Part V

Managing Data with Access

Chapter 18

Getting Started with Access Databases

How to…

- Understand database concepts and terminology
- Set up tables to store your data
- Relate tables in your database to expand the ways your data can be used

Ever need a piece of information in a hurry and you find yourself fumbling through the papers on your desk for that information? Databases can help you organize large volumes of related information and place that information at your fingertips. In this chapter, we'll discuss databases and how to use them in some real-world examples. You'll also learn how to create and relate tables, the building blocks of a database. Tables are the most important design element of a database. If you don't set them up right, your database won't work properly.

What Is a Database?

Simply put, a database is a container for organizing and storing information. You have probably been using a database of some kind for years without even knowing it. The classic example is a telephone book. It holds information (names, addresses, and phone numbers) about people in a certain geographical area. It is organized so that you can easily find the information you need.

Electronic data-management systems such as Access allow you to store mass quantities of information without taking up mass quantities of physical space. Imagine a telephone book that encompasses everyone in the United States. That would be a huge book! Further, imagine trying to find your friend John Smith in that book. Talk about a page-turner! That same telephone book stored in an electronic database would take up a fraction of the physical space and offer tools to help you quickly find your friend John Smith among all the other John Smiths based on anything that's unique about him.

Understanding Database Concepts

There are two common types of electronic databases: relational and flat-file. A flat-file database is a single list, such as the type you can create in Excel. A relational database such as Access consists of multiple lists that can be joined together, related by one or more common elements. The main advantage of a relational database is that it requires less repetition of data. For example, suppose you were creating a database for your small business. Your business sells software and you want to track your orders. With a flat-file database, each time an existing customer places an order, you'd have to enter their shipping and payment information on the order. With a relational database, you can maintain two lists: the first with all the customer information, and the second with the order particulars. The relational database allows you to join the two lists together by a common field, such as an assigned customer number, so that you don't have to repeatedly enter customer information for each new order.

Understanding Database Objects

Access is an object-oriented application. It consists of a series of objects that when put together make up a database. Some of the objects are used for advanced features that allow you to automate and customize Access, whereas others are required to build even the simplest of databases. In this section, we will discuss the four basic Access objects. Later in this chapter and book, we will explore these objects in much more detail.

The first and most important database object is called a *table*. A table is a container for data that shares something in common. The first step in building a database is to determine how to organize your data into tables. This is often the hardest step. Tables are to databases what foundations are to houses. If your house has a poorly designed foundation, its walls will eventually come crumbling down. If your tables are poorly designed, your database will not give you the information you need in the way that you need it. The focus of this chapter is to show you how to build the proper foundation, through suitable table design, for your database.

Forms are used to provide a user-friendly interface for data entry and viewing. Forms can contain items such as check boxes and list boxes to make data entry easier. In addition, you can build your forms to improve the accuracy of the data being entered. Chapter 19 will go into more detail on building forms and entering data in them.

Queries are used to extract data from tables. What's the point of having all this information stored in a database if you can't easily get to it? Queries allow you to select the data you need and order it the way you want. You can even perform complex calculations with queries as well as add and remove data from your tables. Chapter 20 takes a closer look at queries.

Reports show you the data from your database in a printable format. Queries allow you to select the data you want, and reports allow you to display that data in a professional manner. Reports are the pot of gold at the end of the database rainbow. Chapter 21 will get you started with Access reporting.

Viewing Objects in Your Database with the Database Window

When you open an Access database, the first thing you usually see is the Database window (see Figure 18-1). The Database window allows you to navigate to the various objects that make up your database. The Objects bar, located down the left side of the Database window, categorizes database objects for easy access. Click a category button, such as Tables, on the Objects bar to see the objects, if any, for that category. The toolbar across the top of the Database window contains tools to manipulate objects. You can easily access the Database window by pressing F11 or by selecting Window | *<database name>*:Database.

Designing Tables to Store Your Data

Before you create your first table, you must decide what information you are to capture. It helps to write down the answers to the following questions:

■   What is the overall purpose of the database?

18
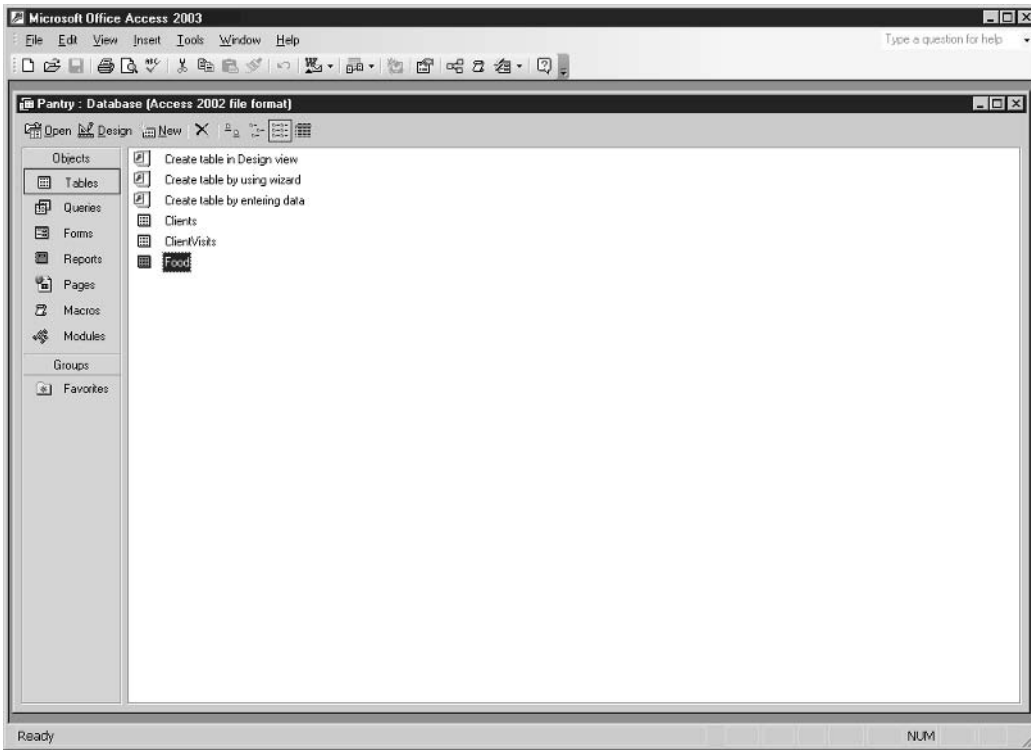
FIGURE 18-1 The Database window for the Pantry database.

- What categories of information do I need to store?
- What subcategories of information do I need to store?

Let's look a little closer with a specific example. Suppose you work for the local food pantry. The pantry distributes food to needy people in your area. You've decided to volunteer your time at the pantry to design its database. Table 18-1 gives you some ideas on what to think about before you start your design.

NOTE

The food pantry example has been simplified for the purposes of our discussion. Building an actual database for a food pantry would most likely be more complex than the example used here. We want to keep the example simple so that you don't get bogged down in the details but rather learn the concepts.

When answering the questions in Table 18-1, pay close attention to subcategories. If you find yourself repeating subcategories for a group of information, you probably need a new table. In

Question	Answer	
What is the overall purpose of the database?	To track information required to run the pantry	
What categories of information do I need to store?	Food inventory, clients, client visits	
What subcategories of information do I need to store?	**Category**	**Subcategory**
	Food inventory	Item, quantity needed, quantity on hand, food type
	Who is served?	Name, address, phone, date of birth, income
	How often served?	Name, date of visit

TABLE 18-1   Initial Questions for the Food Pantry Database Design

the food pantry example, you might have started with two tables: one for food inventory and one for clients that includes client visits. With that design, however, each time a new client visit is entered, client names, addresses, phone numbers, and so on must be repeated. The client particulars include information that has already been entered. What's new here is the visit information. So, it would make sense to have a table for client particulars to eliminate the data-entry repetition and a third, new table for visit particulars.

What You Need to Know about Tables Before You Begin

Tables are divided into smaller groups of related information called *fields*. A collection of field information about one item (such as a food item in our Pantry database) is called a *record*. Each table should have one or more fields designated as a *primary key*. A primary key is a unique identifier for each record in a table. The primary key helps Access locate records faster when you ask for them. Usually, an ID field is created in each table to uniquely identify each record within that table. Access can generate the ID number for you, or you can use your own manual numbering scheme.

Not only must you think about how to categorize your data into tables and fields, you must also decide what type of data can be entered in a field. Access requires you to assign a data type to each field. For example, the Number data type will accept numbers but not letters or other nonnumeric characters. Assigning data types properly can help prevent erroneous data entry in tables. We'll discuss data types in more detail later in this section.

Finally, you will have to set properties for each table field. A *property* describes something about the field. For example, the Field Size property describes how many characters will be allowed in a field. Set the Field Size property to 2, and only two characters or fewer will be allowed in the field. If the field in question were a state field, this would prevent the user from spelling out the name of the state and force him or her to use a two-character or less abbreviation. You don't want

18

some people entering "California," others entering "CA," and yet others entering "Calif." You want everyone to enter it the same way. Why? Because it's easier to ask for all records containing CA than to ask for assorted variations of the spelling. So, properties help streamline the type of data that is entered in a field.

The secret to good database design is to categorize data properly into tables and fields. That's why it's so important to spend time thinking this through before you begin the actual design. If you don't do the thinking up-front, you will find yourself redesigning tables later on. Because tables are used as the basis for queries, forms, and reports, you will not only end up changing your table design but also the forms, queries, and reports that are based on the tables. That's like trying to change the foundation after the house has been built. It can be done, but it's not easy!

Viewing a Table and Its Data

All Access objects, whether they are tables, forms, queries, or reports, can be viewed in several ways. Every object has a Design view. Design view allows you to create and modify the object components that make up the object. Figure 18-2 shows a table in Design view. Notice that not
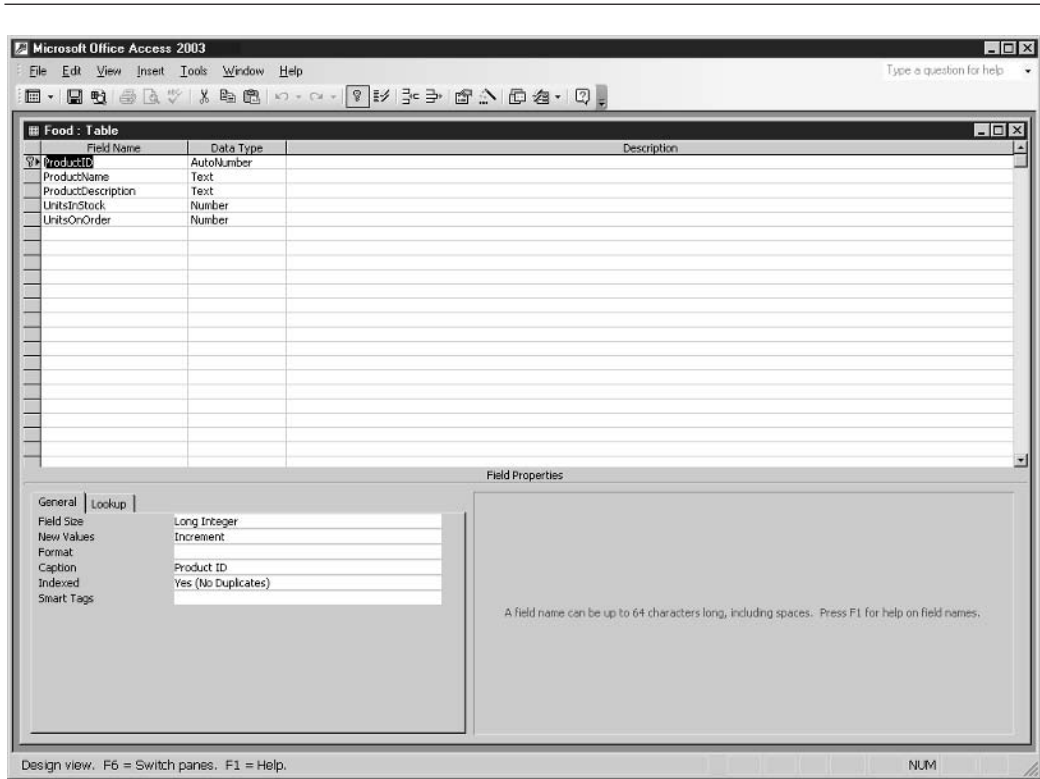
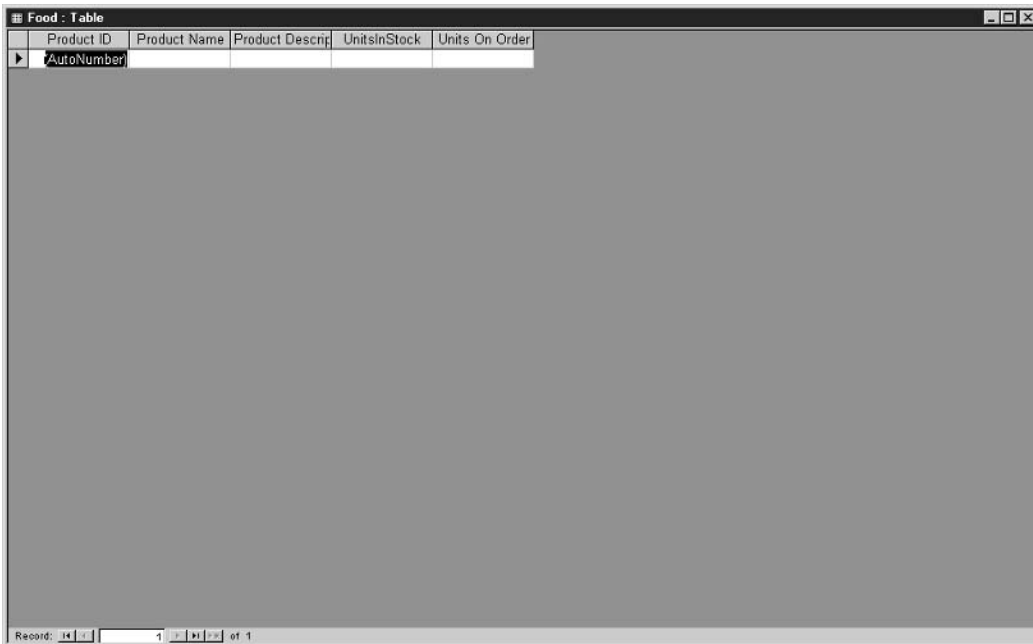**FIGURE 18-2**   The Food table in Design view.

only can you input the name of each field within your table but also the type of data the field will hold, a description of the data in the field, and some properties about the field, such as its size and format.

