Keeping Your Information Accurate

In this chapter, you will learn to:

- Restrict the type and amount of data in a field.
- Specify the format of data in a field.
- Restrict data by using validation rules.
- Create a simple or multi-column lookup list.
- Update information in a table.
- Delete information from a table.
- Prevent database problems.

Depending on how much information you have and how organized you are, you might compare a database to an old shoebox or to a file cabinet, into which you toss items such as photographs, bills, receipts, and a variety of other paperwork for later retrieval. However, neither a shoebox nor a file cabinet restricts anything other than the physical size of what you can place in it or imposes any order on its content. It is up to you to decide what you store there and to organize it properly so that you can find it when you next need it.

When you create a database by using Microsoft Office Access 2007, you can set properties that restrict what can be entered and impose order on the database contents, thereby helping you to keep the database organized and useful. You would not, for example, want employees to enter text into a price field, or to enter a long text description in a field when a simple "yes" or "no" answer would work best.

To ensure the ongoing accuracy of a database, you can create and run *action queries* that quickly update information or delete selected records from a table. You could, for example, increase the price of all products in one category by a certain percentage, or

remove all the elements of a specific product line. This type of updating is easy to do with an action query. Not only does using a query save time, but it helps to avoid errors.

In this chapter, you will restrict the type, amount, and format of data allowed in a field, and create a list from which a database user can choose a specific option. Then you will create and run an update guery and a delete guery.

See Also Do you need only a quick refresher on the topics in this chapter? See the Quick Reference entries on pages xxxix–lxv.



Important Before you can use the practice files in this chapter, you need to install them from the book's companion CD to their default location. See "Using the Book's CD" on page xxy for more information.

Troubleshooting Graphics and operating system–related instructions in this book reflect the Windows Vista user interface. If your computer is running Microsoft Windows XP and you experience trouble following the instructions as written, please refer to the "Information for Readers Running Windows XP" section at the beginning of this book.

Restricting the Type of Data in a Field

The Data Type setting restricts entries in a field to a specific type of data, such as text, numbers, or dates. If, for example, the data type is set to Number and you attempt to enter text, Access refuses the entry and displays a warning.

The *field properties* you can set to control input are:

- Required
- Allow Zero Length
- Field Size
- Input Mask
- Validation Rule

The Required and Allow Zero Length properties are fairly obvious. If the Required property is set to Yes, the field can't be left blank. However, Access differentiates between a blank field (which it refers to as a Null field) and a field that looks blank, but contains an empty string. If Allow Zero Length is set to Yes, you can enter an *empty string* (two quotation marks with nothing in between), which looks like a blank field, but it is classified as empty rather than Null. This differentiation might seem silly, but if you are using programming

code to work with an Access database, you will find that some commands produce different results for Null fields than they do for empty fields.

The Field Size, Input Mask, and Validation Rule properties are more complex, so the exercises in this chapter will focus on them.

Tip Each field property has many options. For more information, search for *field property* in Access Help.

In this exercise, you will add fields of the most common data types to a table, and then use the Data Type setting and Field Size property to restrict the data that can be entered into the table.



USE the *01_FieldTest* database. This practice file is located in the *Chapter07* subfolder under *SBS Access2007*.

OPEN the *01_FieldTest* database. Then display the Field Property Test table in Design view.

- 1. Click in the first available Field Name cell (below the automatically-generated ID field), type fText, and then press the help key to move to the Data Type cell.
 - The data type defaults to **Text**.
- 2. In the second Field Name cell, type fNumber, and then press [Tab].
- 3. Click the Data Type arrow, and in the list, click Number.

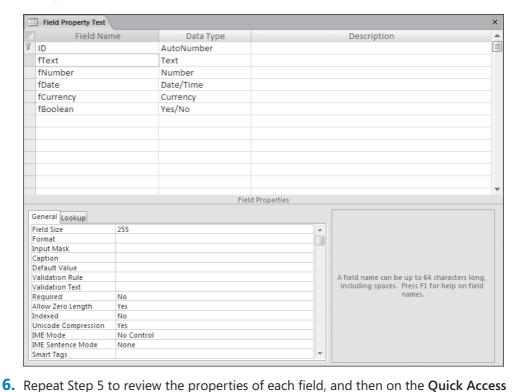
Tip You can scroll the list to the data type you want by typing the first letter of its name in the cell.

4. Repeat Steps 2 and 3 to add the following fields:

Field	Data type	
fDate	Date/Time	
fCurrency	Currency	
fBoolean	Yes/No	

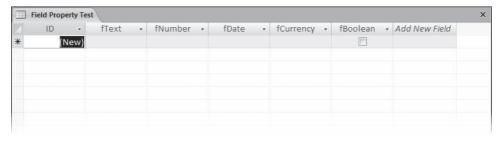
Tip The data type referred to as *Yes/No* in Access is more commonly called *Boolean* (in honor of George Boole, an early mathematician and logistician). This data type can hold either of two mutually exclusive values, often expressed as *yes/no*, 1/0, on/off, or *true/false*.

Click the fText field name to select it.Access displays the properties of the selected field in the lower portion of the dialog box.





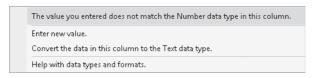
- Datasheet View
- 7. On the View toolbar, click the Datasheet View button.



- **8.** In the fText cell, type This entry is 32 characters long.
- **9.** In the **fNumber** cell, type **Five hundred**.

Toolbar, click the Save button.

The data type for this field is Number. Access does not accept your text entry, and displays a warning offering you several options.



- **10.** In the **Microsoft Office Access** message box, click **Enter new value**. Then replace *Five Hundred* with **500**.
- In the fDate cell, type date, and then press Tab.
 Access does not accept the unexpected data format.
- 12. In the Microsoft Office Access message box that appears, click Enter new value, type Jan 1, and then press [Tab].

The fDate field accepts almost any entry that can be recognized as a date, and displays it in the default date format. Depending on the default format on your computer, Jan 1 might be displayed as 1/1/2007, 1/1/07, or in some other format.

Tip If you enter a month and day but no year in a date field, Access assumes the date is in the current year. If you enter a month, day, and two-digit year from 00 through 30, Access assumes the year is 2000 through 2030. If you enter a two-digit year that is greater than 30, Access assumes you mean 1931 through 1999.

- 13. In the fCurrency field, type the word currency, and then press [Tab].

 Access does not accept the unexpected data format.
- 14. In the Microsoft Office Access message box that appears, click Enter new value, type –45.3456, and then press [Tab].

