# 5 Focusing on Specific Data by Using Filters

**In this chapter, you will learn how to**

- ✔ Limit data that appears on your screen.
- ✔ Manipulate worksheet data.
- ✔ Define valid sets of values for ranges of cells.

With Microsoft Excel 2010, you can manage huge data collections, but storing more than 1 million rows of data doesn't help you make business decisions unless you have the ability to focus on the most important data in a worksheet. Focusing on the most relevant data in a worksheet facilitates decision making, whether that data represents the 10 busiest days in a month or revenue streams that you might need to reevaluate. Excel offers a number of powerful and flexible tools with which you can limit the data displayed in your worksheet. When your worksheet displays the subset of data you need to make a decision, you can perform calculations on that data. You can discover what percentage of monthly revenue was earned in the 10 best days in the month, find your total revenue for particular days of the week, or locate the slowest business day of the month.

Just as you can limit the data displayed by your worksheets, you can create validation rules that limit the data entered into them as well. Setting rules for data entered into cells enables you to catch many of the most common data entry errors, such as entering values that are too small or too large, or attempting to enter a word in a cell that requires a number. If you add a validation rule to worksheet cells after data has been entered into them, you can circle any invalid data so that you know what to correct.

In this chapter, you'll learn how to limit the data that appears on your screen, manipulate list data, and create validation rules that limit data entry to appropriate values.

**Practice Files** Before you can complete the exercises in this chapter, you need to copy the book's practice files to your computer. The practice files you'll use to complete the exercises in this chapter are in the Chapter05 practice file folder. A complete list of practice files is provided in "Using the Practice Files" at the beginning of this book.

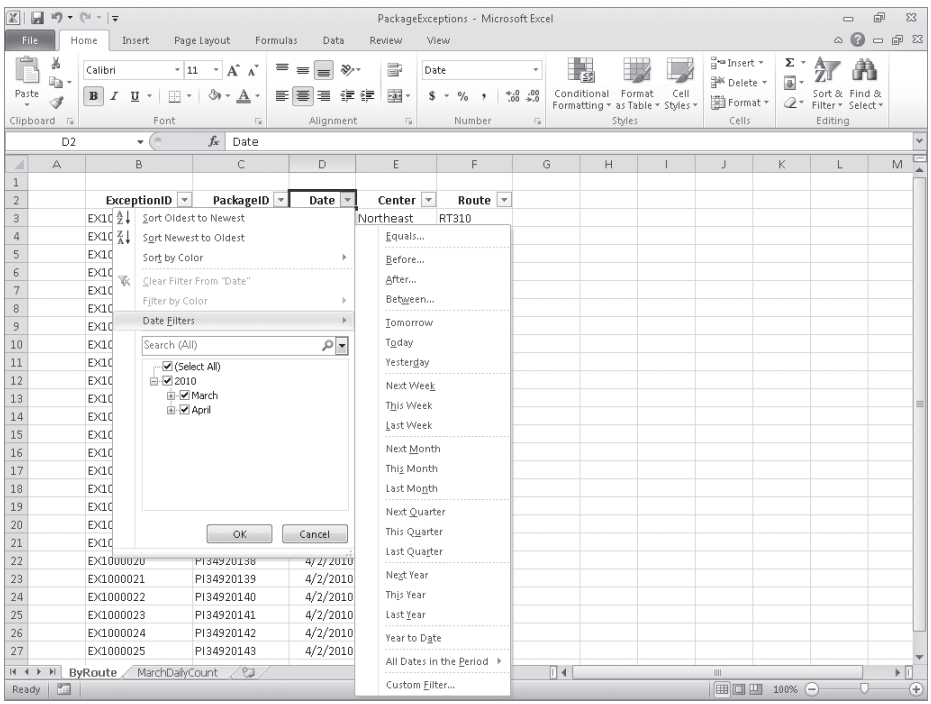
# Limiting Data That Appears on Your Screen

Excel spreadsheets can hold as much data as you need them to, but you might not want to work with all the data in a worksheet at the same time. For example, you might want to see the revenue figures for your company during the first third, second third, and final third of a month. You can limit the data shown on a worksheet by creating a filter, which is a rule that selects rows to be shown in a worksheet.

To create a filter, you click the cell in the data you want to filter and then, on the Home tab, in the Editing group, click Sort & Filter and then click Filter. When you do, Excel displays a filter arrow at the right edge of the top cell in each column of the data. The arrow indicates that the Excel AutoFilter capability is active.

**Important** **When you turn on filtering, Excel treats the cells in the active cell's column as a range. To ensure that the filtering works properly, you should always have a label at the top of the column you want to filter. If you don't, Excel treats the first value in the list as the label and doesn't include it in the list of values by which you can filter the data.**

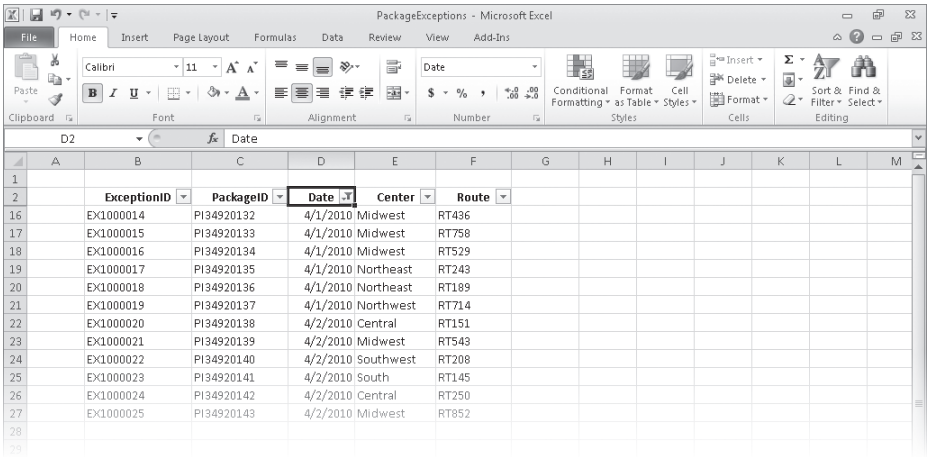
Clicking the filter arrow displays a menu of filtering options and a list of the unique values in the column. The first few commands in the list are sorting commands, followed by the Clear Filter command and then the Filter By Color command. The next command that appears on the list depends on the type of data in the column. For example, if the column contains a set of dates, the command will be Date Filters. Clicking the command displays a list of commands specific to that data type.



**Troubleshooting** The appearance of buttons and groups on the ribbon changes depending on the width of the program window. For information about changing the appearance of the ribbon to match our screen images, see "Modifying the Display of the Ribbon" at the beginning of this book.