Tables can also be displayed in Datasheet view. Datasheet view displays the data contained in the table in a spreadsheet-like format (see Figure 18-3). You can enter data directly into your tables in Datasheet view very much as you would enter data in a spreadsheet. To do so, use the mouse or ENTER or TAB to navigate to the record and field where you want to enter data. Then, type the data for the field and press ENTER or TAB to move to the next field. When you reach the end of a record, press ENTER or TAB to move to the next record. Although data entry is sometimes done in Datasheet view, it is most often done in a form. Forms provide an easier interface for data entry and are discussed in detail in Chapter 19.

When working with tables, you will constantly be switching back and forth between Design and Datasheet view. Okay. Enough discussion. Now that you have the proper foundation to begin designing your database tables, let's get to work.

Creating a Table

You can create a table in Access in several ways. The two most common are via the Table Wizard and manually. A *wizard* is a tool that helps you complete a task. Each of the four database objects

FIGURE 18-3   The Food table in Datasheet view.

we discussed earlier in this chapter come with their own creation wizard. Some wizards are more useful than others. I think you will find the Table Wizard extremely useful in that it handles much of the table design for you. It provides a suggested list of fields, chooses the proper data type, and sets some properties for you. If you manually create tables, you must enter all this information yourself. So, why not use the wizard all the time? Because although the wizard contains examples for creating common types of tables, it may not offer examples for the type of table you require, so you'll need to create the table manually.

The Table Wizard

The general rule of thumb in creating tables is to use the wizard if possible. You can take what the wizard gives you and customize the result when the wizard is finished. Let's use the Table Wizard to create the first table—Food—in our Pantry database. Here's how:

1. If Access isn't already running, launch it from the Start | Programs menu.

2. Click Blank Database from the New section of the task pane at the right of the screen. You will be prompted for a file name for the new database.

3. Select a folder to store the database file and type **Pantry** in the File Name box. Click the Create button. A new, blank database will open in the Database window. The task pane will automatically close.

4. From the Database window, choose Tables (if necessary) from the Objects bar.

5. Double-click the Create Table by Using a Wizard icon. The Table Wizard appears (see Figure 18-4).

6. Select Business from the option group on the left side of the wizard screen. A list of business tables appears in the Sample Tables list.

7. Choose Products from the Sample Tables list.

8. Double-click ProductID, ProductName, ProductDescription, UnitsInStock, and UnitsOnOrder from the Sample Fields list.

9. Click the ProductDescription field from the Fields in My New Table list. Click the Rename Field button. Change the word *Description* to **Type** and click OK.

10. Click the UnitsOnOrder field from the Fields in My New Table list. Click the Rename Field button. Change *OnOrder* to **Needed** and click OK.

11. Click the Next button. The second screen of the wizard appears.

12. Enter the name **Food** for your table in the name box at the top of the wizard screen and click Next. The last screen of the Table Wizard appears.

13. Choose Modify the Table Design from the list in the middle of the dialog box.

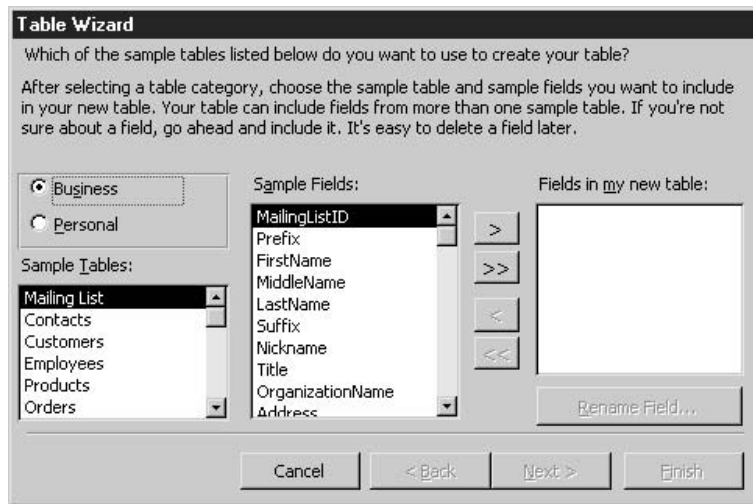14. Click the Finish button. The new table will appear in Design view.

FIGURE 18-4   The Table Wizard

Here's your first big test. See if you can create the "who is served?" table using the wizard. Try using the Employees sample table and naming the table "Clients." While using the wizard, you will be prompted to relate your new table to the Food table. Just click Next. The two tables should not be related.

Here are the fields you'll need:

- ClientID (use the Employee ID field and rename)
- First Name
- Last Name
- Address
- City
- State
- Postal Code
- Home Phone

18

- Birth date
- Income (use the Salary field and rename)

Understanding Data Types and Properties

As stated earlier, not only can you create a table with the Table Wizard, but you can also create one manually by entering the required information in table Design view. Before you manually create a table, you need to understand data types and field properties. *Data types* further define the type and amount of data that a field will allow. Setting the proper data type for each field can improve data-entry accuracy and optimize database size. As Table 18-2 illustrates, the Date/Time data type will not allow a nonvalid date to be entered. So, by choosing the Date/Time data type for all your date fields, you will be forced to enter a valid date between the years 100 and 9999. You might not enter the correct date for the record in question, but at least you'll be entering a real date!

NOTE   *Some data types refer to sizes in bytes. A byte is a unit of computer storage equivalent to approximately two digits for numbers and one character for text.*

Data Type	Size	Type of Data Allowed
Text	Up to 255 characters.	Text or combinations of text and numbers, as well as numbers that don't require calculations, such as phone numbers.
Memo	Up to 65,535 characters.	Lengthy text or combinations of text and numbers.
Number	Up to 8 bytes.	Numeric data used in mathematical calculations.
Date/Time	8 bytes.	Date and time values for the years 100 through 9999.
Currency	8 bytes.	Currency values and numeric data used in mathematical calculations involving data with one to four decimal places.
AutoNumber	4 bytes (16 bytes if the Field Size property is set to Replication ID).	A unique sequential number or random number (incremented by 1) assigned by Access whenever a new record is added to a table. AutoNumber fields can't be updated.
Yes/No	1 bit.	Yes and No values and fields that contain only one of two values (Yes/No, True/False, or On/Off).
OLE Object	Up to 1 gigabyte (limited by available disk space).	An object (such as an Excel spreadsheet, Word document, a graphic, a sound, or other binary data) linked to or embedded in an Access table.
Hyperlink	Hyperlink addresses can contain up to 6,144 characters.	Text or combinations of text and numbers stored as text and used as a hyperlink address.

TABLE 18-2   Access Field Data Types

Size is a key factor in database design. Always try to keep the size of your database as small as possible. Do this by choosing the proper data type and Field Size property setting for each field you create. Keeping the database small will make your queries and reports run faster.

The Number and Text data types have an adjustable Field Size property that further defines the amount of data stored. The Field Size property is set on the General tab in table Design view. Table 18-3 lists the settings for the Field Size property for the Number data type. The Text data type will allow entry of up to 255 characters in a field.

TIP   *Use the Text data type for all numeric fields that do not require a calculation or contain leading zeros. ZIP codes are a perfect example. In many cases, text fields use less space than number fields.*

As you can see, some field sizes reserve more space than others. The Byte field size uses much less space than the Decimal field size. If your field was to store movie ratings, and the rating numbers could be between 1 and 10, you certainly wouldn't want to choose the Decimal field size. That would be like building a garage the size of a 747 for your bicycle. It's unnecessary and wastes space. Instead, you would choose the Byte field size because it is the smallest field size that will allow the entry of the maximum value for your field. So, choose your data types and field sizes carefully. Always choose the size that requires the minimum amount of space yet will allow the maximum value required for the field.

Creating a Table Without the Table Wizard

Now that you know more about data types and field sizes, you are ready to manually create a table. Sometimes it makes more sense to create a table manually. Perhaps the wizard doesn't

Setting	Decimal Precision	Storage Size	Description
Byte	None	1 byte	Stores numbers from 0 to 255 (no fractions).
Decimal	28	12 bytes	Stores numbers from $-10^{28}-1$ through $10^{28}-1$.
Integer	None	2 bytes	Stores numbers from –32,768 to 32,767 (no fractions).
Long Integer	None	4 bytes	(Default) Stores numbers from –2,147,483,648 to 2,147,483,647 (no fractions).
Single	7	4 bytes	Stores numbers from –3.402823E38 to –1.401298E–45 for negative values and from 1.401298E–45 to 3.402823E38 for positive values.
Double	15	8 bytes	Stores numbers from –1.79769313486231E308 to –4.94065645841247E–324 for negative values and from 1.79769313486231E308 to 4.94065645841247E–324 for positive values.

TABLE 18-3   Field Size Property Settings for the Number Data Type

18

offer an option close enough to the table you need to create, or maybe your table requires only a few fields. Tables are created manually in table Design view.

Here are the steps to manually create the "how often served" table (which we'll call ClientVisits) from our food pantry example:

1. From the Database window, choose Tables (if necessary) from the Objects bar. Three icons appear in the Database window to the right of the Objects bar beginning with the word *Create*.

2. Double-click the Create Table in Design View icon. A new table opens in Design view.

TIP
Access object names such as table and field names can be up to 64 characters long. Try sticking with letters and numbers. Make the name descriptive of the object's contents. Finally, avoid spaces. Any Access object name that contains spaces must be surrounded by brackets ([ ]) when it is referred to in a query, on a form, or in a report. You'll quickly grow tired of typing those extra brackets!

3. In the first row of the Field Name column, type **VisitID**. In the Data Type column select AutoNumber. The AutoNumber data type will generate a unique sequential ID number for each client visit record. Type a brief description of the field in the Description column.

TIP
The contents of the Description column for a field will display in the status bar when entering data in that field. This can be helpful in prompting for what to enter in the field.

4. In the second row of the Field Name column, type **ClientID**. In the Data Type column select Number. Confirm that the Field Size property is set to Long Integer. Type a brief description of the field in the Description column.

NOTE
Most ID fields are AutoNumber fields. For example, the ClientID field from the Clients table is an AutoNumber field. When adding it to a secondary table, such as the ClientVisits table, always choose the Number data type and the Long Integer field size. If you don't, you won't be able to join the two tables together so that you can simultaneously retrieve information from them. More on joins later in this chapter.

5. In the third row of the Field Name column, type **VisitDate**. In the Data Type column select Date/Time. Type a brief description of the field in the Description column, such as "Enter the date of this visit."

6. Choose File | Save As from the menu bar. You will be prompted for a table name. Enter **ClientVisits** and press ENTER.

7. Access will next ask if you want to set a primary key. Choose Yes, and the VisitID field will be set as the primary key because you chose the AutoNumber data type. Note the key icon indicating the primary key next to the VisitID field.

8. Close the table design window for the ClientVisits table.

NOTE

In Access, saving is a little bit different than it is in other Office products. Access requires that you save only the objects you create. It will prompt you to do so when you close that object after creating or modifying it. Unlike Word, Excel, and PowerPoint, in which you must manually save data entered with the Save command, Access saves data entered for each record after you leave that record. So, Access saves your data for you automatically.

More Table Properties

Most Access objects have myriad properties that could be written about for hours on end. If you decide to become an Access expert, you will have to become familiar with many of these properties. Because you're not yet an expert and might never want to be, we'll discuss only three more field properties. All three—Format, Decimal Places, and Caption—can be set on the General tab in table Design view (see Figure 18-5).

