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**PC3104**  
**DEVELOPING DATABASE**  
**USING MICROSOFT ACCESS**  
**WITH VISUAL BASIC**

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# 1 Database Essentials

## 1.1 Getting Started

A **database** is a tool for collecting and organizing information. An example is a phone book, which organizes a large amount of data—names, addresses, and phone numbers—so you can access it by name in alphabetic order.

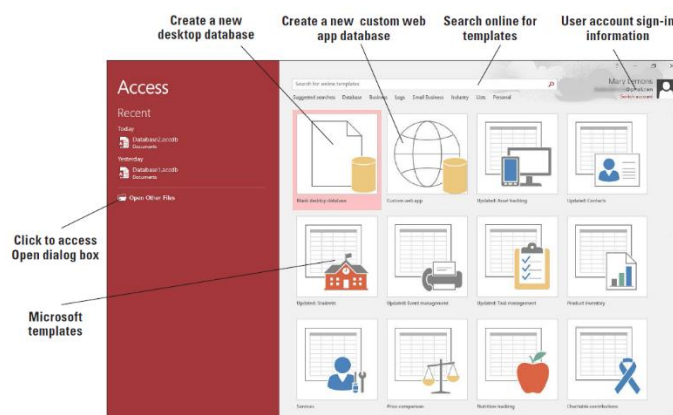
A computerized **database management system (DBMS)**, such as Access, enables you to easily collect large volumes of data organized into categories of related information. This type of database allows you to store, organize, and manage your data, no matter how complex it is, and then retrieve and present it in various formats and reports.

The Access startup screen allows you to:

- Create a new, custom web app database
- Create a blank desktop database
- Create a database from a template
- Open a recent database (if you've already created one)
- Search online for templates.

### 1.1.1 Step by Step: Start Access in Windows 10

- 1 Before you begin these steps, make sure that your computer is on. Sign on, if necessary.
- 2 Press the **Windows** key on the keyboard to display the Start menu.
- 3 Click **All apps**, point to **Access 2016**, and then click **Access 2016** to start Access and display its Start screen.
- 4 **LEAVE** Access open to use in the next exercise.





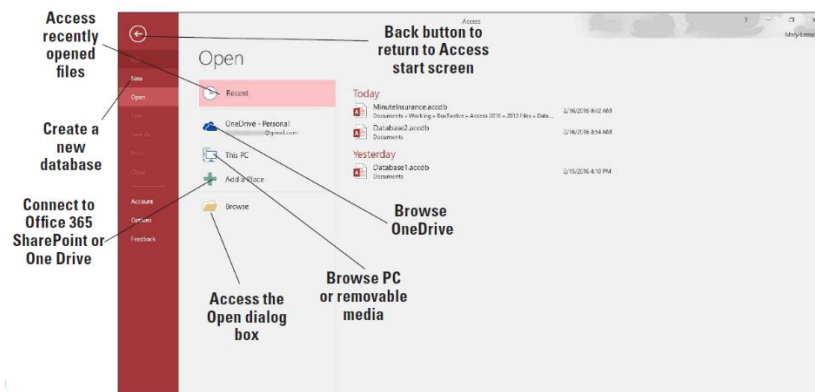
## 1.1.2 Opening an Existing Database

When you open an existing database, you access not only your previously entered and saved data, but also the elements you created to organize that data. The Open Other Files command on the Access startup screen displays the Open screen. From there, you can choose to open a recent file, a file on your OneDrive location, This PC, or you can Add a Place or Browse for a file.

The This PC command allows you to find files stored locally in a folder on your computer or on some type of removable media, or on a network drive. The Add a Place command allows you to set up network locations like OneDrive or an Office 365 SharePoint location.

### 1.1.2.1 Step by Step: Open an Existing Database

- 1 The Access startup screen should be on the screen from the previous exercise.



- 2 Click the **Open Other Files** command on the left side of the Access startup screen. The Open screen appears.
- 3 Click **Browse**, navigate to the data files for this lesson, and then select **StudentInformation.accdb**.
- 4 In the *Open* dialog box, click the **Open** button. The existing database opens.
- 5 **LEAVE** the database open to use in the next exercise.
- 6 If you open a file in a multi-user environment, other users can read and write to the database as well. You may want to open the database with other options. Click the down arrow next to the Open button to view these options:
  - **Open:** Opens with default access.
  - **Open Read-Only:** Opens with only viewing ability and not editing ability. Others can still read and write.

- **Open Exclusive:** Opens so that the database is only available to you. Others will receive a message that the file is already in use.
- **Open Exclusive Read-Only:** Opens with only viewing ability and not editing ability.

### 1.1.3 Using the Navigation Pane

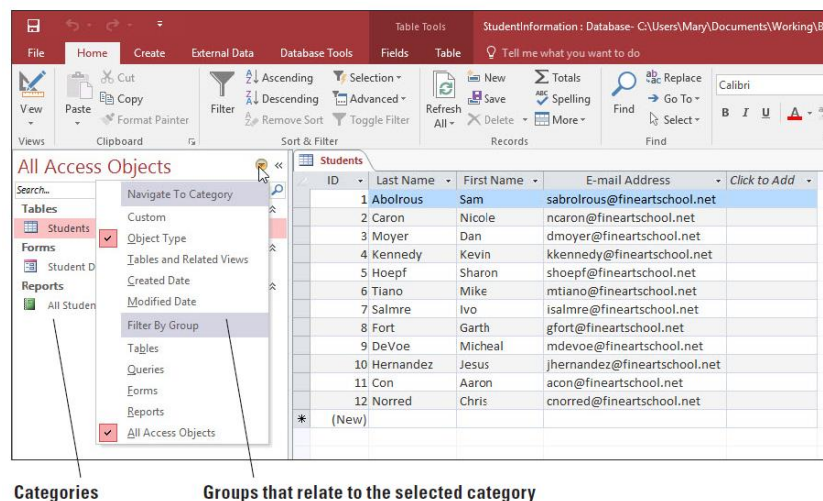
The Navigation Pane enables you to open, copy, and delete tables and other database **objects**. It also lists all the objects in your database:

- **Tables:** The most basic database object that stores data in categories
- **Queries:** Allow you to search and retrieve the data you have stored
- **Forms:** Control data entry and data views and provide visual cues that make data easier to work with
- **Reports:** Present your information in ways that are most useful to you

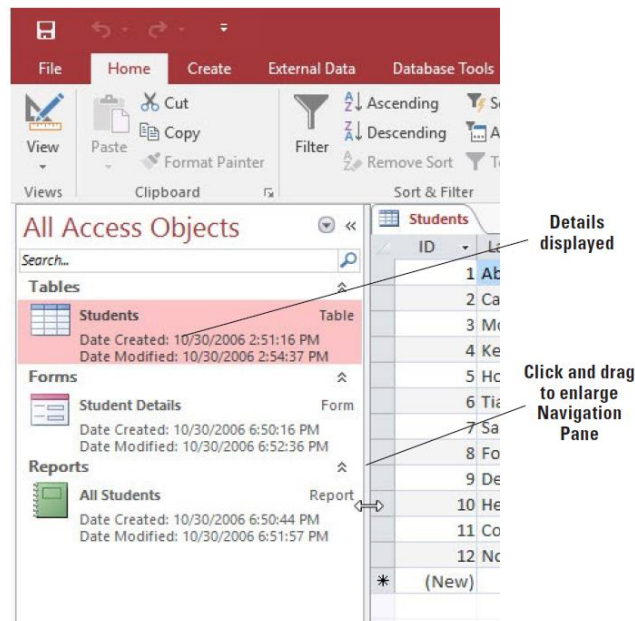
Before you can create a database, you need to understand its most basic elements.

