UNIT K
Access 2010

Sorting Records in a Table

You can rearrange, or **sort**, the records in a table in alphabetical or numerical order. To perform a sort, you need to indicate the field on which you want Access to sort, then specify whether to sort the database in ascending order (alphabetically from A to Z or numerically from 0 to 9) or descending order (alphabetically from Z to A or numerically from 9 to 0). For example, in a customer database, you could sort records by the Sales field in descending order to quickly identify the customers who purchased the most products. You might also want to sort records using more than one field. For example, you might wish to sort primarily by state but also by customer name, so that the records for each state are grouped together, with customers listed in alphabetical order within each state grouping. [redacted] Serena asks you to create a sorted list that groups the records first by Rep ID and then, within each Rep ID grouping, by YTD Orders in descending order. First, you experiment with sorting in different ways.

STEPS

1. **Click the Shutter Bar Close button « in the Navigation Pane**
   The database window now displays the Customers table with all its fields in view. Just to experiment, you decide to sort the table in ascending order by customer name.
2. **Click any field in the Customer column**
   Before performing a sort, you need to select the field by which you want to sort.
3. **Click the Ascending button in the Sort & Filter group on the Home tab**
   The table is now sorted by customer name in alphabetical order, with Al's Sports Hut listed first. Notice that there is a small upward-pointing arrow to the right of the Customer column header, indicating that the table is sorted in ascending order by this field, as shown in Figure K-4.

QUICK TIP
If you select two columns in a table, click either the Ascending or the Descending button—Access will first sort the records in the left column, then sort the records in the right column.

4. **Click the Descending button in the Sort & Filter group on the Home tab**
   The table is now sorted by customer name in descending alphabetical order (Z to A), with Wilderness Outfitter listed first. Notice the downward-pointing arrow in the Customer column heading, indicating that the records in the table are sorted in descending order by this field.
5. **Click the Remove Sort button in the Sort & Filter group**
   The table is now ordered in its original order, with Country Goods listed first in the Customer column.
6. **Click any field in the YTD Orders column, then click the Descending button in the Sort & Filter group**
   The records are now sorted in descending order by year-to-date order amounts. You see that Hiking Emporium has purchased the most this year, with $75,764.00 in the YTD Orders field value text box.

QUICK TIP
To capture a screen shot of your sorted table after Step 7, follow the instructions in the yellow box below.

7. **Click any field in the Rep ID column, then click the Ascending button in the Sort & Filter group**
   The records in the Customers table are now sorted first by Rep ID in ascending order and then, within each Rep ID grouping, by YTD Order amounts in descending order, as shown in Figure K-5.
8. **Click the Remove Sort button in the Sort & Filter group**
   The table reverts to its original order.

Capturing a screen shot of your sorted table

Your instructor might ask you to capture a screen shot of the sorted Customers table and submit it. To do this, start Microsoft Word, click the Insert tab, click the Screenshot button, then click the image of the screenshot in the Available Windows menu. The screen shot of your sorted table is pasted into a new word document. Save this document as Unit K Screen Shots and submit it to your instructor. Click the Access program button on the taskbar to return to Access.

UNIT
K
Access 2010

Filtering Records in a Table

Just as you can apply a filter to an Excel worksheet to display only the information that you want to see, you can also apply a filter to an Access table to display only those records that meet criteria that you specify. **Criteria** are conditions that must be met for a record to be displayed. For example, you might want to filter a database to see only the records for customers who are located in Florida, or only those for customers who made a purchase within the past three months. The simplest way to filter a table is to select a field that matches your criterion (for instance, a State field containing FL), and then use the Equals command to display those records that match the selection. You can also apply a Number Filter to a selected field to filter records that are greater than, less than, or equal to a specific number, or between two different numbers. You cannot save a filter as a database object, but you can save it as part of the table or form you are working on and reapply it the next time. You can also print the results of a filter. [redacted] Serena needs you to print a list of customers whose year-to-date orders are greater than $5000 for sales rep Jose Garcia. You decide to apply filters to display records that meet these criteria.

STEPS

1. **Click a field in the Rep ID column containing the value R-1999**
   This Rep ID number (R-1999) is the ID number for Jose Garcia, a rep in the West region.
2. **Click the Selection button in the Sort & Filter group**
   The Selection menu opens and displays four commands. These commands let you filter records that are equal or not equal to the selected field value, or that do or do not contain the selected value.
3. **Click Equals "R-1999"**
   Seventeen records containing R-1999 in the Rep ID field appear in the datasheet window, as shown in Figure K-6. These records are all Jose Garcia's customers. Notice that a filter icon appears to the right of the Rep ID column heading, indicating that a filter is applied to this field.
4. **Click the Toggle Filter button in the Sort & Filter group**
   The filter is removed, and all the records in the table appear again. Clicking the Toggle Filter button once removes the filter; clicking it again reapplies it.
5. **Click the Toggle Filter button**
   The filter is reapplied, so that only the 17 customer records for rep R-1999 (Jose Garcia) appear.
6. **Click any value in the YTD Orders field, then click the Filter button in the Sort & Filter group**
   The Filter menu opens and displays commands for filtering and sorting records specific to the YTD Orders field. The bottom of the list displays all the specific values for the YTD Orders field, with check boxes next to each. To show only records with one of these specific values, you can click the check box next to that value. You want to display records that are greater than 5000, so you need to use a Number Filter command.
7. **Point to Number Filters in the Filter list, click Greater Than, type 5000 in the Custom Filter dialog box, compare your screen to Figure K-7, then click OK**
   The filtered list now shows ten records, with two filter criteria applied. All the records contain R-1999 in the Rep ID field, and all the values in the YTD Orders field are greater than 5000, as shown in Figure K-8.
8. **Click the Toggle Filter button, then save your changes**
   The filter is removed, and your changes are saved.

