Excel Data Analysis Options

xcel's functionality falls into three different categories: entering data, analyzing data, and displaying the results. Understanding and accurately performing these functions help the analyst organize data, recognize trends, and generally gain insight into whatever situation started the data gathering process. Although the main focus of this book is on the tools Excel provides for data analysis, it also explores the available methods for entering data and displaying the analyzed results. When you group related data values in your worksheet, you can use Excel's built-in tools to perform simple functions such as summing or averaging related numeric values, or to create charts to visually display data. Excel also lets you create formulas to automatically calculate results after a user inputs data into your worksheet, and create custom macros, which perform repetitive tasks for you. You can use PivotTables to cross-tabulate data that you have stored in lists, and a PivotChart to graphically display a PivotTable. Exel has advanced analysis tools to perform more sophisticated data analysis.

Data Entry

The foundation of data analysis is data entry accuracy, which directly impacts your results, and ultimately, your interpretation of those results. Although manually typing data in a worksheet to create a data list is the simplest method, you may find it the most cumbersome when you must analyze a large amount of data. Fortunately, you can gather data from other sources, such as already created external databases, and import the data it directly into your worksheet. You can also create data forms to simplify the process of inputting data into specific columns.

Data Lists

In its simplest form, a *data list* is merely a group of common values, such as items you want to purchase from the grocery store. When you place this type of information in Excel, you typically group related data values. For example, you place grocery items in one column and the quantity of each item to purchase in the next column. See Chapter 2 for more information on working with data lists.

Data from External Sources

Excel interfaces with many different Microsoft Office programs, making it possible to acquire data from external sources. One simple way to do this is to copy and paste data; you can also import text files directly into Excel. Typically, organizations store large quantities of data in database files. You can perform a database query to access an external database and import the desired data values. See Chapter 5 for more information on working with external data sources.

Data Forms

If you need to manually input data into Excel, you can simplify the process by creating a *data form*, which consists of a worksheet or a dialog box with fields into which a user can input data. With a data form, you can request the specific data values. You can also use VBA to verify that you have appropriate data before entering it in the worksheet column. See Chapter 10 for more information about the creation of data forms and use of form controls. When you analyze data, you perform a function to compare different values. Data analysis occurs when you do something as simple as totaling the numeric values in a column or sorting a list alphabetically. You can perform more complex comparisons by

Formula Creation

You can use *formulas* to create a custom calculation that analyzes data values in a cell or series of cells. You create formulas using any combination of cell references, mathematical operators, and the built-in functions available in Excel. See Chapter 4 for more information about creating formulas, and Appendix D for formula basics in Excel.

You can also create custom functions that you can call from any workbook using the VBA editor. See Chapter 9 for information on creating custom VBA functions.

Macro Creation

Because they combine a series of calculations that you want to perform into one step, *macros* help you save time by automating any tasks that you perform in Excel. You can create a macro by recording a series of keystrokes or by manually coding the macro using the VBA editor in Excel. See Chapter 9 for more information on creating custom macros.

creating formulas or by writing macros with the VBA editor. Excel also provides a set of analysis tools that perform complex analysis, such as calculating descriptive statistics.

PivotTables

You use PivotTables to perform a *cross-tabulation* of data, which is summarizing data into one or more classifications. *PivotTables* analyze data from both an Excel worksheet and an external database all within the same table. Everything in a PivotTable is *dynamic*, meaning that each time you change a value, any corresponding cells update immediately. See Chapter 7 for more information on working with PivotTables.

Analysis Tools

Excel provides several other analysis tools that you can use with your data values, including conditional formatting, which formats data based on specific criteria, filtering, and even data validation. See Chapter 3 for built-in Excel data analysis tools.

Excel's Add-in data analysis tools provide more complex analysis of your data values. You can use these tools to find moving averages, run an ANOVA analysis on your data, or determine rank and percentile values. See Chapter 11 for more information about Add-ins.

Result Presentation

While Excel's analysis tools can provide detailed numeric summaries of your data values, you can also use them to create graphical representations of your data. After you analyze your data, you have different options for displaying your results.

Chart Creation

In Excel, you can create *charts*, which provide a visual representation of your data values. You can embed a chart directly into a worksheet or create a separate chart sheet. Excel provides fourteen different chart types, each of which has at least two different subtypes or variations. After you determine the desired chart type, you can customize it further by changing such options as text fonts and font colors. See Chapter 6 for more information on creating and customizing charts.

PivotCharts

PivotCharts combine all of the same functionality of standard Excel charts with the dynamic characteristics of PivotTables. The result is a graphic representation of a PivotTable that updates whenever you change your data. See Chapter 8 for more information on working with PivotCharts.

Excel Data Types

n Excel, a *data type* refers to the type of value stored in a cell. When you input data, Excel automatically parses it and determines its data type. Excel recognizes three different data types: text, numeric, and formula. The default data type that Excel assigns to a cell determines the type of data analysis you can apply to it. For example, most data analysis tools require numeric values; if you try to use a text value, the tools return error messages.

