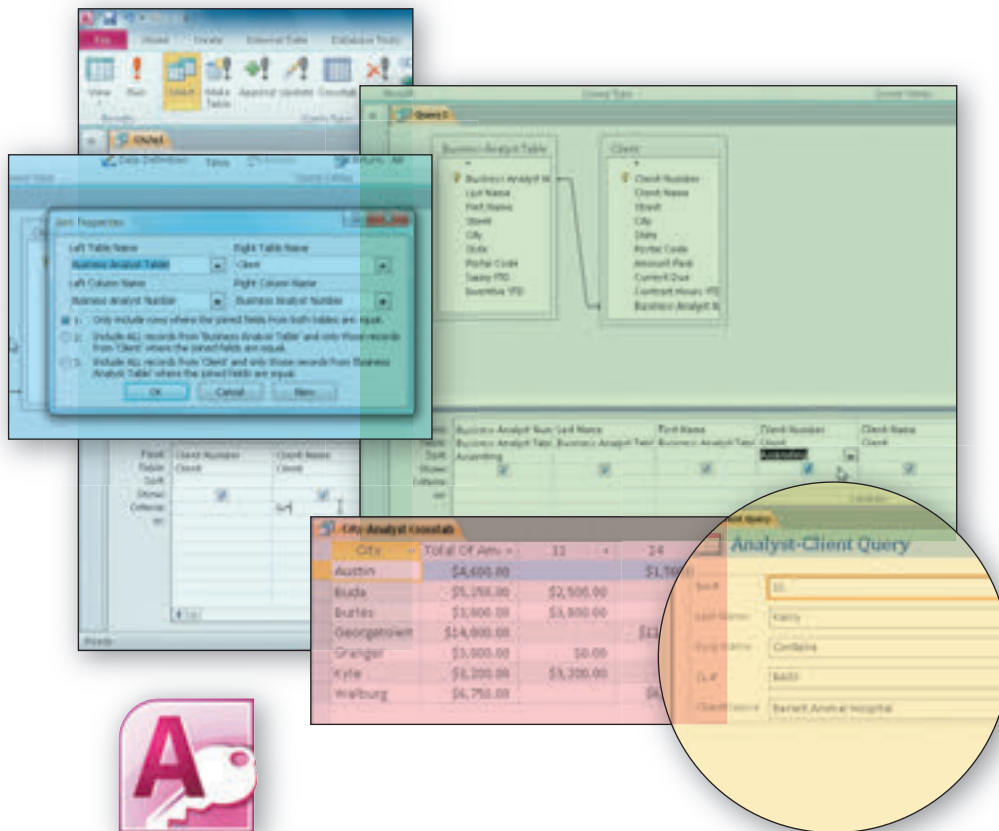# 2 | Querying a Database

Objectives

You will have mastered the material in this chapter when you can:

- Create queries using Design view
- Include fields in the design grid
- Use text and numeric data in criteria
- Save a query and use the saved query
- Create and use parameter queries
- Use compound criteria in queries
- Sort data in queries
- Join tables in queries

- Create a report and a form from a query
- Export data from a query to another application
- Perform calculations and calculate statistics in queries
- Create crosstab queries
- Customize the Navigation Pane

2 | Querying a Database

Introduction

One of the primary benefits of using a database management system such as Access is the ability to find answers to questions related to data stored in the database. When you pose a question to Access, or any other database management system, the question is called a query. A **query** is simply a question presented in a way that Access can process.

Thus, to find the answer to a question, you first create a corresponding query using the techniques illustrated in this chapter. After you have created the query, you instruct Access to display the query results, that is, to perform the steps necessary to obtain the answer. Access then displays the answer in Datasheet view.

Project — Querying a Database

Organizations and individuals achieve several benefits from storing data in a database and using Access to manage the database. One of the most important benefits is the capability of easily finding the answers to questions and requests such as those shown in Figure 2–1 and the following, which concern the data in the Camashaly Design database:

1. What are the number, name, amount paid, and current due for client BC76?
2. What are the number, name, amount paid, and current due for all clients whose name starts with Gr?
3. Give me the number, name, amount paid, current due, and business analyst number for all clients whose amount paid is more than $3,000 and whose business analyst number is 11.
4. List the client number, name, business analyst number, and amount paid for all clients. Sort the results by business analyst number and amount paid.
5. For each business analyst, list the number, last name, and first name. Also, list the client number and name for each of the business analyst's clients.
6. List the client number, client name, amount paid, current due, and the total amount (amount paid plus current due) for each client.
7. Give me the average amount paid by clients of each business analyst.
8. Summarize the total amount paid by city and by business analyst.

In addition to these questions, Camashaly Design managers need to find information about clients located in a specific city, but they want to enter a different city each time they ask the question. The company can use a parameter query to accomplish this task. Camashaly Design managers also want to summarize data in a specific way, and they can use a crosstab query to present the data in the desired form.
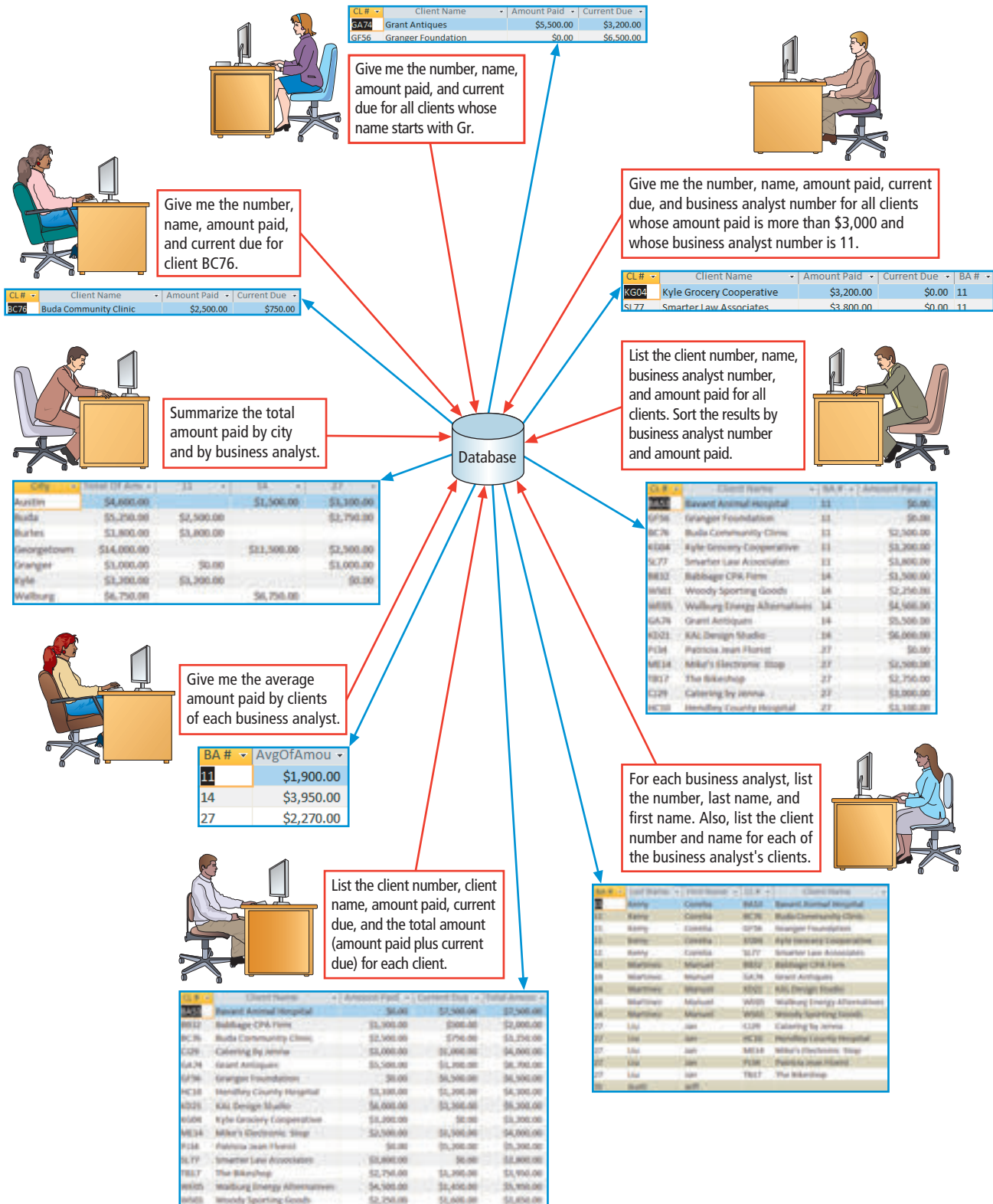
Figure 2–1

Overview

As you read this chapter, you will learn how to query a database by performing these general tasks:

- Create queries using Design view.
- Use criteria in queries.
- Create and use parameter queries.
- Sort data in queries.
- Join tables in queries.
- Create reports and forms from a query.
- Export data from a query.
- Perform calculations in queries.
- Create crosstab queries.

Plan Ahead

Query Design Decisions

When posing a question to Access, you must design an appropriate query. In the process of designing a query, the decisions you make will determine the fields, tables, criteria, order, and special calculations included in the query. To design a query, you can follow these general guidelines:

1. **Identify the fields.** Examine the question or request to determine which fields from the tables in the database are involved. Examine the contents of these fields to make sure you understand the data type and format for storing the data.

2. **Identify restrictions.** Unless the question or request calls for the inclusion of all records, determine the restrictions or the conditions records must satisfy to be included in the results.

3. **Determine whether special order is required.** Examine the question or request to determine whether the results must appear in some specific order.

4. **Determine whether more than one table is required.** If all the fields identified in Step 1 are in the same table, no special action is required. If this is not the case, identify all tables represented by those fields.

5. **Determine whether calculations are required.** Examine the question or request to determine whether, in addition to the fields determined in Step 1, calculations must be included. Such calculations include individual record calculations (for example, adding the values in two fields) or group calculations (for example, finding the total of the values in a particular field for all the records).

6. **If data is to be summarized, determine whether a crosstab query would be appropriate.** If data is to be grouped by two different types of information, you can use a crosstab query. You will need to identify the two types of information. One of the types will form the row headings and the other will form the column headings in the query results.

When necessary, more specific details concerning the decisions and/or actions are presented at appropriate points in the chapter. The chapter also will identify the use of these guidelines in creating queries such as those shown in Figure 2–1.

BTW

Designing Queries
Before creating queries, examine the contents of the tables involved. You need to know the data type for each field and how the data for the field is stored. If a query includes a state, for example, you need to know whether state is stored as the two-character abbreviation or as the full state name.

To Start Access

The following steps, which assume Windows 7 is running, start Access based on a typical installation. You may need to ask your instructor how to start Access for your computer. For a detailed example of the procedure summarized below, refer to the Office 2010 and Windows 7 chapter at the beginning of this book.

1 Click the Start button on the Windows 7 taskbar to display the Start menu.

2 Type `Microsoft Access` as the search text in the 'Search programs and files' text box and watch the search results appear on the Start menu.

3 Click Microsoft Access 2010 in the search results on the Start menu to start Access.

4 If the Access window is not maximized, click the Maximize button next to the Close button on its title bar to maximize the window.

> For an introduction to Windows 7 and instruction about how to perform basic Windows 7 tasks, read the Office 2010 and Windows 7 chapter at the beginning of this book, where you can learn how to resize windows, change screen resolution, create folders, move and rename files, use Windows Help, and much more.

To Open a Database from Access

In the previous chapter, you saved your database on a USB flash drive using the file name, Camashaly Design. The following steps open the Camashaly Design database from the Access folder in the CIS 101 folder on the USB flash drive. For a detailed example of the procedure summarized below, refer to the Office 2010 and Windows 7 chapter at the beginning of this book.

1 With your USB flash drive connected to one of the computer's USB ports, click File on the Ribbon to open the Backstage view, if necessary.

2 Click Open in the Backstage view to display the Open dialog box.

3 Navigate to the location of the file to be opened (in this case, the USB flash drive, then to the CIS 101 folder [or your class folder], and then to the Access folder).

4 Click Camashaly Design to select the file to be opened.

5 Click the Open button (Open dialog box) to open the selected file and display the opened database in the Access window.

6 If a Security Warning appears, click the Enable Content option button.

> For an introduction to Office 2010 and instruction about how to perform basic tasks in Office 2010 programs, read the Office 2010 and Windows 7 chapter at the beginning of this book, where you can learn how to start a program, use the Ribbon, save a file, open a file, quit a program, use Help, and much more.

Creating Queries

Queries are simply questions, the answers to which are in the database. Access contains a powerful query feature. Through the use of this feature, you can find the answers to a wide variety of complex questions.

> BTW
>
> **Q&As**
> For a complete list of the Q&As found in many of the step-by-step sequences in this book, visit the Access 2010 Q&A Web page (scsite.com/ac2010/qa).

Note: In this chapter, you will save each query example. When you use a query for another task, such as to create a form or report, you will assign a specific name to a query; for example, Analyst-Client Query. In situations in which you will not use the query again, you will assign a name using a convention that includes the chapter number and a query number; for example, Ch2q1. Queries are numbered consecutively.

To Create a Query in Design View

Most of the time, you will use Design view to create queries. Once you have created a new query in Design view, you can specify fields, criteria, sorting, calculations, and so on. The following steps create a new query in Design view.

1

- Close the Navigation Pane.

- Click Create on the Ribbon to display the Create tab.

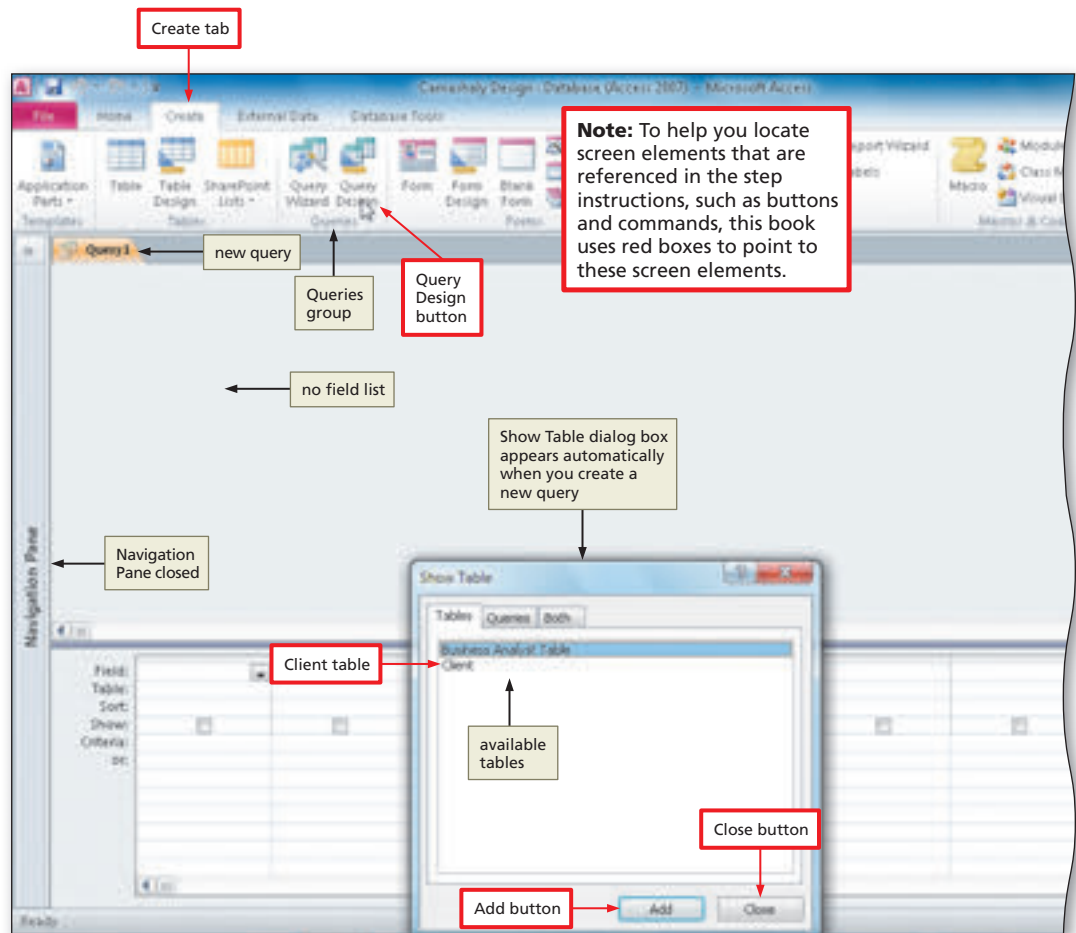- Click the Query Design button (Create tab | Queries group) to create a new query (Figure 2–2).

Figure 2–2

Q&A Is it necessary to close the Navigation Pane?

No. It gives you more room for the query, however, so it is usually a good practice to hide it.

2

- Click the Client table (Show Table dialog box) to select the table.

- Click the Add button to add the selected table to the query.

- Click the Close button to remove the dialog box from the screen.

Q&A What if I inadvertently add the wrong table?

Right-click the table that you added in error and click Remove Table on the shortcut menu. You also can just close the query, indicate that you don't want to save it, and then start over.

- Drag the lower edge of the field list down far enough so all fields in the table appear (Figure 2–3).
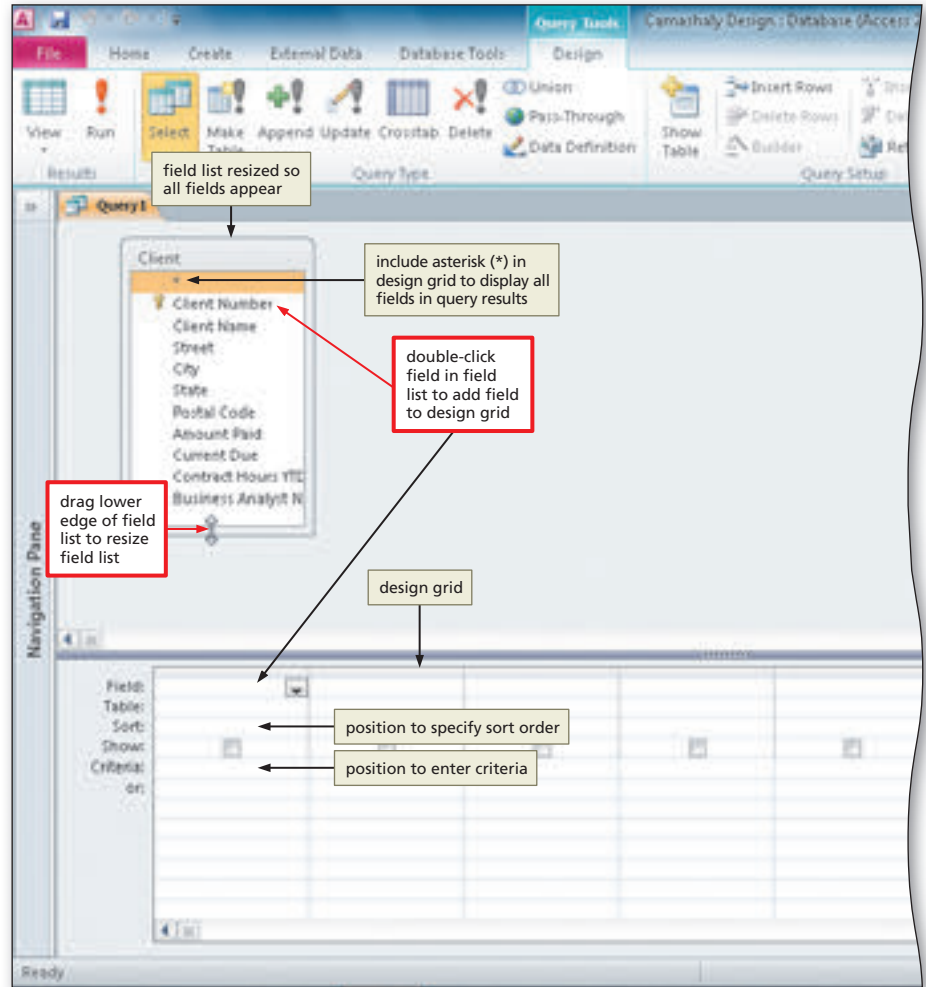
Figure 2–3

Q&A How do I drag the lower edge?

Point to the lower edge, press and hold the left mouse button, move the mouse pointer to the new position for the lower edge, and then release the left mouse button. While the mouse pointer points to the lower edge of the field list, its shape changes to a two-headed arrow.

Q&A Is it essential that I resize the field list?

No. You can always scroll through the list of fields using the scroll bar. It is usually more convenient to resize the field list so all fields appear.

To Add Fields to the Design Grid

Once you have a new query displayed in Design view, you are ready to make entries in the design grid, located in the lower pane of the window. You add the fields you want included in the query to the Field row in the grid. Only the fields that appear in the design grid will be included in the results of the query. The following steps begin the creation of a query that Camashaly Design might use to obtain the client number, client name, amount paid, and current due for a particular client. The following step selects the appropriate fields for the query.

1

- Double-click the Client Number field in the field list to add the field to the query.

Q&A

What if I add the wrong field?

Click just above the field name in the design grid to select the column and then press the DELETE key to remove the field.

- Double-click the Client Name field in the field list to add the field to the query.

- Add the Amount Paid field to the query.

- Add the Current Due field to the query (Figure 2–4).

Q&A

What if I want to include all fields? Do I have to add each field individually?

No. Instead of adding individual fields, you can double-click the asterisk (*) to add the asterisk to the design grid. The asterisk is a shortcut indicating all fields are to be included.
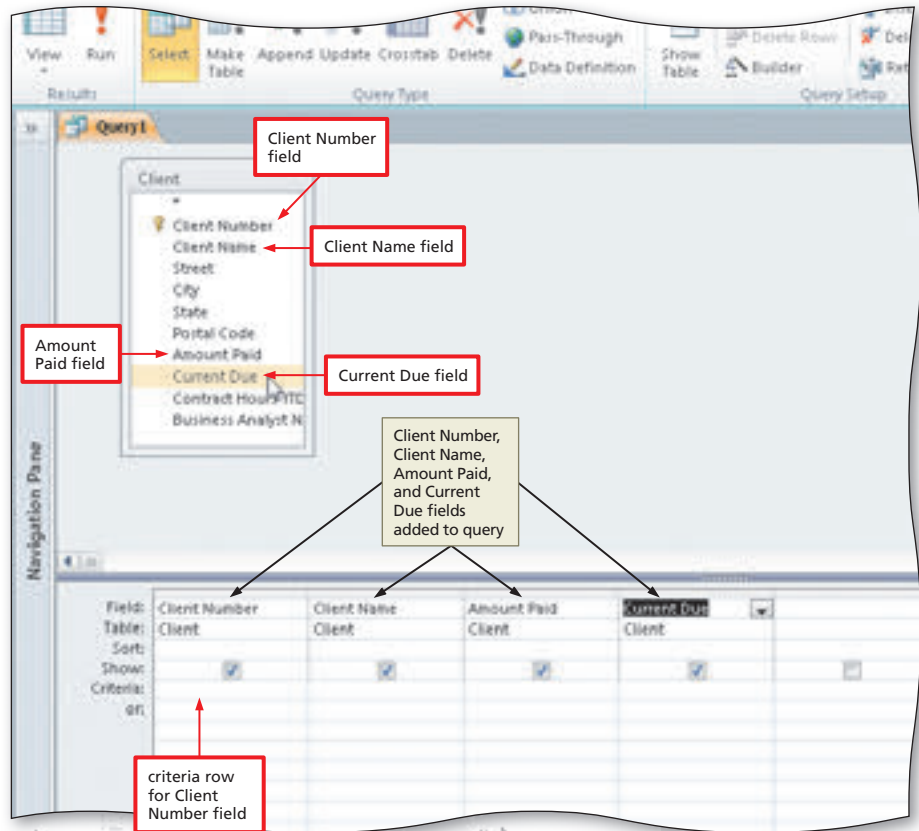
Figure 2–4

Determining Criteria

When you use queries, usually you are looking for those records that satisfy some criterion. In the simple query you created in the previous chapter, for example, you entered a criterion to restrict the records that were included to those on which the business analyst number is 14. In another query, you might want the name, amount paid, and current due amounts of the client whose number is BC76, for example, or of those clients whose names start with the letters, Gr. You enter criteria in the Criteria row in the design grid below the field name to which the criterion applies. For example, to indicate that the client number must be BC76, you first must add the Client Number field to the design grid. You then would type BC76 in the Criteria row below the Client Number field.

To Use Text Data in a Criterion

To use **text data** (data in a field whose data type is Text) in criteria, simply type the text in the Criteria row below the corresponding field name. The following steps finish the creation of a query that Camashaly Design might use to obtain the client number, client name, amount paid, and current due amount of client BC76. These steps add the appropriate criterion so that only the desired client will appear in the results. The steps also save the query.

1
- Click the Criteria row for the Client Number field to produce an insertion point.
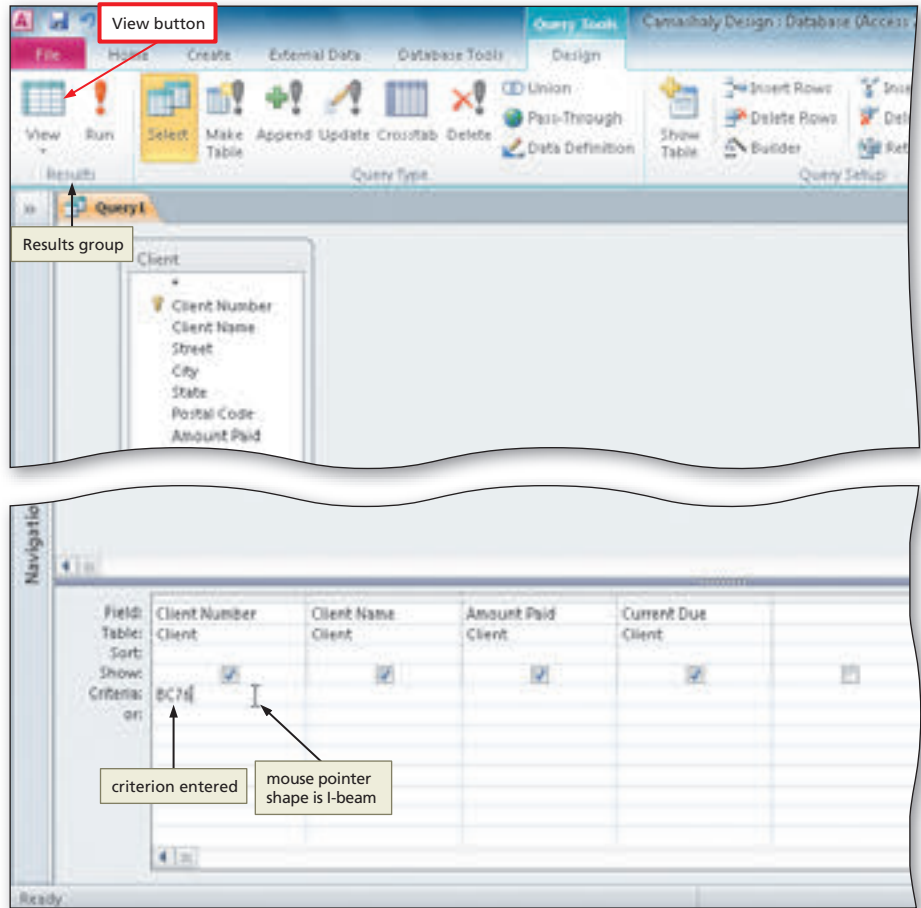- Type **BC76** as the criterion (Figure 2–5).

Figure 2–5

2
- Click the View button (Query Tools Design tab | Results group) to display the query results (Figure 2–6).

Q&A

I noticed that there is a View button on both the Home tab and the Design tab. Do they both have the same effect?

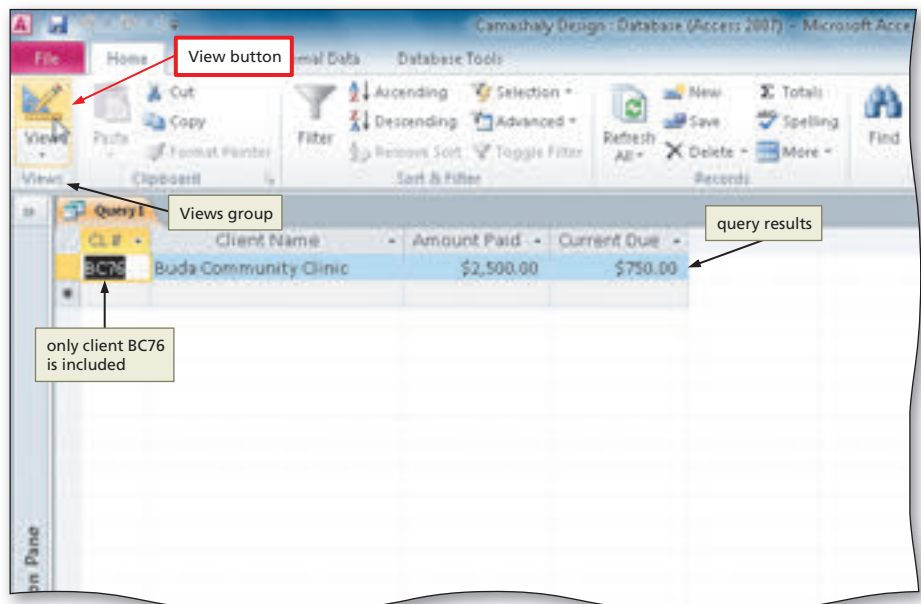Yes. Use whichever one you find most convenient.

Figure 2–6

3

- Click the Save button on the Quick Access Toolbar to display the Save As dialog box.

- Type **Ch2q1** as the name of the query (Figure 2–7).

Q&A

Can I also save from Design view?

Yes. You can save the query when you view it in Design view just as you can save the query when you view the query results in Datasheet view.
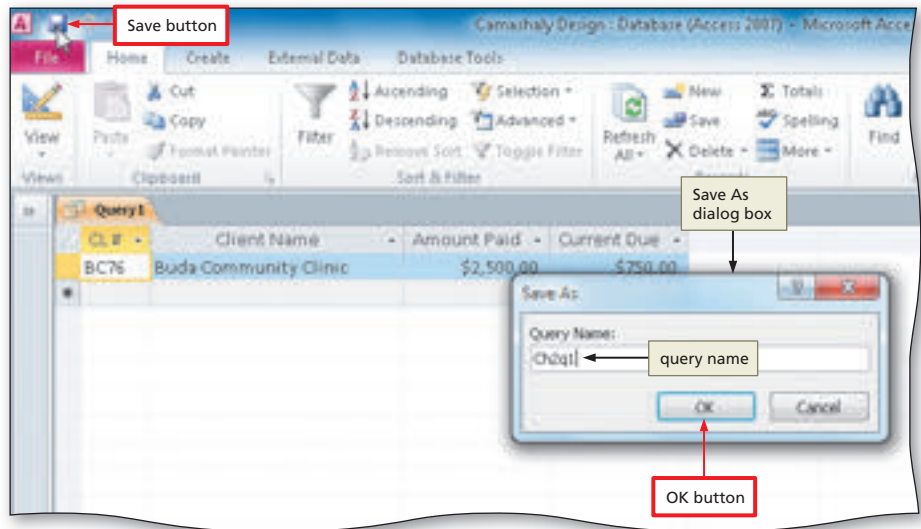

Figure 2–7

4

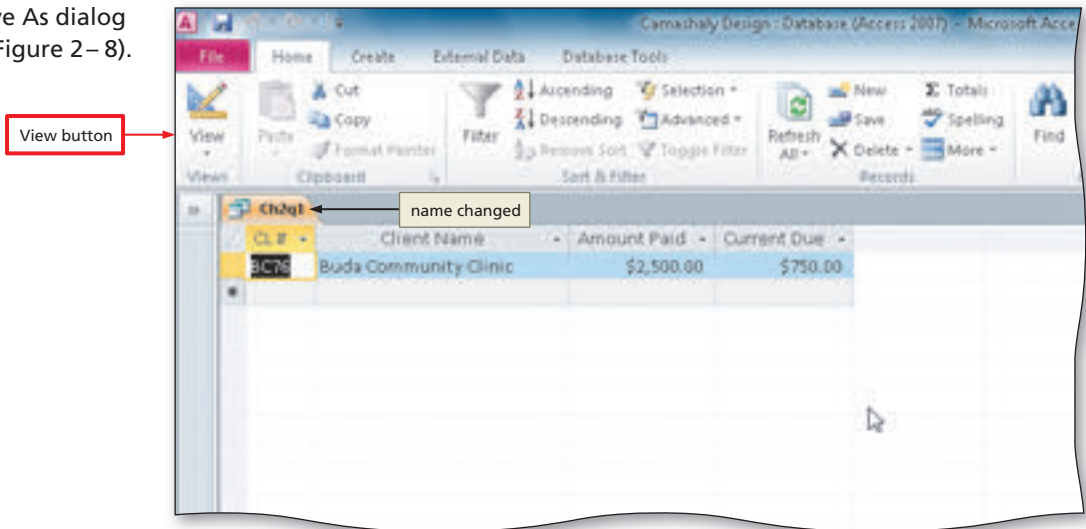- Click the OK button (Save As dialog box) to save the query (Figure 2–8).

