Advanced Access 2010: Advanced Databases

Unit Exercises:

EXERCISE 1 Define Data Needs

EXERCISE 2 Define Field Data Types

EXERCISE 3 Modify Field Properties

EXERCISE 4 Set Validation Rules

EXERCISE 5 Define and Modify Primary Keys

EXERCISE 6 Define and Modify Multi-Field Primary Keys

EXERCISE 7 Define Tables in Databases

EXERCISE 8 Create Tables Based on the Structure of Other Tables

EXERCISE 9 Create and Modify Queries

EXERCISE 10 Open Databases

EXERCISE 11 Format and Modify a Chart

EXERCISE 12 Import and Export Data

EXERCISE 13 Set Printing Options

EXERCISE 14 View Code and Convert Macros to Visual Basic

EXERCISE 15 Modify Forms and Reports



Why It Matters

A database is an organized collection of information. You may be using databases every day without realizing it. For example, personal music players, such as iPods, organize thousands of music, photo, and video files by title, artist, year, and more. The best thing about databases is that they make it easy to search for information using different criteria saving time and effort. *What other common databases might you use daily?*

Choose Start>All Programs>Microsoft **Office®>Microsoft Excel** 2010.

Choose File>Open.

- Locate and open the data file Product Info.xlsx. Save as: Product Info-[your first initial and last name] (for example, Product Inforgupta).
- Read each field name. Note that the fields **Product ID**, **Product Name, Cost,** and Inventory all contain stored data.
- Click in cell E2 in the Total Value field (see Figure 1.1).



should look like Figure 1.1.

Continued on the next page.

ech Tip

If a database stores customer address information, the data remains the same until a user goes into the database and changes it. If the database tracks the total value of a product, the value in inventory changes when the price changes.

EXERCISE 1-1 Define Data Needs



When you begin to design a database, you should think about the types of data that you need to include. One way to prepare data for use in a database is to create a table for your data fields in a spreadsheet program such as Microsoft Excel. When entering data in an Access database, consider whether the data should be calculated by the database or entered by the user. Stored data will remain the same until the user manually changes it. Calculated data changes in response to other data modifications. Examples of stored data and calculated data are shown in Table 1.1.

TABLE 1.1 Examples of stored data fields and calculated data fields

| Stored Data | Calculated Data |
|--------------|---|
| Product ID | Total value of all products in inventory. |
| Product name | Total number of products in inventory. |
| Product cost | Total Value is calculated by multiplying the Product cost field by the Inventory field. |
| Inventory | Average monthly inventory levels. |

FIGURE 1.1 Product Info worksheet

| | | | Product Info-rgupta. | dsx - Microsoft Excel | | |
|--------|-------------|--------------------------|---|--------------------------------|--------------------------|-----------|
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| Paste | Arial | | ● ≫ · · · · · · · · · · · · · · · · · · | , <u>*.</u> , Fic Ca | eld with Iculated dat | ta 🎽 |
| Clipbo | bard 🕞 | Font 🕞 Alig | nment 🕞 N | umber 🕞 | Style s | d |
| | E2 🔻 | fx =PRODUCT(C2:D2 |) | | * | |
| | А | В | С | D | E | F |
| 1 | Product ID | Product Name | Cost | Inventory | Total Value | |
| 2 | 1 | Type 2 fuel injector | \$265.20 | 1,000 | \$265,200.00 | |
| 3 | ▶ 2 | Head bolt | \$22.50 | 1,500 | \$33,750.00 | |
| 4 | 3 | Head gasket | \$45.00 | 800 | \$36,000.00 | Cell |
| 5 | 4 | Tailpipe | \$76.25 | 800 | \$61,000.00 | E2 |
| 6 | 5 | 3-series fuel pump | \$710.44 | 200 | \$142,088.00 | |
| 7 | Bocorde 6 | Exhaust bracket | \$17.50 | 600 | \$10,500.00 | |
| 8 | necolus | | ^ | ^ | | |
| 9 | | | | | | |
| 11 | | | Exam | ples of fields |] | |
| 12 | | | with s | tored data | | |
| 13 | | | | | 4 | |
| 14 | | | | | | |
| 15 | | | | | | |
| 16 | | | | | | |
| 17 | | | | | | |
| 18 | | | | | | |

Click in cell **D2** (see Figure 1.2).

8 Select 1000. Key: 500. Press ENTER.

OCHECK Your screen should look like Figure 1.3. Note that the value in cell
 E2 changes to \$132,600.

Save and close the **Product Info** spreadsheet and exit **Excel**.

Continue to the next exercise.

You Should Know

Stored data, such as the price of an inventory in an automotive parts warehouse database, must be changed manually. Calculated data depends on other data. For example, the total value of all gaskets held in the warehouse's inventory would change if either the price of head gaskets went up or the quantity of gaskets went up or down. You can calculate stored data in Excel and import it to Access. You also can create calculated and stored data directly in Access.

EXERCISE 1-1 (Continued) Define Data Needs



FIGURE 1.2 Stored data in Product Info worksheet

| | ∃ ⊮) × (* • ⊚ ∓ | | Product Info-rgupta.x | dsx - Microsoft Excel | | |
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| Cipo | D2 - | (fx 1000 | initerite of the | diliber is | Styres | |
| | A | В | С | D | E | F |
| 1 | Product ID | Product Name | Cost | Inventory | Total Value | |
| 2 | 1 | Type 2 fuel injector | \$265.20 | 1,000 | \$265,200.00 | |
| 3 | 2 | Head bolt | \$22.50 | 1,500 | \$33,750.00 | |
| 4 | 3 | Head gasket | \$45.00 | 800 | \$36,000.00 | |
| 5 | 4 | Tailpipe | \$76.25 | 800 | \$61,000.00 | |
| 6 | 5 | 3-series fuel pump | \$710.44 | 200 | \$142,088.00 | |
| 7 | 6 | Exhaust bracket | \$17.50 | 600 | \$10,500.00 | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| 13 | | | | | | |

FIGURE 1.3 Calculated data changed

| | | | Product Info- | rgupta.x | lsx - Microsoft Exc | :el | | |
|------|----------------|--|--|------------------|------------------------|-------|---|--------------------|
| Fil | e Home Insert | Page Layout Formulas D | Data Review | View | Developer | | | |
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| | A | B | С | | D | | E | F |
| 1 | Product ID | Product Name | Cost | | Inventory | | Total Value | |
| 2 | 1 | Type 2 fuel injector | \$20 | 65. 20 | | 500 | \$132,600.00 | |
| 3 | 2 | Head bolt | \$2 | 2.50 | 1, | 500 | \$33,750.00 < | - 1 |
| 4 | 3 | Head gasket | \$4 | 5.00 | | 800 | \$36,000.00 | |
| 5 | 4 | Tailpipe | \$7 | 6.25 | | 800 | \$61,000.00 | |
| 6 | 5 | 3-series fuel pump | \$7 | 0.44 | | 200 | \$142,088.00 | |
| 7 | 6 | Exhaust bracket | \$ | 7.50 | | 600 | \$10,500.00 | |
| 8 | | | | | | | - | |
| 9 | | | | Cha | inge in ce | II D | 2 causes | |
| 10 | | | | calc | culated va | lue | in cell E2 to | |
| 11 | | | | cha | nge | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |

Tech Tip 🚪

When you begin to design forms and reports, you will choose how to find, display, and edit data from one or more tables or queries.

Click Start>All Programs>Microsoft Office®>Microsoft Access 2010.

Choose File>Open.

- Navigate to the **Phils Pick-a-Part.accdb** database file. Ask your teacher how and where to copy the database before working in it.
- 4 Select the database file and click **Open**.

5 In the Navigation Pane, right-click the Product Info table and select Design View from the menu.



Click the **Data Type** dropdown arrow . From the list of data types, select **Number**.

- B (CHECK) Your screen should look like Figure 1.4.
- 9 Under Field Properties, click in the Caption box and key: Stock Quantity.

Click Save . Click the
 Cost field and press TAB.
 Change the Data Type to
 Currency.



Continued on the next page.

EXERCISE 1-2 Define Field Data Types



You can use various data types to organize the data tables in your database. Some data is best presented as text, while other data should appear as a number. Sometimes, data should be stored as a combination of both, or as one of two values, such as Yes or No. A Memo data type, which can store up to 65,535 characters, is best for storing large amounts of text data, such as a comment or note about a particular order or product. A Currency data type is best for storing monetary values. To ensure that data in a field supports searches or meets certain conditions, use a data type that supports a conditional expression, or Boolean operator, such as AND, OR, or NOT. One kind of Boolean operator is a comparison operator, such as equal, not equal, less than, more than, and so on. Common data types that support Boolean operators are shown in Table 1.2.