**Tip** When a column contains several types of data, the filter command becomes Number Filters.

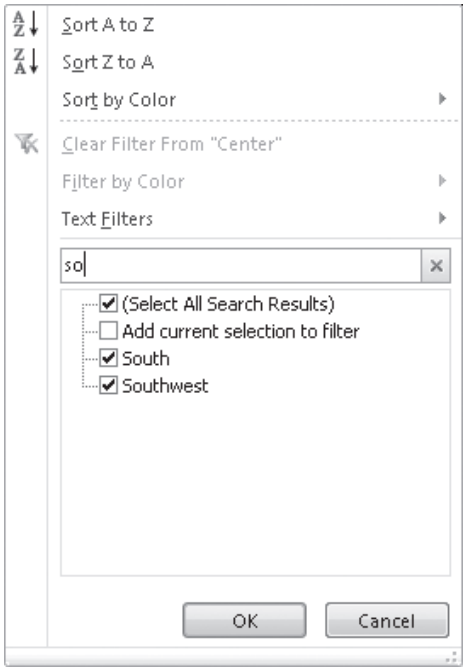
When you click a filtering option, Excel displays a dialog box in which you can define the filter's criteria. As an example, you could create a filter that displays only dates after 3/31/2010.




| | ExceptionID | PackageID | Date | Center | Route |
|---|---|---|---|---|---|
| 16 | EX1000014 | PI34920132 | 4/1/2010 | Midwest | RT436 |
| 17 | EX1000015 | PI34920133 | 4/1/2010 | Midwest | RT758 |
| 18 | EX1000016 | PI34920134 | 4/1/2010 | Midwest | RT529 |
| 19 | EX1000017 | PI34920135 | 4/1/2010 | Northeast | RT243 |
| 20 | EX1000018 | PI34920136 | 4/1/2010 | Northeast | RT189 |
| 21 | EX1000019 | PI34920137 | 4/1/2010 | Northwest | RT714 |
| 22 | EX1000020 | PI34920138 | 4/2/2010 | Central | RT151 |
| 23 | EX1000021 | PI34920139 | 4/2/2010 | Midwest | RT543 |
| 24 | EX1000022 | PI34920140 | 4/2/2010 | Southwest | RT208 |
| 25 | EX1000023 | PI34920141 | 4/2/2010 | South | RT145 |
| 26 | EX1000024 | PI34920142 | 4/2/2010 | Central | RT250 |
| 27 | EX1000025 | PI34920143 | 4/2/2010 | Midwest | RT852 |

If you want to see the highest or lowest values in a data column, you can create a Top 10 filter. Choosing the Top 10 command from the menu doesn't just limit the display to the top 10 values. Instead, it opens the Top 10 AutoFilter dialog box. From within this dialog box, you can choose whether to show values from the top or bottom of the list, define the number of items you want to see, and choose whether the number in the middle box indicates the number of items or the percentage of items to be shown when the filter is applied. Using the Top 10 AutoFilter dialog box, you can find your top 10 salespeople or identify the top 5 percent of your customers.

Excel 2010 includes a new capability called the *search filter*, which you can use to type a search string that Excel uses to identify which items to display in an Excel table or a data list. To use a search filter, click a column's filter arrow and start typing a character string in the Search box. As you type the character string, Excel limits the items displayed at the bottom of the filter panel to those that contain the character or characters you've entered. When the filter list's items represent the values you want to display, click OK.




When you point to Text Filters and then click Custom Filter, you can define a rule that Excel uses to decide which rows to show after the filter is applied. For instance, you can create a rule that determines that only days with package volumes of less than 100,000 should be shown in your worksheet. With those results in front of you, you might be able to determine whether the weather or another factor resulted in slower business on those days.

Excel indicates that a column has a filter applied by changing the appearance of the column's filter arrow to include an icon that looks like a funnel. After you finish examining your data by using a filter, you can remove the filter by clicking the column's filter arrow and then clicking Clear Filter. To turn off filtering entirely and remove the filter arrows, display the Home tab and then, in the Editing group, click Sort & Filter and then click Filter.

In this exercise, you'll filter worksheet data by using a series of AutoFilter commands, create a filter showing the five days with the highest delivery exception counts in a month, create a search filter, and create a custom filter.

**SET UP** You need the PackageExceptions_start workbook located in your Chapter05 practice file folder to complete this exercise. Start Excel, open the PackageExceptions_start workbook, and save it as *PackageExceptions*. Then follow the steps.

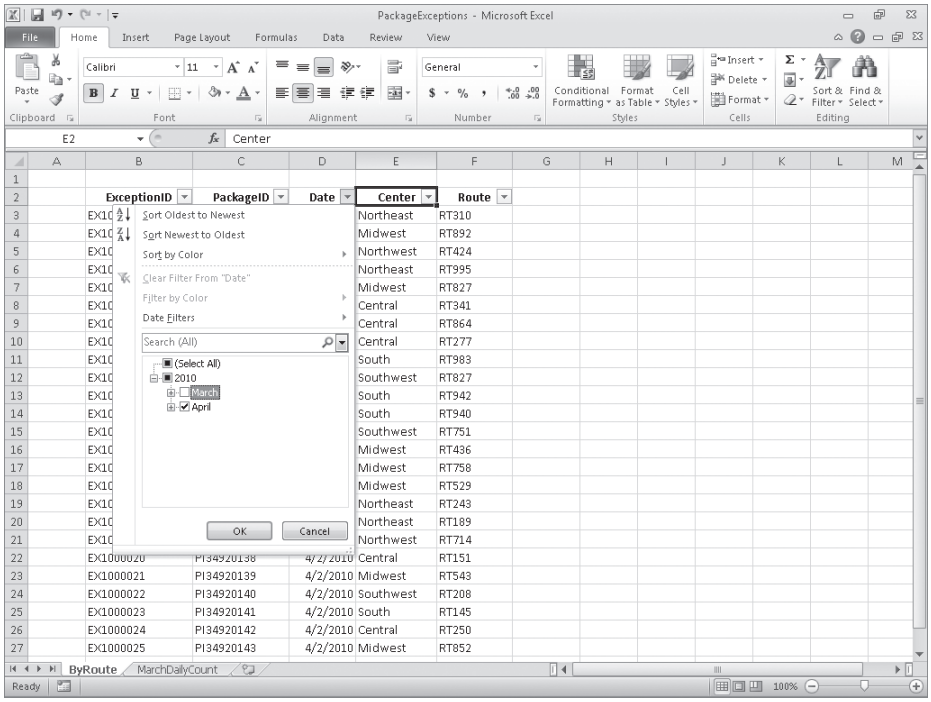
1. On the **ByRoute** worksheet, click any cell in the cell range **B2:F27**.


2. On the **Home** tab, in the **Editing** group, click **Sort & Filter**, and then click **Filter**.

   A filter arrow appears in each column's header cell.

3. Click the **Date** column filter arrow and then, from the menu that appears, clear the **March** check box.

   Excel removes the check from the March check box and changes the state of the Select All and 2010 check boxes to indicate that some items within those categories have been filtered.