Text

Text data types contain letters for use as text or labels within a worksheet. You typically place *labels* in a worksheet to identify columns and rows that contain numeric values. However, not all values that contain a letter are text. For example, although 1.45E+05 contains a letter, Excel recognizes it as a number expressed in scientific notation.

You can use any combination of letters and numbers in a cell as long as the total number of characters in the cell does not exceed

32,000 characters. By default, when Excel determines that a cell contains text, it left-justifies the entire contents of the cell.

You cannot perform any mathematical operations on a number as long as the cell also contains text. For this reason, you may want to consider separating text and numeric values into two separate cells. If you want Excel to treat a numeric value, such as Zip Code or Social Security Number, as text, you place an apostrophe (') before the numeric value in the cell.

Numeric

A *numeric value* is any number, percentage, currency, time, or date value. By default, Excel formats all numeric values by right-justifying them in the cell. Because Excel has a specific

Number

Excel allows nearly any number you can possibly type in a cell within the range 2.250748585072E-308 to

1.797693486231E308. You can input numbers in a wide variety of formats or use the six different built-in number formats to customize how a number displays in a cell.

NUMERIC CHARACTERS

You can use any of the following characters to express a numeric value: 0 1 2 3 4 5 6 7 8 9 + , - () / \$ % . E e. The placement of the characters within the number is important. For example, the letters E and e allow you to express large numbers, such as 1,256,000.000,000 in a format that is easier to display, 1.256E+07, called scientific notation. If you use an E in any other location, such as preceding a number E54, Excel treats the cell contents as text.

Fractions

If you type a fraction in a cell without preceding it with a number, Excel automatically converts it to a date. To avoid this conversion, place an apostrophe (') or zero (**0**) in front of it. No matter what number precedes a fraction, you must leave a space between the number and the fraction.

method for storing date and time values, they are considered

using the Number tab on the Format Cells dialog box.

numeric values. You can customize the look of numeric values

NUMBER PRECISION

Excel only guarantees precision up to 15 digits and converts any digits beyond 15 to zeros without rounding values up to the nearest place. For example, Excel converts both 35,555,545,365,875,988 and 35,555,545,365,875,922 to 35,555,545,875,900. Obviously this limitation makes storing large numbers, such as a 16-digit credit card number, in their entirety difficult. To avoid truncating credit card numbers, you can format cells as text or create a special number format. See the section "Create a Custom Number Format" for more information.

Numeric (continued)

Dates and Time

Excel uses the *Western*, formally called *Gregorian*, calendar as a basis for all dates and times, and stores them as a combined number. Dates are all sequential, whole numbers from 1 to 2958465. Excel stores times, which are all portions of the dates, as decimal values. For example, if you type the value **12/05/02 4:00 PM** in a cell, Excel stores it as the numeric value 37595.66667, where 37595 represents the date portion, and .66667 represents the time.

You can apply any mathematical calculations to compare and manipulate dates and time. For example, you can add, subtract, or determine the elapsed time between two dates and times. The cell's formatting determines how the date or time value displays.

DATES

Although a date displays in a cell on your worksheet, Excel actually stores its numeric equivalent. Using the Western calendar, Excel determines the number of days in each month. For example, January always has 31 days, and February has 28 days with the exception of leap year.

Excel for Windows bases all dates on what is commonly referred to as the 1900 date system, which recognizes 1/1/1900 as the first date with a stored value of 1. The last date that Excel recognizes is December 31, 9999 or 12/31/9999, which it stores as 2958465. If you use Excel on a Macintosh computer, dates are based on a 1904 date system, which means 1/1/1904 has a value of 1 and 12/31/9999 has a value of 2957003.

Although the two operating systems use different date systems, you can convert them when moving worksheets between a Windows and a Macintosh computer. If you open a Macintosh-created Excel (version 2.0 or later) worksheet in Windows, the dates automatically convert to the 1900 date format. Likewise, opening a Windows-created worksheet on a Macintosh converts dates to the 1904 system. You can also manually force the date conversion in Excel for Windows by selecting the 1904 date system option on the Calculation tab of the Options dialog box.

If you decide to use two-digit dates in Excel, you must exercise caution when entering them. Excel interprets two-digit years between 00 and 29 as the years 2000 though 2029. Excel interprets two-digit years between 30 and 99 as 1930 to 1999. To avoid errors, consider always using a four-digit year.

Тіме

Excel stores all time values as decimal values between 0 and 0.99999999, with 12:00 midnight being 0, and 11:59:59 PM being 0.999999999. So a time that displays as 12:00 P.M. (noon) has a value of 0.5.

By default, Excel bases all times on a 24-hour clock, commonly known as military time. This means that if you enter 10:30 without an A.M. or P.M., Excel assumes you mean 10:30 A.M. If you want 10:30 P.M., enter P.M. after the time, or use the corresponding 24-hour clock value of 22:30.

Formula

You can create formulas within any cell of a worksheet to evaluate data values in other cells within your worksheet. For example, the following formula adds the numeric values in cells A1 through A10 and displays the total in the cell containing the formula.