Access stores the number you entered but displays (\$45.35), the default format for negative currency numbers.

Tip Access uses the regional settings in the Windows Control Panel to determine the display format for date, time, currency, and other numbers. You can create custom formats to ensure that the correct currency symbol is always displayed with your values. Otherwise, the numbers won't change, but the currency symbol might, for instance from dollars to pounds, pesos, or euros.

15. In the **fBoolean** field, enter **123**. Then click anywhere in the field to toggle the check box between **No** (not checked) and **Yes** (checked), finishing with the field in the checked state.

This field won't accept anything you type; you can switch only between two predefined values.



Tip In Design view, you can open the Properties dialog box, and on the Lookup tab, set the Boolean field to display as a check box, text box, or combo box. You can set the Format property on the General tab to use True/False, Yes/No, or On/Off as the displayed values in this field (though the stored values will always be -1 and 0).



CLOSE the table without saving your changes, and then close the 01_FieldTest database.

Restricting the Amount of Data in a Field

The Field Size property, which is valid for the Text, Number, and AutoNumber data types, restricts the number of characters that can be entered in a text field (from 0 to 255) and the number of digits that can be entered in a number or AutoNumber field. You can set number fields to any of the following values:

Setting	Description
Byte	Stores whole numbers from 0 to 255
Integer	Stores whole numbers from -32,768 to 32,767
Long Integer	(The default.) Stores whole numbers from -2,147,483,648 to 2,147,483,647
Single	Stores negative numbers from -3.402823E38 to -1.401298E-45 and positive numbers from 1.401298E-45 to 3.402823E38
Double	Stores negative numbers from -1.79769313486231E308 to -4.94065645841247E-324 and positive numbers from 1.79769313486231E308 to 4.94065645841247E-324
Decimal	Stores numbers from -10^28 -1 through 10^28 -1

AutoNumber fields are automatically set to Long Integer.

By setting the Field Size property to a value that allows the largest valid entry, you prevent the user from entering certain types of invalid information. If you try to type more characters in a text field than the number allowed by the Field Size setting, an audio alert sounds, and Access refuses to accept the entry. Likewise, Access rejects any value that is below or above the limits of a number field when you try to move out of the field.

In this exercise, you will change the Field Size property for several fields to see the impact this has on data already in the table and on new data that you enter.



USE the *02_Size* database. This practice file is located in the *Chapter07* subfolder under *SBS Access2007*.

OPEN the *02 Size* database. Then open the Field Property Test table in Datasheet view.

1. Review the contents of the one record.





- 2. On the View toolbar, click the Design View button.
- 3. Click any cell in the fText row, and then in the Field Properties area, change the Field Size property from 255 to 12.
- **4.** Click any cell in the **fNumber** row, click the **Field Size** arrow, and then in the list, click **Byte**.

Access restricts the number of characters that can be entered in the text field to 12, and the values that can be entered in the number field to the range from 0 to 255 (inclusive).

5. Switch to Datasheet view, clicking **Yes** when prompted to save the table. The table contains data that doesn't fit these new property settings, so Access displays a warning that some data might be lost.



6. Click **Yes** to acknowledge the risk, and click **Yes** again to accept the deletion of the contents of one field.



fText now contains only 12 characters, rather than the 32 you entered. The other 20 characters have been permanently deleted. fNumber is empty because it is now limited to whole numbers from 0 through 255, and the value of 500 that you entered was deleted.

7. In the fNumber field, type 2.5, and then press the Enter key.

Access rounds the entered value to the nearest whole number.



Specifying the Format of Data in a Field

When you use *masks* in tables or forms, people entering information can see at a glance the format in which they should make entries and how long they should be. You can use the InputMask property to control how data is entered in text, number, date/time, and currency fields. This property has three sections, separated by semicolons, like the mask for a telephone number, shown here:

!\(000") "000\-0000;1;#

The first section contains characters that are used as placeholders for the information to be typed, as well as characters such as parentheses and hyphens. Together, all these characters control the appearance of the entry. The following table explains the purpose of the most common input mask characters:

Character	Description
0	Required digit (0 through 9).
9	Optional digit or space.
#	Optional digit or space; blank positions are converted to spaces; plus and minus signs are allowed.
L	Required letter (A through Z).
?	Optional letter (A through Z).
A	Required letter or digit.
a	Optional letter or digit.
&	Required character (any kind) or a space.
С	Optional character (any kind) or a space.
<	All characters that follow are converted to lowercase.
>	All characters that follow are converted to uppercase.
!	Characters typed into the mask fill it from left to right. You can include the exclamation point anywhere in the input mask.
\	Character that follows is displayed as a literal character.
"any text"	Access treats the string enclosed in double quotation marks as a literal string.
Password	Creates a password entry box. Any character typed in the box is stored as the character but displayed as an asterisk (*).

Any characters not included in this list are displayed as literal characters. If you want to use one of the special characters in this list as a literal character, precede it with the (backslash) character.

The second and third sections of the input mask are optional. Including a 1 in the second section or leaving it blank tells Access to store only the characters entered; including a 0 tells it to store both the characters entered and the mask characters. Entering a character in the third section causes Access to display that character as a placeholder for each of the characters to be typed; leaving it blank displays an underscore as the placeholder.

The input mask !\(000") "000\-0000;1;# creates this display in a field in either a table or a form:

(###) ###-###

In this example, you are restricting the entry to ten digits—no more and no less. The database user does not enter the parentheses, space, or dash, nor does Access store those characters (although you could display them in your table, form, or report if you set the correct format property). Access stores only the ten digits.

In this exercise, you will use the Input Mask wizard to apply a predefined telephone number input mask to a text field, forcing entered numbers into the (XXX) XXX-XXXX format. You will then create a custom mask to force the first letter entered in another text field to be uppercase (a capital letter).

USE the *03_Accurate* database. This practice file is located in the *Chapter07* subfolder under *SBS_Access2007*.

OPEN the *03_Accurate* database. Then display the Field Property Test table in Design view.

- 1. In the first blank Field Name cell, type fPhone, and leave the data type set to Text.
- 2. Click the row selector to select the row, and then drag the selected field up to place it just below the ID field.
- Save the table design, and with fPhone still selected, click Input Mask in the Field Properties area.
- **4.** Click the ellipsis button to the right of the cell to start the Input Mask wizard and display the first page of the wizard. (If you are prompted to install this feature, click Yes.)



With Phone Number selected in the Input Mask list, click Next.