TABLE 1.2 Common Data Types that Support Boolean Operators

| Text | Currency |
|-----------|------------|
| Number | Yes/No |
| Date/Time | AutoNumber |

FIGURE 1.4 Product Info QtyInStock field added to parts database

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|--------------------------------------|--|---|---|---|-------|
| File Home Create Ex | ternal Data Database Tools Desig | n | | | ۵ 🕜 |
| Views Views | → Insert Rows → Delete Rows Modify Lookups Sheet Show/Hide | Create Data Rename/Delete Macros + Macro Field, Record & Table Events | Relationships Object Dependencies Relationships | | |
| Tables 🔍 « | | | | | |
| Customer Info | Product Info | | | | 23 |
| Order Info | Field Name | Data Type | De | escription | |
| Product Info | Product Name | Text | | | 1 |
| | Cost | Number | | | - 11 |
| ▲ ▲ | QtyInStock | Number 🔹 | | | |
| | | | | | |
| Draduat | | î | | | _ |
| Product | | | | 1 | - |
| Info table | Da | ta type drop | -down arrow | | - |
| | | | | - | |
| | | Field | 1 Properties | | |
| | General Lookup | | | | |
| | Field Size Long Integ | er | | | |
| | Decimal Places Auto | | | | |
| | Input Mask | 1 | | | |
| | Navigation | | The | data type determines the kind of values | |
| ▲ | Pane | | that | users can store in the field. Press F1 for help on data types. | |
| | Required No | J | | | |
| | Indexed No | | | | |
| | Text Align General | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| Design view. F6 = Switch panes. F1 = | Help. | | | Num Lock 🔲 🏨 | ي 🗷 😃 |

- Under Field Properties, click in the Format box. Choose Currency.
- Click **Datasheet View**. Click **Yes** to save changes. Click **Yes** again.
- **13 (CHECK)** Your screen should look like Figure 1.5. Close the **Product Info** table.
- Open the **Customer Info** table in **Design View**.
- Click in the **Notes** field **Data Type** box. Click the drop-down arrow and select **Memo**.
- **16 ()CHECK** Your screen should look like Figure 1.6.





Customer Into table. Continue to the next exercise.

Troubleshooter

The data types you assign will depend on how you want to use the data. A **Date/Time** data type stores dates. A **Number** data type performs calculations. The **Memo** data type saves notes. To ensure that data meets a condition, change a field's data type to support searches or comparisons.

EXERCISE 1-2 (Continued) Define Field Data Types



FIGURE 1.5 Product Info table in Datasheet View

| A | Microsoft Access | Table Tools | | |
|--|--------------------------|----------------------------------|------------------------------------|---|
| File Home Create Extent Image: State | rmal Data Database Tools | Fields Table | Find birth Size to Fit Form W Wind | Arial B I U Switch findows + Iow Te |
| Tables 😪 « | Product Info | | | |
| Order Info | Product ID - Pr | roduct Name , 2 fuel injector | Cost - Stock Qu \$265 20 | antity 👻 Click to Add |
| 🛄 Product Info | 2 Head | bolt gasket | \$22.50 \$45.00 | |
| | 4 Tailpip | De | \$76.25 | |
| | 6 Exhau | ust bracket | \$17.50 | (|
| | * (New) | | New field | defined |
| | | | and added | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

FIGURE 1.6 Customer Info table in Design View

| A | | Table Tools Micro | soft Access | | |
|--|--|--------------------|-----------------------------|---------------------|-------------------------------------|
| File Home Create Exte | rnal Data Database Tools | Design | | | |
| View View Key Builder Test Validatio Rules | Insert Rows → Delete Rows Modify Lookups Proper Shee | ty Indexes t | ta Rename/Delete Macro | Object Dependenc | ies |
| Views Tools | Sho | ow/Hide Field, Red | ord & Table Events Relation | iships | |
| Tables 💌 « | | | | | |
| Order Info | Customer Info | | | | _ |
| Product Info | Field Name | 2 D | ata Type | | Description |
| | Customer ID | AutoNu | mber | | |
| | Customer Name | Text | | | |
| | Street | Text | | | |
| | City | Text | | | |
| | State | Text | | | |
| | Zip | Text | | | |
| | Description | Text | | | |
| | Account Manager | Text | | | |
| | Contact Name | Text | | | |
| | Account Start Date | Date/Ti | ne | | |
| | Notes | Memo | - | | |
| | Payment Terms | Text | | | |
| | | | Field Properties | | |
| | General Lookup | | | | |
| | Format | | | ^ | |
| | Caption | | | | |
| | Validation Pule | | | - | |
| | Validation Text | | | - 11 | |
| | Required | No | | T | he data type determines the kin |
| | Allow Zero Length | Yes | | t | hat users can store in the field. I |
| | Indexed | No | | - | neip on uata types. |
| | IME Mode | No Control | | | |
| | Contence Mode | None | | | |

In your **Phil's Pick-a-Part** database, in the **Navigation Pane**, double-click the **Customer Info** table.

Choose Home>Views> Design View

Click the Customer Name field. In Field Properties, click in the Field Size box. Key: 80. Press ENTER.

Click the row selector to the left of **Telephone**. While still holding the mouse button, drag down until the bold black line is above the **Description** field.

5 Release the mouse. Scroll down the field names list and click in the **Notes** field.



Click the drop-down arrow and select **Yes**.

8 (CHECK) Your screen should look like Figure 1.7.



Continue to the next exercise.

You Should Know

Access assigns a default field name if you do not enter a caption for a field.

EXERCISE 1-3 Modify Field Properties

Access allows you to set and modify properties for entire tables and for individual fields within a table. For example, by specifying the Field Size, or maximum number of characters that a user can enter in a field, you can ensure that data in the Phone Number field contains ten digits. You also can set a memo field as Append Only. With this option, users can add data to a field, but they cannot delete data from it. Common properties for fields in a table are shown in Table 1.3.

TABLE 1.3 Common Field Properties

| Allow Zero Length | Specifies that a Text, Memo, or Hyperlink field can accept strings of <i>zero length</i> , or null values, with no characters. |
|-------------------|--|
| Append Only | Specifies that data can be added to a Memo field, but that the existing data in the field cannot be overwritten. |
| Caption | Specifies the name of a Text field. |
| Field Size | Specifies the maximum number of characters a user can enter in a field. |
| Required | Specifies that data must be entered in a field. |

FIGURE 1.7 Customer Info table edited

| A ♥ ▼ (♥ ▼ ∓ File Home Create Exteri | nal Data Database Tools | Table Tools Design | Microsoft Access | | | | | | | • |
|---|-------------------------------|-----------------------|--|------------------------|---------------------------|--------------------------------|-------------------------|--------------|-----------|--------|
| Views Views Tools | Delete Rows Modify Lookups | v/Hide | ate Data Rename, acros × Mac d, Record & Table | Delete ro Events | Relationships Relation | Object ependencies ships | | | | |
| Tables 🔍 « | | | | | | | | | | |
| Customer Info | Customer Info | | | | | | | - | | 23 |
| - Order lafe | Z Field Name | | Data Type | 0 | | N | escription | | | |
| Order Info | Customer Name | < le> | | Cu | stomer | Nam | | | | - 1 |
| Product Info | Street | Tex | d I | | | | | | | |
| | City | Tex | d . | | | | | | | |
| | State | Tex | (t | | | | | | | |
| | Zip | Tex | d | | | | | | | |
| | Telephone | Tex | d d | | | | | | | |
| | Description | Tex | d d | | | | | | | |
| | Account Manager | Tex | d d | | | | | | | |
| | Contact Name | Tex | d | | | | | | | |
| | Account Start Date | Dat | te/Time | | | | | | | |
| | Notes | - L. | | No | tos field | d | | | | |
| | Payment Terms | Tex | d | 140 | tes nen | u | | | | |
| | Payment renns | 167 | | Field | Properties | | | | | |
| | | | | | | | | | | |
| | General Lookup | | | | | | | | | |
| | Caption | | | | | - | | | | |
| | Validation Rule | | | | | | | | | |
| | Validation Text | | | | | | | | | |
| | Required | 0 | | | | | | | | |
| | Allow Zero Length Y | es | | | | | | | | |
| | Indexed N | lo | | | | Wou | Ild you like to collect | t history on | this fiel | ld? |
| | Unicode Compression Y | es | | | | | | | | |
| | IME MODE N | o Control | | | | | | | | |
| | Smart Tags | Une | | | | | | | | |
| | Text Format P | lain Text | | | | | | | | |
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| | Append Only | es | | | | | | | | |
| Design view. F6 = Switch pages. F1 = He | *10. | | | | | | | Num Lock | ma | L (11. |



In your Phil's Pick-a-Part file, in the Navigation Pane, double-click the Customer Info table.

Choose Home>Views> Design View K.

Click in the Account Start Date field box. Under Field Properties, click in the Validation Rule box and key: >=#01/01/2011#.

Click in the Validation Text box and key: Date entered must be after January 1, 2011.

5 **()CHECK** Your screen should look like Figure 1.8.

6 Choose Design>Views> Datasheet View . Click Yes to save changes.



8 If necessary, in the Data Integrity warning box, click Yes.

Continued on the next page.

To delete a field in **Datasheet View**, rightclick on the field's column head and select **Delete Field**.