=SUM(\$A\$1:\$A\$10)

You must always precede formulas with an equal sign, which signals that what follows is a formula that Excel needs to evaluate. You can use any of the built-in functions, mathematical operators, constant values, and cell references to create a formula. Although you can use any combination of elements in a formula, the total number of characters in the formula cannot exceed 1,024 characters.

Excel formats a cell based upon the resulting *value* of the formula. For example, most formulas return a numeric value; therefore, by default, Excel right-justifies the returned value of numeric formula cells like other numeric cells. See Chapter 4 for more information about creating formulas in your worksheets. For more on formula basics, see Appendix D.

Locate a Value in a Worksheet

o locate values that match specific criteria without manually scrolling through a large list of data values, you can use Excel's Find option. A data analyst can quickly use this feature to find any number or word, such as a region's sales forecast for the year or a salesman's name. You simply enter what you want to search for in the Find what field in the Find and Replace dialog box.

If you do not know the exact value you want to locate, you can use one of two wildcard characters as part of the search. You use either an asterisk (*) or a question mark (?) to denote a missing character from a value. The question mark represents one value. For example, if you enter a search value of 1?4, Excel finds the values 104, 114, and any other three digit number that matches the pattern. An asterisk represents any number of missing characters. For example, 1*4 finds not only the value 114, but also 1234, and 199854.

When you search, Excel finds the first match for the specified pattern after the active cell. If the located cell is not correct, you can repeat the search to find the next cell.

Extra

To narrow your search, you can match not only the value in the Find what field, but also a specific formatting. For example, you can find a value that matches 145.34 and that displays in Arial Bold.

To specify formatting, click the Options button in the Find and Replace dialog box. Click the Format button to display the Find Format dialog box. The Find Format dialog box displays the formatting tabs that you find in the Format Cells dialog box. Specify the formatting for which you want to search and click OK. The specified formatting displays in the Preview field in the Find and Replace dialog box. When you click Find Next, Excel finds the text that matches the text in the Find what field and has the specified formatting. See the section "Create a Custom Number Format" for more information about formatting options.

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2002 Sales Figures

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Locate a Value in a Worksheet

Click Edit⇔Find.

Excel displays the Find and Replace dialog box.

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Find All

April

\$5,874.74 \$8,194.83

\$13,630.18 \$15,950.27

March

\$4,995.83



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Find

Find what:

Replace

38*

 Excel locates the cell containing a matching value.

Repeat step 3 to continue searching.

When you find the correct value, click Close to close the dialog box.

6

Select a Range of Cells

ou can make modifications to several cells in a worksheet simultaneously, a process referred to as *selecting a range of cells*, by choosing all the related cells together before implementing the changes. Typically, you select a range of cells to apply different formatting options, to copy cells, or to change the Excel value type. The range of cells does not need to be contiguous; you can select cells from different locations in a worksheet. See the section "Copy and Paste a Range of Cells" for information on copying a range of cells. See the section "Create a Custom Number Format" for more information on formatting cells.

You can select anywhere from a single cell to the entire worksheet. Excel highlights the group of cells to remind you of your selection. If you select multiple ranges of cells simultaneously, Excel highlights each selected range.

Select a Range of Cells

- Click the corner of the first block of cells.
- 2 Drag the mouse to highlight the desired cells.
- 3 Press Ctrl.
- 4 Select the next block of cells.

Repeat steps 3 and 4 to select all cell blocks.

 Excel highlights each of the selected cell blocks.

Any changes you make affect only the highlighted cells.

Extra

To select an entire row or column, you simply click the corresponding identifier. For example, to select all cells in column C, you click the C identifier for the column. To select multiple columns, you click the first column and then continue holding down the mouse button as you drag to the other columns you want to select. To select entire rows, you click the row identifiers on the left side of each row.

You can select a smaller group of cells by clicking a cell in one corner of the desired selection range, holding down the mouse button, and dragging until you select the desired range.

To select a noncontiguous range of cells, select the first block of cells, and then press the Ctrl key and select the next block. If you do not hold down the Ctrl key, Excel unselects the first range of cells when you select a new range of cells.

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6	April	750	256	79	1000	110	211	\$1,509.00		
7	May	\$750.00	\$307.00	\$100.00	\$110.00	\$110.00	\$345.00	\$1,722.00		
8	June	750	350	85	120	110	149	\$1,564.00		
9	July	750	310	94	145	110	190	\$1,599.00		
10	August	750	299	110	130	110	256	\$1,655.00		
11	September	750	245	120	111	🔼 110	298	\$1,634.00		
12	October	750	280	99	98	110	245	\$1,582.00		
13	November	750	400	110	88	110	405	\$1,863.00		
14	December	750	415	130	84	110	605	\$2,094.00		
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Name a Range

f you need to reference a specific range of cells in multiple locations, it can become tedious to remember the cell locations. You can create range names to easily locate specific information, to avoid having to remember the cell locations, and for use in any formulas that you create. For example, if you create a range name in Sheet1 named Sales_Amounts, in Sheet2 you can create a formula that sums the range by typing the following:

=SUM(Sales_Amounts)

Using the named range eliminates the need to specify a worksheet or cell reference. Although the example shows how to access a range from any worksheet in the same workbook, you can also reference a named range of cells from another workbook. For example,

=SUM(Sales2002!Sales_Amount) references a named range in the workbook Sales2002.xls. See Chapter 4 for more information on creating formulas.