4. Click **OK**.

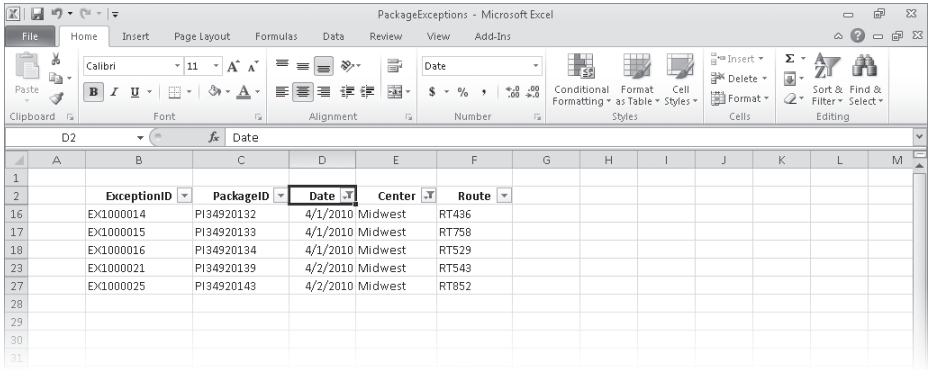
   Excel hides all rows that contain a date from the month of March.

5. Click the **Center** column filter arrow and then, from the menu that appears, clear the **Select All** check box.

   Excel clears all the check boxes in the list.

6. Select the **Midwest** check box, and then click **OK**.

   Excel displays only those exceptions that occurred in the Midwest distribution center during the month of April.




7. On the **Home** tab, in the **Editing** group, click **Sort & Filter**, and then click **Clear**.

   Excel clears all active filters but leaves the filter arrows in place.

8. Click the **Route** column header's filter arrow, and then type **RT9** in the **Search** box.

   The filter list displays only those routes with an identifier that includes the characters *RT9*.

9. Click **OK**.

   Excel applies the filter, displaying exceptions that occurred on routes with identifiers that contain the string *RT9*.

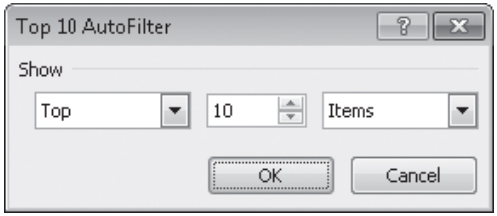
10. Click the **MarchDailyCount** sheet tab.

    The MarchDailyCount worksheet appears.

11. Click any cell in the Excel table.

12. Click the **Exceptions** column filter arrow, point to **Number Filters**, and then click **Top 10**.

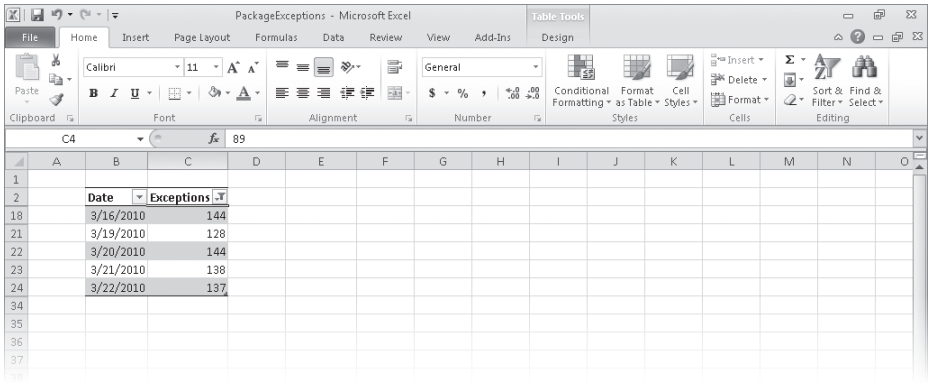
    The Top 10 AutoFilter dialog box opens.




13. In the middle field, type **5**.

14. Click **OK**.

    Excel displays the table rows that contain the five highest values in the Exceptions column.




15. Click the **Exceptions** column filter arrow, and then click **Clear Filter from "Exceptions"**.

    Excel removes the filter.

16. Click the **Date** column filter arrow, point to **Date Filters**, and then click **Custom Filter**.

    The Custom AutoFilter dialog box opens.

17. In the upper-left list, click **is after or equal to**.

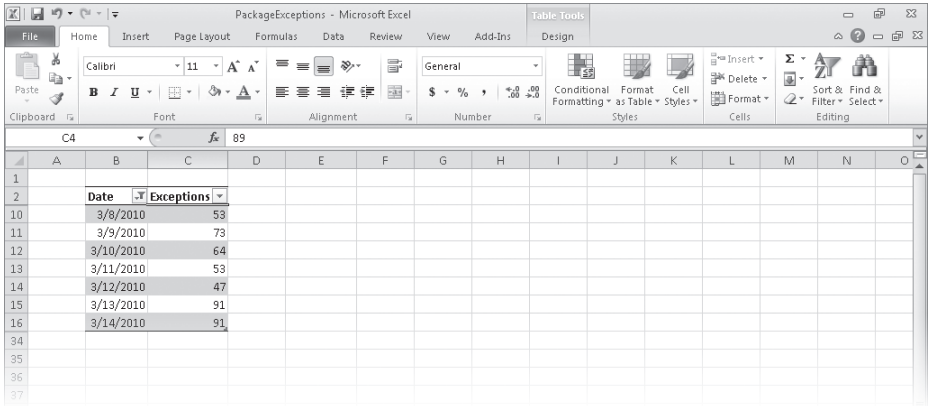
18. In the upper-right list, click **3/8/2010**.

19. In the lower-left list, click **is before or equal to**.

20. In the lower-right list, click **3/14/2010**.

21. Click **OK**.

    Because you left the And option selected, Excel displays all table rows that contain a date from 3/8/2010 to 3/14/2010, inclusive.




22. On the Quick Access Toolbar, click the **Undo** button to remove your filter.

    Excel restores the table to its unfiltered state.

**CLEAN UP** Save the PackageExceptions workbook, and then close it.

# Manipulating Worksheet Data

Excel offers a wide range of tools you can use to summarize worksheet data. This section shows you how to select rows at random using the *RAND* and *RANDBETWEEN* functions, how to summarize worksheet data using the *SUBTOTAL* and *AGGREGATE* functions, and how to display a list of unique values within a data set.

## Selecting List Rows at Random

In addition to filtering the data that is stored in your Excel worksheets, you can choose rows at random from a list. Selecting rows randomly is useful for choosing which customers will receive a special offer, deciding which days of the month to audit, or picking prize winners at an employee party.