Figure 2–8

Other Ways

1. Right-click query tab, click Save on shortcut menu

Using Saved Queries

After you have created and saved a query, you can use it in a variety of ways:

- To view the results of the query that is not currently open, open it by right-clicking the query in the Navigation Pane and clicking Open on the shortcut menu.
- If you want to change the design of the query that is already open, return to Design view and make the changes.
- If you want to change the design of the query that is not currently open, right-click the query in the Navigation Pane and then click Design View on the shortcut menu to open the query in Design view.
- To print the results with the query open, click File on the Ribbon, click the Print tab in the Backstage view, and then click Quick Print.

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- To print the query without first opening it, be sure the query is selected in the Navigation Pane and click File on the Ribbon, click the Print tab in the Backstage view, and then click Quick Print.
- You can switch between views of a query using the View button (Home tab | Views group). Clicking the arrow at the bottom of the button produces the View button menu. You then click the desired view in the menu. The two query views you use in this chapter are Datasheet view (see the results) and Design view (change the design). You can click the top part of the View button, in which case, you will switch to the view identified by the icon on the button. In the figure, the button contains the icon for Design view, so clicking the button would change to Design view. For the most part, the icon on the button represents the view you want, so you can usually simply click the button.

To Use a Wildcard

Microsoft Access supports wildcards. **Wildcards** are symbols that represent any character or combination of characters. One common wildcard, the **asterisk** (*), represents any collection of characters. Thus Gr* represents the letters, Gr, followed by any collection of characters. Another wildcard symbol is the **question mark** (?), which represents any individual character. Thus T?m represents the letter, T, followed by any single character, followed by the letter, m; a search might return the names Tim or Tom.

The following steps modify the previous query so that Camashaly Design can select only those clients whose names begin with Gr. Because you do not know how many characters will follow the Gr, the asterisk wildcard symbol is appropriate. The steps also save the query with a new name using the Save As command.

1

- Click the View button (Home tab | Views group) to return to Design view.

- If necessary, click the Criteria row below the Client Number field to produce an insertion point.

Q&A

The text I entered now has quotation marks surrounding it. What happened?

Criteria for text data needs to be enclosed in quotation marks. You do not have to type the quotation marks; Access adds them automatically.

- Use the DELETE or BACKSPACE key as necessary to delete the current entry.

- Click the Criteria row below the Client Name field to produce an insertion point.

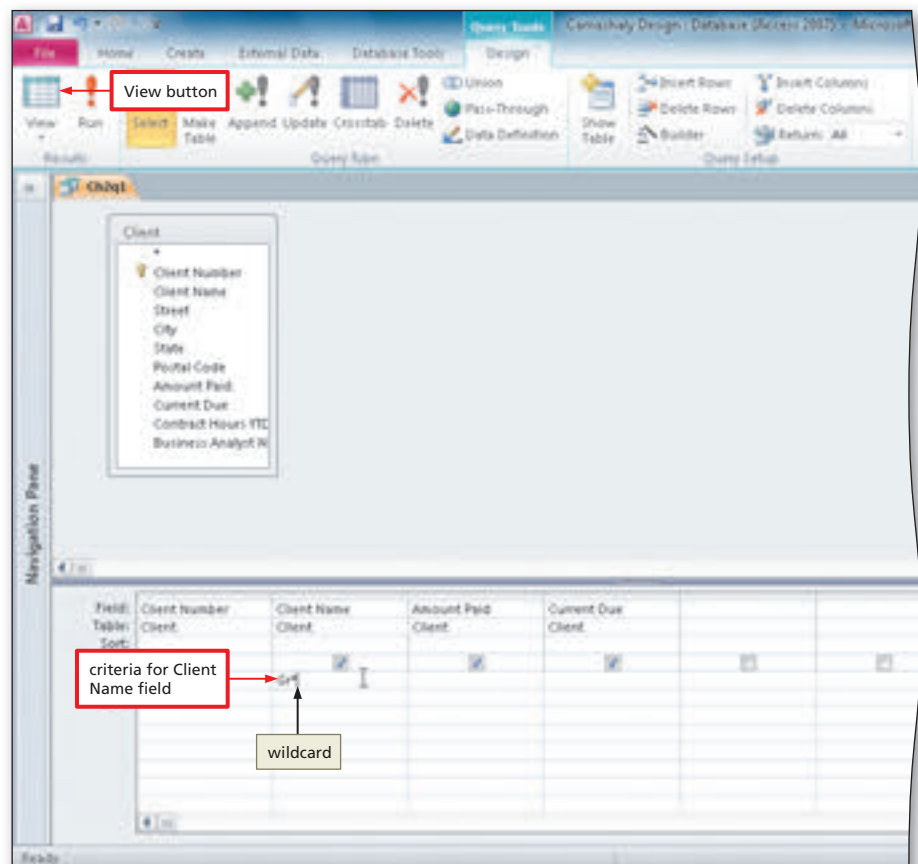- Type **Gr*** as the criterion (Figure 2–9).

Figure 2–9

2

- View the query results by clicking the View button (Query Tools Design tab | Results group) (Figure 2–10).

🔍 **Experiment**

- Vary the case of the letters in the criteria and view the results to determine whether case makes a difference when entering a wildcard.
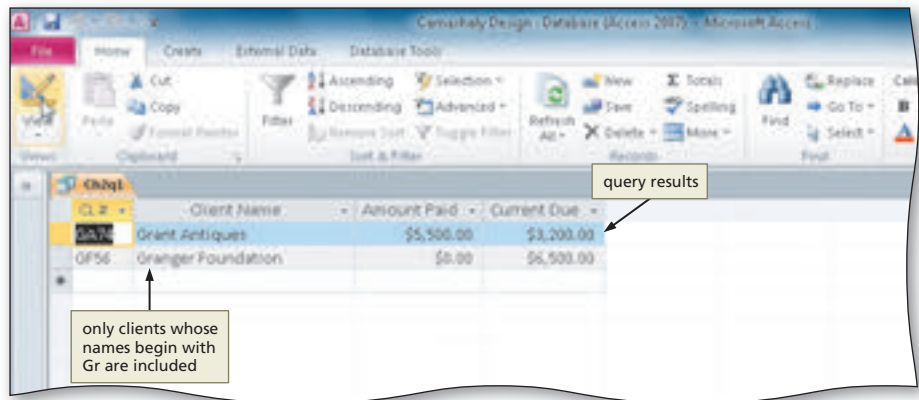

query results

only clients whose names begin with Gr are included

Figure 2–10

3

- Click File on the Ribbon to open the Backstage view (Figure 2–11).

Q&A Why can't I just click the Save button on the Quick Access Toolbar like I did when I saved the previous query?

If you did, you would replace the previous query with the version you just created. Because you want to save both the previous query and the new one, you need to save the new version with a different name. To do so, you must use Save Object As, which is available through the Backstage view.
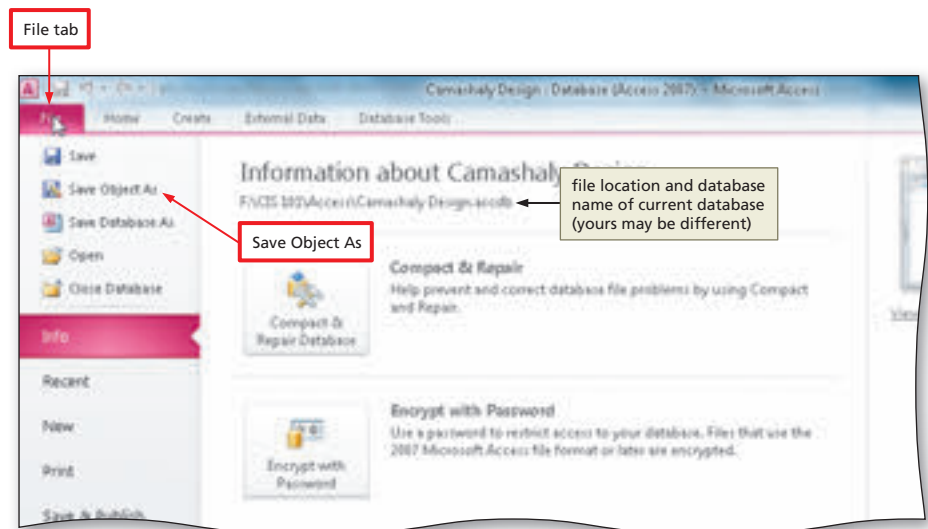

File tab

file location and database name of current database (yours may be different)

Save Object As

Figure 2–11

4

- Click Save Object As in the Backstage view to display the Save As dialog box.

- Type **Ch2q2** as the name for the saved query (Figure 2–12).

Q&A The current entry in the As text box is Query. Could I save the query as some other type of object?

Although you usually would want to save the query as another query, you also can save it as a form or report by changing the entry in the As text box. If you do, Access would create either a simple form or a simple report for the query.
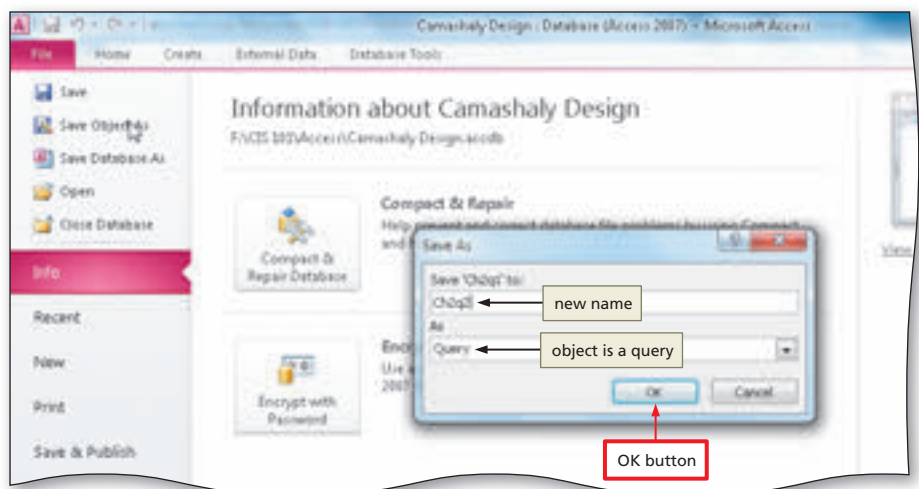

new name

object is a query

OK button

Figure 2–12

5

- Click the OK button (Save As dialog box) to save the query with the new name, and then click File on the Ribbon to close the Backstage view (Figure 2–13).
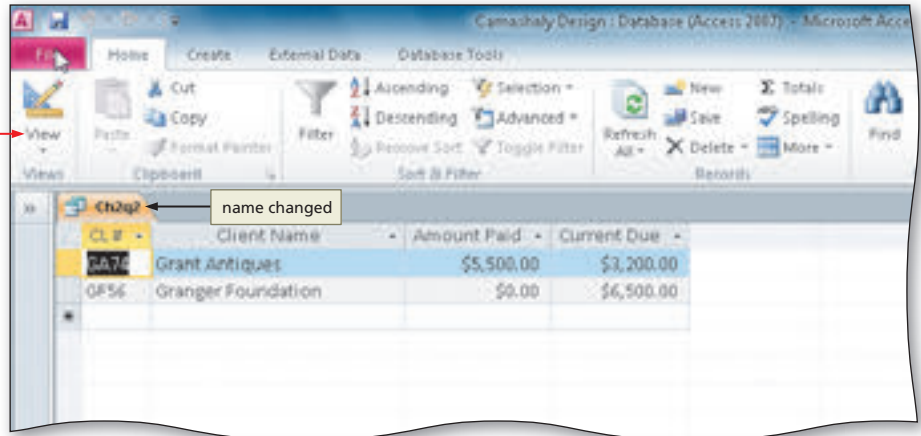
Q&A
How can I tell that the query was saved with the new name?

The new name will appear on the tab.

Figure 2–13

To Use Criteria for a Field Not Included in the Results

In some cases, you might require criteria for a particular field that should not appear in the results of the query. For example, you may want to see the client number, client name, address, and amount paid for all clients located in Georgetown. The criteria involve the City field, but you do not want to include the City field in the results.

To enter a criterion for the City field, it must be included in the design grid. Normally, this also would mean it would appear in the results. To prevent this from happening, remove the check mark from its Show check box in the Show row of the grid.

The following steps modify the previous query so that Camashaly Design can select only those clients located in Georgetown. Camashaly does not want the city to appear in the results, however. The steps also save the query with a new name.

1

- Click the View button (Home tab | Views group), shown in Figure 2–13, to return to Design view.

Q&A
The text I entered is now preceded by the word, Like. What happened?

Criteria including wildcards need to be preceded by the word, Like. You do not have to type the word, Like, however. Access adds it automatically to any criterion involving a wildcard.

- Erase the criterion in the Client Name field.

- Add the City field to the query.

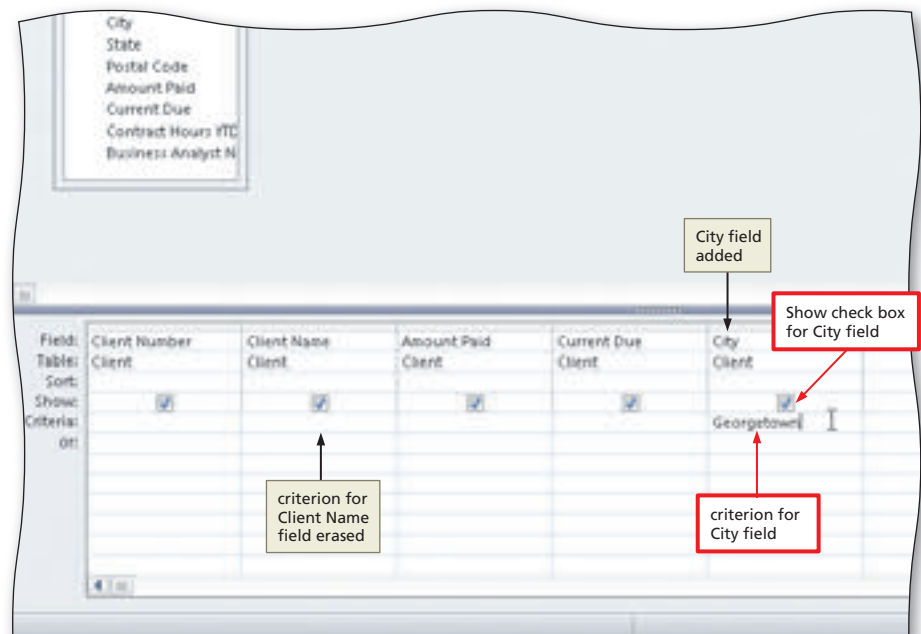- Type **Georgetown** as the criterion for the City field (Figure 2–14).

Figure 2–14

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2

- Click the Show check box for the City field to remove the check mark (Figure 2–15).

Could I have removed the check mark before entering the criterion?

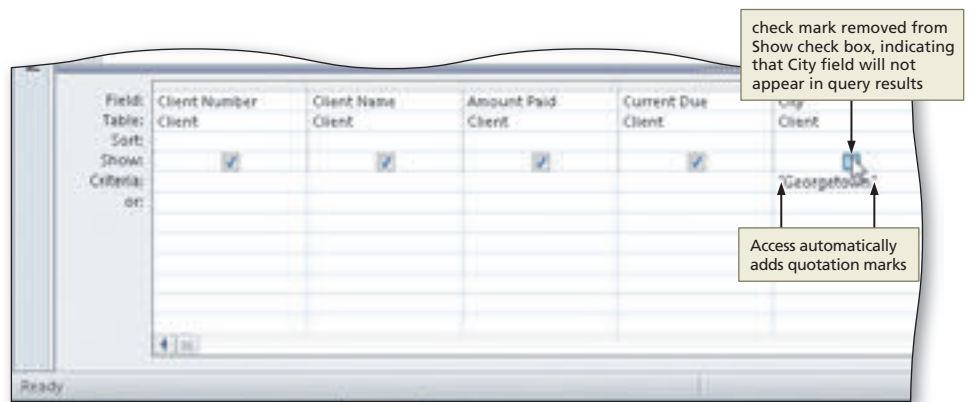Yes. The order in which you perform the two operations does not matter.

Figure 2–15

3

- View the query results (Figure 2–16).

Experiment

- Click the View button to return to Design view, enter a different city name, and view the results. Repeat this process with a variety of city names, including at least one city name that is not in the database. When finished, change the criterion back to Georgetown.
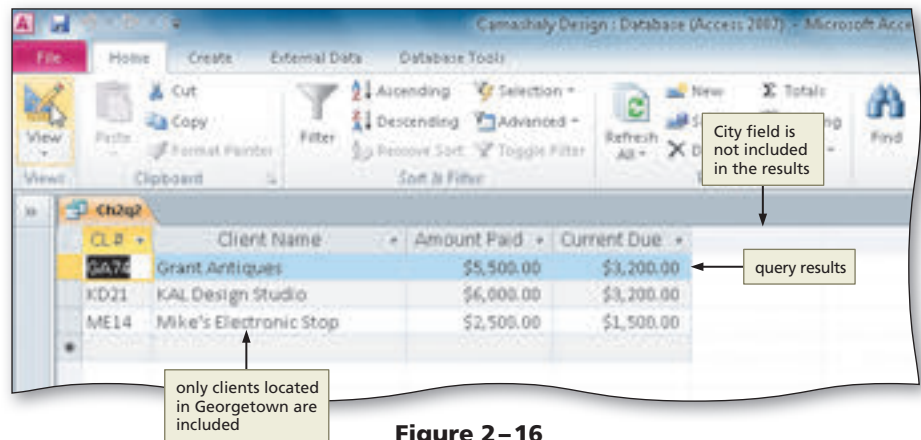

Figure 2–16

4

- Click File on the Ribbon to open the Backstage view.

- Click Save Object As in the Backstage view to display the Save As dialog box.

- Type **Ch2q3** as the name for the saved query.

- Click the OK button (Save As dialog box) to save the query with the new name.

- Click File on the Ribbon to close the Backstage view.

Creating a Parameter Query

Queries: Query-by-Example
Query-By-Example, often referred to as QBE, was a query language first proposed in the mid-1970s. In this approach, users asked questions by filling in a table on the screen. The Access approach to queries is based on Query-By-Example.

If you wanted to find clients located in Kyle instead of Georgetown, you would either have to create a new query or modify the existing query by replacing Georgetown with Kyle as the criterion. Rather than giving a specific criterion when you first create the query, on occasion, you may want to be able to enter part of the criterion when you view the query results and then have the appropriate results appear. For example, to include all the clients located in Kyle, you could enter Kyle as a criterion in the City field. From that point on, every time you ran the query, only the clients in Kyle would appear.

A better way is to allow the user to enter the city at the time the user wants to view the results. Thus, a user could view the query results, enter Kyle as the city, and then see all the clients in Kyle. Later, the user could use the same query but enter Georgetown as the city, and then see all the clients in Georgetown.

To enable this flexibility, you create a **parameter query**, which is a query that prompts for input whenever it is used. You enter a parameter (prompt for the user), rather than a specific value as the criterion. You create one by enclosing a value in a criterion in square brackets. It is important that the value in the brackets does not match the name of any field. If you enter a field name in square brackets, Access assumes you want that particular field and does not prompt the user for input. To prompt the user to enter the city name as the input, you could place [Enter City] as the criterion in the City field.

To Create and View a Parameter Query

The following steps create a parameter query that will prompt the users at Camashaly to enter a city, and then display the client number, name, address, and amount paid for all clients located in that city. The steps also save the query with a new name.

1

- Return to Design view.

- Erase the current criterion in the City column, and then type `[Enter City]` as the new criterion (Figure 2–17).

Q&A What is the purpose of the square brackets?

The square brackets indicate that the text entered is not text that the value in the column must match. Without the brackets, Access would search for records on which the city is Enter City.
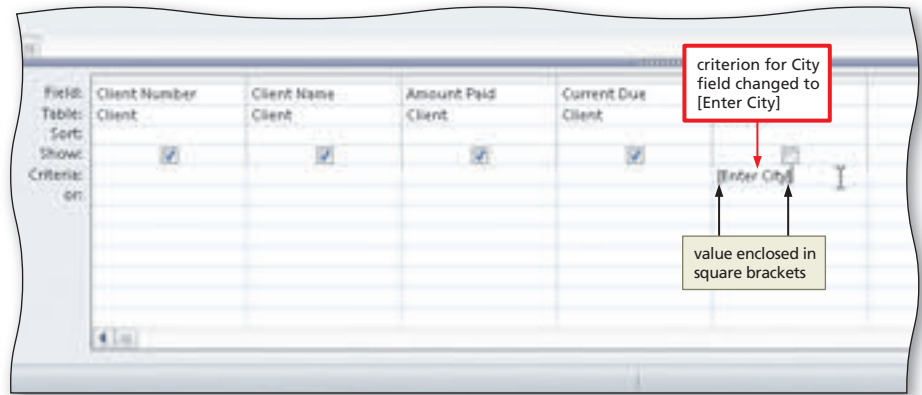

Figure 2–17

Q&A What if I typed a field name in the square brackets?

Access would simply use the value in that field. To create a parameter query, you must not use a field name in the square brackets.

2

- Click the View button (Query Tools Design tab | Results group) to display the Enter Parameter Value dialog box (Figure 2–18).
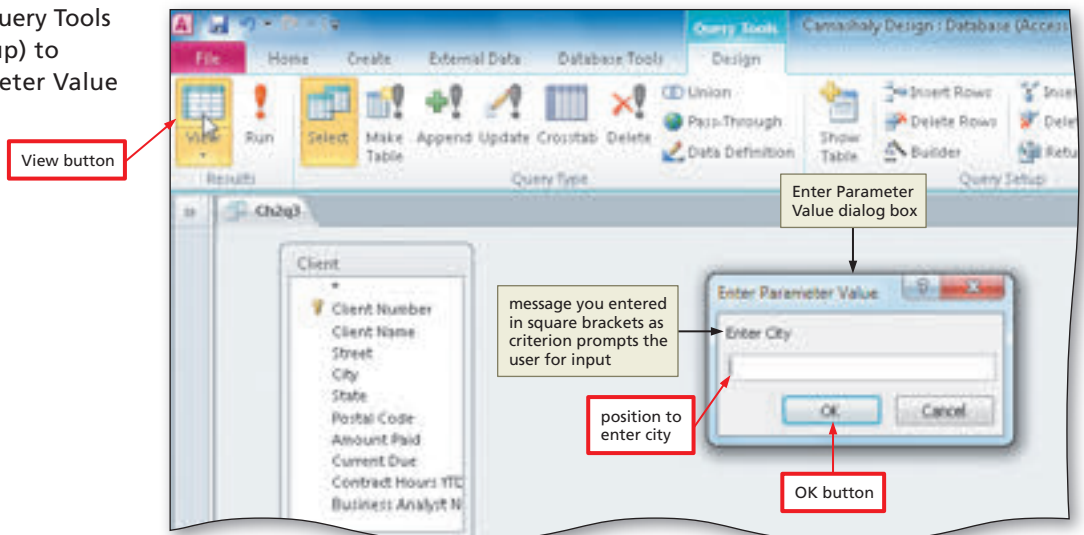

Figure 2–18

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3

- Type **Kyle** as the parameter value in the Enter City text box and then click the OK button (Enter Parameter Value dialog box) to close the dialog box and view the query (Figure 2–19).

Experiment

- Try other characters between the square brackets. In each case, view the results. When finished, change the characters between the square brackets back to Enter City.
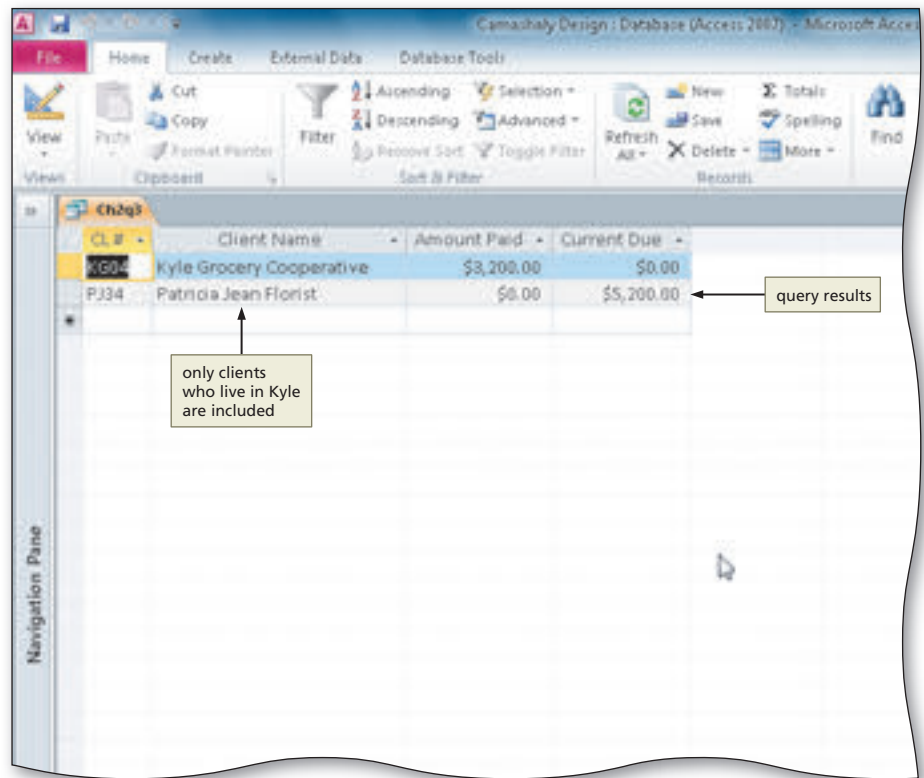

Figure 2–19

4

- Click File on the Ribbon to open the Backstage view.

- Click Save Object As in the Backstage view to display the Save As dialog box.

- Type **Client-City Query** as the name for the saved query.

- Click the OK button (Save As dialog box) to save the query with the new name and then click File on the Ribbon (Figure 2–20).

5

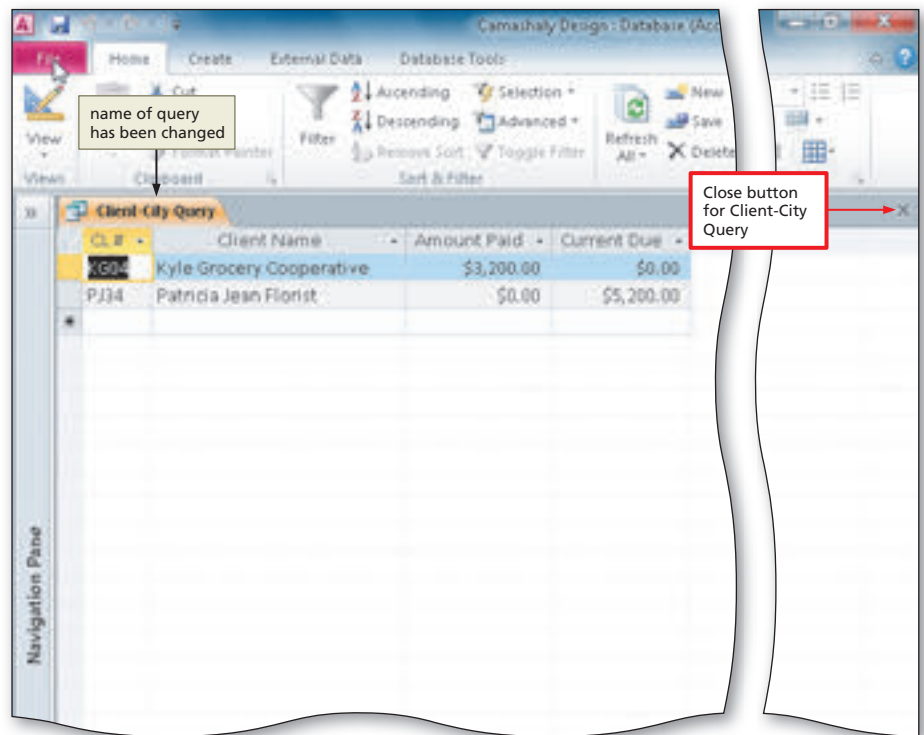- Click the Close button for the Client-City query to close the query.

Figure 2–20

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To Use a Parameter Query

You use a parameter query like any other saved query. You can open it or you can print the query results. In either case, Access prompts you to supply a value for the parameter each time you use the query. As with other queries, the query always uses the data that is currently in the table. Thus, if changes have been made to the data since the last time you ran the query, the results of the query may be different, even if you enter the same value for the parameter. The following steps use the parameter query named Client-City Query.

1

- Open the Navigation Pane.

- Right-click the Client-City Query to produce a shortcut menu.

- Click Open on the shortcut menu to open the query and display the Enter Parameter Value dialog box (Figure 2–21).

Q&A

The title bar for my Navigation Pane contains Tables and Related Views rather than All Access Objects as it did in Chapter 1. What should I do?

Click the Navigation Pane arrow and then click All Access Objects.

Q&A

I do not have the Search bar at the top of the Navigation Pane that I had in Chapter 1. What should I do?

Right-click the Navigation Pane title bar arrow to display a shortcut menu, and then click Search Bar.
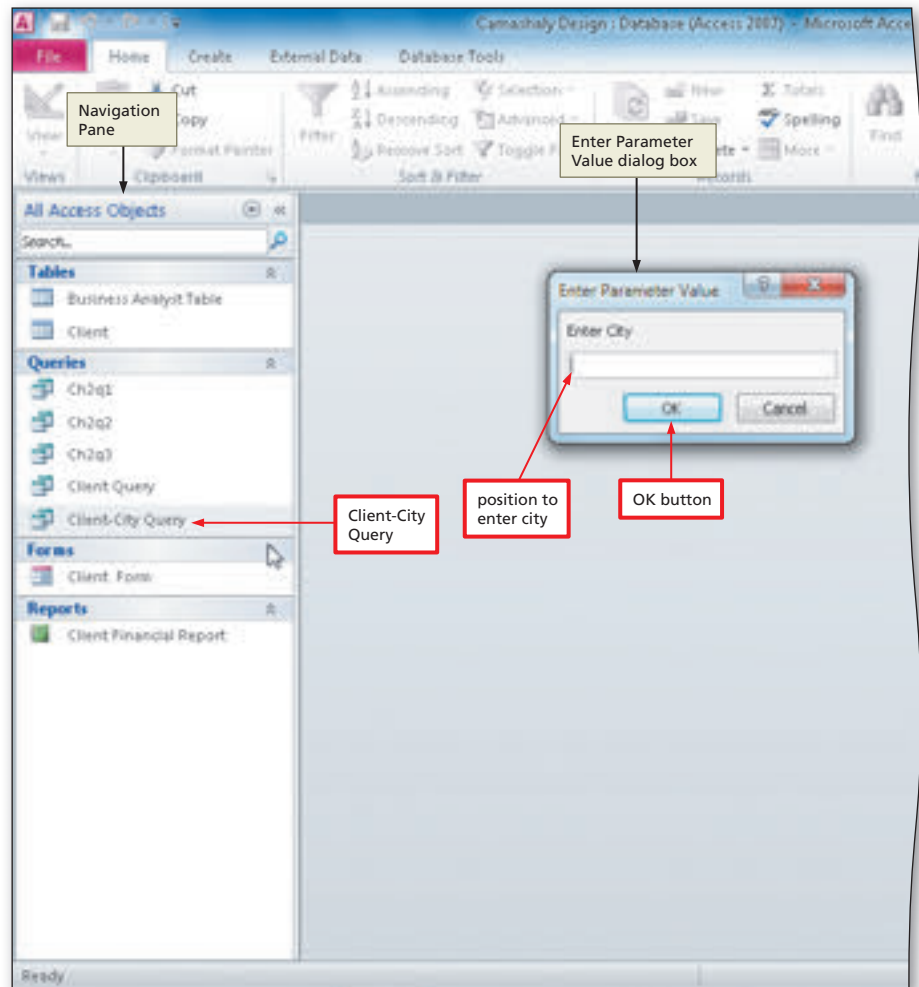

Figure 2–21

2

- Type **Kyle** in the Enter City text box, and then click the OK button (Enter Parameter Value dialog box) to display the results using Kyle as the city, as shown in Figure 2–20.