Name a Range

- Select the range of cells that you want to name.
- **Note:** See the section "Select a Range of Cells" for more information on selecting a range.

You create the range name in the Define Range dialog box. Your range names can consist of up to 255 characters, but you only see about the first 16 characters of the name in the Name box. Therefore, you may want to use names that you can easily distinguish after viewing the first few characters.

Excel only allows you to use a range name once in a workbook; therefore, if you have a duplicate name in another worksheet, you must use a different name. If you create a range name that already exists, Excel replaces the previously specified range with the new range. To avoid potential errors, verify that you have a unique range name before using it.

If you duplicate a worksheet containing a named range, Excel only recognizes the range name in the original worksheet for other worksheets in the workbook. You can only access the copied range name on the copied worksheet.

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10	August	5	\$350.00	\$910	.00	\$215.00	\$110.00	\$50.00	\$256.00	1		
11	September		\$350.00	\$845	.00	\$400.00	\$110.00	\$50.00	\$298.00	1		
12	October	5	\$350.00	\$765	.00	\$450.00	\$110.00	\$50.00	\$245.00	1		
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Click Insert⇔Name⇔Define.

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12	October	\$	350.0	20	\$765.00	\$450.00) :	\$110.00	\$50.00	\$245.00			
13	November	\$	350.0	00	\$900.00	\$465.00) !	\$110.00	\$50.00	\$405.00			
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The Define Name dialog box displays.

Define Nam

- **3** Type the name of the range.
 - You can click the Collapse Dialog button to make a previously assigned range appear in the Refers to box.
- 4 Click OK.

Excel creates the new range name.

 You can click next to the Name field to see the current range names.

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If you no longer want to use a named range, you can delete it by clicking Insert÷Name÷ Define. In the Define Names dialog box, select the range name and click Delete.

When you delete a named range, you only remove the name. The cells referenced by the name remain unchanged. If you have a formula that references the deleted range name, the error #NAME ? displays in the cell containing the reference. You must update each formula that references the deleted range name. If you have a worksheet that includes formulas that reference cells from a named range, you can convert the cell references to the range name. To do so, select the cells containing the formula and click Insert⁺ Name⁺ Apply to display the Apply Names dialog box. The dialog box displays the names that exist within the workbook. Click OK to update the formula in the selected cell to include the named ranges.

Keep in mind that Excel only updates the range names within the existing worksheet and not those in other worksheets.

Create Label Ranges

ou can automatically have Excel use the column or row labels as the range names for your worksheet. This eliminates time required to manually create a range for each column or row of data in your worksheet. Excel creates names based upon the labels in the top row, bottom row, left column, or right column within the range of cells. For example, if your worksheet contains various office expenses for an entire year, you can create named ranges of monthly expenses. If the month names are in the left column, Excel creates the range name from the left column labels.

In the Create Names dialog box you must first select the range of cells containing both the labels and the cells for the named ranges. For example, if your top row contains the column names for the worksheet, and the remaining rows contain the corresponding data values, you must select both the labels and the data values. When you activate this option, Excel creates a separate range name for each label within the range of selected cells.

If you have labels in the top row and the left column, and you select the top row option, Excel only creates range names for the top row. If you want to create range names for both the top row and left column, you must select both options in the Create Names dialog box.

Although Excel uses your worksheet labels to create the range names, only the selected cells become a part of the corresponding range. For example, if column C contains telephone expenses, but you only selected a range of cells that contained rows 1 through 12, Excel does not create a range for the any values beyond row 12.

Create Label Ranges

- Select the range of cells containing labels.
- **Note:** See the section "Select a Range of Cells" for more information on selecting a range.

Click Insert=>Name=>Create.

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The Create Names dialog box displays.

Create Names

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3 Click the option corresponding to the location of the labels.

4 Click OK.

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	7	June	\$350.00	\$795.00	\$310.00	\$110.00	\$50.00	\$149.00			
	8	July	\$350.00	\$600.00	\$340.00	\$110.00	\$50.00	\$190.00			
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Excel creates the range names.

 Click next to the Name field to see the current range names.

Extra

You can quickly eliminate any unwanted named ranges using the Define Name dialog box, which you display by clicking Insert Name Define. The Define Name dialog box lists all of the names defined within the current workbook. To delete a named range, click it and then click Delete. Excel only deletes the range name. It does not delete any data. You can change a range from the Define Name dialog box by selecting the desired range, specifying the range of cells in the Refers To field, and clicking Add. To create a new range of cells, type the new range name in the Names in workbook field, specify the desired range in the Refers To field, and click Add. You can use dates as the names for your ranges. However, if your labels are numeric dates, Excel must reformat the label to match the name rules. For example, 1/31/2002 begins with a number and contains a slash character, which you cannot use in range names. If this date exists in a label column that you use to create names, Excel changes the range name to _1_31_2002. See the section "Name a Range" for more on naming ranges. See Excel Help for specific range naming rules.

