Database Thre

# **2** Querying a Database



## **Objectives:**

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

- Create queries using the Simple Query Wizard
- Print query results
- Create queries using Design view
- Include fields in the design grid
- Use text and numeric data in criteria
- Create and use parameter queries
- Save a query and use the saved query

- Use compound criteria in queries
- Sort data in queries
- Join tables in queries
- Create a report from a query
- Perform calculations in queries
- Calculate statistics in queries
- Create crosstab queries
- Customize the Navigation pane

# **2** Querying a Database

# Introduction

A database management system such as Access offers many useful features, among them the capability of answering questions, the answers to which are found 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 such as those shown in Figure 2-1 and the following, which concern the data in the JSP Recruiters database:

- 1. What are the number, name, the amount paid, and the current due of client FD89?
- 2. Which clients' names begin with Be?
- 3. Which clients are located in Berridge?
- 4. Which clients have a current due of \$0.00?
- 5. Which clients have an amount paid that is more than \$20,000.00?
- 6. Which clients of recruiter 21 have an amount paid that is more than \$20,000.00?
- 7. In what cities are all the clients located?
- 8. What is the total amount (amount paid + current due) for each client?
- 9. What is the client number and name of each client, and what is the number and name of the recruiter to whom each client is assigned?

In addition to these questions, JSP Recruiters needs to find information about clients located in a specific city, but they want to enter a different city each time they ask the question. A parameter query would enable this. The agency also has a special way it wants to summarize data. A crosstab query will present the data in the desired form.

### Microsoft Office Access 2007



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 the Simple Query Wizard and Design view
- Use criteria in queries
- Create and use parameter queries
- Sort data in queries
- Join tables in queries
- Perform calculations in queries
- Create crosstab queries

Plan Ahead

### **Query Design Guidelines**

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 should 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 how the data is stored.
- 2. Identify restrictions. Unless the question or request calls for all records, determine the restrictions, that is, the conditions records must satisfy in order 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. Results of mathematical operations typically are not stored in the database because they can be calculated easily when necessary. 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 on 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 above decisions and/or actions are presented at appropriate points in the chapter.

# **Starting Access**

If you are using a computer to step through the project in this chapter and you want your screen to match the figures in this book, you should change your screen's resolution to  $1024 \times 768$ . For information about how to change a computer's resolution, read Appendix E.

### **To Start Access**

The following steps, which assume Windows is running, start Access.

- Click the Start button on the Windows taskbar to display the Start menu.
- Point to All Programs on the Start menu to display the All Programs submenu and then point to Microsoft Office on the All Programs submenu to display the Microsoft Office submenu.
- 3 Click Microsoft Office Access 2007 on the Microsoft Office submenu to start Access and display the Getting Started with Microsoft Office Access window.
- If the Access window is not maximized, click the Maximize button on its title bar to maximize the window.

### To Open a Database

In Chapter 1, you created your database on a USB flash drive using the file name, JSP Recruiters. There are two ways to open the file containing your database. If the file you created appears in the Recent Documents list, you can click it to open the file. If not, you can use the More button to open the file. The following steps use the More button to open the JSP Recruiters database from the USB flash drive.

- 1 With your USB flash drive connected to one of the computer's USB ports, click the More button to display the Open dialog box.
- 2 If necessary, click the Look in box arrow and then click UDISK 2.0 (E:) to select the USB flash drive in the Look in list as the new open location. (Your drive letter might be different.)
- 3 Click JSP Recruiters to select the file name.
- 4 Click the Open button to open the database.
- 5 If a Security Warning appears, click the Options button to display the Microsoft Office Security Options dialog box.
- 6 With the option button to enable this content selected, click the OK button to enable the content.

# **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.

### To Use the Simple Query Wizard to Create a Query

Once you have examined the question you wish to ask to determine the fields involved in the question, you can begin creating the query. If there are no restrictions involved in the query, nor any special order or calculations, you can use the Simple Query wizard. The following steps use the Simple Query wizard to create a query to display the number, name, and recruiter number of all clients.



Figure 2–2

Access Chapter 2

# 2

0&A

- Be sure Simple Query Wizard is selected, and then click the OK button to display the Simple Query Wizard dialog box (Figure 2–3).
- This looks like the screen I saw in the Report Wizard. Do I select fields in the same way?

Yes. In fact, you will see a similar screen in other wizards and you always select the fields just as you did in the Report Wizard.

Simple Query Wizard	Simple Query Wizard	onns Design	Kepore wizard Desig	gn   Wizard L	Design
dialog box	W.	Which fields do you You can choose from	want in your query? n more than one table or	query,	
Report Report Client table	Iables/Queries ► Table: Client Available: Fields:	Add Field button	selected fields (currently there are none)		
e sss Report hcial Report	Client Name Street Clipy State Postal Code Amount Paid Current Due		k		
	available fields	Cancel < Back	Next >	Einish	

Figure 2–3

#### 19-(24 - ) = JSP Recruiters : Database (Access 2 1 External Data Database Tools Home Create 8 only Client Number, Client Name, and Table Table Table Form Split Mult orm Repo Recruiter Number Templates Ite newlv Form sian Design fields are included created Ta query Client Query All Tables Client Numb -Client Name + Recruiter NL + Client 🛄 Client : Table AC34 Alys Clinic 21 Close 'Client Query' button **BH72** Berls Hospital 24 eP Client Query BL12 Benton Labs 24 -8 **Client Form** EA45 ENT Assoc. 27 F **Client Address Report** FD89 Ferb Dentistry 21 F **Client Financial Report** Family Health 24 FH22 Recruiter MH56 Maun Hospital 24 Recruiter : Table **PR11** Peel Radiology 21 Recruiter Address Report TC37 Tarleton Clinic 27 WL56 West Labs 24 Recruiter Financial Report \*

Figure 2–4

### B

- Click the Add Field button to add the Client Number field.
- Click the Add Field button a second time to add the Client Name field.
- Click the Recruiter Number field, and then click the Add Field button to add the Recruiter Number field.
- Click the Next button.
- Be sure the title of the query is Client Query.
- Click the Finish button to create the query (Figure 2–4).

### 4

### • Click the Close button for the Client Query to remove the query results from the screen.

If I want to use this query in the future, do I need to save the query?

Normally you would. The one exception is a query created by the wizard. The wizard automatically saves the query it creates.

### **Using 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, open it by right-clicking the query in the Navigation pane and clicking Open on the shortcut menu.
- To print the results with the query open, click the Office Button, point to Print on the Office button menu, and then click Quick Print on the Print submenu.
- If you want to change the design of the query, right-click the query and then click Design View on the shortcut menu to open the query in Design view.
- To print the query without first opening it, be sure the query is selected in the Navigation pane and then click the Office Button, point to Print on the Office button menu, and then click Quick Print on the Print submenu.

You can switch between views of a query by using the View button (Figure 2–5). Clicking the arrow at the bottom of the button produces the View button menu as shown in the figure. You then click the desired view in the menu. The two views you will use in this chapter are Datasheet view (see the results) and Design view (change the design). You also can click the top part of the 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.



Figure 2–5

### To Use a Criterion in a Query

1

After you have determined the fields to be included in a query, you will determine whether there are any restrictions on the records that are to be included. For example, you might only want to include those clients whose recruiter number is 24. In such a case, you need to enter the 24 as a criterion, which is a condition that the records to be included must satisfy. To do so, you will open the query in Design view, enter the criterion below the appropriate field, and then view the results of the query. The following steps enter a criterion to include only the clients of recruiter 24 and then view the query results.









Figure 2–7

### B

- Click the Criteria row in the Recruiter Number column of the grid, and then type 24 as the criterion (Figure 2-8).
- The Recruiter Number field is a Q & text field. Do I need to enclose the value for a text field in quotation marks?

You could, but it is not necessary, because Access inserts the quotation marks for you automatically.



Figure 2-8



# 5

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(Figure 2–9).

Could I click the View

Datasheet view?

- Close the Client Query window by clicking the Close 'Client Query' button.
- When asked if you want to save your changes, click the No button.
- If I saved the query, what would happen the next time I ran the query? 4
- Q& You would see only clients of recruiter 24.

### **Other Ways**

- 1. Click Run button on Ribbon
- 2. Click Datasheet View button on status bar

# Access Chapter 2

## To Print the Results of a Query

To print the results of a query, use the same techniques you learned in Chapter 1 on pages AC 41 and AC 42 to print the data in the table. The following steps print the current query results.

- 1 With the Client Query selected in the Navigation pane, click the Office Button.
- Point to Print on the Office button menu.
- Click Quick Print on the Print submenu.

### 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.

### 0

- Hide the Navigation pane.
- Click Create on the Ribbon to display the Create tab.
- Click the Query Design button to create a new query (Figure 2–10).
- Is it necessary
   to hide the
   Navigation pane?

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



Figure 2–10

(H + ) =

Create

field list

Client Number

**Client Name** 

Street

resized so all

fields appear

External Data

41

19-

Hom

ļ

Run

Query1

Client

Results

View

>>

### 2

- With the Client table selected, click the Add button in the Show Table dialog box to add the Client table to the query.
- Click the Close button in the Show Table dialog box to remove the dialog box from the screen.