QUICK TIP
When a filter is applied to a table, the word "Filtered" appears in the record navigation bar; when you click the Toggle Filter button, the navigation bar displays "Unfiltered". If no filter is applied, the navigation bar displays "No filter".

QUICK TIP
To capture a screen shot of your filtered table after Step 7, follow the steps in the yellow box in the previous lesson.

UNIT K
Access 2010

Creating a Query Using the Query Wizard

All Sort & Filter + which fields, what order - save as Object - other

Filtering data in tables is helpful, but it has some limitations. For one thing, you cannot limit or change the order of the fields Access displays when you apply a filter. You also cannot save a filter. For greater flexibility and control, you need to use a query. A **query** is a database object that extracts data from one or more tables in a database according to criteria that you set. A query displays only the fields you specify. For instance, in a database that contains ten fields that store product information, you could create a query that displays only the fields for product names and prices. You can also use a query to pull together information from several tables. Because a query is an object, you can save it for later use. The simplest way to create a query is to use the Query Wizard. [redacted] Serena wants to see a view of the data that shows customer names, their state, and Rep ID numbers. To accomplish this, you decide to use the Query Wizard.

STEPS

1. **Click the Customers table Close button in the database window, then click the Shutter Bar Open button**

   You need to close a table before creating a query that is based on it. The Navigation Pane is now open.

2. **Click the Create tab, then click the Query Wizard button in the Queries group**

   The New Query dialog box opens, as shown in Figure K-9, where you select the type of Query Wizard you want to use. By default, Simple Query Wizard is selected. This wizard creates a **select query**, a query that retrieves or selects data from one or more tables or queries according to your criteria. This is the most commonly used type of query and is the one you want to create.

3. **Click OK**

   The Simple Query Wizard dialog box opens. First you need to specify the table or query from which you want to select fields for your query.

4. **Click the Table/Queries list arrow, then click Table: Customers**

   Notice that all the fields from the Customers table are listed in the Available Fields list. You now need to choose the fields you want from this list.

QUICK TIP
You can also select a field by double-clicking its name in the Available Fields list.

5. **Click Customer in the Available Fields list, then click the Select Single Field button**

   The Customer field moves to the Selected Fields list. You can move fields back and forth between the Available Fields list and the Selected Fields list using the buttons shown in Table K-1.

6. **Click State, click , click Rep ID, then click**

   Now the Customer, State, and Rep ID fields are listed in the Selected Fields area, as shown in Figure K-10.

7. **Click Next**

   In this dialog box, you specify a name for the query. Unless you specify otherwise, the Query Wizard will automatically name the query "Customers Query", which is currently in the text box.

QUICK TIP
Records resulting from a query look like a table but are actually a view based on the query.

8. **Select Query in the text box, type by State, then click Finish**

   The Query Wizard closes and the Customers by State query results appear in Datasheet view, showing the Customer, State, and Rep ID fields. Notice that the Customers by State query is now listed in the Navigation Pane below Sales Reps: Table, as shown in Figure K-11. This query contains only fields that Serena needs to see. She can now sort and apply filters to the query to get just the information she needs.

9. **Save your changes**

Live Data

Hide/Unhide columns Rt. Click

UNIT K
Access 2010

Modifying a Query in Design View

You can modify an existing query if you need to make changes to it using Design view. In Design view, you can add or delete fields, specify a sort order for one or more fields, or specify criteria for fields. You can also use Design view instead of Query Wizard to create a query. Serena asks you to modify the Customers by State query so that it includes the YTD Orders field. She also wants the results to be sorted by YTD Orders in descending order. In addition, she wants you to create another query based on the Customers by State query that displays customers in the state of California. You decide to create this new query in Design view.

STEPS

1. **Click the Home tab, then click the View button in the Views group**
   The database window displays the Customers by State query in Design view, and the Query Tools Design tab is active. In Design view, the database window is divided into two panes. The upper pane displays the Customers table field list. The lower pane is called the query design grid. You use the cells in this grid to specify fields and their criteria for the current query. The query design grid currently contains the three fields in the Customers by State query (Customer, State, and Rep ID). Notice that the check box in the Show cell under each field contains a check mark, indicating that these fields should be displayed in the query.

QUICK TIP
You can also add fields to the query design grid by dragging them from the field list.