To choose rows randomly, you can use the *RAND* function, which generates a random value between 0 and 1, and compare the value it returns with a test value included in the formula. As an example, suppose Consolidated Messenger wanted to offer approximately 30 percent of its customers a discount on their next shipment. A formula that returns a *TRUE* value 30 percent of the time would be *RAND<=0.3*; that is, whenever the random value was between 0 and 0.3, the result would be *TRUE*. You could use this formula to select each row in a list with a probability of 30 percent. A formula that displayed *TRUE* when the value was equal to or less than 30 percent, and *FALSE* otherwise, would be *=IF(RAND()<=0.3,"True","False")*.

If you recalculate this formula 10 times, it's very unlikely that you would see exactly three *TRUE* results and seven *FALSE* results. Just as flipping a coin can result in the same result 10 times in a row by chance, so can the *RAND* function's results appear to be off if you only recalculate it a few times. However, if you were to recalculate the function 10 thousand times, it is extremely likely that the number of *TRUE* results would be very close to 30 percent.

**Tip** **Because the *RAND* function is a volatile function (it recalculates its results every time you update the worksheet), you should copy the cells that contain the *RAND* function in a formula and paste the formulas' values back into their original cells. To do so, select the cells that contain the *RAND* formulas and press Ctrl+C to copy the cell's contents. Then, on the Home tab, in the Clipboard group, in the Paste list, click Paste Values to replace the formula with its current result. If you don't replace the formulas with their results, you will never have a permanent record of which rows were selected.**

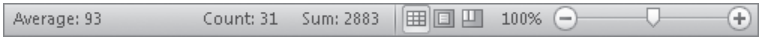
The *RANDBETWEEN* function generates a random whole number within a defined range. For example, the formula *=RANDBETWEEN(1,100)* would generate a random integer value from 1 to 100, inclusive. The *RANDBETWEEN* function is very useful for creating sample data collections for presentations. Before the *RANDBETWEEN* function

was introduced, you had to create formulas that added, subtracted, multiplied, and divided the results of the *RAND* function, which are always decimal values between 0 and 1, to create your data.

## Summarizing Worksheets with Hidden and Filtered Rows

The ability to analyze the data that's most vital to your current needs is important, but there are some limitations to how you can summarize your filtered data by using functions such as *SUM* and *AVERAGE*. One limitation is that any formulas you create that include the *SUM* and *AVERAGE* functions don't change their calculations if some of the rows used in the formula are hidden by the filter.

Excel provides two ways to summarize just the visible cells in a filtered data list. The first method is to use AutoCalculate. To use AutoCalculate, you select the cells you want to summarize. When you do, Excel displays the average of values in the cells, the sum of the values in the cells, and the number of visible cells (the count) in the selection. You'll find the display on the status bar at the lower edge of the Excel window.




When you use AutoCalculate, you aren't limited to finding the sum, average, and count of the selected cells. To display the other functions you can use, right-click the status bar and select the function you want from the shortcut menu. If a check mark appears next to a function's name, that function's result appears on the status bar. Clicking a checked function name removes that function from the status bar.

AutoCalculate is great for finding a quick total or average for filtered cells, but it doesn't make the result available in the worksheet. Formulas such as *=SUM(C3:C26)* always consider every cell in the range, regardless of whether you hide a cell's row by right-clicking the row's header and then clicking Hide, so you need to create a formula by using either the *SUBTOTAL* function or the *AGGREGATE* function (which is new in Excel 2010) to summarize just those values that are visible in your worksheet. The *SUBTOTAL* function enables you to summarize every value in a range or summarize only those values in rows you haven't manually hidden. The *SUBTOTAL* function has this syntax: *SUBTOTAL(function_num, ref1, ref2, ...)*. The *function_num* argument holds the number of the operation you want to use to summarize your data. (The operation numbers are summarized in a table later in this section.) The *ref1*, *ref2*, and further arguments represent up to 29 ranges to include in the calculation.

As an example, assume you have a worksheet where you hid rows 20-26 manually. In this case, the formula *=SUBTOTAL(9, C3:C26, E3:E26, G3:G26)* would find the sum of all values in the ranges C3:C26, E3:E26, and G3:G26, regardless of whether that range contained

any hidden rows. The formula *=SUBTOTAL(109, C3:C26, E3:E26, G3:G26)* would find the sum of all values in cells C3:C19, E3:E19, and G3:G19, ignoring the values in the manually hidden rows.

**Important** **Be sure to place your *SUBTOTAL* formula in a row that is even with or above the headers in the range you're filtering. If you don't, your filter might hide the formula's result!**

The following table lists the summary operations available for the *SUBTOTAL* formula. Excel displays the available summary operations as part of the Formula AutoComplete functionality, so you don't need to remember the operation numbers or look them up in the Help system.

| Operation number (includes hidden values) | Operation number (ignores values in manually hidden rows) | Function | Description |
|---|---|---|---|
| 1 | 101 | *AVERAGE* | Returns the average of the values in the range |
| 2 | 102 | *COUNT* | Counts the cells in the range that contain a number |
| 3 | 103 | *COUNTA* | Counts the nonblank cells in the range |
| 4 | 104 | *MAX* | Returns the largest (maximum) value in the range |
| 5 | 105 | *MIN* | Returns the smallest (minimum) value in the range |
| 6 | 106 | *PRODUCT* | Returns the result of multiplying all numbers in the range |
| 7 | 107 | *STDEV.S* | Calculates the standard deviation of values in the range by examining a sample of the values |
| 8 | 108 | *STDEV.P* | Calculates the standard deviation of the values in the range by using all the values |
| 9 | 109 | *SUM* | Returns the result of adding all numbers in the range together |
| 10 | 110 | *VAR.S* | Calculates the variance of values in the range by examining a sample of the values |
| 11 | 111 | *VAR.P* | Calculates the variance of the values in the range by using all of the values |

As the previous table shows, the *SUBTOTAL* function has two sets of operations. The first set (operations 1-11) represents operations that include hidden values in their summary, and the second set (operations 101-111) represents operations that summarize only values

visible in the worksheet. Operations 1-11 summarize all cells in a range, regardless of whether the range contains any manually hidden rows. By contrast, the operations 101-111 ignore any values in manually hidden rows. What the *SUBTOTAL* function doesn't do, however, is change its result to reflect rows hidden by using a filter.

The new *AGGREGATE* function extends the capabilities of the *SUBTOTAL* function. With it, you can select from a broader range of functions and use another argument to determine which, if any, values to ignore in the calculation. *AGGREGATE* has two possible syntaxes, depending on the summary operation you select. The first syntax is *=AGGREGATE(function_num, options, ref1...)*, which is similar to the syntax of the *SUBTOTAL* function. The other possible syntax, *=AGGREGATE(function_num, options, array, [k])*, is used to create *AGGREGATE* functions that use the *LARGE*, *SMALL*, *PERCENTILE.INC*, *QUARTILE.INC*, *PERCENTILE.EXC*, and *QUARTILE.EXC* operations.