#### 1.1.3.1 Step by Step: Use the Navigation Pane

- 1 **USE** the ***Student Information*** database that is still open from the previous exercise.
- 2 In the Navigation Pane, double-click **Students** to display the table in the Access work area.
- 3 Click the **down arrow** next to All Access Objects at the top of the Navigation Pane to display the menu.
- 4 Click **Tables and Related Views**. The default group in this category is All Tables, which appears in the menu at the top of the Navigation Pane. Notice the Students table and all other objects related to it are displayed under the Students object tab.



- 5 Click the **down arrow** next to All Tables at the top of the Navigation Pane to display the menu again and then click **Object Type** to return to the original view.
- 6 Right-click in the white area of the Navigation Pane to display a shortcut menu. Click **View By** and then click **Details**.
- 7 The database objects are displayed with details. Click the right side of the Navigation Pane and drag to make it wider so all the information can be read, as shown on the right.



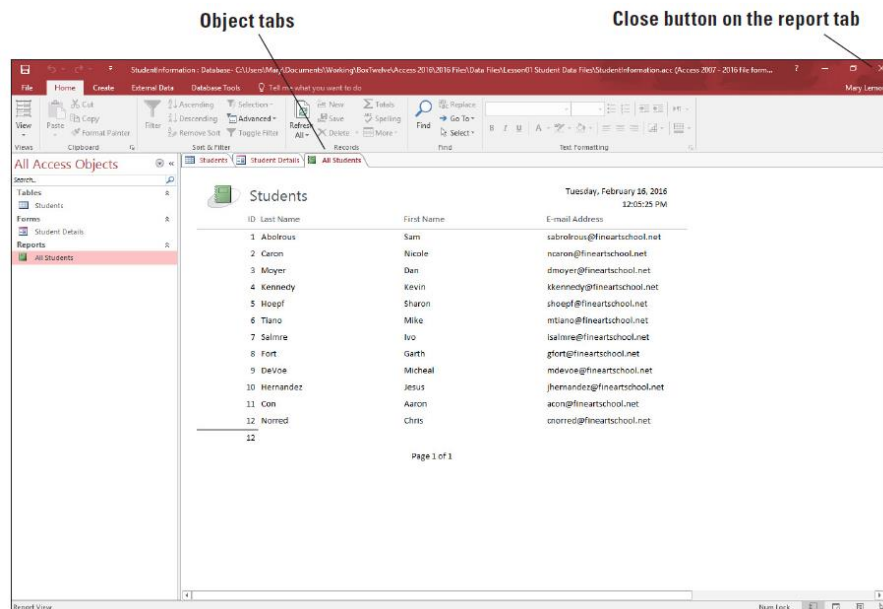
- 8 If the search bar does not appear at the top of the Navigation Pane, right-click the **All Access Objects** header of the Navigation Pane. On the shortcut menu, click **Search Bar**. A search bar is displayed at the top of the Navigation Pane.
- 9 Right-click in the white area of the Navigation Pane, click **View By** and then click **List** in the shortcut menu to display the database objects in a list again.
- 10 Click the **Shutter Bar Open/Close** button to collapse the Navigation Pane. Notice it is not entirely hidden.
- 11 Click the **Shutter Bar Open/Close** button to expand the Navigation Pane again.
- 12 **LEAVE** the database open to use in the next exercise.

### 1.1.4 Using Object Tabs

When you create a database in Access, all the objects in that database—including forms, tables, reports, queries—are displayed in a single window separated by tabs. Tabs help keep open objects visible and accessible.

### 1.1.4.1 Step by Step: Use Object Tabs

- 1 **USE** the **Student Information** database that is still open from the previous exercise.
- 2 In the Navigation Pane, double-click **Student Details**. A new object tab opens to display the form.
- 3 In the Navigation Pane, double-click **All Students**. A new object tab opens to display the All Students report tab along with the other two tabs.
- 4 Click the **Close** button on the report tab to close it.
- 5 Right-click the **Student Details** tab to display the shortcut menu. This menu allows you to save the object, close the object, close all object tabs, or change the object view.
- 6 Click **Close** to close the form.
- 7 **LEAVE** the database open to use in the next exercise.



### 1.1.5 Changing Views

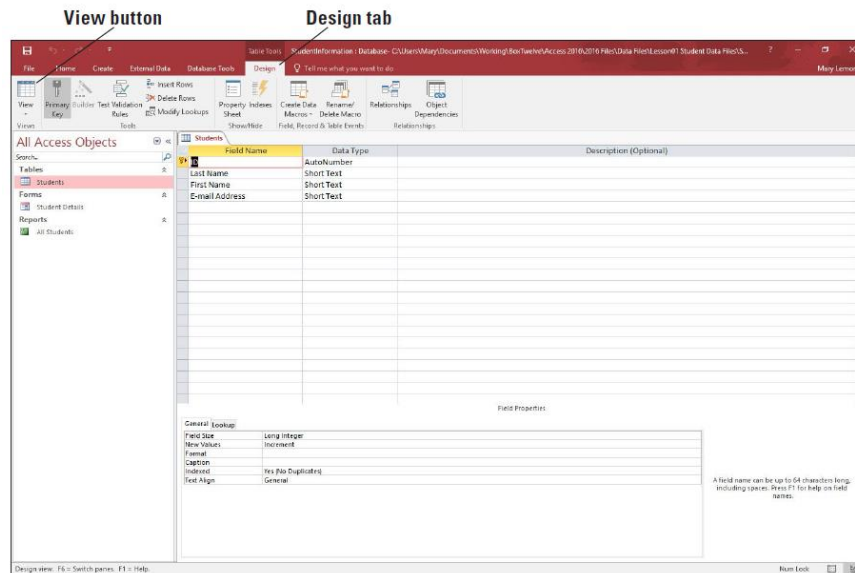
Each database object can be viewed several different ways. The main views for a table are Datasheet View and Design View. Datasheet View can be used to perform most table design tasks, so you will probably use it most often.

A **datasheet** is the visual representation of the data contained in a table or of the results returned by a query. A query is simply a question you can ask a table or another query.

#### 1.1.5.1 Step by Step: Change Views

- 1 **USE** the **Student Information** database you used in the previous exercise. The Students table should be displayed in the Access work area.

- 2 On the Home tab, in the Views group, click the **down arrow** on the View button.
- 3 Click **Design View**. The table is displayed in Design View. Notice that the Design tab is now displayed on the Ribbon.
- 4 On the Design tab, in the Views group, click the **down arrow** on the View button and then click **Datasheet View**.
- 5 On the Ribbon, in the Table Tools group, click the **Fields** tab to display the contextual commands for that view.
- 6 **LEAVE** the database open to use in the next exercise.



## 1.2 Selecting Tools and Commands

A **command** is a tool (such as an icon, a button, or a list) that tells Access to perform a specific task. Each tab provides commands that are relevant to the kind of task you are performing. Many of the tools and commands for working with Access are accessible through the Access Ribbon.

Access also offers tools and commands on:

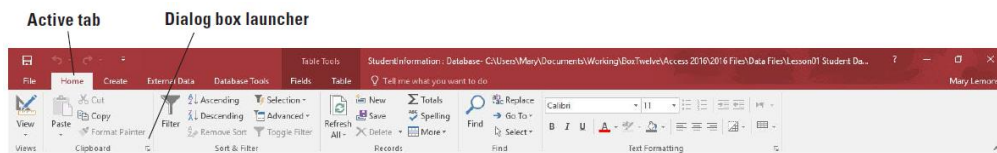
- The File menu (also known as **Backstage view**)
- A Quick Access toolbar
- A status bar.

## 1.2.1 Using the Ribbon

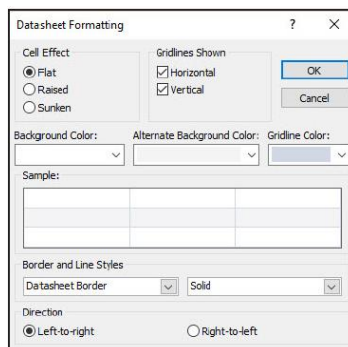
The Ribbon is located across the top of the screen and contains tabs and groups of commands. The Ribbon is contextual, which means it offers you commands related to the object that you are working on or the task that you are performing. Some groups have a **dialog box launcher**, which is a small arrow in the lower-right corner of the group that you click to launch a dialog box or task pane that displays additional options or information.