2. **Scroll down the Customers table field list in the upper pane, then double-click YTD Orders**
   The YTD Orders field is now added to the query design grid and appears in the fourth column.
3. **Click the Sort cell for the YTD Orders field in the query design grid, click the Sort list arrow, then click Descending**
   See Figure K-12.
4. **Click the View button in the Results group**
   The query results appear in Datasheet view, and the records are sorted by the YTD Orders field in descending order. As you modify a query, it is convenient to switch back and forth between Design view and Datasheet view to see the modified query results, as shown in Figure K-13.
5. **Click the Save button on the Quick Access toolbar, then click the View button in the Views group**
   The changes you made to the Customers by State query are saved, and the query appears in Design view.

QUICK TIP
Criteria that you type are not case sensitive; typing "WA" in the Criteria cell displays records with "WA", "wa", "Wa", or "wA" in the State field.

6. **Click the Criteria cell for the State field in the query design grid, type ca, then press [Enter]**
   After you press [Enter], quotation marks appear around your entry. The criteria "ca" specifies that the query results should only display records that contain CA in the State field.
7. **Click the View button in the Results group**
   The query results appear in Datasheet view, as shown in Figure K-14. The results show seven records that contain CA in the State field. Notice that the records are sorted in descending order by YTD Orders.
8. **Click the File tab, click Save Object As, type California Customers in the Save 'Customers by State' to text box in the Save As dialog box, then click OK**
   The modified query is saved as California Customers and appears in the Navigation Pane below Customers: Table.
9. **Click the Home tab, then click the California Customers query Close button**
   The California Customers query closes.

Select the best answer from the list of choices.

13. **Which of the following cannot be saved as an object in Access?**
    - **a.** A query
    - **b.** A table
    - **c.** A form
    - **d.** A filter
14. **Which of the following shows how the Year 1 Sales field would appear in an expression?**
    - **a.** =Year 1 Sales
    - **b.** <Year 1 Sales>
    - **c.** [Year 1 Sales]
    - **d.** (Year 1 Sales)
15. **Which of the following is not possible to do in Query Design view?**
    - **a.** Specify a relationship between two fields in two tables.
    - **b.** Specify criteria for a field in a query.
    - **c.** Specify a sort order for one of the fields in the query.
    - **d.** Add a field to a query.
16. **To apply a filter that displays all the records that display Ohio in the State field, which of the following actions would you take?**
    - **a.** Click the Filter button, then type Ohio.
    - **b.** Click Ohio in the table, click the Selection button, then click Equals Ohio.
    - **c.** Click any field in the table, click the Selection button, then click Equals Ohio.
    - **d.** Click the State field name in the column heading, click the Selection button, then click Equals Ohio.
17. **Which of the following cannot be included in an expression?**
    - **a.** Fields
    - **b.** Mathematical operators
    - **c.** Field descriptions
    - **d.** Values
18. **Table A and Table B are related in a one-to-many relationship. Table A is on the "one" side of the relationship, and Table B is on the "many" side of the relationship. Which of the following statements about these tables is NOT true?**
    - **a.** In Table A, the shared field is the foreign key.
    - **b.** In Table B, the shared field is not the primary key field.
    - **c.** The shared field is the foreign key in Table B.
    - **d.** One record in Table A is related to many records in Table B.

Skills Review

1. **Open an existing database.**
    - **a.** Start Access.
    - **b.** Open the Data File K-2.accdb from the drive and folder where you store your Data Files. Specify to enable the content in the database.
    - **c.** Save the database as a new database with the name **K-Puzzle Universe.accdb**. Enable the content.
    - **d.** Open the Suppliers table in Datasheet view, and review the fields and records it contains. View the Products table in Datasheet view, and review its fields and records.
    - **e.** View each table in Design view. Note the number of fields in each table and the data type assigned to each.
    - **f.** Close the Suppliers table.
2. **Sort records in a table.**
    - **a.** View the Products table in Datasheet view. Close the Navigation Pane.
    - **b.** Sort the table by the Puzzle Name field in ascending order. What is the product ID of the first record in the sorted list? Reverse the sort order so that the records are sorted descending by Puzzle Name. What is the product ID of the first record now?
    - **c.** Clear all sorts, so that the records appear in their original order.
    - **d.** Sort the table by the Units Sold field in descending order. What is the Puzzle Name of the first record? Then sort the table by the Category field in ascending order. Now what is the Puzzle Name for the top record in the sorted list?
    - **e.** Select the first Puzzle ID value (11242), then type your name. Save your changes to the Products table. If your instructor asks you to provide a screen shot of your sort results, follow the instructions in the yellow box on page 248.