The following table summarizes the summary operations available for use in the *AGGREGATE* function.

| Number | Function | Description |
|---|---|---|
| 1 | *AVERAGE* | Returns the average of the values in the range. |
| 2 | *COUNT* | Counts the cells in the range that contain a number. |
| 3 | *COUNTA* | Counts the nonblank cells in the range. |
| 4 | *MAX* | Returns the largest (maximum) value in the range. |
| 5 | *MIN* | Returns the smallest (minimum) value in the range. |
| 6 | *PRODUCT* | Returns the result of multiplying all numbers in the range. |
| 7 | *STDEV.S* | Calculates the standard deviation of values in the range by examining a sample of the values. |
| 8 | *STDEV.P* | Calculates the standard deviation of the values in the range by using all the values. |
| 9 | *SUM* | Returns the result of adding all numbers in the range together. |
| 10 | *VAR.S* | Calculates the variance of values in the range by examining a sample of the values. |
| 11 | *VAR.P* | Calculates the variance of the values in the range by using all of the values. |
| 12 | *MEDIAN* | Returns the value in the middle of a group of values. |
| 13 | *MODE.SNGL* | Returns the most frequently occurring number from a group of numbers. |
| 14 | *LARGE* | Returns the *k*-th largest value in a data set; *k* is specified using the last function argument. If *k* is left blank, Excel returns the largest value. |

*(continued)*

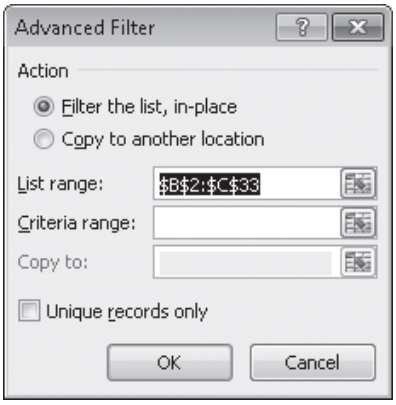
| Number | Function | Description |
|---|---|---|
| 15 | *SMALL* | Returns the *k*-th smallest value in a data set; *k* is specified using the last function argument. If *k* is left blank, Excel returns the smallest value. |
| 16 | *PERCENTILE.INC* | Returns the *k*-th percentile of values in a range, where *k* is a value from 0 to 1, inclusive. |
| 17 | *QUARTILE.INC* | Returns the quartile value of a data set, based on a percentage from 0 to 1, inclusive. |
| 18 | *PERCENTILE.EXC* | Returns the *k*-th percentile of values in a range, where *k* is a value from 0 to 1, exclusive. |
| 19 | *QUARTILE.EXC* | Returns the quartile value of a data set, based on a percentage from 0 to 1, exclusive. |

The second argument, *options*, enables you to select which items the *AGGREGATE* function should ignore. These items can include hidden rows, errors, and *SUBTOTAL* and *AGGREGATE* functions. The following table summarizes the values available for the options argument and the effect they have on the function's results.

| Number | Description |
|---|---|
| 0 | Ignore nested *SUBTOTAL* and *AGGREGATE* functions |
| 1 | Ignore hidden rows and nested *SUBTOTAL* and *AGGREGATE* functions |
| 2 | Ignore error values and nested *SUBTOTAL* and *AGGREGATE* functions |
| 3 | Ignore hidden rows, error values, and nested *SUBTOTAL* and *AGGREGATE* functions |
| 4 | Ignore nothing |
| 5 | Ignore hidden rows |
| 6 | Ignore error values |
| 7 | Ignore hidden rows and error values |

## Finding Unique Values Within a Data Set

Summarizing numerical values can provide valuable information that helps you run your business. It can also be helpful to know how many different values appear within a column. For example, you might want to display all of the countries in which Consolidated Messenger has customers. If you want to display a list of the unique values in a column, click any cell in the data set, display the Data tab and then, in the Sort & Filter group, click Advanced to display the Advanced Filter dialog box.




In the List Range field, type the reference of the cell range you want to examine for unique values, select the Unique Records Only check box, and then click OK to have Excel display the row that contains the first occurrence of each value in the column.

**Important** Excel treats the first cell in the data range as a header cell, so it doesn't consider the cell as it builds the list of unique values. Be sure to include the header cell in your data range!

In this exercise, you'll select random rows from a list of exceptions to identify package delivery misadventures to investigate, create an *AGGREGATE* formula to summarize the visible cells in a filtered worksheet, and find the unique values in one column of data.

**SET UP** You need the ForFollowUp_start workbook located in your Chapter05 practice file folder to complete this exercise. Open the ForFollowUp_start workbook, and save it as *ForFollowUp*. Then follow the steps.

1. Select cells **G3:G27**.

   The average of the values in the selected cells, the number of cells selected, and the total of the values in the selected cells appear in the AutoCalculate area of the status bar.

2. In cell **J3**, enter the formula **=AGGREGATE(1,1,G3:G27)**.

   The value *$15.76* appears in cell J3.


3. On the **Data** tab, in the **Sort & Filter** group, click **Advanced**.

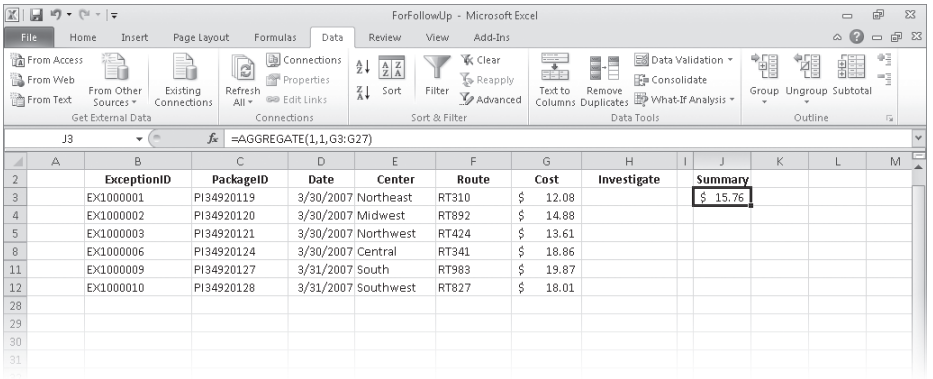
   The Advanced Filter dialog box opens.

4. In the **List range** field, type **E2:E27**.

5. Select the **Unique records only** check box, and then click **OK**.

   Excel displays the rows that contain the first occurrence of each different value in the selected range.