### 1.2.1.1 Step by Step: Use the Ribbon

- 1 **USE** the *Student Information* database that is still open from the previous exercise.
- 2 Click the **Home** tab to make it active. As shown below, the Ribbon is divided into groups of commands. Notice the dialog box launcher in the lower-right corner of the Clipboard group.



- 3 Click the **Create** tab to make it the active tab. Notice that the groups of commands change.
- 4 Click **External Data** and then click **Database Tools** to see the commands available on those tabs.
- 5 Click the **Home** tab.
- 6 On the Students Object tab, click the **ID** column header in the table to select the ID column.
- 7 Click the **dialog box launcher** in the lower-right corner of the Text Formatting group. *The Datasheet Formatting dialog box appears, as shown here.*



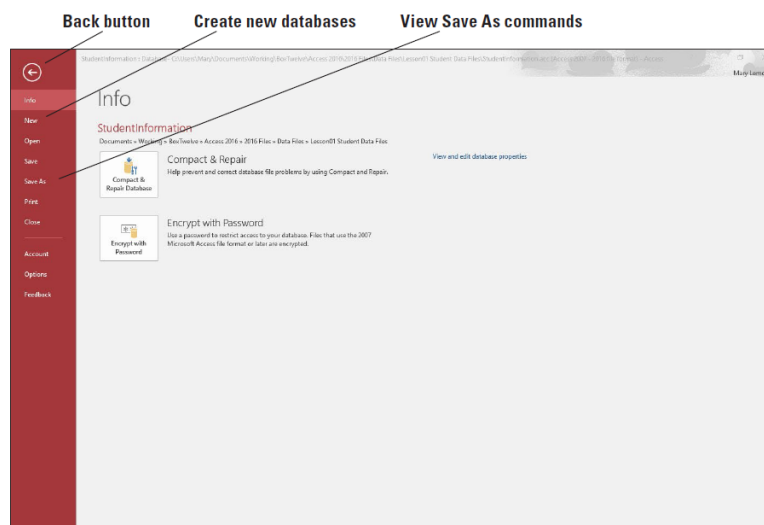
- 8 Click **Cancel** to close the dialog box.
- 9 Double-click the **Home** tab. Notice the groups are hidden to give you more screen space to work with your database.

- 10 Double-click **Home** again to display the groups.
- 11 Click **File** and then click **Close** to close the database. Access appears with no database open.
- 12 **LEAVE** Access open to use in the next exercise.

### 1.2.2 Using the Backstage View

Backstage view appears when you click the File tab from an open database. It contains a menu of options and commands that allows you to access various screens to perform common tasks with your database files (creating a new database, opening, saving, printing, closing, and changing user account settings and options).

You can click several options and commands to view related screens containing various options and commands used to create and manage your database. The Back button returns you to the Access database workspace.



The following is an overview of the options in the Backstage view:

- **Info:** Default view. Used to view the current database file path, view and edit database properties, compact and repair the database, and encrypt the database.
- **New:** Use this option to create a new database.
- **Open:** Use this option to open an existing database and view a list of recently accessed databases.
- **Save:** Use this option to return to the open database window where objects can be saved.

- **Save As:** Use this option to save the current database object as a new object or save the database in another format that is compatible with earlier versions of Access. You can save the database to a document management server for sharing or you can package the database and apply a digital signature.
- **Print:** Use this option to quick-print to a printer, open a dialog box from which to choose print options, or preview your document before printing.
- **Close:** Use this option to close the open database but keep the Access application open.
- **Account:** Use this option to view and modify user account settings, change application background and theme, add a service, manage your Office 365 account, update office, and learn more about Access.
- **Options:** Use this option to customize language, display, proofing, and other settings.
- **Feedback:** Opens the Windows Feedback dialog box, which allows you to provide feedback to Microsoft and explore other users' feedback.

#### 1.2.2.1 Step by Step: Use the Backstage View

- 1 **START** Access if it's not already running.
- 2 Click the **File** tab. Backstage view opens.
- 3 Click **Open** and then navigate to the **StudentData** database from the data files for this lesson.
- 4 Click **File** again. Backstage view now displays a menu of options down the left side of the window and information about the currently opened database.
- 5 Click the **New** option to view the options and commands available.
- 6 Click the **Save As** option to view more options and commands.
- 7 Select **Access Database (\*.accdb)** if it's not already selected.
- 8 Click the **Save As** button in the right pane under the Save Database as area to save the Student Data file as **StudentData-final**. Click **Yes** in the dialog box that appears informing you that the objects will be closed.
- 9 Select the location to save the file and then click **Save**. The new database file opens automatically.
- 10 Select **File** again to re-open Backstage view.
- 11 Click the **Print** option to view more options and commands.
- 12 Click the **Account** option to view the options and commands .



- 13 Click the **Options** option to view more options and commands.
- 14 Click the **Cancel** button to close the *Access Options* dialog box and return to the Access workspace.
- 15 **LEAVE** the database open to use in the next exercise.

## 1.3 Defining Data Needs and Types

When planning a database, the first step is to consider the purpose of your database. Design the database so that it accommodates all your data-processing and reporting needs. Gather and organize all the information that you want to include, starting with any existing forms or lists, and think about the reports and mailings you might want to create using the data. Categorize the information by dividing it into subjects, which become the tables in your database. Each table should only contain information that relates to that subject. If you find yourself adding extra information, create a new table.

In a database table, data is stored in rows and columns—similar in appearance to a spreadsheet. Each row in a table is called a **record**. Each column in a table is called a **field**.

### 1.3.1 Step by Step: Review Database Fields

- 1 **USE** the *StudentData-final* database that is still open from the previous exercise.
- 2 On the Student List form, click the **ID** for record 5 to display the *Student Details* dialog box for Sharon Hoepf.
- 3 Click the **Guardian Information** tab and then click the **Emergency Information** tab. Each field on each tab is an example of the type of information that could be contained in a database table.
- 4 Click **Close** to close the *Student Details* dialog box.
- 5 **LEAVE** the database open to use in the next exercise.

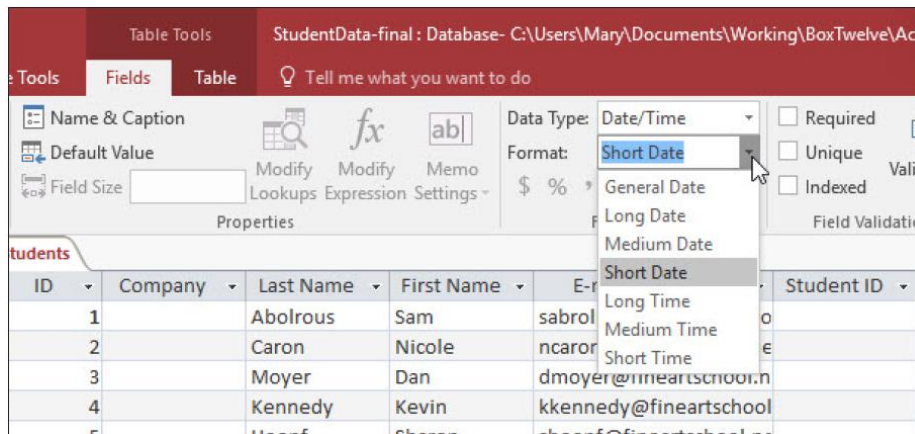
### 1.3.2 Defining and Modifying Data Types for Fields

When designing the database, you set a **data type** for each field (column) that you create to match the information it will store. A data type controls the type of data a field will contain—whether it is text, number, date/time, or some other type of data.

When defining table fields, it is important to define them as specifically as possible. Access provides 11 data types, each with its own purpose.