NOTE

For more in-depth coverage of Access, try a book such as Microsoft Office Access 2003: The Complete Reference *by Virginia Andersen (McGraw-Hill/Osborne, 2003).*

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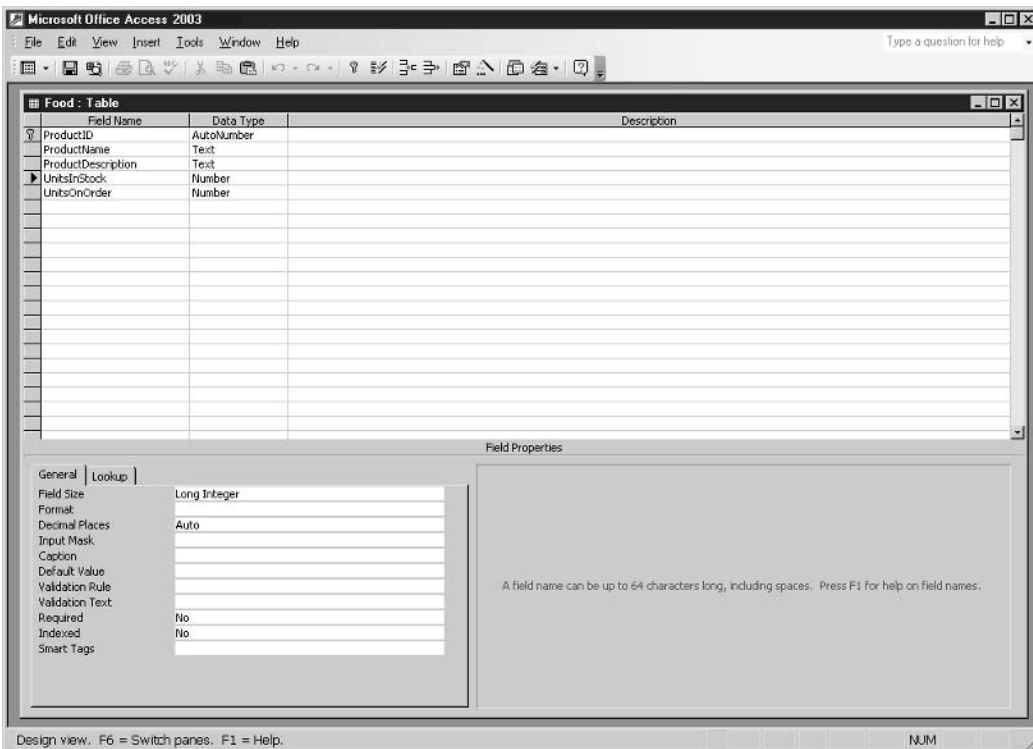
FIGURE 18-5   Setting the Format, Decimal Places, and Caption properties

The Caption property allows you to set a description for each field as it will appear on a form, report, or as a column heading in Datasheet view. If you don't set a Caption property, the field name is used. Enter **Last Visit** as the caption for the VisitDate field in the ClientVisits table of the Pantry database and you will see Last Visit as the description for that field wherever it appears throughout the database.

CAUTION   *Make sure that the correct field is selected in the Field Name column before you change a property.*

The Format and Decimal Places properties go together. The Format property applies to all data types except OLEObject and determines how data in a field will appear. For certain number field Format properties, the Decimal Places property sets the number of decimals that will display. Access Format properties are similar to Excel Format properties. The Percent format adds a percent sign to a number, the Currency format adds a dollar sign, and so on. Choose the format you want for your numbers and that format will apply to the field wherever it appears in your database. The following steps explain how to change the Caption and Format properties for a field in the Pantry database.

NOTE   *If you choose to ignore setting these properties for a field, you will have to set them every time you use that field on a form or report. In this case, a little more work up-front can save hours of work later on.*

1. Open the ClientVisits table in Design view.

2. In the Field Name column, select the VisitDate row.

3. On the General tab in the Field Properties section, click in the Format row. Select the Short Date format.

4. Click the Caption row and type **Last Visit**.

5. Close the table.

6. Choose Yes when prompted to save. Figure 18-6 shows the resulting table in Datasheet view.

CAUTION   *Formatting a number in a field does not change the actual number itself, only how that number appears throughout the database. So, formatting the number 3.14 to zero decimal places displays the number only as 3. However, any calculations performed on the number will use its actual value of 3.14.*

Manually Setting the Primary Key

Sometimes you will need to change or add a primary key after a table has been created. This is done in table Design view. Remember, setting a primary key improves query performance, so most tables should have one, especially those that will be queried often. By setting a field as the primary key, you are telling Access that no two records in the table will contain duplicate information in that field. So, make sure you select a field that will be unique to each record. If you don't, Access will not allow you to enter certain records in the table.

FIGURE 18-6   The ClientVisits table after formatting properties have been set.

For example, suppose you're using Phone Number as the primary key field. Everyone has a unique phone number, right? Well, not always. John and Jane Doe are both clients. They share the same phone number. You could enter Jane without a hitch. However, when it came time to enter John, Access would display a message that essentially tells you that you cannot enter that phone number because another record already contains that value.

Here's how to set the primary key manually:

1. Open the table in Design view.

2. In the Field Name column, select the field that you want designated as the primary key.

3. Click the Primary Key button (You guessed it. It's the one with the key on it!) on the Table Design toolbar.

NOTE   *It is best to set the primary key before entering any data. If duplicate data exists in a field you try to designate as a primary key, Access will not let you set that field as the primary key.*

18

How to Connect Tables with Relationships

When we hear the word *relationship*, most of us think of a bond between two people. In Access, you can play matchmaker. It won't, however, be between human beings but rather between tables.

Doesn't sound like quite as much fun, does it? Table relationships make possible the pulling of information from more than one table at a time. The whole point of a relational database is to economize on data entry by excluding repetitive information. So, you'll need a way to connect tables so that you can access their information at the same time. You relate (more often referred to as *join*) the tables in Access to connect them. As with setting field properties during table design, setting relationships up-front can save you time in the long run by speeding query design.

Understanding Relationship Types

In the human world, we have friendships, marriages, and casual and serious relationships. In the Access world we have the following relationships:

- One to many
- One to one
- Many to many

The most common relationship by far is the one-to-many relationship. So, we will limit our discussion to this type of relationship. In a one-to-many relationship, a record in Table 1 can have many matching records in Table 2, but a record in Table 2 has only one matching record in Table 1. We will use this type of relationship in our Pantry database when relating the Clients table to the ClientVisits table. A client can have many visits, but a visit cannot exist without a client.

Besides relating tables, you will also have to decide if you want Access to enforce referential integrity between the two tables. When referential integrity is turned on, a record in Table 2 cannot exist without a corresponding record in Table 1. In other words, you cannot enter a client visit without first entering the client.

NOTE   *To enforce referential integrity in a one-to-many relationship, the related field in Table 1 must be the primary key of that table, whereas the related field in Table 2 cannot.*

This sounds perfectly reasonable. Why would you ever want to enter a visit for a client that does not exist? Most of the time you would not. So, most of the time turning on referential integrity makes sense. Just keep in mind that with referential integrity on, you could never record a client visit, then go back later to fill in the client information. Maybe someone else on staff had that information, and the only information currently available was the visit information. Referential integrity improves the quality of your data by eliminating bogus records such as client visits for nonexistent clients.

When choosing to enforce referential integrity, you will have the options Cascade Update Related Fields and Cascade Delete Related Records. The former will update the primary key data in Table 2 if it changes in Table 1. The latter will delete all visit records from the ClientVisits table if the client is deleted from the Clients table. If you do not choose Cascade Delete Related Records, you will not be able to delete a client record from the Clients table without first deleting all that client's visits from the ClientVisits table.

Creating Relationships

Relationships are created in the Relationships window by dragging a shared field from Table 1 on top of its counterpart from Table 2 (see Figure 18-7). A line will connect the two fields. If you
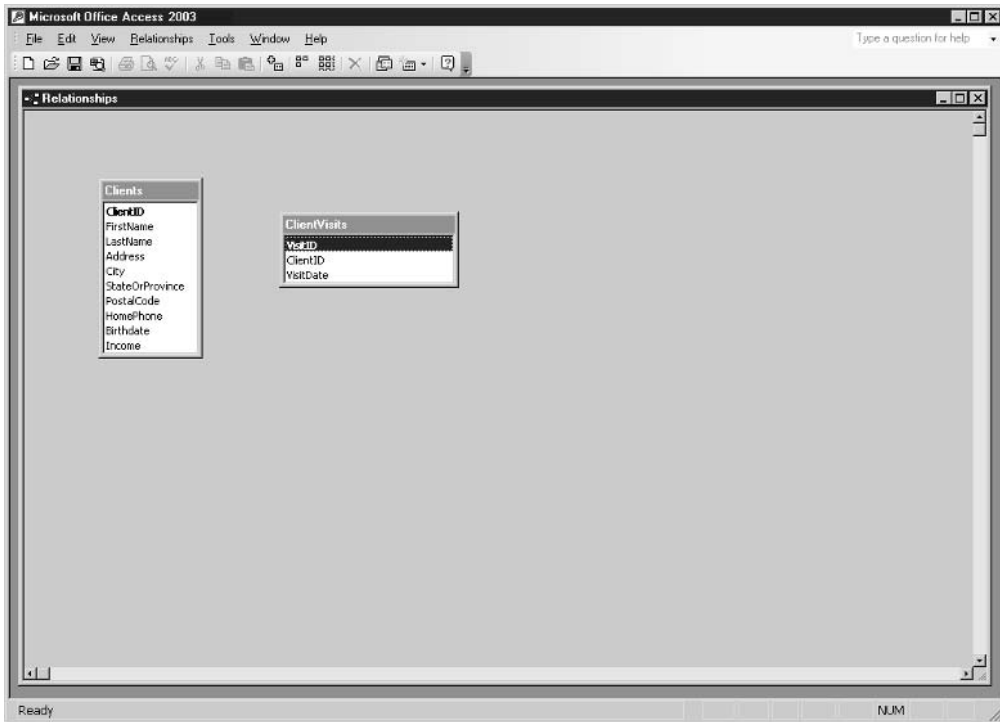
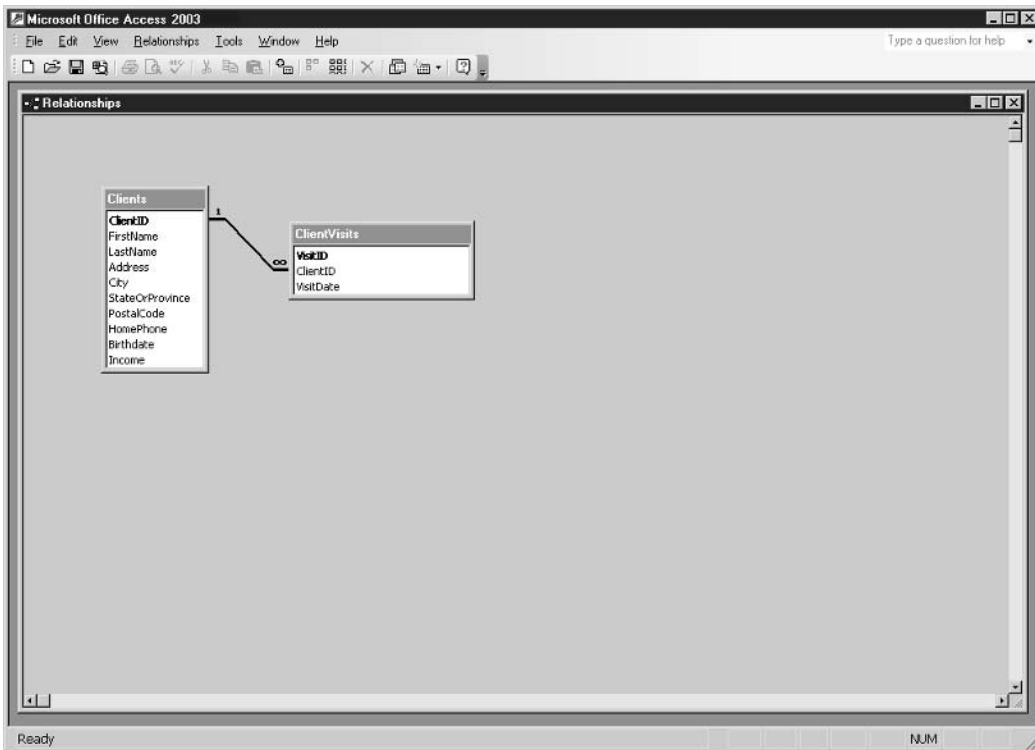**FIGURE 18-7**   The Relationships window

make a mistake and join the wrong fields, you can delete the relationship by clicking the join line and pressing DELETE.

Follow these steps to relate the Clients and ClientVisits tables in the Pantry database:

1. Activate the Database window if necessary.

2. Choose Relationships from the Tools menu. The Relationships window will appear, displaying the Show Tables dialog box.

3. Double-click the Clients and ClientVisits tables from the list of tables on the Tables tab.

4. Close the Show Table dialog box.

5. Click and drag the ClientID field from the Clients table on top of the ClientID field from the ClientVisits table and release the mouse. The Edit Relationships dialog box will appear.

18
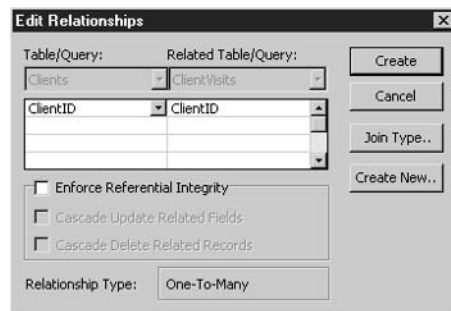
6. Check the Enforce Referential Integrity, Cascade Update Related Fields, and Cascade Delete Related Records check boxes.

7. Click the Create button. A line will appear joining the two tables on the ClientID field (see Figure 18-8). The "one" table will have a 1 near it on the join line, whereas the "many" table will have an infinity symbol (∞) near it on the join line.

8. Close the Relationships window. When prompted to save the relationship layout, choose Yes. The relationship is saved automatically when you create it.

FIGURE 18-8   The Relationships window showing the join line between the Clients and ClientVisits tables.

Chapter 19

Simplifying Data Entry with Forms

How to…

- ■ Build a form with the Form Wizard
- ■ View a form's design and data
- ■ Add and edit text, combo, and check boxes
- ■ Enter data in a form

Forms are an easy-to-use gateway to your table data. Although data can be entered directly into tables, doing so can be difficult. Access provides the form as a tool to arrange your table data for data entry however you prefer, as shown in this example. Such flexibility is not possible with tables and makes for easier data entry.

Forms can also be used to create custom dialog boxes, such as the one shown next. Through custom dialog boxes, you can carry out an action based on information the user enters in the dialog box. For example, you can build a dialog box form that lists the reports you have created in your database. With your reports dialog box, the user can select a report and preview or print it.

Finally, you can use forms to open other forms. Many professionally developed Access databases contain a switchboard, shown next, with buttons that are used to navigate to the data-entry forms and reports within the database. This is especially important if the users of the database aren't familiar with how to use Access. A switchboard makes the database easier to use.