The second page of the wizard displays the input mask and gives you the opportunity to change the placeholder character that will indicate what to type. The exclamation point causes Access to fill the mask from left to right with whatever is typed. The parentheses and hyphen are characters that Access will insert in the specified places. The nines represent optional digits, and the zeros



represent required digits. This allows you to enter a telephone number either with or without an area code.

Tip Because Access fills the mask from left to right, you would have to press the Right Arrow key to move the insertion point past the first three placeholders to enter a telephone number without an area code.

6. Change 999 to 000 to require an area code, and then change the placeholder character to #.

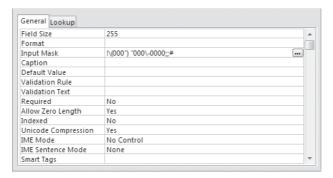


7. Click Next.

On the third page of the wizard, you specify whether you want to store the symbols with the data. If you store the symbols, the data will always be displayed in tables, forms, and reports in this format. However, the symbols take up space, meaning that your database will be larger.



8. Accept the default selection—to store data without the symbols—by clicking **Finish**. Access closes the wizard and displays the edited mask as the Input Mask property.



9. Press Finter to accept the mask.

Access changes the format of the mask to !\(000") "000\-0000;;#.\) Notice the two semicolons that separate the mask into its three sections. Because you told Access to store data without the symbols, nothing is displayed in the second section of the mask. Notice also that Access added double quotation marks to ensure that the closing parenthesis and following space are treated as literals.

Tip When you press Enter, a button appears in front of the Input Mask. This is the Property Update Options button, and if you click it, a list of options is displayed. In this case, the only options are to apply the input mask everywhere fPhone is used, and to provide help. This button disappears when you edit any other property or change to a different field.

- **10.** Save your changes, and then switch to Datasheet view.
- 11. Press the key to move to the new record, then press the key to move to the fphone field. Type a series of numbers and letters to see how the mask works.

Access formats the first ten numbers you enter as a telephone number, ignoring any letters or additional digits you type. If you type fewer than ten digits and then press Tab or Enter, Access warns that your entry doesn't match the input mask.

Tip An input mask can contain more than only placeholders for the data to be entered. If, for example, you type "The number is" in front of the telephone number in the Input Mask property, the default entry for the field is *The number is (###) ###-###*. Then if you place the insertion point at the beginning of the field, the numbers you type replace the # placeholders, not the text. The Field Size setting is not applied to the characters in the mask, so if this setting is 15, the entry is not truncated even though the number of displayed characters (including spaces) is 28.

- **12.** Switch to Design view, and add a new field below fBoolean. Name it LastName. Leave the Data Type setting as the default, Text.
- - The greater than symbol (>) forces all following text to be uppercase. The L requires a letter. The less than symbol ()< forces all following text to be lowercase. Each question mark allows any letter or no letter, and there is one fewer question mark than the maximum number of letters you want to allow in the field (19, including the leading capital letter). The Field Size setting must be greater than this maximum.
- 14. Save your changes, return to Datasheet view, type smith in the LastName field of one of the records, and press [76]. Try entering SMITH, and then McDonald.

 Regardless of how you type the name, only its the first letter appears in the record capitalized, This type of mask has its limitations, but it can be useful in many situations.



CLOSE the Field Property Test table and the 03_Accurate database.

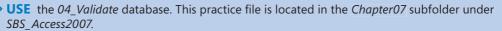
Tip You can create an input mask manually for text, number, date, or currency fields, or you can apply one of several standard masks for text and date fields by using the Input Mask wizard.

Restricting Data by Using Validation Rules

A *validation rule* is an expression that can precisely define the information that will be accepted in one or several fields in a record. You might use a validation rule in a field containing the date an employee was hired to prevent a date in the future from being entered. Or if you make deliveries to only certain local areas, you could use a validation rule on the phone field or ZIP code field to refuse entries from other areas.

You can type validation rules in by hand, or you can use the *Expression Builder* to create them. At the field level, Access uses the rule to test an entry when you attempt to leave the field. At the table level, Access uses the rule to test the content of several fields when you attempt to leave the record. If an entry doesn't satisfy the rule, Access rejects the entry and displays a message explaining why.

In this exercise, you will create and test several field validation rules and one table validation rule.

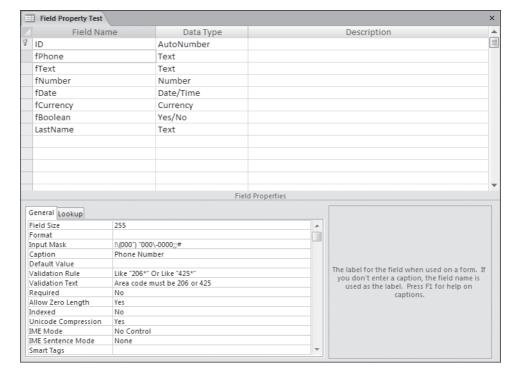


OPEN the 04_Validate database. Then display the Field Property Test table in Design view.

- Select fPhone, and then click in the Validation Rule box.
 An ellipsis button appears at the end of the Validation Rule box. You can click this button to use the Expression Builder to create an expression, or you can type an expression in the box.
- 2. Type Like "206*" Or Like "425*" in the Validation Rule box, and press [Enter].

Troubleshooting Be sure to include the asterisk after the 206 and 425.

- 3. In the Validation Text box, type Area code must be 206 or 425.
 A rule is set for the first three digits typed in the fPhone field including the text that Access should display if someone attempts to enter an invalid phone number.
- 4. In the Caption box, type Phone Number.



5. Save the table.

Access warns that data integrity rules have changed. The table violates the new rule because it contains blank phone number fields.

6. Click **No** to close the message box without testing the data.

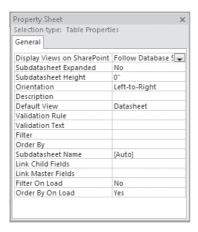
Tip When displaying tables as overlapping windows (rather than tabbed documents), you can test the validation rules in a table at any time by right-clicking the title bar of the table in Design view and then clicking Test Validation Rules. For more information about display options, see "Working in Access 2007" in Chapter 1, "Exploring Access 2007."

- 7. Return to Datasheet view, where the caption for the first field is now *Phone Number*.
- 8. Place the insertion point to the left of the first # of any Phone Number field, type 3605550109, and then press [Enter].

Tip To select the entire field, move the pointer to the left end of the Phone Number field, and when the pointer changes to a thick cross, click the field. The insertion point is then at the start of the area code when you begin typing.

The Validation Rule setting causes Access to display an alert box, warning you that the area code must be either 206 or 425.