### 1.3.2.1 Step by Step: Review and Modify Data Types for Fields

- 1 **USE** the *StudentData-final* database that is still open from the previous exercise.
- 2 **CLOSE** the Student List form.
- 3 In the Navigation Pane, in the Students group, double-click **Students: Table** to open it.
- 4 Click the **Date of Birth** field header.
- 5 On the Ribbon, click the **Fields** tab. Notice in the Formatting group that the Data Type is Date/Time.
- 6 In the Format box, click the **down arrow** to display the menu of formatting options for that type.
- 7 Click the **Last Name** header. Notice that the Data Type is Short Text and that no formatting options are available for that data type.



- 8 Scroll to the right and then click the **Address** header.
- 9 In the Data Type box, click the **down arrow** and then click **Short Text** to change the data type.
- 10 Scroll to the far right and then click the **Click to Add** column header. In the Data Type drop-down list that appears, select **Yes/No**. Once you click Yes/No, notice the name of the column header, Field1, is highlighted.
- 11 Rename the field by typing **Additional Contact Info on File?**. Press **Enter** and then click the **Additional Contact Info on File?** header.
- 12 On the Ribbon, in the Formatting group, click the **down arrow** in the Format box to display the menu of formatting options for the Yes/No data type.
- 13 Click outside the menu to close it.
- 14 **LEAVE** the database open to use in the next exercise.

### 1.3.3 Defining Database Tables

Tables are the most basic organizational element of a database. Not only is it important to plan the tables so they will hold the type of data you need, but it's also important to plan how the tables and information will be connected.

In database applications like Access, you can create a relational database. A **relational database** stores information in separate tables and these tables are connected or linked by a defined relationship that ties the data together.

An important principle to consider when planning a database is to try to record each piece of information only once. Duplicate information, or **redundant data**, wastes space and increases the likelihood of errors.

Relationships among database tables help ensure consistency and reduce repetitive data entry. As you create each table, keep in mind how the data in the tables are related to each other.

The last step is to apply data normalization rules to see if your tables are structured correctly and make adjustments as needed. **Normalization** is the process of applying rules to your database design to ensure that you have divided your information items into the appropriate tables.

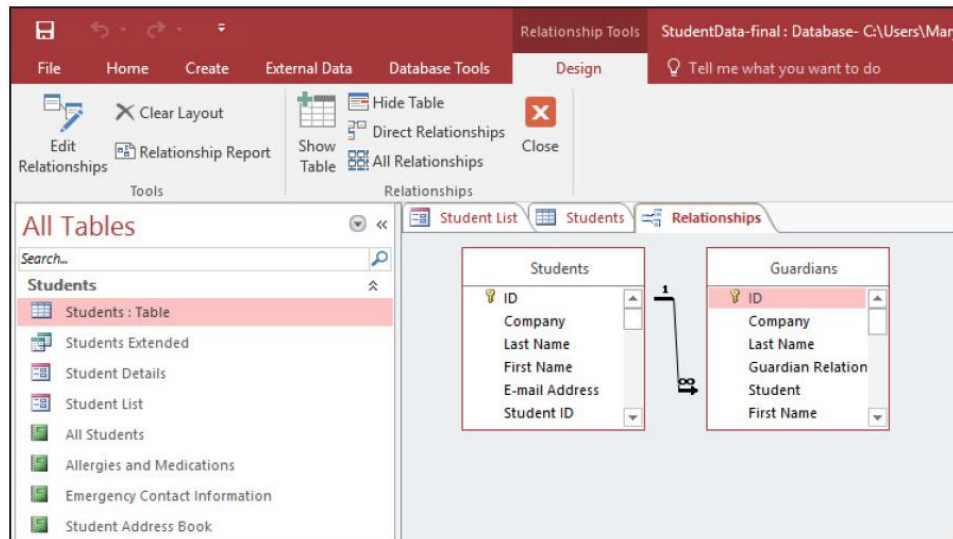
These are referred to as **normal forms**. There are five normal forms, but typically only the first three are applied:

- **First Normal Form (1NF):** This form divides each field according to its smallest meaningful value, removes repeating groups of data, and creates a separate table for each set of related data.
- **Second Normal Form (2NF):** With this form, each non-key column should be fully dependent on the entire primary key. Create new tables for data that applies to more than one record in a table and add a related field to the table.
- **Third Normal Form (3NF):** Use this form to remove fields that do not relate to, nor provide a fact about, the primary key.

#### 1.3.3.1 Step by Step: Define Database Tables

- 1 **USE** the *StudentData-final* database that is still open from the previous exercise.
- 2 On the Database Tools tab, in the Relationships group, click **Relationships** to display a visual representation of the relationship between the Students and Guardians tables.
- 3 **CLOSE** the Relationships tab.
- 4 **CLOSE** the Students tab.

- 5 **CLOSE** the Student List tab.
- 6 **CLOSE** the database and Access.



## 2 Creating Database Tables

### 2.1 Creating a Database

You can create a database using one of the many available templates or by creating a new blank database. Templates are ready-to-use databases that contain all of the tables, queries, forms, and reports needed for performing specific tasks.

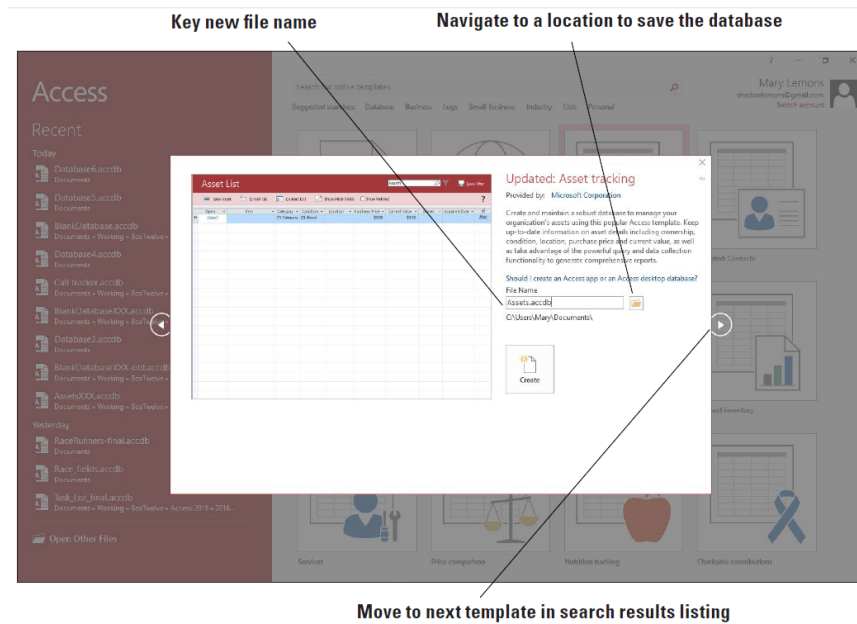
#### 2.1.1 Using a Template to Create a Database

Access offers a variety of templates to help get you started. Some templates are built into Access whereas others can be easily downloaded from the Internet.

There are built-in and online templates are available that you can use to track issues, manage contacts, and keep a record of expenses. Some templates contain a few sample records to help demonstrate their use. You can use templates as-is or you can customize them to better suit your needs.

##### 2.1.1.1 Step by Step: Use a Template to Create a Database

- 1 Before you begin these steps, make sure that your computer is on. Sign on, if necessary.  
**LAUNCH** Access to display the startup screen.
- 2 On the top of the startup screen window, in the Search for online templates search box, type **personal**, and then press **Enter**.
- 3 In the list of Personal templates that appears in the middle of the startup screen results pane, click **Home inventory**. A preview screen of the selected template appears in the center of the startup screen. Close the Home inventory template preview screen.
- 4 In the search box, type **assets** and then press **Enter**.
- 5 In the Assets template results list, click the **Updated: Asset tracking** database. The Updated: Asset tracking template preview screen appears.
- 6 In the Desktop asset tracking template preview screen, click in the **File Name** box and then replace the default file by typing **Assets**.
- 7 Click the folder icon to the right of the File Name box. The *File New Database* dialog box appears.
- 8 Navigate to the location where you want to save the file and then click **OK**.
- 9 Click the **Create** button at the bottom of the preview pane. The preview pane indicates that the template is being downloaded. When the download is complete, the preview pane closes.