NOTE   *Creating switchboards and custom dialog boxes requires some advanced knowledge of Access. These topics are beyond the scope of this book.*

Creating a Form with the Form Wizard

The Form Wizard is a powerful tool that can quickly make a data-entry form for you. I think you will find yourself starting with the Form Wizard for each form you create, with very few exceptions. Once the Form Wizard has finished, all you need to do is fine-tune the form to suit your needs. In many cases, this means moving or sizing objects on the form and adding or editing labels. How much fine-tuning is required often depends on how well you set field properties in your tables. For example, if you don't set a caption for each field, the Form Wizard will use field names as captions. Often, field names do not work well as captions.

How to See the Form Design and Data

Access offers three common ways to view a form. All three are available on the View menu or with the View tool on the Forms toolbar.
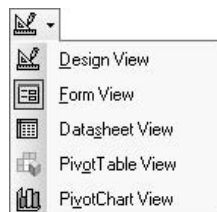
The first is Design view. Here you can set properties for the form, such as what data it will display. In addition, it is in Design view that you can alter a form's appearance.

The second is called Form view. Form view lets you see data in the form. So once the form is designed and complete, you will use Form view to view, add, delete, and modify your data.

The final view is Datasheet view. Datasheet view displays the contents of your form in a spreadsheet-like format, just like it appears in the table Datasheet view. Datasheet view is usually used for a type of form called a *subform*. Subforms are beyond the scope of this book and therefore will not be discussed any further.

Understanding Some Basic Form Concepts

Before we create a form with the Form Wizard, let's discuss a few concepts about forms that you'll need to know. Most forms are bound to what Access calls a *record source*. A record source is the name of a table or query that contains the data the form will display. The Form Wizard will prompt you to select a table or query for the form's record source.

The objects used to label and display data on a form are called *controls*. Most Windows dialog boxes contain the same types of controls that you can add to your forms in Access. These controls include check, text, list, and combo boxes as well as labels and buttons. The *Toolbox* is the toolbar used to add these controls to a form. If you do not see the Toolbox when opening a form in Design view, choose View | Toolbox from the menu bar to show it. Forms and controls have *properties*. These properties determine how the form or control will appear and what it will do.

Using the Form Wizard to Create a Form

The Form Wizard will ask you several questions and create a form based on your answers. Here are the questions:

- What table or query contains the data you want the form to display?

- What fields from the table or query will the form display?

- What layout will the form have? *Columnar* will display controls in columns on the form. Use this layout if your table or query contains many fields. *Tabular* will display controls in rows on the form. Use this layout if your table or query has a small number of fields and you want to display more than one record at a time. *Datasheet* will display the form in Datasheet view. This layout is commonly used for subforms. *Justified* will give the controls on the form a uniform size.

- What style will your form have? Access comes with some form templates that will give your form a professionally designed appearance. You can click a style name in the wizard to see how your form will appear.

- What name will your form have?

- How do you first want to see the new form, in Design or Form view?

Let's once again use our Pantry database—this time to create a form for the Clients table. Follow these steps:

1. Press F11 to display the Database window, if necessary.

2. Click the Forms button on the Objects toolbar.

3. Double-click the Create Form by Using Wizard icon. The Form Wizard appears.

4. The first screen of the Form Wizard asks for the table or query that contains the data you want the form to display and the fields to display on the form. Select Table:Clients from the Tables/Queries list.

5. Click the double right chevron (>>) button to choose all fields in the Clients table. When you click it, all the fields from the Available Fields list are moved to the Selected Fields list.

6. Click the Next button. The layout screen of the Form Wizard appears.

7. Click a layout name to see an example of how your form will be laid out. Select the Justified layout.

8. Click the Next button. The Style screen of the Form Wizard appears.

9. Click a style name to see an example of that style. Select the SandStone style.

10. Click the Next button. The last page of the Form Wizard appears.

11. Leave the default name of Clients for the form. Choose the Modify the Form's Design option.

12. Click the Finish button. The new form will appear in Design view (see Figure 19-1).

Modifying Your Form

In many cases, the Form Wizard creates a form that requires no modification. However, it does have limitations that might require some manual intervention on your part. In Design view, you can move, size, add, delete, and format controls.

Managing the Controls on Your Form

Before you can modify a control in any way, you must select it. To select a control, click it with the mouse. To select multiple controls, press and hold SHIFT as you click the controls. You can also draw a box around the controls to select them. If you've worked with graphics before, such as clip art, you should have no trouble working with Access controls.

To size a control, try this:

1. Open the form in Design view.

2. Select the control.

3. Roll the mouse pointer to one corner of the control. A diagonal double arrow will appear. Drag to resize.

19
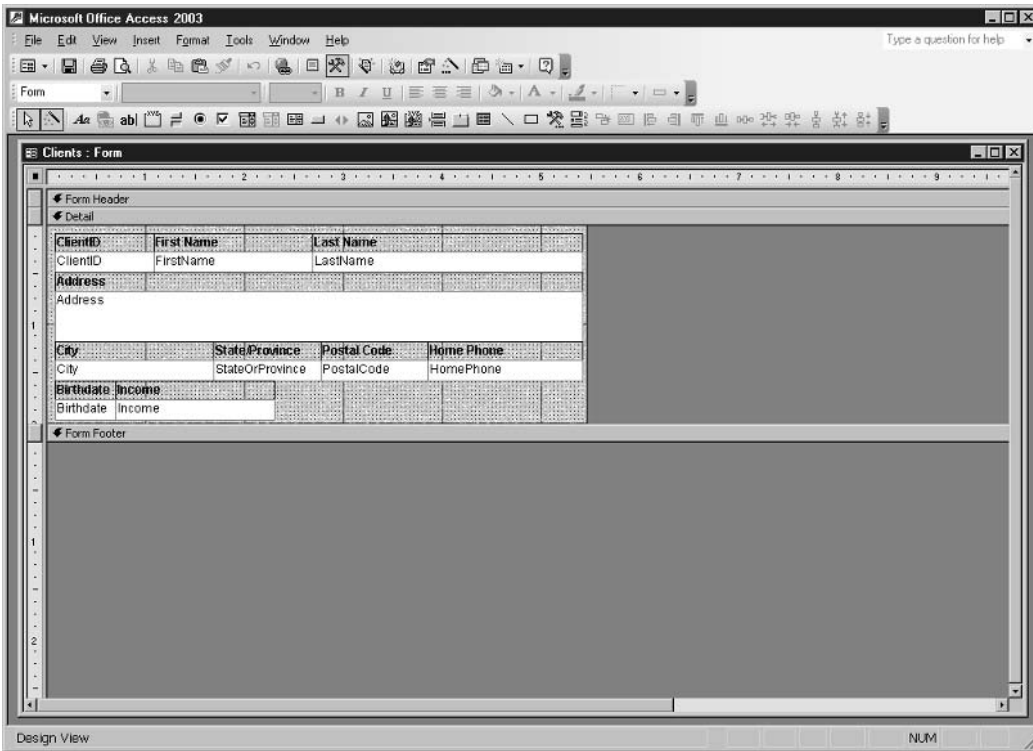
FIGURE 19-1 The Clients form in Design view.

To move a control, follow these steps:

1. Open the form in Design view.

2. Click the control to select it.

3. Roll the mouse pointer over the edge of the control but away from the corners. An open hand will appear. Drag the control to its new location. The control's associated label will also move.

NOTE

Most data-entry controls are created with an associated label. When you move or delete the control, its label is moved or deleted as well.

4. To move a control independent of its label, and vice versa, roll the mouse to the upper-left corner of the control or label. A hand with the index finger pointing will appear. Drag the control or label to its new location.

Controls can be sized and moved with more precision using the keyboard. To size a control, press and hold SHIFT, *then press a directional arrow. To move a control, press and hold* CTRL, *then press a directional arrow.*

Here's how to delete a control:

1. Select the control.

2. Press DELETE.

Remember when working with controls that you can undo up to the last 20 actions. So if you make a mistake, use the Undo tool on the toolbar or press CTRL-Z *to reverse your mistake. If you want to undo multiple actions in one step, click the arrow to the right of the Undo tool and select the action you want to undo. When you undo an action, you also undo all actions above it on the list.*

Let's try working with some controls on the Clients form. Here's what to do:

1. Open the Clients form in Design view (as shown in Figure 19-1).

2. Click the text box containing the text StateOrProvince. The text box will be white, whereas its associated label containing the text State/Province will be transparent.

3. Press DELETE to delete it. Notice that the text box and label are deleted simultaneously.

4. To reduce the width of the Income control, click the Income text box.

5. Press and hold SHIFT to select the Income label.

6. Roll the mouse pointer to the right side of either the text box or the label and look for a double arrow.

7. Press and drag to the left to make the control about three quarters of its original size.

8. Roll the mouse pointer to the left of the Postal Code label.

9. Press and drag over the Postal Code and Home Phone text boxes and labels to select them.

10. Press and hold CTRL and press LEFT ARROW several times to move the selection.

Making a Pick List with the Combo Box Control

Whenever designing a form, you always want to make the form as easy to use as possible so that data entry is simple and data-entry errors are reduced. The combo box control is effective in both these areas. With it, you can provide the data-entry person with a list of items for the field. In addition, you can limit the user to selecting one of those items so that you can better control the data that is entered into the field (search the Help system for Limit to List for more details). Let's add a combo box to our Clients form that will provide a state pick list:

1. View the Clients form in Design view.

19

2. Select the Combo Box tool on the Toolbox.
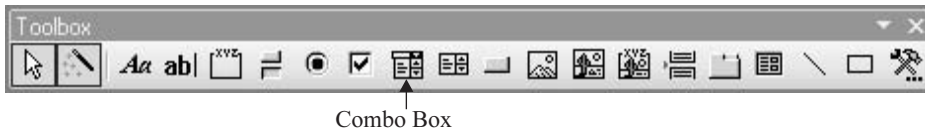
Combo Box

3. Roll the mouse pointer slightly to the right of the upper-right corner of the City text box. Press and drag just to the left of the bottom-left corner of the Postal Code text box. Release the mouse. The Combo Box Wizard will appear.

4. Select "I Will Type the Values That I Want" from the first screen of the wizard.

5. Click Next.

6. The food pantry is located on the border of New Jersey (NJ) and Pennsylvania (PA). It serves people from both states, so we will add those states to the pick list. Click in the first row under the Col1 label and type **NJ**. Do not press ENTER or you will be taken to the next screen of the wizard.

7. Click in the next row and type **PA**.

8. Click the Next button.

9. Select the arrow on the Store That Value in This Field combo box, choose StateOrProvince, and click Next.

10. Type **State** as the label for the pick list.

11. Click the Finish button. The State combo box will appear with its label to the left of the combo box. Its color is not the same as the text boxes. We will address this later on in this chapter.

12. Click the State label to select it.

13. Roll the mouse over the upper-left corner of the control. Look for the hand with the index finger for the mouse pointer shape.

14. Drag the control over the top of the State combo box.

15. Select View | Form View from the menu bar.

16. Click the State combo box arrow and select a state.

17. Close the form and save it.

Adding a Title to Your Form

A form is divided into sections. The following table defines the sections that are displayed by default:

Section Name	Definition
Form Header	Data in this section will display at the top of the form in Form view. This is often used for titles.
Detail	This section displays records from the form's table or query record source.
Form Footer	Data in this section will display at the bottom of the form in Form view. This is sometimes used to display custom command buttons or instructional labels.

Sometimes you will need to add additional text to a form to further define its contents or to title the form. The Label control allows you to do this. Although the Form Wizard does much of the work, it does not provide a title for the forms it creates. The Label control can be used to title a form. To add a title to the Clients form, follow these steps:

1. Open the Clients form in Design view.

2. Place the mouse pointer on the line dividing the Form Header and Detail section buttons. A vertical double-arrow shape will appear.

3. Drag the Form Header section down about one half inch to make room for the title.

4. Select the Label tool from the Toolbox.

5. Draw a rectangle about the size of the Form Header section and release the mouse.

6. Type **NJ/PA Food Pantry Clients**.

7. Click the label again to deselect it.

Changing the Appearance of Controls by Formatting

The easiest way to format a control is with the Formatting toolbar.

This toolbar appears in Design view of a form and contains common buttons from other Microsoft Office applications—some you might know. To format a control, select it, then click the appropriate button from the Formatting toolbar (see Table 19-1 for a description of each tool).

Tool Name	Function
Object	Lists all objects on the form and selects the object chosen from the list.
Font	Sets the font of the selected control.
Font Size	Sets the font size of the selected control.
Bold	Bolds the selected control.
Italics	Italicizes the selected control.
Underline	Underlines the selected control.
Align Left	Left aligns text within the selected control.
Center	Centers text within the selected control.
Align Right	Right aligns text within the selected control.
Fill/Back Color	Fills the selected control with a color or removes the color.
Fore/Font Color	Sets the font color of the selected control.
Line/Border Color	Sets the border color of the selected control.
Line/Border Width	Sets the width of the selected control's edge.
Special Effect	Gives the selected control an appearance such as sunken, raised, or etched.

TABLE 19-1   The Formatting Toolbar Icons

Here's how to use the toolbar to format our new controls on the Clients form:

1. Make sure you are still displaying the Clients form in Design view.
2. Click the title label in the Form Header section to select it.
3. Click the Font tool on the Formatting toolbar and select Times New Roman to change the label's font.
4. Click the Font Size tool on the Formatting toolbar and select 16 to change the size of the label.
5. Select the State combo box by clicking it.
6. Click the arrow on the Fill/Back Color tool (looks like a pouring bucket) from the Formatting toolbar and select the color white from the resulting color palette.
7. Choose File | Save from the menu bar to save the latest design changes.
8. Display the form in Form view to see your changes.