- 9. Click OK to close the alert box, type a new phone number with one of the allowed area codes, and press [Enter].
- 10. Return to Design view, and add another date field. Type Date2 as the field name, set the data type to Date/Time, and drag the new field to just below fDate.
- **11.** Right-click in the table window, and then click **Properties**.



Tip The purpose of this Property Sheet is to set properties that apply to more than one field in the table, as opposed to setting properties for a single field in the Field Properties area.

- 12. Click in the Validation Rule box, type [Date2]>[fDate], and press [Enter].
- **13.** In the Validation Text box, type Date2 must be later than fDate, and then close the sheet.
 - A table validation rule is added that ensures that the second date is always later than the first one.
- **14.** Save the table (click **No** to close the data-integrity alert box), and return to Datasheet view.
- **15.** In any record, type 6/1/07 in fDate and 5/1/07 in Date2, and then click in another record.
 - Access displays the Validation Text setting from the Table Properties dialog box, reminding you that Date2 must be later than fDate.
- 16. Click OK, change Date2 to 6/2/2007, and then click in another record.



CLOSE the Field Property Test table and the *04_Validate* database.

Creating a Simple Lookup List

It is interesting how many different ways people can come up with to enter the same items of information in a database. Asked to enter the name of their home state, for example, residents of the state of Washington will type *Washington*, *Wash*, or *WA*, plus various typographical errors and misspellings. If you ask a dozen sales clerks to enter the name of a specific product, customer, and shipper in an invoice, it is unlikely that all of them will type the same thing. In cases like this, in which the number of correct choices is limited (to actual product name, actual customer, and actual shipper), providing the option to choose the correct answer from a list will improve your database's consistency.

Minor inconsistencies in the way data is entered might not be really important to someone who later reads the information and makes decisions. For example, *Arizona* and *AZ* refer to the same state. But a computer is very literal, and if you tell it to create a list so that you can send catalogs to everyone living in *AZ*, the computer won't include anyone whose state is listed in the database as *Arizona*.

You can limit the options for entering information in a database in several ways:

- For only two options, you can use a Boolean field represented by a check box. A
 check in the box indicates one choice, and no check indicates the other choice.
- For several mutually exclusive options on a form, you can use option buttons to gather the required information.
- For more than a few options, a combo box is a good way to go. When you click the arrow at the right end of a combo box, a list of choices is displayed. Depending on the properties associated with the combo box, if you don't see the option you want, you might be able to type something else, adding your entry to the list of possible options displayed in the future.
- For a short list of choices that won't change often, you can have the combo box look up the options in a list that you provide. Although you can create a lookup list by hand, it is a lot easier to use the *Lookup wizard*.

In this exercise, you will use the Lookup wizard to create a list of months from which the user can choose.

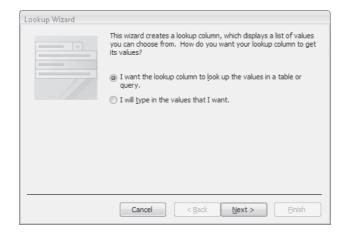


USE the 05_SimpleLookup database. This practice file is located in the Chapter07 subfolder under SBS Access 2007.

OPEN the <u>05_SimpleLookup</u> database. Then display the Field Property Test table in <u>Design</u> view.

 Add a new field below LastName. Name it Month1, and set the data type to Lookup Wizard.

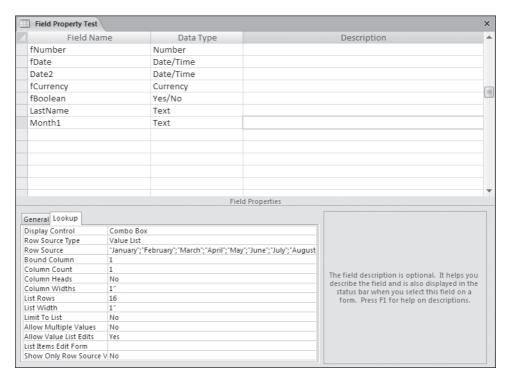
The Lookup wizard starts.



You can use the Lookup wizard to create a combo box that provides the entry for a text field. The combo box list can come from a table or query, or you can type the list in the wizard.

Tip If a field has a lot of potential entries, or if they will change often, you can link them to a table. (You might have to create a table expressly for this purpose.) If a field has only a few possible entries that won't change, typing the list in the wizard is easier.

- 2. Select the I will type in the values that I want option, and then click Next.
- 3. Leave the number of columns set to 1, and click in the Col1 box.
- **4.** Enter the 12 months of the year (January, February, and so on), pressing after each one to move to a new row.
- 5. Click Next, and then click Finish.
- **6.** In the Field Properties area, click the Lookup tab to view the Lookup information for the Month1 field.

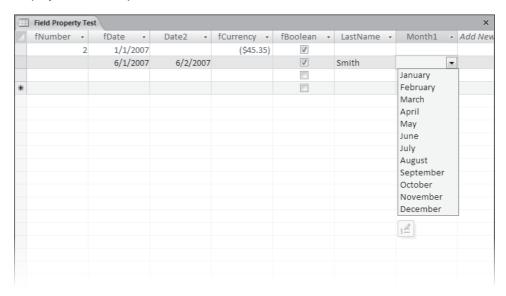


The wizard entered this information, but you can easily figure out what you would have to enter to create a lookup list by hand.

- 7. Switch to Datasheet view, clicking Yes to save your changes.
- **8.** Double-click the vertical bars between the column headers to adjust the column widths so that you can see all the fields.

Tip You can manually resize columns by dragging the vertical bars between the column headers.

9. Click in the **Month1** field of a record, and then click the arrow that appears to display the list of options.



Notice the button below the Month1 options list. Clicking this button opens the Edit List Items dialog box. This feature is new with Access 2007. The database user can open the editor by clicking the button, or by entering text that is not in the list and answering Yes when asked whether she or he wants to edit the list. If you don't want users to be able to edit the list, you can disable this property, as we do later in this exercise.

- **10.** If you opened it, close the **Edit List Items** dialog box and then click **February** to enter it in the field.
- **11.** Click in the next **Month1** field, type **Jan**, and press **Enter**.

 As soon as you type the *J*, the combo box displays *January*. If you had typed *Ju*, the combo box would have displayed *June*.

12. In the next **Month1** field, type **jly**, and press **Enter**].

Even though the entry isn't in the list, it is accepted just as you typed it. Although there might be times when you want to allow the entry of information other than the items in the list, this isn't one of those times, so you need to change the field properties to limit what can be entered.