- 10 Access creates and then opens the Assets database. Because this database was downloaded from Office.com (a trusted source), click **Enable Content** on the Message Bar. Getting Started and Access Help windows may appear, which contain helpful videos and links about using the Asset tracking database. **CLOSE** these windows, if necessary, to return to the Assets database with the Asset List form active.
- 11 Click to place the insertion point in the first cell of the Item field and then type **Canon EOS Rebel T3i**. Press **Enter**.
- 12 Click the **Shutter Bar Open/Close Button**, if necessary, to display the Navigation Pane to see all the objects in the database.
- 13 Click **File** and then click **Close** to close the database.
- 14 **LEAVE** Access open to use in the next exercise.

### 2.1.2 Creating a Blank Database

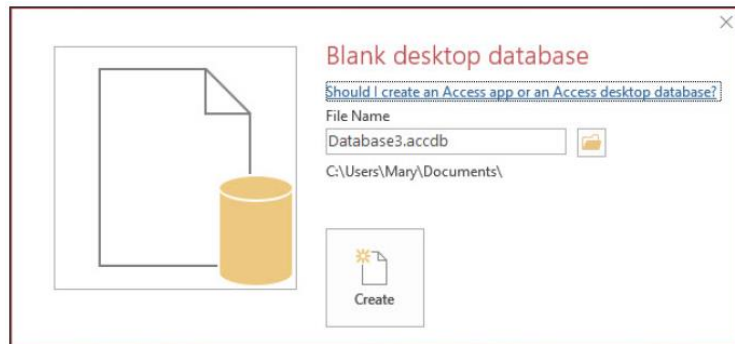
If you have existing data, you may decide that it is easier to create a blank database rather than using a template because it would require a lot of work to adapt your existing data to the template's defined data structure.

When you create a new blank database, Access opens a database that contains a table where you can enter data, but it creates no other database objects.

By default, Access creates a primary key field named "ID" for all new datasheets and sets the data type for the field to AutoNumber.

### 2.1.2.1 Step by Step: Create a Blank Database

- 1 **START** Access if it's not already running.
- 2 Click the **File** tab to open the New screen in Backstage view.
- 3 In the templates section of the New screen, click the **Blank desktop database** icon. A Blank desktop database screen appears in the center of the screen.



- 4 In the File Name box, type **BlankDatabase**.
- 5 If you want to save the file in a location other than the one shown beneath the File Name box, click the folder icon to the right of the File Name box and browse to a different location.
- 6 Click **Create** button create the blank database. Access creates the database and then opens an empty table named Table1 in Datasheet view.
- 7 **LEAVE** the database open to use in the next exercise.

With the insertion point placed in the first empty cell of your new, blank database, you can begin typing to add data.

Entering data in Datasheet view is very similar to entering data into an Excel worksheet, except that data must be entered in related rows and columns, starting at the upper-left corner of the datasheet.

The table is structured through rows and columns, which become meaningful as you enter appropriate data.

Any time you add a new column to the table, Access defines a new field for that column's data.

You do not need to format your data by including blank rows or columns, as you might do in an Excel worksheet, because that just wastes space in your table.

The table merely contains your data.

All visual presentation of that data will be done in the forms and reports that you design later.

## 2.2 Creating a Table

It is easy to create a new table by using the Application Parts gallery and Quick Start. **Application Parts** consist of predefined templates that you can add to an existing database to help extend its functionality.

Another way to create a table is to copy the structure of an existing table and then paste it into the database. You can copy a database object and paste it into the same database or into a different database that is open in another instance of Access.

### 2.2.1 Using the Application Parts Gallery and Quick Start

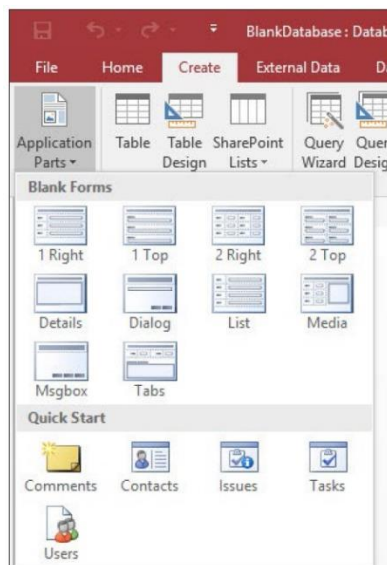
The Templates group on the Create tab contains the Application Parts gallery that you can use to insert predefined templates. Application parts vary from a single table to a collection of database objects like tables, forms, and reports.

The Application Parts gallery consists of two categories:

- **Blank Forms:** Contains a collection of form parts that allows you to add predefined forms to a database.
- **Quick Start:** Contains a collection of predefined objects arranged by parts for tracking things such as comments, contacts, and issues.

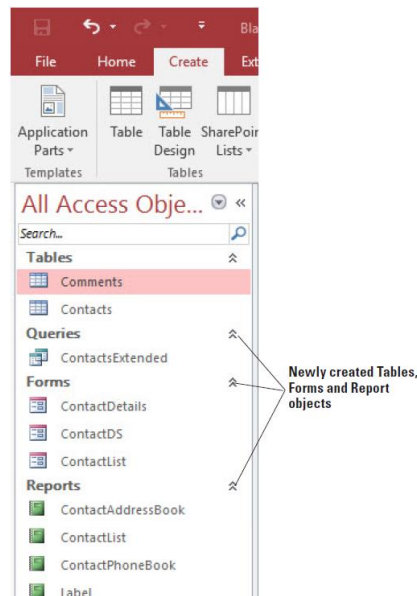
#### 2.2.1.1 Step by Step: Create a Table Using the Application Parts Gallery and Quick Start

- 1 **USE** the *BlankDatabase* database that is still open from the previous exercise.
- 2 On the Create tab in the Templates group, click the **Application Parts** button to display the gallery.





- 3 In the Quick Start section of the gallery, click **Comments**. If you are prompted to close all open objects before instantiating this application part, click **Yes** in the dialog box that appears. Notice the Comments table appears as a new object in the Navigation Pane.
- 4 Click the **Enable Content** button on the Message Bar to trust the database.
- 5 In the Navigation Pane, double-click **Comments** to display the newly created table with fields for comments. **CLOSE** the Comments table by clicking the Comments table Close button.
- 6 **OPEN** the Application Parts menu and then click **Contacts**.
- 7 In the *Create Relationship* dialog box that appears, select the **There is no relationship** option button and then click **Create**. A new table is created along with supporting forms and report objects.



- 8 **LEAVE** the database open to use in the next exercise.

### 2.2.1.2 Step by Step: Create a Table from Another Table

- 1 **USE** the **BlankDatabase** database that is still open from the previous exercise.
- 2 On the Navigation Pane, right-click the **Comments** table database object and then select **Copy** from the shortcut menu.
- 3 Right-click in a blank area of the Navigation Pane and select **Paste** from the shortcut menu. The *Paste Table As* dialog box appears. Notice the default name, Copy Of Comments, in the Table Name box.
- 4 In the Paste Options section, select the **Structure Only** option button to paste only the table's structure.

- 5 Click **OK**. The new table appears at the end of the list of database table objects in the Navigation Pane.
- 6 Double-click **Copy Of Comments** to open the new table. Notice that the structure of the new table is the same as the table from which it was copied.
- 7 Click **File** and then click **Close** to close the database.
- 8 **LEAVE** Access open to use in the next exercise.

## 2.2.2 Saving a Database Object

You need to save the design of a table, or any other database object, after it is created. Additionally, you can use the Save Object As command in the Backstage view to create a duplicate of a database object (like a table, query, or report) by specifying an alternate name.