- Close the query.

To Use a Number in a Criterion

To enter a number in a criterion, type the number without any dollar signs or commas. The following steps create a query that Camashaly Design might use to display all clients whose current due amount is $0. The steps also save the query with a new name.

1

- Close the Navigation Pane.

- Click Create on the Ribbon to display the Create tab.

- Click the Query Design button (Create tab | Queries group) to create a new query.

- Click the Client table (Show Table dialog box) to select the table.

Figure 2–22

- Click the Add button to add the selected table to the query.

- Click the Close button to remove the dialog box from the screen.

- Drag the lower edge of the field list down far enough so all fields in the field list are displayed.

- Include the Client Number, Client Name, Amount Paid, and Current Due fields in the query.

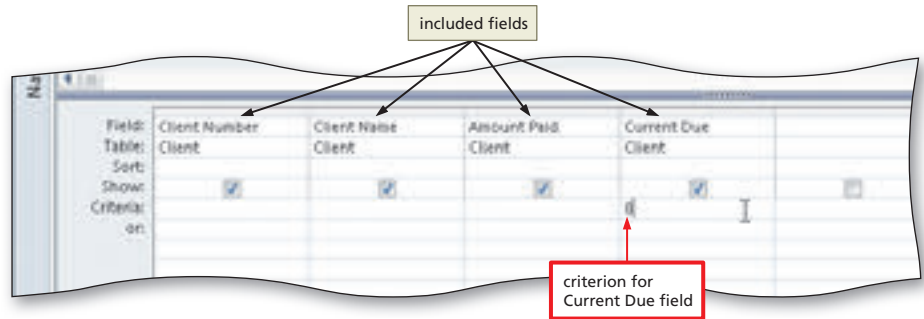- Type 0 as the criterion for the Current Due field (Figure 2–22).

Q&A Do I need to enter a dollar sign and decimal point?

No. Access will interpret 0 as $0 because the data type for the Current Due field is currency.

2

- View the query results (Figure 2–23).

Q&A Why did Access display the results as $0.00 when I only entered 0?

Access uses the format for the field to determine how to display the result. In this case, the format indicated that Access should include the dollar sign, decimal point, and two decimal places.
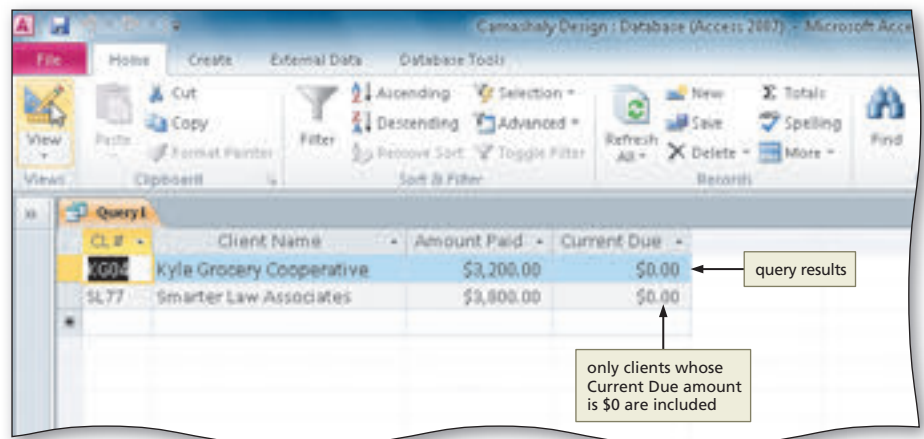
Figure 2–23

3

- Save the query as Ch2q4.

Q&A How do I know when to use the Save button to save a query or use the Backstage view to perform a Save As?

If you are saving a new query, the simplest way is to use the Save button on the Quick Access Toolbar. If you are saving changes to a previously saved query but do not want to change the name, use the Save button. If you want to save a previously saved query with a new name, you must use the Backstage view and perform a Save Object As.

To Use a Comparison Operator in a Criterion

Unless you specify otherwise, Access assumes that the criteria you enter involve equality (exact matches). In the last query, for example, you were requesting those clients whose current due amount is equal to 0 (zero). If you want something other than an exact match, you must enter the appropriate **comparison operator**. The comparison operators are > (greater than), < (less than), >= (greater than or equal to), <= (less than or equal to), and NOT (not equal to).

The following steps use the > operator to create a query that Camashaly Design might use to find all clients whose amount paid is more than $3,000. The steps also save the query with a new name.

1

- Return to Design view.

- Erase the 0 in the Current Due column.

- Type >3000 as the criterion for the Amount Paid field (Figure 2–24).
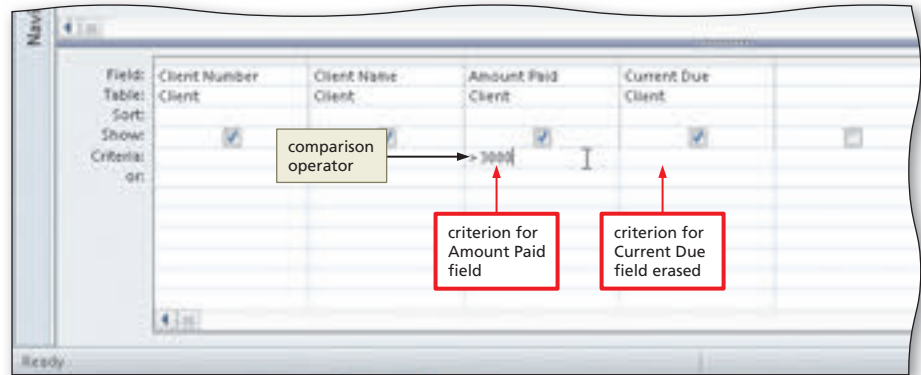

Figure 2–24

2

- View the query results (Figure 2–25).

  Experiment

- Return to Design view. Try a different criterion involving a comparison operator in the Amount Paid field and view the results. When finished, return to Design view, enter the original criterion (>3000) in the Amount Paid field, and view the results.
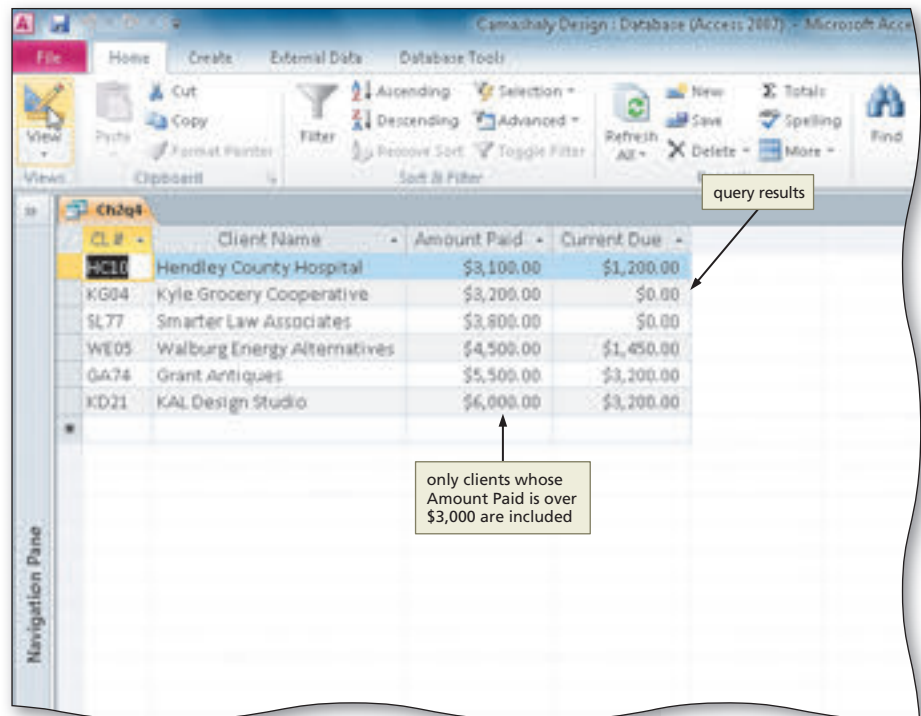
3

- Save the query as Ch2q5.

Figure 2–25

Using Compound Criteria

Often you will have more than one criterion that the data for which you are searching must satisfy. This type of criterion is called a **compound criterion**. Two types of compound criteria exist.

In an **AND criterion**, each individual criterion must be true in order for the compound criterion to be true. For example, an AND criterion would allow you to find those clients that have an amount paid greater than $3,000 and whose business analyst is business analyst 11.

Conversely, an **OR criterion** is true provided either individual criterion is true. An OR criterion would allow you to find those clients that have an amount paid greater than $3,000 and also those clients whose business analyst is business analyst 11 — either one criterion or the other is true. In this case, any client whose amount paid is greater than $3,000 would be included in the answer, regardless of whether the client's business analyst is business analyst 11. Likewise, any client whose business analyst is business analyst 11 would be included, regardless of whether the client had an amount paid greater than $3,000.

To Use a Compound Criterion Involving AND

To combine criteria with AND, place the criteria on the same row of the design grid. The following steps use an AND criterion to enable Camashaly to find those clients whose amount paid is greater than $3,000 and whose business analyst is analyst 11. The steps also save the query with a new name.

1

- Return to Design view.

- Include the Business Analyst Number field in the query.

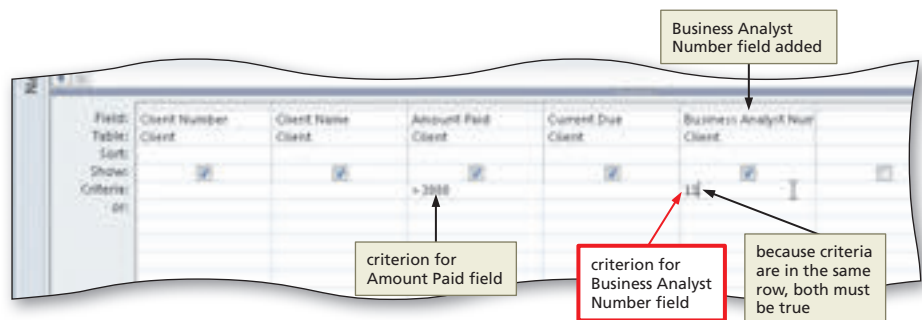- Type 11 as the criterion for the Business Analyst Number field (Figure 2–26).

Figure 2–26

2

- View the query results (Figure 2–27).

3

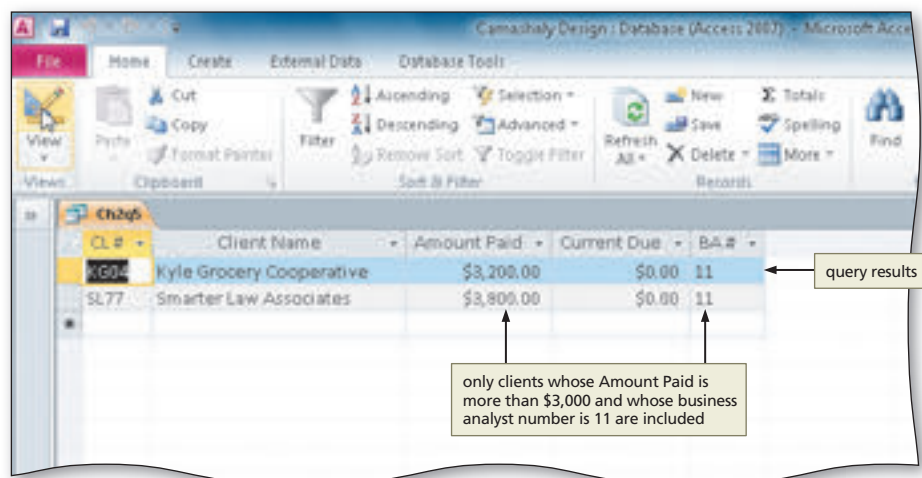- Save the query as Ch2q6.

Figure 2–27

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To Use a Compound Criterion Involving OR

To combine criteria with OR, the criteria must go on separate rows in the Criteria area of the grid. The following steps use an OR criterion to enable Camashaly to find those clients whose amount paid is greater than $3,000 or whose business analyst is analyst 11 (or both). The steps also save the query with a new name.

1

- Return to Design view.

- If necessary, click the Criteria entry for the Business Analyst Number field and then use the BACKSPACE key or the DELETE key to erase the entry ("11").

- Click the or row (the row below the Criteria row) for the Business Analyst Number field and then type 11 as the entry (Figure 2–28).

or row

because criteria are on separate rows, only one needs to be true

criterion for Amount Paid field

criterion for Business Analyst Number field
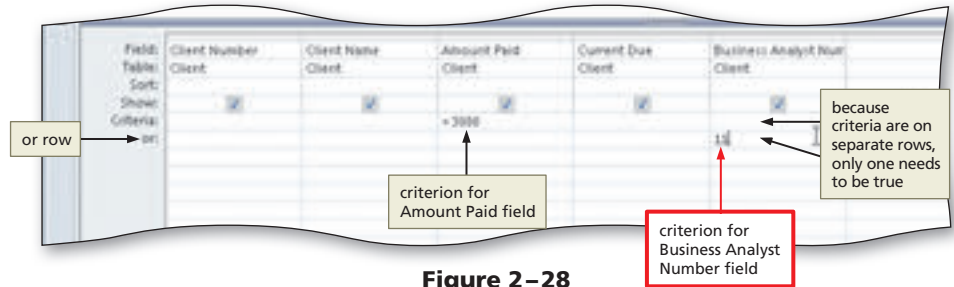
Figure 2–28

2

- View the query results (Figure 2–29).

3

- Save the query as Ch2q7.

only clients whose amount paid is more than $3,000 or whose business analyst number is 11 are included
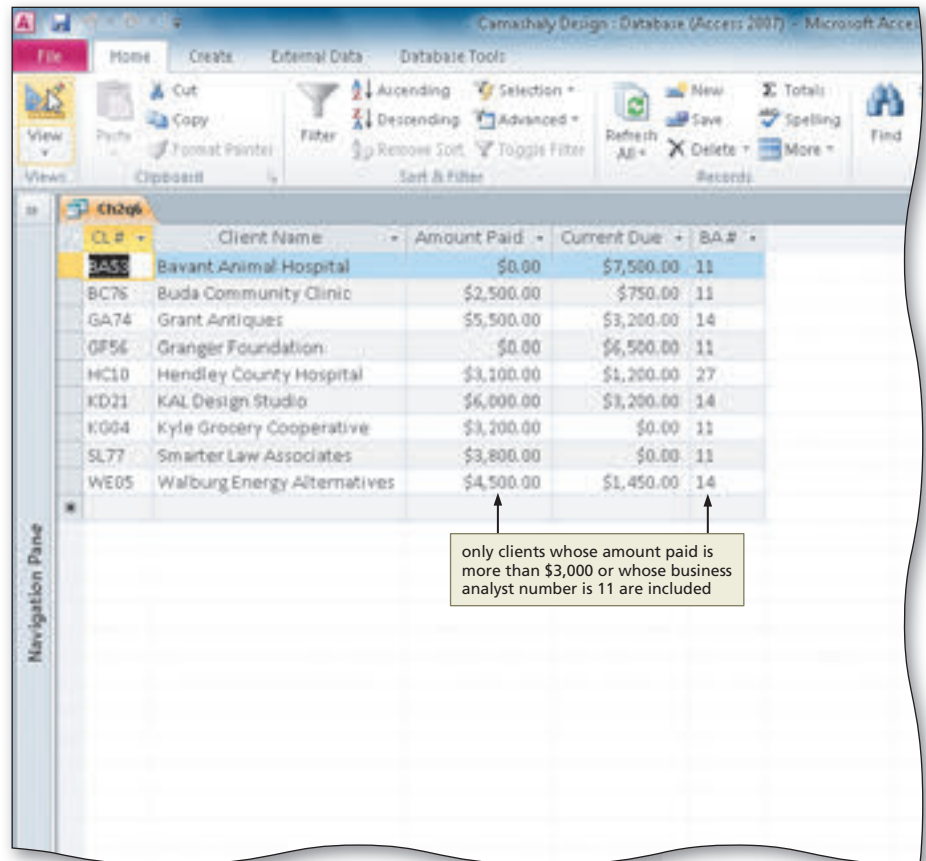
Figure 2–29

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Special Criteria

There are three special criteria you can use in queries:

1. If you want to create a criterion involving a range of values in a single field, you can use the **AND operator**. You place the word AND between the individual conditions. For example, if you wanted to find all clients whose amount paid is >= $1,000 and <= $4,000, you would enter `>= 1000 AND <= 4000` as the criterion in the Amount Paid column.

2. You can select values in a given range by using the **BETWEEN operator**. This is often an alternative to the AND operator. For example, to find all clients whose amount paid is between $1,000 and $4,000, inclusive, you would enter `BETWEEN 1000 AND 4000` as the criterion in the Amount Paid column.

3. You can select values in a list by using the **IN operator**. You follow the word IN with the list of values in parentheses. For example, to find clients whose business analyst number is 11 or 14 using the IN operator, you would enter `IN ("11","14")` as the criterion in the Business Analyst Number column. Unlike when you enter a simple criterion, you must enclose text values in quotation marks.

Sorting

In some queries, the order in which the records appear is irrelevant. All you need to be concerned about are the records that appear in the results. It does not matter which one is first or which one is last.

In other queries, however, the order can be very important. You may want to see the cities in which clients are located and would like them arranged alphabetically. Perhaps you want to see the clients listed by business analyst number. Further, within all the clients of any given business analyst, you might want them to be listed by amount paid from largest amount to smallest.

To order the records in a query result in a particular way, you **sort** the records. The field or fields on which the records are sorted is called the **sort key**. If you are sorting on more than one field (such as sorting by amount paid within business analyst number), the more important field (Business Analyst Number) is called the **major key** (also called the **primary sort key**) and the less important field (Amount Paid) is called the **minor key** (also called the **secondary sort key**).

To sort in Microsoft Access, specify the sort order in the Sort row of the design grid below the field that is the sort key. If you specify more than one sort key, the sort key on the left will be the major sort key, and the one on the right will be the minor key.

The following are guidelines related to sorting in queries.

BTW

Sorting Data in a Query
When sorting data in a query, the records in the underlying tables (the tables on which the query is based) are not actually rearranged. Instead, the DBMS determines the most efficient method of simply displaying the records in the requested order. The records in the underlying tables remain in their original order.

Determine whether special order is required.
Examine the query or request to see if it contains words, such as order or sort, that would imply that the order of the query results is important. If so, you need to sort the query.

- **Determine the sort key(s).** If sorting is required, identify the field or fields on which the results are to be sorted. In the request, look for language such as ordered by or sort the results by, both of which would indicate that the specified field is a sort key.

- **If using two sort keys, determine major and minor key.** If you are using two sort keys, determine which one is the more important, or the major key. Look for language such as sort by amount paid within business analyst number, which implies that the overall order is by business analyst number. Thus, the Business Analyst Number field would be the major sort key and the Amount Paid field would be the minor sort key.

- **Determine sort order.** Words such as increasing, ascending, or low-to-high imply Ascending order. Words such as decreasing, descending, or high-to-low imply Descending order. Sorting in alphabetical order implies Ascending order. If there are no words to imply a particular order, you would typically use Ascending.

- **Determine restrictions.** Examine the query or request to see if there are any special restrictions. One common restriction is to exclude duplicates. Another common restriction is to list only a certain number of records, for example, to list only the first five records.

To Clear the Design Grid

If the fields you want to include in the next query are different from those in the previous query, it is usually simpler to start with a clear grid, one with no fields already in the design grid. You always can clear the entries in the design grid by closing the query and then starting over. A simpler approach to clearing the entries is to select all the entries and then press the DELETE key. The following steps return to Design view and clear the design grid.

1
- Return to Design view.

- Click just above the Client Number column heading in the grid to select the column.

Q&A
I clicked above the column heading, but the column is not selected. What should I do?

You didn't point to the correct location. Be sure the mouse pointer changes into a down-pointing arrow and then click again.

- Hold the SHIFT key down and click just above the Business Analyst Number column heading to select all the columns (Figure 2–30).

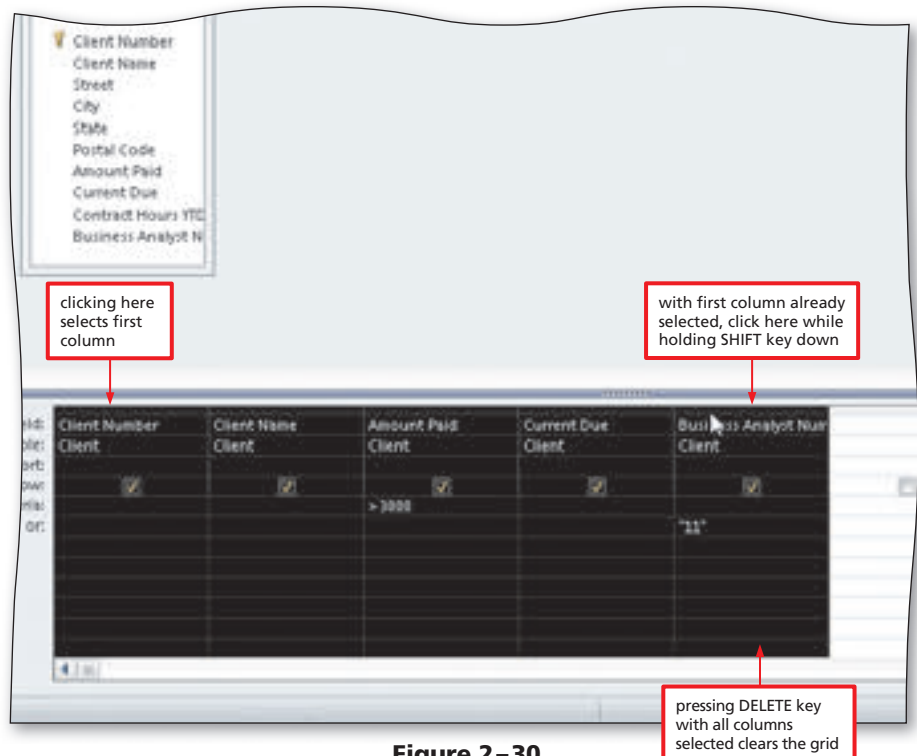**2**
- Press the DELETE key to clear the design grid.

clicking here selects first column

with first column already selected, click here while holding SHIFT key down

pressing DELETE key with all columns selected clears the grid

Figure 2–30

To Sort Data in a Query

After determining in the design process that a query is to be sorted, you will need to specify the sort key to Access. The following steps sort the cities in the Client table by indicating that the City field is to be sorted. The steps specify Ascending sort order.

1
- Include the City field in the design grid.

- Click the Sort row below the City field, and then click the Sort row arrow to display a menu of possible sort orders (Figure 2–31).
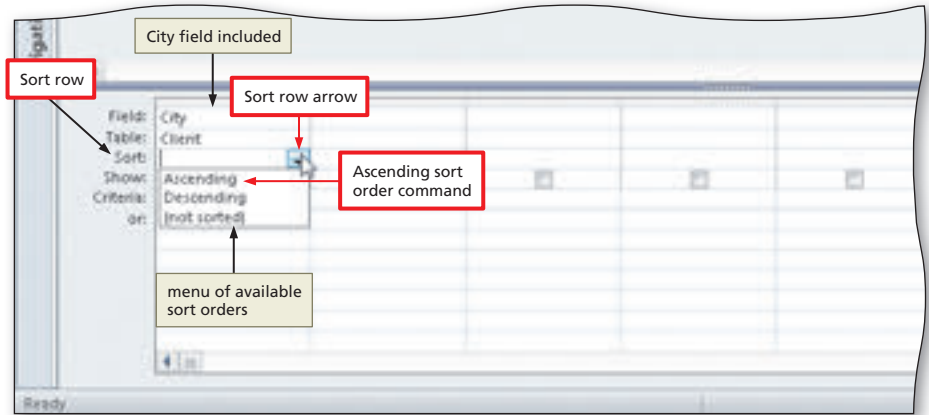
Figure 2–31

2
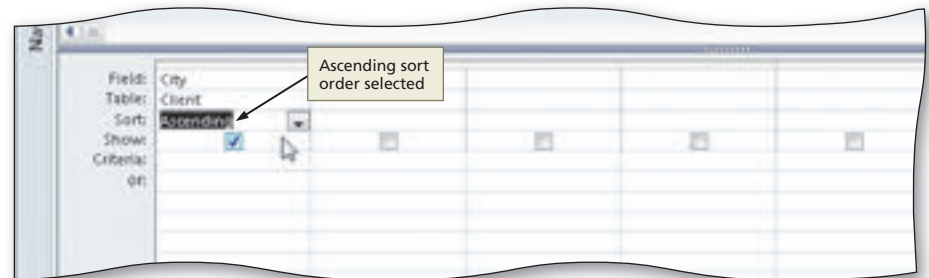- Click Ascending to select the sort order (Figure 2–32).

Figure 2–32

3
- View the query results (Figure 2–33).

Experiment
- Return to Design view and change the sort order to Descending. View the results. Return to Design view and change the sort order back to Ascending. View the results.

Q&A
Why do some cities appear more than once?
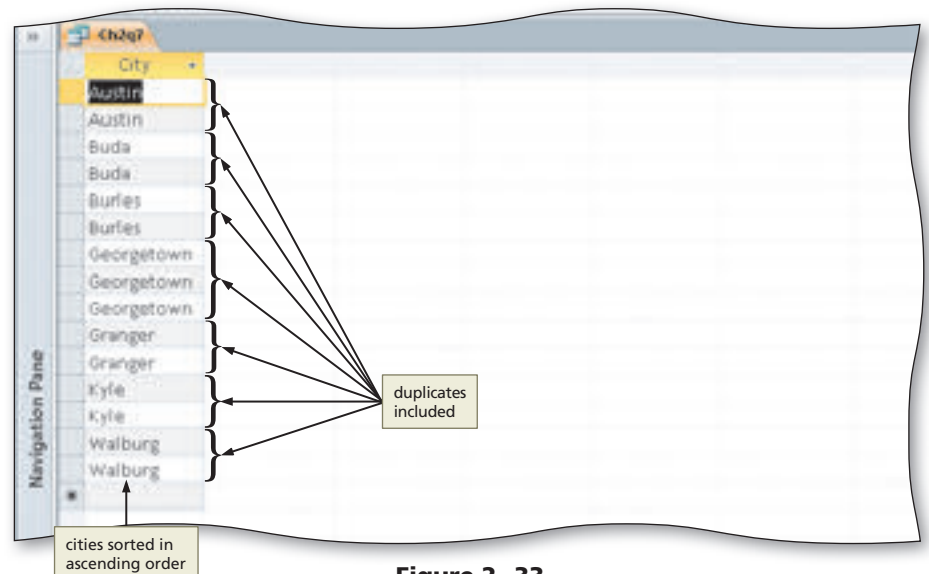
More than one client is located in those cities.

Figure 2–33

To Omit Duplicates

When you sort data, duplicates normally are included. In Figure 2–33, for example, Austin appeared twice, as did Buda, Burles, Granger, Kyle, and Walburg. Georgetown appeared three times. These duplicates do not add any value, so you should eliminate them from the results. To eliminate duplicates, display the query's property sheet. A **property sheet** is a window containing the various properties of the object. To omit duplicates, you will use the property sheet to change the Unique Values property from No to Yes.

The following steps create a query that Camashaly Design might use to obtain a sorted list of the cities in the Client table in which each city is listed only once. The steps also save the query with a new name.

1

- Return to Design view.

- Click the second field (the empty field to the right of City) in the design grid.

- If necessary, click Design on the Ribbon to display the Design tab.

- Click the Property Sheet button (Query Tools Design tab | Show/Hide group) to display the property sheet (Figure 2–34).

Q&A My property sheet looks different. What should I do?

If your sheet looks different, you clicked the wrong place and will have to close the property sheet and repeat this step.
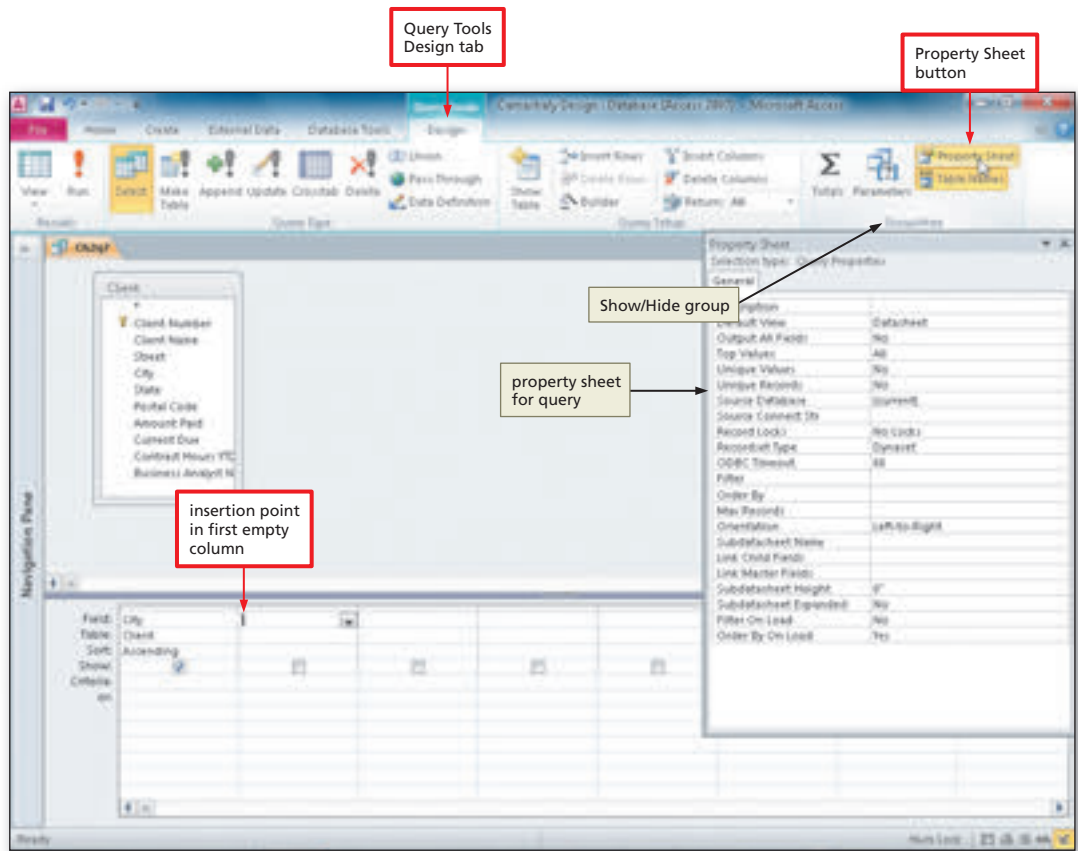

Figure 2–34

2

- Click the Unique Values property box, and then click the arrow that appears to produce a list of available choices (Figure 2–35).
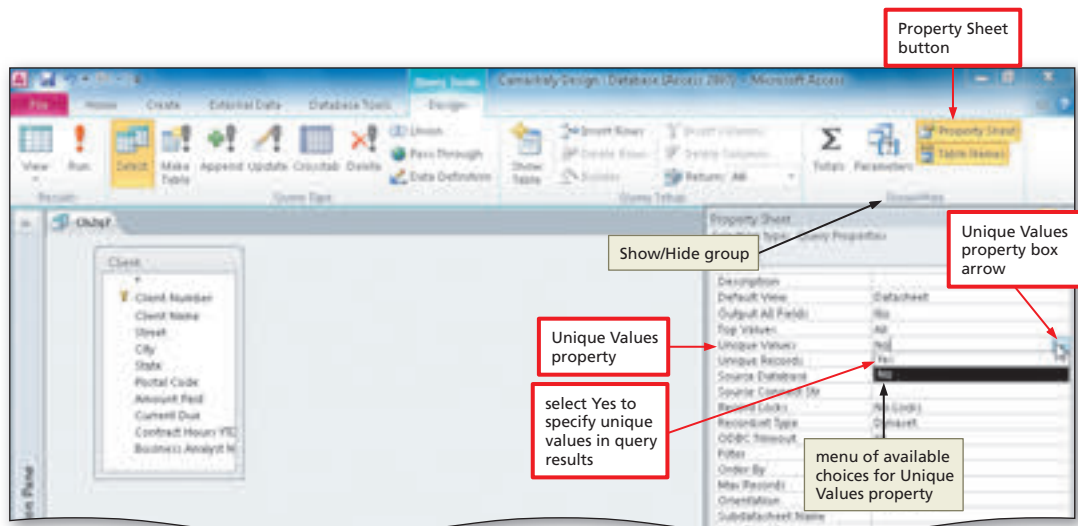

Figure 2–35

3

- Click Yes and then close the Query Properties property sheet by clicking the Property Sheet button (Query Tools Design tab | Show / Hide group) a second time.