13. Return to Design view.

The Limit To List property on the Lookup tab for Month1 is currently set to No, which allows people to enter information that isn't in the list.

- 14. Change Limit To List to Yes.
- 15. Change Allow Value List Edits to No.
- **16.** Save the table, return to Datasheet view, type jly in a new Month1 field, and then press Enter.

Access informs you that the text you entered is not in the list, and refuses the entry.

- **17.** In the Microsoft Office Access message box, click **OK**.
- 18. In the Month1 list, click July.
 The month of July is displayed in the field.



CLOSE the 05_SimpleLookup database, saving your changes.

Creating a Multi-Column Lookup List

Selecting a month from a list of names is convenient for people, but if your computer has to deal with this information in some mathematical way, a list of the numbers associated with each month is easier for it to use.

In this exercise, you will use the Lookup wizard to create a two-column list of months from which the user can choose.



USE the 06_MulticolumnLookup database. This practice file is located in the Chapter07 subfolder under SBS Access2007.

OPEN the <u>O6_MulticolumnLookup</u> database. Then display the Field Property Test table in <u>Design view.</u>

Add a new field below Month1. Name it Month2, and set the data type to Lookup Wizard.

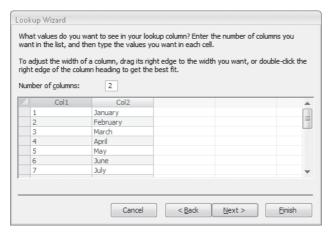
- 2. Select the I will type in the values that I want option, and then click Next.
- 3. Type 2 to add a second column, and then click in the Col1 cell.

Access adds a second column, labeled Col2.

4. Enter the following numbers and months in the two columns:

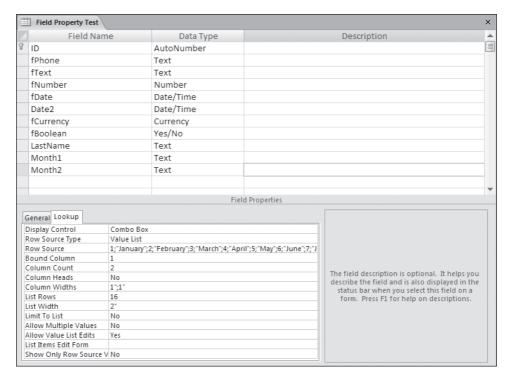
Number	Month
1	January
2	February
3	March
4	April
5	May
6	June
7	July
8	August
9	September
10	October
11	November
12	December
	·

It is not necessary to adjust the width of the columns in the Lookup wizard other than to make them visible within the wizard itself.



5. Click Next, and then click Finish.

6. In the **Field Properties** area, click the **Lookup** tab to view the Lookup information for the Month2 field.

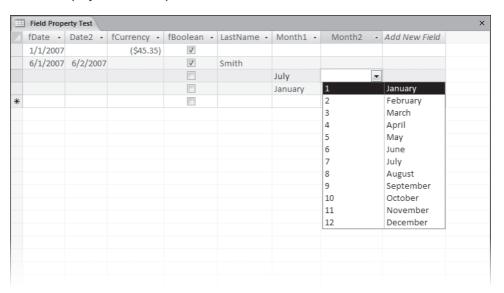


The wizard has inserted your column information into the Row Source box and set the other properties according to your specifications.

7. Change Limit To List to Yes and Allow Value List Edits to No.

Tip When a property has two or more possible values, you can quickly cycle through them by double-clicking the value, rather than clicking the arrow to open the list.

8. Save your changes, switch to Datasheet view, and then click the arrow in a Month2 field to display the list of options.



- 9. In the Month2 list, click January.
 - Access displays the number 1 in the field, which is useful for the computer. However, people might be confused by the two columns and by seeing something other than what they clicked or typed.
- **10.** Switch back to Design view, and in the Column Widths box—which appears as 1";1"—change the width for the first column to 0 (you don't have to type the symbol for inches) to prevent it from being displayed.
- 11. Save your changes, return to Datasheet view, and as a test, in the remaining records set Month2 to February in two records and to March in one record.

 Only the name of the month is now displayed in the list, and when you click a month, that name is displayed in the field. However, Access actually stores the associated number from the list's first column.
- **12.** Right-click any cell in the Month2 column, point to Text Filters, and then click Equals.

13. In the Custom Filter box, type 2, and then press Enter.

Access now displays only the two records with February in the Month2 field.



14. Click the **Toggle Filter** button, and then repeat Steps 12 and 13, this time typing 3 in the box to display the one record with March in the **Month2** field.



CLOSE the 06_MulticolumnLookup database, saving your changes.

Updating Information in a Table

As you use a database and as it grows, you might discover that errors creep in or that some information becomes out of date. You can tediously scroll through the records looking for those that need to be changed, but it is more efficient to use a few of the tools and techniques provided by Access for that purpose.

If you want to find or replace multiple instances of the same word or phrase, you can use the Find and Replace commands on the Edit menu. This command works much like the same commands in Microsoft Office Word or Microsoft Office Excel.

If you want to change information stored in the database only under certain circumstances, you need the power of an *update query*, which is a select query that performs an action on the query's results.

Tip Running an update query makes irreversible changes to the table; therefore, you should always create a backup copy of the table before running a query.

You can quickly create a copy of a table by displaying the Tables list in the Navigation Pane, clicking the table you want to copy pressing Ctrl+C, and then pressing Ctrl+V to paste a copy. In the Paste Table As dialog box, type a name for the new table, and then click OK

In this exercise, you will create an update query to increase the price of selected items by 10 percent.



USE the 07_Update database. This practice file is located in the Chapter07 subfolder under SBS Access2007.

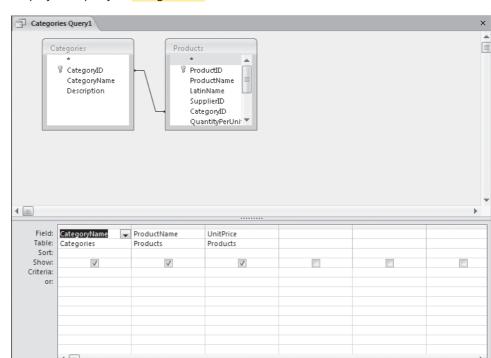
OPEN the *07_Update* database.