EXERCISE 1-4 Set Validation Rules

You can use the Validation Rule property to restrict the type and amount of data users can enter into a field by creating a Boolean (or conditional) expression in the Validation field. Validation rules use conditional expressions to specify that the data meets certain criteria. You can use the Validation Text property to customize the error message that Access displays when data that is entered into a field violates a validation rule. Validation messages should contain information about the invalid data and how to fix the error. Examples of validation rules are shown on page 256 in Table 1.4.

FIGURE 1.8 Customer Info table with validation added

| A = | | Table To | ols Microsoft Access | | | D 23 |
|---|--|---------------------------------------|---|---|---------------------------------------|---------|
| File Home Create Extern | nal Data Database To | ols Design | | | | ۵ 🕜 |
| View Primary Builder Test Validation Rey Tools | Insert Rows Delete Rows Modify Lookups | roperty Indexes Sheet Show/Hide | Create Data Rename/Delete Macros * Macro Field. Record & Table Events | Relationships Object Dependencies Relationships | | |
| Tables | | 511011/1102 | | ricialiteristrips | | _ |
| Customer Info | Customer Info | | | | - 9 | 23 |
| | Z Field N | lame | Data Type | C | Description | |
| | Customer ID | | AutoNumber | | | |
| Product Info | Customer Name | | Text | | | |
| | Street | | Text | | | |
| | City | | Text | | | |
| | State | | Text | | | |
| | Zip | | Text | | | |
| | Telephone | | Text | | | |
| | Description | | Text | | | |
| | Account Manage | er | Text | | | |
| | Contact Name | | Text | | | |
| | Account Start Da | ite | Date/Time | | | |
| | Notes | | Memo | | | |
| | Vali | dation | rule Valida | tion text | | |
| | General Lookop | | | | | |
| | Format | | | | | |
| | Input Mask | | | | | |
| | Default Value | - V | | | | |
| | Validation Rule | >=#1/1/201 | 1# | | | |
| | Validation Text | Date entere | d must be after January 1, 201 | 1 Th | e error message that appears when yo | u |
| | Required | No | | ente | Press F1 for help on validation text. | ule. |
| | IME Mode | No Control | | | | |
| | IME Sentence Mode | None | | | | |
| | Smart Tags | | | | | |
| | Text Align | General | | | | |
| | Show Date Picker | For dates | | | | |
| | | | | | | |
| I I | | | | | | |
| Design view. F6 = Switch panes. F1 = He | elp. | | | | Num Lock | 6 6 😢 , |



| ▲ → * (* * - | Microsoft Access | | | | | | • 23 |
|---|--|--|--|---|--|----------------|----------|
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| Views Clipboard G | Image: Provide with the second se | Refresh All → Control | Find Control C | Arial B I witch ndows • A • B w | ・ 1 旦 律律 + ゲー <u>公</u> ・ ■= Text Formatting | L0 ▼ := π * | area []] |
| Tables 🔍 « | | | | | | | |
| 🛄 Customer Info | | | | | | | |
| Order Info | Customer Info | | | | | - • | 23 |
| Product Info | 🔟 Customer ID 👻 Cu | ustomer Name 🛛 👻 | Street . | City - | State 🗸 | Zip | • |
| | A1 Au | to Parts | 419 Washington Boulevard | Los Angeles | CA | 91367 | |
| | 2 Jack's | Quick Fix-it | 883 Ocean Street | Canton | OH | 45150 | |
| | 3 Arnie's | s AutoHaus | 1010 Highway 56 | Concord | MA | 02118 | |
| | 4 Micha | el's Motors | 78 Arlen Avenue | Nashville | TN | 37213 | 1 |
| | 5 Wrend | ch Worx | 221 Oro Vista Avenue | Rome | GA | 30349 | - 1 |
| | 6 Inple- | A Auto | 86 Meadow Lane | Indianapolis | IN | 46403 | |
| | * (New) | | | | | | / |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

- 9 Scroll to the right until you can see the Account
 Start Date field.
- Olick in the first record under the heading.
- Highlight the year **2011** in the date and key: 2009.

Press TAB

- **()CHECK** Your screen should look like Figure 1.10.
- In the warning dialog box, click **OK**. Highlight the date and key: 2011.
- 5 Press ENTER

Close the table. Click **Yes**.

Continue to the next exercise.

You Should Know

If you enter data into a field that violates a validation rule, Access prevents you from moving to another field until the problem is fixed. The **Validation Text** property tells you how to fix the error.

EXERCISE 1-4 (Continued) Set Validation Rules





TABLE 1.4 Sample Validation Rules

| Validation Rule | Description of Rule |
|--------------------------------|---|
| >0 | Requires users to enter a positive value |
| <100 | Requires users to enter a value that is less than 100 |
| >100 AND <1000 | Requires users to enter a value between 100 and 1,000 |
| [EndDate]>=[StartDate] | Requires users to enter an ending date that occurs on or after a starting date |
| >=#01/01/2012# | Requires users to enter a date on or after January 1, 2012 |
| [RequiredDate]<=[OrderDate]+30 | Requires users to enter a date that is no later than 30 days after the order date |

- In your Phil's Pick-a-Part database, open the
 Customer Info table in
 Design View.
- 2 Click the record selector for the Customer ID field. Choose Design>Tools> Primary Key ?
- Click the record selector for the **Customer Name** field. Choose **Design> Tools>Primary Key**
- Choose Design>Views> Datasheet View
- 5 Click **Yes** to save the changes to the **Customer Info** table.
- 6 (CHECK) Your screen should look like Figure 1.11.
- Choose Design>Views> Design View
- Click Save 戻 and close the Customer Info table.

Continue to the next exercise.

Academic Skills

Some database fields would not make a good choice for primary keys. For example, you may have more than one John Smith in the **Name** field.

EXERCISE 1-5 Define and Modify Primary Keys

23

A *primary key* is a field that ensures that each record in a table is unique. By default, Access records in a table are sorted based on the primary key. In the Phil's Pick-a-Part database, for example, the Customer ID acts as a unique identifier for each customer in the database. You can identify each customer uniquely because no two customers have the same Customer ID number. A field with the AutoNumber data type is often used as the primary key because the numbers assigned to the field increase automatically with each new record. Characteristics of a good choice for a primary key are shown in Table 1.5.



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|--|------|
| File Home Create External Data Database Tools Fields Table | ۵ () |
| View Paste Gopy Filter Ascending 型 View Paste Format Painter Ascending 型 Filter Size to Switch Views Format Painter Size to Switch Filter Size to Switch Size to Switch Views Format Painter Sort & Filter Deleter To Teleter Size to Switch Views Cipboard Got & Filter Deleter Teleter Size to Switch Views Cipboard Got & Filter Customer Name alphabetized as Primary Key Filter | |
| | |
| Customer Info | |
| Product Info Customer ID Cu | |
| Ready Num Lock 🔲 🛱 🕮 | ۲. |

TABLE 1.5 Choosing a primary key

| | A good candidate for a primary key |
|----|---|
| 1. | Is a value that uniquely identifies each record in the table. |
| 2. | Is a field that is never empty. It always contains a value. |
| 3. | Is a value that does not change. |

- In your **Phil's Pick-a-Part** database, open the **Product Info** table in **Design View**.
- 2 Click the record selector for the Product Name.
- Hold down <u>CTRL</u> and click the record selector for **Cost**.
- Choose Design>Tools> Primary Key
- 5 (CHECK) Your screen should look like Figure 1.12.
- 6 Choose Design>Views> Datasheet View . Click Yes.
- **OCHECK** Your screen should look like Figure 1.13.
- 8) Click Design View 🛄.
- Olick the record selector for the Product ID field. Click Primary Key .
- Click Close and the
 Product Info table. Select
 Yes to save changes.



You Should Know

A multi-field primary key is also referred to as a composite key.

EXERCISE 1-6 Define and Modify Multi-Field Primary Keys

A *multi-field primary key* is a table with two or more fields defined as the primary key. A multi-field key is used if a table has no single field that is appropriate to serve as the primary key. Although a primary key should include as few fields as possible, if a table has no single field with a set of unique values, two or more fields can be combined to create a unique value. In this exercise, the Product ID field in the Product Info table is not a suitable primary key. Multiple primary keys are assigned to the Product Name and Cost fields to fix this problem. Because there are no two products with the same name or price in the Phil's Pick-a-Part database, the multiple primary keys assign a unique value to the relationship between these two fields.