**Tip** Remember that you must include cell E2, the header cell, in the List Range field so that the filter doesn't display two occurrences of Northeast in the unique values list. To see what happens when you don't include the header cell, try changing the range in the List Range field to E3:E27, selecting the Unique Records Only check box, and clicking OK.




| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | | ExceptionID | PackageID | Date | Center | Route | Cost | Investigate | | Summary | | | |
| 3 | | EX1000001 | PI34920119 | 3/30/2007 | Northeast | RT310 | $ 12.08 | | | $ 15.76 | | | |
| 4 | | EX1000002 | PI34920120 | 3/30/2007 | Midwest | RT892 | $ 14.88 | | | | | | |
| 5 | | EX1000003 | PI34920121 | 3/30/2007 | Northwest | RT424 | $ 13.61 | | | | | | |
| 8 | | EX1000006 | PI34920124 | 3/30/2007 | Central | RT341 | $ 18.86 | | | | | | |
| 11 | | EX1000009 | PI34920127 | 3/31/2007 | South | RT983 | $ 19.87 | | | | | | |
| 12 | | EX1000010 | PI34920128 | 3/31/2007 | Southwest | RT827 | $ 18.01 | | | | | | |
| 28 | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | |


6. On the **Data** tab, in the **Sort & Filter** group, click **Clear**.

   Excel removes the filter.

7. In cell **H3**, type the formula **=IF(RAND()<0.15,"Yes","No")**, and press Enter.

   A value of *Yes* or *No* appears in cell H3, depending on the *RAND* function result.

8. Select cell **H3**, and then drag the fill handle down until it covers cell **H27**.

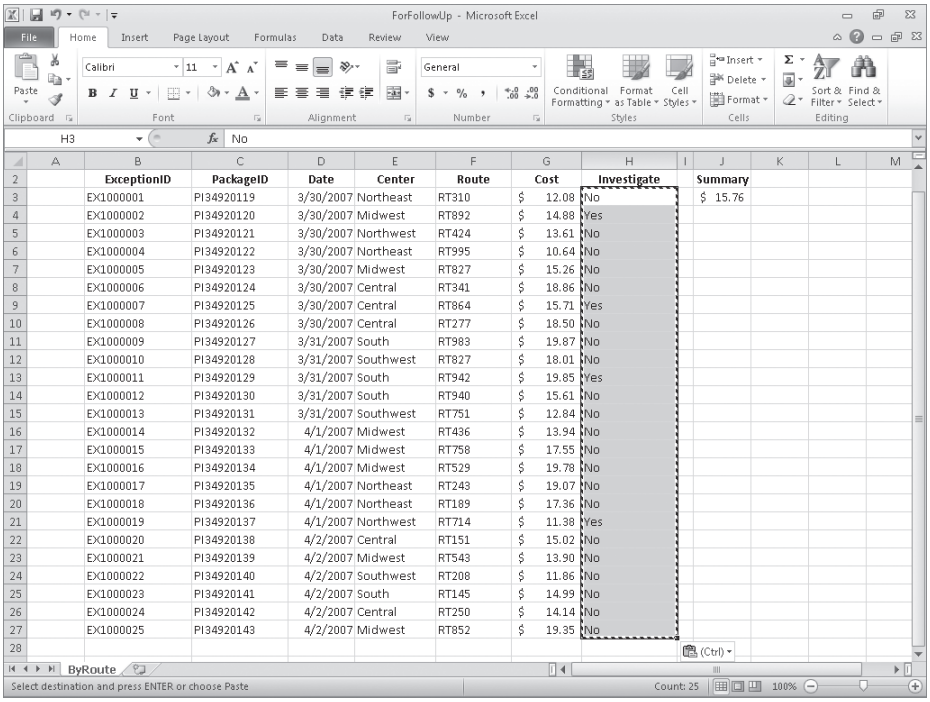
   Excel copies the formula into every cell in the range H3:H27.

9. With the range **H3:H27** still selected, on the **Home** tab, in the **Clipboard** group, click the **Copy** button.

   Excel copies the cell range's contents to the Microsoft Office Clipboard.


10. Click the **Paste** arrow, and then in the **Paste** gallery that appears, click the first icon in the **Paste Values** group.

    Excel replaces the cells' formulas with the formulas' current results.

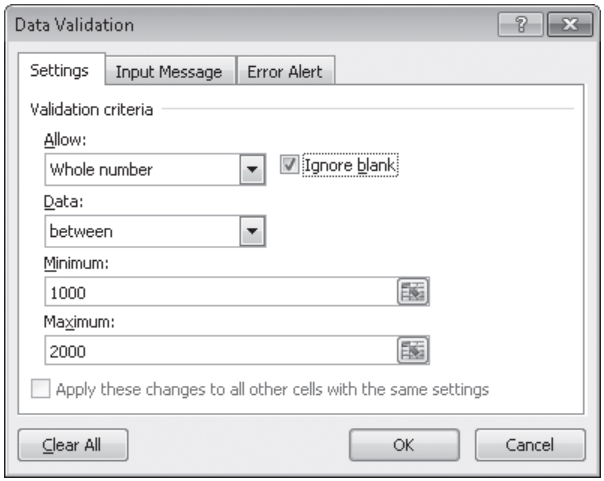



**CLEAN UP** Save the ForFollowUp workbook, and then close it.

# Defining Valid Sets of Values for Ranges of Cells

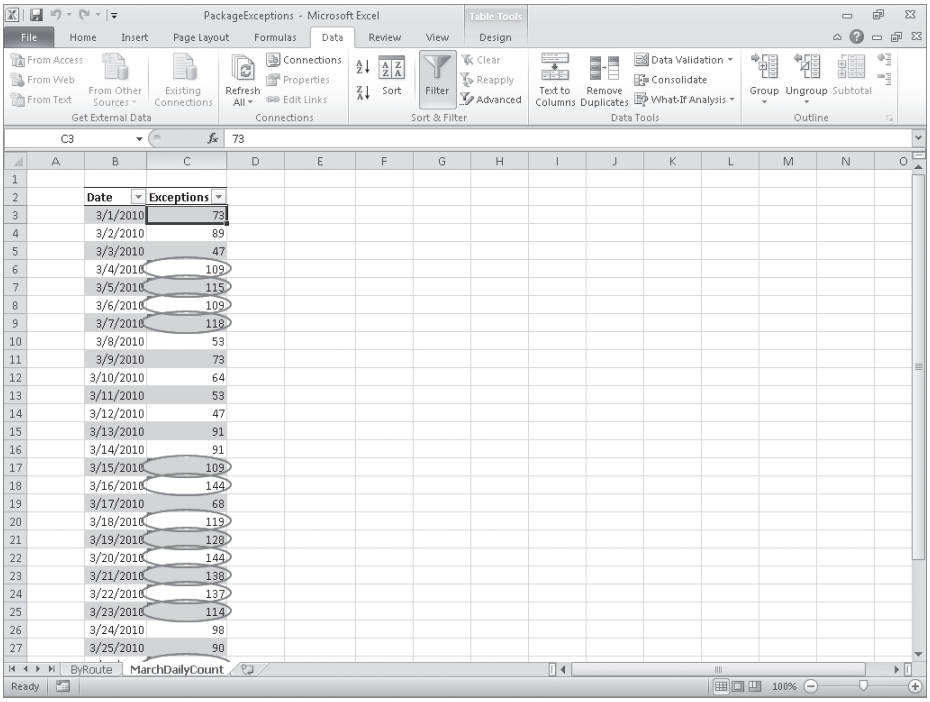
Part of creating efficient and easy-to-use worksheets is to do what you can to ensure the data entered into your worksheets is as accurate as possible. Although it isn't possible to catch every typographical or transcription error, you can set up a validation rule to make sure that the data entered into a cell meets certain standards.