Entering Data in Your Form

Now that you know how to make and modify a form, you'll want to start entering some data in that form. To do so effectively, you'll need to know a little about form navigation. In addition, we'll look at some data-entry shortcuts to improve data-entry time.

Data-Entry Tips

Of course, there is no way around typing much of the data that is to go in your data-entry forms unless of course you hire someone to do it for you! However, there are some keyboard shortcuts that can make that data entry and editing a little bit easier. Table 19-2 lists them and what they do.

Keystroke	Function
END	Move to the end of a single line of data in the current field.
HOME	Move to the beginning of a single line of data in the current field.
CTRL-RIGHT ARROW	Move to the next word.
CTRL-LEFT ARROW	Move to the previous word.
TAB	Move to the next field.
SHIFT-TAB	Move to the previous field.
CTRL-; (semicolon)	Insert the current date.
CTRL-: (colon)	Insert the current time.
CTRL-' (apostrophe)	Insert the value from the same field in the previous record.
CTRL-+ (plus sign)	Add a new record.
CTRL- – (minus sign)	Delete the current record.
SHIFT-ENTER	Save changes to the current record. Remember, moving to a new record also saves changes to the current record.

TABLE 19-2   Data-Entry and Editing Shortcuts

19

| Keystroke	Function
SPACEBAR	Switch between the values in a check box or option button.
CTRL-ENTER	Insert a new line in a text field.
CTRL-Z	Undo the last entry.
CTRL-C	Copy the selection.
CTRL-X	Cut the selection.
CTRL-V	Paste the selection.

TABLE 19-2   Data-Entry and Editing Shortcuts *(continued)*

Navigating Through Records

Many forms, such as the Clients form, display your data one record at a time. The record navigation buttons are located in the lower-left corner of a form, as shown in Figure 19-2, and help you move through the form's records.

As the amount of data in your table increases, these buttons will be especially helpful in navigating through the data. Another useful tool to help you navigate to a specific record is the Find command, located on the Edit menu. The Find command lets you type in a search word or phrase and then searches the data in your form to locate that word or phrase. To use the Find command, follow these steps:

1. Click in the field that will contain the data you want to find.

2. Choose Edit | Find from the menu bar. The Find and Replace dialog box appears.
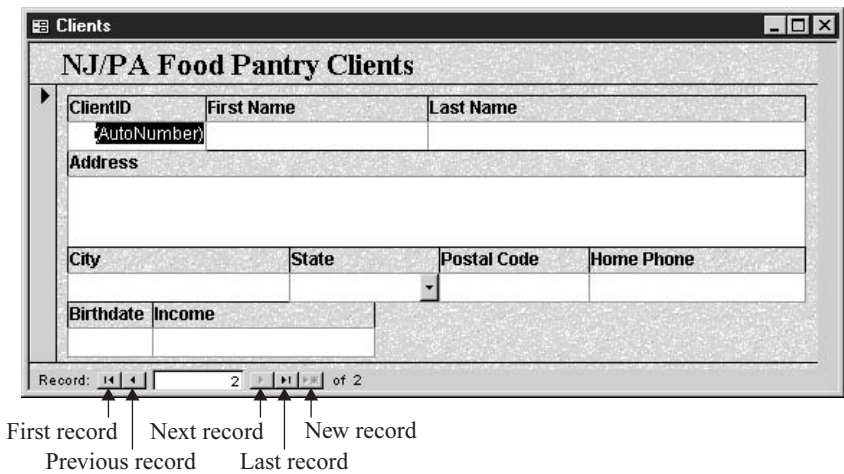
FIGURE 19-2   The record-navigation buttons

3. Type the text you are looking for in the Find What box.

4. The Look In list should already name the field you want to search.

5. From the Match list, choose Any Part of Field. This choice gives you the most flexibility in finding the text you typed in the Find What box because it instructs Access to locate your search text, whether it is part of a word or a whole word.

6. Click Find Next. The first record containing the text you are seeking will be highlighted in the field on the form. Sometimes you have to drag the dialog box aside because the text you seek can be covered up by the Find dialog box.

TIP   *You can also use CTRL-F to open the Find dialog box.*

Chapter 20

Extracting Data with Queries

How to…

- Differentiate between query types
- View query designs and data
- Create queries that select specific records from a table
- Write comparison criteria to help you find specific data
- Create queries that select records from multiple tables

Now that you've learned how to create tables and put data into them for safekeeping, we will concentrate on extracting data from tables. After all, what's the point in storing all this data if you can't get to it? In this chapter, we will discuss the Access tool for working with data: the query.

Normally, the next step after table and form design in the development of a database is to enter some sample data, usually about 10 to 15 records per form. If you find yourself typing the same data repeatedly, you might want to reconsider your table design. This usually means that you need at least one or more tables joined back to the original table where the duplication is taking place. You might also find yourself thinking of things you left out, which means adding some fields. Take the time at this stage in the development of your database to fine-tune its design. The worst thing that could happen is that you have thousands of records entered, all your forms, queries, and reports written, and you then discover a major design flaw. A major flaw found toward the end of the design process means a lot of query, form, and report editing.

We will switch gears in our examples, from being the benevolent creator of a food pantry database to a corporate database developer for the Northwind Traders Corporation. We are doing this not because we are suddenly abandoning those in need, but rather because Access comes with a sample database named Northwind.mdb that has a lot of data in it for us to play with.

NOTE   *The Northwind database is located in a subfolder of the Office folder called Office\Samples. If the file is not in this folder on your PC, you must install it from the Office 2003 installation CD. For instructions on installing Northwind, search the Help system for the word Northwind and select the topic Open the Northwind Sample Database.*

Queries and reports go hand in hand. Although it is possible to print the results of a query in Datasheet view, it's unlikely that you would do this, especially if you were printing the results to give to others. Instead, most queries are attached to reports. Reports provide a visually appealing way to display query results, and in Chapter 21, you'll learn how to create and format them.

Understanding Query Types

Although it is true that queries do allow you to extract data from a table or tables, they can do much more. Queries can also perform specific actions on a subset of data that you specify, such as delete a group of records, add records from one table to another, or update a group of records. For example, suppose an area code changed for a group of contacts in a contacts table. An Update query can update the existing area code to the new one in less than a second! Before

you can fly though, you need to try a little walking. Therefore, we will concentrate on the extracting type of query in this chapter, which is called the *Select* query. By far, the Select query is the most common Access query type.

Viewing Query Designs and Data

Like tables and forms, the query has a Design and Datasheet view. And like those other objects, the Design view lets you build the object, whereas the Datasheet view lets you see the data. Unlike those objects, however, the query has a view unique to it called the *SQL view.* SQL stands for *Structured Query Language*—a language common in one form or another to all relational database management systems. It is also the language used to manipulate table data in relational databases.

The SQL view displays the SQL statement that will extract your data. Don't worry; you don't have to become an expert in SQL to write an Access query. That's because Access allows you to design a query using something called the *QBE grid.* The QBE grid appears in Design view. The letters QBE stand for *query by example.*

In effect, the QBE grid allows you to graphically design a query. After you enter the necessary information in the QBE grid, Access builds the SQL statement for you in the background. So, use the QBE grid to ask for the data you want to see and use the Datasheet view to see the results. As you fine-tune your query, you will constantly switch back and forth between these two views.

Using the Simple Query Wizard to Make a Select Query

Access comes with several wizards to help you construct queries. We will use the Simple Query Wizard to construct a Select query. To follow the steps in the example, you must have the Northwind database open with its Database window displayed. Let's create a customer phone number listing using the Simple Query Wizard. Here's how:

1. Choose Queries from the Objects bar.

2. Double-click the icon labeled Create Query by Using Wizard. This is the second icon on the list located on the right side of the database window. The first screen of the Simple Query Wizard appears.
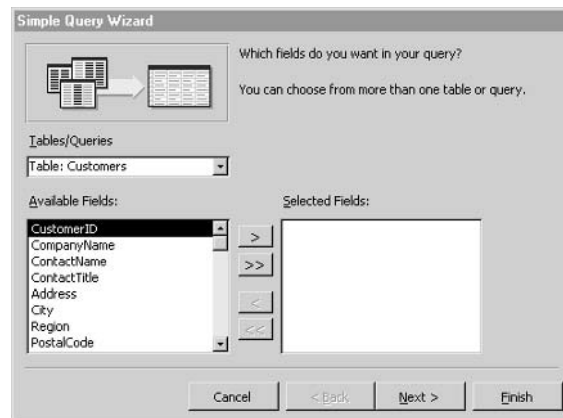
3. From the Table/Queries list, select Table: Customers.

4. Double-click the fields CompanyName, ContactName, City, Phone, and Fax from the Available Fields list. This will add the fields to the Selected Field list.

5. Click the Next button. You will be prompted for a title for your query.

6. Type the title **CustomerPhoneList** in the title box.

7. Click Finish. A list of customers will appear in Datasheet view for the new query.

Designing a Query in the QBE Grid

Although the Simple Query Wizard is helpful in getting you started, it does have its limitations. For example, you can't specify sorting through the wizard. You might find, therefore, that it is best to design your queries directly in the QBE grid.

Figure 20-1 shows the CustomerPhoneList query in Design view. Note that the QBE grid is divided into halves. The top half is where you identify the tables that contain the data you would
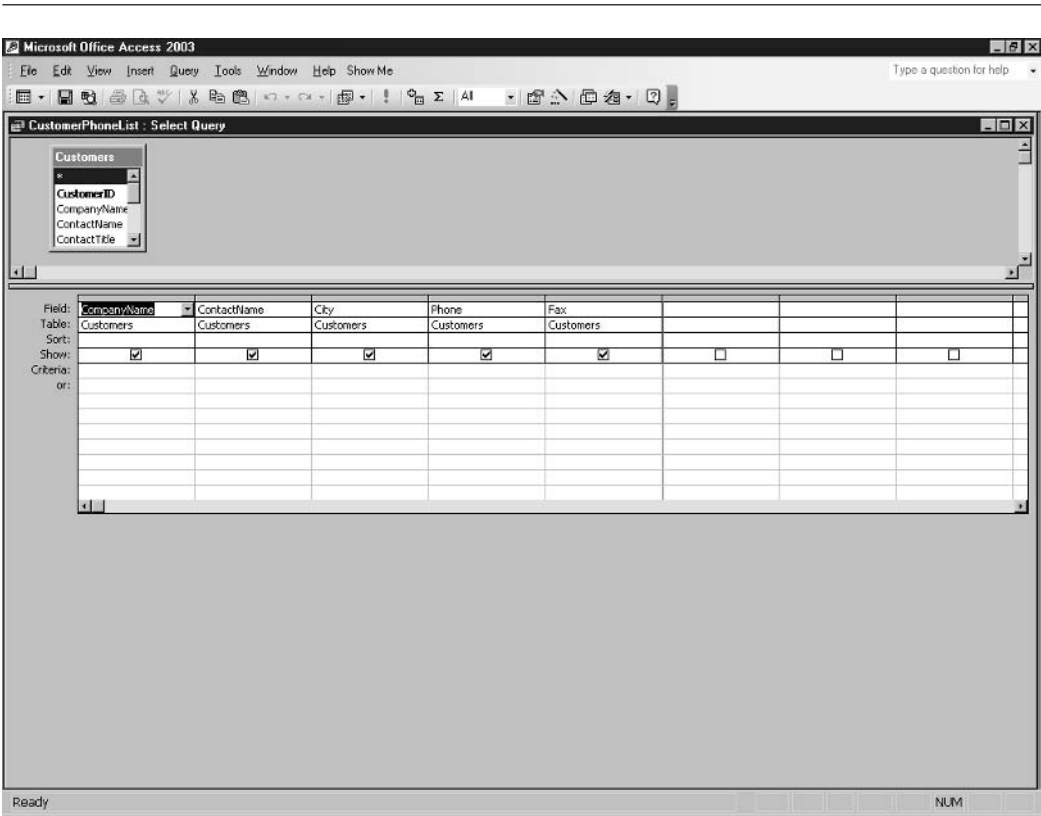
FIGURE 20-1   The CustomerPhoneList query in Design view showing the QBE grid.

like extracted. If you specify more than one table, you also indicate how those tables are related in the top half of the grid.

NOTE *If you relate your tables as described in Chapter 18, they will already be joined when added to the top half of the QBE grid.*

The bottom half is where you specify the fields that you want displayed, the sort order of the data, and *criteria*.
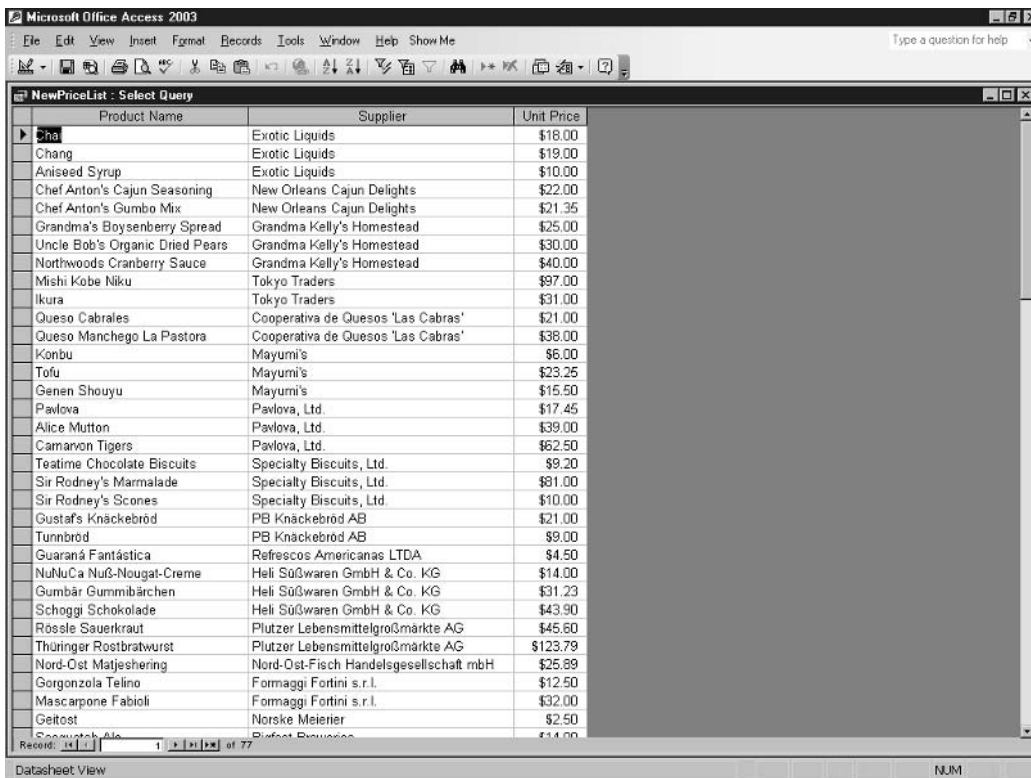
Criteria are a set of restrictions you can apply to the query to limit its results to the records you would like to see. Learning to write effective criteria is the key to seeing the results you want. We will discuss criteria in detail later in this chapter. First, we will create a query in Design view.