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| Product | ···· , | , | | c | - 0 | 23 |
| Eield Na | me | Data Type | | Description | | |
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| Product Info | - T | fevt | | | | |
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| General Lookup | | | | | | |
| Format | Currency | | | | | |
| Decimal Places | Auto | | | | | |
| Input Mask Caption | | | | | | |
| Default Value | 0 | | | | | |
| Validation Rule | - | | | A field name can be up to 64 cha | racters Ion | ig, |
| Validation Text | | | | including spaces. Press F1 for h | elp on fiel | d |
| Required | No | | | names. | | |
| Indexed | No | | | | | |
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| Tables 💿 « | Product Info | | | | | 23 |
| | Product ID 👻 Pr | roduct Name 🚽 | Cost - Stock (| Quantity 🖌 Click to Add 🚽 | | |
| Order Info | 5 3-serie | es fuel pump | \$710.44 | | | |
| Product Info | 6 Exhau | ust bracket | \$17.50 | | | |
| | 2 Head | bolt | \$22.50 | | | |
| | 3 Head | gasket | \$45.00 | | | |
| | 4 Tailpip | De la | \$76.25 | | | |
| | 1 Type 4 | 2 tuel injector | \$265.20 | | | |
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- In your Phil's Pick-a-Part database, open the Customer Info table.
- Scroll to the right until you see the Account
 Manager field. Read the Account Managers' last names listed in the
 Customer Info table.
- Close the **Customer Info** table.
- Choose Create>Tables> Table
- 5 Choose Datasheet> Views>Design View ↓ In the Save As dialog box key: Sales Info. Click OK.
- 6 (CHECK) Your screen should look like Figure 1.14.
 - Key: Account Manager. Press TAB.
 - Continued on the next page.

Academic Skills

Formatting the objects in your database can make data much more readable. Adding a visual element, such as a logo, is especially useful when creating forms and reports. Logos can make your forms and reports look more professional and visually appealing.

EXERCISE 1-7 Define Tables in Databases

When you design a database, it should be structured correctly so that the data is accurate, easy to work with, and accommodates your needs. When you add new tables to any database, analyze your design for errors to see if your tables are normalized, or structured correctly without repeated groups of information. A well-designed database typically contains 3NF tables. A *3NF table* is a table that is normalized to the third order. This means that they comply with the first three rules of normalization. The three rules to create a 3NF table are shown in Table 1.6. The rules of form build on the previous rules, so a Third Normal Form table complies with all the rules of the first and second forms as well as the third form.

TABLE 1.6 Rules of normalization

RuleDescription of Rule1NFEach field in database table contains a single value, and the table has no repeating groups of
information2NFEach non-key field in the table must be dependent on the entire primary key (including multi-field
primary keys)3NFEach non-key field in the table is dependent *only* on the primary key

FIGURE 1.14 New Sales Info table

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| lables 💌 | Sales Info | | |
| Customer Info | Field Name | Data Type | Description |
| Order Info | P D | AutoNumber | |
| Product Info | | | |
| Sales Info | | | |
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| Table seved as (| | | |
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| | | F | ield Properties |
| | General Lookup | | |
| | Field Size | .ong Integer | |
| | Format | ncrement | |
| | Caption | | |
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- 8 Click the **Data Type** dropdown arrow and select **Text**. Press TAB twice.
- 9 Key: First Name. Press
- Set the **Data Type** to **Text**. Press TAB twice.
- Key: Cell Phone. Click in the field below Cell Phone.
- Key: Employee Number. Press TAB.
- Click the drop-down arrow and select **Number**. Press
 - Key: Client. Press TAB
- 5 Click the drop down arrow and select **Text**.
- **() () CHECK** Your screen should look like Figure 1.15.
- Choose **Design>Views> Datasheet View**. In the dialog box, click **Yes** to save changes to the table.
- 18 Key the information into the table as it is shown in Figure 1.16.
- Click Close If to close
 the Sales Info table. Click
 Yes to save changes to
 table layout, if necessary.

Continue to the next exercise.

EXERCISE 1-7 (Continued) Define Tables in Databases

FIGURE 1.15 Sales Info table 3NF fields Design View

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| View Views | Primary Build Key | ler Test Va Ru | lidation ules Tools | : ₹ | Insert Rows Delete Rows Modify Lookups | Property Indexes Sheet Show/Hide | Create Data Rename/Delet Macros * Macro Field, Record & Table Even | e Relationships O Depe | Obje end | encies |
| Tables | 5 | (| • « | _ | | | | | _ | |
| | Customer Info | | | | Sales Info | 1.01 | | | | |
| | Order Info | | | 0 | Fiel | d Name | Data Type | | | Description |
| | order mild | | | U | Account Man | ager | Text | | | |
| | Product Info | | | | First Name | | Text | | | |
| | Sales Info | | | | Cell Phone | | Text | | | |
| | | | | | Employee Nu | mber | Number | | | |
| | | | | | Client | | Text | | | |
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| | | | | (| General Lookup | | | | | |
| | | | | | Field Size | 255 | | - | • | |
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| | | | | | Validation Rule | | | | | that users can store in the fil |
| | | | | | Validation Text | No | | | | help on data typ |
| | | | | | Allow Zero Length | Vec | | | | |
| | | | | Í | indexed | No | | | | |
| | | | | | Unicode Compres | sion Yes | | | | |
| | | | | | IME Mode | No Control | | | | |
| | | | | | tonce Mo | de v | | | | |

FIGURE 1.16 Populated Sales Info table in Datasheet View

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| Table | s | ✓ « | | Sales Info | | | | |
| | Customer Info Order Info | | | Account Manager 👻 | First Name 👻 | Cell Phone | F Employee Number 👻 | Client - Click to Ad |
| | Product Info | | | Blowfeld | Jonathan | 213-555-8706 | 225 | |
| | Sales Info | | | Rogers | Gennifer | 213-555-7564 | 576 | ∢ ¬ |
| | | | | Stantz | Linda | 213-555-3456 | 528 | |
| | | | | Williams | Joe | 213-555-3461 | 324 | |
| | | | 不 | 1 | | | | |
| | All fields are dependent only on Primary Key | | | | | | | peating |
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- In your Phil's Pick-a-Part database, in the Navigation Pane, rightclick the Sales Info table and select Copy.
- Right-click in an open area of the Navigation Pane.
 Select Paste.
- 3 In the Paste Table As dialog box, click in the Table Name box. Key: Customer Contacts.
- Under Paste Options, select Structure Only (see Figure 1.17). Click OK.
- In the Navigation Pane, double-click the Customer Contacts table.
- 6 **()CHECK** Your screen should look like Figure 1.18. Close the table.
- In the Navigation Pane, right-click the Customer Contacts table. Select Rename.
- Key: Quick Customer Contacts. Press ENTER.
 - Continue to the next exercise.

Troubleshooter

To delete a database object, such as table, select the object in the **Navigation Pane**, rightclick and select **Delete**.

EXERCISE 1-8

Create Tables Based on the Structure of Other Tables

Rather than using a table template, or taking the time to build a new table for your database using Design View or Datasheet View, you can use an existing table's structure to create a new table. You can create a table by copying and pasting the structure of an existing table in the Navigation Pane. You can edit the table name using the Paste Table As dialog box.

FIGURE 1.17 Paste Options in Paste Table As dialog box

| Paste Table As | | -? <mark>-</mark> X- |
|-------------------------|-------------------|----------------------|
| Table Name: | | ОК |
| Customer Contacts | | |
| Paste Options | | Cancel |
| Structure Only | Structure Only op | tion |
| Structure and Data | | |
| Append Data to Existing | Table | |
| | | |
| | | |

FIGURE 1.18 Table structure copied to Customer Contacts

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| Tables 🛞 « | | | | | |
| Customer Contacts | | | | | |
| Customer Info | Customer Contacts | First Namo - Coll | Phone - Employee Number - | Client - Click to Add - | 23 |
| Product Info | * | Filst Name + Cent | Filone • Employee Number • | | |
| Sales Info | | | • | | |
| | | | | | |
| | Stru | icture from | Sales Info table | • | |
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| New Custome | er Contacts ta | ble | | | |
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| | Record: M ≤ 1 of 1 → | ⊨ ► 😵 No Filter Se | arch | | |

In your **Phil's Pick-a-Part** file, choose **Create> Queries>Query Wizard** (see Figure 1.19).

In the New Query dialog box, make sure the Simple Query Wizard option is selected. Click OK.

- In the Simple Query Wizard dialog box, under Tables/Queries, click the drop-down arrow and select Table: Sales Info.
- Under Available Fields, click the double right arrow
 ≥ to select all fields in the Sales Info table.
- 5 (CHECK) Your dialog box should look like Figure 1.20.
- 6 Click Next. Leave the Detail option selected and click Next.
 - Do not change the title for your query. Click **Finish**.
 - Continued on the next page.