- View the query results (Figure 2–36).
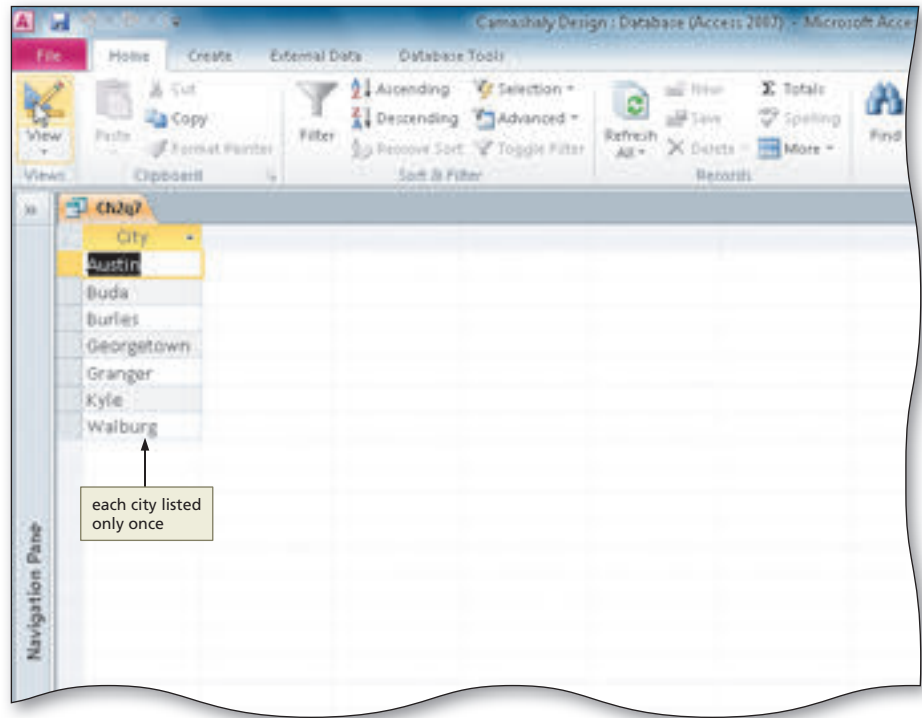
4

- Save the query as Ch2q8.

each city listed only once

Figure 2–36

Other Ways

1. Right-click second field in design grid, click Properties on shortcut menu

To Sort on Multiple Keys

The following steps sort on multiple keys. Specifically, Camashaly needs the data to be sorted by amount paid (low to high) within business analyst number, which means that the Business Analyst Number field is the major key and the Amount Paid field is the minor key. The steps also save the query with a new name.

1

- Return to Design view. Clear the design grid by clicking the first column in the grid, and then pressing the DELETE key to clear the design grid.

- In the following order, include the Client Number, Client Name, Business Analyst Number, and Amount Paid fields in the query.

- Select Ascending as the sort order for both the Business Analyst Number field and the Amount Paid field (Figure 2–37).
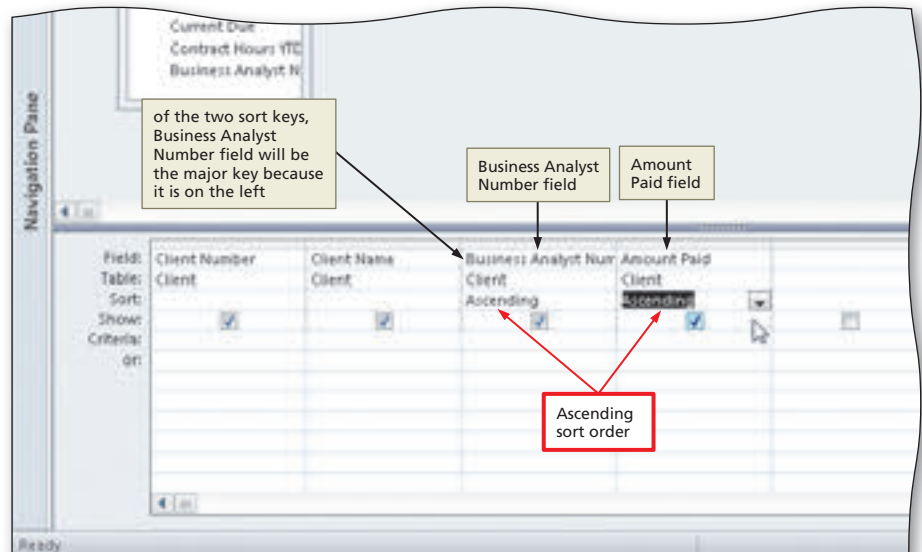

of the two sort keys, Business Analyst Number field will be the major key because it is on the left

Business Analyst Number field

Amount Paid field

Ascending sort order

Figure 2–37

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2

• View the query results (Figure 2–38).

🔍 **Experiment**

• Return to Design view and try other sort combinations for the Business Analyst Number and Amount Paid fields, such as Ascending for Business Analyst Number and Descending for Amount Paid. In each case, view the results to see the effect of the changes. When finished, select Ascending as the sort order for both fields.

Q&A What if the Amount Paid field is to the left of the Business Analyst Number field?

It is important to remember that the major sort key must appear to the left of the minor sort key in the design grid. If you attempted to sort by amount paid within business analyst number, but placed the Amount Paid field to the left of the Business Analyst Number field, your results would be incorrect.
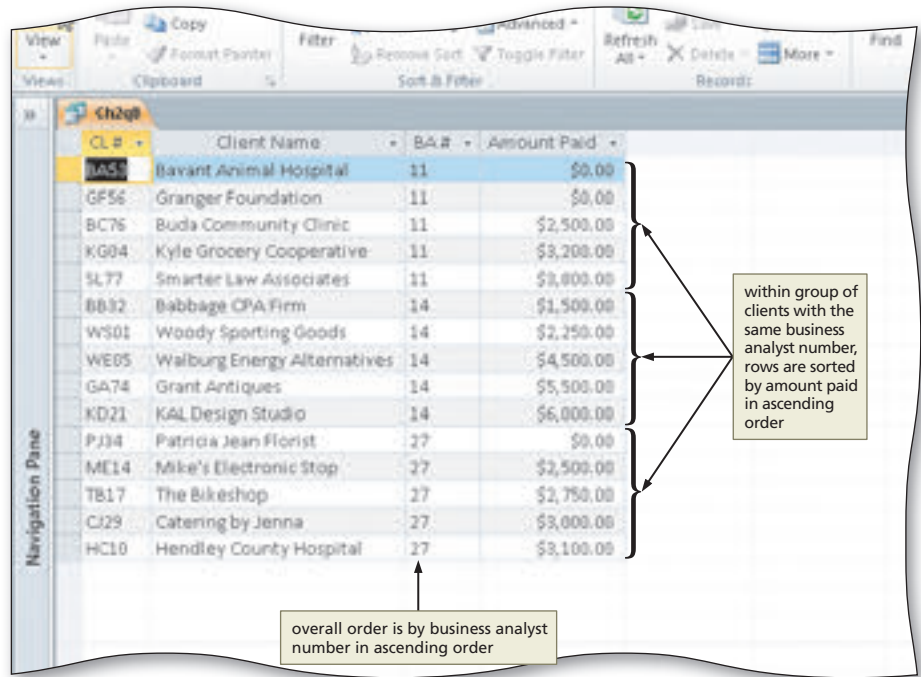

within group of clients with the same business analyst number, rows are sorted by amount paid in ascending order

overall order is by business analyst number in ascending order

Figure 2–38

3

• Save the query as Ch2q9.

To Create a Top-Values Query

Rather than show all the results of a query, you may want to show only a specified number of records or a percentage of records. Creating a **top-values query** allows you to quantify the results. When you sort records, you can limit results to those records having the highest (descending sort) or lowest (ascending sort) values. To do so, first create a query that sorts the data in the desired order. Next, use the Return box on the Design tab to change the number of records to be included from All to the desired number or percentage. The following steps create a query for Camashaly Design that shows only the first five records that were included in the results of the previous query. The steps also save the resulting query with a new name.

1

• Return to Design view.

• If necessary, click Design on the Ribbon to display the Design tab.

• Click the Return box arrow (Query Tools Design tab | Query Setup group) to display the Return box menu (Figure 2–39).
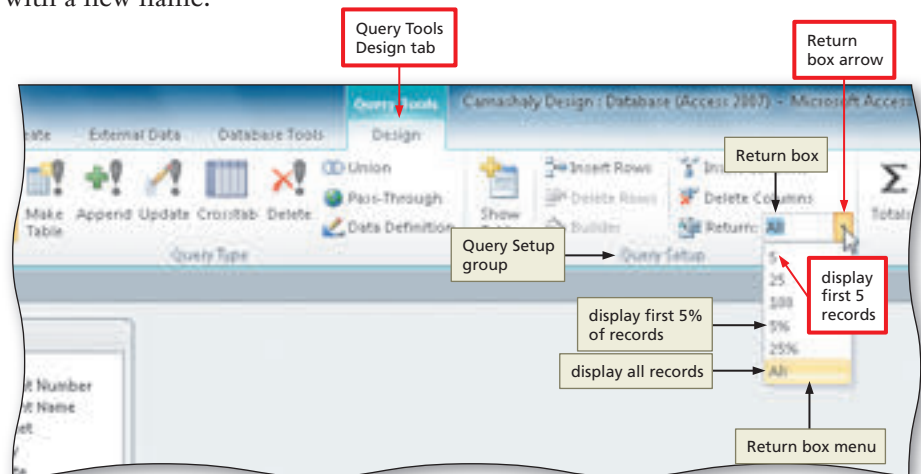

Query Tools Design tab

Return box arrow

Return box

Query Setup group

display first 5% of records

display first 5 records

display all records

Return box menu

Figure 2–39

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2

- Click 5 in the Return box menu to specify that the query results should contain the first five rows.

Could I have typed the 5? What about other numbers that do not appear in the list?

Yes, you could have typed the 5. For numbers not appearing in the list, you must type the number.

- View the query results (Figure 2–40).

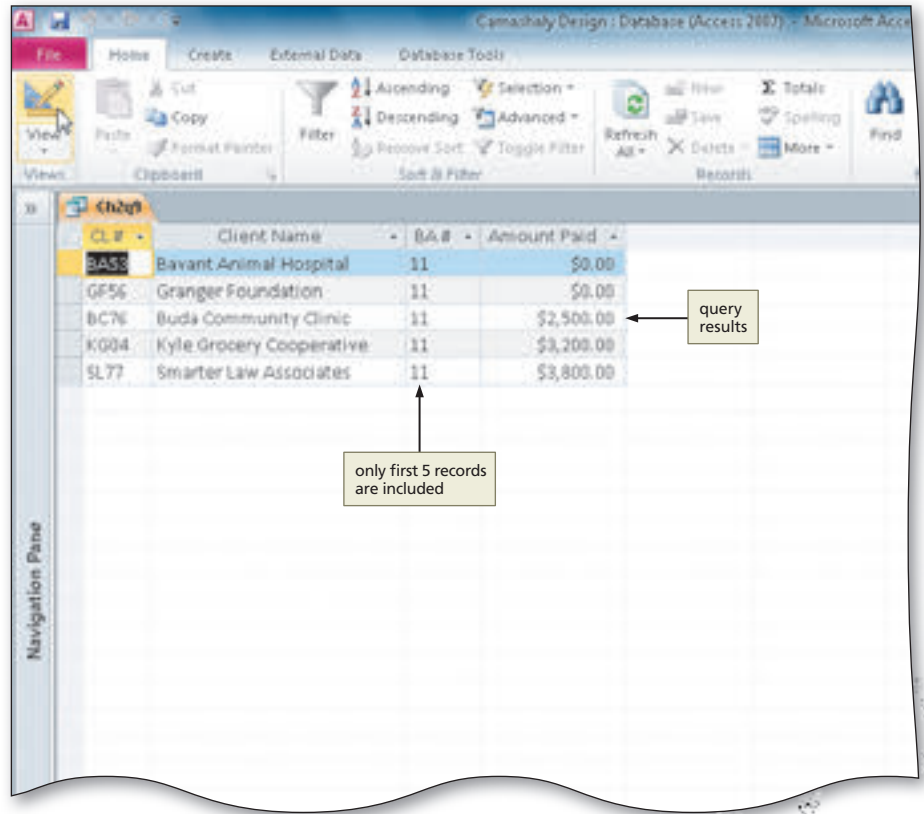**3**

- Save the query as Ch2q10.

- Close the query.

Figure 2–40

Do I need to close the query before creating my next query?

Not necessarily. When you use a top-values query, however, it is important to change the value in the Return box back to All. If you do not change the Return value back to All, the previous value will remain in effect. Consequently, you might not get all the records you should in the next query. A good practice whenever you use a top-values query is to close the query as soon as you are done. That way, you will begin your next query from scratch, which guarantees that the value is reset to All.

Break Point: If you wish to take a break, this is a good place to do so. You can quit Access now. To resume at a later time, start Access, open the database called Camashaly Design, and continue following the steps from this location forward.

Join Line
If you do not get a join line automatically, there may be a problem with one of your table designs. Open each table in Design view and make sure that the data types are the same for the matching field in both tables and that one of the matching fields is the primary key in a table. Correct these errors and create the query again.

Joining Tables

In designing a query, you need to determine whether more than one table is required. If the question being asked involves data from both the Client and Business Analyst tables, for example, both tables are required for the query. For example, a query may require listing the number and name of each client along with the number and name of the client's business analyst. The client's name is in the Client table, whereas the business analyst's name is in the Business Analyst Table. Thus, this query cannot be completed using a single table; both the Client and Business Analyst tables are required. You need to **join** the tables; that is, to find records in the two tables that have identical

values in matching fields (Figure 2–41). In this example, you need to find records in the Client table and the Business Analyst table that have the same value in the Business Analyst Number fields.
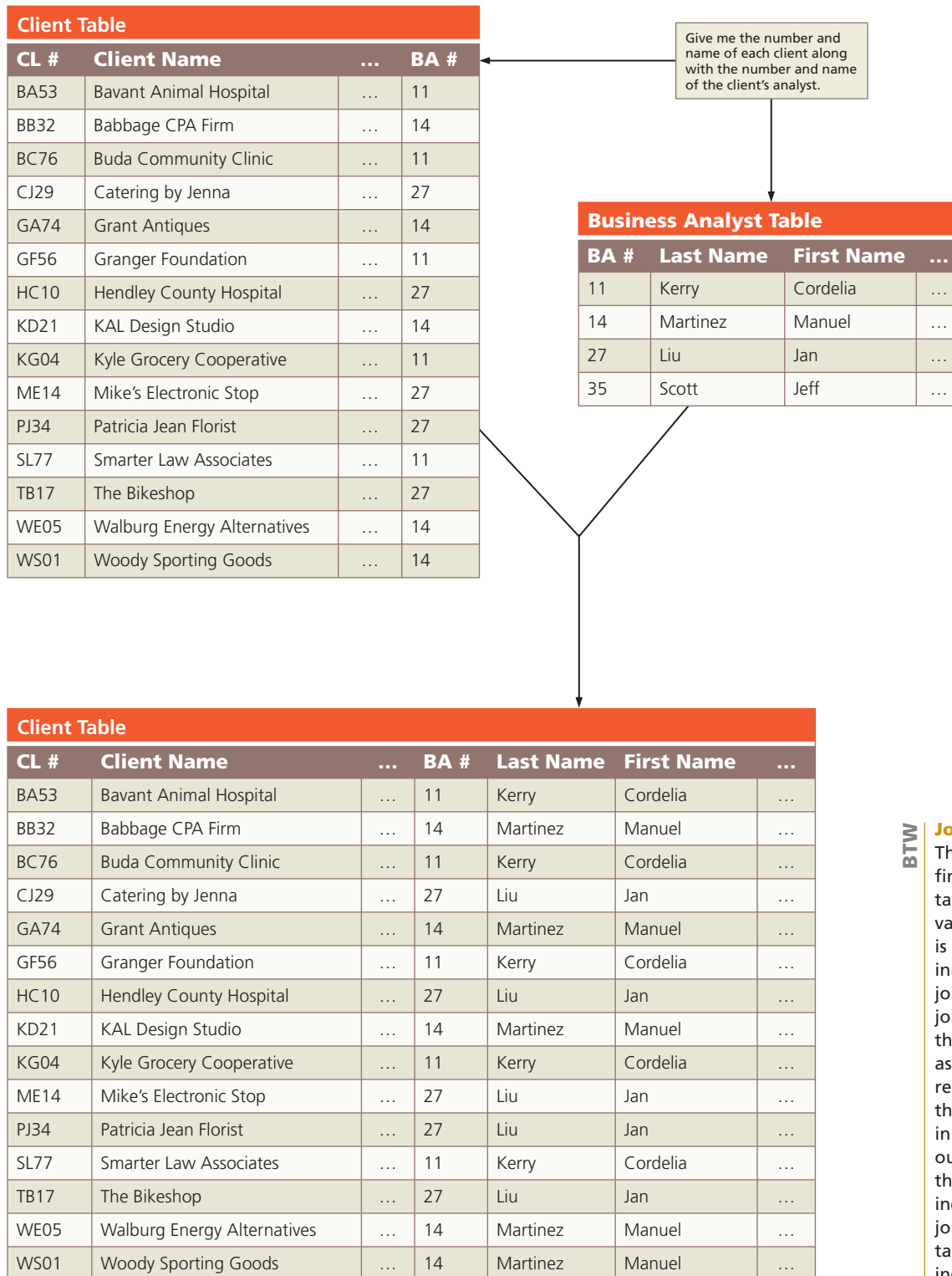
Client Table

CL #	Client Name	...	BA #
BA53	Bavant Animal Hospital	...	11
BB32	Babbage CPA Firm	...	14
BC76	Buda Community Clinic	...	11
CJ29	Catering by Jenna	...	27
GA74	Grant Antiques	...	14
GF56	Granger Foundation	...	11
HC10	Hendley County Hospital	...	27
KD21	KAL Design Studio	...	14
KG04	Kyle Grocery Cooperative	...	11
ME14	Mike's Electronic Stop	...	27
PJ34	Patricia Jean Florist	...	27
SL77	Smarter Law Associates	...	11
TB17	The Bikeshop	...	27
WE05	Walburg Energy Alternatives	...	14
WS01	Woody Sporting Goods	...	14

Give me the number and name of each client along with the number and name of the client's analyst.

Business Analyst Table

BA #	Last Name	First Name	...
11	Kerry	Cordelia	...
14	Martinez	Manuel	...
27	Liu	Jan	...
35	Scott	Jeff	...

Client Table

CL #	Client Name	...	BA #	Last Name	First Name	...
BA53	Bavant Animal Hospital	...	11	Kerry	Cordelia	...
BB32	Babbage CPA Firm	...	14	Martinez	Manuel	...
BC76	Buda Community Clinic	...	11	Kerry	Cordelia	...
CJ29	Catering by Jenna	...	27	Liu	Jan	...
GA74	Grant Antiques	...	14	Martinez	Manuel	...
GF56	Granger Foundation	...	11	Kerry	Cordelia	...
HC10	Hendley County Hospital	...	27	Liu	Jan	...
KD21	KAL Design Studio	...	14	Martinez	Manuel	...
KG04	Kyle Grocery Cooperative	...	11	Kerry	Cordelia	...
ME14	Mike's Electronic Stop	...	27	Liu	Jan	...
PJ34	Patricia Jean Florist	...	27	Liu	Jan	...
SL77	Smarter Law Associates	...	11	Kerry	Cordelia	...
TB17	The Bikeshop	...	27	Liu	Jan	...
WE05	Walburg Energy Alternatives	...	14	Martinez	Manuel	...
WS01	Woody Sporting Goods	...	14	Martinez	Manuel	...

Figure 2–41

BTW

Join Types
The type of join that finds records from both tables that have identical values in matching fields is called an inner join. An inner join is the default join in Access. Outer joins are used to show all the records in one table as well as the common records; that is, the records that share the same value in the join field. In a left outer join, all rows from the table on the left are included. In a right outer join, all rows from the table on the right are included.

The following are guidelines related to joining tables.

Plan Ahead

> **Determine whether more than one table is required.**
> Examine the query or request to see if all the fields involved in the request are in one table. If the fields are in two (or more) tables, you need to join the tables.
>
> • **Determine the matching fields.** If joining is required, identify the matching fields in the two tables that have identical values. Look for the same column name in the two tables or for column names that are similar.
>
> • **Determine whether sorting is required.** Queries that join tables often are used as the basis for a report. If this is the case, it may be necessary to sort the results. For example, the Analyst-Client Report is based on a query that joins the Business Analyst and Client tables. The query is sorted by business analyst number and client number.
>
> • **Determine restrictions.** Examine the query or request to see if there are any special restrictions. For example, the user may only want clients whose current due amount is $0.00.
>
> • **Determine join properties.** Examine the query or request to see if you only want records from both tables that have identical values in matching fields. If you want to see records in one of the tables that do not have identical values, then you need to change the join properties.

To Join Tables

If you have determined in the design process that you need to join tables, you will first bring field lists for both tables to the upper pane of the Query window while working in Design view. Access will draw a line, called a **join line**, between matching fields in the two tables, indicating that the tables are related. You then can select fields from either table. Access joins the tables automatically.

The first step is to create a new query and add the Business Analyst Table to the query. Then, add the Client table to the query. A join line will appear, connecting the Business Analyst Number fields in the two field lists. This join line indicates how the tables are related, that is, linked through these matching fields. If the names of the matching fields differ from one table to the other, Access will not insert the line. You can insert it manually, however, by clicking one of the two matching fields and dragging the mouse pointer to the other matching field.

The following steps create a query that Camashaly Design might use to display information from both the Client table and the Business Analyst Table.

1
• Click Create on the Ribbon to display the Create tab.

• Click the Query Design button (Create tab | Queries group) to create a new query.

• If necessary, click the Business Analyst Table (Show Table dialog box) to select the table.

• Click the Add button (Show Table dialog box) to add a field list for the Business Analyst Table to the query (Figure 2–42).
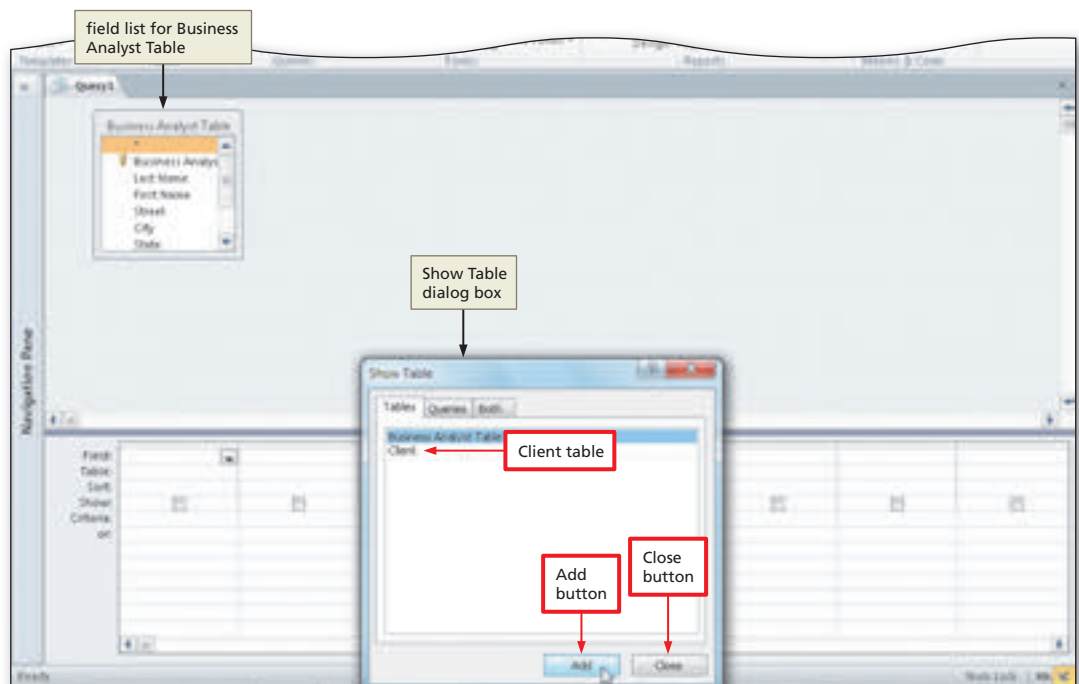

Figure 2–42

2

- Click the Client table (Show Table dialog box).

- Click the Add button (Show Table dialog box) to add a field list for the Client table.

- Close the Show Table dialog box by clicking the Close button.

- Expand the size of the two field lists so all the fields in the Business Analyst and Client tables appear (Figure 2–43).

Q&A

I didn't get a join line. What should I do?

Ensure that the names of the matching fields are exactly the same, the data types are the same, and the matching field is the primary key in one of the two tables. If all of these are true and you still don't have a join line, you can produce one by pointing to one of the matching fields, pressing the left mouse button, dragging to the other matching field, and releasing the left mouse button.
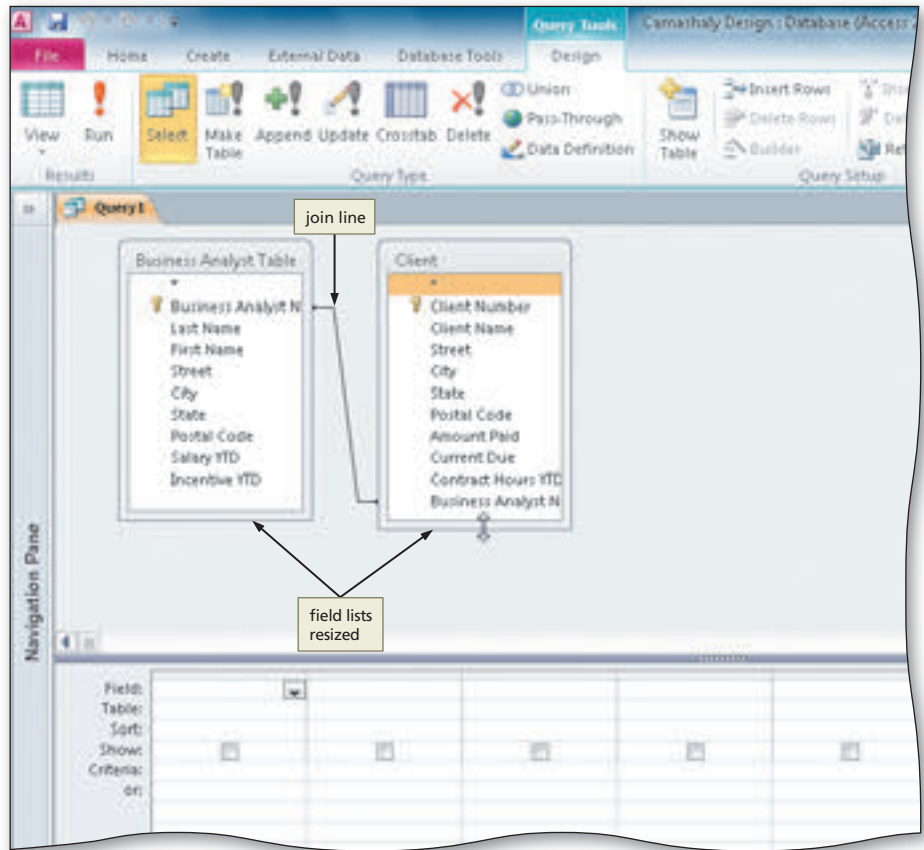
Figure 2–43

3

- In the design grid, include the Business Analyst Number, Last Name, and First Name fields from the Business Analyst Table as well as the Client Number and Client Name fields from the Client table.

- Select Ascending as the sort order for both the Business Analyst Number field and the Client Number field (Figure 2–44).

Figure 2–44

Property of Cengage Learning

4
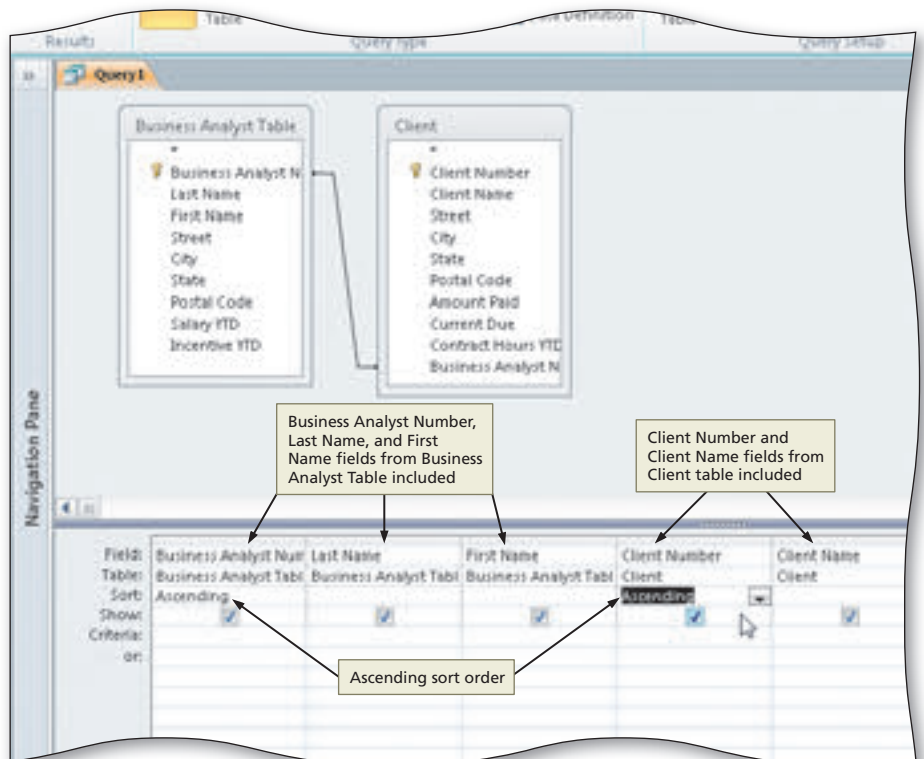
- View the query results (Figure 2–45).
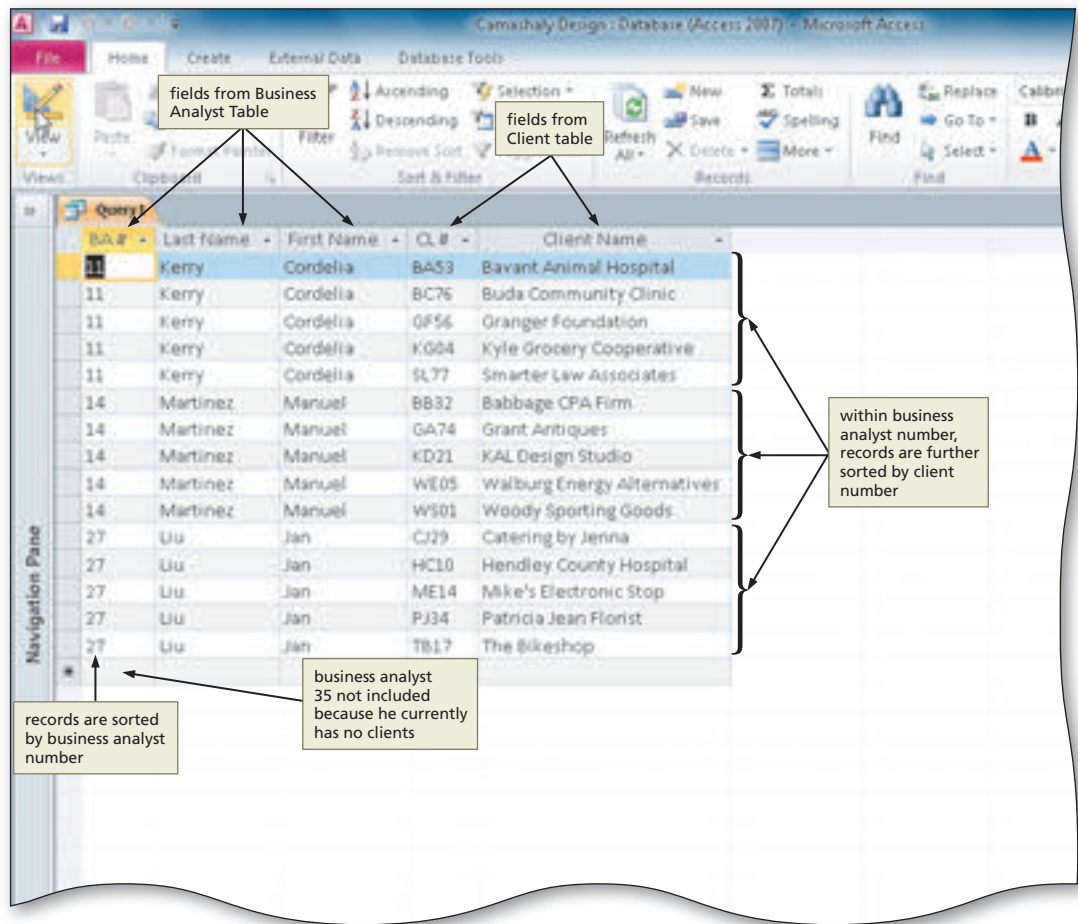
Figure 2–45

5

- Click the Save button on the Quick Access Toolbar to display the Save As dialog box.