To create a validation rule, display the Data tab on the ribbon and then, in the Data Tools group, click the Data Validation button to open the Data Validation dialog box. You can use the controls in the Data Validation dialog box to define the type of data that Excel should allow in the cell and then, depending on the data type you choose, to set the conditions data must meet to be accepted in the cell. For example, you can set the conditions so that Excel knows to look for a whole number value between 1000 and 2000.




Setting accurate validation rules can help you and your colleagues avoid entering a customer's name in the cell designated to hold the phone number or setting a credit limit above a certain level. To require a user to enter a numeric value in a cell, display the Settings page of the Data Validation dialog box, and, depending on your needs, choose either Whole Number or Decimal from the Allow list.

If you want to set the same validation rule for a group of cells, you can do so by selecting the cells to which you want to apply the rule (such as a column in which you enter the credit limit of customers of Consolidated Messenger) and setting the rule by using the Data Validation dialog box. One important fact you should keep in mind is that, with Excel, you can create validation rules for cells in which you have already entered data. Excel doesn't tell you whether any of those cells contain data that violates your rule at the moment you create the rule, but you can find out by having Excel circle any worksheet cells containing data that violates the cell's validation rule. To do so, display the Data tab and then, in the Data Tools group, click the Data Validation arrow. On the menu, click the Circle Invalid Data button to circle cells with invalid data.




When you're ready to hide the circles, in the Data Validation list, click Clear Validation Circles.

Of course, it's frustrating if you want to enter data into a cell and, when a message box appears that tells you the data you tried to enter isn't acceptable, you aren't given the rules you need to follow. With Excel, you can create a message that tells the user which values are expected before the data is entered and then, if the conditions aren't met, reiterate the conditions in a custom error message.

You can turn off data validation in a cell by displaying the Settings page of the Data Validation dialog box and clicking the Clear All button in the lower-left corner of the dialog box.

In this exercise, you'll create a data validation rule limiting the credit line of Consolidated Messenger customers to $25,000, add an input message mentioning the limitation, and then create an error message if someone enters a value greater than $25,000. After you create your rule and messages, you'll test them.

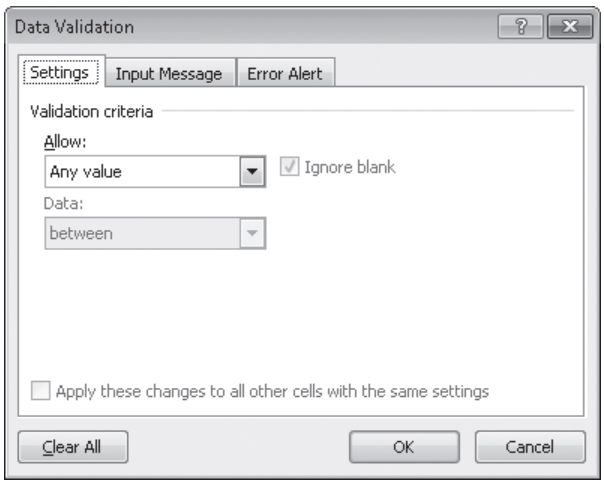
**SET UP** You need the Credit_start workbook located in your Chapter05 practice file folder to complete this exercise. Open the Credit_start workbook, and save it as *Credit*. Then follow the steps.

1. Select the cell range **J4:J7**.

   Cell J7 is currently blank, but you will add a value to it later in this exercise.

2. On the **Data** tab, in the **Data Tools** group, click **Data Validation**.


   The Data Validation dialog box opens and displays the Settings page.




3. In the **Allow** list, click **Whole Number**.

   Boxes labeled Minimum and Maximum appear below the Data box.

4. In the **Data** list, click **less than or equal to**.

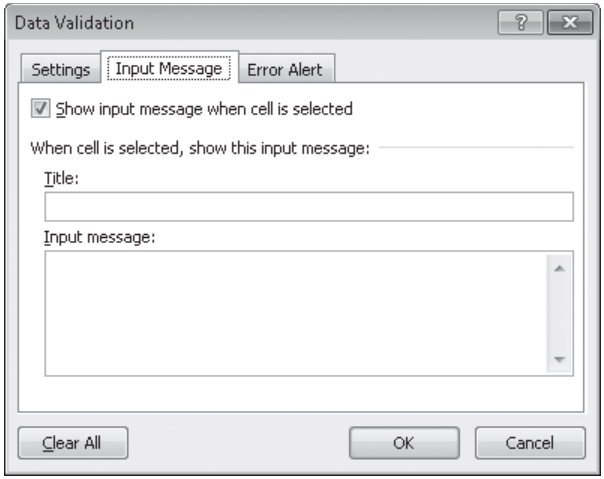
   The Minimum box disappears.

5. In the **Maximum** box, type **25000**.

6. Clear the **Ignore blank** check box.

7. Click the **Input Message** tab.

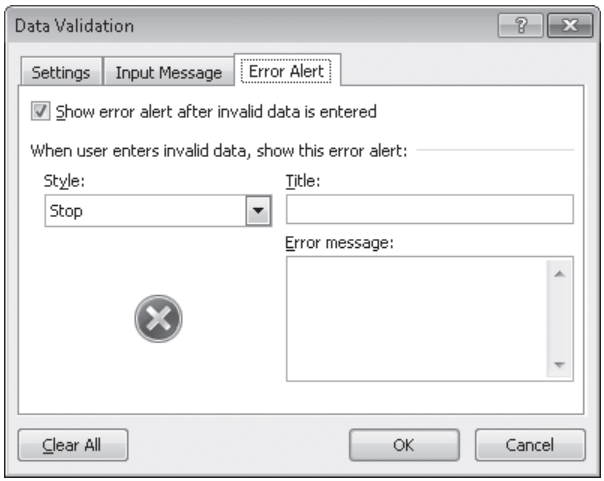
   The Input Message page is displayed.




8. In the **Title** box, type **Enter Limit**.
9. In the **Input Message** box, type **Please enter the customer's credit limit, omitting the dollar sign and any commas**.
10. Click the **Error Alert** tab.

    The Error Alert page is displayed.
11. In the **Style** list, click **Stop**.

    The icon that appears on your message box changes to the Stop icon.




