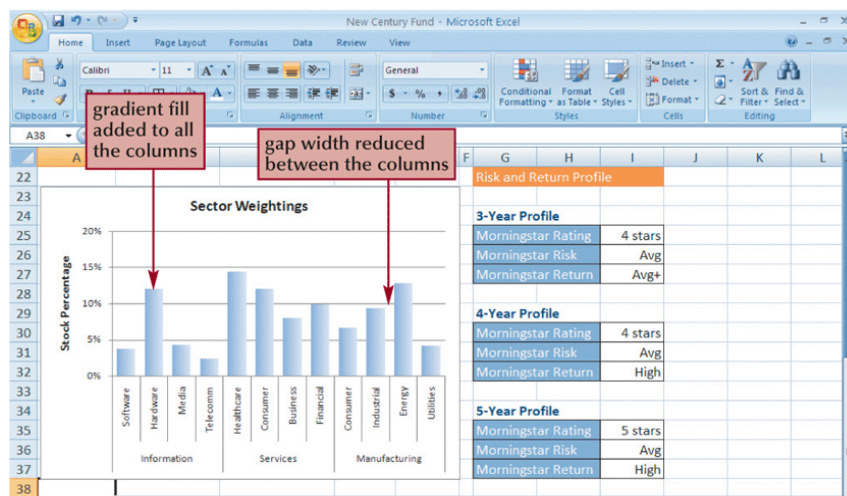Figure 4-25 — Formatted chart axes

Formatting Chart Columns

- Click any column in the Sector Weightings chart
- In the Current Selection group on the Chart Tools Layout tab, click **Format Selection**

Fill options set in the Format Data Series dialog box

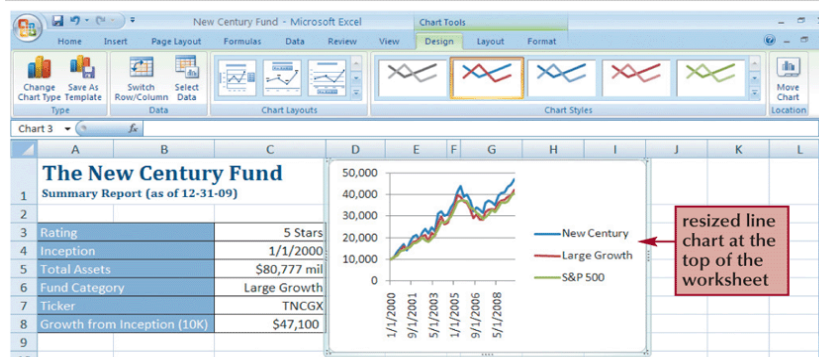## Formatting Chart Columns

▸ Formatted chart columns

Creating a Line Chart

- Select the range
- Click the **Insert** tab on the Ribbon
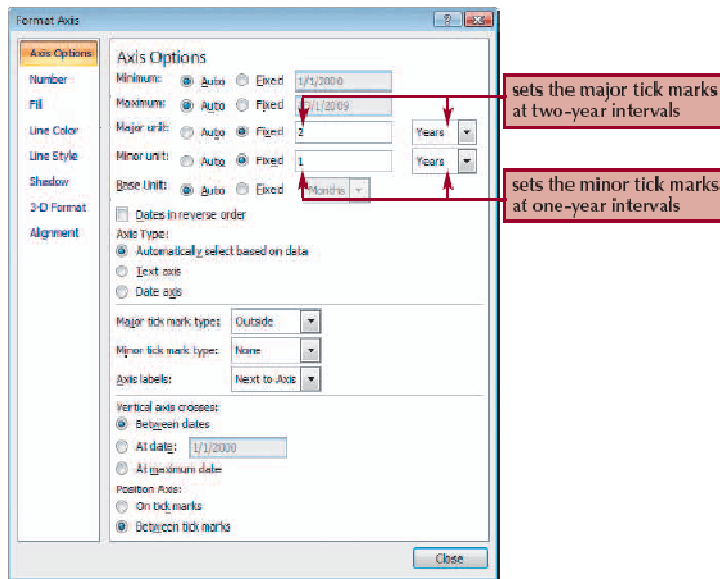- In the Charts group, click the **Line** button, and then click the **Line** chart