Skills Review (continued)

3. **Filter records in a table.**
   a. Apply a filter to the Products table to show only records that contain the field value **Cityscapes** in the Category field. How many records are displayed with the filter applied? What is the Puzzle Name of the first record?
   b. Remove the filter using a button on the Home tab.
   c. Apply a Number filter to show only records with values greater than 17500 in the Units Sold field. How many records are displayed with the filter applied? What is the Puzzle Name for the last record?
   d. Save your changes. If your instructor asks you to provide a screen shot of your sort results, follow the instructions in the yellow box on page 248. Remove the filter, then save your changes.
4. **Create a query using the Query Wizard.**
   a. Close the Products table, then open the Navigation Pane. Create a new query using the Simple Query Wizard.
   b. Base the query on the Products table, and include the Puzzle Name, Target Age Group, and Units Sold fields in the query.
   c. Name the query **Puzzles by Target Age Group**, then finish the Wizard and view the query results in Datasheet view.
   d. Sort the query in ascending order by the Target Age Group field.
   e. Save your changes.
5. **Modify a query in Design view.**
   a. View the Puzzles by Target Age Group query in Design view.
   b. Add the Category field to the query design grid.
   c. Set the sort order to **Descending** for the Units Sold field.
   d. Use the query design grid to enter the criteria **Nature** for the Category field.
   e. View the query results in Datasheet view. Use the Save Object As command on the File tab to save the modified query as **Nature Units Sold**. Compare your datasheet to Figure K-25.
   f. Close the Nature Units Sold query.

FIGURE K-25

Nature Units Sold

Puzzle Name	Target Age Group	Units Sold	Category
Volcano	8 and up	38765	Nature
Tornado	8 and up	26543	Nature
Grand Canyon	8 and up	15436	Nature
Sunset	8 and up	15436	Nature
Palm Trees	8 and up	13453	Nature
Rain Forest	8 and up	12975	Nature
Lake	8 and up	12098	Nature
Beach	8 and up	10234	Nature
*			

6. **Relate two tables.**
   a. Open the Relationships window.
   b. Add the Products table to the Relationships window, then add the Suppliers table to the Relationships window. Close the Show Tables dialog box.
   c. Drag the Supplier ID field from the Suppliers table to the Supplier ID field in the Products table.
   d. Specify to enforce referential integrity, then create the relationship.
   e. View the tables in the Relationships window, and make sure there is a one-to-many relationship set between the Supplier ID fields.
   f. Save your changes, then close the Relationships window.
7. **Create a query using two tables.**
   a. Create a new query in Query Design view.
   b. Use the Show Table dialog box to add the Suppliers table and the Products table to the upper pane of the query design window. Close the Show Table dialog box.
   c. Notice the relationship line between the Suppliers table and the Products table.
   d. Add the Puzzle Name and Units Sold fields from the Products table to the query design grid.
   e. Add the Supplier Name and Contact Email fields from the Suppliers table to the query design grid.
   f. In the Criteria cell for the Units Sold field, enter an operator and value that will return records with values greater than 20,000.

Skills Review (continued)

g. Set the Units Sold sort order to Descending.

h. View the query results in Datasheet view. Type your name in the first cell in the Puzzle Name field. Save the query as **Top Puzzles by Supplier**.

i. Compare your datasheet to Figure K-26. Close the query.

8. Add a calculated field to a table.

a. Open the Products table in Datasheet view, then close the Navigation Pane.

b. Add a calculated field to the table with the Currency data type.

c. In the Expression Builder dialog box, enter an expression that multiplies the Net Price field by the Units Sold field. (*Hint*: The multiplication operator is *.) Click OK to close the Expression Builder dialog box.

d. Enter the field name Total Revenue for the new field. Increase the width of the column so that the entire field name is visible.

e. Save your changes, close the Products table, then close the database. Exit Access. Submit your completed database to your instructor.

FIGURE K-26

Top Puzzles by Supplier

Puzzle Name	Units Sold	Supplier Name	Contact Email
Your Name	78976	Morales Paper	esme@planktonps.com
Saturn	78654	Choy Paper Products	linyau@choypaperproducts.com
Satellites	76456	Choy Paper Products	linyau@choypaperproducts.com
Truck	54667	Lee Industries	imoi@leeindustries.com
Cow	45876	Lee Industries	imoi@leeindustries.com
Volcano	38765	Lee Industries	imoi@leeindustries.com
Pizza	32765	Lee Industries	imoi@leeindustries.com
Fire Truck	28987	Lee Industries	imoi@leeindustries.com
Mona Lisa	28654	Korea Paper Traders	nancy@kpt.com
Boston	28377	Morales Paper	esme@planktonps.com
Airplane	27876	Lee Industries	imoi@leeindustries.com
Tornado	26543	Lee Industries	imoi@leeindustries.com
London	25654	Morales Paper	esme@planktonps.com
Chocolates	23667	Choy Paper Products	linyau@choypaperproducts.com
The Scream	20988	Korea Paper Traders	nancy@kpt.com

Independent Challenge 1

You work for Jorge Suarez, the director of the Bay Town Sports Camp. He recently hired you to help manage information about his campers and coaches. Applications for camp have just started coming in for the summer session. Jorge has created a database to manage the data about each counselor and camper. He wants you to answer some questions about the campers and counselors so that he can make appropriate plans for the summer session.

a. Start Access, then open the Data File **K-3.accdb** from the drive and folder where you store your Data Files. Enable the content in the database. Save the database as **K-Bay Town Sports Camp**, and enable the content. Open each table in the database, and review the fields and records of each.