**0**&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
- Drag the lower edge of the field box down far enough so all fields in the Client table appear (Figure 2–11).
- How do I drag the < Q & 1
  - lower edge?

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õ

start over.

list to add field City to design grid State Postal Code Amount Paid Current Due Recruiter Number **Vavigation Pane** drag lower design grid edge of field list to resize field list 4 ..... Field: position Table: to specify Sort: sort order Show: Criteria: or: position to enter criteria 4 Ready 🛃 start Microsoft Access - JS.

Query Tools

Design

Pass-Through

Data Definition

Show

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Database Tools

include asterisk (\*) in design grid to

display all fields in

query results

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field in field

end Undate Crosstab Delete

Query Type

JSP Recruiters : Database (Access 2007) - Microsoft Acc

≓ Insert Rows 🚹 Insert Columns

🗩 Delete Rows 📌 Delete Columns

Query Setup

Return: All

Te

### Figure 2–11

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.

### Is it essential that I resize the field box?

No. You can always scroll through the list of fields using the scroll bar. If you can resize the field box so all fields appear, it is usually more convenient.

### To Add Fields to the Design Grid

Once you have a new query displayed in Design view, you are ready to create the query by making entries in the design grid in the lower pane of the window. You add the fields you want included in 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 step includes the client number, client name, amount paid, and current due for all clients by adding only those fields in the design grid.

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

1

- What if I add the wrong field? 4 Š
- Click just above the field name Ô 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 Client Name field to the query.
  - Add the Amount Paid field to the query by double-clicking the Amount Paid field in the field list.
  - Add the Current Due field to the query (Figure 2-12).
- What if I want to include all
- 0 % 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.





# **Entering Criteria**

When you use queries, usually you are looking for those records that satisfy some criterion. In the simple query you created earlier, for example, you entered a criterion to restrict the records that were included to those on which the recruiter number was 24. In another query, you might want the name, amount paid, and current due amounts of the client whose number is FD89, for example, or of those clients whose names start with the letters, Be. 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 FD89, you first must add the Client Number field to the design grid. You then would type FD89 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 query the Client table and display the client number, client name, amount paid, and current due amount of client FD89.

### 1

2

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8 S

Click the View

button to display

the same effect?

most convenient.

- Click the Criteria row for the Client Number field to produce an insertion point.
- Type FD89 as the criterion (Figure 2-13).







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ABC Spe

#### View button - 1 -JSP Recruiters : Database (Access 2007) - Microsoft Acc 5 Create External Data Database Tools the query results (Figure 2–14). - New • 憲憲書 建建 /// • Calibri - 11 C I noticed that there is a View - Save View Refresh B I U A - 🕸 - 🖽 - 🖽 -1Ξ Ξ |ab/ button on both the Home tab and X Delete - 📰 Mo All the Design tab. Do they both have Rich Text Clipboard 😡 15 Views Font Records Query1 >> Client Numt 👻 Client Name 👻 Amount Paic 👻 Current Due 👻 Yes. Use whichever one you find FD89 Ferb Dentistry \$21,000.00 \$12,500.00 query results \* only client FD89 is included



### 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 Be\* represents the letters, Be, 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, such as Tim or Tom.

The following steps use a wildcard to find the number, name, and address of those clients whose names begin with Be. Because you do not know how many characters will follow the Be, the asterisk is appropriate.

# 0

- Click the View button to return to Design view.
- If necessary, click the Criteria row below the Client Number field to produce an insertion point.
- 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 Be\* as the criterion (Figure 2–15).







## 2

• View the query results by clicking the View button (Figure 2–16).

# 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.

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»	ġ	Query1						
		Client Numb	🝷 Client Name	📼 Amount Pair 👻	Current Due	-		
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		BL12	Benton Labs	\$16,500.00	\$38,225.0		ery results	
	*		1					
			names begin wi	th				
			Be are included					



### To Use Criteria for a Field Not Included in the Results

In some cases, you may have 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 Berridge. The criteria involve the City field, which is not one of the fields to be included 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 display the client number, client name, amount paid, and current due for clients located in Berridge.

- 0
- Click the View button to return to Design view.
- Erase the criterion in the Client Name field.
- Include the City field in the query.
- Type Berridge as the criterion for the City field (Figure 2–17).

		7.8		City field added		
Client Number	Client Name	Amount Paid	Current Due	City		
Client	Client	Client	Client	Client	Show check box for City field	
	₹			Berridge I		
	criterion for Client Name field erased			criterion for City field		

Figure 2–17

View	Run	Select Make Ap	pend Update Crosstab	Delete 2 Data Del	ough finition	Geiter Ro Selete R Selete R Builder C	wws 🕌 Insert C ows 🕊 Delete 👰 Return Query Setup	Columns Columns ; All •	
Nan							check mark rem from Show chec ndicating that field will not ap n query results	noved ck box City opear	_
	Field: Table:	Client Number Client	Client Name Client	Amount Paid Client	Current Due Client	City	it /		
	Sort:			<b>V</b>			r.	-	
	Snow; Criteria: or:					Ben	ridge 15		
	Criteria: or:					Access au adds quo	idge k		

Figure 2–18

# 0

### • Click the Show check box for the City field to remove the check mark (Figure 2–18).

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

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

# Access Chapter 2

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• View the query results (Figure 2–19).

### **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.

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Pane	*	Query1 Client Num AC34 FD89	t ▼ Clie Alys Fert	nt Name - s Clinic o Dentistry only client in Berridg included	Amount Paid \$0.0 \$21,000.0 ts located e are	<ul> <li>Current D</li> <li>\$17,50</li> <li>\$12,50</li> </ul>	ue + 0.00	query results	]		
Navigation											

Figure 2–19

# **Creating a Parameter Query**

If you wanted to find clients located in Fort Stewart rather than Berridge, you would either have to create a new query or modify the existing query by replacing Berridge with Fort Stewart 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 Berridge, you could enter Berridge as a criterion in the City field. From that point on, every time you ran the query, only the clients in Berridge 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 Berridge as the city and then see all the clients in Berridge. Later, the user could use the same query, but enter Fort Stewart as the city, and then see all the clients in Fort Stewart.

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, rather than a specific value, as the criterion. You create a parameter 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. For example, you could place [Enter City] as the criterion in the City field.

# Removing a Table from a Query

3

If you add the wrong table to a query or have an extra table in the query, you can remove it by right-clicking the field list for the table and then clicking Remove Table on the shortcut menu.

### To Create a Parameter Query

The following steps create a parameter query that prompts the user to enter a city, and then displays the client number, client name, amount paid, and current due for all clients located in that city.



- Return to Design view.
- Erase the current criterion in the City column, and then type [Enter City] as the new criterion (Figure 2–20).
- 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, for example, Access would search for records on which the city is Enter City.

# What if I typed a field name in the square brackets?

Access would simply use the value in that field. In order to create a parameter query, it is essential that the text typed in the square brackets not be a field name.

# 2

• Click the View button to display the Enter Parameter Value dialog box (Figure 2–21).

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Home	Create Exte	rnal Data Databa	ase Tools Design	b Jor Recruite	is . Database (Access 2007)	IVIICI USUIT ACC		
lew Run Results	Select Make Ap	pend Update Crossta Query Type	ab Delete	ough finition	G⊴Insert Rows 🕌 Insert Colui Delete Rows 🦉 Delete Colu Mulider Marketurn: Al Query Setup	mns Imns I •	Arroperty Sheet	
Query 1	<u> </u>							
C	fient * Client Number Client Name Street City State Postal Code Amount Paid							
	Current Due Recruiter Numbe	r			criterion for ci	ty		,
4 III	Current Due Recruiter Numbe	r Client Name	Amount Paid	Current Due	criterion for ci field changed to Enter City	ty		
Field:	Client Number Client	r Client Name Client	Amount Paid Client	Current Due Client	criterion for ci field changed to Enter City	ty		,
Field: Table: Soft: Show: Criteria: or	Client Number Client Number	r Client Name Client	Amount Paid Client	Current Due Client	criterion for ci field changed to Enter City Client Enter City	ty		
Field Table: Software Criteria: or:	Client Number Client Number Client	r Client Name Client	Amount Paid Client	Current Due Client	criterion for ci field changed to Enter City Client Enter City I tenter City Value enclosed in square brackets	ty		
Field: Table: Sort: Show. Criteria: or:	Client Number Client	r Client Name Client	Amount Paid Client	Current Due Client	criterion for ci field changed to Enter City Client Enter City I value enclosed in square brackets	ty I		
Field Table: Sort: Show: Criteria: ori	Client Number Client	r Client Name Client	Amount Paid Client	Current Due Client	criterion for ci field changed to Enter City Client Enter City Value enclosed in square brackets	ty		

Figure 2–20



Figure 2–21

# 8

• Type Fort Stewart as the parameter value in the Enter City text box and then click the OK button (Figure 2–22).

### 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.

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» 🗄	Query1					
	Client Numt 👻	Client Name 👻	Amount Paic 👻	Current Due	-	
	EA45	ENT Assoc.	\$12,750.00	\$15,000.00		uery results
	PR11	Peel Radiology	\$31,750.00	\$0.00		dery results
*		×				
		only clie in Fort S included	ents located Stewart are			

Figure 2–22

Each time you use this query, you will be asked to enter a city. Only clients in the city you enter will be included in the results.