- Type **Analyst-Client Query** as the query name (Figure 2–46).

6

- Click the OK button (Save As dialog box) to save the query.
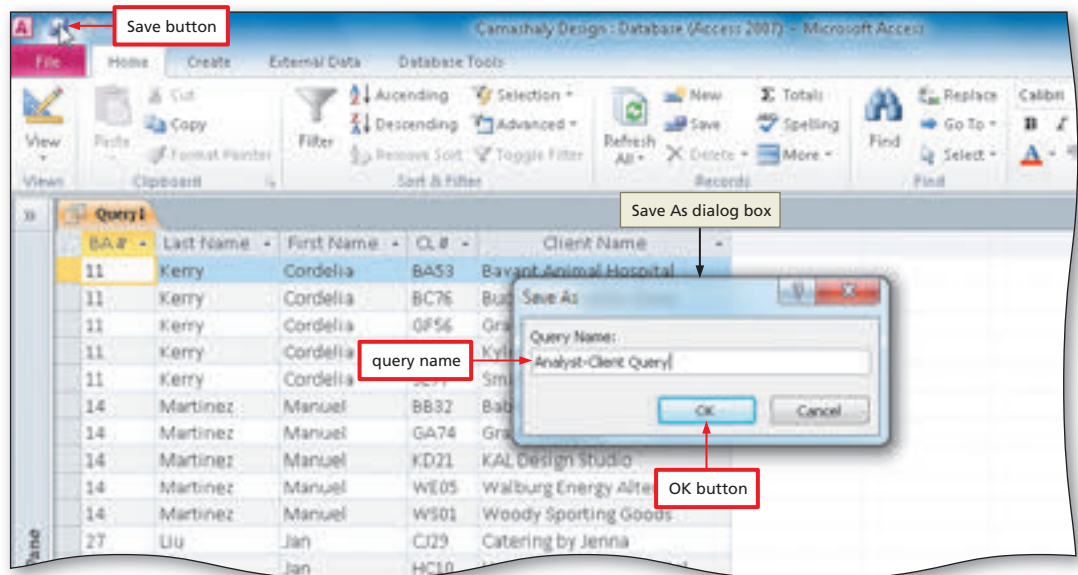
Figure 2–46

To Change Join Properties

Normally, records that do not match do not appear in the results of a join query. For example, a business analyst such as Jeff Scott, for whom no clients currently exist, would not appear in the results. To cause such a record to be displayed, you need to change the **join properties**, which are the properties that indicate which records appear in a join. The following steps change the join properties of the Analyst-Client Query so that Camashaly can include all business analysts in the results, rather than only those analysts who have already been assigned clients.

❶

• Return to Design view.

• Right-click the join line to produce a shortcut menu (Figure 2–47).

Q&A

I don't see Join Properties on my shortcut menu. What should I do?

If Join Properties does not appear on your shortcut menu, you did not point to the appropriate portion of the join line. You will need to point to the correct (middle) portion and right-click again.

Figure 2–47

❷
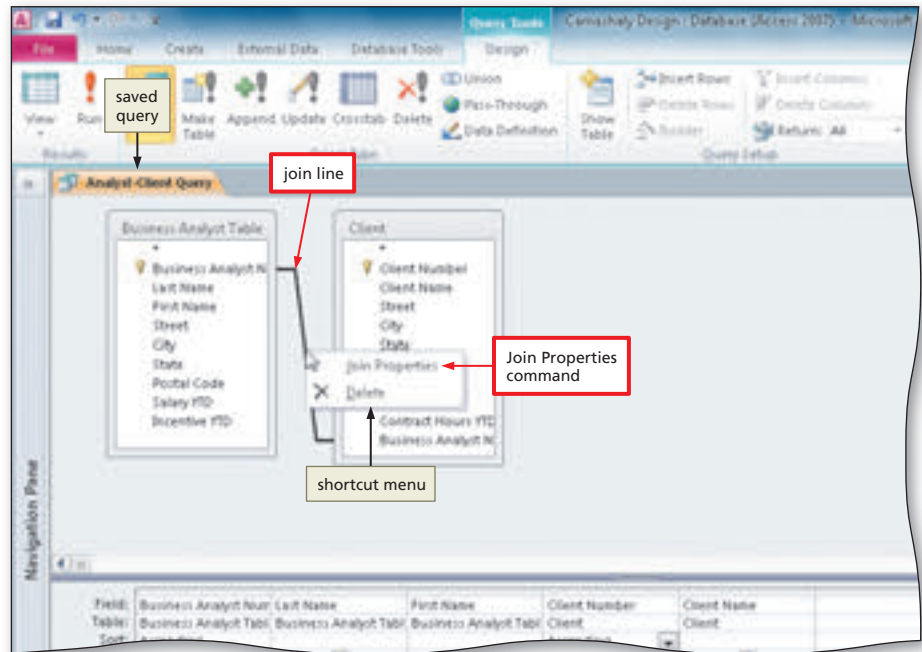
• Click Join Properties on the shortcut menu to display the Join Properties dialog box (Figure 2–48).
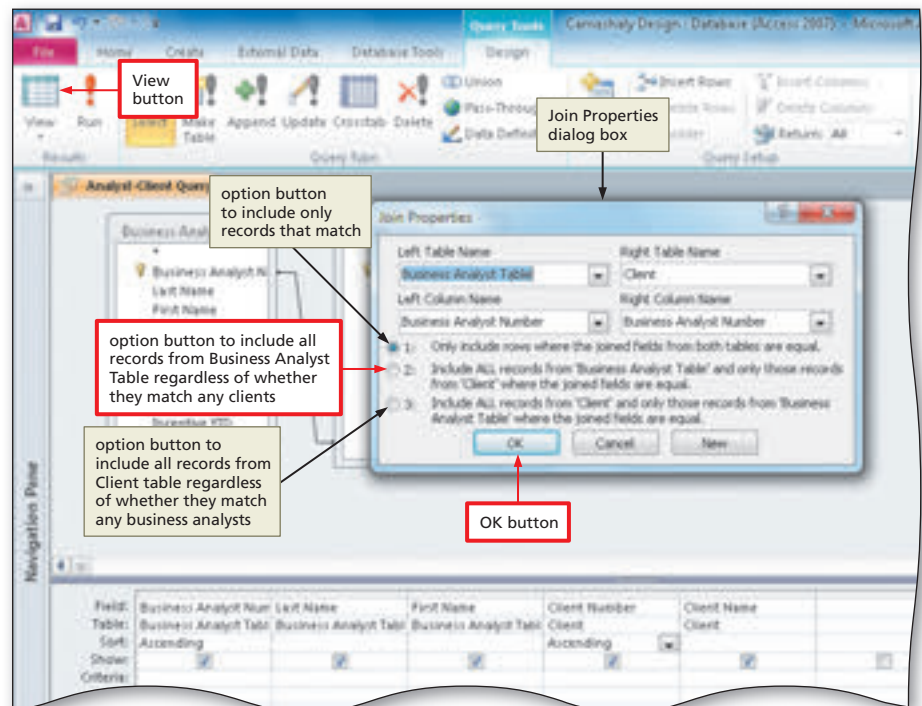
Figure 2–48

3

- Click option button 2 (Join Properties dialog box) to include all records from the Business Analyst Table regardless of whether they match any clients.

- Click the OK button (Join Properties dialog box) to modify the join properties.

- View the query results (Figure 2–49).

🔍 **Experiment**

- Return to Design view, change the Join properties, and select option button 3. View the results to see the effect of this option. When done, return to Design view, change the Join properties, and once again select option button 2.

4

- Click the Save button on the Quick Access Toolbar to save the changes to the query.

- Close the Analyst-Client Query.
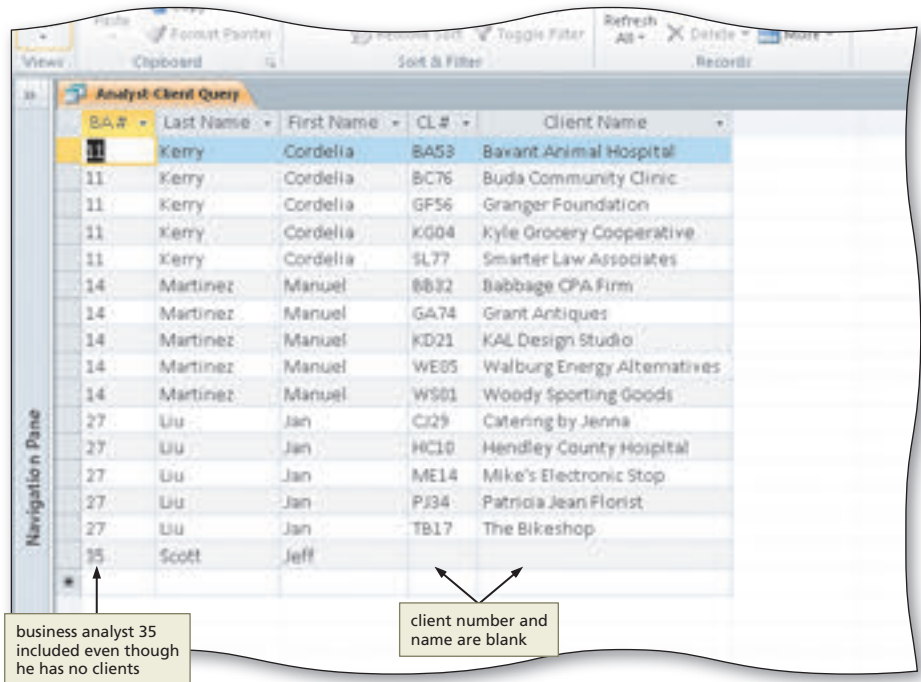
Q&A I see a dialog box that asks if I want to save the query. What should I do?

Click the OK button to save the query.

business analyst 35 included even though he has no clients

client number and name are blank

Figure 2–49

To Create a Report Involving a Join

The following steps use the Report Wizard to create the report for Camashaly Design that is shown in Figure 2–50.

Figure 2–50

Property of Cengage Learning

1

- Open the Navigation Pane, and then select the Analyst-Client Query in the Navigation Pane.

- Click Create on the Ribbon to display the Create tab.

- Click the Report Wizard button (Create tab | Reports group) to display the Report Wizard dialog box (Figure 2–51).
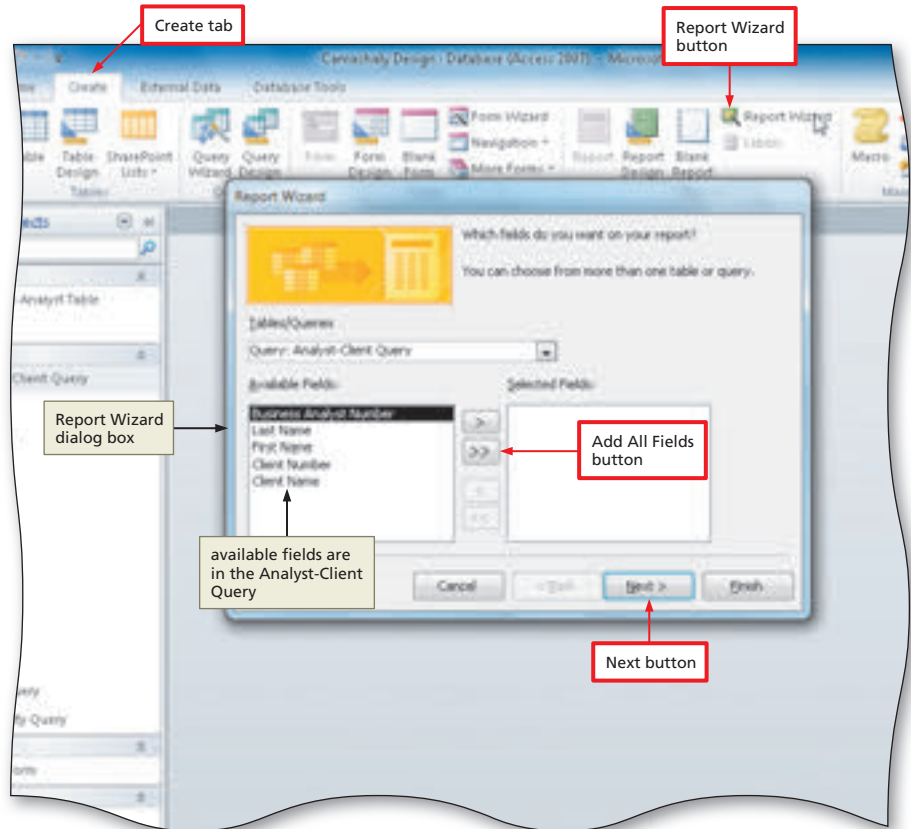

Create tab

Report Wizard button

Report Wizard dialog box

Add All Fields button

available fields are in the Analyst-Client Query

Next button

Figure 2–51

2

- Click the Add All Fields button (Report Wizard dialog box) to add all the fields in the Analyst-Client Query.

- Click the Next button to display the next Report Wizard screen (Figure 2–52).

question concerning grouping levels

Next button

Figure 2–52

Property of Cengage Learning
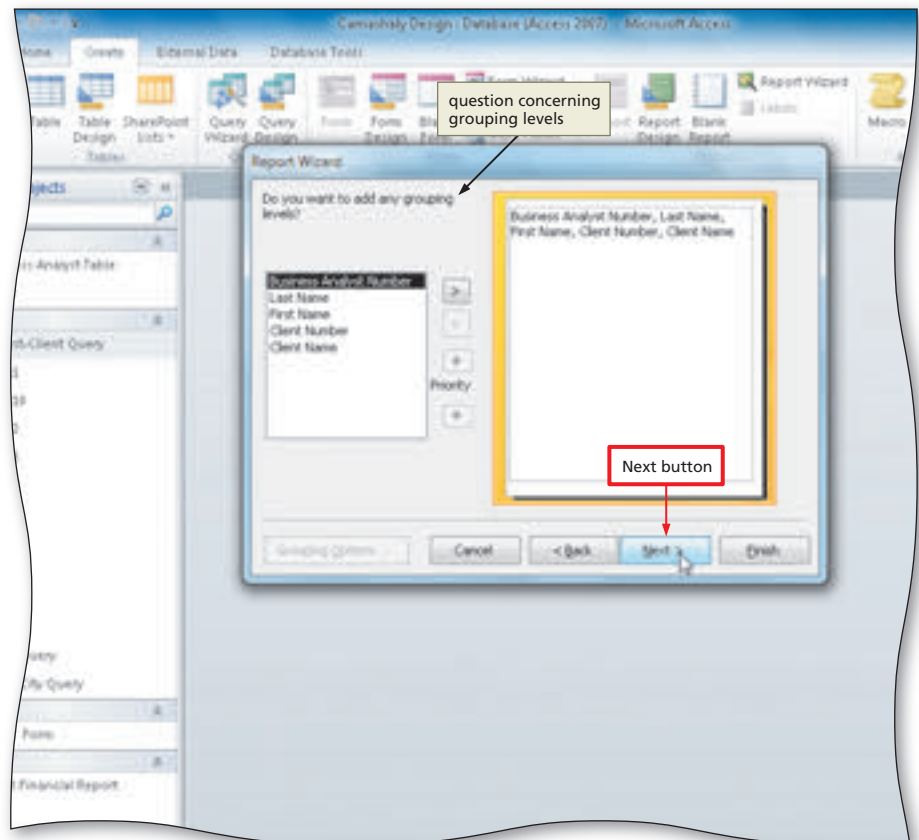
3

- Because you will not specify any grouping, click the Next button in the Report Wizard dialog box to display the next Report Wizard screen.

- Because you already specified the sort order in the query, click the Next button again to display the next Report Wizard screen.

- Make sure that Tabular is selected as the Layout and Portrait is selected as the Orientation.

- Click the Next button to display the next Report Wizard screen.

- Erase the current title, and then type **Analyst-Client Report** as the new title.

- Click the Finish button to produce the report (Figure 2–53).

4

- Close the Analyst-Client Report.

preview of report

Analyst-Client Report
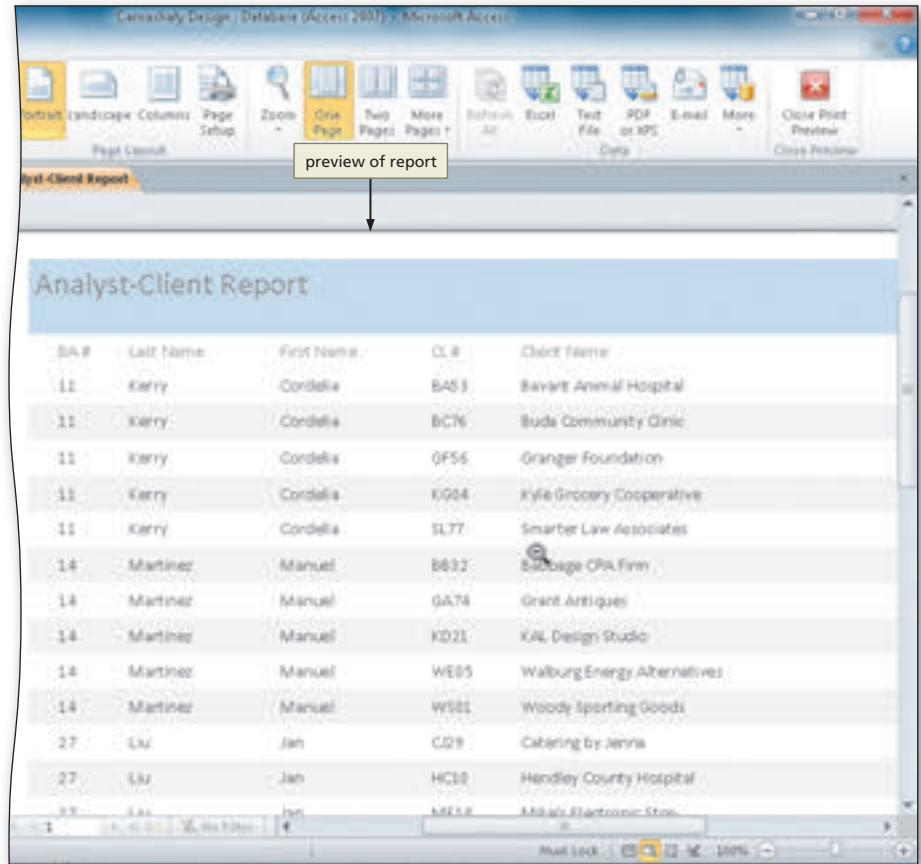
Figure 2–53

To Print a Report

The following steps print a hard copy of the report.

1 With the Analyst-Client Report selected in the Navigation Pane, click File on the Ribbon to open the Backstage view.

2 Click the Print tab in the Backstage view to display the Print gallery.

3 Click the Quick Print button to print the report.

Creating a Form for a Query

In the previous chapter, you created a form for the Client table. You also can create a form for a query. Recall that a **form** in a database is a formatted document with fields that contain data. Forms allow you to view and maintain data.

To Create a Form for a Query

The following steps create a form and then save the form.

1

- If necessary, select the Analyst-Client Query in the Navigation Pane.

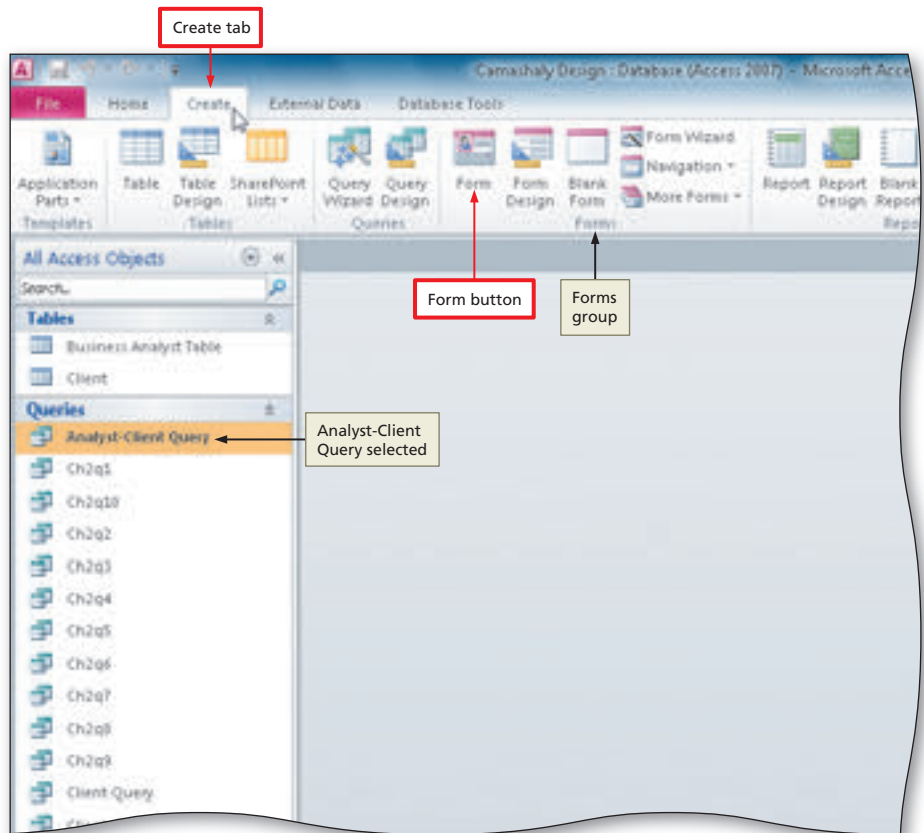- Click Create on the Ribbon to display the Create tab (Figure 2–54).

Figure 2–54

2

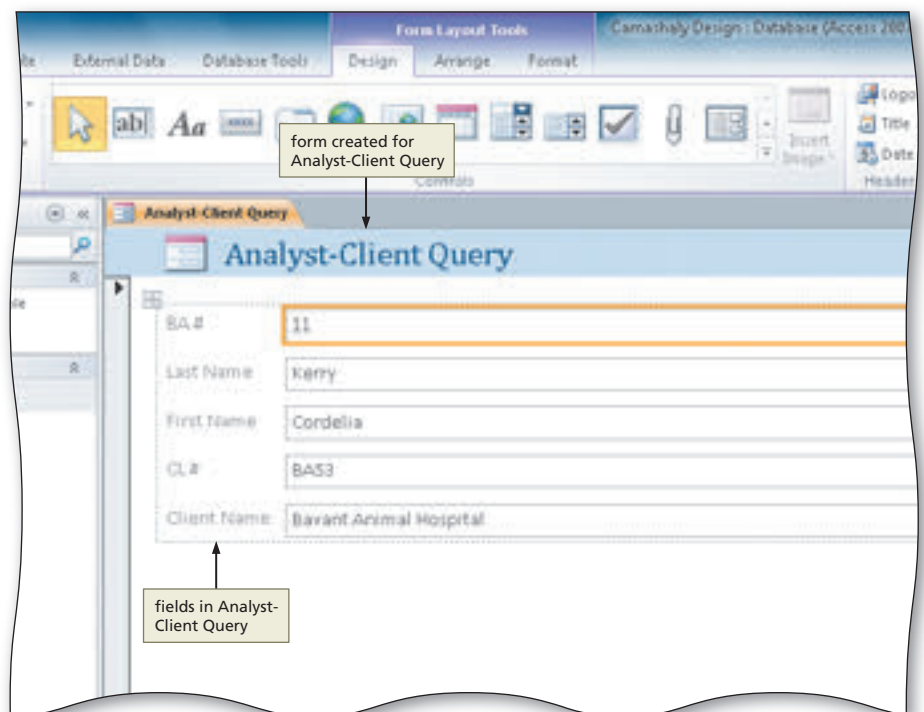- Click the Form button (Create tab | Forms group) to create a simple form (Figure 2–55).

Figure 2–55

Property of Cengage Learning

3

- Click the Save button on the Quick Access Toolbar to display the Save As dialog box.

- Type **Analyst-Client Form** as the form name (Figure 2–56).

4

- Click the OK button to save the form.

- Click the Close button for the form to close the form.
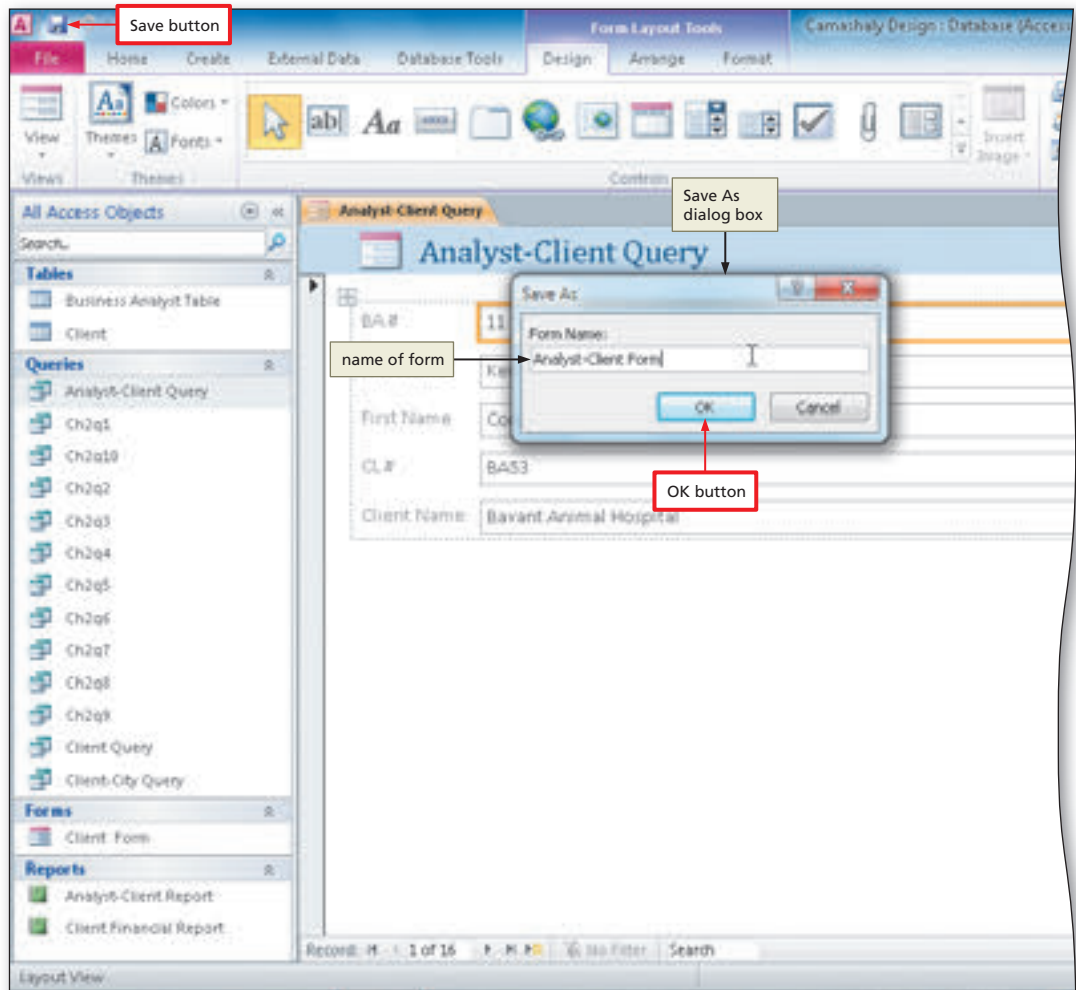
Save button

Save As dialog box

name of form

OK button

Figure 2–56

Using a Form

After you have saved a form, you can use it at any time by right-clicking the form in the Navigation Pane and then clicking Open on the shortcut menu. If you plan to use the form to enter data, you must ensure you are viewing the form in Form view.

Exporting Data from Access to Other Applications

You can **export**, or copy, data from an Access database so that another application (for example, Excel or Word) can use the data. The application that will receive the data determines the export process to be used. You can export to text files in a variety of formats. For applications to which you cannot directly export data, you often can export an appropriately formatted text file that the other application can import. Figure 2–57 shows the Analyst-Client Query exported to Excel.
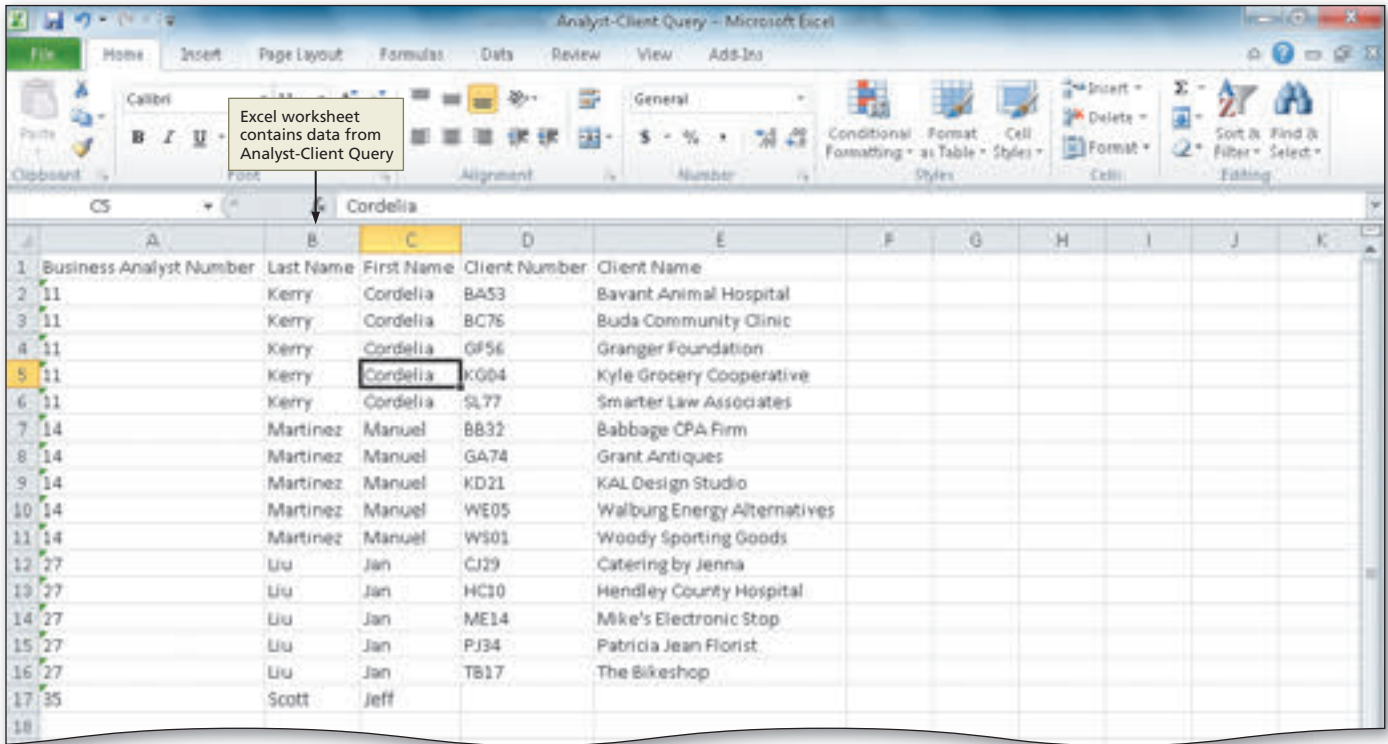
Figure 2–57

To Export Data to Excel

For Camashaly Design to make the Analyst-Client Query available to Excel users, it needs to export the data. To export data to Excel, select the table or query to be exported, and then click the Excel button in the Export group on the External data tab. The following steps export the Analyst-Client Query to Excel and save the export steps. By saving the export steps, you could easily repeat the export process whenever you like without going through all the following steps. You would use the saved steps to export data in the future by clicking the Saved Exports button (External Data tab | Export group) and then selecting the steps you saved.