12. In the **Title** box, type **Error**, and then click **OK**.
13. Click cell **J7**.

    A ScreenTip with the title *Enter Limit* and the text *Please enter the customer's credit limit, omitting the dollar sign and any commas* appears near cell J7.

14. Type **25001**, and press Enter.

    A stop box with the title Error opens. Leaving the Error Message box blank in step 12 causes Excel to use its default message.


15. Click **Cancel**.

    The error box closes.

    **Important** Clicking Retry enables you to edit the bad value, whereas clicking Cancel deletes the entry.

16. Click cell **J7**.

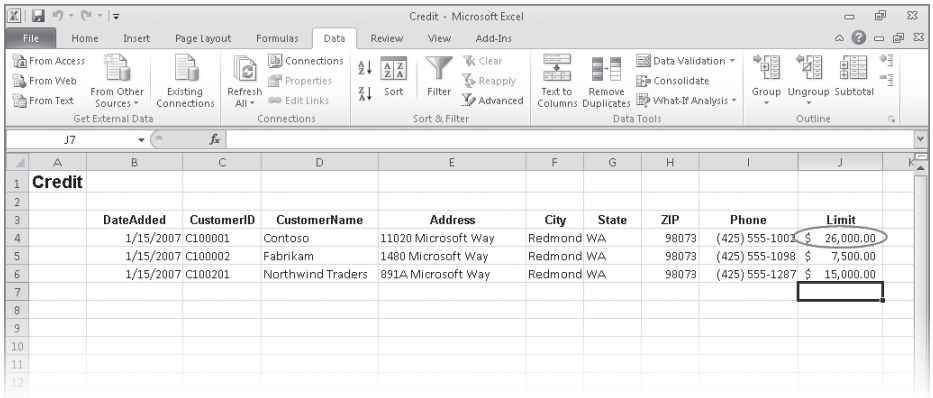
    Cell J7 becomes the active cell, and the ScreenTip reappears.

17. Type **25000**, and press Enter.

    Excel accepts your input.

18. On the **Data** tab, in the **Data Tools** group, click the **Data Validation** arrow and then, in the list, click **Circle Invalid Data**.

    A red circle appears around the value in cell J4.




19. In the **Data Validation** list, click **Clear Validation Circles**.

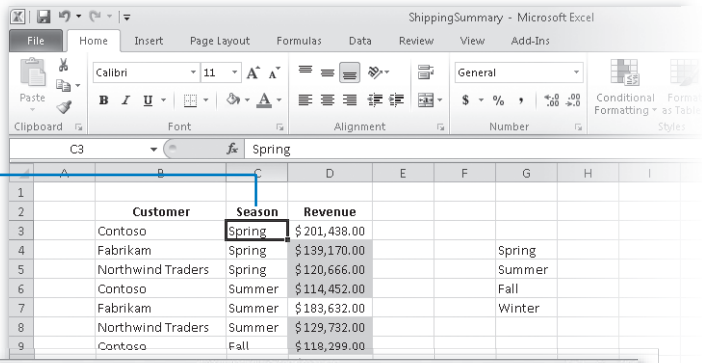
    The red circle around the value in cell K4 disappears.

**CLEAN UP** Save the Credit workbook, and then close it. If you are not continuing directly to the next chapter, exit Excel.

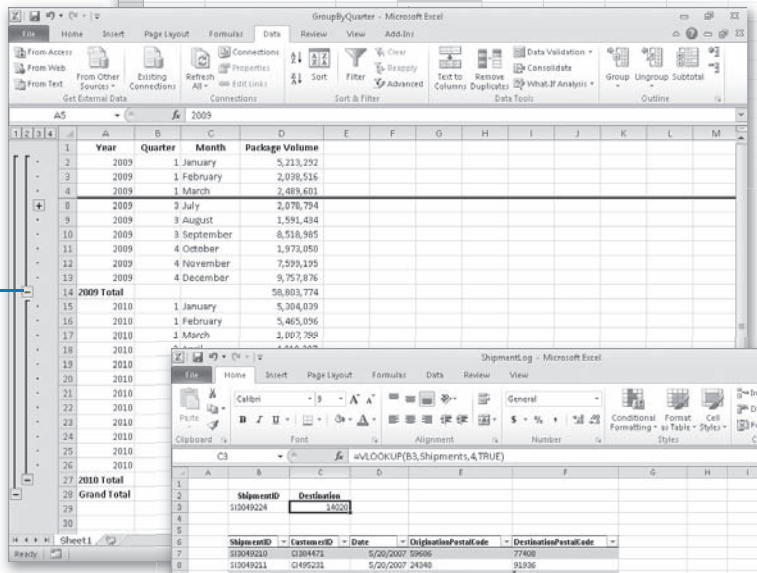
# Key Points

- A number of filters are defined in Excel. (You might find the one you want is already available.)
- Filtering an Excel worksheet based on values in a single column is easy to do, but you can create a custom filter to limit your data based on the values in more than one column as well.
- With the new search filter capability in Excel 2010, you can limit the data in your worksheets based on characters the terms contain.
- Don't forget that you can get a running total (or an average, or any one of several other summary operations) for the values in a group of cells. Just select the cells and look on the status bar: the result will be there.
- Use data validation techniques to improve the accuracy of data entered into your worksheets and to identify data that doesn't meet the guidelines you set.

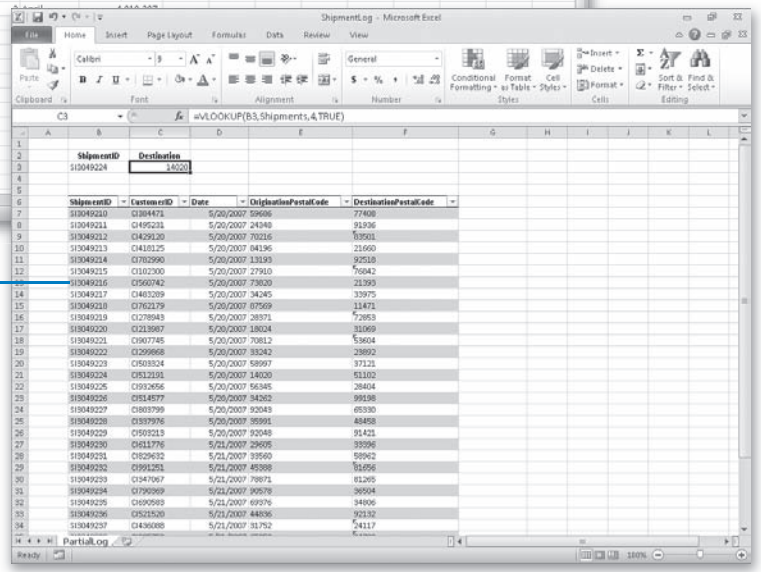
# Chapter at a Glance




Sort worksheet data, **page 144**




Organize data into levels, **page 153**




Look up information in a worksheet, **page 160**