b. View the Counselors table in Datasheet view. Replace **Johnson** in the Counselor Last Name field with your last name. Replace **Lamont** in the counselor First Name field with your first name. Save and close the Counselors table.

c. View the Campers table in Datasheet view, then sort the table by the Age field in ascending order. Then sort the Campers table in ascending order by Counselor ID.

d. Apply a filter to the Campers table so that only the campers for Counselor ID CO-110 are displayed. Apply a second filter to show only the campers who are 11 and under. (*Hint*: Use an appropriate number filter.) If your instructor asks you to provide a screen shot of your results, follow the instructions in the yellow box on page 248. Save your changes. Close the Campers table.

e. Create a simple query using the Query Wizard. Base the query on the Campers table, and include the fields Camper First Name, Camper Last Name, and Age. Name the query **Campers Query**. In Datasheet view, sort the query results in ascending order by the Camper Last Name field, and then by Age. Replace the first name of the first camper with your name. Save your changes.

Independent Challenge 1 (continued)

f. Open the Campers Query in Design view. Add the Counselor ID field to the query. Add appropriate criteria to one of the Sort cells in the query design grid specifying to show only the records containing 110 in the Counselor ID field. View the query results in Datasheet view, then save the modified query as **CO-110 Campers**. Close the query.

g. Open the Relationships window, then add the Counselors table and the Campers table to the window.

h. Drag the Counselor ID field from the Counselors table to the Counselors ID field in the Campers table. In the Edit Relationships dialog box, specify to enforce referential integrity, then create the relationship.

i. Save the layout of the relationship, then close the Relationships window.

j. Create a new query in Query Design view. Add the Counselors table and the Campers table to the grid. Use the appropriate tables to add the following fields to the query design grid in this order: Camper First Name, Camper Last Name, Age, Counselor First Name, Counselor Last Name, and Sport.

k. Set the sort order for the Age field to Ascending. Set the criteria for the Sport field to **Soccer**.

l. Save the query as **Soccer Campers**. View the query results in Datasheet view, then close the Soccer Campers query.

Advanced Challenge Exercise

- Create a new table, and save it as **Sports**. Change the ID field name to **Sport**, and apply the Text data type to it. Add a second field named **Cost**, then apply the Currency data type to it.
- Enter five records into the table using the following information:

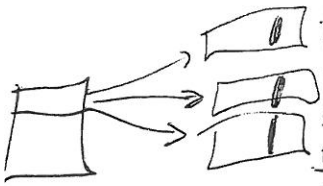
Sport	Cost
Baseball	$275
Gymnastics	$250
Soccer	$350
Tennis	$300
Volleyball	$250

- Close the table. Open the Relationships window, then set up a one-to-many relationship with the Sport field in the Sports table to the Sport field in the Counselors table. (Hint: Add the Sports table to the Relationships window. Drag the tables in the Relationships window so that the Sports table appears to the left of the Counselors table.) Specify to enforce referential integrity. Save the layout of the relationship, then close the Relationships window.
- Create a new query in Query Design view. Show the Sports, Counselors, and Campers tables (in that order). Add the Sport, Camper First Name, Camper Last Name, and Cost fields to the query design grid.
- Save the query as **Camper Payments Due**. View the query results in Datasheet view, then close the query.

m. Close the database, then exit Access. Submit your completed database to your instructor.

UNIT K
Access 2010

Relating Two Tables



To take advantage of the full power of Access, you sometimes want to create queries that pull fields from more than one table. For instance, the queries you created in the previous lesson pulled from a single table, the Customers table, but it would have been helpful also to include the Rep Last Name field from the Sales Reps table. This is possible if you first **relate** the two tables, or specify a relationship between them. To do so, your tables must share a common field, and that shared field must be the primary key field in one of the tables. You use the Relationships window to specify a relationship between two or more tables. The most common type of relationship to set up is a **one-to-many relationship**, in which the primary key field in one table is associated with multiple records in a second table. You need to specify a one-to-many relationship between the Sales Reps table and the Customers table so that you can create queries that pull fields from both tables.

STEPS

1. **Click the Database Tools tab, then click the Relationships button in the Relationships group**

   The Relationships window opens. It is currently empty, because there are no related tables or queries in this database. To set up relationships, you first need to choose the tables you want to relate.

2. **Click the Show Table button in the Relationships group**

   The Show Table dialog box opens, with the Tables tab in front and the Customers table selected, as shown in Figure K-15. You use this dialog box to add specific tables or queries to the Relationships window, so that you can specify relationships among them.

3. **Click Sales Reps, click Add, click Customers, click Add, then click Close**

   The Show Table dialog box closes, and the Relationships window displays the Sales Reps and Customers tables. Notice that in the Sales Reps table, the Rep ID field is the primary key field, but in the Customers table, the Rep ID field is *not* the primary key field. This is appropriate; in order to relate two tables, the shared field must be a primary key field in *only* the first table. In the second table, the common field shared with the first table is called the **foreign key**. To create a one-to-many relationship, you need to drag the primary key from the first table to the foreign key in the second table.