You can even save objects in other formats such as the Adobe Portable Document Format (PDF) or XML Paper Specification (XPS), which helps you share data with others who may not have Access installed. You can even save some objects as other compatible object types, such as a new report.

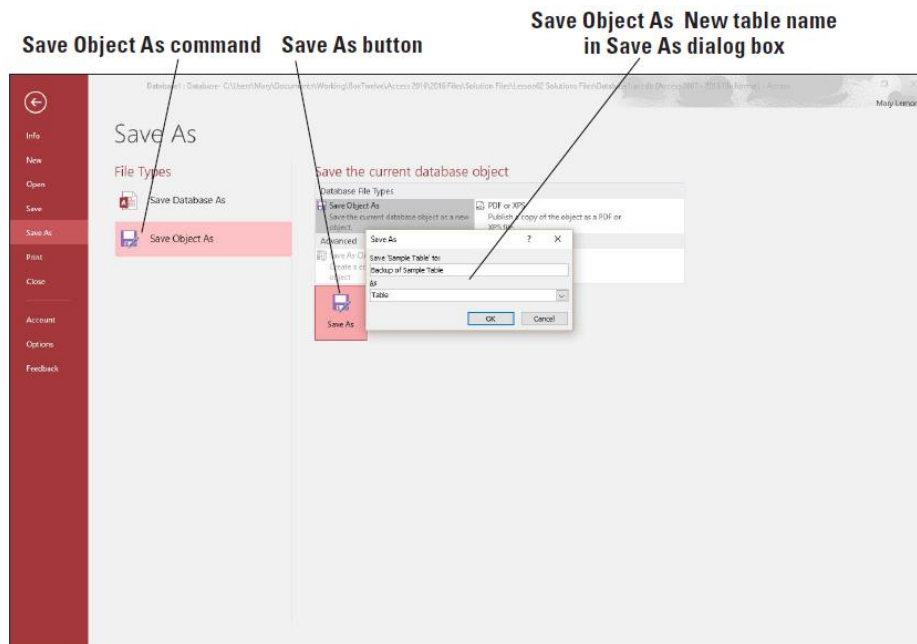
## 2.2.3 Saving a Table

When you save a new table for the first time, give it a name that describes the information it contains. You can use up to 64 characters (letters or numbers), including spaces.

### 2.2.3.1 Step by Step: Save a Table

- 1 **START** Access if it's not already running.
- 2 From the File tab, click the **New** command and then click the **Blank desktop database** icon; a Blank desktop database screen appears in the center of the screen.
- 3 In the Blank desktop database screen's File Name box, the default name should be **Database1**. If not, replace the default name by typing **Database1**.
- 4 If you want to save the file in a location other than the one shown beneath the File Name box, click the folder icon and browse to a different location.
- 5 Click the **Create** button. A new blank database appears with the default table labeled Table1 displayed.
- 6 Click to place the insertion point in the cell under the Click to Add field and then type **Sample Data**.
- 7 Right-click on the **Table1** tab to display the shortcut menu and then click **Save**. The Save As dialog box appears.

- 8 In the Table Name box, type **Sample Table**.
- 9 Click **OK** to close the dialog box and return to the table, which now is labeled Sample Table.
- 10 Click the **File** tab to display the Backstage view.
- 11 Click **Save As** to display the Save As screen.
- 12 Under the File Types heading, click the **Save Object As** command.
- 13 Click the **Save As** button.
- 14 In the *Save As* dialog box that appears, type **Backup of Sample Table** in the area under “Save ‘Sample Table’ to:” .
- 15 Click **OK**.



- 16 Notice the new table object named Backup of Sample Table in the Navigation Pane.
- 17 The Backup of Sample Table should now be open. Notice the table contains the same row you created in the Sample Table table.
- 18 **CLOSE** the Backup of Sample Table.
- 19 **CLOSE** the database and then **EXIT** Access.

## 3 Working with Tables and Database Records

### 3.1 Navigating Among Records

Database tables can be very large, and contain useful information that can be manipulated in different ways. When a table contains many records and fields, it is important to be able to navigate among them.

#### 3.1.1 Navigating Using the Keyboard

Access users who prefer using the keyboard to navigate records can press keys and key combinations to move among records in Datasheet view. In Datasheet view, you can navigate among records using the up, down, left, and right arrow keys to move to the field you want.

You can also use the Tab key to move from field to field in a record and from the last field in a record to the first field of the next record. If you prefer to use the mouse, you can move among records by clicking the navigation buttons.

This table lists keys and key combinations for moving among records.

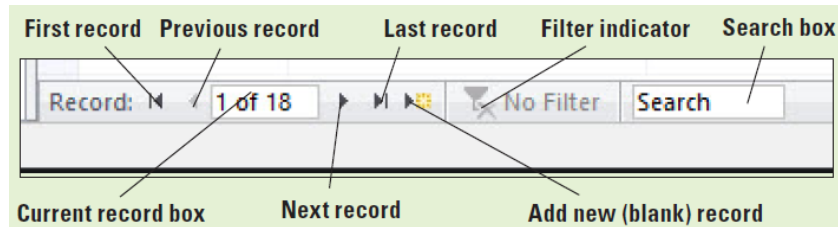
##### 3.1.1.1 Step by Step: Use the Keyboard to Navigate among Records

- 1 Before you begin these steps, make sure that your computer is on. Sign on, if necessary, and **LAUNCH** Access.
- 2 **OPEN** *Fourth Coffee* from the data files for this lesson.
- 3 Click the **File** tab and then click the **Save As** option on the left side of the Backstage view.
- 4 Click the **Save As** command. The *Save As* dialog box appears. Type **Fourth Coffee-final** in the File name box. Find the location where you will save the solution files for this lesson and then click **Save**.
- 5 Click Enable Content.
- 6 In the Navigation Pane, double-click **Coffee Inventory: Table** to open the table.
- 7 Notice that the first cell of the first record is selected.
- 8 Press the **Down Arrow** key to move down to the next row. Notice that the first cell is selected.
- 9 Press the **Right Arrow** key to move to the Product Name field.
- 10 Press the **Tab** key to move to the next cell.
- 11 Press the **Tab** key to move to the next cell.
- 12 Press the **Tab** key to move to the next row.
- 13 Press **Ctrl+Down Arrow** to move to the first field of the last record.
- 14 **LEAVE** the database open to use in the next exercise.

### 3.1.2 Using Navigation Buttons

The record navigation buttons are displayed at the bottom of the screen in Datasheet view. Click the First record, Previous record, Next record, Last record, and New (blank) Record buttons to go to those records.

Your ability to click these may differ based on the number of records in the database you have open. Type a record number into the Current Record box and then press Enter to go to that record. Type data into the Search box to find a match in the table.



#### 3.1.2.1 Step by Step: Use Navigation Buttons

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.
- 2 Click the **First record** button. The selection moves to the first record.
- 3 Click the **Next record** button. The selection moves to the next record.
- 4 Select and then delete the number **2** in the Current Record box. Type **5** and then press **Enter**. The selection moves to the fifth record.
- 5 Click the **Search** box to position the insertion point. Type **sunrise** into the Search box. Notice that the selection moves to the first occurrence of the word Sunrise.
- 6 Press **Enter**. The selection moves to the next occurrence of the word Sunrise.
- 7 Click the **New (blank) record** button. The insertion point moves to the first column and last row of the table.
- 8 **LEAVE** the database open to use in the next exercise.