### To Save a Query

In many cases, you will want to repeatedly use the queries you construct. By saving the query, you eliminate the need to repeat all your entries. The following steps save the query you just have created and assign it the name Client-City Query.

### 0

### • Click the Save button on the Quick Access Toolbar to open the Save As dialog box.

Can I also save from Design view? Yes, You can save the guery when

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.

• Type Client-City Query in the Query Name text box (Figure 2-23).

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-		Home Creat	te External Data	a Database To	ols				
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Vie *	w	Paste	B I U 🔺 -	<u></u> → <u></u> + <u></u>	- 1	1= 1=	aby Ref	resh X De	lete - 📰 N
View	NS	Clipboard 🖻		Font	k) الأ	Rich	Text	Re	cords
*	-	Query1					dialog box		
		Client Numt +	Client Name 👻	Amount Paic 👻	Current Du	ie 🔹	/	]	
		EA45	ENT Assoc.	\$12,750.00	\$15,000	.00 🖌	·		
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Figure 2–23



• Click the OK button to save the query (Figure 2–24).

### B

Other Ways 1. Right-click tab for query, click Save on

shortcut menu 2. Press CTRL+S

• Click the Close 'Client-City Query' button to close the query and remove it from the screen.



### To Use a Saved Query

Once you have saved a query, you can use and manipulate it at any time in the future by opening it. When you right-click the query in the Navigation pane, Access displays a shortcut menu containing commands that allow you to open and change the design of the query. You also can print the results by clicking the Office Button, pointing to Print on the Office button menu, and then clicking Quick Print on the Print submenu.

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. The following steps use the query named Client-City Query.



• Show 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 2–25).
- What would have happened if there were no parameters?

You would immediately see the results without needing to furnish any additional information.





### 2

- Type Fort Stewart in the Enter City text box, and then click the OK button to display the results using Fort Stewart as the city as shown in Figure 2–24.
- Click the Close 'Client-City Query' button, shown in Figure 2–24, to 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 display all clients whose current due amount is \$0.00.

- 0
- Hide the Navigation pane.
- Click Create on the Ribbon to display the Create tab.
- Click the Query Design button to create a new query.
- With the Client table selected, click the Add button in the Show Table dialog box to add the Client table to the query.
- Click the Close button in the Show Table dialog box to remove the dialog box from the screen.
- Drag the lower edge of the field box down far enough so all fields in the Client table 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 2–26).
- Do I need to enter a dollar sign and decimal point?

No. Access will interpret 0 as \$0.00, because the data type for the Current Due field is currency.

# 2

# • View the query results (Figure 2–27).



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 and decimal point.



Figure 2–26



Figure 2–27

### 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 find all clients whose amount paid is more than \$20,000.00.

1

- Return to Design view.
- Erase the 0 in the Current Due column.
- Type >20000 as the criterion for the Amount Paid field (Figure 2–28).





Figure 2–28

2

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

### 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 (>20000) in the Amount Paid field, and view the results.





# **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 \$20,000.00 and whose recruiter is recruiter 21.

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 \$20,000.00 or whose recruiter is recruiter 21. In this case, any client whose amount paid is greater than \$20,000.00 would be included in the answer, regardless of whether the client's recruiter is recruiter 21. Likewise, any client whose recruiter is recruiter 21 would be included, regardless of whether the client had an amount paid greater than \$20,000.00.

### The BETWEEN Operator

≥

The BETWEEN operator allows you to search for a range of values in one field. For example, to find all clients whose amount paid is between \$10,000 and \$20,000, you would enter Between 10000 and 20000 in the Criteria row for the Amount Paid field.

### To Use a Compound Criterion Involving AND

To combine criteria with AND, place the criteria on the same line. The following steps use an AND criterion to find those clients whose amount paid is greater than \$20,000.00 and whose recruiter is recruiter 21.

- 0
- Return to Design view.
- Include the Recruiter Number field in the query.
- Type 21 as the criterion for the Recruiter Number field (Figure 2–30).



Figure 2–30





# • View the query results (Figure 2–31).

### To Use a Compound Criterion Involving OR

To combine criteria with OR, the criteria must go on separate lines in the Criteria area of the grid. The following steps use an OR criterion to find those clients whose amount paid is greater than \$20,000.00 or whose recruiter is recruiter 21 (or both).

### 0

- Return to Design view.
- If necessary, click the Criteria entry for the Recruiter Number field and then use the BACKSPACE key or the DELETE key to erase the entry ("21").
- Click the or: row (the row below the Criteria row) for the Recruiter Number field and then type 21 as the entry (Figure 2–32).







• View the query results (Figure 2–33).



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Figure 2–33

Sorting AC 97

# Sorting

In some queries, the order in which the records appear really does not matter. 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 recruiter number. Further, within all the clients of any given recruiter, you might want them to be listed by amount paid from largest amount to smallest.

To order the records in the answer to a query 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 recruiter number), the more important field (Recruiter 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.

### Determine whether special order is required.

- 1. Determine whether sorting 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.
- 2. Determine the sort key(s). If sorting is required, identify the field or fields on which the results are to be sorted. Look for words such as "ordered by" or "sort the results by," both of which would indicate that the specified field is a sort key.
- 3. If using two sort keys, determine major and minor key. If you are using two sort keys, determine which one is more important. That will be the major key. Look for words such as "sort by amount paid within recruiter number," which imply that the overall order is by recruiter number. Thus, the Recruiter Number field would be the major sort key and the Amount Paid field would be the minor sort key.
- 4. 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.
- 5. **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.

Plan Ahead

### 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, that is, 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.

- Return to Design view.
- Click just above the Client Number column heading in the grid to select the column.
- 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 turns to a down-pointing arrow and then click again.
  - Hold the SHIFT key down and click just above the Recruiter Number column heading to select all the columns (Figure 2–34).

#### selected, clicking here while clicking here selects holding SHIFT key down selects all five columns first column Field: Client Number Client Name Amount Paid Current Due Recruiter Jumber Table: Client Client Client Client Client Sort Show $\checkmark$ V 2 riteria >20000 or "21' pressing DELETE key with all 4 columns selected clears the grid 💯 Microsoft Access - JS.

with first column already



### 2

1

• Press the DELETE key to clear the design grid.

### To Sort Data in a Query

If you have determined in the design process that a query is to be sorted, you must identify the sort key, that is, the field on which the results are to be sorted. In creating the query, 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.

 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 2–35).

	Field:	City			1	
Sort row	Table: Sort: Show: Criteria: or:	Client Ascending Descending (not sorted)	Sort row arrow Ascending sort order			
		available sort orders				

Figure 2–35

Access Chapter 2

# 2

• Click Ascending to select Ascending sort order (Figure 2–36).



Figure 2–36

# B

• View the query results (Figure 2–37).

### **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.
- Why do some cities appear more than once?

More than one client is located in those cities.

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	Mason						
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*							
	cities sorted in Ascending order						

Figure 2–37

### **To Omit Duplicates**

When you sort data, duplicates normally are included. In Figure 2–37 on the previous page, for example, Berridge appeared twice, as did Fort Stewart and Tarleton. These duplicates do not add any value, so you can 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 produce a sorted list of the cities in the Client table in which each city is listed only once.

0

• Return to Design view.

- Click the second field in the design grid (the empty field following City).
- If necessary, click Design on the Ribbon to display the Design tab.
- Click the Property Sheet button on the Design tab to display the property sheet (Figure 2–38).
- 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 2–38

# 2

 Click the Unique Values property box, and then click the arrow that appears to produce a menu of available choices for Unique Values (Figure 2–39).

- 17 - C1 oft Access Home Create External Data Database To Property Shee View Σ Close button for I.V 4 button Table Names property sheet Select Make Append Update Crosstab D View Run Totals Parameters Table Result: Query Type Show/Hide 🗐 Query1 × Property Sheet >> Selection type: Query Propertie . Unique Values Client **Unique Values** property box property box iption arrow 💡 Client Number Default view Datasheet Client Name Output All Fields No Street Top Values All select Yes to specify City Unique Values No unique values in State Unique Records Ves query results Postal Code Source Database No Amount Paid Source Connect St Current Due Record Loc menu of available Recordset T Recruiter Number choices for Unique ODBC Time Values property

Figure 2–39

# B



### **To Sort on Multiple Keys**

The following steps sort on multiple keys. Specifically, the data is to be sorted by amount paid (low to high) within recruiter number, which means that the Recruiter Number field is the major key and the Amount Paid field is the minor key.

### 0

- Return to Design view.
- Clear the design grid.
- Include the Client Number, Client Name, Recruiter Number, and Amount Paid fields in the query in this order.
- Select Ascending as the sort order for both the Recruiter Number field and the Amount Paid field (Figure 2–41).