1
- Click the Analyst-Client Query in the Navigation Pane to select it.
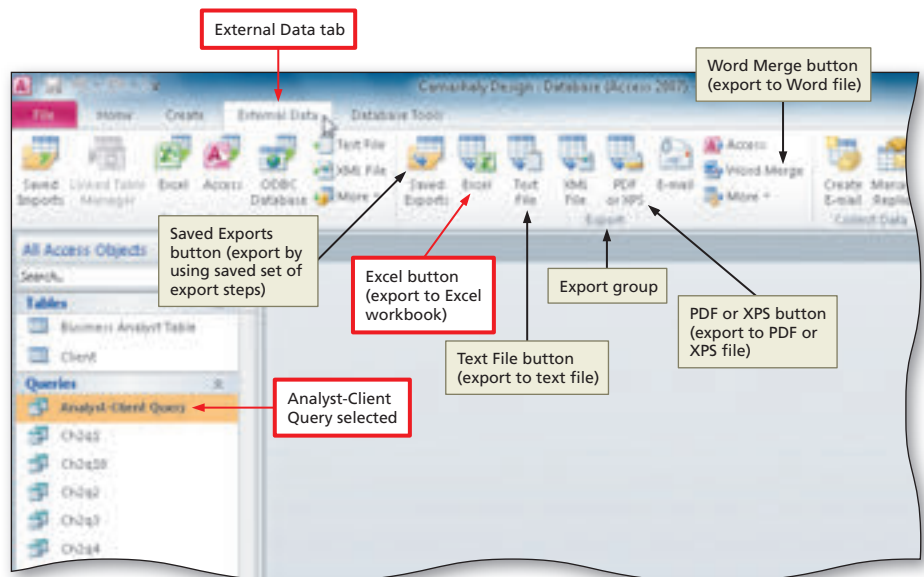- Click External Data on the Ribbon to display the External Data tab (Figure 2–58).

Figure 2–58

2

- Click the Excel button (External Data tab | Export group) to display the Export - Excel Spreadsheet dialog box.

- Click the Browse button (Export - Excel Spreadsheet dialog box) to display the File Save dialog box, and select your USB flash drive as the file location.

- Be sure the file name is Analyst-Client Query and then click the Save button (File Save dialog box) (Figure 2–59).

Q&A Did I need to browse?

No. You could type the appropriate file location.

Q&A Could I change the name of the file?

You could change it. Simply replace the current file name with the one you want.

Q&A What if the file I want to export already exists?

Access will indicate that the file already exists and ask if you want to replace it. If you click the Yes button, the file you export will replace the old file. If you click the No button, you must either change the name of the export file or cancel the process.
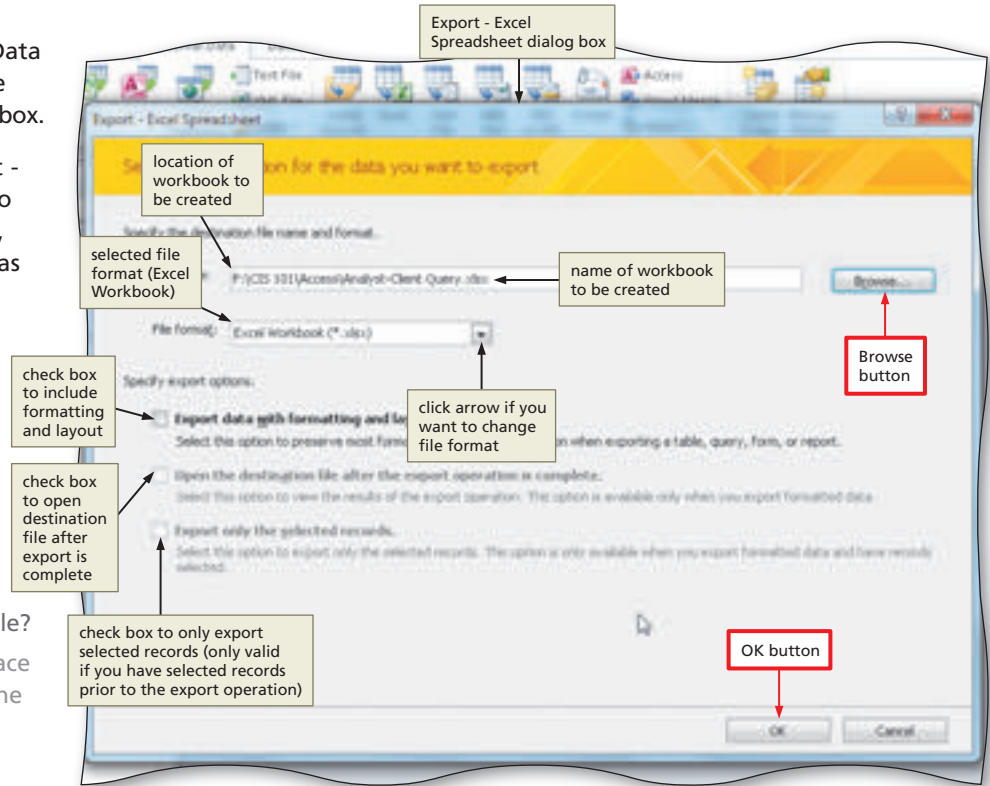
Export - Excel Spreadsheet dialog box

location of workbook to be created

selected file format (Excel Workbook)

name of workbook to be created

Browse button

check box to include formatting and layout

click arrow if you want to change file format

check box to open destination file after export is complete

check box to only export selected records (only valid if you have selected records prior to the export operation)

OK button

Figure 2–59

3

- Click the OK button (Export - Excel Spreadsheet dialog box) to export the data (Figure 2–60).

message indicates that the export process is complete

Check box to save export steps. You can use these steps to export data in the future by clicking the Saved Exports button (External Data tab | Export group) and then selecting the steps you saved.
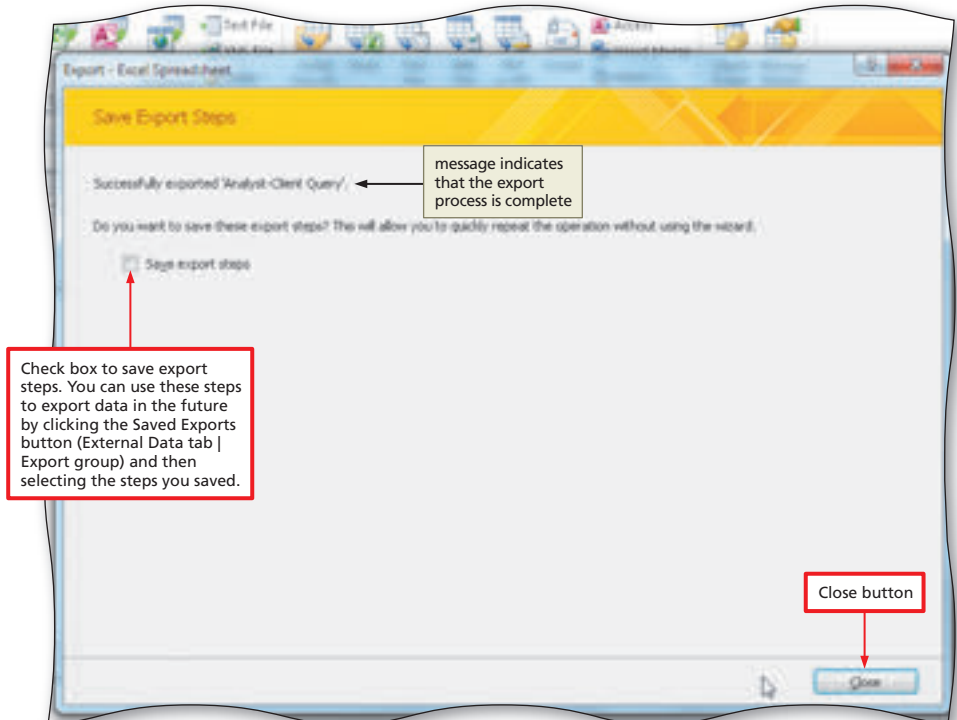
Close button

Figure 2–60

Property of Cengage Learning

4

- Click the 'Save export steps' check box (Export - Excel Spreadsheet dialog box) to display the Save export steps options.

- If necessary, type **Export-Analyst-Client Query** in the Save as text box.

- Type **Export the Analyst-Client Query without formatting** in the Description text box (Figure 2–61).

5

- Click the Save Export button (Export - Excel Spreadsheet dialog box) to save the export steps.
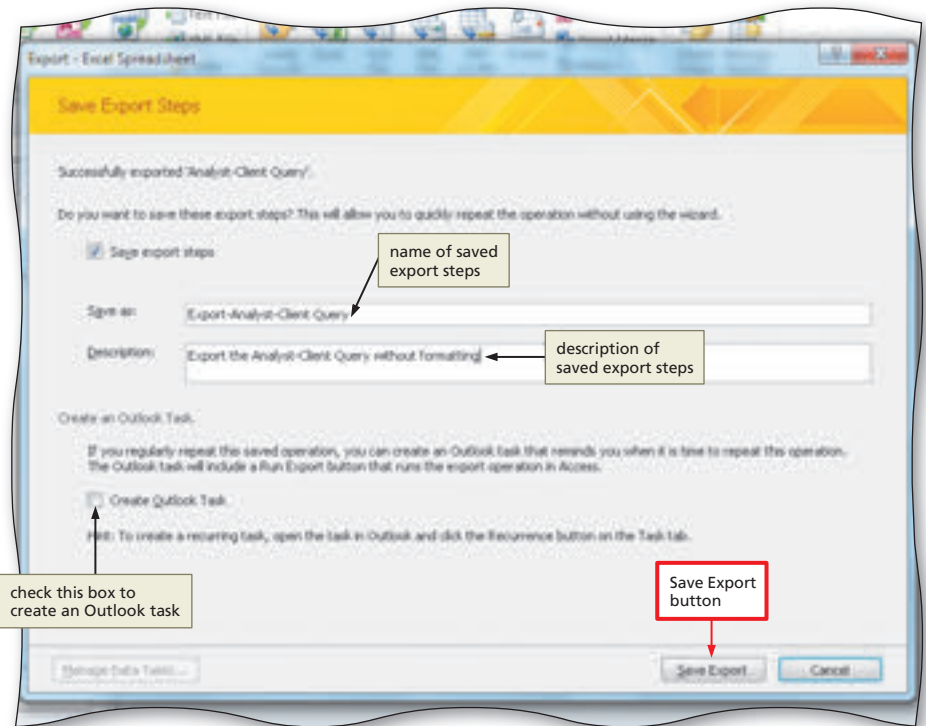

Figure 2–61

TO EXPORT DATA TO WORD

It is not possible to export data to the standard Word format. It is possible, however, to export the data as a rich text format (RTF) file, which Word can access. To export data from a query or table to an RTF file, you would use the following steps.

1. With the query or table to be exported selected in the Navigation Pane, click the More button (External Data tab | Export group) and then click Word on the More menu to display the Export - RTF File dialog box.

2. Select the name and location for the file to be created.

3. Click the Save button, and then click the OK button to export the data.

4. Save the export steps if you want, or simply click the Close button in the Export - RTF File dialog box to close the dialog box without saving the export steps.

Text Files

You also can export to text files. Text files contain unformatted characters, including alphanumeric characters, and some special characters, such as tabs, carriage returns, and line feeds.

In **delimited files**, each record is on a separate line, and the fields are separated by a special character, called the **delimiter**. Common delimiters are tabs, semicolons, commas, and spaces. You also can choose any other value that does not appear within the field contents. The comma-separated values (CSV) file often used in Excel is an example of a delimited file.

In **fixed-width files**, the width of any field is the same on every record. For example, if the width of the first field on the first record is 12 characters, the width of the first field on every other record also must be 12 characters.

TO EXPORT DATA TO A TEXT FILE

When exporting data to a text file, you can choose to export the data with formatting and layout. This option preserves much of the formatting and layout in tables, queries, forms, and reports. For forms and reports, this is the only option.

If you do not need to preserve the formatting, you can choose either delimited or fixed-width as the format for the exported file. The most common option, especially if formatting is not an issue, is delimited. You can choose the delimiter and also whether to include field names on the first row. In many cases, delimiting with a comma and including the field names is a good choice.

To export data from a table or query to a comma-delimited file in which the first row contains the column headings, you would use the following steps.

1. With the query or table to be exported selected in the Navigation Pane, click the Text File button (External Data tab | Export group) to display the Export - Text File dialog box.

2. Select the name and location for the file to be created.

3. If you need to preserve formatting and layout, be sure the 'Export data with formatting and layout' check box is checked. If you do not need to preserve formatting and layout, make sure the check box is not checked. Once you have made your selection, click the OK button in the Export - Text File dialog box.

4. To create a delimited file, be sure the Delimited option button is selected in the Export Text Wizard dialog box. To create a fixed-width file, be sure the Fixed Width option button is selected. Once you have made your selection, click the Next button.

5. a. If you are exporting to a delimited file, choose the delimiter that you want to separate your fields, such as a comma. Decide whether to include field names on the first row and, if so, click the Include Field Names on First Row check box. If you want to select a text qualifier, select it in the Text Qualifier list. When you have made your selections, click the Next button.

   b. If you are exporting to a fixed-width file, review the position of the vertical lines that separate your fields. If any lines are not positioned correctly, follow the directions on the screen to reposition them. When you have finished, click the Next button.

6. Click the Finish button to export the data.

7. Save the export steps if you want, or simply click the Close button in the Export - Text File dialog box to close the dialog box without saving the export steps.

Saving Export Steps
Because query results are based on the data in the underlying tables, a change to an underlying table would result in a new query answer. For example, if the last name for business analyst 11 changed from Kerry to Smith, the change would be made in the Business Analyst Table. If you run the Analyst-Client Query again and export the query using the saved export steps, the Excel workbook would show the changed name.

Adding Criteria to a Join Query

Sometimes you will want to join tables, but you will not want to include all possible records. For example, you would like to create a report showing only those clients whose amount paid is greater than $3,000. In such cases, you will relate the tables and include fields just as you did before. You also will include criteria. To include only those clients whose amount paid is more than $3,000.00, you will include >3000 as a criterion for the Amount Paid field.

To Restrict the Records in a Join

The following steps modify the Analyst-Client Query so that the results for Camashaly Design only include those clients whose amount paid is more than $3,000.

1

- Open the Analyst-Client Query in Design view and close the Navigation Pane.
- Add the Amount Paid field to the query.
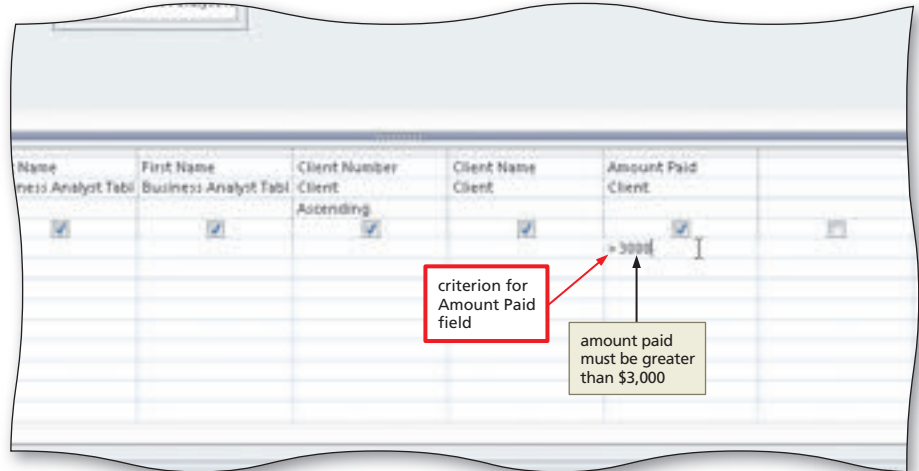- Type **>3000** as the criterion for the Amount Paid field (Figure 2–62).

Figure 2–62

2

- View the query results (Figure 2–63).

3

- Close the query.
- When asked if you want to save your changes, click the No button.

Q&A

What if I saved the changes?

The next time you used this query, you would only see clients whose amount paid is more than $3,000.
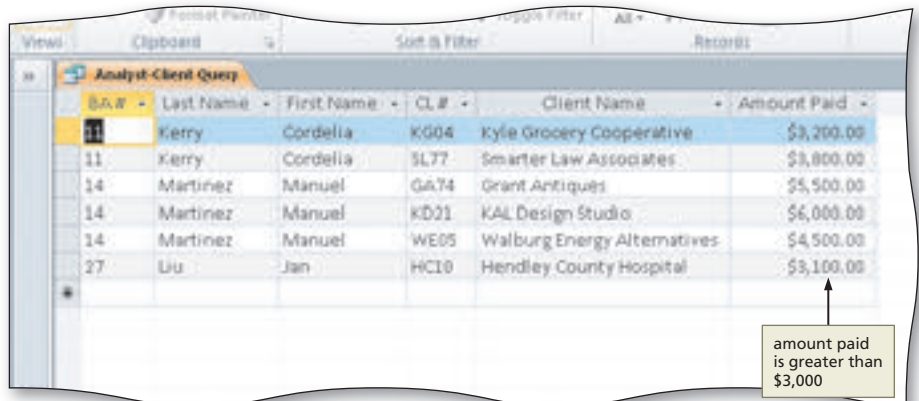
Figure 2–63

Calculations

If you have determined that a special calculation is required for a query, you then need to determine whether the calculation is an individual record calculation (for example, adding the values in two fields) or a group calculation (for example, finding the total of the values in a particular field on all the records).

Camashaly Design may want to know the total amount (amount paid and current due) from each client. This would seem to pose a problem because the Client table does not include a field for total amount. You can calculate it, however, because the total amount is equal to the amount paid plus the current due. A field that can be computed from other fields is called a **calculated field** or a **computed field**. A calculated field is an individual record calculation because each calculation only involves fields in a single record.

BTW

Expression Builder
Access includes a tool to help you create complex expressions. If you click Build on the shortcut menu (see Figure 2–64), Access displays the Expression Builder dialog box, which includes an expression box, operator buttons, and expression elements. You can type parts of the expression directly and paste operator buttons and expression elements into the box. You also can use functions in expressions.

Camashaly also may want to calculate the average amount paid for the clients of each business analyst. That is, they may want the average for the clients of business analyst 11, the average for the clients of business analyst 14, and so on. This type of calculation is called a **group calculation** because each calculation involves groups of records. In this example, the clients of business analyst 11 would form one group, the clients of business analyst 14 would be a second group, and the clients of business analyst 27 would form a third group.

The following are guidelines related to calculations in queries.

<table>
<tr><td>**Plan Ahead**</td><td>**Determine whether calculations are required.**
Examine the query or request to see if there are special calculations to be included. Look for words such as total, sum, compute, or calculate.

• **Determine a name for the calculated field.** If calculations are required, decide on the name for the field. Assign a name that helps identify the contents of the field. For example, if you are adding the cost of a number of items, the name Total Cost would be appropriate. The name, also called an **alias**, becomes the column name when the query is run.

• **Determine the format for the calculated field.** Determine how the calculated field should appear. If the calculation involves monetary amounts, you would use the currency format. If the calculated value contains decimals, determine how many decimal places to display.</td></tr>
</table>

To Use a Calculated Field in a Query

If you have determined that you need a calculated field in a query, you enter a name, or alias, for the calculated field, a colon, and then the calculation in one of the columns in the Field row of the design grid for the query. Any fields included in the expression must be enclosed in square brackets ([ ]). For example, for the total amount, you will type Total Amount:[Amount Paid]+[Current Due] as the expression.

You can type the expression directly into the Field row. You will not be able to see the entire entry, however, because the Field row is not large enough. The preferred way is to select the column in the Field row and then use the Zoom command on its shortcut menu. When Access displays the Zoom dialog box, you can enter the expression.

You are not restricted to addition in calculations. You can use subtraction (–), multiplication (*), or division (/). You also can include parentheses in your calculations to indicate which calculations should be done first.

The following steps create a query that Camashaly Design might use to obtain financial information on its clients, including the total amount (amount paid + current due), which is a calculated field.

1

• Create a query with a field list for the Client table.

• Add the Client Number, Client Name, Amount Paid, and Current Due fields to the query.

• Right-click the Field row in the first open column in the design grid to display a shortcut menu (Figure 2–64).
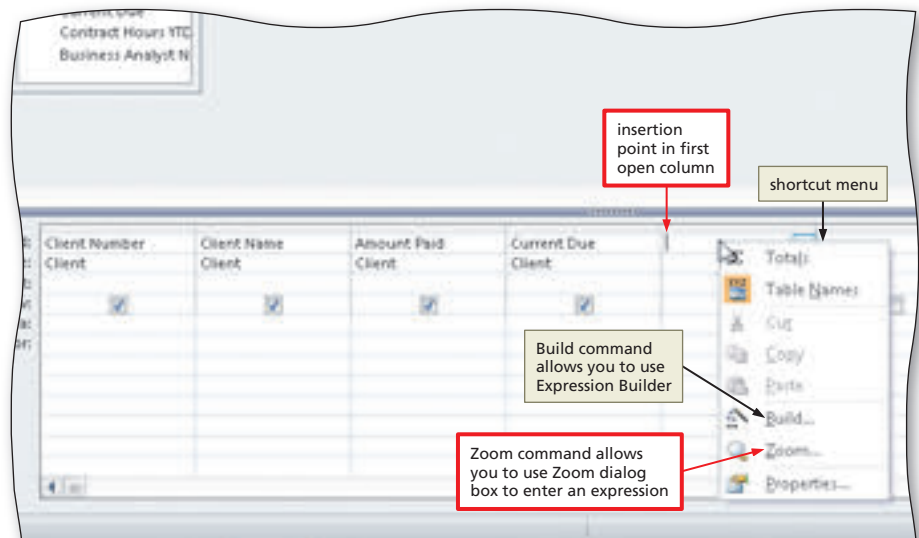

Figure 2–64

2

- Click Zoom on the shortcut menu to display the Zoom dialog box.

- Type **Total Amount: [Amount Paid]+ [Current Due]** in the Zoom dialog box (Figure 2–65).

Q&A

Do I always need to put square brackets around field names?

If the field name does not contain spaces, square brackets are technically not necessary, although it is still acceptable to use the brackets. It is a good practice, however, to get in the habit of using the brackets.
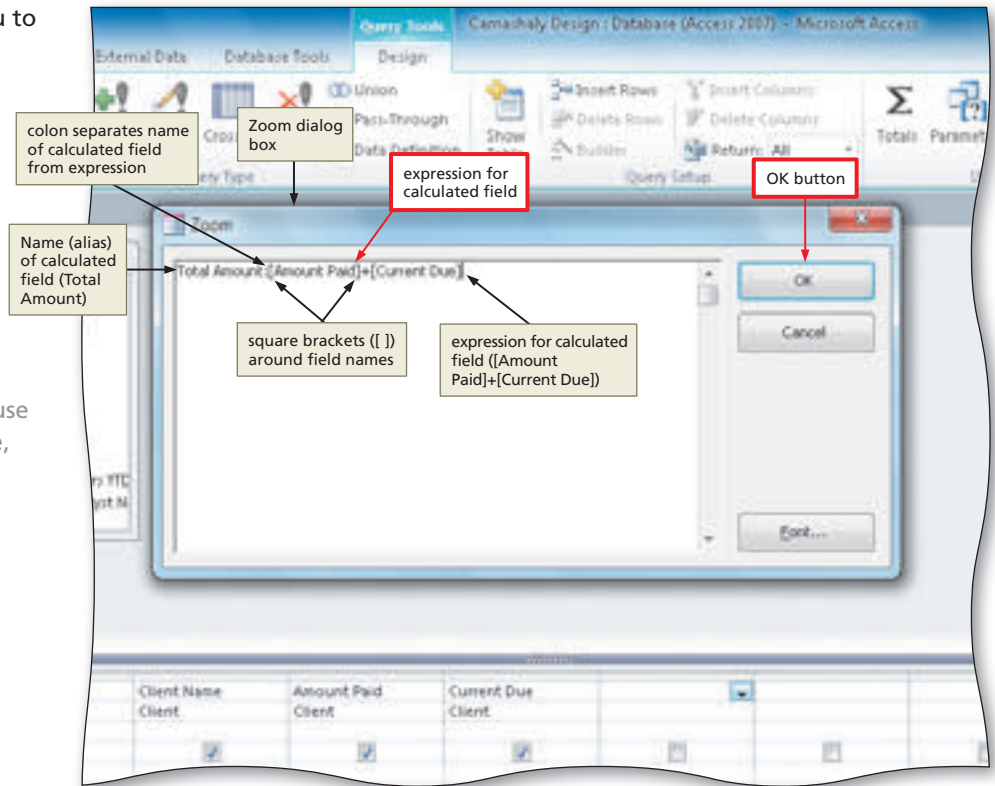

Figure 2–65

3

- Click the OK button (Zoom dialog box) to enter the expression (Figure 2–66).

Figure 2–66

Property of Cengage Learning

4
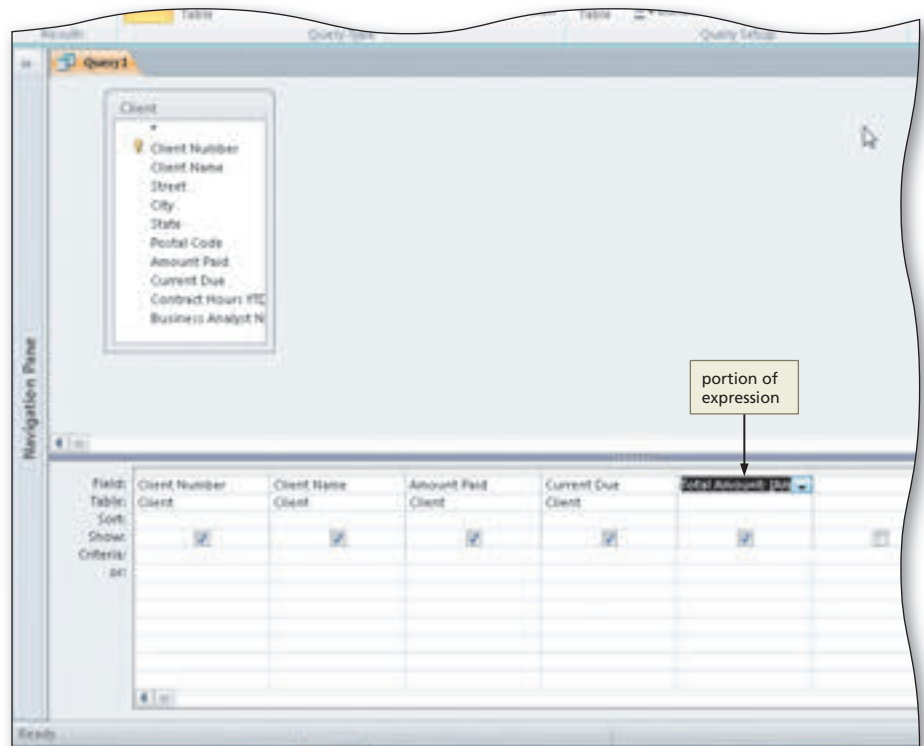
- View the query results (Figure 2–67).

  Experiment

- Return to Design view and try other expressions. In at least one case, omit the Total Amount and the colon. In at least one case, intentionally misspell a field name. In each case, view the results to see the effect of your changes. When finished, reenter the original expression.

results are calculated by adding the amount paid and the current due

Total Amount field

Figure 2–67

To Change a Caption

You can change the way items appear in the results of a query by changing their format. You also can change a query result's heading at the top of a column by changing the caption. Just as when you omitted duplicates, you will make this change by using a property sheet. In the property sheet, you can change the desired property, such as the format, the number of decimal places, or the caption. The following steps change the caption of the Amount Paid field to Paid and the caption of the Current Due field to Due. The steps also save the query with a new name.

1

- Return to Design view.

- If necessary, click Design on the Ribbon to display the Design tab.

- Click the Amount Paid field in the design grid, and then click the Property Sheet button (Query Tools Design tab | Show/Hide group) to display the properties for the Amount Paid field.

- Click the Caption box, and then type **Paid** as the caption (Figure 2–68).

Q&A

My property sheet looks different. What should I do?

If your sheet looks different, you clicked the wrong place and will have to close the property sheet and repeat this step.
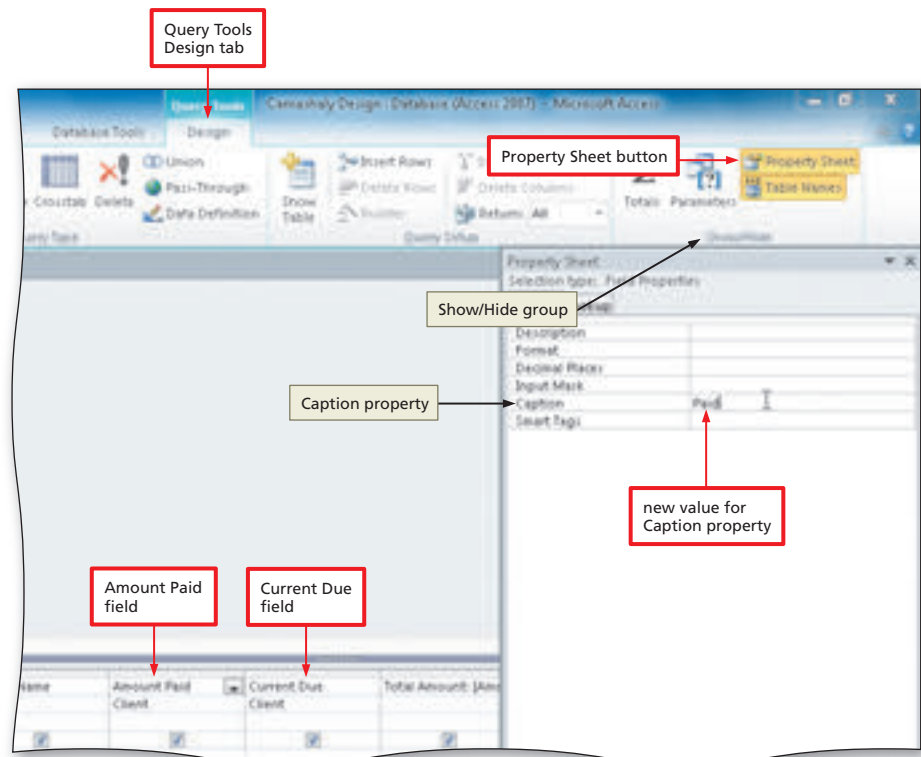

Query Tools Design tab

Property Sheet button

Show/Hide group

Caption property

new value for Caption property

Amount Paid field

Current Due field

Figure 2–68

2

- Close the property sheet by clicking the Property Sheet button a second time.

- Click the Current Due field in the design grid, and then click the Property Sheet button (Query Tools Design tab | Show/Hide group).

- Click the Caption box, and then type **Due** as the caption.

- Close the Property Sheet by clicking the Property Sheet button a second time.
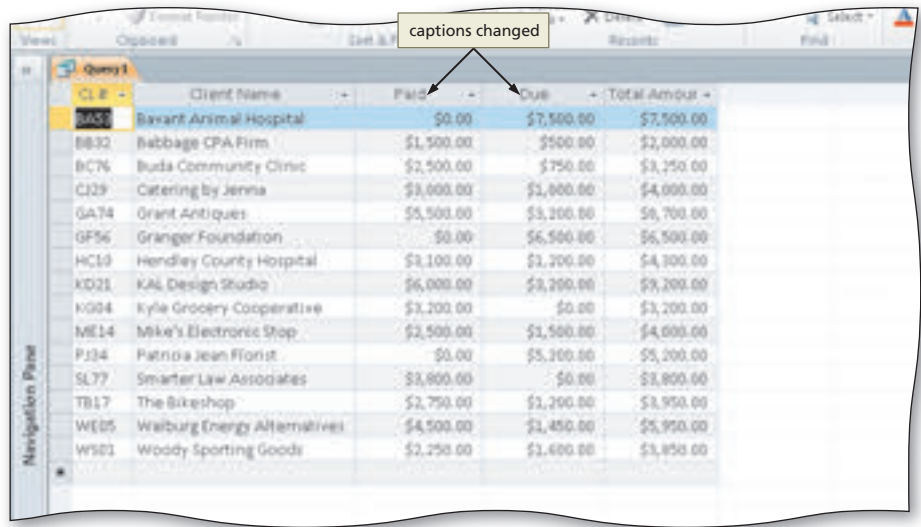
- View the query results (Figure 2–69).