▸ Moved and resized line chart
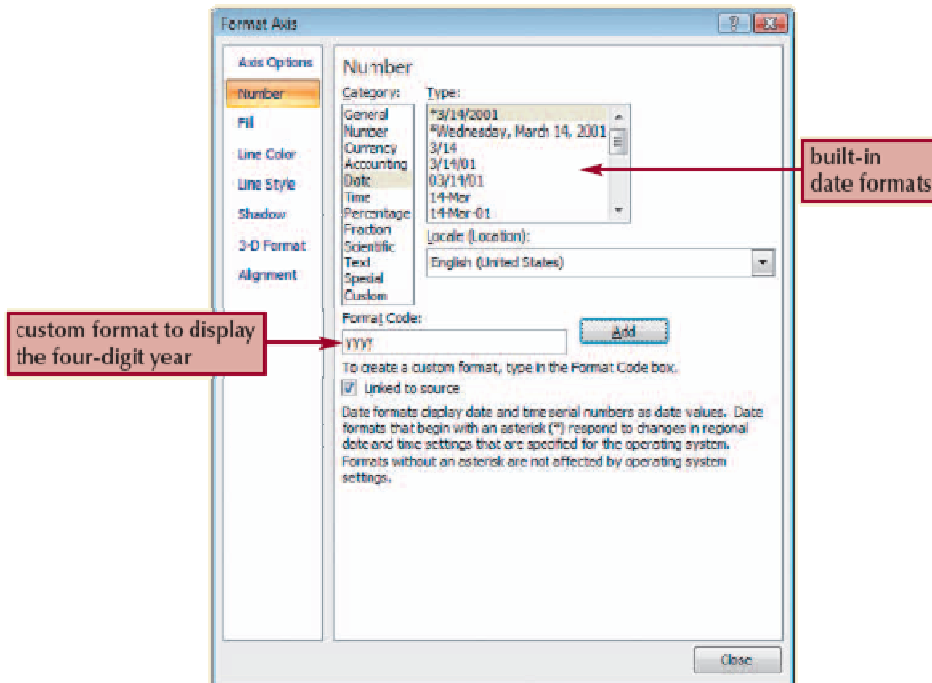
Formatting Date Labels

- Click the **Chart Tools Layout** tab on the Ribbon
- In the Axes group, click the **Axes** button, point to **Primary Horizontal Axis**, and then click **More Primary Horizontal Axis Options**
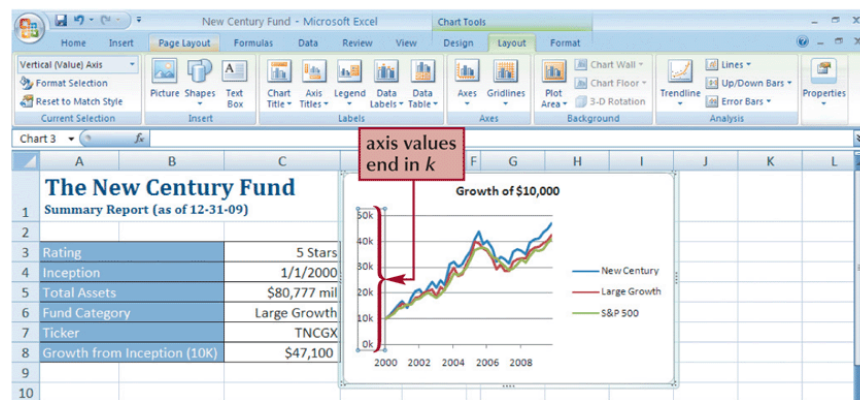

Formatting Date Labels

Setting Label Units

- In the Axes group on the Chart Tools Layout tab, click the **Axes** button, point to **Primary Vertical Axis**, and then click **More Primary Vertical Axis Options**
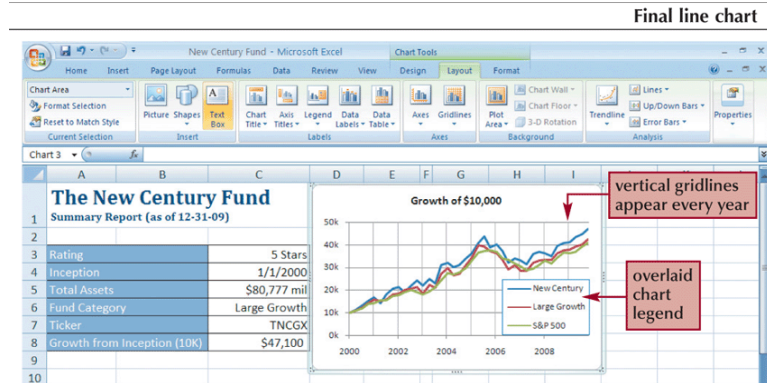- Click the **Display units** arrow and then make your selection