Viev	v Run	Select Make Ap	pend Update Crosstab	Delete 🖉 Data Definit	tion Table ☆ Builder  Retu
» I	Query1	<u>\</u>	Quely type		Quely Secur
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Navigation Pane	4	of the t Recruit field wi because	wo sort keys, er Number II be major key e it is on the left	Recruiter Number field	Amount Paid field
	Field:	Client Number	Client Name Client	Recruiter Number	Amount Paid

Access Chapter 2

Figure 2–41

### 2

8 S

 View the guery results (Figure 2-42).

### Experiment

- Return to Design view and try other sort combinations for the **Recruiter Number and Amount** Paid fields, such as Ascending for **Recruiter 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.
- What if the Amount Paid field is to ∢ the left of the Recruiter Number?

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 recruiter number, but placed the Amount Paid field to the left of the Recruiter Number field, your results would be incorrect.

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	FD89	Ferb Dentistry	21	\$21,000.00	X	
	PR11	Peel Radiology	21	\$31,750.00		
	FH22	Family Health	24	\$0.00	) Ì	
	MH56	Maun Hospital	24	\$0.00		within group of clients
	WL56	West Labs	24	\$14,000.00	$\rightarrow$	number, rows are
	BL12	Benton Labs	24	\$16,500.00		sorted by amount paid
	BH72	Berls Hospital	24	\$29,200.00	) _	
	EA45	ENT Assoc.	27	\$12,750.00		
	TC37	Tarleton Clinic	27	\$18,750.00	<i></i>	
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### 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 show the first five records that were included in the results of the previous query.

### 1

• Return to Design view.

- If necessary, click Design on the Ribbon to display the Design tab.
- Click the Return box arrow on the Design tab to display the Return box menu (Figure 2-43).



Figure 2-43

# 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 2–44).

### B

- Close the query by clicking the Close 'Query1' button.
- When asked if you want to save your changes, click the No button.

Q&A 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 may very well 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

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	FD89	Ferb Dentistry	21	\$21,000.00	query	
	PR11	Peel Radiology	21	\$31,750.00	results	
	FH22	Family Health	24	\$0.00		
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Figure 2–44

your next query from scratch, which guarantees that the value is set back to All.

# **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 Recruiter tables, for example, both tables are required for the query. Such a query may require listing the number and name of each client along with the number and name of the client's recruiter. The client's name is in the Client table, whereas the recruiter's name is in the Recruiter table. Thus, this query cannot be completed using a single table; both the Client and Recruiter 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 2–45). In this example, you need to find records in the Client table and the Recruiter table that have the same value in the Recruiter Number fields.

Client table		
Client Number	Name	Recruiter Number
AC34	Alys Clinic	 21
BH72	Berls Hospital	 24
BL12	Benton Labs	 24
EA45	ENT Assoc.	 27
FD89	Ferb Dentistry	 21
FH22	Family Health	 24
MH56	Maun Hospital	 24
PR11	Peel Radiology	 21
TC37	Tarleton Clinic	 27
W/I 56	West Lahs	 24

### Join Types The type of

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.

### Join of Client and Recruiter tables

Client Number	Name	Recruiter Number	Last Name	First Name	
AC34	Alys Clinic	 21	Kerry	Alyssa	
BH72	Berls Hospital	 24	Reeves	Camden	
BL12	Benton Labs	 24	Reeves	Camden	
EA45	ENT Assoc.	 27	Fernandez	Jaime	
FD89	Ferb Dentistry	 21	Kerry	Alyssa	
FH22	Family Health	 24	Reeves	Camden	
MH56	Maun Hospital	 24	Reeves	Camden	
PR11	Peel Radiology	 21	Kerry	Alyssa	
TC37	Tarleton Clinic	 27	Fernandez	Jaime	
WL56	West Labs	 24	Reeves	Camden	

### Figure 2–45

The following are guidelines related to joining tables.

Plan Ahead

### Determine whether more than one table is required.

- 1. 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.
- 2. 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.

(continued)

Access Chapter 2

### (continued)

- 3. 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 Recruiter-Client Report is based on a query that joins the Recruiter and Client tables. The query is sorted by recruiter number and client number.
- 4. Determine restrictions. Examine the query or request to see if there are any special restrictions. For example, the query may only want clients whose current due amount is \$0.00.
- 5. 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. When two tables have fields with the same name, you also need to determine which table contains the field to be used in the query. For example, if you want to see all recruiters, even if they have no clients, then you should include the recruiter number from the Recruiter table in the design grid. If you want only records with identical values in matching fields, then it does not matter which matching field you select.

Plan Ahead

### **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. 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 Recruiter table to the query. Then, add the Client table to the query. A join line will appear connecting the Recruiter Number fields in the two field lists. This join line indicates how the tables are related; that is, linked through these matching fields. (If you fail to give the matching fields the same name, 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 new query, add the Client table, and then select the appropriate fields.



- Click Create on the Ribbon to display the Create tab.
- Click the Query Design button to create a new query.
- Click the Recruiter table in the Show Table dialog box to select the table.
- Click the Add button to add a field list for the Recruiter table to the query (Figure 2–46).



Figure 2–46

### 2

- Click the Client table in the Show Table dialog box.
- Click the Add button 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 field lists so all the fields in the Recruiter and Client tables appear (Figure 2–47).
- 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 and dragging to the other matching field.

# B

- In the design grid, include the Recruiter Number, Last Name, and First Name fields from the Recruiter table as well as the Client Number and Client Name fields from the Client table.
- Select Ascending as the sort order for both the Recruiter Number field and the Client Number field (Figure 2–48).



Figure 2–47



Figure 2–48





Figure 2–49

## To Save the Query

The following steps save the query.

## 0

- Click the Save button on the Quick Access Toolbar to display the Save As dialog box.
- Type Recruiter-Client Query as the query name (Figure 2-50).

### 2

• Click the OK button to save the query.

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	21	Kerry	Alyssa	AC34	Alys Clinic
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	21	Kerry	Alyssa	PR11	Alexa a
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	24	Reeves	Camder quer	y 12 Recid	
	24	Reeves	Camder	1122	OK Cancel
	24	Reeves	Camden	MH56	
	24	Reeves	Camden	WL56	West Labs
	27	Fernandez	Jaime	EA45	ENT A OK button
	27	Fernandez	Jaime	TC37	Tarleton Clinic
*					

Figure 2–50

### **To Change Join Properties**

Normally records that do not match do not appear in the results of a join query. A recruiter such as Jan Lee, for whom no clients currently exist, for example, would not appear. 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, of the query, as in the following steps.

### 1

- Return to Design view.
- Right-click the join line to produce a shortcut menu (Figure 2–51).
- 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 portion and right-click again.



Figure 2–51

# 2

- Click Join Properties on the shortcut menu to display the Join Properties dialog box (Figure 2–52).
- How do the options in the Join Properties dialog box match the various types of joins described earlier?

Option button 1 gives an inner join, option button 2 gives a left join, and option button 3 gives a right join.



Figure 2-52

# Access Chapter 2

# B

- Click option button 2 to include all records from the Recruiter table regardless of whether they match any clients.
- Click the OK button.
- View the query results by clicking the View button (Figure 2–53).
- Click the Save button on the Quick Access Toolbar.

### 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

• Close the Recruiter-Client Query by clicking the Close 'Recruiter-Client Query' button.

### To Create a Report Involving a Join

The following steps create the report shown in Figure 2–54. The records in the report are sorted (ordered) by Client Number within Recruiter Number. To ensure that the records appear in this order, the steps specify that the Recruiter Number and Client Number fields are sort keys.

Recruiter-C	Client Report			
Recruiter Number	Last Name	First Name	Client Number	Client Name
21	Kerry	Alyssa	AC34	Alys Clinic
21	Kerry	Alyssa	FD89	Ferb Dentistry
21	Kerry	Alyssa	PR11	Peel Radiology
24	Reeves	Camden	BH72	Berls Hospital
24	Reeves	Camden	BL12	Benton Labs
24	Reeves	Camden	FH22	Family Health
24	Reeves	Camden	MH56	Maun Hospital
24	Reeves	Camden	WL56	West Labs
27	Fernandez	Jaime	EA45	ENT Assoc.
27	Fernandez	Jaime	TC <sub>37</sub>	Tarleton Clinic
34	Lee	Jan		

	Recruiter-Clien	Query			There is a second se	
	Recruiter NL 🗸	Last Name 👻	First Name 👻	Client Numt -	Client Nam	Close 'Recruiter-
	21	Kerry	Alyssa	AC34	Alys Clinic	Client Query'
	21	Kerry	Alyssa	FD89	Ferb Dentis	button
	21	Kerry	Alyssa	PR11	Peel Radiolo	ogy
	24	Reeves	Camden	BH72	Berls Hospit	al query result
	24	Reeves	Camden	BL12	Benton Labs	queryresur
	24	Reeves	Camden	FH22	Family Healt	th
	24	Reeves	Camden	MH56	Maun Hospi	tal
	24	Reeves	Camden	WL56	West Labs	
	27	Fernandez	Jaime	EA45	ENT Assoc.	
	27	Fernandez	Jaime	TC37	Tarleton Clir	nic
2	34	Lee	Jan	×	4	
*						
Idvigatio	recrui includ thoug	ter 34 led even lh she has		client and n blank	number name are	

Figure 2–53

### 0

- Show the Navigation pane and be sure the Recruiter-Client Query is selected in the Navigation pane.
- I have two copies of
- Recruiter-Client Query. Does it matter which one I use?