3

- Save the query as Ch2q11.

- Close the query.

captions changed

Figure 2–69

Other Ways

1. Right-click field in design grid, click Properties on shortcut menu

To Calculate Statistics

For group calculations, Microsoft Access supports several built-in statistics: COUNT (count of the number of records), SUM (total), AVG (average), MAX (largest value), MIN (smallest value), STDEV (standard deviation), VAR (variance), FIRST (first value), and LAST (last value). These statistics are called aggregate functions. An **aggregate function** is a function that performs some mathematical function against a group of records. To use any of these aggregate functions in a query, you include it in the Total row in the design grid. The Total row usually does not appear in the grid. To include it, click the Totals button on the Design tab.

The following steps create a new query for the Client table. The steps include the Total row in the design grid, and then calculate the average amount paid for all clients.

1

- Create a new query with a field list for the Client table.

- Click the Totals button (Query Tools Design tab | Show/Hide group) to include the Total row in the design grid.

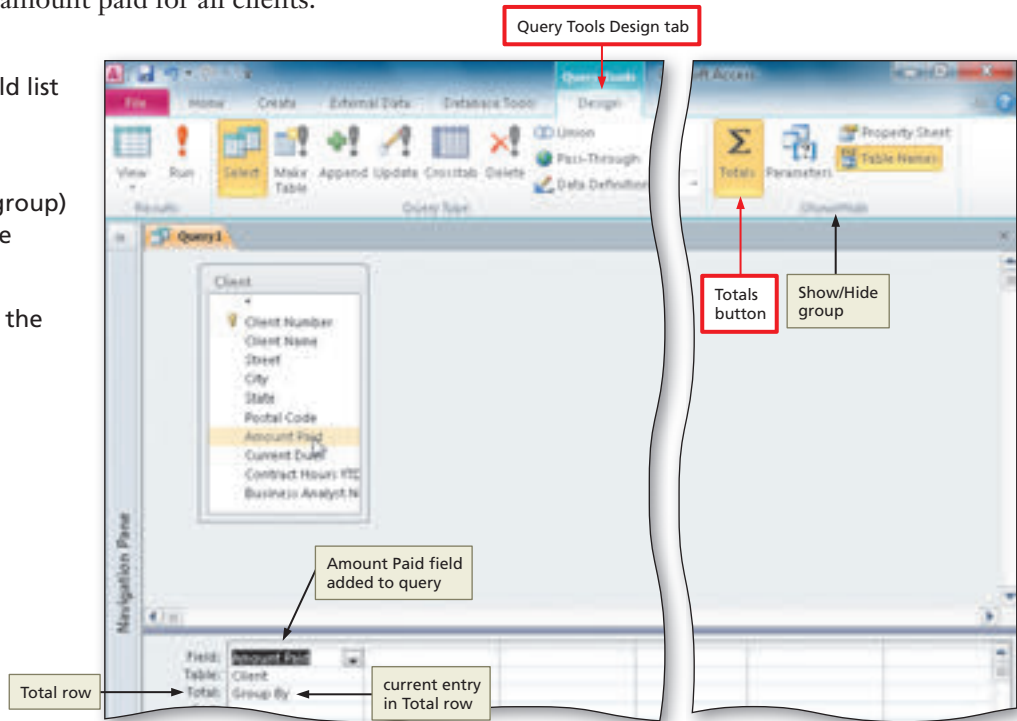- Add the Amount Paid field to the query (Figure 2–70).

Query Tools Design tab

Totals button

Show/Hide group

Amount Paid field added to query

Total row

current entry in Total row

Figure 2–70

2

- Click the Total row in the Amount Paid column to display the Total box arrow.

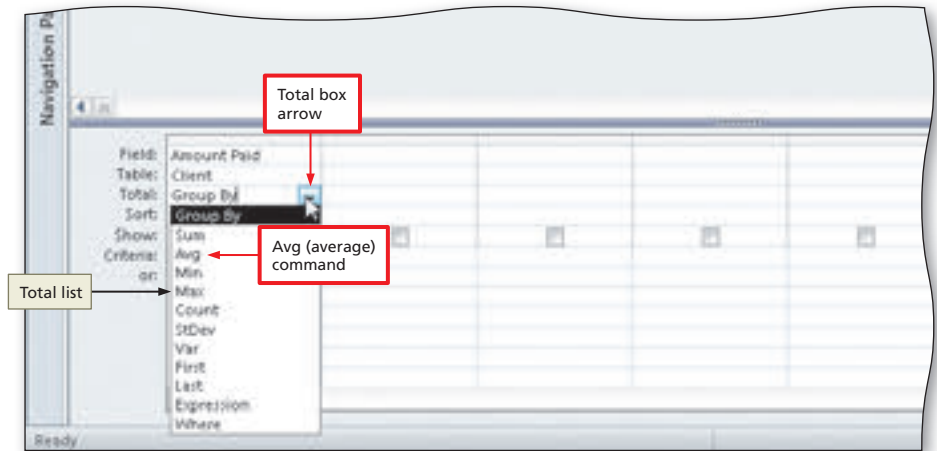- Click the Total box arrow to display the Total list (Figure 2–71).

Figure 2–71

3

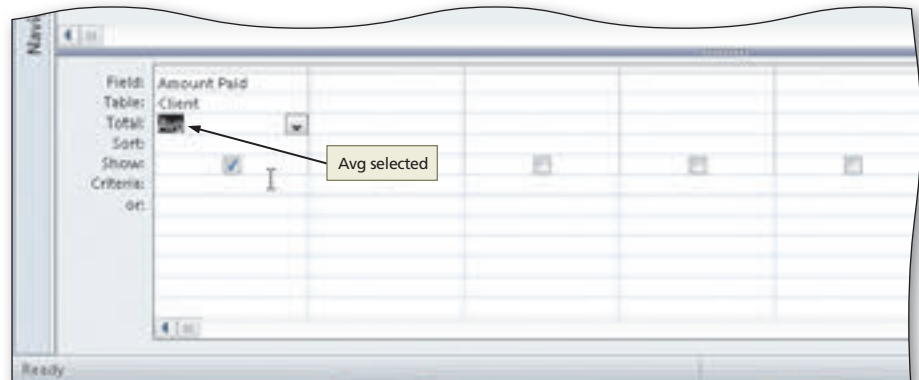- Click Avg to select the calculation that Access is to perform (Figure 2–72).

Figure 2–72

4

- View the query results (Figure 2–73).

  Experiment

- Return to Design view and try other aggregate functions. In each case, view the results to see the effect of your selection. When finished, select Avg once again.
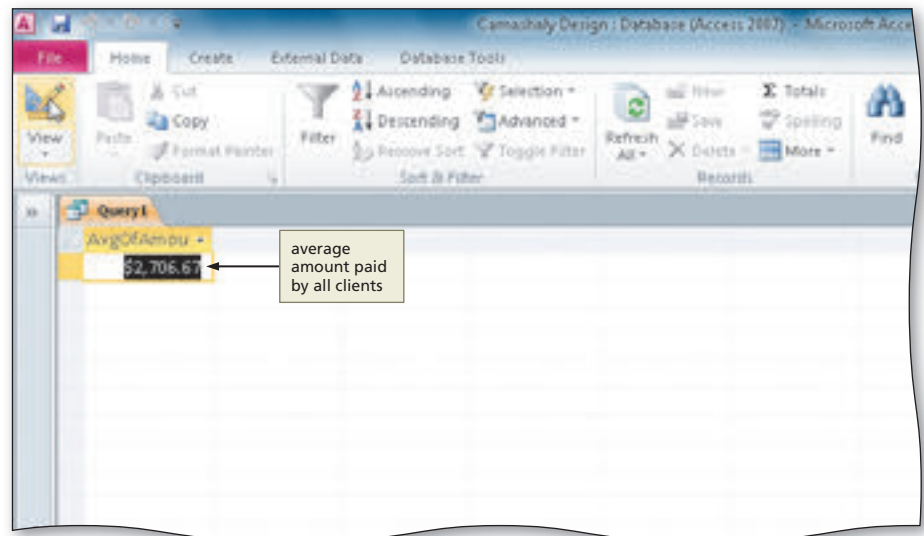
Figure 2–73

To Use Criteria in Calculating Statistics

Sometimes calculating statistics for all the records in the table is appropriate. In other cases, however, you will need to calculate the statistics for only those records that satisfy certain criteria. To enter a criterion in a field, first you select Where as the entry in the Total row for the field, and then enter the criterion in the Criteria row. The following steps use this technique to calculate the average amount paid for clients of business analyst 11. The steps also save the query with a new name.

1

- Return to Design view.

- Include the Business Analyst Number field in the design grid.

- Click the Total box arrow in the Business Analyst Number column to produce a Total list (Figure 2–74).
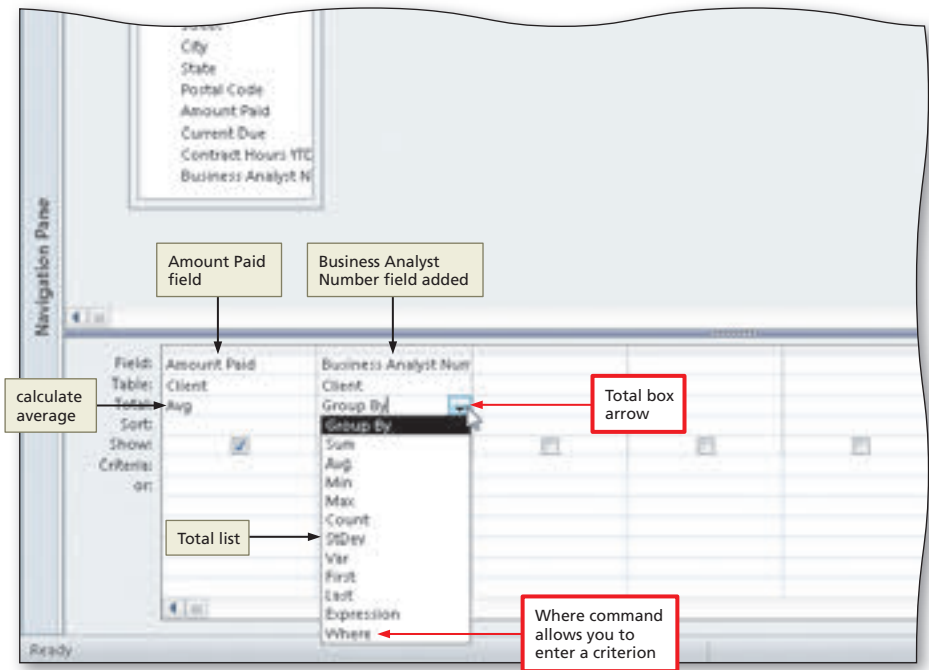
Figure 2–74

2

- Click Where.

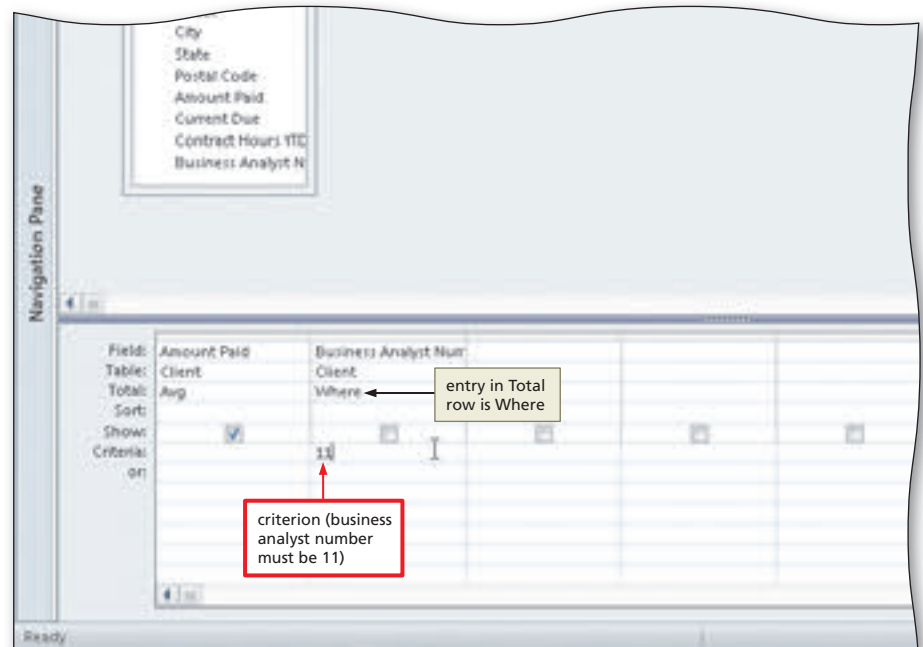- Type 11 as the criterion for the Business Analyst Number field (Figure 2–75).

Figure 2–75

Property of Cengage Learning

3
- View the query results (Figure 2–76).

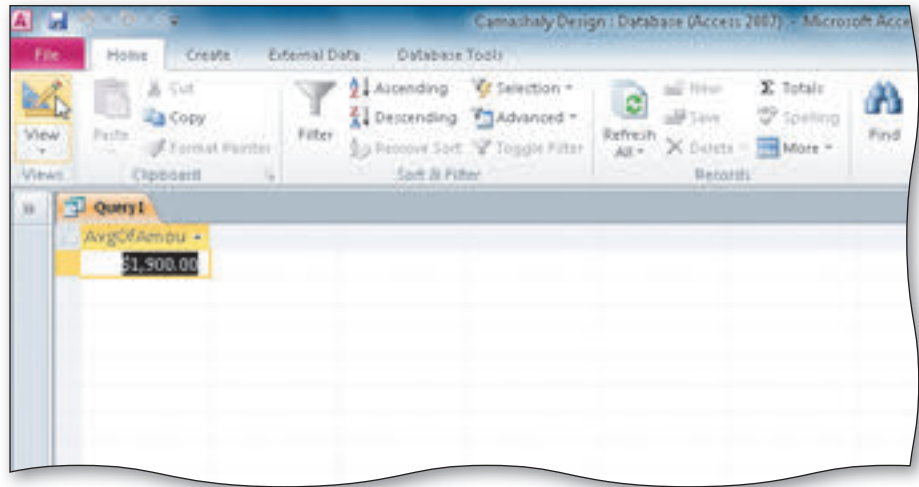**4**
- Save the query as Ch2q12.

Figure 2–76

To Use Grouping

Another way statistics often are used is in combination with grouping; that is, statistics are calculated for groups of records. You may, for example, need to calculate the average amount paid for the clients of each business analyst. You will want the average for the clients of business analyst 11, the average for clients of business analyst 14, and so on.

Grouping means creating groups of records that share some common characteristic. In grouping by Business Analyst Number, for example, the clients of business analyst 11 would form one group, the clients of business analyst 14 would form a second, and the clients of business analyst 27 would form a third group. The calculations then are made for each group. To indicate grouping in Access, select Group By as the entry in the Total row for the field to be used for grouping.

The following steps create a query that calculates the average amount paid for clients of each business analyst at Camashaly Design. The steps also save the query with a new name.

1
- Return to Design view and clear the design grid.

- Include the Business Analyst Number field in the query.

- Include the Amount Paid field in the query.

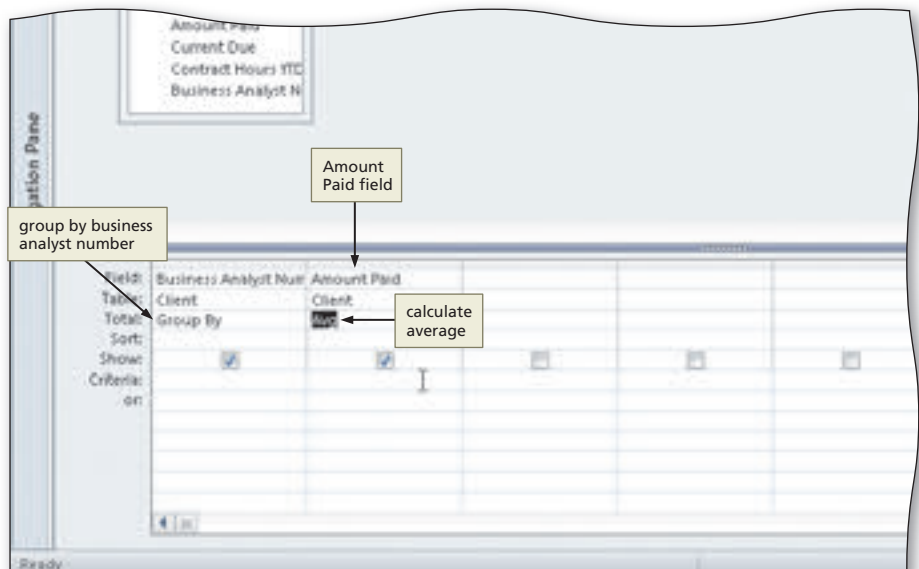- Select Avg as the calculation in the Total row for the Amount Paid field (Figure 2–77).

Q&A
Why didn't I need to change the entry in the Total row for the Business Analyst Number field?

Group By, which is the initial entry in the Total row when you add a field, is correct. Thus, you didn't need to change the entry.

Figure 2–77

2
• View the query results (Figure 2–78).

3
• Save the query as Ch2q13.
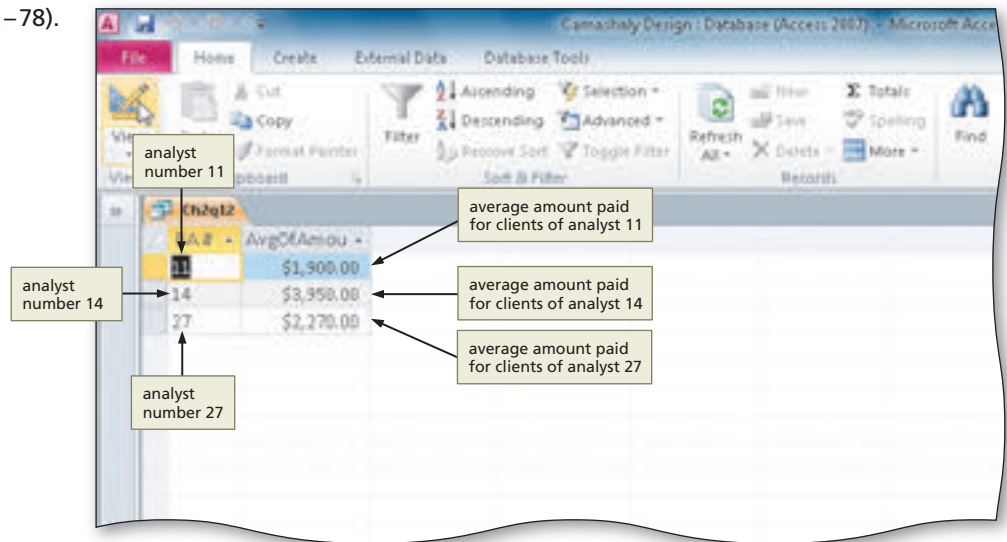
• Close the query.

Figure 2–78

Crosstab Queries

A crosstab query calculates a statistic (for example, sum, average, or count) for data that is grouped by two different types of information. One of the types will appear down the side of the resulting datasheet, and the other will appear across the top. Crosstab queries are useful for summarizing data by category or group.

For example, if you have determined that a query must summarize the sum of the amounts paid grouped by both city and business analyst number, you could have cities as the row headings, that is, down the side. You could have business analyst numbers as the column headings, that is, across the top. The entries within the datasheet represent the total of the amounts paid. Figure 2–79 shows a crosstab in which the total of amount paid is grouped by both city and business analyst number with cities down the left side and business analyst numbers across the top. For example, the entry in the row labeled Georgetown and in the column labeled 14 represents the total of the amount paid by all clients of business analyst 14 who are located in Georgetown.

BTW

Certification
The Microsoft Office Specialist (MOS) program provides an opportunity for you to obtain a valuable industry credential — proof that you have the Access 2010 skills required by employers. For more information, visit the Access 2010 Certification Web page (scsite.com/ac2010/cert).
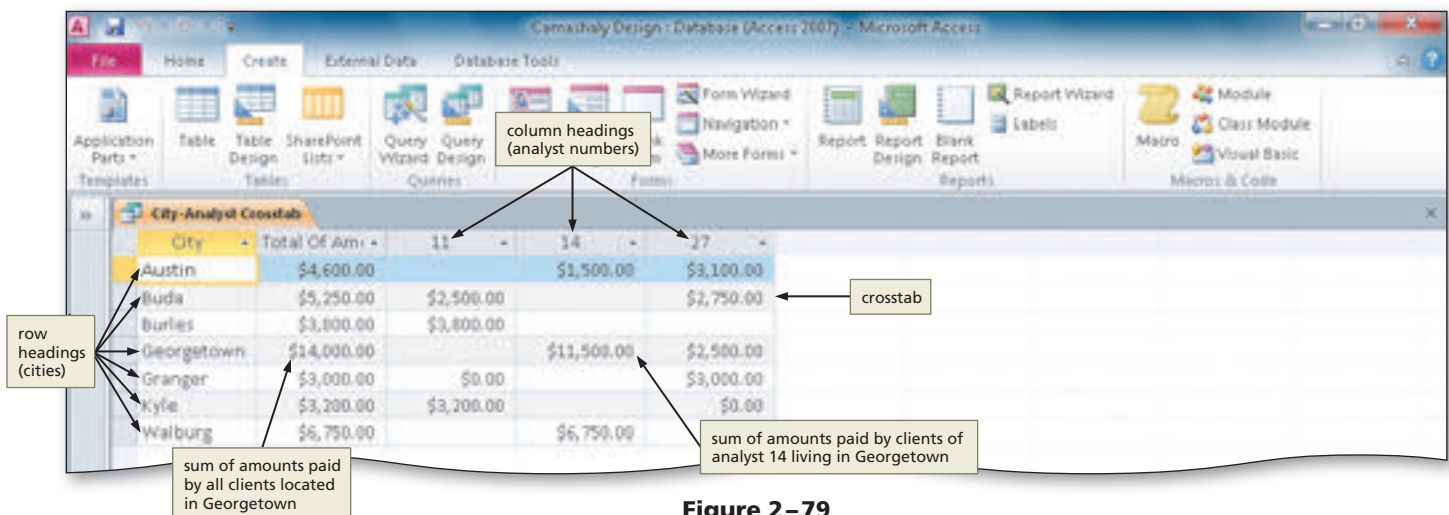

Figure 2–79

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To Create a Crosstab Query

The following steps use the Crosstab Query Wizard to create a crosstab query for Camashaly Design that summarizes financial information by city and business analyst.

1

- Click Create on the Ribbon to display the Create tab.

- Click the Query Wizard button (Create tab | Queries group) to display the New Query dialog box (Figure 2–80).
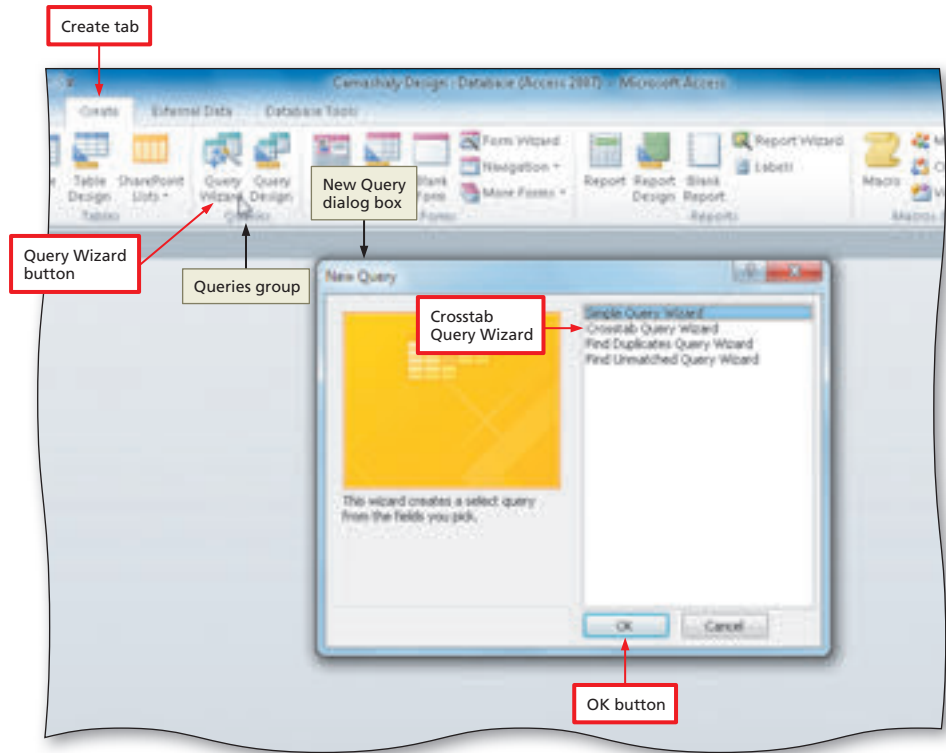

Figure 2–80

2

- Click Crosstab Query Wizard (New Query dialog box).

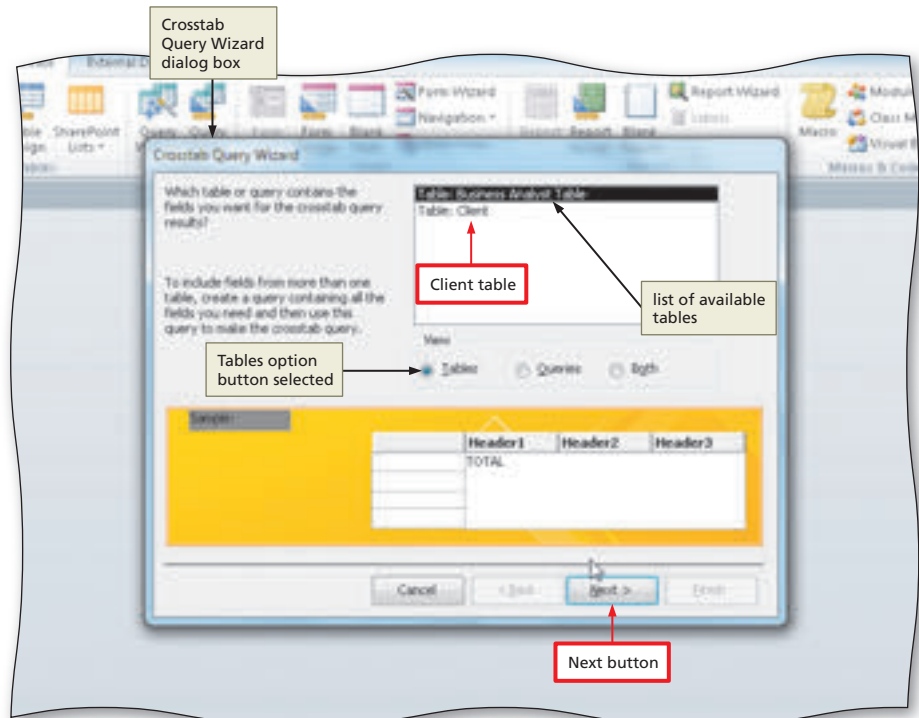- Click the OK button to display the Crosstab Query Wizard dialog box (Figure 2–81).

Figure 2–81

3

- With the Tables option button selected, click Table: Client to select the Client table, and then click the Next button to display the next Crosstab Query Wizard screen.

- Click the City field, and then click the Add Field button to select the City field for row headings (Figure 2–82).
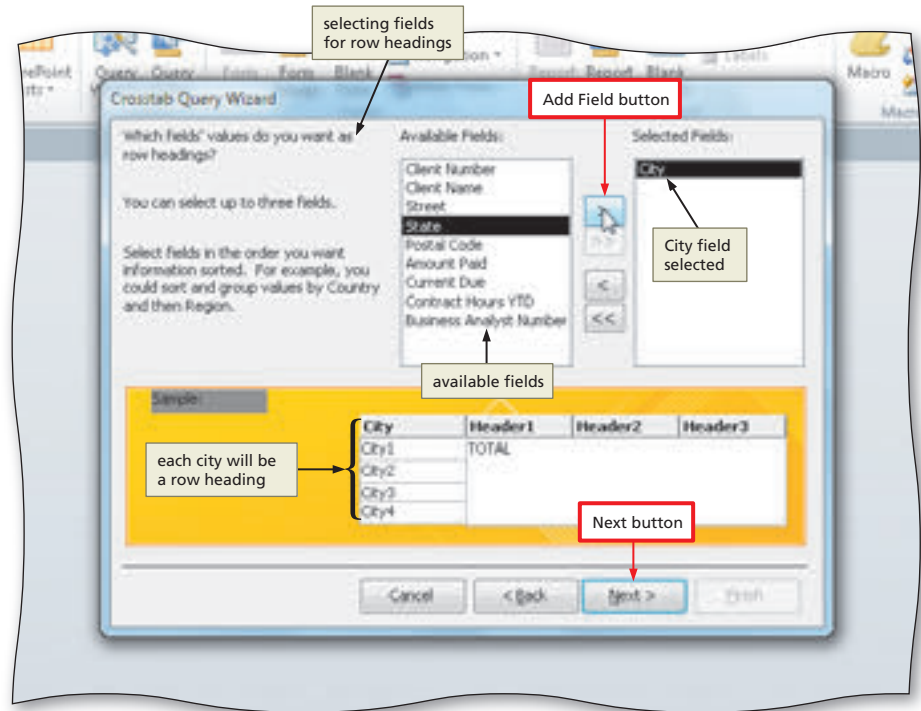

Figure 2–82

4

- Click the Next button to display the next Crosstab Query Wizard screen.

- Click the Business Analyst Number field to select the Business Analyst Number field for column headings (Figure 2–83).
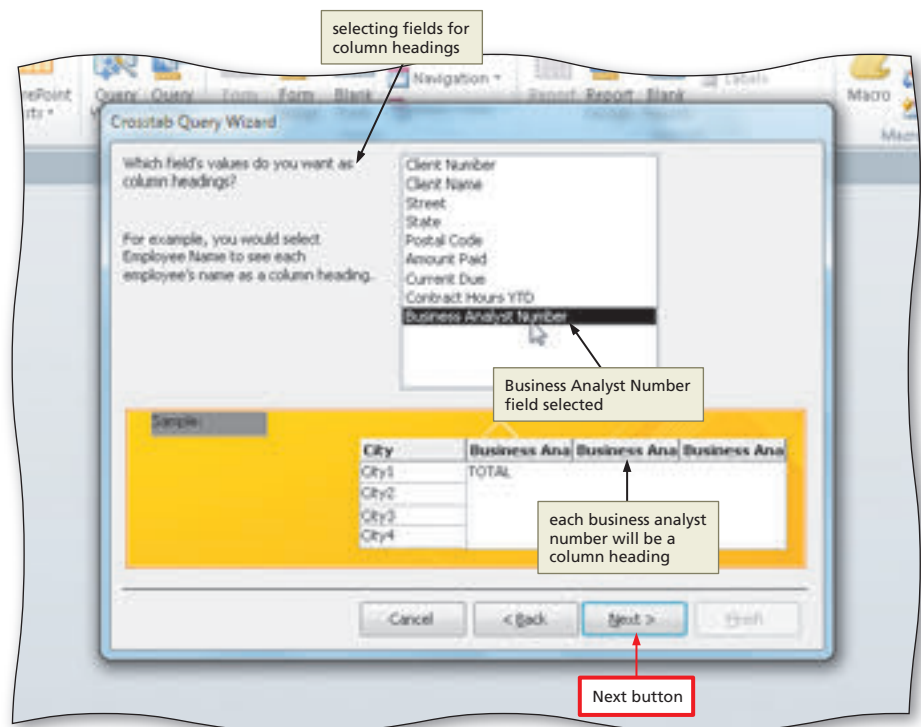

Figure 2–83

5

- Click the Next button to display the next Crosstab Query Wizard screen.
- Click the Amount Paid field to select the Amount Paid field for calculations.