Modify Named Ranges

fter you create a named range, Excel continues to use the stored named range whenever you refer to it with the assigned range name. If you change the worksheet by adding or removing corresponding data values, you must update the corresponding named ranges so that Excel references the appropriate cells when you use that range name. To create named ranges, and for more on the benefits of using them, see the section "Create Label Ranges."

When you modify a named range, the changes affect every location that refers to the corresponding range. For example, if you create a formula that uses a specific named range, and then change the cells that the range name references by deleting a column of data, the formula continues to reference the new version of the named range. See Chapter 4 for more information on creating formulas. You use the Define Names dialog box to modify a named range. In this dialog box, you select the desired range name and make the appropriate modifications either by entering them in the Refers to field or by using the Collapse Dialog button to select a new range of cells. If you have multiple ranges to modify, you can use the Add button to save the changes to the first named range and then modify the next range name.

If you change the actual range name in the Define Names dialog box, Excel actually creates a new range name and keeps the old range name. You can delete the old range name using the Delete button. See "Create Label Ranges" for information on deleting a range name.

Modify Named Ranges

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Click Insert⇔Name⇔Define.

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2 Click the name of the range you want to modify.

Click the Collapse Content button.

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The corresponding cells in the selected range display.

- Change the range selection.
- Note: See the section "Select a Range of Cells" for more information.
- 5 Click the Restore dialog button.
 - The revised range selection displays in the Refers to field.
- 6 Click Add to update the saved range.
- 7 Click OK.
 - Excel saves the revised range.



Extra

When you have several different named ranges in a workbook, you may find it difficult to keep track of them all. Excel provides a feature that quickly creates a list of all names and the corresponding cell ranges. To create the list of named ranges, click Insert=>Name=>Paste. In the Paste Name dialog box, click the Paste List button. Excel creates a list with the first column containing the range names, and the second column identifying the corresponding cell ranges. For example, if cells B2 through B10 contain your advertising expenses, Excel pastes values similar to the following:

Advertising =Sheet1!\$B\$2:\$B\$12

The range reference simply identifies the cells within the named range. Excel first lists the name of the worksheet containing the range and then the cells within the range. See Appendix D for more information on cell references.

Excel places the list in your active worksheet starting in the cell containing your cursor. Therefore, it is a good idea to place your cursor in a blank cell with plenty of blank cells below it. Excel places no links in the list, so to keep it up-to-date, you must re-create it whenever you change the named ranges.

Copy and Paste a Range of Cells

f you want to use the same values in multiple locations, instead of retyping, you can copy and paste. For example, you may want to copy a data list for use in another report, or duplicate a formula in multiple cells. You can repeat information within Excel using the Copy and Paste options. When you copy a cell or range of cells, Excel duplicates everything in the cell — including the cell values, formulas, formatting, comments, and data validation — and leaves the original cell values unchanged. You can multiple cells so long as they are adjacent. You cannot copy multiple cell ranges.

When you apply the Copy command to a range of cells, Excel surrounds the cells with a dotted line. The selected cells remain marked until you perform a task that deselects them. You can quickly press the Esc key to deselect cells. You can also apply menu options that change the worksheet, including copying another range of cells, inserting cells, or hiding rows.

After you copy a range of cells, you can paste the cell contents at any location within your current workbook, another Excel workbook, or any other Microsoft Windows program. Excel replaces the content of the cells where you paste with the copied values. You can paste the copied cells as long as you have not copied another range of cells or until you close Excel.

Be careful when you paste the copied cells. The best method is to select the first cell where you want to paste the contents of the cells and then apply the Paste command. If you attempt to select the entire range of cells where you want Excel to paste the contents and do not select the exact number of cells, you receive an error message.

Copy a Range of Cells

Select the cells you want to copy.

- Note: See the section "Select a Range of Cells" for more information.
- Click Edit⊄>Copy.

You can also copy by clicking the Copy button (\mathbb{E}).

Excel displays a dotted line around the copied cells.

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Paste a Range of Cells

- Place the cursor where you want to paste the cells.
- Click Edit ⇒Paste.

You can also click the Paste button.

• Excel places a copy of the copied cells in the new location.

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Apply It

You can customize the way Excel pastes values by clicking Edit⁺Paste Special. The Paste Special dialog box displays several different options for specifying the content to paste as well as what operations to perform during the paste.

If you select All, Excel pastes the entire contents of the copied cells. By selecting Values (O changes to •), Excel only pastes the value of the copied cells ignoring any formulas, comments, or formatting. If you only want to paste comments, data validation, or formats, Excel does not modify the existing values in the cells to which you paste. If you paste formulas, Excel only changes the values in the cells where you paste.