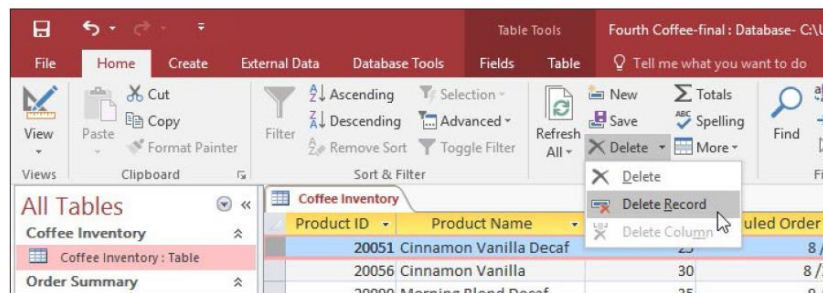
## 3.2 Entering, Editing, and Deleting Records

You can easily enter data by positioning the insertion point in the table cell where you want to add data and begin typing. To insert a new record, select any record in the table and then click the New button on the Home tab in the Records group. You can also click the Record Selector box, right-click the selected record, and then select New Record from the shortcut menu.

### 3.2.1 Step by Step: Enter, Edit, and Delete Records

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.

- 2 The insertion point should be positioned in the first field of the new, blank row at the bottom of the datasheet. Notice the asterisk in the Record Selector box, which indicates that this is a new record, ready for data.
- 3 Type **21905** and then press **Tab**. Notice that the asterisk has changed to a pencil icon, indicating that the record is being edited.
- 4 Type **Hazelnut** and then press **Tab**.
- 5 Type **30** and then press **Tab**.
- 6 Type **09252016** and then press **Enter**.
- 7 Highlight **sunrise** in the Search box and then type **Kona** to locate the Kona record.
- 8 Click **Kona** in the record to position the blinking insertion point there. Delete **Kona**, type **Hawaiian**, and then press **Tab**.
- 9 Click the **Undo** button on the Quick Access Toolbar. Notice Hawaiian disappears and Kona reappears.
- 10 Press **Tab**. Type **08212016** and then press **Tab**.
- 11 Click the **Record Selector** box to the left of the Product ID field of the first record, 20051.
- 12 On the Home tab, in the Records group, click the **Delete** button drop-down arrow. Select **Delete Record** from the menu. Click **Delete Record**.
- 13 A dialog box appears asking if you are sure you want to delete the record. Click **Yes**.
- 14 Notice that the Undo button on the Quick Access Toolbar is not available because you cannot undo a record deletion. **CLOSE** the table.
- 15 **LEAVE** the database open to use in the next exercise.



## 3.3 Working with Primary Keys

### 3.3.1 Defining a Primary Key

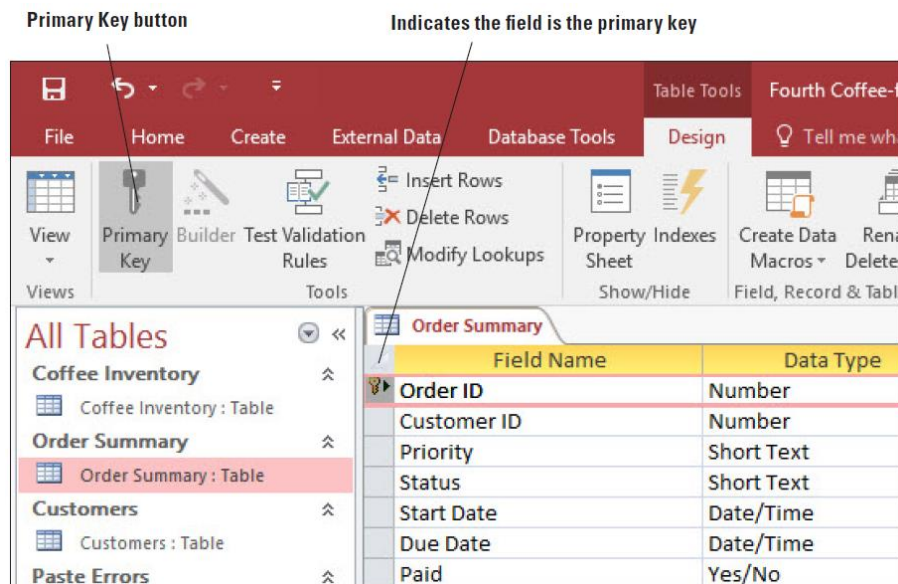
A primary key is a column that uniquely identifies a record or row in a table. Customer IDs, serial numbers, or product IDs usually make good primary keys. Each table should have a primary key, and some tables might have two or more. When you divide information into separate tables, the primary keys help Access bring the information back together again.

You can define a primary key for a field in Design view by selecting the row that contains the field for which you want to assign a primary key and then clicking the Primary Key button on the Design

tab in the Tools group on the Ribbon. When you create a new database, Access creates a primary key field named “ID” by default and sets the data type for the field to AutoNumber.

### 3.3.1.1 Step by Step: Define a Primary Key

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.
- 2 In the Navigation Pane, double-click **Order Summary: Table** to open the table.
- 3 On the Home tab, in the Views group, click the bottom half of the **View** button, and from the menu that appears, select **Design View**.
- 4 Click the **Row Selector** box beside the Order ID row to select the row.
- 5 On the Design tab, in the Tools group, click the **Primary Key** button. The Primary Key button is highlighted. A key icon appears on the Order ID row to designate the field as a primary key.
- 6 **LEAVE** the table open to use in the next exercise.



### 3.3.2 Defining and Modifying a Multifield Primary Key

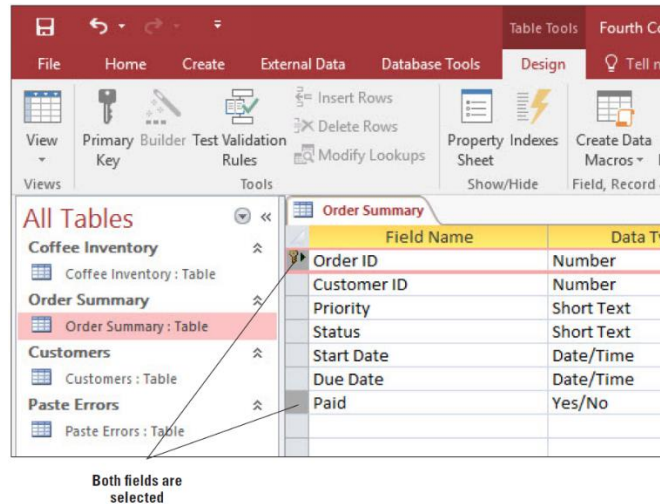
In some cases, you may want to use two or more fields that, together, provide the primary key of a table. In Design view, select the rows you want to designate as primary keys and then click the Primary Key button.

Two or more primary keys in a table are called the **composite key**. Composite keys are useful in unique situations when a combination of data from two fields needs to provide a unique identifier in a table; for example, area code field data and phone number field data.

#### 3.3.2.1 Step by Step: Define and Modify a Multifield Primary Key

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise. Be sure you are still in Design View on the Order Summary table.

- 2 Press and hold the **Ctrl** key.
- 3 Click the **Row Selector** box beside the Paid row. Continue to hold down the **Ctrl** key and then click the **Order ID Row Selector** box. Both fields should be selected. If not, continue to hold the **Ctrl** key and then click the **Paid Row Selector** box again.



- 4 On the Design tab, in the Tools group, click the **Primary Key** button. A key icon should be displayed beside both of the two selected fields. The combination of data from these two fields *do not* make a sensible composite key, and this designation will be removed.
- 5 With the rows still selected, click the **Primary Key** button again to remove the primary key designation from both fields.
- 6 Click any field name to remove the selection.
- 7 Click the **Row Selector** box beside the Order ID row. Press and hold the **Ctrl** key and then click the **Row Selector** box beside the Customer ID row. Both fields should be selected.
- 8 On the Design tab, in the Tools group, click the **Primary Key** button. Both rows should have a key displayed beside them. The resulting composite key is more valid.
- 9 Click the **Save** button on the Quick Access Toolbar and **CLOSE** the table.
- 10 **LEAVE** the database open to use in the next exercise.

### 3.4 Finding and Replacing Data

Using a computer database allows you to quickly search for and/or replace data. You access these features from the Find and Replace dialog box.

Use the Find command to search for specific text in a table or to move quickly to a particular word or number in the table. Use the Replace command to automatically replace a word or number with something else.