No. There are two copies because the recruiter-Client Query involves two tables. It does not matter which one you select.

- Click Create on the Ribbon to display the Create tab.
- Click the Report Wizard button to display the Report Wizard dialog box (Figure 2–55).



Figure 2–55

External Data

Data

### 2

- Click the Add All Fields button to add all the fields in the Recruiter-Client Query.
- Click the Next button to display the next Report Wizard screen (Figure 2–56).

SharePoint Table Lists * Design	Image: Second
ry t Query	Report Wizard       Pthe         Do you want to add any grouping levels?       Recruiter Number, Last Name, First Name, Client Number, Client Name         Recruiter Number       >         Last Name       >         First Name       >
s Report al Report	Client Number Client Name Priority
ht Query ess Report cial Report	Grouping Options Cancel Agack Mext Einish
	Next button

Figure 2–56

# B

- 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.
- Be sure the Module style is selected.
- Click the Next button to display the next Report Wizard screen.
- Erase the current title, and then type Recruiter-Client Report as the new title.
- Click the Finish button to produce the report (Figure 2–57).

## 4

• Click the Close button for the Recruiter-Client Report to remove the report from the screen.

### **To Print a Report**

Once you have created a report, you can print it at any time. The layout will reflect the layout you created. The data in the report will always reflect current data. The following step prints the Recruiter-Client Report.

1 With the Recruiter-Client Report selected in the Navigation pane, click the Office Button, point to Print on the Office button menu, and then click Quick Print on the Print submenu to print the report.

	JSP Recruit	ters : Database (Access 2007	) - Microsoft Access	_ 6
ai	Show Margins Print Data Only Columns Columns	Zoom Pag preview of report	Refresh All Excel SharePoint List Data	Close Print Preview Close Preview
1	Recruiter-Client Report	Ļ	<u>k</u>	Close 'Recruiter-Client Report' button

### **Recruiter-Client Report**

21	Kerry	Alyssa	AC34	Alys Clinic
21	Kerry	Alyssa	FD89	Ferb Dentistry
21	Kerry	Alyssa	PR11	Peel Radiology
24	Reeves	Camden	BH72	Berls Hospital
24	Reeves	Camden	BL12	Benton Labs
24	Reeves	Camden	FH22	Family Health
24	Reeves	Camden	MH <sub>5</sub> 6	Maun Hospital
24	Reeves	Camden	WL <sub>5</sub> 6	West Labs
27	Fernandez	Jaime	EA45	ENT Assoc
27	Fernandez	Jaime	TC37	Tarleton Clinic
34	Lee	Jan		



### To Restrict the Records in a Join

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 \$20,000, but you do not want the Amount Paid field to appear in the results. 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 \$20,000.00, you will include >20000 as a criterion for the Amount Paid field.

40

The following steps modify the Recruiter-Client query to restrict the records that will be included in the join.

### 0

- Open the Recruiter-Client Query in Design view and hide the Navigation pane.
- Add the Amount Paid field to the query.
- Type >20000 as the criterion for the Amount Paid field and then click the Show check box for the Amount Paid field to remove the check mark (Figure 2–58).

		Amount field add	Paid led check ma removed	rk	•
st Name	Client Number	Client Name	Amount Paid		
ruiter	Client	Client	Client		
1.1	Ascending				54400
<b>v</b>			20000		
		criterion for Amount Paid field	amount paid must be greater than \$20,000		

Figure 2-58

(1 - ) = JSP Recruiters : Database (Access 2007) - Microsoft Acc Home Create External Data Database Tools ΣΤο ž. • 11 · 憲憲書 建建 // · Calibri đ ABC Sp View B I U - A - H - - -1 = 1 = | aby Refresh 🗙 Delete 🔹 🚟 M Clipboard G Font 5 **Rich Text** Records Recruiter-Client Query Recruiter NL - Last Name - First Name - Client Numt - Client Name -Ferb Dentistry 21 Kerry Alyssa FD89 clients whose Peel Radiology amount paid Kerry PR11 21 Alyssa is greater than \$20.000 24 Camden **BH72** Berls Hospital Reeves \* Pane

• View the query results (Figure 2–59).

### B

- Close the query by clicking the Close 'Recruiter-Client Query' button.
- When asked if you want to save your changes, click the No button.



# **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).

JSP Recruiters may want to know the total amount (amount paid plus 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**. A calculated field is an individual record calculation.

JSP also may want to calculate the average amount paid for the clients of each recruiter. That is, they want the average for the clients of recruiter 21, the average for the clients of recruiter 24, and so on. This type of calculation is called a group calculation, because it involves groups of records. In this example, the clients of recruiter 21 would form one group, the clients of recruiter 24 would be a second, and the clients of recruiter 27 form a third group.

The following are guidelines related to calculations in queries.

### Determine whether calculations are required.

- 1. 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."
- 2. 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.
- 3. 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.

### 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 (alias) for the calculated field, a colon, and then the expression in one of the columns in the Field row. Any fields included in the expression must be enclosed in square brackets []. For the total amount, for example, 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 steps on the next page use a calculated field to display the number, name, amount paid, current due, and the total amount for all clients.

### **Expression Builder**

≥

'n

Access includes a tool to help you create complex expressions. If you click Build on the shortcut menu (see Figure 2-60 on the next page), Access displays the Expression Builder dialog box. The dialog box includes an expression box, operator buttons, and expression elements. You use the expression box to build the expression. 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.

### Plan Ahead

### 0

- 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 2–60).

allows you to us Expression Build	Build
Build command	Paste
ber Client Name Amount Paid Current Due Client Client Client	Totals
included fields	insertion point in first open column

Figure 2-60

# 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 2-61).
- Do I always need to put squarebrackets 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 2-61

# B

• Click the OK button to enter the expression (Figure 2–62).



### 4

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

### 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, re-enter the original expression. Figure 2–62

	019	Tout		A	II - Delete -
		Font	1.0	Rich Text	Records
Client Numt -	Client Name 🗸	Amount Pair 👻	Current Due 🔹	Total Amour 🗸	
AC34	Alys Clinic	\$0.00	\$17,500.00	\$17,500.00	
BH72	Berls Hospital	\$29,200.00	\$0.00	\$29,200.00	
BL12	Benton Labs	\$16,500.00	\$38,225.00	\$54,725.00	query results
EA45	ENT Assoc.	\$12,750.00	\$15,000.00	\$27,750.00	
FD89	Ferb Dentistry	\$21,000.00	\$12,500.00	\$33,500.00	
FH22	Family Health	\$0.00	\$0.00	\$0.00	
MH56	Maun Hospital	\$0.00	\$43,025.00	\$43,025.00	
PR11	Peel Radiology	\$31,750.00	\$0.00	\$31,750.00	
TC37	Tarleton Clinic	\$18,750.00	\$31,500.00	\$50,250.00	
WL56	West Labs	\$14,000.00	\$0.00	\$14,000.00	
			Total Amoun field	t	results are calculate by adding the amount paid and th
	Clipboard '5 Query1 Client Numk • AC34 BH72 BL12 EA45 FD89 FH22 MH56 PR11 TC37 WL56	Clipboard F Query1 Client Numk • AG34 BH72 BH72 BH72 BH72 Berls Hospital BL12 Benton Labs EA45 ENT Assoc. FD89 Ferb Dentistry FH22 Family Health MH56 Maun Hospital PR11 Peel Radiology TC37 Tarleton Clinic WL56 West Labs	Query1FontQuery1Client Name -Client Numb -Client Name -C34Alys ClinicBH72Berls Hospital\$29,200,00BL12Benton Labs\$16,500,00EA45ENT Assoc.\$12,750,00FD89Ferb Dentistry\$21,000,00FH22Family Health\$0,00PR11Peel Radiology\$31,750,00TC37Tarleton Clinic\$14,000,00WL56West Labs\$14,000,00	Clipboard G         Font         Font           Query1         Client Numk •         Client Numk •         Current Due •           4:34         Alys Clinic         \$0.00         \$17,500.00           BH72         Berls Hospital         \$29,200.00         \$0.00           BL12         Benton Labs         \$16,500.00         \$38,225.00           EA45         ENT Assoc.         \$12,750.00         \$15,000.00           FD89         Ferb Dentistry         \$21,000.00         \$12,500.00           FH22         Family Health         \$0.00         \$0.00           MH56         Maun Hospital         \$0.00         \$0.00           TC37         Tarleton Clinic         \$18,750.00         \$31,500.00           WL56         West Labs         \$14,000.00         \$0.00           Musch         Sinter Sint	Clipboard G         Font         Rich Text           Query1         Client Numk •         Amount Pair •         Current Due •         Total Amour •           Alys Clinic         \$0.00         \$17,500.00         \$17,500.00           BH72         Berls Hospital         \$29,200.00         \$0.00         \$29,200.00           BL12         Benton Labs         \$16,500.00         \$38,225.00         \$54,725.00           EA45         ENT Assoc.         \$12,750.00         \$15,000.00         \$27,750.00           FD89         Ferb Dentistry         \$21,000.00         \$12,500.00         \$33,500.00           FH22         Family Health         \$0.00         \$0.00         \$0.00           MH56         Maun Hospital         \$0.00         \$43,025.00         \$31,750.00           PR11         Peel Radiology         \$31,750.00         \$31,500.00         \$50,250.00           WL56         West Labs         \$14,000.00         \$0.00         \$14,000.00



Instead of clicking Zoom on the shortcut menu, you can click Build. Access displays the Expression Builder dialog box that provides assistance in creating the expression. If you know the expression you will need, however, it is often easier to enter it using the Zoom command.