You can click one of the Operation buttons (\bigcirc changes to \odot) to perform a mathematical operation on the pasted data. For example, if you select Add, Excel adds the pasted values to the existing values in the cells.

Click the Skip Blanks option (\square changes to \checkmark) to prevent Excel from pasting a blank value from a copied cell into a cell that contains a value.

When you click the Transpose option (\square changes to \checkmark), Excel transposes copied values from row to column or vice versa.

Create a Custom Number Format

f you want the numbers in your worksheet to have a specific format, for example, three decimal places, you can create a custom number format. With one definition, you can control how Excel formats a positive value, negative value, zero value, and text value. You can use any combination of the four format types, but you must place them in order and separate them with semicolons:

Positive Number Format; Negative Number Format; Zero Value Format; Text Format

Excel applies one specified format for all four conditions. If you specify two different formats, Excel applies the first one to both positive and zero values, and the second to negative values. The following example formats positive numbers with two decimal places and a dollar sign, negative numbers in red and parentheses, zero values as 0, and text in cyan: You create custom number formats using any combination of the format codes with 0 and # being the most useful numeric codes. You use 0 to define digit placement. For example, if you type **000.000**, Excel displays the value 670.45 as 670.450. The # tells Excel not to display insignificant zeros in the value. You can use color names in square brackets to define color formatting. For example, for red text, a popular color for negative values, you type **[Red]** before the format.

You can place characters, such as parentheses, within your format. For example, the following custom format displays positive numbers with two decimal places and a dollar sign, negative numbers in red and parentheses, zero values as 0, and text in cyan. The format uses the \$, . and parentheses symbols.

\$#,##0.00; [Red] (\$#,##0.00);0; [Cyan]

\$#,330.00;[Red](\$#,##0.00);0;[Cyan]

Create a Custom Number Format

Select the cells you want to format.

- Note: See the section "Select a Range of Cells" for more information.
- Click Formats Cells.

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The Format Cells dialog box displays.

- If it is not displayed, click the Number tab.
- Click Custom in the Category list box.



- A list of current custom formats displays in the Type box.
- 5 Type the desired custom format in the Type field.

6 Click OK.

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Excel applies the custom format	to your
cell selection.	



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5	March	\$2,345.44		\$15.60	\$890.34	\$3,251.38			
6	April	\$2,345.44	(\$56.79)	\$12.34	\$6,654.34	\$8,955.33			
7	May	\$2,345.44	\$34.45	\$111.44	\$245.66	\$2,736.99			
8	June	\$2,345.44	\$45.60	\$99.89	0	\$2,490.93			
9	July	\$2,345.44	\$244.20	\$100.90	\$1,123.67	\$3,814.21			
10	August	\$2,345.44	(\$112.43)	\$155.90	\$900.45	\$3,289.36			
11	September	\$2,345.44	\$250.54	\$120.23	\$1,412.78	\$4,128.99			
12	October	\$2,345.44	\$13.56	(\$19.41)	\$875.90	\$3,215.49			
13	November	\$2,345.44	\$134.00		\$1,200.34	\$3,679.78			
14	December	\$2,345.44	\$112.00	(\$56.55)	\$1,221.45	\$3,622.34			
15							3		

Apply It

If you cannot find a default format you want for dates and times, you can create custom date and time formats. To do so, you combine the codes, presented in the tables, for the day, year, month, hour, minute, and seconds. You can use these codes with any of the custom number codes, such as the color codes. For example, to display the date and time as 3:45 PM March 14, 2002 in green, you type:

Example:

[Green]h:mm AM/PM mmmm dd, yyyy

DATE SYMBOLS	5 DESCRIPTION
d	Use d to display days as 1–31 or dd to display days as 01–31. Use ddd for a three-letter day name abbreviation, Mon–Sun. If you want the entire day name, use dddd .
m	Use m to display months as 1-12 or mm to display months as 01-12. Use mmm for a three-letter month name abbreviation, JanDec. If you want the entire month name, use mmmm .
У	Use yy to display a two-digit year, such as 01 or yyyy to display the entire year.

TIME SYMBOLS	DESCRIPTION
h	Use h to display hours as 0-23 or hh to display single-digit hours with leading zeros, such as 09.
М	Use M to display minutes as 0-59 or MM to display single digit minutes with leading zeros, such as 08. Make sure to use a capital M , or Excel will view it as months.
S	Use s to display seconds as 0–59 or ss to display single-digit seconds with leading zeros, such as 05.
AM/PM	Displays either AM or PM with the specified time.

Apply AutoFormat to a Worksheet

f you want to quickly change the appearance of your worksheet, you can apply a predefined format. Excel provides 15 different formats that create a table-like layout for your data. The formats work best when your worksheet contains row and column headings and totals for rows and columns.