4. **Drag the Rep ID field from the Sales Reps table to the Rep ID field in the Customers table**

   The Edit Relationships dialog box opens. The current settings reflect the relationship you just specified by dragging. The Rep ID field from the Sales Reps table is on the left, and the Rep ID field from the Customers table is on the right. At the bottom, the Relationship Type is listed as One-To-Many. These settings are exactly what you want; one sales rep is associated with multiple customers, but each customer is associated with a single sales rep. Therefore, it makes sense to set up a one-to-many relationship with the Rep ID field in the Sales Reps table on the "one" side of the relationship, and the Rep ID field in the Customers table on the "many" side.

5. **Click the Enforce Referential Integrity check box to add a check mark**

   Selecting this check box tells Access to reject any attempts to enter data that would be inconsistent. For instance, if a user entered "55" as a Rep ID number in the Customers table, Access would reject the entry because that Rep ID number does not exist in the Sales Reps table. See Figure K-16.

6. **Click Create**

   A relationship line now connects the Rep ID field in the Sales Reps table and the Rep ID field in the Customers table, as shown in Figure K-17. Note that there is a 1 at the top of the line and an infinity symbol at the bottom of the line, indicating that these two fields have a one-to-many relationship.

7. **Click the Save button on the Quick Access toolbar, then click the Close button in the Relationships group**

QUICK TIP
When you make changes to the relationships in a database, you need to save your changes.

UNIT K
Access 2010

Creating a Query Using Two Tables

Setting up relationships between tables offers many advantages. One is that you can create a query that pulls fields from two or more related tables. Also, if you specify to enforce referential integrity in related tables, any changes you make to fields in one table are instantly reflected in all related tables or queries that contain that field. This is a huge benefit and ensures that the data in your database is consistent. Setting up table relationships also ensures that your data is valid and accurate. Access will prohibit any attempt to enter data in the foreign key field that is not consistent with the data in the primary key field. [redacted] Serena would like a view of the data that shows customers whose year-to-date orders exceed $10,000. Because you have set up a one-to-many relationship between the Sales Reps table and the Customers table, you can create a query that contains the information Serena needs.

STEPS

1. **Click the Create tab, then click the Query Design button in the Queries group**
   A new blank query opens in Design view, and the Show Table dialog box opens with the Customers table selected.

TROUBLE
If the Show Table dialog box is covering the field lists, drag its title bar to a new location.

2. **On the Tables tab of the Show Table dialog box, click Sales Reps, click Add, click Customers, click Add compare your screen to Figure K-18, then click Close**
   The field lists for the Sales Reps table and the Customers table appear. Notice that the relationship you created between the Rep ID field in the Sales Reps table and the Rep ID field in the Customers table is shown.

QUICK TIP
To delete a field from a query, click anywhere in the field column in the query design grid, then click the Delete Columns button in the Query Setup group.

3. **In the Sales Reps field list, double-click Rep Last Name, then double-click Region**
   The Rep Last Name and Region fields are added to the query design grid.

4. **In the Customers field list, double-click Customer, double-click State, then double-click YTD Orders**

QUICK TIP
To specify multiple criteria for a field, type additional criteria in the Or cell for that field in the query design grid; results will include any records that match either the Criteria cell contents or the Or cell contents.

5. **Click the Sort cell for the YTD Orders field, click the Sort list arrow, then click Descending**

6. **Click in the Criteria cell for the YTD Orders field, then type >10000**
   This criteria specifies that the query results should only display records whose YTD Sales field value is greater than 10,000. The greater than symbol (>) is one type of operator you can use in the Criteria cell to return the query results that you want. Table K-2 displays useful comparison operators.

7. **Click the Sort cell for the Rep Last Name field, click the Sort list arrow, click Ascending, then compare your screen to Figure K-19**

QUICK TIP
You can also view query results by clicking the Run button in the Results group in Design view.

8. **Click the View button in the Results group**
   The query results appear in Datasheet view, as shown in Figure K-20. You can see that the results are grouped first by Rep Last Name in alphabetical order, then by YTD Orders in descending order.

9. **Click the Save button on the Quick Access toolbar, type Top Customers by Rep in the Save As dialog box, click OK, then close the Top Customers by Rep query**
   The query is saved as Top Customers by Rep and appears in the Navigation Pane. It appears in both the Customers grouping and the Sales Reps grouping because it contains fields from both of these tables.

Group By
Rep Last Name
Region

Region
State

UNIT K
Access 2010

Adding a Calculated Field to a Table

You might want to add a calculated field to a table if the table contains values. A **calculated field** is a field that contains an **expression**, which is a combination of fields, values, and mathematical operators (similar to a formula). A calculated field is useful when you want to show the results of calculations based on values in certain fields. For instance, in a products table that contains a field for net price, you could add a calculated field for determining the sales tax; the expression would multiply the Net Price field by .08 (or the appropriate tax percentage). Calculated fields have the Calculated data type. Choosing a Calculated data type opens the Expression Builder dialog box, where you can easily build the expression you want by specifying fields, values, and operators. [redacted] Serena asks that you add a field to the Customers table that shows the total orders for each customer. You need to create a calculated field that adds the Prior Year Orders field to the YTD Orders field.