Experiment

- Click other fields. For each field, examine the list of calculations that are available. When finished, click the Amount Paid field again.
- Click Sum to select Sum as the calculation to be performed (Figure 2–84).

Q&A My list of functions is different. What did I do wrong?

Either you clicked the wrong field, or the Amount Paid field has the wrong data type. For example, if you mistakenly assigned it the Text data type, you would not see Sum in the list of available calculations.
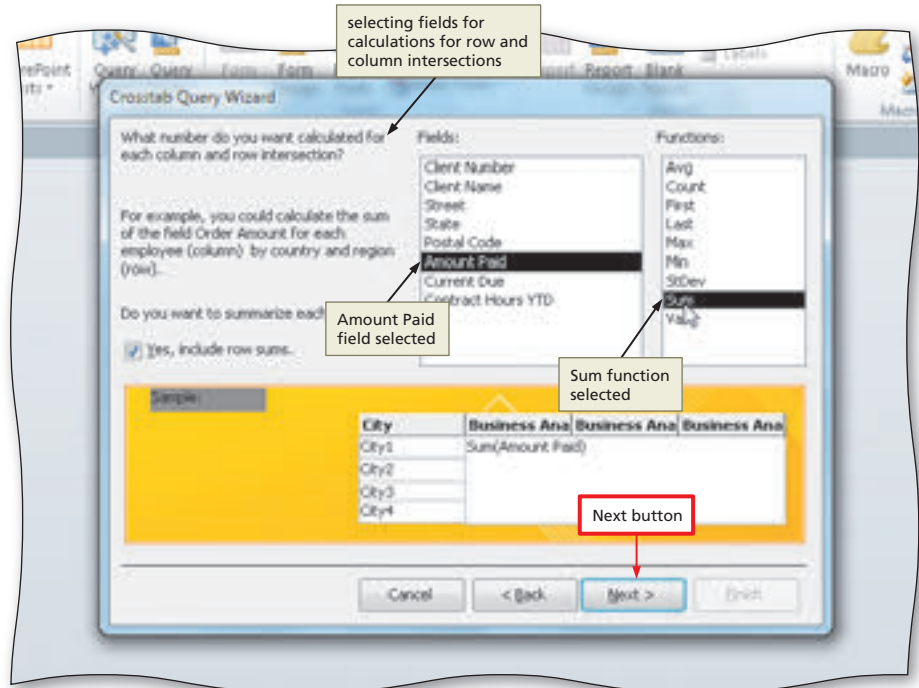

Figure 2–84

6

- Click the Next button to display the next Crosstab Query Wizard screen.
- Type **City-Analyst Crosstab** as the name of the query (Figure 2–85).

7

- Click the Finish button to produce the crosstab shown in Figure 2–79 on Page AC 123.
- Close the query.

Q&A If I want to view the crosstab at some future date, can I just open the query?
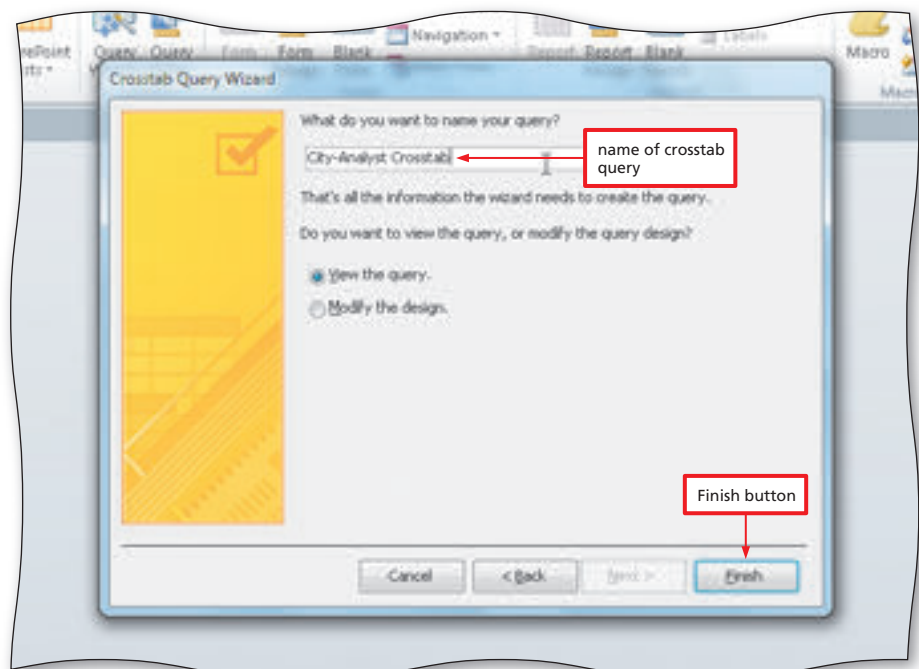
Yes.

Figure 2–85

To Customize the Navigation Pane

Currently, the entries in the Navigation Pane are organized by object type. That is, all the tables are together, all the queries are together, and so on. You might want to change the way the information is organized. For example, you might want to have the Navigation Pane organized by table, with all the queries, forms, and reports associated with a particular table appearing after the name of the table. You also can use the Search bar to restrict the objects that appear to only those that have a certain collection of characters in their name. For example, if you entered the letters, Cl, only those objects containing Cl somewhere within the name will be included.

The following steps change the organization of the Navigation Pane. They also use the Search bar to restrict the objects that appear.

1
- If necessary, click the Shutter Bar Open/Close Button to open the Navigation Pane.

- Click the Navigation Pane arrow to produce the Navigation Pane menu (Figure 2–86).

2
- Click Tables and Related Views to organize the Navigation Pane by table rather than by the type of object (Figure 2–87).

3
- Click the Navigation Pane arrow to produce the Navigation Pane menu.

- Click Object Type to once again organize the Navigation Pane by object type.
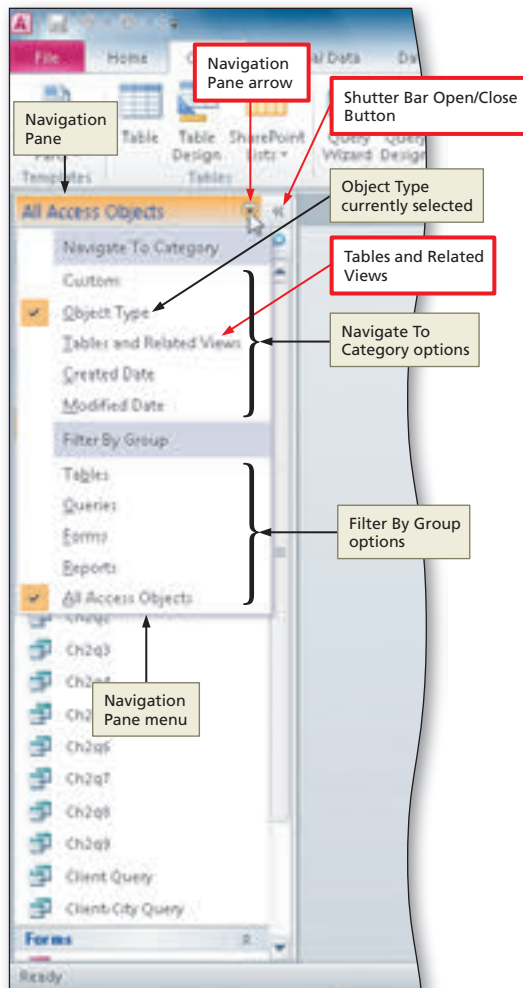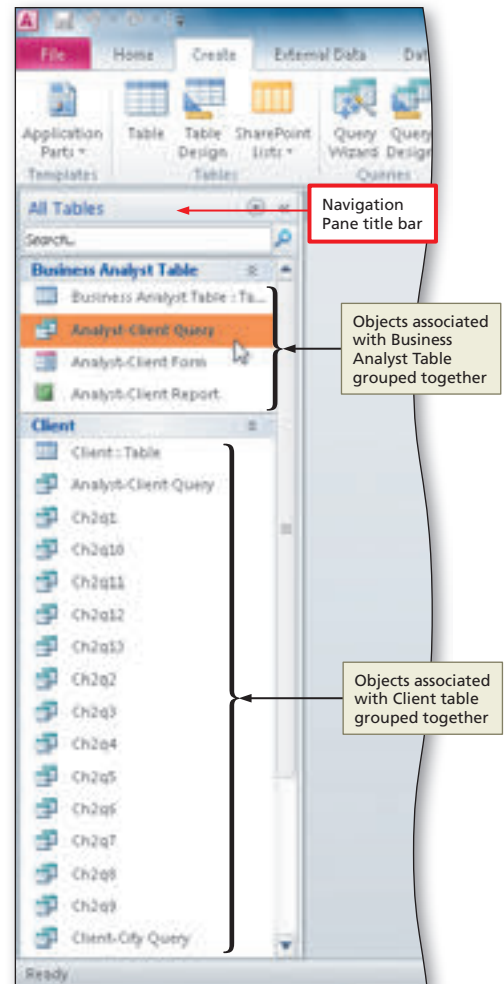
Figure 2–86

Figure 2–87

Experiment
- Select different Navigate To Category options to see the effect of the option. With each option you select, select different Filter By Group options to see the effect of the filtering. When you have finished experimenting, select the Object Type Navigate To Category option and the All Access Objects Filter By Group option.

4

- If the Search bar does not appear, right-click the Navigation Pane and click Search Bar on the shortcut menu.

- Click in the Search bar box to produce an insertion point.

- Type `Cl` as the search string to restrict the objects displayed to only those containing the desired string (Figure 2–88).

5

- Click the Clear Search String button to remove the search string and redisplay all objects.

Q&A

Did I have to click the button to redisplay all objects? Couldn't I have simply erased the current string to achieve the same result?

You didn't have to click the button. You could have used the DELETE or BACKSPACE keys to erase the current search string.
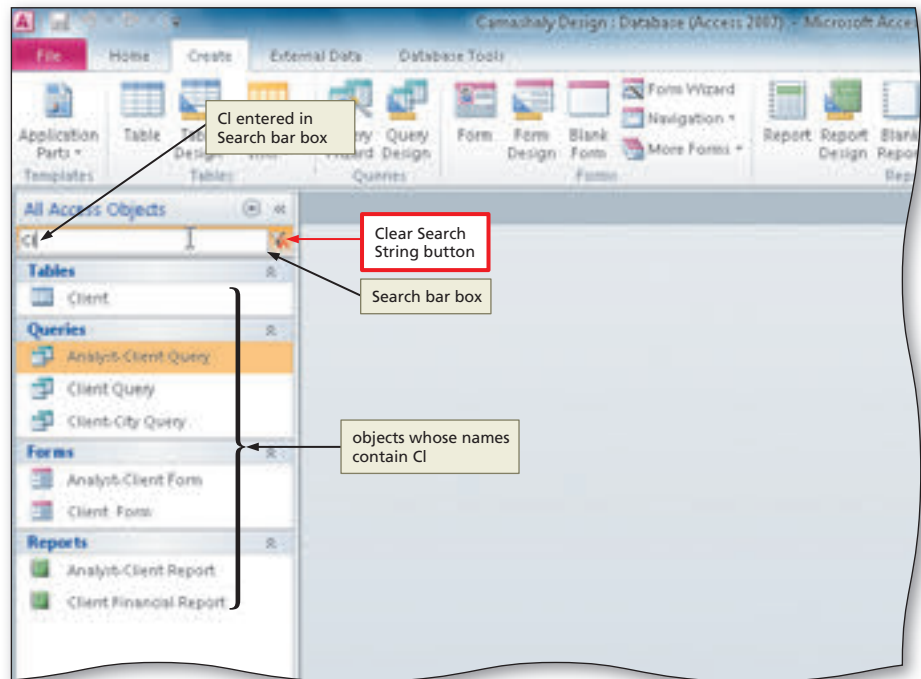
Figure 2–88

To Quit Access

The following steps quit Access.

1 Click the Close button on the right side of the title bar to quit Access.

2 If a Microsoft Access dialog box appears, click the Save button to save any changes made to the object since the last save.

Chapter Summary

In this chapter you have learned to create queries, enter fields, enter criteria, use text and numeric data in queries, use wildcards, use compound criteria, create parameter queries, sort data in queries, join tables in queries, perform calculations in queries, and create crosstab queries. You also learned to create a report and a form that used a query, to export a query, and to customize the Navigation Pane. The items listed below include all the new Access skills you have learned in this chapter.

1. Create a Query in Design View (AC 78)
2. Add Fields to the Design Grid (AC 79)
3. Use Text Data in a Criterion (AC 80)
4. Use a Wildcard (AC 83)
5. Use Criteria for a Field Not Included in the Results (AC 85)
6. Create and View a Parameter Query (AC 87)
7. Use a Parameter Query (AC 89)
8. Use a Number in a Criterion (AC 90)
9. Use a Comparison Operator in a Criterion (AC 91)
10. Use a Compound Criterion Involving AND (AC 92)
11. Use a Compound Criterion Involving OR (AC 93)
12. Clear the Design Grid (AC 95)
13. Sort Data in a Query (AC 96)
14. Omit Duplicates (AC 97)
15. Sort on Multiple Keys (AC 98)
16. Create a Top-Values Query (AC 99)
17. Join Tables (AC 102)
18. Change Join Properties (AC 105)
19. Create a Report Involving a Join (AC 106)

SAM If you have a SAM 2010 user profile, your instructor may have assigned an autogradable version of this assignment. If so, log into the SAM 2010 Web site at www.cengage.com/sam2010 to download the instruction and start files.

Learn It Online

Test your knowledge of chapter content and key terms.

Instructions: To complete the Learn It Online exercises, start your browser, click the Address bar, and then enter the Web address **scsite.com/ac2010/learn**. When the Access 2010 Learn It Online page is displayed, click the link for the exercise you want to complete and then read the instructions.

Chapter Reinforcement TF, MC, and SA
A series of true/false, multiple choice, and short answer questions that test your knowledge of the chapter content.

Flash Cards
An interactive learning environment where you identify chapter key terms associated with displayed definitions.

Practice Test
A series of multiple choice questions that test your knowledge of chapter content and key terms.

Who Wants To Be a Computer Genius?
An interactive game that challenges your knowledge of chapter content in the style of a television quiz show.

Wheel of Terms
An interactive game that challenges your knowledge of chapter key terms in the style of the television show *Wheel of Fortune*.

Crossword Puzzle Challenge
A crossword puzzle that challenges your knowledge of key terms presented in the chapter.

Apply Your Knowledge

Reinforce the skills and apply the concepts you learned in this chapter.

Using Wildcards in a Query, Creating a Parameter Query, Joining Tables, and Creating a Report
Instructions: Start Access. Open the Babbage CPA Firm database that you modified in Apply Your Knowledge in Chapter 1 on page AC 64. (If you did not complete this exercise, see your instructor for a copy of the modified database.)

Perform the following tasks:
1. Create a query for the Client table and add the Client Number, Client Name, City, and Amount Paid fields to the design grid. Find all clients who live in cities that start with Bu. Save the query as Apply 2 Step 1 Query.

Apply Your Knowledge *continued*

2. Create a query for the Client table and add the Client Number, Client Name, Bookkeeper Number, and Balance Due fields to the design grid. Sort the records in descending order by Balance Due. Add a criterion for the Bookkeeper Number field that allows the user to enter a different bookkeeper each time the query is run. Save the query as Apply 2 Step 2 Query.

3. Create a query that joins the Bookkeeper and the Client tables. Add the Bookkeeper Number, First Name, and Last Name fields from the Bookkeeper table and the Client Number and Client Name fields from the Client table. Sort the records in ascending order by Bookkeeper Number and Client Number. All bookkeepers should appear in the result, even if they currently have no clients. Save the query as Bookkeeper-Client Query.

4. Create the report shown in Figure 2–89. The report uses the Bookkeeper-Client Query.

Bookkeeper-Client Report

BKR #	First Name	Last Name	CL #	Client Name
22	Johanna	Lewes	A54	Afton Mills
22	Johanna	Lewes	D76	Dege Grocery
22	Johanna	Lewes	J77	Jones Plumbing
22	Johanna	Lewes	S56	SeeSaw Industries
24	Mario	Rodriguez	A62	Atlas Suppliers
24	Mario	Rodriguez	B26	Blake-Scripps
24	Mario	Rodriguez	G56	Grand Cleaners
24	Mario	Rodriguez	M26	Mohr Crafts
34	Choi	Wong	C29	Catering by Jenna
34	Choi	Wong	H21	Hill Shoes
34	Choi	Wong	T45	Tate Repair
34	Choi	Wong	W24	Woody Sporting Goods
38	Theresa	Sinthin		

Figure 2–89

5. Submit the revised database in the format specified by your instructor.
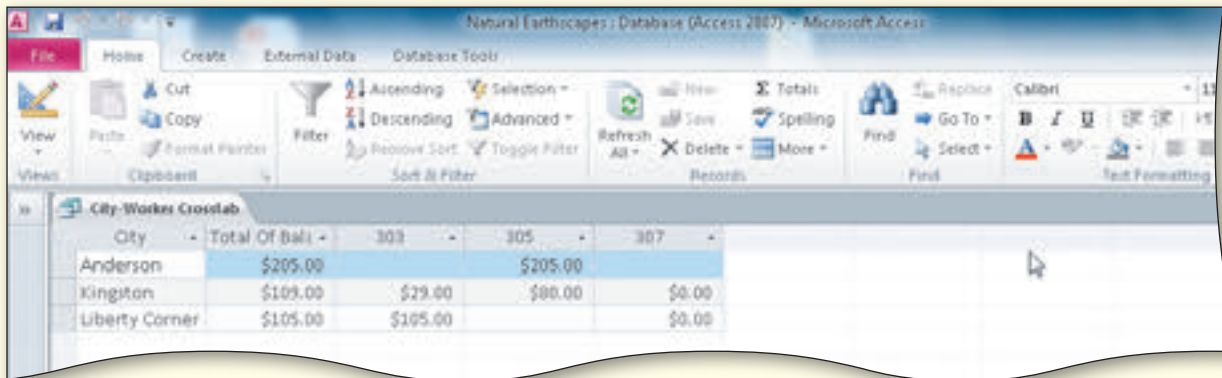
Extend Your Knowledge

Extend the skills you learned in this chapter and experiment with new skills. You may need to use Help to complete the assignment.

Creating Crosstab Queries, Creating Queries Using Criteria, and Exporting a Query

Instructions: Start Access. Open the Natural Earthscapes database. See the inside back cover of this book for instructions for downloading the Data Files for Students, or see your instructor for information on accessing the files required in this book.

Natural Earthscapes is a small landscaping company that specializes in landscaping with native plants. The owners have created an Access database in which to store information about the customers they serve and the workers they employ. You will create the crosstab shown in Figure 2–90. You also will query the database using specified criteria.

Figure 2–90

Perform the following tasks:

1. Create the crosstab query shown in Figure 2–90. The crosstab query groups the total of customers' balances by city and worker number.

2. Create a query to find all customers who do not live in Kingston. Include the Customer Number, Last Name, Balance, and Amount Paid fields in the design grid. Save the query as Extend 2 Step 2 Query.

3. Create a query to find all customers where the customer's first name is either Frances or Francis. Include the Customer Number, Last Name, First Name, Street, and City fields in the query results. Save the query as Extend 2 Step 3 Query.

4. Create a query to find all customers where the worker number is 303 or 305 and the balance is greater than $40.00. Include the Customer Number, Last Name, First Name, Balance, and Worker Number fields in the design grid. Use the IN operator in your query design. Save the query as Extend 2 Step 4 Query.

5. Export the City-Worker Crosstab as a Word file with the name City-Worker Crosstab.rtf and save the export steps.

6. Open the Customer table and change the balance for AB10 to $90.

7. Use the saved export steps to export the City-Worker Crosstab again. When asked if you want to replace the existing file, click Yes.

8. Change the database properties, as specified by your instructor. Submit the revised database and the exported RTF file in the format specified by your instructor.

Make It Right

Analyze a database and correct all errors and/or improve the design.

Correcting Errors in the Query Design

Instructions: Start Access. Open the Retired Pet Sitters database. See the inside back cover of this book for instructions for downloading the Data Files for Students, or see your instructor for information on accessing the files required in this book.

Make It Right *continued*

Retired Pet Sitters is a database maintained by a small pet-sitting business. The queries shown in Figure 2–91 contain a number of errors that need to be corrected before the queries run properly. The query shown in Figure 2–91a displays the query results in the proper order (Last Name, First Name, Balance, Sitter Number), but it is sorted incorrectly. The query results should be sorted by last name within sitter number in ascending order. Also, the caption for the Balance field should be Owed. Save the query with your changes.

When you try to run the query shown in Figure 2–91b, you get 0 results. You are trying to find all customers who live on Magee. Correct the error and save the query with your changes.

Figure 2–91 (a) Incorrect Sort Query

Figure 2–91 (b) Incorrect Criteria Query

Change the database properties, as specified by your instructor. Submit the revised database in the format specified by your instructor.

In the Lab

Design, create, modify, and/or use a database following the guidelines, concepts, and skills presented in this chapter. The assignments are listed in order of increasing difficulty.
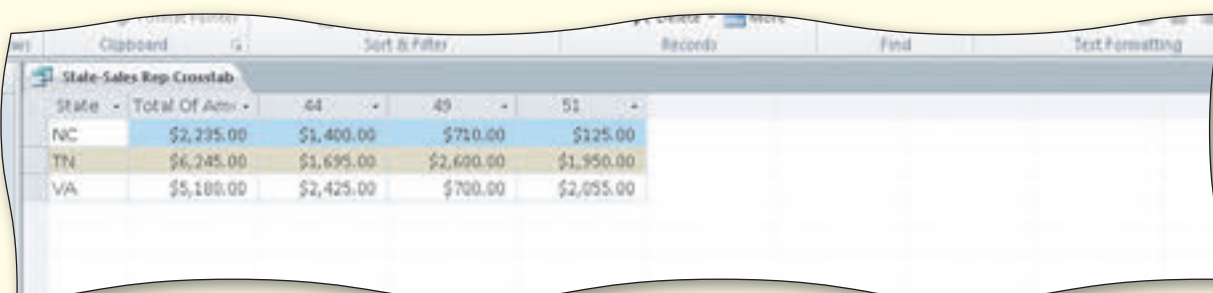
Lab 1: Querying the ECO Clothesline Database
Problem: The management of ECO Clothesline has determined a number of questions it wants the database management system to answer. You must obtain answers to the questions posed by management.

Instructions: Use the database modified in the In the Lab 1 of Chapter 1 on page AC 66 for this assignment, or see your instructor for information on accessing the files required for this book.

Perform the following tasks:

1. Open the ECO Clothesline database and create a new query for the Customer table that includes the Customer Number, Customer Name, Amount Paid, and Sales Rep Number fields in the design grid for all customers where the sales rep number is 49. Save the query as Lab 2-1 Step 1 Query.

2. Create a query that includes the Customer Number, Customer Name, and Amount Paid fields for all customers located in Virginia (VA) with a paid amount greater than $1,000.00. Save the query as Lab 2-1 Step 2 Query.

3. Create a query that includes the Customer Number, Customer Name, Street, and City fields for all customers whose names begin with T. Save the query as Lab 2-1 Step 3 Query.

4. Create a query that lists all cities in ascending order. Each city should appear only once. Save the query as Lab 2-1 Step 4 Query.

5. Create a query that allows the user to enter the city to search when the query is run. The query results should display the Customer Number, Customer Name, Balance, and Amount Paid fields. Test the query by searching for those records where the client is located in Ashton. Save the query as Lab 2-1 Step 5 Query.

6. Include the Customer Number, Customer Name, and Balance fields in the design grid. Sort the records in descending order by the Balance field. Display only the top 25 percent of the records in the query result. Save the query as Lab 2-1 Step 6 Query.

7. Join the Sales Rep and the Customer table. Include the Sales Rep Number, First Name, and Last Name fields from the Sales Rep table. Include the Customer Number, Customer Name, and Balance from the Customer table. Sort the records in ascending order by sales rep's last name and customer name. All sales reps should appear in the result even if they currently have no customers. Save the query as Lab 2-1 Step 7 Query.

8. Open the Lab 2-1 Step 7 Query in Design view and remove the Sales Rep table. Add the Amount Paid field to the design grid. Calculate the total of the balance and amount paid amounts. Assign the alias Total Amount to the calculated field. Change the caption for the Balance field to Due. Save the query as Lab 2-1 Step 8 Query.

9. Create a query to display the average balance amount for all customers. Save the query as Lab 2-1 Step 9 Query.

10. Create a query to display the average balance amount for sales rep 51. Save the query as Lab 2-1 Step 10 Query.

11. Create a query to display the average balance amount for each sales rep. Save the query as Lab 2-1 Step 11 Query.

12. Create the crosstab shown in Figure 2–92. The crosstab groups the total of customers' amount paid amounts by state and sales rep number. Save the crosstab as State-Sales Rep Crosstab.

13. Submit the revised database in the format specified by your instructor.

State	Total Of Am	44	49	51
NC	$2,235.00	$1,400.00	$710.00	$125.00
TN	$6,245.00	$1,695.00	$2,600.00	$1,950.00
VA	$5,180.00	$2,425.00	$700.00	$2,055.00

Figure 2–92

Property of Cengage Learning

In the Lab

Lab 2: Querying the Walburg Energy Alternatives Database

Problem: The manager of the Walburg Energy Alternatives store has determined a number of questions he wants the database management system to answer. You must obtain answers to the questions posed by the manager.

Instructions: Use the database created in the In the Lab 2 of Chapter 1 on page AC 67 for this assignment, or see your instructor for information on accessing the files required for this book.

Perform the following tasks:

1. Open the Walburg Energy Alternatives database and create a query that includes all fields and all records in the Item table. There should be only one column in the design grid. Name the query Lab 2-2 Step 1 Query.

2. Create a query that includes the Item Number, Description, Cost, and Vendor Code fields for all items where the vendor code is JM. Save the query as Lab 2-2 Step 2 Query.

3. Create a query that includes the Item Number and Description fields for all items where the description starts with the letters, En. Save the query as Lab 2-2 Step 3 Query.

4. Create a query that includes the Item Number and Description fields for all items with a cost less than $4.00. Save the query as Lab 2-2 Step 4 Query.

5. Create a query that includes the Item Number and Description fields for all items with a selling price greater than $20.00. Save the query as Lab 2-2 Step 5 Query.

6. Create a query that includes all fields for all items with a vendor code of AS and where the number on hand is fewer than 10. Save the query as Lab 2-2 Step 6 Query.

7. Create a query that includes all fields for all items that have a selling price greater than $10.00 or a vendor code of JM. Save the query as Lab 2-2 Step 7 Query.

8. Join the Vendor table and the Item table. Include the Vendor Code and Vendor Name fields from the Vendor table and the Item Number, Description, On Hand, and Cost fields from the Item table. Sort the records in ascending order by item number within vendor code. Save the query as Vendor-Item Query.

9. Create the form shown in Figure 2–93. The form uses the Vendor-Item Query.

Figure 2–93

Property of Cengage Learning

10. Create a query that includes the Item Number, Description, On Hand, and Cost fields. Calculate the inventory value (on hand*cost) for all records in the table. Assign the alias Inventory Value to the calculated field. Change the caption for the On Hand column to In Stock. Format the Inventory Value field as currency with two decimal places. Sort the records in descending order by inventory value. Save the query as Lab 2-2 Step 10 Query.

11. Create a query that calculates and displays the average cost of all items. Save the query as Lab 2-2 Step 11 Query.

12. Create a query that calculates and displays the average cost of items grouped by vendor code. Save the query as Lab 2-2 Step 12 Query.

13. Submit the revised database in the format specified by your instructor.

In the Lab

Lab 3: Querying the Philamar Training Database

Problem: The management of Philamar Training has determined a number of questions it wants the database management system to answer. You must obtain answers to the questions posed by management.

Instructions: Use the database created in the In the Lab 3 of Chapter 1 on page AC 70 for this assignment, or see your instructor for information on accessing the files required for this book. For Part 1 and Part 3, save each query using a format similar to the following: Lab 2-3 Part 1a Query, Lab 2-3 Part 3a Query, and so on. Submit the revised database and the Trainer-Client Query.xlsx file in the format specified by your instructor.

Instructions Part 1:   Create a new query for the Client table and include the Client Number, Client Name, Amount Paid, and Current Due fields in the design grid. Create queries that answer the following questions: (a) Which clients' names begin with F? (b) Which clients are located in Kingston? (c) Which clients have a current due amount of $0.00? (d) Which clients have an amount paid amount between $5,000.00 and $10,000.00? (e) Which two clients have the highest current due amounts? (f) For each client, what is the total of the current due and amount paid?

Instructions Part 2:   Join the Trainer and the Client table. In the design grid, include the Trainer Number, First Name, and Last Name from the Trainer table and the Client Number, Client Name, and Amount Paid from the Client table. Sort the records in ascending order by trainer number and client number. All trainers should appear in the result, even if they currently have no clients. Save the query as Trainer-Client Query. Export the query to Excel and save the export steps.

Instructions Part 3:   Create queries to calculate the following statistics: (a) What is the average current due amount for clients assigned to trainer 42? (b) What is the total current due amount for all clients? (c) What is the total amount paid for each trainer?

Cases and Places

Apply your creative thinking and problem solving skills to design and implement a solution.

Note: To complete these assignments, you may be required to use the Data Files for Students. See the inside back cover of this book for instructions on downloading the Data Files for Students, or contact your instructor for information about accessing the required files.

1: Querying the Chamber of Commerce Database

Academic

Use the Chamber of Commerce database you created in Cases and Places 1 in Chapter 1 on page AC 72 for this assignment. Use the concepts and techniques presented in this chapter to create queries for the following:

a. Find the advertiser name and address of all advertisers located on Main.

Cases and Places *continued*

b. Find the advertiser number, advertiser name, balance, and amount paid for all advertisers whose balance is greater than $300 or whose amount paid is $0.00.

c. Find the total of the balance and amount paid amounts for each advertiser. Show the advertiser number, advertiser name, and total amount. Sort the results in descending order by total.

d. Find the advertiser number, advertiser name, balance, and amount paid for all advertisers whose balance is between $200 and $500.

e. Create a parameter query for the Advertiser table that will allow the user to enter a different postal code each time the query is run. The user should see all fields in the query result.

f. Find the ad rep for each advertiser. List the ad rep number, last name, first name, advertiser number, advertiser name, and balance. Sort the results in ascending order by ad rep number and advertiser number.

g. Determine the total of the balance amounts and amount paid amounts for all advertisers.

Submit the revised database in the format specified by your instructor.

2: Querying the Consignment Database

Personal

Use the Consignment database you created in Cases and Places 2 in Chapter 1 on page AC 72 for this assignment. Use the concepts and techniques presented in this chapter to create queries for the following:

a. Find the item number and description of all items that contain the word, Table.

b. Find the item number, description, condition, and date of the item that has the earliest posting date.

c. Find the total price (price*quantity) of each item available for sale. Show the item number, item description, and total price.

d. Find the seller of each item. Show the seller's first name and last name as well as the item description, price, quantity, and date posted. Sort the results by item description within seller last name.

e. Create a report based on the query you created in Step d. Include all fields in the report.

f. Modify the query you created in Step d to restrict retrieval to those items with a price greater than $50.00.

g. Find all items posted between March 1, 2012, and March 4, 2012. The user should see all fields in the query result.

Submit the revised database in the format specified by your instructor.

3: Querying the Senior Care Database

Professional

Use the Senior Care database you created in Cases and Places 3 in Chapter 1 on page AC 72 for this assignment. Use the concepts and techniques presented in this chapter to create queries for the following:

a. Find the first name, last name, and address of all clients where the street name begins with the letter U.

b. Find the client number, last name, first name, balance, and amount paid for all clients whose balance is $0.00 or whose amount paid is $0.00.

c. Find the total of the balance and amount paid amounts for each client. Show the client number, client last name, client first name, and total amount. Sort the results in descending order by total.

d. Find the helper for each client. List the helper number, helper last name, helper first name, client number, client last name, and client first name. Sort the results in ascending order by helper number and client number.

e. Create a report for the query created in Step d. Include all fields except the helper first name in the report. Create a form for the query created in Step d.

f. Export the query created in Step d as a text file.

g. Find the highest and lowest balances.

Submit the exported text file and revised database in the format specified by your instructor.