You select a predefined format from the AutoFormat dialog box. At the bottom of the dialog box, you find six different format options: Number, Borders, Font, Alignment, Patterns, and Column Width/Height. By default, Excel selects all six options for you. You can adapt any one of the predefined tables by deselecting options to achieve the effect that you want. For example, if you deselect the Font category, Excel does not make any font changes. As you select or deselect different formats, the AutoFormat dialog box reflects the changes letting you view how the various options affect a particular table format before you select it. Excel replaces any previously applied custom formatting with those that you select in the AutoFormat dialog box. For example, if you have previously selected Arial Black as the font for the entire worksheet, and you apply the Accounting 1 format, Excel changes the font to Arial, the default font for the Accounting 1 style.

The cells that you select before applying a format greatly affect how Excel applies that format to your worksheet. If you select only one cell in a range of cells, Excel examines the worksheet and applies the selected format to all surrounding cells that contain values. As soon as Excel encounters a row or column of blank cells, it no longer applies the formatting. If you type values in the adjoining cells after you apply the format, those cells automatically receive the selected format. If you select a range of cells, Excel only applies the selected format to those cells.

Apply AutoFormat to a Worksheet

- Select the range of cells you want to format.
- Note: See the section "Select a Range of Cells" for more information.
- Click FormatdAutoFormat.

The AutoFormat dialog box displays.

Click Options.





Excel lists the format categories at the bottom of the dialog box.

- 4 Click the desired table format.
 - You can easily remove AutoFormatting by selecting the None format option.
- 6 Click to remove check marks from any unwanted format categories.
- 6 Click OK.

Excel applies the selected predefined format settings to the worksheet.

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Extra

Clicking Options in the AutoFormat dialog box displays a list of the format categories. You can select or deselect these options before applying a format to gauge the effect they have on your worksheet. The following table lists each format option and what it does:

CATEGORY	DESCRIPTION
Number	Specifies the formats for numeric values, such as which values receive currency symbols. Selecting this category overrides any number formats applied using the Number tab in the Format Cells dialog box.
Font	Defines all font settings including font type, size, bold, italic, underline, font color, and font effects.
Alignment	Controls the alignment of the values within each cell.
Border	Controls which cells have borders and specifies properties, including line thickness and line color.
Patterns	Defines the background design and color of the table.
Width/Height	Adjusts the width of each column and height of each row to accommodate the cell contents. In most formats, Excel makes all columns the same width so that the values within each cell are visible.

Create a Named Style

f you consistently apply specific formatting options within a worksheet, you can use a named style to simplify the formatting process. When you have a style that contains the formatting you want, you simply apply that style to selected cells within a worksheet. For example, you can create a Stocks style the changes numbers to fractional values and displays them in Arial 10 point font and bold. The advantage of creating and applying style is that you can update them to suit your needs. For example, if you want your Stocks style to apply italics to your worksheet, you simply modify the style, and Excel automatically updates the formatting in all cells using that style.

You create styles from the Style dialog box by modifying an existing style. Excel provides six default styles, which you can select in the Style name field. Normal is the default

style Excel applies to all cells of your worksheet. The other styles provide default Number formats for formatting numbers with commas, currency, or percent.

You modify default style format options using the six tabs in the Format Cells dialog box: Number, Alignment, Font, Border, Patterns, and Protection. You can modify the various properties of your style by selecting options in any one of these tabs. For example, if you specify that you want to center the text within the cell, the Alignment option displays the value: Horizontal Center.

When you create a new style, it becomes a part of only the existing workbook. To make the style available to other workbooks, you need to create a template. See the section "Create a Custom Template" for more information about creating templates.

Merge..

Create a Named Style

 Select the cells where you want to apply the style. 	☑ Microsoft Excel - ch01-Style.xls □ ☑ File Edit View Insert Format Iools Data Window Help Type a question for help • - 5 □ ☞ □ □ □ □ □ □ ☞ □ □ □ □ □ □ □ ☞ □ □ □ □ □ □ □	×
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The Style dialog box displays.3 Type a name for your style.4 Click Modify.	Style ? X Style name: Month Names 3 OK Style Includes (By Example) Cancel V Number General Alignment General, Bottom Aligned V Eont Arial 10 Add	

No Borders

No Shading

Locked

Border

Patterns

Protection

The Format Cells dialog box displays.

5 Make the desired formatting selections.

6 Click OK.

The Style dialog box displays the format settings for the style.

A check mark displays next to each type of formatting with settings listed next to them.

Click Add.

Excel creates the new style.

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Apply It

Styles are most useful when you can easily apply them to your worksheet, and using the Style dialog box is the quickest way to do so. Unlike Microsoft Word, Microsoft Excel does not have the Style dialog box as a default option on any of its toolbars. To add the feature, click Toolst?Customize. In the Customize dialog box, click the Commands tab. In the Categories box, click Format. A list of the available format commands displays in the Commands box. Click the Style dialog box and drag it to one of the toolbars displayed at the top of your Excel window. You can now click the down arrow on the toolbar and view a list of available styles. After creating a new style, you can apply it at any location. To do so, select the cells you want to change and click Insert \$Style. In the Style dialog box, click the down arrow next to the Style name field and then the desired style. The check boxes under Style Includes correspond to tabs from the Format Cells dialog box with the corresponding setting displayed next to the tab.