STEPS

1. **Open the Customers table in Datasheet view, then click the Shutter Bar Close button**
   The Customers table opens in Datasheet view.
2. **Scroll to the right until you see the last field in the table and the blank field to the right of it**
3. **Click Click to Add, point to Calculated Field, as shown in Figure K-21, then click Currency**
   The Expression Builder dialog box opens, which lets you build the expression using fields, values, and mathematical operators. You need to build an expression that sums the Prior Year Orders field and the YTD Orders field.

QUICK TIP
Unlike Excel formulas, expressions do not start with an equal sign (=).

4. **Double-click Prior Year Orders in the Expression Categories section**
   The Prior Year Orders field appears in the top part of the dialog box in brackets. This field is the first part of your expression. Next you need to enter the addition operator.
5. **Type +**
   You typed the plus sign (the addition operator). You can now add the YTD Orders field to complete the expression.

QUICK TIP
Note that a calculated field in a table can only include field references to fields in that table.

6. **Double-click YTD Orders in the Expression Categories section**
   The top section of the dialog box shows the completed expression, as shown in Figure K-22.
7. **Click OK**
   The new column (next to Prior Year Orders) is now populated with currency values, which are the result of the expression you built (Prior Year Orders + YTD Orders). You need to type a label for this field. The placeholder label is selected, so you can type a new label.
8. **Type Total Orders, then press [Enter]**
   The field name Total Orders now appears as the last field name in the table, as shown in Figure K-23.
9. **Click , click the File tab, click Close Database, then click Exit**
   The Customers table, the database, and Access all close.

Real Life Independent Challenge

You can use relational databases to help you manage information in your own life. For instance, you could create a database to track your personal expenses, your assets, or your music collection. In this Real Life Independent Challenge, you create a database to help you keep track of your classes.

a. Start Access, then open the Data File **K-6.accdb** from the drive and folder where you store your Data Files. Enable the content in the database. Save the database as **K-My Class Information**.

b. Open the Classes, Professors, and Books tables in Datasheet view, review the fields that each contains, and identify the data types for each field.

c. Add appropriate records to all three of the tables using information from your classes, professors, and books. (*Note*: You may need to make up Professor ID numbers. Therefore, it is recommended that you enter your Professors' records first, then enter those made-up Professor IDs in the Classes table.) When you are done, widen columns as necessary to ensure that all field names and field values are visible onscreen. Save your changes, then close all open tables.

d. Open the Relationships window. Show the Professors table, the Classes table, and the Books table (in that order). Create a one-to-many relationship between the Professor ID field in the Professors table and the Professor ID field in the Classes table. Enforce referential integrity. Then create a one-to-many relationship between the Class ID field in the Classes table and the Class ID field in the Books table. Enforce referential integrity. Save your changes, then close the Relationships window.

e. Create a new query in Design view. Display the Professors, Classes, and Books tables (in that order) in the upper pane. Save the query as **MyBook List**.

f. Add the following fields to the query design grid in the order specified: **Book Title**, **Author**, **Class Name**, **Class Schedule**, **Professor Last Name**, **Data Entered By**. View the query results in Datasheet view, then type your name in the first Data Entered By field. Save your changes.

g. Close all open objects, then exit Access. Submit your completed database to your instructor.

Independent Challenge 2

You manage the Fiesta Dance Studios. You have created an Access database to manage information about your classes and your students. In preparation for upcoming classes, you want to filter and query the data.

a. Start Access, then open the Data File **K-4.accdb** from the drive and folder where you store your Data Files. Enable the content in the database. Save the database as **K-Fiesta Dance Studio**.

b. Open the Students table in Datasheet view, then filter the data to show students who are signed up to take the class with Class Code 2014. Sort the filtered results in alphabetical order by the Last field. Type your name in the Data Entered By field for the first filtered record, then save your changes. If your instructor asks you to provide a screen shot of your results, follow the instructions in the yellow box on page 248. Remove the filter, then close the table.

c. Use the Relationships window to create a one-to-many relationship from the Classes table to the Students table using the Class Code field. Specify to enforce referential integrity in the Edit Relationships dialog box. Save the relationship, then close the Relationships window.

d. Open the Classes table. Add a calculated field to the table that has the Currency data type. Build an expression for this new field that multiplies the Sessions field by the Fee Per Class field. Name the field **Total Cost**.

e. Create a new query in Query Design view. Use the Show Table dialog box to open both the Classes table field list and the Students table field list. Close the Show Table dialog box.

f. Add the following fields to the query design grid: First, Last, Class Name, Start Date, Instructor Last Name, and Total Cost.

g. Set the sort order to Ascending for the Class Name field. Use the Save Object As command on the File tab to save the query with the name **Students Class List**. View the query in Datasheet view.

h. Return to Design view, then set the criteria for the Class Name field as **Tango**. Set the sort order to Ascending for the Last field. Use the Save Object As command to save the modified query as **Tango Class List**. View the query results in Datasheet view.

i. Click the Classes table tab in Datasheet view. Select **Howard** in the Instructor Field for the Tango class, then type your name.

j. Save and close the Classes table. Now look at the Tango Class List query in Datasheet view, and observe the change in the Instructor Last Name field. Close the Tango Class List query.

k. View the Students Class List query in Datasheet view. Observe your name in the Instructor Last Name field for the Tango class. Close the Students Class List query.

l. Close the database, then exit Access.