To view the results of a query, choose **Design> Results>Run** or switch to **Datasheet View**.

ou Should Know

EXERCISE 1-9 Create and Modify Queries

23

A query gathers data from one or more tables based on criteria. Queries allow you to retrieve and display information from tables so that you can edit the results. A query is made up of the fields and records you add, remove, and rearrange in the order you want. If two or more tables have fields with the same name, you must identify which table you want the query to draw from. The information you need to provide to run a query is:

- 1. the criteria that you want the data to meet
- 2. the fields that you want to include
- 3. the tables from which you will retrieve the data

FIGURE 1.19 Simple Query Wizard

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| File Home Create External Data | Database Tools | ۵ 🕜 |
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| Tables 💿 « | | |
| Cut Query Wizard bu Order Info Product Info Quick Customer Contacts Sales Info | This wizard creates a select query from the fields you paid. | |
| | OK Cancel | |
| | | |



| Simple Query Wizard | | | | | | |
|---------------------------|---|----------------------|-----------|--|--|--|
| | Which fields do you want in your query? | | | | | |
| | You can choose from more t | han one table o | r query. | | | |
| <u>T</u> ables/Queries | | | | | | |
| Table: Sales Info | | All fields table add | in ded | | | |
| <u>A</u> vailable Fields: | Selected Fields: | | | | | |
| | >> Account Manager First Name Cell Phone Employee Number | | | | | |
| | < Client | | | | | |
| Car | ncel < <u>B</u> ack | Next > | Einish | | | |

- Choose Home>Views> Design View <u></u>.
 - 9 (CHECK) Your screen should look like Figure 1.21.
- Choose Design>Query Setup>Show Table
- In the Show Table dialog box, select the Customer Info table and click Add.
- **2** Click **Add** again.
- 3 **()CHECK** Your screen should look like Figure 1.22.
- Close the **Show Table** dialog box. Right-click the header of the **Customer Info_1** table and select **Remove Table**.

Continued on the next page.

Tech Tip

Another way to add all the fields from a table to query is to open the query in **Design View.** Then, double-click the **asterisk** (*) at the top of the list of fields in the query.

Shortcuts

To remove a field from a query, select the field in the field list area, right-click and select **Cut**.

EXERCISE 1-9 (Continued) Create and Modify Queries



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| Order Info | 📑 Sales Info | Query | | | | | | - 23 |
| Product info Quick Customer Contacts Sales Info | Sa | es nfo * Account Manager First Name Cell Phone Employee Number Client | | | | | | |
| | | | | Field list a | rea | | | • |
| | Field: | Account Manage: - Sales Info | [First Name] | Field list a | [Employee Number] | [Client] Sales Info | | • |
| | Field: Table: Sot: Show: Criteria: or: | Account Manage - | [First Name] Sales Info | Field list a | rea Employee Number Sales Info | [Client] Sales Info | | |



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| Order Info Product Info Quick Customer Contacts Sales Info | Sales Info Query Sales Info Sales Info * Call Phone Employee Numt Client | per Customer Info | Customer ID Customer ID Customer IN Street City State Zp |
| | 4 .m | | Show Table |
| | Field: Account Manage Table: Sales Info Soft: Show Criteria: | I (El Phone) Sales Info IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII | Quick Customer Contacts Sales Info |
| | | | Add Close |

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In the Sales Info Query, click the Customer Info table. Scroll through the field list and double-click the Account Manager field.

- Scroll to the top of the table and double-click the Customer Name field.
 - Choose Design>Results> Datasheet View

B (CHECK) Your screen should look like Figure 1.23.

Click Design View 📈

In the field list area, under the **Account Manager** field of the **Customer Info** table, uncheck the box in the **Show** field.



19

Click Datasheet View



Click Save . Close the Sales Info Query.

Click the File tab and select Close Database.

Continue to the next exercise.

ou Should Know

To rearrange fields, select the field that you want to move in the field list pane and click and drag the field to the right or left.

EXERCISE 1-9 (Continued) Create and Modify Queries

FIGURE 1.23 Sales Info Query in Datasheet View

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| Tables 🔍 « | Sales Info Query | | | | |
| Order Info | Zales Info.Account - | First Name 👻 Cell P | hone 👻 Employee | Number 👻 | Client - Customer Info.Aci - |
| Product Info | Blowfeld J | onathan 213-55 | 5-8706 | 225 | Blowfeld |
| Quick Customer Contacts | Juneau H | Harvey 213-55 Compifer 212-55 | 5-8090 | 534 | Juneau |
| Sales Info | Stantz L | inda 213-55 | 5-3456 | 528 | Stantz |
| | Williams J | oe 213-55 | 5-3461 | 324 | Williams |
| | Williams J | oe 213-55 | 5-3461 | 324 | Williams |
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FIGURE 1.24 Query with duplicate field drawn from single table

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| Tables 💿 « | | | |
| Customer Info | | | X = |
| Order Info | unt 🔻 First Name 👻 Cell | Phone 🔹 Employee Number 🔹 | Client 👻 Customer Name 👻 |
| Product Info | Jonathan 213- | 555-8706 225 | A1 Auto Parts |
| Juneau Juneau | Harvey 213- | 555-8090 534 | Jack's Quick Fix-it |
| Rogers | Gennifer 213- | 555-7564 576 | Arnie's AutoHaus |
| Sales Info Stantz | Linda 213- | 555-3456 528 | Michael's Motors |
| Williams | Joe 213- | 55-3461 324 | Wrench Worx |
| Williams | Joe 213- | 555-3461 324 | Iriple-A Auto |
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Click File. Click Open.

In the **Open** dialog box, navigate to your **Phil's Pick-a-Part** file. Select the database file and click the **Open** drop-down arrow.

- 3 (CHECK) Your dialog box should look similar to Figure 1.25. Select **Open Exclusive**.
- Click the File tab and select Close Database.
- 5 Choose File>Open. Select the database file again and click the Open drop-down arrow. Select Open Exclusive Read-Only.
- 6 (CHECK) Your screen should look like Figure 1.26.
- Click the **File** tab and close the database.

Continue to the next exercise.

Shortcuts

Press CTRL + O to display the **Open** dialog box.



EXERCISE 1-10 Open Databases

When you open a database in Access, by default it can still be opened and edited by others at the same time. This is called shared access. If you need to ensure that you are the only one who can open and make changes to the database, you can select the Open Exclusive option in the Open dialog box or set the Default open mode to Exclusive using the Access Options dialog box. That means that no one else can open or edit the database because you have exclusive access. Access also offers an Open Exclusive Read Only option so that you and other users can view the database at the same time but cannot edit it. This read-only mode is helpful in a multi-user environment if you want to view a file but want to avoid making any accidental changes.

FIGURE 1.25 Open dialog box



FIGURE 1.26 Database opened exclusive read-only

| | மி - (ப - = | | Phils Pick | a-Part : Database (Access 200 | ') (Read-Only) - | Microsoft Access | | - 0 |
|---------------|------------------------|-----------|---|---------------------------------|------------------------------|--|---|---------------|
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| View Views | Paste V Cipboard | ter Fi | Ascending Image: Second sec | Refresh All → Records | Find Abac ⇒ ₹ Find Bac | Size to Switch Fit Form Windows * Window | ■ I U 译 读 M ~ 目 A ~ 砂 ~ 魚 ~ 王 王 三 Text Formatting | • := \ • · |
| 1 Rea | ad-Only This database | has beer | n opened read-only. You ca | n only change data in linked ta | bles. To make de | sign changes, save a co | py of the database. Save As | |
| Tables | 6 | e) «« | | ▲ | | | | 1 |
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| 🛄 OI | rder Info | - 1 | | | _ | | | |
| Pr | oduct Info | - 1 | Read- | Only messag | je | | | |
| 💷 Q | uick Customer Contacts | - 1 | - | | _ | | | |
| 🛄 Sa | iles Info | - 1 | | | | | | |
| | | | | | | | | |

Choose File>Open. Select your Phil's Pick-a-Part database. Click Open.

9 In the Navigation Pane, click the Navigation Bar. Under Filter By Group, select Forms.

Double-click the All Orders Chart form. Choose Design>Tools> Property Sheet. With the General tab selected. click Quantity (to the right of Years) on the chart space. Click Delete in the Properties dialog box. Close the dialog box.

OCHECK Your screen should look like Figure 1.27.

Choose Design>Type> Change Chart Type 📊

In the dialog box, on the Type tab in the left column, select Bar. Click the 3D Bar Clustered chart type (see Figure 1.28).

Click the largest graphed quantity on the chart (see Figure 1.28). In the Properties dialog box, click the Border/Fill tab.

Under Fill, in the Fill Type box, select Gradient. Click the Border Color dropdown arrow. Select White.

Continued on the next page.

EXERCISE 1-11 Format and Modify a Chart

Access offers many tools to format and present data. You can reformat the font in a form, apply a background image to a report, add Quick Styles to controls, or apply conditional formatting in a form. However, often one of the easiest and most effective ways to present data is through the use of charts. Depending upon the type of data and your audience, the same data can be presented in several different chart formats. Access allows you to easily change the format and type of a chart to improve the presentation of your data.





FIGURE 1.28 Chart type to 3D Bar Clustered





- Olick in an open area of the chart space to select the chart background.
- In the Properties box, under Fill, click the Color drop-down arrow and select MediumSeaGreen.
- In the **Properties** box, click the **Show/Hide** tab. Under **Show by default**, uncheck the **Field buttons/drop zones** option.
- **CHECK** Your screen should look similar to Figure 1.29.
- In the **Properties** box, click the **General** tab. Under **Add**, click **Add Title 1**.
 - Click Chart Workspace Title in the chart window. In the Properties box, click the Format tab.
- In the **Caption** box, highlight the default text and key: Parts Purchases by Volume.
- Choose Design>Tools> Property Sheet .
- **OCHECK** Your screen should look similar to Figure 1.30.
 - Close the All Orders Chart.