Create a Custom Template

f you frequently create worksheets with the same layout, such as a weekly stock analysis report, you can make a template to eliminate repetitive tasks. *Templates* provide a desired layout complete with specific styles, border settings, headers, footers, and even default text and images, such as a company logo.

You create a template by designing a generic workbook that contains the worksheet layouts you want and then change any aspect of it to suit your needs. You can create custom styles, number formats, customized macros, and formulas. You can also specify custom column and row headings in a template. For example, if you generate a budget worksheet each month, you can create a Budget template that contains the column headings for all expenses and includes formulas for summing the totals. See the sections "Create a Custom Number Format" and "Create a Named Style" for information on creating custom styles and number formats. See Chapter 4 for information on creating formulas and Chapter 9 for more about macros. Your custom template can contain settings for the entire workbook. For example, if you only want the workbook to contain one worksheet, you simply remove the other worksheets before saving your template.

You can now save your generic workbook as a template. On the Save As dialog box, you select the Template (*.xlt) option in the Save as Type field. The option may also appear as Template. When you do so, Excel specifies a default storage location similar to the following:

C:\Documents and Settings\user_name\ Application Data\Microsoft\Templates

Your drive letter may differ, and you must replace user_name with the username you use to log in to Windows. You should allow Excel to store your workbook in the default location. This ensures that the template appears in the General tab of the Templates dialog box when you create a new workbook.

Create a Custom Template

- Create your default workbook with the features you want in the template.
- Click File⇔Save As.

The Save As dialog box displays.

Click the Template (*.xlt) option.

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• The Templates folder displays as the storage location in the Save In field.

Excel creates the specified template.

4 Type a name for your template.

5 Click Save.



Apply It

When you create a new blank workbook, Excel uses the default system settings to create it – the default font settings and three blank worksheets. Excel uses the system default settings as long as a default workbook template does not exist. If you consistently make changes to every new, blank workbook, you can make a default workbook template that always loads.

To do so, you first create a workbook that contains all your desired format settings, custom macros, formulas, and a default number of worksheets. When you save the workbook as a template, name it Book.xlt and save it in the XLStart folder, which is typically located in the following location:

C:\\Program Files\Microsoft Office\Office10\XLStart

Each time you create a new workbook, Excel uses the default Workbook template you modified.

You can also create a default worksheet template by clicking Insert Worksheet. You must save the worksheet template in the same location as the workbook template, but name it Sheet.xls. Excel copies the contents of the Sheet.xls worksheet into your workbook each time you add a new worksheet.

Protect Worksheets

f you intend to share your worksheet with other users, you may want to password protect it to ensure that users cannot alter values in individual cells. By protecting the worksheet, you ensure that the integrity of the data remains intact, no matter who views the worksheet contents.

To protect a worksheet, you use the Protect Sheet dialog box. Excel requires you to specify a password to protect and unprotect the worksheet. Use a password that you can easily remember; after you apply a password to a worksheet, no one, including you, can alter the worksheet without specifying the appropriate password. After you unprotect a worksheet, it remains that way until you protect it again.

The Protect Sheet dialog box gives you further control over others' actions by allowing you to specify the functions that users can perform while the worksheet is protected. There are fifteen different options from which to choose, including locking and unlocking cells, formatting, and inserting or deleting cells. If a user attempts to perform a task that is not allowed, Excel displays a message box indicating that the worksheet is protected. In order for users to make any modifications to a protected worksheet, they must unprotect the worksheet with the appropriate password.

By default, Excel applies allow the user to select both locked and unlocked cells. When users select a protected cell, they can view the contents of the cell in the Formula bar. If you have created formulas that you do not want others to view, you should make sure both of these options are not selected. If users select an unprotected cell, they can modify the cell in the Formula bar.

Protect Worksheets

Click Tools=⇒Protection=⇒Protect Sheet.

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The Protect Sheet dialog box displays.

- 2 Make sure you select the Protect worksheet and contents of locked cells option.
- Type the password to protect the worksheet.
- 4 Select the options you want to allow the user to perform while the worksheet is protected.

5 Click OK.

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Apply It

If you want to modify a protected worksheet, you must click Tools Protection Duprotect Sheet. In the Unprotect Sheet dialog box, type the password that locks the worksheet in the Password field and click OK. By default, Excel allows you to lock all cells of the worksheet, so that users can view the cells' contents without altering it. You can unlock certain cells in the worksheet so that users can input values, such as sales total, so that formulas in other cells can perform calculations.

You specify the lock status of a cell in the Protection tab of the Format Cells dialog box. Select the range of cells to unlock, click Format^c Cells to display the Format Cells dialog box, and then click the Protection tab. Click the Locked option to unlock the selected range of cells (\checkmark changes to \square).

You can also select the Hidden options, which hides the contents of a cell in the Formula bar if a user selects the cell. This ensures that a user cannot view special formulas. Just like the Locked option, the Hidden option only takes effect if you protect the worksheet.