Setting Label Units

Overlaying a Legend

- In the Labels group on the Chart Tools Layout tab, click the **Legend** button, and then click **More Legend Options**
- Click the **Show the legend without overlapping the chart** check box to remove the check mark
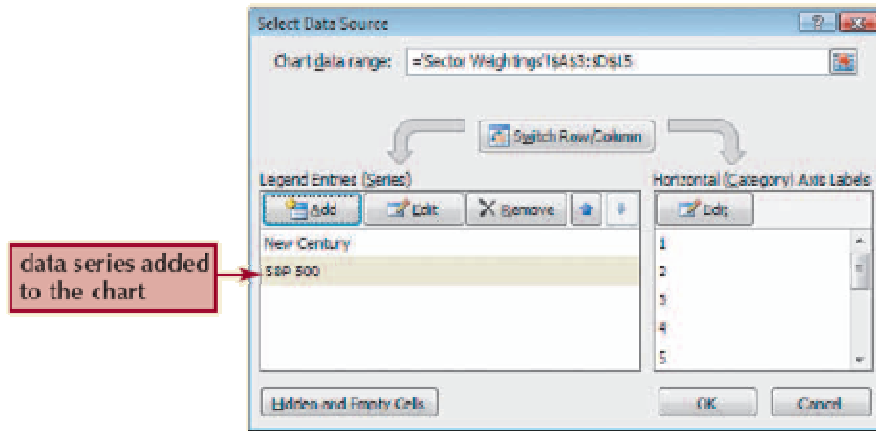

Adding a Data Series
to an Existing Chart

- Select the chart to which you want to add a data series
- In the Data group on the Chart Tools Design tab, click the Select Data button
- Click the Add button in the Select Data Source dialog box
- Select the range with the series name and series values you want for the new data series
- Click the OK button in each dialog box

Adding a Data Series
to an Existing Chart

Edit Series dialog box

Select Data Source dialog box


data series added to the chart
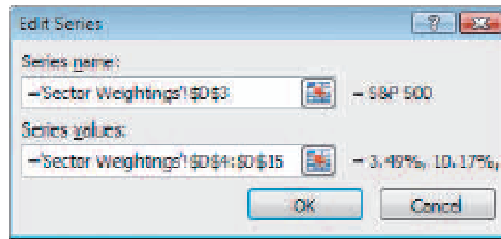
Creating a Combination Chart

- Select a data series in an existing chart that you want to appear as another chart type
- In the Type group on the Chart Tools Design tab, click the Change Chart Type button, and then click the chart type you want
- Click the OK button
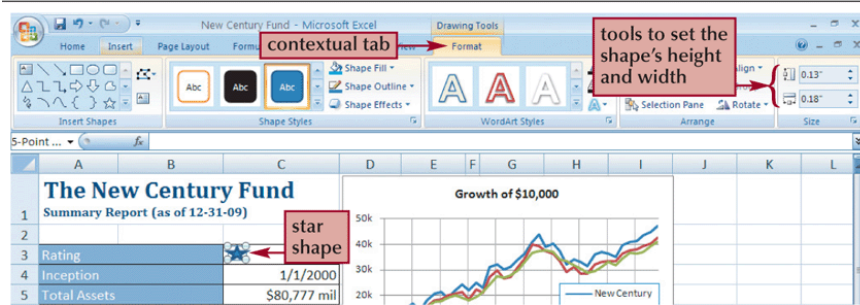
Creating a Combination Chart

Combination chart

S&P 500 values shown as a line with markers

New Century Fund values remain shown as columns
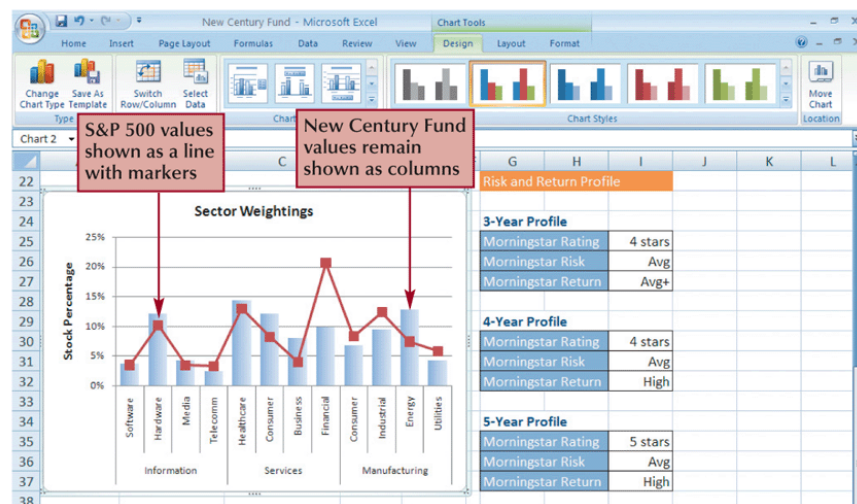
Inserting a Shape

- Click the **Insert** tab on the Ribbon
- In the Illustrations group, click the **Shapes** button, and then choose the shape you want
- Draw the shape in your worksheet

Aligning and Grouping Shapes

- Hold down the **Shift** key and then click each shape to select it
- Click the **Drawing Tools Format** tab on the Ribbon
- In the Arrange group, click the **Align** button, and then click your alignment option
- To group several shapes into a single unit, select the shapes, and then click the **Group** button in the Arrange group on the Drawing Tools Format tab

Aligning and Grouping Shapes

*_____*_____*_____*
*_____*_____*_____*

Designed by: Shakeel Armaan