- 1. On the Create tab, in the Other group, click the Query Wizard button.
- 2. In the New Query dialog box, with Simple Query Wizard selected, click OK.
- 3. In the Tables/Queries list, click Table: Categories.
- **4.** In the **Available Fields** list, double-click **CategoryName** to move it to the **Selected Fields** list.
- 5. In the Tables/Queries list, click Table: Products.
- **6.** In the **Available Fields** list, double-click **ProductName** and **UnitPrice** to move them to the **Selected Fields** list.
- 7. In the Simple Query Wizard dialog box, click Finish to create the query using the default detail setting and title.

Access displays the query results in a datasheet. Only the Category Name, Product Name, and Unit Price fields are displayed.

Categories Query1		Heit Deise	
Category Nam -	Product Name -	Unit Price +	
Bulbs	Magic Lily	\$40.00	
Bulbs	Autumn crocus	\$18.75	
Bulbs	Anemone	\$28.00	
Bulbs	Lily-of-the-Field	\$38.00	
Bulbs	Siberian Iris	\$12.95	
Bulbs	Daffodil	\$12.95	
Bulbs	Peony	\$19.95	
Bulbs	Lilies	\$10.50	
Bulbs	Begonias	\$18.95	
Bulbs	Bulb planter	\$6.95	
Cacti	Prickly Pear	\$3.00	
Ground covers	Crown Vetch	\$12.95	
Ground covers	English Ivy	\$5.95	
Ground covers	European Ginger	\$6.25	
Ground covers	St. John's Wort	\$9.75	
Ground covers	Fairies Fern	\$9.95	
Grasses	The Best Bluegrass	\$17.95	
Grasses	Decorator moss	\$15.45	
Grasses	Colonial Bentgrass	\$15.50	
Grasses	Creeping Bentgrass	\$12.05	
Grasses	Red Fescue	\$20.00	
Grasses	Perennial Ryegrass	\$19.95	
Grasses	Redtop	\$21.50	
Flowers	Lily-of-the-Valley	\$33.00	
ecord:	▶ ► ► ► No Filter Search		



8. Display the query in Design view.

The current query results include the products in all categories. You want to raise the prices of only the products in the *bulbs* and *cacti* categories, so your next task is to change the query to select only those categories.

- 9. In the Criteria row, under CategoryName, type bulbs. Then in the or row, type cacti.
- **10.** Click the Run button to run the query to confirm that only bulbs and cacti are listed, and then return to Design view.

The query now selects only the records you want to change. But to actually make a change to the records, you have to use an update query.

Tip You can't create an action query directly; you must first create a select query and then change the query to one of the action types. With an existing select query open in Design view, you can find the command to convert it to an action query in the Query Type group and on the shortcut menu that appears when you right-click the query window and then point to Query Type.





11. Display the query in Design view. On the **Design** contextual tab, in the **Query Type** group, click the **Update** button.

Access converts the select query to an update query. In the design grid, the Sort and Show rows disappear and an Update To row appears.

12. In the Update To row, under UnitPrice, type [UnitPrice]*1.1.

Tip Enclosing UnitPrice in brackets indicates that it is an Access object. If you use the Expression Builder to insert this expression, it looks like this: [Products]![UnitPrice]*1.1. Because this description of the field includes the table in which it is found, you can also insert this expression in other tables.

13. Display the query in Datasheet view.

In a select query, clicking the View button is the same as clicking the Run button. But in an update query, clicking the View button simply displays a list of the fields that will be updated. In this case, you see a list of unit prices that matches the ones shown earlier in the select query.

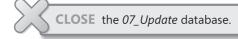
14. Switch to Design view. Then on the Query Tools **Design** contextual tab, in the **Results** group, click the **Run** button.

Access displays a warning that you can't undo the changes you are about to make, and asks you to confirm that you want to update the records.





- **15.** In the Microsoft Office Access message box, click Yes. Then click the View Datasheet button to display the UnitPrice field, where all the prices have been increased by 10 percent.
- **16.** Save and close the query.



Deleting Information from a Table

Over time, some of the information stored in a database might become obsolete. The Products table in our sample database, for example, lists all the products the company currently offers for sale or has sold in the past. You can indicate that a product is no longer available for sale by placing a check mark in the Discontinued field. Discontinued products aren't displayed in the catalog or offered for sale, but they are kept in the database for a while in case it becomes practical to sell them again. A similar situation could exist with customers who haven't placed an order in a long time or who have asked to be removed from a mailing list but might still place orders.

To maintain an efficient database, it is a good idea to clean house and discard outdated records from time to time. You could scroll through the tables and delete records manually, but if all the records you want to delete match some pattern, you can use a delete query to quickly get rid of all of them.

Important Keep in mind several things when deleting records from a database. First, you can't recover deleted records. Second, the effects of a delete query can be more far-reaching than you intend. If the table from which you are deleting records is linked to another table, and the Cascade Delete Related Records option for that relationship is selected, records in the second table will also be deleted. Sometimes this is what you want, but sometimes it isn't. For example, you probably don't want to delete records of previous sales at the same time you delete discontinued products.

To safeguard against these problems, it is a good idea to back up your database before deleting the records, or to create a new table (perhaps named *Deleted*<*file name*>), and then move the records you want to delete to the new table, where you can review them before deleting them permanently.

In this exercise, you will create a delete query to remove all discontinued products from a database table.



USE the *08_Delete* database. This practice file is located in the *Chapter07* subfolder under *SBS Access2007*.

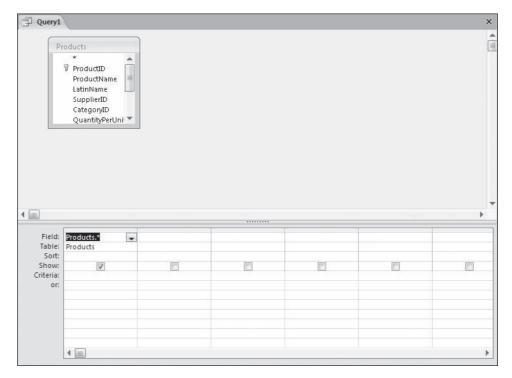
OPEN the 08 Delete database.



- On the Create tab, in the Other group, click the Query Design button.
 Access opens a new query object and the Show Table dialog box.
- 2. In the Show Table dialog box, double-click Products to add that table to the query window list area, and then click Close.

3. In the **Products** field list, double-click the asterisk to copy all the fields in the table to the query.

*Products.** appears in the Field row of the first column of the design grid, and *Products* appears in the Table row.