### **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.

### 0

- Return to Design view.
- 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 on the Design tab.
- Click the Caption box, and then type Paid as the caption (Figure 2–64).
- 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.

ta Databa	Qu ase Tools	eny Tools Design	JSP Recri	uiters : D gn tab	atabase (	Access 2	007) - Mic	crosof	t Access		but	tton	
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Query Type	e		Tab		Queŋ	/ Setup				Show/Hide	Close prope	button for rty sheet	
							Caption property	×	Propert Selectio General Descrip Format Decima Input N Captio Smart 1	y Sheet n type: Fiel Lookup otion : : : : : : : : ! ! ! ! ! ! ! ! ! ! !	ld Propert	Paid Paid ew value	Ĩ
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int Name int	Amount Pa Client	need Amou field	to select int Paid Current Du Client	e	Total Am	ount: (Amo	pui	*			fa	r Caption roperty	
int Name int	Amount Pa Client	need Amou field	to select int Paid Current Du Client	e	Total Am	ount: (Ama	our and a second	•			fdpr	r Caption roperty	
Int Name Int	Amount Pa Client	need Amou field	to select int Paid Current Du Client	e ]	Total Am	ount: (Amo		*			fd pr	operty	

Figure 2–64

# 2

- Close the property sheet by clicking its Close button.
- Click the Current Due field in the design grid, and then click the Property Sheet button on the Design tab.
- Click the Caption box, and then type Due as the caption.
- Close the Property Sheet by clicking its Close button.
- View the query results (Figure 2–65).

### B

- Click the Close 'Query1' button to close the query.
- When asked if you want to save your changes, click the No button.
- What would happen if I clicked the Yes button instead of the No button?

If you had saved the query, the changes you made to the properties would be saved in the database along with the query.

0	))	<b>u</b> ) • (u •	Ŧ	19	JSP Recruiters	: Database (Ad	ccess 2007) - Microsoft Acce
-	~	Home Creat	te External Data	Database To	ols		
	R	i i	Calibri	• 11 • 1		E (E )-	Save Spe
Vie	ws	Cliphoard G	B I <u>U</u> A ·	Eant cap	otions anged	Rich Text	All + X Delete + Mo Records
>>	F	Ouerv1			$\overline{}$	form form	
		Client Numt -	Client Name -	Paid 🗸	Due	- Total Amou	ir -
		AC34	Alys Clinic	\$0.00	\$17,500.00	\$17,500.	00
		BH72	Berls Hospital	\$29,200.00	\$0.00	\$29,200.	00
		BL12	Benton Labs	\$16,500.00	\$38,225.00	\$54,725.	00
		EA45	ENT Assoc.	\$12,750.00	\$15,000.00	\$27,750.	00
		FD89	Ferb Dentistry	\$21,000.00	\$12,500.00	\$33,500.	00
		FH22	Family Health	\$0.00	\$0.00	) \$0.	00
		MH56	Maun Hospital	\$0.00	\$43,025.00	\$43,025.	00
		PR11	Peel Radiology	\$31,750.00	\$0.00	\$31,750.	00
		TC37	Tarleton Clinic	\$18,750.00	\$31,500.00	\$50,250.	00
		WL56	West Labs	\$14,000.00	\$0.00	\$14,000.	00
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Figure 2–65

- **Other Ways**
- Right-click field in design grid, click Properties on shortcut menu

# **Calculating 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 routinely does not appear in the grid. To include it, click the Totals button on the Design tab.

### **To Calculate Statistics**

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



- If necessary, click Design on the Ribbon to display the Design tab.
- Add the Amount Paid field to the query.
- Click the Totals button on the Design tab to include the Total row in the design grid (Figure 2-66).



### 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 2–67).

City State Postal Code Amount Paid Current Due Recruiter Number **Navigation Pane** 4 ..... Total box Field: Amount Paid arrow Table: Client Total: Group By Sort: Group By now: Sum Total list Ava Avg Min or: (average) Max Count StDev Var First Last Expression Where Ready 🛃 start 💋 Microsoft Access - JS.

Figure 2–67

# 8

• Click Avg to indicate that Access is to calculate an average (Figure 2–68).



4

• View the query results (Figure 2–69).

# **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 average once again.



Figure 2–69

### **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 recruiter 21.

- 1
- Return to Design view.
- Include the Recruiter Number field in the design grid.
- Click the Total box arrow in the Recruiter Number column to produce a Total list (Figure 2–70).



Figure 2–70

- Click Where.
- Type 21 as the criterion for the Recruiter Number field (Figure 2–71).



Figure 2–71

• View the query results (Figure 2–72).



### **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 recruiter. You will want the average for the clients of recruiter 21, the average for clients of recruiter 24, and so on.

**Grouping** means creating groups of records that share some common characteristic. In grouping by Recruiter Number, for example, the clients of recruiter 21 would form one group, the clients of recruiter 24 would form a second, and the clients of recruiter 27 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 calculate the average amount paid for clients of each recruiter.

0

0&A

- Return to Design view and clear the design grid.
- Include the Recruiter 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 2–73).
- Why didn't I need to change the entry in the Total Row for the Recruiter Number field?

Group By currently is the entry in the Total row for the Recruiter Number field, which is correct; thus, it was not changed.



Figure 2–73

2

• View the query results (Figure 2–74).

### В

- Close the query.
- Do not save your changes.



Figure 2–74

### Certification

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The Microsoft Certified Application Specialist (MCAS) program provides an opportunity for you to obtain a valuable industry credential proof that you have the Access 2007 skills required by employers. For more information, see Appendix F or visit the Access 2007 Certification Web page (scsite.com/ac2007/cert).

### **Crosstab Queries**

Crosstab queries are useful for summarizing data. 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.

For example, if you have determined that a query must summarize the sum of the amounts paid grouped by both city and recruiter number, you could have cities as the row headings, that is, down the side. You could have recruiter numbers as the column headings, that is, across the top. The entries within the data sheet represent the total of the amounts paid. Figure 2–75 shows a crosstab in which the total of amount paid is grouped by both city and recruiter number with cities down the left-hand side and recruiter numbers across the top. For example, the entry in the row labeled Fort Stewart and in the column labeled 21 represents the total of the amount paid by all clients of recruiter 21 who are located in Fort Stewart.



Figure 2–75

## To Create a Crosstab Query

The following steps use the Crosstab Query wizard to create a crosstab query.

# 1

- Click Create on the Ribbon to display the Create tab.
- Click the Query Wizard button to display the New Query dialog box (Figure 2–76).



Figure 2–76

# 2

- Click Crosstab Query Wizard in the New Query dialog box.
- Click the OK button to display the Crosstab Query Wizard (Figure 2–77).

t Table Design	crosstab Query Wizard	Client ta selected	able Report Report Query Query N	lacro
	Which table or query contains the fields you want for the crosstab query results? To include fields from more than one table, create a query containing all the fields you need and then use this query to make the crosstab query. Tables option button selected	le: Client le: Recruiter list of available tables ew Tables	Queries O Both	
		Header1	Header2 Header3	
	Cancel	TOTAL	Next button	

Access Chapter 2

### B

4

• Click the Next button to

Wizard screen.

display the next Crosstab Query

Click the Recruiter Number field to

select the Recruiter Number field

for column headings (Figure 2–79).

- With the Tables option button selected and the Client table selected, 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 2–78).

	JSP Recruiters : Dat	abase (Access 2007) - Microsoft Access
External Data	Split Multiple	Form Report Report Query Query Macro
Design Cl v rn y S ir c C	rosstab Query Wizard Which fields' values do you want as ow headings? You can select up to three fields. Fielect fields in the order you want formation sorted. For example, you ould sort and group values by country and then Region. available fields	Add Field button Selected Fields: Client Number Client Name Street Street State Postal Code Amount Paid Current Due Recruiter Number
	Sample: each city will be a row heading	Header1     Header2     Header3       1     TOTAL       2     3       4     Next button
		Cancel < Back Next > Einish

Figure 2–78

JSP Recruiters : Database (Access 2007) - Microsoft Access External Data Database Tools PivotChart Labels selecting fields Blank Report BI for column t Table Repo Quenz Query Macro -Design headings Crosstab Query Wizard Which field's values do you want as Client Number column headings? Client Name Street State Recruiter Number For example, you would select Postal Code field selected Employee Name to see each Amount Paid employee's name as a column heading. Current Due Recruiter Numb each recruiter number will be a column heading Sample: City Recruiter Nur Recruiter Nur Recruiter Nur City1 TOTAL City2 City3 City4 Next button Cancel < <u>B</u>ack Next > Einish

### Figure 2–79

# Access Chapter 2

# 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 2-80).
- 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. If you mistakenly assigned it the Text data type for example, you would not see Sum in the list of available calculations.