EXERCISE 1-11 (Continued) Format and Modify a Chart









23

- In your Phil's Pick-a-Part database, in the Navigation Pane, show Tables.
- Choose External Data> Import>Text File
- 3 Select the Append a copy of the records to the table: option. Click the drop-down arrow. Select the Quick Customer Contacts table.
- 4 (CHECK) Your screen should look similar to Figure 1.31.
- 5 Click the **Browse** button. In the **File Open** dialog box, navigate to and select the **Customer Contacts. txt** data file. Click **Open**.
- In the Get External Data –
 Text File dialog box, click
 OK. Click Next twice. Click
 Finish. Click Close.
- Double-click the Quick Customer Contacts table.
- 8 (CHECK) Your screen should look like Figure 1.32.

Continued on the next page.

EXERCISE 1-12 Import and Export Data



You can gather and present different types of information in Access by importing the data. You can import Excel files, XML Paper Specification (XPS) files, and Access databases. You also can import data from ordinary text files, as long as the information is delimited. A delimited file is a file that uses delimiters, or separators, such as semicolons, colons, or tabs to separate information. An example of a delimited file is a comma-separated values (CSV) file. Access allows you to export data in a database file to many different files, programs, or databases. Access also allows you import and append records to an existing table and import data as a linked table.

FIGURE 1.31 Importing a CSV file





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|--|---|-----------------------------|---------------------------|---|---|
| File Home Create Exter | nal Data Database Tools | Fields Table | | | |
| Saved Linked Table Excel Access C Imports Manager | Text File DBC tabase → More → Saved Exports | Excel Text XML File File | PDF E-mail More * | Create Manage E-mail Replies Collect Data | ork Synchronize line Web Linked Lists |
| Tables 💿 « | | | | | |
| Customer Info | | | | | |
| Order Info | Quick Customer Contacts | s | | | - |
| Product Info | 🔀 Account Manager 👻 | First Name 👻 Ce | ell Phone 👻 Employee Numb | oer - Client | - Click to Add |
| Quick Customer Contacts | Blowfeld | Jonathon 213 | 3-555-8706 | 225 A1 Auto Parts | |
| Sales Info | Juneau | Harvey 213 | 3-555-8090 | 534 Jack's Quick F | xi |
| | Rogers | Gennif 213 | 3-555-7564 | 576 Arnie's Auto | la |
| | Stantz | Linda 213 | 3-555-3456 | 528 Michael's Mo | tc |
| | Williams | Joe 213 | 3-555-3461 | 324 Wrench Worx | 6 |
| | * | | ▲ | | |
| | | | | | |
| | Data from | CSV file er | ntered into empl | y table | 1 |
| | | | | | |
| | | | | | |

Close the **Quick Customer Contacts** table.

Open the **Customer Info** table and scroll to the last column on the right.

In the **Attachment** field, in the first record, doubleclick the attachment (see Figure 1.33).

In the Attachments

dialog box, select the listed attachment and click **Save As**. Save the attachment in the location specified by your teacher. Click **OK**.

Choose File>Save & Publish>Save Object As>PDF or XPS. Click Save As (see Figure 1.34). Click the Save as type drop-down arrow. Select

XPS Document (*.xps).

Continued on the next page.

Tech Tip

To export an attachment to a record in a database table, use the **Save Object As** command.

You Should Know

If you want to keep a file in its original format, you can link to it or attach the file to the database.

EXERCISE 1-12 (Continued) Import and Export Data



FIGURE 1.33 Customer Info table attachment

| A J → C → → Microsoft Access | Table To | ols | | | - (|
|--|-----------------------------|-----------------------------|------------------------------------|---------------------------------|------------------|
| File Home Create External Data Databa | se Tools Fields | Table | | | |
| Saved Linked Table Excel Access Imports Manager | Saved Excel Text Exports | XML PDF E-mi File or XPS | Access Access Word Merge More * | Create Manage E-mail Replies | Work Synchronize |
| Import & Link | | Attachme | nt field = | Collect Data | Web Linked Lists |
| Tables 🔍 « | Ľ | | | | |
| Order Info | | | • | | - 0 |
| Product Info Double-clic | k es | - Payment Ter - | 0 Cli | ck to Add , | |
| Quick Customer Contacts | n parts | 15 days | 0(1) | | |
| Sales Info | only | 15 days | (O) | | |
| OTT-brand/dis | count manufacturers | 30 days | (0) | | |
| Off brand/dis | count manufacturers | 30 days | (0) (0) | | |
| OEM and dis | count | 15 days | (0) (0) | | |
| * | | | U(0) | | |
| | | | | | |
| | Attachments | | | | |
| | Attachments (Double-cl | ick to open) | | | |
| Eirst record | (i) car.jpg | | | | |
| | | | | <u>.</u> aa | |
| attachment | | | B | emove | |
| | | | | 2pen | |
| | | | Sav | /e As | |
| | | | Say | /e All | |
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FIGURE 1.34 Saving Object As XPS file

| A → ¹) × (¹ × → | Microsoft Access | | |
|---|----------------------------------|--------------|---|
| File Home Create | External Data Database Tools | Fields Table | |
| Jave Save Object As Are Database As Coop | File Types Save Database As | | Save the current database object Database File Types Save Object As |
| Close Database Phils Pick-a-Part.acc | Save Object As PDF or XPS option | n | object. → PDF or XPS Publish a copy of the object as a PDF or XPS file. |
| Phils Pick-a-Part.acc Sports-smarquez.ac Estate.accdb | Publish to Access Servic | :es | Advanced Save As Client Object Create a copy of this object as a client object |
| Info Recent | | | Save Ar |
| New | | | |
| Print | | | 1 |
| Save & Publish | | | |
| Help | | | |

In the **Publish** as **XPS** dialog box, navigate to the location given by your teacher.

Select the **Open file after publishing** option and click **Publish** (see Figure 1.35).

20 **()CHECK** Your screen should look like Figure 1.36.

Close the application displaying the XPS document. Close the **Customer Info** table.

Continue to the next exercise.

You Should Know

To save or publish a database object as an XPS document or PDF file, choose **External Data> Export>PDF or XPS**. To save or publish a copy of the database object as a PDF or XPS file, choose **File>Save & Publish> Save Object As>PDF or XPS**.

Tech Tip 🚽

When creating and designing forms, create a hyperlink to a file, a Web page, a picture, an e-mail address or another program by choosing **Design>Controls>** Hyperlink.

EXERCISE 1-12 (Continued) Import and Export Data



FIGURE 1.35 Publish as PDF or XPS dialog box

| A Publish as PDF or XPS | × |
|--|---|
| Coordinate Contraction Check > Unit 3 > + + Search Unit 3 | ٩ |
| Organize ▼ New folder III ▼ | 0 |
| A Microsoft Access ★ Favorites Documents Music Pictures Videos Saving Customer Info as XPS | |
| Not Homegroup | • |
| File name: Customer Info.xps Save as type: XPS Document (*.xps) | • |
| ♥ Open file after publishing Optimize for: ③ Standard (publishing online and printing) ● Open file option ● Publish button ● Hide Folders Tools ▼ Publish Cancel | |



| Customer Info.xps - > | (PS Viewer | | | | |
|-----------------------|--------------|---------------------|--------------------------|--------------|-----------|
| File 🔻 l | Permission 🔻 | Signatures 🔻 | 🔳 🖶 🥰 🔻 Find | | P - 🤇 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Customer Info | | 12/14/201 |
| Document of | displayed | in XPS Viewer | | | 12/14/201 |
| | 0 | Queles North | Quere et | 01 | |
| | Customer ID | Customer Name | Street | City | |
| | 1. | A1 Auto Parts | 419 Washington Boulevard | Los Angeles | |
| | 3 | Arnie's AutoHaus | 1010 Highway 56 | Concord | |
| | 2 | Jack's Quick Fix-It | 883 Ocean Street | Canton | |
| | 4 | Michael's Motors | 78 Arlen Avenue | Nashville | |
| | 6 | Triple-A Auto | 86 Meadow Lane | Indianapolis | - |
| | 5 | Wrench Worx | 221 Oro Vista Avenue | Rome | |
| | | | | | |
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- In your Phil's Pick-a-Part database, in the Navigation Pane, click the Navigation Bar and select Reports.
- Open the **All Orders** report.
- Choose Home>Views> Layout View
- Scroll to the end of the report.
- 5 **()CHECK** Your screen should look like Figure 1.37.
- Select Home>Views and click the View drop-down arrow. Select Print
 Preview Preview
- Choose Print Preview> Zoom>Two Pages
 - **CHECK** Your screen should look like Figure 1.38.
 - Continued on the next page.

ou Should Know

You can also use a Page Break control to mark where you want to start a new page within a section when designing your reports. To insert a page break control, open the report in Design view, choose **Design>Controls> Insert Page Break** and click where you want to insert the page break.