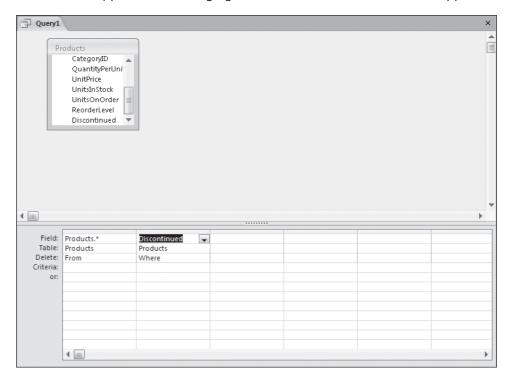
Important Double-clicking the asterisk in the field list is a quick way to move all the fields in a table to the query, without having each field appear in its own column. However, selecting multiple fields in this way prevents you from setting Sort, Show, and Criteria values for individual fields. To set these values, you have to add the specific fields to the design grid, thereby adding them twice. To avoid displaying the fields twice, clear the check mark in the Show row of the duplicate individual fields.

4. In the **Products** field list, double-click **Discontinued** to copy it to the next available column in the design grid.



5. In the **Query Type** group, click the **Delete** button to convert this select query to a delete query.

A Delete row appears in the design grid, and the Sort and Show rows disappear.



In the first column, which contains the reference to all fields in the Products table, the Delete row contains the word *From*, indicating that this is the table from which records will be deleted. When you add individual fields to the remaining columns, as you did with the Discontinued field, the Delete row displays *Where*, indicating that this field can include deletion criteria.

- 6. In the Criteria row, under Discontinued, type Yes.
 - The Discontinued field is set to the Boolean data type, which is represented in the datasheet as a check box that is selected to indicate Yes and cleared to indicate No. To locate all discontinued products, you need to identify records with the Discontinued field set to Yes.
- 7. To check the accuracy of the query, switch to Database view.

Testing the query results in a list of 18 discontinued products that would be deleted if you ran the query. Scroll to the right to verify that all records display a check mark in the Products. Discontinued field.

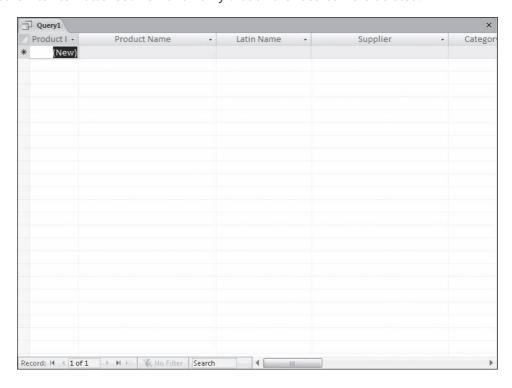


8. Switch to Design view. Then on the **Design** contextual tab, in the **Results** group, click the **Run** button to run the delete query.

Access displays a warning to remind you of the permanence of this action.

Tip Before actually deleting records, you might want to display the Relationships window by clicking the Relationships button in the Show/Hide Group on the Database Tools tab. If the table you are deleting data from has a relationship with any table containing information that shouldn't be deleted, right-click the relationship line, click Edit Relationship, and make sure that the Enforce Referential Integrity check box is selected and the Cascade Delete Related Records check box is not selected.

- **9.** In the Microsoft Office Access message box, click Yes to delete the records.
- **10.** Switch to Datasheet view and verify that all the records were deleted.



11. If you think you might run the same delete query in the future, save and name the query.

Tip If you are concerned that someone might accidentally run a delete query and destroy records you weren't ready to destroy, change the query back to a select query before saving it. You can then open the select query in Design view and change it to a delete query the next time you want to run it.



CLOSE the query and the 08_Delete database.

Preventing Database Problems

In the day-to-day use of an Access database—adding and deleting records, modifying forms and reports, and so on—various problems can develop. This is especially true if the database is stored on a network share, rather than on a local drive, and is accessed by multiple users. Access monitors the condition of database files as you open and work with them. If a problem develops, Access attempts to fix it. If Access can't fix the problem, it usually provides additional information that might help you to find a solution. But Access doesn't always spot problems before they affect the database; if this happens, you might notice that the database performance seems to slow down or become erratic. Even if no actual errors occur, normal database use causes the internal structure of a database to become fragmented, resulting in a bloated file and inefficient use of disk space.

You don't have to wait for Access to spot a problem. There are various things you can do to help keep your database healthy and running smoothly. Your first line of defense against damage or corruption in any kind of file is the maintenance of backups. Database files rapidly become too large to conveniently back up onto a floppy disk, but you have many other options: you can copy the file to another computer on the network or to removable media such as a USB flash drive, send it as an e-mail attachment to another location, create a tape backup, or burn a CD-ROM.

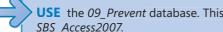
Tip To back up a database in Access 2007, click the Microsoft Office Button, point to Manage, and then click Back Up Database.

You can use the following Access utilities to keep your database running smoothly:

- Compact and Repair Database. This utility first optimizes performance by rearranging how the file is stored on your hard disk, and then attempts to repair corruption in tables, forms, reports, and modules.
- Performance Analyzer. This utility analyzes the objects in your database and offers three types of feedback: ideas, suggestions, and recommendations. You can instruct Access to optimize the file by following through on any of the suggestions or recommendations.
- Database Documenter. This tool produces a detailed report containing enough information to rebuild the database structure if that were ever necessary.
- Analyze Table. This wizard tests database tables for compliance with standard database design principles, suggests solutions to problems, and implements those solutions at your request.
- Microsoft Office Diagnostics. This command attempts to diagnose and repair problems with your Microsoft Office programs.

Important Take care when running the Microsoft Office Diagnostics utility, because it might change files and registry settings that affect all Office programs.

In this exercise, you will back up a database and then run the Compact And Repair Database, Performance Analyzer, and Database Documenter utilities.



USE the 09 Prevent database. This practice file is located in the Chapter07 subfolder under

OPEN the 09_Prevent database. Do not display any of the database tables.

- 1. Click the Microsoft Office Button, point to Manage, and then click Back Up Database.
- 2. In the Save As dialog box, navigate to your Documents\MSP\SBS_Access2007\ Chapter07 folder, and then click Save.

Tip When you back up a database, Access appends the current date to the database file name in the following format: 09_Prevent_2007-04-22.accdb. You can change the file name to suit your needs.

Access creates a compacted copy of the database in the specified folder.

3. Click the Microsoft Office Button, point to Manage, and then click Database Properties.

The Database Properties dialog box opens, displaying information about your database on five tabs.



- **4.** On the **General** tab, note the size of the database. Then click **OK** to close the dialog box.
- Click the Microsoft Office Button, point to Manage, and then click Compact and Repair Database. Acknowledge the safety warning if prompted to do so.