# 6

- Click the Next button to display the next Crosstab Query Wizard screen.
- Type Client-Recruiter Crosstab as the name of the query (Figure 2-81).

### 7

- Click the Finish button to produce the crosstab shown in Figure 2-75 on page AC 122.
- Close the query.

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

External Data	JSP Recruits	selecting calculatio row and intersecti	fields for ros for column ons	t Access
Design	Crosstab Query Wizard What number do you want calceach column and row intersection For example, you could calculat of the field Order Amount for e employee (column) by country (row). Do you want to summari Yes, include row sum Sample:	e the sum ach and region	Fields: Client Number Client Name Street State Postal Code Amount Paid Current Due	Functions: Avg Count Sum First function Last selected Max Min StDev Sum Var
		City City1 City2 City3 City4	Recruiter Nur     Recruiter       Sum(Amount Paid)     Ne       Cel     < Back	xt button

### Figure 2–80





### To Customize the Navigation Pane

Currently the entries in the Navigation pane are organized by table. That is, the queries, forms, and reports associated with a particular table appear after the name of the table. In addition, all tables are included. You might want to change the way the information is organized. For example, you might wish to have all the queries appear together, all the forms appear together, and all the reports appear together, regardless of the table on which they are based. The following steps change the organization of the Navigation pane.



 Click Object Type to organize the Navigation pane by the type of object rather than by table (Figure 2–83).

### B

- Click the Navigation pane arrow to produce the Navigation pane menu.
- Click Tables and Related Views to once again organize the Navigation pane by table.

### **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 Tables and Related Views Navigate To Category option and the All Tables Filter By Group option.



Figure 2-82

Figure 2–83

### Quick Reference

≥

### For a table that lists how to complete the tasks covered in this book using the mouse, Ribbon, shortcut menu, and keyboard, see the Quick Reference Summary at the back of this book, or visit the Access 2007 Quick Reference Web page (scsite.com/ac2007/qr).

# **To Quit Access**

You saved all your changes and are ready to quit Access. The following step quits Access.

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

# **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, create crosstab queries, and customize the Navigation pane. The following list includes all the new Access skills you have learned in this chapter.

- 1. Start Access (AC 77)
- 2. Open a Database (AC 77)
- 3. Use the Simple Query Wizard to Create a Query (AC 78)
- 4. Use a Criterion in a Query (AC 81)
- 5. Print the Results of a Query (AC 83)
- 6. Create a Query in Design View (AC 83)
- 7. Add Fields to the Design Grid (AC 85)
- 8. Use Text Data in a Criterion (AC 86)
- 9. Use a Wildcard (AC 87)
- 10. Use Criteria for a Field Not Included in the Results (AC 88)
- 11. Create a Parameter Query (AC 90)
- 12. Save a Query (AC 91)
- 13. Use a Saved Query (AC 92)
- 14. Use a Number in a Criterion (AC 93)
- 15. Use a Comparison Operator in a Criterion (AC 94)
- 16. Use a Compound Criterion Involving AND (AC 95)
- 17. Use a Compound Criterion Involving OR (AC 96)

- 18. Clear the Design Grid (AC 98)
- 19. Sort Data in a Query (AC 98)
- 20. Omit Duplicates (AC 100)
- 21. Sort on Multiple Keys (AC 101)
- 22. Create a Top-Values Query (AC 102)
- 23. Join Tables (AC 105)
- 24. Save the Query (AC 107)
- 25. Change Join Properties (AC 108)
- 26. Create a Report Involving a Join (AC 109)
- 27. Print a Report (AC 111)
- 28. Restrict the Records in a Join (AC 112)
- 29. Use a Calculated Field in a Query (AC 113)
- 30. Change a Caption (AC 116)
- 31. Calculate Statistics (AC 118)
- 32. Use Criteria in Calculating Statistics (AC 120)
- 33. Use Grouping (AC 121)
- 34. Create a Crosstab Query (AC 123)
- 35. Customize the Navigation Pane (AC 126)
- 36. Quit Access (AC 127)



If you have a SAM user profile, you may have access to hands-on instruction, practice, and assessment. Log in to your SAM account (http://sam2007.course.com) to launch any assigned training activities or exams that relate to the skills covered in this chapter.

### 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/ac2007/learn. When the Access 2007 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 the Query Wizard, Creating a Parameter Query, Joining Tables, and Creating a Report

*Instructions:* Start Access. Open the The Bike Delivers 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. Use the Simple Query Wizard to create a query for the Customer table. Include the Customer Name, Balance, and Courier Number in the query. Assign the name, Customer Query, to the query.
- Create a query for the Customer table and add the Customer Number, Customer Name, Courier Number, and Balance fields to the design grid. Sort the records in descending order by Balance. Add a criterion for the Courier Number field that allows the user to enter a different courier each time the query is run. Save the query as Courier Parameter Query.
- 3. Create a query that joins the Courier and the Customer tables. Add the Courier Number, First Name, and Last Name fields from the Courier table and the Customer Number and Customer Name fields from the Customer table. Sort the records in ascending order by Courier Number and Customer Number. All couriers should appear in the result even if they currently have no customers. Save the query as Courier-Customer Query.
- 4. Create the report shown in Figure 2–84. The report uses the Courier-Customer Query.

			State State State					
ourier-Customer Report								
Courier Number	Customer Number	First Name	Last Name	Customer Name				
102	AS36	Chou	Dang	Asterman Ind.				
102	CJ16	Chou	Dang	CJ Gallery				
102	ME71	Chou	Dang	Mentor Group				
109	AU54	Michelle	Hyde	Author Books				
100	PL Q2	Mill	Hyde	shop				

Figure 2-84

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**

*Instructions:* Start Access. Open the Groom n Fluff 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.

Groom n Fluff is a small pet grooming business. The owner has created an Access database in which to store information about the customers she serves and the pet groomers she employs. You will create the crosstab query shown in Figure 2–85. You also will query the database using specified criteria.

Paste B Z U			All	• X Delete -	More *	Filter Toggle Filter
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All Tables 👻 🤘	📑 City_Groomer Cr	osstab				
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🛄 Customer : Table	Empeer	\$27.25	\$29.00	\$80.00	\$0.00	
City_Groomer Crosstab	Grant City	\$35.00	\$52.50		\$0.00	
<ul> <li>Compound Criteria Query</li> <li>Missing Values Query</li> </ul>	Portage	\$68.33		\$68.33		
Not Criteria Query						

Figure 2-85

#### Extend Your Knowledge continued

Perform the following tasks:

- 1. Create the crosstab query shown in Figure 2–85 on the previous page. The crosstab groups average of customers' balances by city and groomer number.
- 2. Create a query to find all customers who do not live in Grant City. Include the Customer Number, Last Name, and Balance fields in the design grid. Save the query as Not Criteria Query.
- Create a query to find all customers who do not have a telephone number. Include the Customer Number, Last Name, First Name, Street, and City fields in the query results. Save the query as Missing Values Query.
- 4. Create a query to find all customers whose balance is between \$20.00 and \$60.00. Include the Customer Number, Last Name, and Balance fields in the design grid. Save the query as Number Range Query.
- 5. Create a query to find all customers where the groomer number is 203 or 205 and the balance is greater than \$40.00. Include the Customer Number, Last Name, First Name, Balance, and Groomer Number fields in the design grid. Save the query as Compound Criteria Query.
- 6. Change the database properties, as specified by your instructor. Submit the revised database 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 Keep It Green 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.

Keep It Green is a database maintained by a small landscaping business. The queries shown in Figure 2–86 contain a number of errors that need to be corrected before the queries run properly. The sort query shown in Figure 2–86a displays the query results in the proper order (First Name, Last Name, Street, City) but it is sorted incorrectly. The query results should be sorted by last name within city in ascending order. Also the caption for the Street field should be Address. Save the query with your changes.

When you try to run the join query for the Keep It Green database, the message shown in Figure 2–86b appears. The query joins the Worker table and the Customer table. It also calculates the total amount for each customer. The query should be sorted in alphabetical order by worker last name and customer last name. Correct the error that is causing the message shown in Figure 2–86b and sort the records properly. Save the query with your changes.

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

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Figure 2-86

# In the Lab

Design, create, modify, and/or use a database following the guidelines, concepts, and skills presented in this chapter. Labs are listed in order of increasing difficulty.

### Lab 1: Querying the JMS TechWizards Database

*Problem:* The management of JMS TechWizards 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 1 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 JMS TechWizards database and create a new query for the Client table that includes the Client Number, Client Name, and Technician Number fields in the design grid for all clients where the technician number is 23. Save the query as Lab 2-1 Step 1 Query.
- 2. Create a query that includes the Client Number, Client Name, and Paid fields for all clients located in Liberty Corner with a paid amount greater than \$500.00. Save the query as Lab2-1 Step 2 Query.
- 3. Create a query that includes the Client Number, Client Name, Street, and City fields for all clients whose names begin with Gr. Save the query as Lab 2-1 Step 3 Query.
- 4. Create a query that lists all cities in descending 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 Client Number, Client Name, and Billed. Test the query by searching for those records where the client is located in Anderson. Save the query as Client-City Query.