EXERCISE 1-13 Set Printing Options



Sometimes you might want to make sure that the data in a report is kept together to avoid excess pages and to improve the overall appearance of the report. Print Preview lets you review each page and helps you make sure that text and fields are correctly placed and formatted. Layout View allows you to manipulate fields and groups, but it does not show page breaks or certain other elements. Access also lets you use the Keep Groups Together property to keep data together so that a portion of a record does not display on one printed page with the remainder on the next. You can use the Force New Page property to print a section of data on a separate page.



| 🚽 🗉 - (* - | - | Microso | ft Access | | | | | | | | | | _ | ۰ | 23 |
|----------------------|----------|--------------|-------------------------------------|-----------------------------|------------------|------------------------------|-----------------|--------------------|-------------------|----------------|----------------------------------|---------|-----------------------|---------------|-------------|
| File Home | Create | External Dat | ta Dat | abase Tools | Design | Arrange For | mat Pa | ige Setup | | | | | | | ۵ (|
| View Themes A | Colors * | Sort Σ Tor | tals * de Details | | Aa 🔤 | | | * * * | Insert Image * | Page Number | I Logo I Title S S Date ar | nd Time | Add Existin Fields | g Prop She | erty eet |
| /ws Theme | .5 | Grouping 8 | . Totals | | | Controls | | | | H | eader / Foote | er | То | ols | |
| All Olders | | | | | | | | | | | | | | | |
| | - | <u> </u> | All Orders | _ | _ | | _ | _ | - | - | _ | _ | - | | 23 |
| | | | Custome | er Name | | Wrench W | Vorx | | - | | | | | ۲ | 23 |
| View dro | p- | | All Orders Custome 8/24 | er Name 4/2011 | 1 | Wrench W | Vorx | | | | _ | _ | 0 | ٠ | 23 |
| View dro down ari | p- ow | | All Orders Custome 8/2 9/4 | er Name 4/2011 4/2011 | 1 | Wrench W 2 15 | Vorx | | - | - | | | | | 23 |
| View dro down arr | p- ow | | All Orders Custome 8/2 9/ | 4/2011 4/2011 Layou | 1 5 t View | Wrench W 2 15 Shows | vorx | on or | ne p | age |] | | | | 23 |
| View dro down arr | p- ow | | All Orders Custome 8/2 9/ | 4/2011 4/2011 Layou | 1 5 t View | Wrench W 2 15 Shows | ofit o | <mark>n or</mark> | <mark>ie p</mark> | age |] | | | | |
| View dro down arr | p- ow | | All Orders Custome 8/2 9/ | 4/2011 4/2011 Layou | 1 5 t View | Wrench W 2 15 shows | Vorx i fit o | <mark>on or</mark> | ne p | age |] | | | | |

FIGURE 1.38 All Orders report Print Preview

| A . ") - (" - = | Microsoft Access | - • × |
|--|---|---|
| File Print Preview | | ۵ () |
| Print Size Margins Print Data Only Print Page Size | Pottrait Landscape Columns Page Page Layout Page Layout | Close Print Preview Close Preview |
| Reports 🛞 « | | • |
| All Orders | All Orders | - • × |
| | No ders Sandels Sandels <t< td=""><td>Preview</td></t<> | Preview |
| Brok | en grouping over two pages Print Preview s | nows |
| | two pages at a | ume |
| Pag | e H ≺ 1 → H → K No Filter | |
| Ready | Num Lock 🛛 🖾 🖬 🖌 43% 🕞 🗌 | • • • " |

Close Print Preview. Choose Home>Views> Layout View

Choose Design>Tools> Property Sheet . Under Selection type, click the drop-down arrow. Select Detail. On the Format tab, click the Force New Page box. Select After Section.

Right-click in an open area and select **Print Preview**.

CHECK Your screen should look like Figure 1.39. Close Print Preview.

In the **Property Sheet**, under **Selection type**, click the drop-down arrow. Select **Detail**. Click in the **Force New Page** box. Select **None**.

Close the Property Sheet. Choose Design> Grouping & Totals> Group & Sort [[=].

5 (CHECK) Your screen should look like Figure 1.40.

Continued on the next page.

You Should Know

To add a background image to a report using the Report Layout Tools, choose **Format> Background>** Background Image.

EXERCISE 1-13 (Continued) Set Printing Options



FIGURE 1.39 All Orders report with Force New Page After Section

| A □ □ □ ∞ □ ∞ Microsoft Access □ ∞ | | | | | | | | | | |
|--|---------------------------------------|--------------|------------------------------|--------|---|-------------------------------|---------------------|-------------|------------------------|----|
| File Print Preview 🗠 🕜 | | | | | | | | | | |
| Print | Size Margins Print Data | a Only | ndscape Columns Page | Zoom O | Dne Two More | Refresh Excel | Text PDF | E-mail More | Close Prin | t |
| Print | Page Size | | Page Layout | * Pa | Zoom Pages Pages * | All | File or XPS Data | * | Preview Close Previ | ew |
| Report | ts 🔍 « | | | | | | | | | |
| A | All Orders | | | | | | | | | |
| | | 🔄 All Orders | | | | | | | _ 0 | 23 |
| | | | | | | | | | | |
| | | Al C | Orders ProductID Quantity | 7. | Tues day, December 14, 2013 2:42:00 PM | Date Product1D 7/14/2011 3 | Quantity 15 | | | |
| | | Cutomer Neme | AS Auto Partie | | | | | | | |
| | | 7/14/2011 | 4 20 | | | ↑ | | | | |
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| | | | Section | o bro | kon onto | individ | | 100 | | |
| | Sections broken onto individual pages | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | Fage 1 of 26 | | | | Fage 2 of 26 | | | |
| | | | | | | | | | | |
| | Page: Id 4 1 	 > H 30 	 K No Filter | | | | | | | | | |
| | | | | | | | | | | |
| Ready NumLock | | | | | | | | | | |

FIGURE 1.40 Grouping and Sorting window



In the Group, Sort, and Total window on the Group on Customer Name bar, click More.

Click the do not keep group together on one page drop-down arrow and select keep whole group together on one page.

()CHECK Your screen should look like Figure 1.41.

Choose Design>
 Grouping & Totals>
 Group & Sort [[=] to close the window.

Choose Design>Header/ Footer>Logo. Navigate to and select the car.jpg data file. Click OK.



Choose Design>

Controls>More. Click Insert Hyperlink. Click slightly to the right of the Product ID header (when you see the yellow line).

Navigate to your **Product** Info file and click **OK**. Choose **Design>Views** View>Print Preview

()CHECK Your screen should look like Figure 1.42. Close the report. Click **Yes** to save the changes. Close your database. **Exit Access**.

EXERCISE 1-13 (Continued) Set Printing Options



FIGURE 1.41 Grouping sections together on same page

| A | Microsoft Access | Report Layout Tools | | - 8 % | | | | | |
|--|---|-----------------------|---|--|--|--|--|--|--|
| File Home Create Exte | ernal Data Database Tools | Design Arrange Format | Page Setup | ۵ 😮 | | | | | |
| Views Themes Colors Group | Σ Totals * | Aa 🚥 📄 🌏 📑 | Insert ▼ Image → Page Header / Footer | Add Existing Property Fields Sheet Tools | | | | | |
| Reports 💿 « 🔲 All Orders | | | | | | | | | |
| All Orders | All C | Product ID Quantity | | Tuesday, December 14 3:46: | | | | | |
| | Customer Name | A1 Auto Parts | | ≡ ≡ | | | | | |
| | 7/14/2011 | 4 20 | | | | | | | |
| | 8/4/2011 | 2 10 | | | | | | | |
| | Customer Name | Arnie's AutoHau | 15 | | | | | | |
| | 10/14/2011 | 5 10 | | | | | | | |
| | 11/10/2011 | 6 10 | | | | | | | |
| | 11/14/2011 | 5 3 | | - | | | | | |
| | + | | III | | | | | | |
| | Group, Sort, and Total 23 | | | | | | | | |
| | Group on Customer Name 		 with A on top 		, by entire value 		, with no totals 		, with title Customer Name , | | | | | | | | |
| Sort by Date | | | | | | | | | |
| [□] ^{li≡} Add a group ²¹ Add a so Groups are kept on same page | | | | | | | | | |
| Layout View | | | | Num Lock 🛛 🖾 🔛 🕍 | | | | | |





In your Phil's Pick-a-Part database, choose Create> Macros & Code>Macros.

- 2 Under Macro1, in the Add New Action drop-down list, select Maximize Window.
- 3 Click the Add New Action drop-down arrow again and select **OpenReport**. In the **Report Name** box, key: All Orders. Your screen should look like Figure 1.43.
- Click **Save**. In the **Save As** dialog box, key: AutoExec. Click **OK**.
- 5 Click **Run**. Your screen should look like Figure 1.44.
- In the Navigation Pane, click the Reports dropdown arrow and select All Access Objects.
- Under Macros, select the AutoExec Macro. Switch to Design View.