Suppose, as a developer for Northwind Traders, it's your job to create a product price list. Here are the steps you would follow:

1. Select the Queries button on the Objects bar.

2. Double-click the icon labeled Create Query in Design view. This is the first icon on the list located on the right side of the database window. The QBE grid will appear, as will the Show Table dialog box.

3. Double-click Products from the Tables tab. This will add the Products table to the top of the QBE grid.

4. Click the Close button to close the Show Table dialog box. A field list from the Products table will appear in the top half of the QBE grid.

5. Double-click the fields ProductName, SupplierID, and UnitPrice from the field list at the top of the grid. Each field name will appear in a column on the bottom half of the grid.
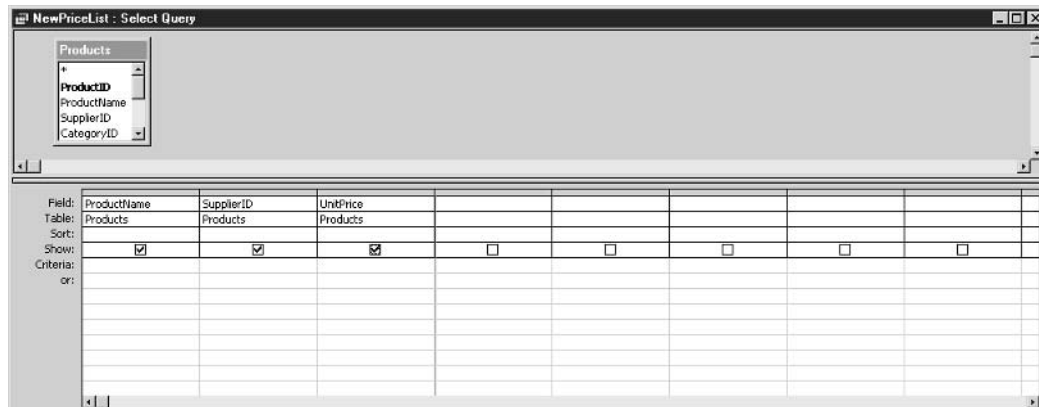
6. Choose File | Save from the menu bar and name the query **NewPriceList**.

7. Switch to Datasheet view by choosing View | Datasheet from the menu bar to see the query results (see Figure 20-2).

FIGURE 20-2   The completed NewPriceList query in Datasheet view showing the query's results.

Ordering Your Records with the Sort Row

In many cases, you'll want your query results ordered in a very specific way. To put your records in a particular order, you must use the Sort row in the QBE grid (see Figure 20-3). To begin sorting a specific field, select Ascending or Descending from the list in the Sort row of the field column you would like to sort. An *ascending* sort will order the records from *A* to *Z* for text fields and from lowest to highest for number fields. *Descending* is just the opposite. To remove sorting from a field, select (Not Sorted) from the Sort row list.

If you want to sort more than one field, Access will sort records first on the leftmost sort field, then the field second to the left, and so on. For example, if you want to sort a customer list by city, then by company within a city, you must arrange those fields in the grid so that city is before company. Here's how to easily rearrange fields in the grid:

1. Roll the mouse pointer over the column header button above the field name in the QBE grid. The column header button is a thin gray horizontal bar. A downward-pointing arrow will appear.
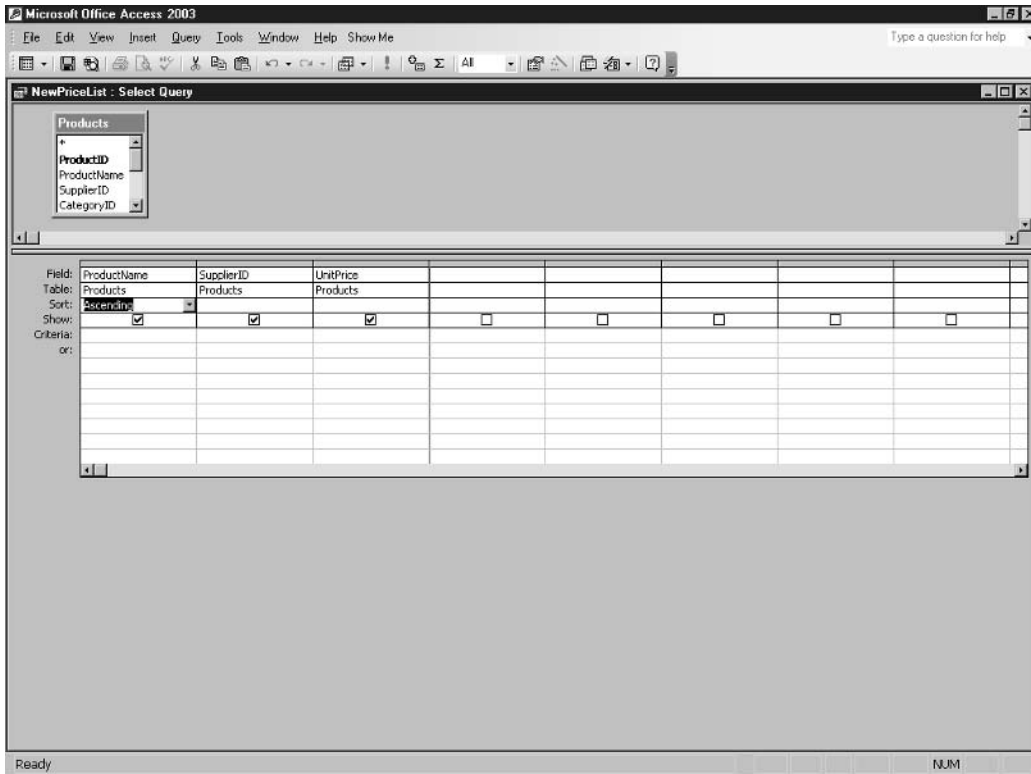
FIGURE 20-3   The NewPriceList query with ProductName as the sort field.

2. Click to select the column.

3. Point to the column header again, and a diagonal left arrow will appear.

4. Press and drag left or right to move the field.

Once you have the fields arranged properly in the grid and you have chosen a sort order in the Sort row, view the query in Datasheet view to see the sorted results.

Here's how to sort records in the CustomerPhoneList query by city, then by company:

1. View the CustomerPhoneList query in Design view.

2. Select the City column.

3. Press and drag the column to the left until it is the first column in the grid.

4. Choose Ascending from the list in the sort row of the City column.

5. Choose Ascending from the list in the sort row of the CompanyName column.

6. Save the query using the File | Save command.

7. View the results in Datasheet view. Notice that the customers are in order by city, then by company name within each city.

City	Company Name	Contact Name	Phone	Fax
Aachen	Drachenblut Delikatessen	Sven Ottlieb	0241-039123	0241-059428
Albuquerque	Rattlesnake Canyon Grocery	Paula Wilson	(505) 555-5939	(505) 555-3620
Anchorage	Old World Delicatessen	Rene Phillips	(907) 555-7584	(907) 555-2880
Århus	Vaffeljernet	Palle Ibsen	86 21 32 43	86 22 33 44
Barcelona	Galería del gastrónomo	Eduardo Saavedra	(93) 203 4560	(93) 203 4561
Barquisimeto	LILA-Supermercado	Carlos González	(9) 331-6954	(9) 331-7256
Bergamo	Magazzini Alimentari Riuniti	Giovanni Rovelli	035-640230	035-640231
Berlin	Alfreds Futterkiste	Maria Anders	030-0074321	030-0076545
Bern	Chop-suey Chinese	Yang Wang	0452-076545	
Boise	Save-a-lot Markets	Jose Pavarotti	(208) 555-8097	
Bräcke	Folk och fä HB	Maria Larsson	0695-34 67 21	
Brandenburg	Königlich Essen	Philip Cramer	0555-09876	

TIP *You can also sort records directly in Datasheet view. First, click any record in the field you want to sort. Then click either Sort Ascending (the button with a stacked AZ on it) or Sort Descending (the button with a stacked ZA on it) on the Query Datasheet toolbar. Don't worry about Access mixing up your data. It won't happen!*

Writing Criteria to Select Specific Records

Criteria allow you to select very specific records from a table or tables. There is a certain way criteria are written, called the criteria's *syntax*. Fortunately, Access will often help you with that syntax as you are writing your criteria. Here are some general rules that you must follow:

■ In text fields, surround your search text with quotation marks ("").

■ In date fields, surround dates with pound signs (#).

TIP *You do not have to type the quotation marks or pound signs around the criteria that you type in the Criteria row. Type the text or date that you are looking for and press ENTER. Access will add the quotation marks and pound signs for you.*

Here's how to find customer contact Ann Devon using the CustomerPhoneList query:

1. Open the CustomerPhoneList query in Design view.

2. Type **Ann Devon** in the first cell of the Criteria row in the ContactName column.

3. Press ENTER. Note that Access adds quotation marks around your criteria.

4. Show the query in Datasheet view to see the record for Ann Devon:

City	Company Name	Contact Name	Phone	Fax
London	Eastern Connection	Ann Devon	(171) 555-0297	(171) 555-3373

Using Operators to Find Records with Numbers

Much like finding specific text, you can find a specific number by typing it in the Criteria row of the field that contains the number. Suppose, however, that you want to find a group of records that follow a pattern, such as all products priced at $50 or more. Writing this type of criteria requires you to use *operators.* An operator is a symbol that represents a type of numeric comparison. I'm sure you've seen some of the numeric operators listed in the following table.

Operator	Description
>	Greater than the specified number
<	Less than the specified number
=	Equal to the specified number
>=	Greater than or equal to the specified number
<=	Less than or equal to the specified number
<>	Not equal to the specified number

You don't have to type the equal sign when trying to exactly match a number because "equal to" is implied. Simply type the value.

Follow these steps to find products priced at or more than $50 using the NewPriceList query:

1. Open the NewPriceList query in Design view.

2. In the first criteria cell in the UnitPrice column, type **>=50**.

3. Switch to Datasheet view to see the results. You should find seven products priced at or more than $50.

NewPriceList : Select Query			
Product Name	Supplier	Unit Price	
Mishi Kobe Niku	Tokyo Traders	$97.00	
Carnarvon Tigers	Pavlova, Ltd.	$62.50	
Sir Rodney's Marmalade	Specialty Biscuits, Ltd.	$81.00	
Thüringer Rostbratwurst	Plutzer Lebensmittelgroßmärkte AG	$123.79	
Côte de Blaye	Aux joyeux ecclésiastiques	$263.50	
Manjimup Dried Apples	G'day, Mate	$53.00	
Raclette Courdavault	Gai pâturage	$55.00	
*		$0.00	

Using Wildcards to Find a Group of Related Records

You've seen that operators are used to find groups of records that contain numbers. To find groups of records that contain text, you use *wildcards.* Wildcards are special characters that you type as part of a criteria expression, and they can help you find records that match a specific pattern. The most commonly used wildcard by far is the asterisk (*). The asterisk matches any number of characters in a text field. For example, if you were looking for a customer company named

Berglunds snabbköp and you couldn't remember how to spell it, you would type **Ber*** in the Criteria row of the CompanyName field. In return, Access would show you all customers whose name starts with the letters *Ber.*

The other common wildcard character is the question mark (?). The question mark matches any single character in a text field. For example, typing "bl?ck" in the criteria row would match the words *black* and *block.* Here are some other examples using wildcards:
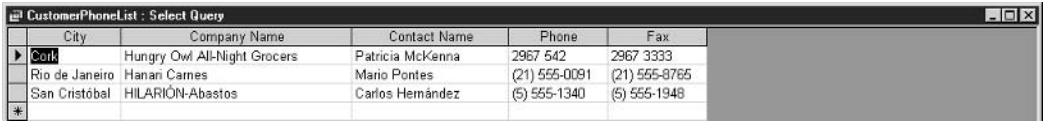
Criteria	Result
555	Finds 000-555-0000 or 000-000-5550
* Smith	Finds John Smith, Jane Smith, and Joe Smith
m*s	Finds Maria Anders and Mario Pontes
b?g	Finds bag, bug, and big, but not brag

NOTE   *Access will add the Like operator to any wildcard criteria you type. Therefore, "m*s" will be changed to Like "m*s" when you press ENTER after typing the criteria.*

Try these steps to find customers whose company names start with *h* and end with *s* using the CustomerPhoneList query:

1. Open the CustomerPhoneList query in Design view.

2. Remove any existing criteria by rolling the mouse to the left edge of the first cell of the criteria row. A black right arrow will appear. Click when you see the right arrow. The entire criteria row will be selected.