In the Lab continued

- 6. Include the Client Number, Client Name, and Billed fields in the design grid. Sort the records in descending order by the Billed 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 Technician and the Client table. Include the Technician Number, First Name, and Last Name fields from the Technician table. Include the Client Number, Client Name, and Billed from the Client table. Sort the records in ascending order by technician's last name and client name. All technicians should appear in the result even if they currently have no clients. Save the query as Technician-Client query.
- 8. Open the Technician-Client query in Design view and remove the Client table. Add the Hourly Rate field to the design grid following the Last Name field. Calculate the number of hours each technician has worked (YTD Earnings/Hourly Rate). Assign the alias Hours Worked to the calculated field. Change the caption for the Hourly Rate field to Rate. Display hours worked as an integer (0 decimal places). Use the Save As command to save the query as Lab 2-1 Step 8 Query.
- 9. Create a query to display the average billed amount for all clients. Save the query as Lab 2-1 Step 9 Query.
- Create a query to count the number of clients for technician 23. Save the query as Lab 2-1 Step 10 Query.
- 11. Create a query to display the average billed amount for each technician. Save the query as Lab 2-1 Step 11 Query.
- 12. Create the crosstab shown in Figure 2–87. The crosstab groups total of clients' paid amounts by city and technician number. Save the crosstab as City-Technician

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

City-Technician	Crosstab			
City 👻	Total Of Paic 🕶	22 🔹	23 🔹	29 •
Anderson	\$1,005.00	\$255.00	\$0.00	\$750.00
Kingston	\$548.50	\$548.50	\$0.00	
Liberty Corner	\$565.00		\$565.00	



## In the Lab

instructor.

### Lab 2: Querying the Hockey Fan Zone Database

*Problem:* The management of the Hockey Fan Zone store 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 2 of Chapter 1 on page AC 68 for this assignment, or see your instructor for information on accessing the files required for this book. Perform the following tasks:

- 1. Open the Hockey Fan Zone database and use the query wizard to create a query that includes the Item Number, Description, On Hand, and Cost fields for all records in the Item table. Name the query Lab 2-2 Step 1 Query.
- 2. Create a query that includes the Item Number, Description, Cost, and Supplier Code fields for all products where the Supplier Code is LG. Save the query as Lab 2-2 Step 2 Query.

- 4. Create a query that includes the Item Number and Description field for all products with a cost less than \$5.00. Save the query as Lab 2-2 Step 4 Query.
- 5. Create a query that includes the Item Number and Description field for all products with a selling price greater than \$15.00. Save the query as Lab 2-2 Step 5 Query.
- 6. Create a query that includes all fields for all products with a selling price greater than \$10.00 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 products that have a selling price greater than \$15.00 or a supplier code of AC. Save the query as Lab 2-2 Step 7 Query.
- 8. Join the Supplier table and the Item table. Include the Supplier Code and Supplier Name fields from the Supplier table and the Item Number, Description, On Hand, and Cost fields from the Item table. Sort the records in ascending order by Supplier Code and Item Number. Save the query as Supplier-Item Query. Note that the Report Wizard limits the size of the On Hand column header because it is a number field.
- 9. Create the report shown in Figure 2–88. The report uses the Supplier-Item query and the Module style.

upplier-	Item Repor	+			
opplier	reentrepor				
Supplier Code	Item Number	Supplier Name	Description	Hand	Cost
AC	5923	Ace Clothes	Jersey	12	\$21.45
AC	7810	Ace Clothes	Tee Shirt	32	\$9.50
LG	3663	Logo Goods	Ball Cap	30	\$11.15
LG	4563	Logo Goods	Earrings	10	\$4.50
LG	4593	Logo Goods	Foam Finger	25	\$2.95
LG	7930	Logo Goods	Visor	9	\$11.95
MN	3683	Mary's Novelties	Bumper Sticker	50	\$0.95
MN	6189	Mary's Novelties	Koozies	35	\$2.00
MN	6343	Mary's Novelties	Note Cube	7	\$5.75



- 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. Change the caption for the On Hand column to In Stock. Format inventory value 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.
- 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 supplier code. Save the query as Lab 2-2 Step 12 Query.
- 13. Submit the revised database in the format specified by your instructor.

STUDENT ASSIGNMENTS

In the Lab continued

### In the Lab

### Lab 3: Querying the Ada Beauty Supply Database

*Problem:* The management of Ada Beauty Supply 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 69 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 in the format specified by your instructor.

*Instructions Part 1:* Create a new query for the Customer table and include the Customer Number, Customer Name, Balance, and Amount Paid fields in the design grid. Answer the following questions: (a) Which customers' names begin with C? (b) Which customers are located on Devon? (c) Which customers have a balance of \$0.00? (d) Which customers have a balance greater than \$200.00 and have an amount paid less than \$800.00? (e) Which two customers have the highest balances? (f) For each customer, what is the total of the balance and amount paid amounts?

*Instructions Part 2:* Join the Sales Rep and the Customer table. Include the Sales Rep Number, First Name, and Last Name from the Sales Rep table and the Customer Number, Customer Name, and Amount Paid from the Customer table in the design grid. Sort the records in ascending order by Sales Rep Number and Customer Number. All sales reps should appear in the result even if they currently have no customers. Save the query as Sales Rep-Customer Query.

*Instructions Part 3:* Calculate the following statistics: (a) What is the average balance for customers assigned to sales rep 44? (b) What is the total balance for all customers? (c) What is the total amount paid for each sales rep?

### **Cases and Places**

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

• Easier •• More Difficult

### • 1: Querying the Second Hand Goods Database

Use the Second Hand Goods database you created in Cases and Places 1 in Chapter 1 on page AC 71 for this assignment, or see your instructor for information on accessing the files required for this book. Create queries for the following:

- a. Find the number and description of all items that contain the word Table.
- b. Find the item number, description, and condition of the item that has the earliest posting date.
- c. Find the total price of each item available for sale. Show the 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 parameter query that will allow the user to enter an item description when the query is run. The user should see all fields in the query result.
- f. Find all items posted between April 1, 2008 and April 4, 2008. The user should see all fields in the query result.

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

### • 2: Querying the BeachCondo Rentals Database

Use the BeachCondo Rentals database you created in Cases and Places 2 in Chapter 1 on page AC 71 for this assignment, or see your instructor for information on accessing the files required for this book. Create queries for the following:

- a. Find all units that rent for less than \$1,000 per week and have at least two bedrooms. The user should see all fields in the query result.
- b. Find all units that are on the fourth floor. (Hint: The first digit of the Unit Number field indicates the floor.) Include the Unit Number and the Weekly Rate fields in the query result.
- c. Find all units that have more than one bedroom and more than one bathroom and provide linens. Include the Unit Number, Bedrooms, and Weekly Rate fields in the query result.
- d. Owner BE20 offers a 15 percent discount on the weekly rate if renters rent for more than one week. What is the discounted weekly rental rate for his units? Your result should include the unit number, bedrooms, bathrooms, sleeps, and discounted weekly rate in your result. Be sure the discounted rate appears as currency.
- e. List the owner's first and last name as well as telephone number. Also include the unit number and the weekly rate. All owners should appear in the result even if they currently have no rental units.
- f. Find the highest and lowest weekly rate.

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

### •• 3: Querying the Restaurant Database

Use the restaurant database you created in Cases and Places 3 in Chapter 1 on page AC 71 for this assignment, or see your instructor for information on accessing the files required for this book. Using the Plan Ahead guidelines presented in this chapter, determine at least five questions the conference director might want to ask the database. Using a word processing program, such as Microsoft Word, write the questions in your own words. Then, design the queries for Access. Run and save each query. Submit the Word document and the revised database in the format specified by your instructor.

Cases and Places continued

### •• 4: Designing Queries to Help in Your Job Search

### **Make It Personal**

Use the contacts database you created in Cases and Places 4 in Chapter 1 on page AC 71 for this assignment, or see your instructor for information on accessing the files required for this book. Consider your own personal job situation. What questions would you want to ask this database? Using a word processing program, such as Microsoft Word, write the questions in your own words. Can your database answer the questions that you listed? If it can, design the queries for Access. Run and save each query. In your Word document, identify which questions were posed to Access and which questions could not be answered. For questions that could not be answered, explain why your database cannot answer the question. Submit the Word document and the revised database in the format specified by your instructor.

### •• 5: Creating Queries to Analyze Data

### **Working Together**

Obtain a copy of the weather page of your local newspaper. As a team, choose 30 cities of interest. Create a database that contains one table and has five fields (City, State or Province, High Temp, Low Temp, Sky). Use the newspaper's abbreviations for Sky; for example, c for cloudy, r for rain and so on. Create queries that do the following:

- a. Display the five cities with the highest high temperatures.
- b. Calculate the difference between the high and low temperatures for each city.
- c. Display the average high and low temperature for all cities.
- d. List the states or provinces in your table. Each state or province should appear only once.

Write a one-page paper that explains what the team learned from querying the database and any conclusions you can draw about the data — for example, describe the Sky conditions for the cities with the least difference in high and low temperature. Submit the assignment in the format specified by your instructor.