Continued on the next page.

If you cannot find the action you want, choose **Design>Show/Hide** and make sure **Show All Actions** is selected.

ech Tip

EXERCISE 1–14 View Code and Convert Macros to Visual Basic

If you find that you regularly perform the same series of actions, or use the same functionality for controls, such as command buttons or text boxes, in your databases, you can create a macro to speed up your work. A macro is an action or sequence of actions that you record and then play back with a single command, a click of a mouse, opening a form, or modifying data in a text box, for example. Macros allow you to improve efficiency because they are an easy way to automate programming tasks and add functionality to your forms, reports, and controls without writing code in a Visual Basic editor. Visual Basic (or VBA) is an event-driven programming language that allows you to perform much more complex operations and applications in Access. In this exercise, you are going to create a macro that will automatically maximize the application window and open a particular report every time your database opens, view code, and convert macros to Visual Basic.

23

FIGURE 1.43 Selecting actions in Macro Builder





| 🔍 🖳 🔊 👻 🔍 🚽 🗧 🛛 All Orders - Microsoft Access | | | | | |
|---|--|--|--|--|--|
| File Home Create Exte | a 😮 🖬 🗆 🕄 | | | | |
| Views Cut Views Copy Views Format Painter | Filter Ascending Ascending A Descending C Descending C C C C C C C C C C C C C C C C C C C | Refresh All + Cords Records New ∑ Save 45 All + Cords | Find Find Find Find Find Find Find Find | → · · : : : :: B I U 读读 ×ī · = · h, w, × A · ※· · · · · · · · · · · · · · · · · | |
| Reports 💿 « | | | | | |
| All Orders | 🚌 All C | Orders | | Tuesday, February 01, 20 4:09:20 i | |
| | Date Product ID Product Info-rgupta.xlsx Quantity | | | | |
| | Customer Name | A1 Auto | Parts | = | |
| | 7/14/2011 | 4 | 20 | | |
| | 7/14/2011 | 1 | 15 | | |
| | 8/4/2011 | 3 | 10 | | |
| | | | | | |
| | Customer Name | | AutoHaus | _ | |
| | 10/14/2011 | 5 | 10 | | |
| | 11/10/2011 | 6 | 10 | | |

- Choose Design>Tools> Convert Report's Macros to Visual Basic (See Figure 1.45). Click Convert. Click OK. The Visual Basic Editor opens.
- In the Visual Basic
 Editor, if necessary,
 choose View>Project
 Explorer to open the
 Project Explorer pane.
- Expand each item on the tree under the Phil's Pick-a-Part database. Under Modules, double-click the Converted Macro-AutoExec.
 - Close the Visual Basic Editor. In the Navigation Pane, under Modules, select Converted Macro-AutoExec.
- Choose Design>Tools> View Code.

You screen should look like Figure 1.42. Close the Visual Basic Editor.

Save and close your database.

Continue to the next exercise.

ou Should Know

If you do not want an AutoExec macro to run when opening a database, hold down SHIFT while you open the database.

EXERCISE 1–14 (Continued) View Code and Convert Macros to Visual Basic

FIGURE 1.45 Converting report's AutoExec macro to Visual Basic Editor

| All Orders | - Microsoft Access Report Design Tools |
|--|---|
| File Home Create External | Data Database Tools Design Arrange Format Page Setup |
| Views Themes ▼ (ﷺ Group & Sort ↓ Golors ▼ Σ Totals ▼ ↓ Totals ▼ ↓ Hide Details Grouping & Totals | Aa Image Im |
| All Access Objects 💿 « | |
| Tables | |
| Book Inventory Customer Info | All Orders Visual Basic =Dat Time |
| Order Info | Date: Product ID Product Info-gupta.xisx Quantity |
| Product Info | |
| Quick Customer Contacts | |
| Sales Info | Customer Name |
| Queries * | Coloner vane |
| All Orders . | Date Product ID Quantity |
| August Orders | ✓ Page Footer |
| Employee Data Query | ="Page." & [Page] & " of " & [Pages] |
| July Orders | |
| Sales Info Query | |
| Forms * | Convert report macros: All Orders |
| All Orders Chart | Add error handling to generated functions |
| Reports | Include macro comments |
| All Orders | |
| Macros | |
| 2 | |
| | |
| Convert macros to Visual Basic | Num Lock 🖾 🖬 🖉 |





- In your **Phil's Pick-a-Part** database, choose **Home>Views>Design View**.
- Choose Design Tools>Tab Order. The Tab Order dialog box opens. Under Custom Order, click and drag Date below Product ID and Quantity in the list (see Figure 1.47). Click OK.
- 3 Click the **Arrange** tab. In the **All Orders** table layout, select the cell that contains the hyperlink to the **Product Info table**.
- Choose Arrange>Move> Move Up. The cell containing a hyperlink moves up in the table layout.
- 5 With the cell still selected, choose Arrange Format> Sizing & Ordering>Align and click To Grid. Your screen should look like Figure 1.48.
- Choose Design>
 Controls>Button. Click just to the right of the hyperlink. With the button still selected, choose
 Format>Control
 Formatting>Change
 Shape. Click Oval.

Continued on the next page.

EXERCISE 1–15 Modify Forms and Reports

23

Before you print out a form or report, you may decide that you want to change its layout to better organize its information. The simplest way to make changes to a form or report to make it more readable is to use the Design Tools in Design View. The layout of a form or report is similar to a table in a word processing document in that it is made up of cells that are arranged in rows and columns. You may decide that you want to add, rearrange, or remove controls from the page layout using the Table group on the Arrange tab, apply Quick Styles to a command button, change the tab order of controls, or align the output to a grid. You may also want to rearrange, or move, a table cell to a new location in the layout, or change a button's shape. In this exercise, you will make changes to the design and layout of the All Orders report. You will also create and format a command button for a form that you plan to use at a future date.

FIGURE 1.47 Tab Order dialog box





| 🔼 🛃 🍠 🕶 🖓 👻 🚽 🛛 Micro | Report Design Tools | | | Alian | | | | | |
|---|-----------------------------------|--|--|-------------------------|---|--|--|--|--|
| File Home Create External | Data Database Tools | Design Arrange | Format | Page Setup | Aligi | <u> </u> | | | |
| Gridlines Stacked Tabular Remove Layout Table | Insert Below Rows & Columns | Select Layout I Miles Sp Select Column Sp Select Row Sp M | erge lit Vertically lit Horizontally erge / Split | Move Up Down Move | A Control Control Margins * Padding * Position | Size/Space Align Bring Send to Front to Back Sizing & Ordering | | | |
| | | | | | | | | | |
| Tables | Tables | | | | | | | | |
| Book Inventory | Report Header | | M | ove aro | un | | | | |
| Customer Info | | | | | | | | | |
| Employee Data | All C | Orders Product | Info-rgupta.x | 5% | | | | | |
| Order Info | Fage Header | | | | · · · · · | | | | |
| Product Info | Date | luct ID | | Quantity | | | | | |
| Quick Customer Contacts | ✓ Customer Name Header | | | | | | | | |
| Sales Info | | | | | | | | | |
| Queries * | | - | | | | | | | |
| All Orders | - Customer Name | Cus | tomer Name | | | | | | |
| August Orders | Detail | | | | | | | | |
| Employee Data Query | Date | | | Quantity |] | | | | |
| July Orders | Page Footer | | -"Dono." 8 | (Done) & " of " | & (Danas) | | | | |
| Sales Info Query | Sales Info Query | | | | | | | | |
| Forms | | | | | | | | | |
| All Orders Chart | : | | | | | | | | |
| Reports | | | | | | | | | |
| All Orders | : | | | | | | | | |
| Macros 🎄 | 1 | | | | | | | | |
| Carl AutoExec | : | | | | | | | | |
| Modula | | | | | | | | | |

- Choose Format>Control Formatting>Quick Styles and select the fourth button in the last row.
- Click inside the button and change the button's text to All Orders. Press ENTER. See Figure 1.49.
- Right-click on the button and select **Delete**.

Close the **All Orders Report** and click **Yes** to save the changes.

- In the Navigation Pane, select All Orders Report and choose Create> Forms>Form Design. Repeat steps 6 and 7 to create and format a similar button called Next.
- In the Command Button Wizard, click Next. Select Text. In the Text box, key Next. Click Finish.
- Apply the same shape and Quick Style. Click anywhere on the form's table grid (see Figure 1.49).
- Save the form as: Next button.

With your teacher's permission, choose **File>Print** to print the modified All Orders Report.

6 Save and close your database.

EXERCISE 1-15 (Continued) Modify Forms and Reports

FIGURE 1.49 Command button's shape and style changed



FIGURE 1.50 New shape and Quick Style applied to command button for a form



You Should Know

If you want to move the content of a table's cells in a form layout, open the form in **Design View** and choose **Arrange>Move** and select **Move Up** or **Move Down**.

Tech Tip

To change a command button's shape in a form or report, choose **Format>Control Formatting>Change Shape**.

Lesson 1: Exercise 1-15