Independent Challenge 3

You own a small, residential pet-care business called We Love Pets. You employ three people who make service calls to clients and care for their pets. You have created a database to help you manage information about your clients and their pets as well as your pet-care providers. You need to create a schedule for your Friday appointments that combines information from two tables in your database. You also need to create some handouts for your pet-care providers that list schedule information and service notes. You first need to relate the two tables, then you will use queries to create the schedule and handouts you need.

a. Start Access, then open the Data File **K-5.accdb** from the drive and folder where you store your Data Files. Enable the content in the database. Save the database as **K-We Love Pets** and enable the content.

b. Open each table in Design view, and review the fields and field types each contains. Note which fields are the primary key fields. Get a sense of the information that each table contains. Close both tables when you have finished reviewing them.

c. Open the Relationships window, then establish a one-to-many relationship between the Care Provider ID field in the Care Providers table and the Care Provider ID field in the Clients table. Specify to enforce referential integrity. Save the relationship, then close the Relationships window.

d. Open the Care Providers table. Replace Aglio in the Last Name field for the first record with your last name. Replace Julio in the First Name field for the first record with your first name.

e. Add a calculated field in the Care Providers table that has the Currency data type. Build an expression for this field that multiplies the Hours Per Week field by the Hourly Rate field. Name the field **Weekly Pay**. Close the Care Providers table.

f. Create a new query in Query Design view. Use the Show Table dialog box to open the field lists for the Care Providers table and the Clients table, then close the Show Table dialog box. Save the query as **My Friday Schedule**.

g. Add the following fields in the order listed to the query design grid: **Day to Visit**, **First Name**, **Last Name**, **Client Name**, **Street Address**, **Pet Name**, **Animal**, and **Visit Time**.

h. Enter **Friday** as the criteria for the Day to Visit field. Enter your first name as the criteria for the First Name field. Save your changes.

i. View the query results in Datasheet view.

j. Switch back to Query Design view, then save the query as **My Cat Visits**. Delete "Friday" in the Criteria cell for the Day to Visit field. Enter **cat** as the criteria for the Animal field. View the query in Datasheet view, then save and close the query.

k. Create a new query in Design view that pulls from both database tables and contains the following fields: Last Name, Client Name, Pet Name, Service Notes. Set the criteria for the Last Name field to **Slatsky**. Save the query as **Slatsky Weekly Service Notes**. View the query results in Datasheet view.

Advanced Challenge Exercise

- Return to Query Design view.
- In the Or cell for the Last Name field, enter **Grasso**. (*Hint*: This cell is below the Criteria cell.)
- Add the Day to Visit field, enter **Monday** in the Criteria cell, then enter **Tuesday** in the Or cell for the Day to Visit field. Set the sort order to Ascending for this field.
- Save the query as **Mon and Tues Notes for Slatsky and Grasso**. View the query results in Datasheet view, then close the query.

l. Close the database, then exit Access.

Visual Workshop

Open the Data File **K-7.accdb** from the drive and folder where you store your Data Files, enable the content, then save it as **K-Teen Charity Race**. Enable the content. Create the query shown in Figure K-27 using fields from the three related tables in the database. Specify the appropriate sort order for the Biker Last Name field and the appropriate criteria for the Charity Name field. View the query in Datasheet view, then replace the sponsor name for the first record with your name. Save the query as **Red Cross Donations**. Close the database, then exit Access. Submit your completed database to your instructor.

FIGURE K-27

Red Cross Donations

Charity Name	Biker Last Name	Sponsor Name	Amount
Red Cross	Estevez	Your Name	$50.00
Red Cross	Grace	Brown Hardware	$25.00
Red Cross	Homes	Franco's Body Shop	$50.00
Red Cross	Jordan	Peppy's Hot Dogs	$50.00
Red Cross	Jordan	Hogan's Flooring	$100.00
Red Cross	Jordan	Pizza Nation	$50.00
Red Cross	Perlman	Bay City Fitness	$199.00
Red Cross	Rajashekar	Gentle Optometry	$25.00
Red Cross	Turkson	Fred's Bowling Alley	$50.00
Red Cross	Turkson	Flapjack's Pancakes	$25.00
Red Cross	Watson	Waterville Surgery	$100.00
Red Cross	Williams	Simonson Coffee	$100.00
Red Cross	Wilson	Valley View Dental	$100.00
Red Cross	Wyatt	Fairways Dental	$25.00
Red Cross	Wyatt	Crystal Cleaners	$100.00
Red Cross	Wyatt	Pringle Plumbing	$100.00
Red Cross	Wyatt	Garvey's Pest Removal	$50.00