3. Press DELETE. The criteria will be erased.

4. Type **h*s** in the first criteria cell of the CompanyName column.

5. Press ENTER. Access will change h*s to Like "h*s".

6. Switch to Datasheet view. You should find that three companies matching the criteria are found.

City	Company Name	Contact Name	Phone	Fax
Cork	Hungry Owl All-Night Grocers	Patricia McKenna	2967 542	2967 3333
Rio de Janeiro	Hanari Carnes	Mario Pontes	(21) 555-0091	(21) 555-8765
San Cristóbal	HILARIÓN-Abastos	Carlos Hernández	(5) 555-1340	(5) 555-1948

Selecting Data from Multiple Tables

In Chapter 18, we discussed table relationships or *joins*. To extract data from multiple tables in Access, those tables must be joined by a common field. For example, the Northwind database has

both a Products and a Suppliers table. To display a list of products and the supplier contact for each product, you would join the two tables on the common field they share, which is SupplierID.

When extracting data from multiple tables, you will sometimes have to add a table to the QBE grid. You can do this by choosing Query | Show Table from the menu bar. The Show Table dialog box will appear. Double-click each table you want added to the query and then close the dialog box.

If you did the work up front in the Relationships window, you shouldn't have to join too many tables in the QBE grid. However, it is sometimes necessary to join tables in the grid. The procedure is exactly the same as it is in the Relationships window. Drag the common field from the field list of one table on top of that same field in the field list of the other table. Once the tables are joined, all you have to do is select the fields you want to see in the results and then specify sorting and criteria.

Now that you know what you'll need to query multiple tables, try these steps to create a list of products and supplier contact information:

1.   To take a look at the relationships already created in the Northwind database, make sure the Database window is active and then choose Tools | Relationships from the menu bar. The Relationships window will open. Note that the Suppliers and Products tables are joined in a one-to-many relationship on the SupplierID field.

2.   Close the Relationships window by clicking the Close button in the upper-right corner of the window.

3.   In the Database window, select the Queries button on the Objects bar.

4.   Double-click the icon labeled Create Query in Design View. This is the first icon on the list located on the right side of the database window. The QBE grid appears, as does the Show Table dialog box.

5.   Double-click Products and Suppliers from the Tables tab. This will add the Products and Suppliers tables to the top of the QBE grid.

6.   Close the Show Table dialog box. Notice that field lists from the Products and Suppliers tables appear in the top half of the QBE grid. The two tables are joined on the SupplierID field.

7.   Double-click the ProductID and ProductName fields from the Products table. These fields will be added to the bottom half of the QBE grid.

8.   Double-click the CompanyName, ContactName, Phone, and Fax fields from the Suppliers table. These fields will also be added to the bottom half of the QBE grid.

9.   Choose Ascending in the Sort row of the ProductName column.

10.   Choose File | Save from the menu.

11.   Name the query **ProductSupplier**.

12. Switch to Datasheet view to see the query results:

Product ID	Product Name	Company Name	Contact Name	Phone	Fax
17	Alice Mutton	Pavlova, Ltd.	Ian Devling	(03) 444-2343	(03) 444-6588
3	Aniseed Syrup	Exotic Liquids	Charlotte Cooper	(171) 555-2222	
40	Boston Crab Meat	New England Seafood Cannery	Robb Merchant	(617) 555-3267	(617) 555-3389
60	Camembert Pierrot	Gai pâturage	Eliane Noz	38.76.98.06	38.76.98.58
18	Carnarvon Tigers	Pavlova, Ltd.	Ian Devling	(03) 444-2343	(03) 444-6588
1	Chai	Exotic Liquids	Charlotte Cooper	(171) 555-2222	
2	Chang	Exotic Liquids	Charlotte Cooper	(171) 555-2222	
39	Chartreuse verte	Aux joyeux ecclésiastiques	Guylène Nodier	(1) 03.83.00.68	(1) 03.83.00.62
4	Chef Anton's Cajun Seasoning	New Orleans Cajun Delights	Shelley Burke	(100) 555-4822	
5	Chef Anton's Gumbo Mix	New Orleans Cajun Delights	Shelley Burke	(100) 555-4822	
48	Chocolade	Zaanse Snoepfabriek	Dirk Luchte	(12345) 1212	(12345) 1210
38	Côte de Blaye	Aux joyeux ecclésiastiques	Guylène Nodier	(1) 03.83.00.68	(1) 03.83.00.62
58	Escargots de Bourgogne	Escargots Nouveaux	Marie Delamare	85.57.00.07	
52	Filo Mix	G'day, Mate	Wendy Mackenzie	(02) 555-5914	(02) 555-4873

The Northwind database is a great tool for you to use in learning Access—beyond its use for demonstrative purposes in this chapter, you can use it yourself to see how various database features are utilized and how a well-built database management system is crafted. The fact that it comes with lots of records already entered also makes it a great resource, because you can play with a lot of different query, form, and report variations and have plenty of data to work with. If you didn't install the Northwind database when you installed Office, you can use the Office CD to install it now.

Chapter 21

Documenting Your Data with Access Reports

How to…

- Work in the report Design and Print Preview views
- Simplify report design with the Report Wizard
- Change margins and paper orientation

Reports are the payoff for your hard database development work. You can use a report to quickly view data from a table or query. You can preview a report or print it out. So, the report allows you to see what you want to see in a polished format that is easy on the eye.

Report and form design are very similar. Just as forms have controls such as text, check, and combo boxes, so do reports. Working with these controls is exactly the same as it is for forms. You move, size, format, and delete them exactly as you do for form controls. See Chapter 19 for more information on working with controls.

Exploring Report-Development Options

Report design is very similar to form design. If you are already comfortable working with forms, you should have no trouble with reports. As with tables, forms, and queries, reports can be viewed in several ways. Of course, reports have a Design view, where you do the work to create and modify your report (see Figure 21-1).

You can also view your report in Print Preview, where you can see onscreen what the entire report will look like on the printed page. From Print Preview, you can move between pages, zoom in and out on a page, and adjust page layout settings. Finally, you can view your report with Layout Preview. This view is especially helpful when attempting to preview a large report. When viewing the full report, you must wait for Access to gather the data to display the pages. The Layout Preview shows an abbreviated version of the report with just enough data in all parts of the report so you can see how every section will look. Therefore, large reports display onscreen much faster using Layout Preview. You can use the View menu or the View tool on the Report Design and Print Preview toolbars to switch between views.

NOTE *The exercises in this chapter were written using the HP LaserJet 4 printer. The printer you are using will affect the way a report displays in Print Preview and on the printed page. Because of this, you might not see what the exercises in this chapter say you will see. Please keep this in mind when doing the exercises that follow.*

Simplifying Report Design with the Report Wizard

The Report Wizard is the most commonly used wizard that comes with Access. Every report that I've ever made in Access I've started from the Report Wizard. The wizard does the vast majority of the work, leaving you to fine-tune its results. The Report Wizard will ask you a few questions that you must answer. Here are the questions and what they mean:

- *Where is the data that you want to see on the report?* Usually, the data is in a query that you select from the list of data sources. You can, however, attach a report to a table as well. Remember that a table will show all records, whereas a query allows you to select the records you want to see as well as records from multiple tables.

- *What fields from the data source do you want to see?* Here you select the fields—in order from left to right or top to bottom—as you would like to see them on the report. On average, you cannot fit more than ten columns on a page turned sideways, so you should keep that in mind when selecting fields. This number might vary depending on how much data there is to display in each column. Sometimes six will fit. Sometimes 16 will fit. It all depends on the data.

- *What grouping would you like? Grouping* is the process of lumping like records together on the page. Suppose you are printing a customer list from the Northwind database. You can group customers by country so that a country heading appears when the list of customers who live in that country is below the heading.
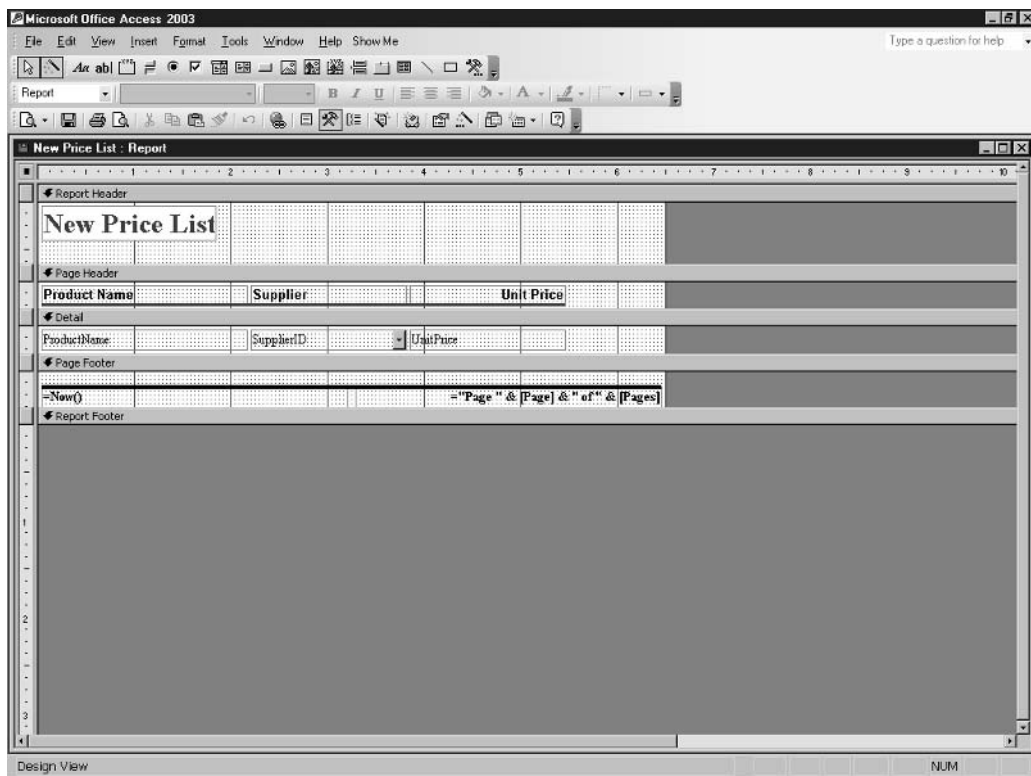
FIGURE 21-1   A report in Design view

■ *What sorting would you like?* Here you can select how you want Access to order the records on the page. You can select up to four fields and ascending or descending order for each field.

NOTE   *When you add grouping to a report that contains numeric data, the Report Wizard adds a Summary Options button to the sort screen. Click the Summary Options button to add totals such as sums and averages to the end of the group. If you're grouping orders by date, for example, the Summary Options button allows you to add a total to the bottom of each day's group of records.*

■ *What layout would you like? Columnar* will display controls in columns on the report. Use this layout if your table or query contains many fields. *Tabular* will display controls in rows on the report. This is the most common report layout because it lets you show multiple records on a page. *Justified* will give the controls on the form a uniform appearance.

NOTE   *When grouping is added to a report, the Report Wizard provides other layout options, such as stepped and blocked. These are variations of the Tabular layout. Choose a layout and look at the preview pane, located to the left of the layout list, to see an example of that layout.*

■ *Which way would you like data to show on the page?* Access calls this *orientation. Landscape* orientation shows the data so that the page is wider than it is long. In most cases, this orientation is better for tabular layouts. *Portrait* is just the opposite. It shows the data so that the page is longer than it is wide. In most cases, Portrait is better for columnar layouts.

■ *Do you want Access to adjust the field width so that the data fits on the page?* Normally what Access does is see what field size you have chosen for a field in table design and make the column for that field on the report equal to its field size. So, if the field size of one of your selected fields is 25 characters, the Report Wizard will make that field 25 characters wide on the report. When you tell Access to adjust field widths to fit the page, it will ignore field size and adjust each field's column width so that all columns fit on the page.

If you select this option with too many fields to display, some of your data will be cut off in the column. If you don't select this option, some of the fields you've selected might spill onto the next page. When this happens, you'll wind up with something like five columns of a record on page 1 and five more on page 2. This is where you have to experiment to see which option works best.

■ *What style do you want for your report?* Access comes with some report templates that will give your report a professionally designed appearance. You can click a style name in the wizard to see how your report will appear.

■ *What title do you want for your report?* The title you enter will display on the top of the first page of the report.

TIP   *Because the Report Wizard is quick and easy, try experimenting with its options. This might mean creating the same report three or four times until you end up with one that is closest to what you want.*

Creating a Report with the Report Wizard

Now that you understand what options the Report Wizard offers, let's create two reports. The first will be a simple report without grouping, whereas the second will use grouping.

We will start with a report using our NewPriceList query from Chapter 20. Here are the steps to follow:

1. Open the Northwind database, if necessary.

2. Select Queries from the Objects bar.

3. Design the NewPriceList query. If you did not do the exercise to create this query, turn to the section "Designing a Query in the QBE Grid" in Chapter 20.