The utility takes only a few seconds to run, and you will see no difference in the appearance of the database.

Troubleshooting If you don't have enough space on your hard disk to store a temporary copy of the database, you don't have appropriate permissions, or another user also has the database open, the Compact And Repair Database function will not run.

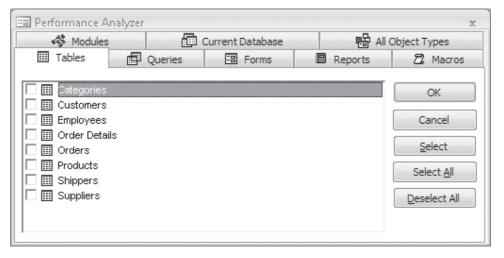
6. Repeat Steps 3 and 4 to display the database size, and compare it to the original database size.

You can expect a 10 to 25 percent reduction in the size of the database if you have been using it for a while.

Tip It is a good idea to compact and repair a database often. You can have Access do this automatically each time the database is closed. To do so, click the Microsoft Office Button, click the Access Options button, and then on the Current Database page, select the Compact On Close check box, and click OK.

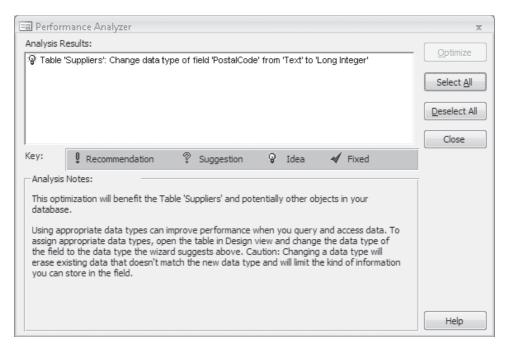
 On the Database Tools tab, in the Analyze group, click the Analyze Performance button.

The Performance Analyzer dialog box opens.



This dialog box contains a tab for each type of object the utility can analyze, and a tab displaying all the existing database objects.

8. On the All Object Types tab, click Select All, and then click OK to start the analyzer. When it finishes, the Performance Analyzer displays its results. (The results you see might be different from those shown here.)

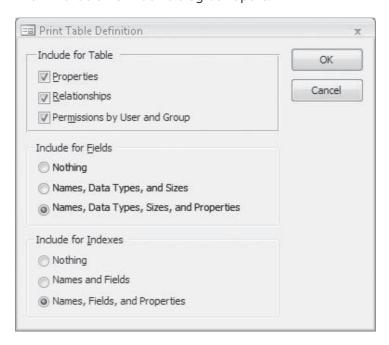


The icons in the left column of the Analysis Results list indicate the category of each entry: *Recommendation, Suggestion,* and *Idea*. (After you perform any of the optimizations, *Fixed* entries will also appear in the list.) Clicking an entry displays information about it in the Analysis Notes section.

- 9. Scroll through the list, clicking each entry in turn, and read all the analysis notes. Most of the suggestions are valid, though some, such as the one to change the data type of the PostalCode field to Long Integer, are not appropriate for this database.
- **10.** Close the Performance Analyzer dialog box.
- **11.** On the **Database Tools** tab, in the **Analyze** group, click the **Database Documenter** button.

The Documenter dialog box opens. This dialog box is identical to the Performance Analyzer database. It contains a tab for each type of object the utility can document, and a tab displaying all the existing database objects.

12. On the **Tables** tab, click the **Options** button. The Print Table Definition dialog box opens.

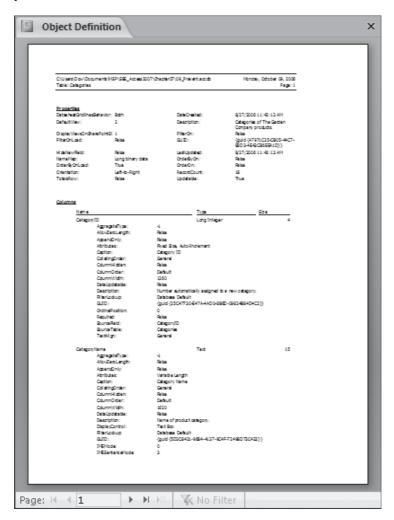


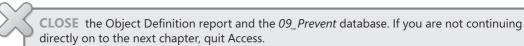
The dialog box offers print options associated with the objects on the selected dialog box tab. The options differ for each tab, but all are similar to these, in that you can use them to specify the documentation to include for each type of object.

- 13. In the Print Table Definition dialog box, click Cancel.
- **14.** On the **All Object Types** tab, click **Select All**, and then click **OK** to start the documentation process.

Tip You can't save the report generated by the Documenter utility, but you can export it as a Word RTF file, Access database, text file, XML file, or HTML document. To do so, right-click the report, point to Export, and then click the format you want.

When the process finishes, Access displays a report in Print Preview. This report can run to hundreds of pages, so you probably don't want to print it. However, it is a good idea to create and save a report such as this for your own databases, in case you ever need to reconstruct them.





Key Points

- You can set properties that restrict the type and amount of data that can be entered into an Access database.
- You can replace specific words or phrases by using the Replace command, or quickly enact conditional changes by running an action query.
- The Data Type setting restricts entries to a specific type of data: text, numbers, dates, and so on. The Field Size property for the Text, Number, and AutoNumber data types restricts the number of characters allowed in a text field or the number of digits allowed in a number or AutoNumber field. The Input Mask property controls the format in which data can be entered.
- You can use a validation rule to precisely define the information that will be accepted in one or several fields in a record. At the field level, Access tests each entry against the rule when you attempt to leave a field. At the table level, Access tests the content of several fields against the rule when you attempt to leave a record. In both cases, Access rejects any entry that doesn't comply with the rule.
- For fields with a fixed set of possible entries, you can use a lookup field to ensure that users enter the right information. This helps prevent inconsistencies, thus making it easier to sort and search your data.
- You can use an update query to quickly perform an action, such as replacing the contents of a field, based on the results of a query.
- You can use a delete query to quickly delete records that meet specific criteria. You should always back up your database before running a delete query, and you must exercise caution when deleting records in this way. The effects of a delete query can be far-reaching, and you can't recover deleted records.
- There are several utilities that you can use to keep your database running smoothly—Compact And Repair Database, Performance Analyzer, Database Documenter, and Microsoft Office Diagnostics. You can keep your application healthy by taking advantage of these utilities before Access indicates there is a problem with your database.