4. Delete any criteria from the query.

5. Save and close the query.

6. Select Reports from the Objects bar.

7. Double-click the Create Report by Using Wizard icon. This is the second icon on the list on the right side of the Database window. The first screen of the wizard appears.
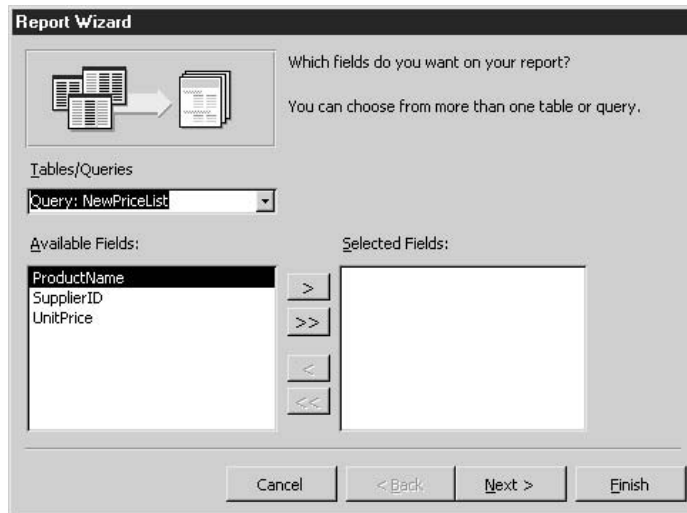

8. Select Query: NewPriceList from the Tables/Queries list.

9. Click the double-chevron (>>) button to bring over all fields from the query.

10. Click the Next button. The grouping screen will appear.

11. If SupplierID is specified as the group field on the grouping screen, double-click directly on it to remove any grouping. You can tell whether SupplierID is selected for grouping by the color and position of its text in the preview pane located on the right side of the grouping screen. If it is in a rectangle by itself and colored blue, it is selected for grouping.

12. Click the Next button again. You will see the sorting screen.
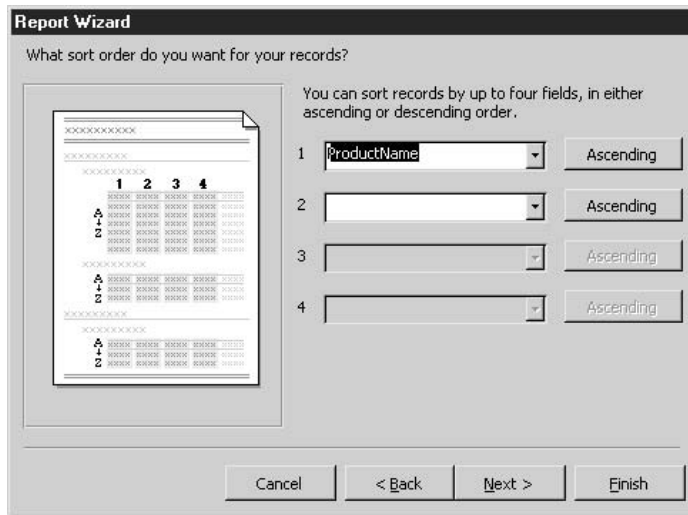
13. Choose ProductName from the first list of sort fields.

NOTE   *If a report is based on a query and records are sorted in the query, the sort order is inherited by the report.*
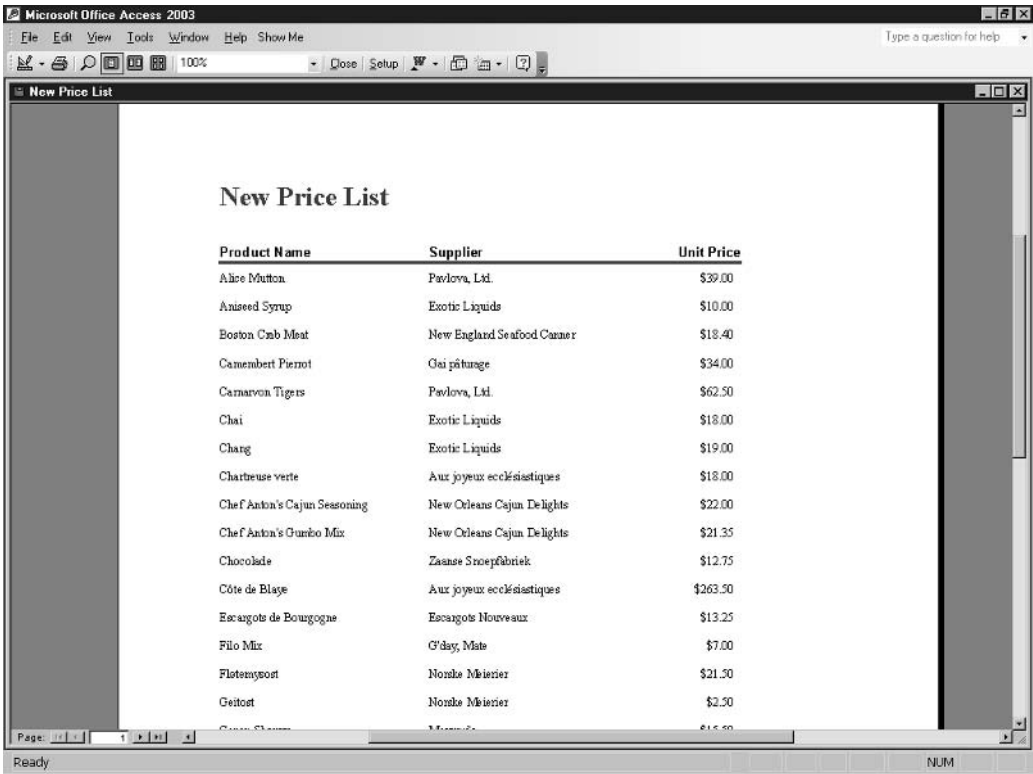
14. Leave the default direction of ascending.

15. Click the Next button. You will see the layout screen, where you can choose layout options of Columnar, Tabular, and Justified, as well as a Portrait or Landscape orientation. My Report Wizard dialog box shows options of Stepped, Blocked, Outline 1, Outline 2, Align Left 1, and Align Left 2.

16. Leave the defaults on the layout screen and choose Next again. You will then see the style screen.

17. Select the Bold style from the list, if necessary.

18. Click Next to see the name screen.

19. Enter the name **New Price List**. Notice that the wizard is set to display the report in Print Preview.

20. Click Finish. The new report displays onscreen in Print Preview.

21. Use the Page arrow buttons on the lower-left corner of the Print Preview screen to move between pages.

22. Figure 21-2 shows a report with Product Name, Supplier, and Unit Price. The finished result from the last 16 steps produces a different report, with SupplierID, Product Name, and Unit Price.

23. Close the report window.

Here's how to make a customer report with grouping:

1. Press F11 to activate the Database window, if necessary.

2. Select Reports from the Objects bar.

3. Double-click the Create Report by Using Wizard icon. This is the second icon on the list on the right side of the Database window. The first screen of the wizard will appear.

FIGURE 21-2   The completed New Price List report in Print Preview.

4. Select Table: Customers from the Tables/Queries list.

5. Click the double-chevron (>>) button to bring all fields from the Available Fields list to the Selected Fields list.

6. Double-click CustomerID from the Selected Fields list to remove it. It will return to the Available Fields list.

7. Click the Next button. The grouping screen will appear.

8. Double-click Country from the list of fields on the left side of the wizard screen. The preview pane to the right of the field list shows you how the grouping will effect the report's layout.
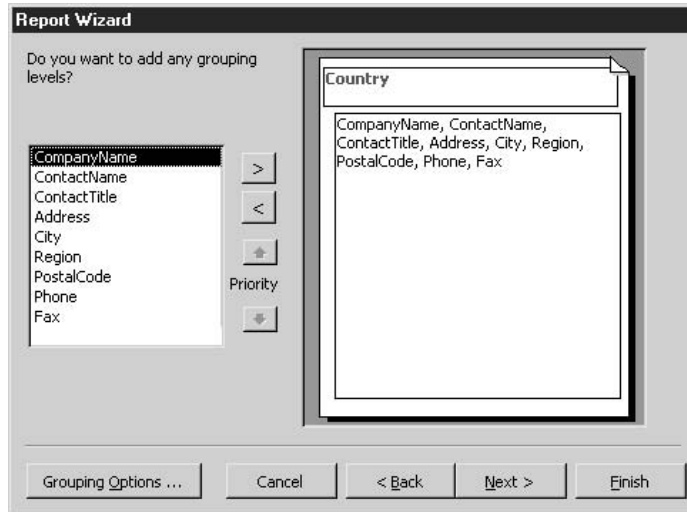
9. Click the Next button. You will see the sorting screen.

10. Choose CompanyName from the first list of sort fields.

11. Choose ContactName from the second list of sort fields. The report will be sorted by company name, then by contact name within each company.

12. Leave the default direction of ascending for each field.

13. Click the Next button. You will see the layout/orientation screen.

14. Select the Align Left 1 layout. Select Landscape orientation. Note that Adjust the Field Width So All Fields Fit on the Page is checked. Access will adjust the fields so that they all fit on the page.

15. Choose Next again. You will see the style screen.

16. Select the Bold style from the list. It is good design practice to use the same style for each report in your database.

17. Click Next to see the name screen.

18. Enter the name **Customer List**.

19. Click Finish. The new report displays in Print Preview (see Figure 21-3).

20. Use the Page arrow buttons at the lower-left corner of the Print Preview screen to move between pages. Notice that some data does not fit in its column, and the title shows only on page 1. We will fix these problems later in this chapter.

21. Close the report window.
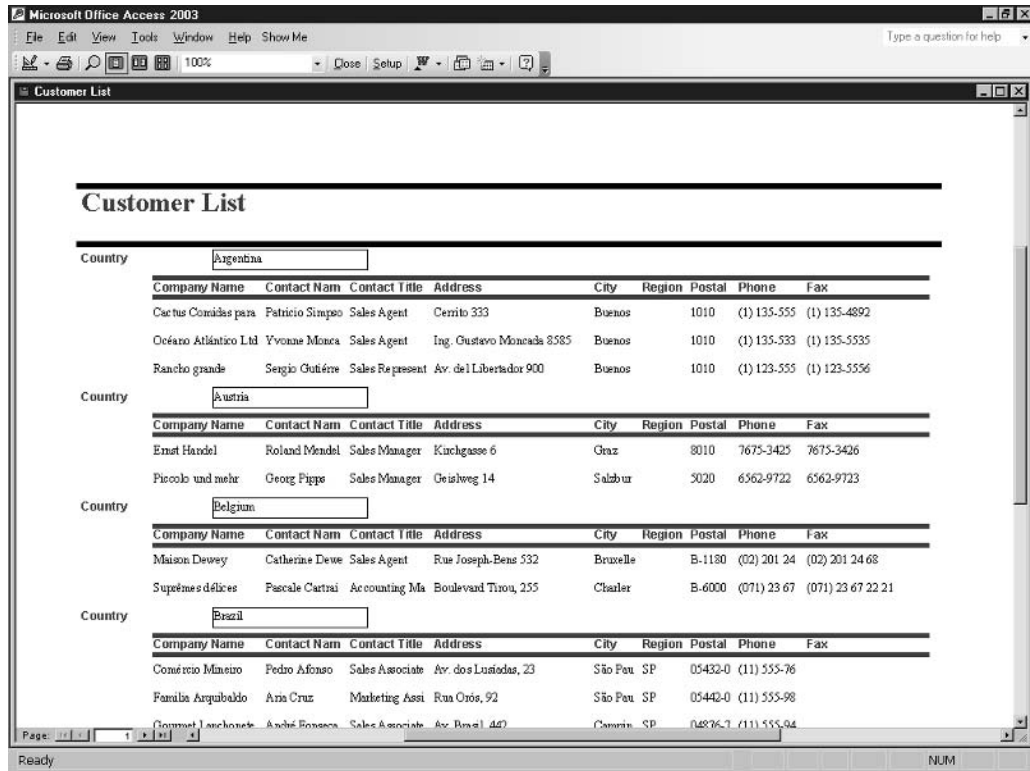
FIGURE 21-3   The Customer List report as created by the Report Wizard.

Changing the Margins to Fit More Data per Page

Sometimes you have to change margins to fit more data on a page either horizontally or vertically. You can change margins with the Page Setup command directly in Print Preview. This is one of the few design elements that Access does not require you to change in Design view.

Let's complete the Customer List report by changing its margin settings to fit more records on a page. Here's how:

1. Select the Customer List report from the Reports list in the Database window.

2. Click the Print Preview button on the toolbar to see the report with its data. Only one record for Brazil appears at the end of page 1.

3. Click the Setup button on the Print Preview toolbar. The Page Setup dialog box displays.
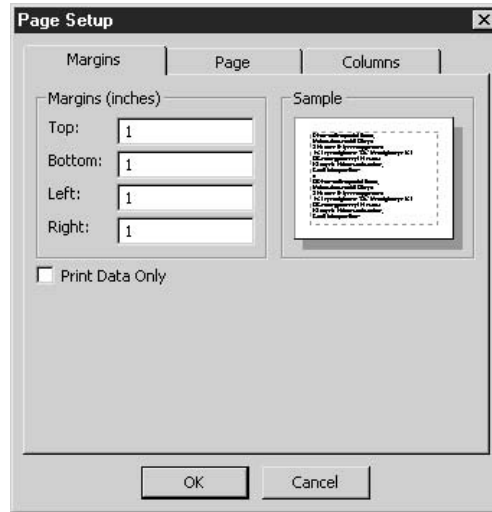
4. Select the text in the Top text box and type **.5** to replace it.

5. Select the text in the Bottom text box and type **.5** to replace it.

TIP

*Some printers can print closer to the edge of the paper than others. You can type **0** in a margin box if you like. Access will adjust this to the lowest possible value your printer will accept.*

6. Click the Page tab. Here is where you can change orientation.

7. Choose OK to lock in your new settings.

8. Close the Customer List report.

Printing Your Reports

After all that hard work, it is time to enjoy the fruits of your labor by printing a completed report. Access gives you several printing options. All are available in the Print dialog box. Here are the most common:

- Select a printer
- Print multiple copies
- Print a page range

You must use the File menu or press CTRL-P to display the Print dialog box. If you click the Print button on the Print Preview toolbar, you will send one copy of the entire report to the currently selected printer.