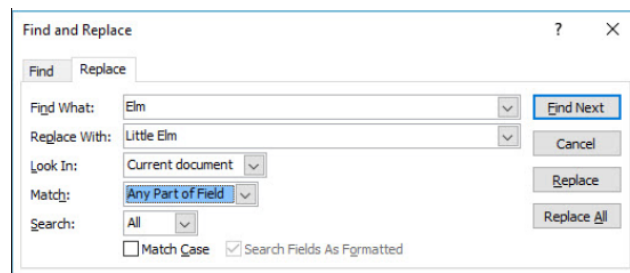
Remember these points when finding and replacing data:



- In the Match menu, you can specify where you want Access to look in a field. Select Any Part of Field for the broadest search.
- Sometimes, Access selects the Search Fields As Formatted check box. When it does, do not clear the check box, or your search probably will not return any results.
- Click the Match Case box to search for text with the same uppercase and/or lowercase capitalization of text.
- Use wildcard characters to find words or phrases that contain specific letters or combinations of letters—a question mark (?) to represent a single character, an asterisk (\*) to represent a string of characters.
- If you type a wildcard character in the Replace With box, Access will insert that character just as you typed it.

### 3.4.1 Step by Step: Find and Replace Data

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.
- 2 **OPEN** the Customers table.
- 3 On the Home tab, in the Find group, click the **Find** button. The *Find and Replace* dialog box appears with the Find tab displayed.
- 4 Click the **Replace** tab in the *Find and Replace* dialog box.
- 5 Type **Elm** into the Find What box.
- 6 Type **Little Elm** into the Replace With box.
- 7 Click the **down arrow** beside the Look in menu, and then select **Current document** if it is not already selected.
- 8 Click the **down arrow** beside the Match menu and then select **Any Part of Field** if it already is not selected to broaden the search.
- 9 Click the **Find Next** button. Access searches the table, finds, and selects the word *Elm*.
- 10 Click the **Replace** button. Access replaces *Elm* with *Little Elm*.



- 11 Click the **Find Next** button. Access finds *Elm* in the new text that was just inserted.
- 12 Click **Find Next** again. Access displays a message saying that no more occurrences of the word have been found. Click **OK**.

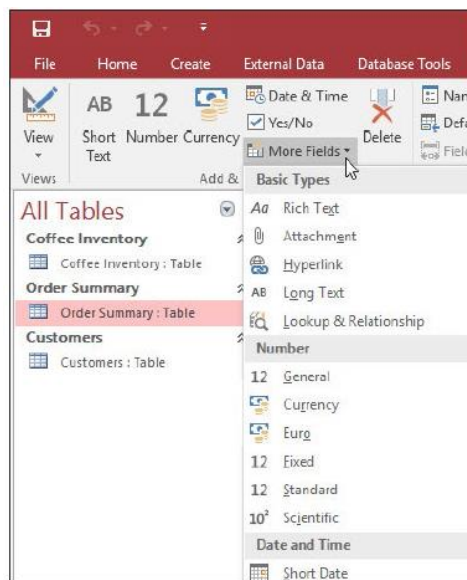
- 13 Click **Cancel** to close the *Find and Replace* dialog box.
- 14 Press the **down arrow** to remove the selection and allow Access to save the change.
- 15 **CLOSE** the table.
- 16 **LEAVE** the database open to use in the next exercise.

### 3.4.2 Attaching and Detaching Documents

Access 2016 allows you to attach documents, such as Word documents or photo files, to records in a database. Before you can start attaching documents, you must create a field in a table and format it with the Attachment data type.

#### 3.4.2.1 Step by Step: Attach and Detach Documents

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.
- 2 **OPEN** the Order Summary table.
- 3 Click the header row of the Due Date field to select it.
- 4 In the Add & Delete group on the Table Tools Fields contextual tab, click the **More Fields** button. The More Fields menu appears.



- 5 Click **Attachment** under Basic Types. The Attachment field is inserted in the table.
- 6 Double-click the first row of the Attachments field. The *Attachments* dialog box appears.
- 7 Click the **Add** button. Navigate to the data files for this lesson and select *invoice100.docx*. Click **Open**. The document appears in the *Attachments* dialog box.
- 8 Click **OK**. The number of attachments in the first record changes to 1.
- 9 Double-click the attachment number in the Attachment field. The *Attachments* dialog box appears.
- 10 Click the **Open** button. The attachment, an invoice document, opens in Word.

- 11 Click the **Close** button to close the invoice document and return to Access.
- 12 Click the **Access** button on the taskbar, if necessary, to return to Access.
- 13 In the *Attachments* dialog box, click the **Remove** button and then click **OK**. The attachment is removed from the record.
- 14 **CLOSE** the Order Summary table.
- 15 **LEAVE** the database open to use in the next exercise.

## 3.5 Sorting and Filtering Data and Setting Field Viewing Options within a Table

It is often helpful to display data in order, display similar records, or hide and freeze certain fields without affecting the preexisting data. Sorting allows you to order records. For example, an office list that displays employees in alphabetical order by last name.

If you wanted to view only the records of employees in a particular department, you could create a filter to display only those records. You could also hide or freeze certain fields.

### 3.5.1 Sorting Data within a Table

To **sort** data means to arrange it alphabetically, numerically, or chronologically. Sorting within a table displays all the records in the table in the order that you select. You can easily sort by one or more fields to achieve the order that you want.

Access can sort text, numbers, or dates in ascending or descending order:

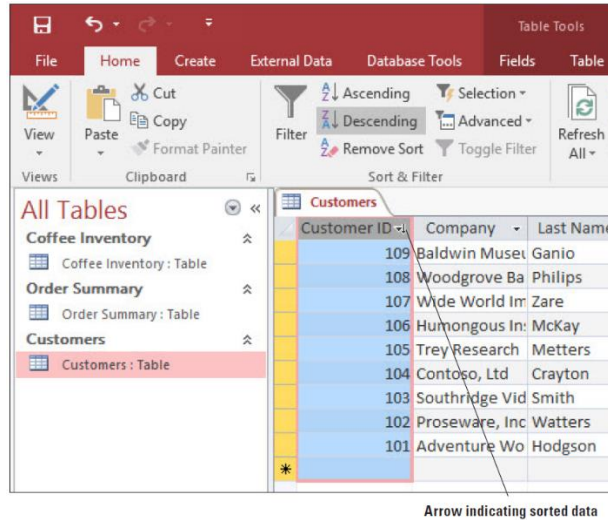
- **Ascending** order sorts data from beginning to end, such as from A to Z.
- **Descending** order sorts data from the end to the beginning, such as from Z to A.

You can also sort records on multiple fields. When you are using multiple fields, determine in which order you want them to be sorted.

- The primary sort field is called the **outermost field**.
- The secondary sort field is called an **innermost field**.

#### 3.5.1.1 Step by Step: Sort Data within a Table

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.
- 2 **OPEN** the Customers table.
- 3 Click the header row of the Customer ID field to select it.
- 4 On the Home tab, in the Sort & Filter group, click the **Descending** button. The data is sorted from largest to smallest. The data is sorted and an arrow is inserted in the header row indicating that the data is displayed in descending sort order.



- 5 On the Home tab, in the Sort & Filter group, click the **Remove Sort** button. The sort is removed from the Customer ID field.
- 6 Select the **First Name** field, right-click in the field to display the shortcut menu, and then click **Sort A to Z**. The data in the First Name field is sorted in ascending order.
- 7 Select the **Last Name** field. On the Home tab, in the Sort & Filter group, click the **Ascending** button. The data in the Last Name field is sorted in ascending order.
- 8 On the Home tab, in the Sort & Filter group, click the **Remove Sort** button. The sort is removed from both the First Name and Last Name fields.
- 9 **CLOSE** the table. If a dialog box appears asking if you want to save changes to the table, click **No**.
- 10 **LEAVE** the database open to use in the next exercise.

### 3.5.2 Filtering Data within a Table

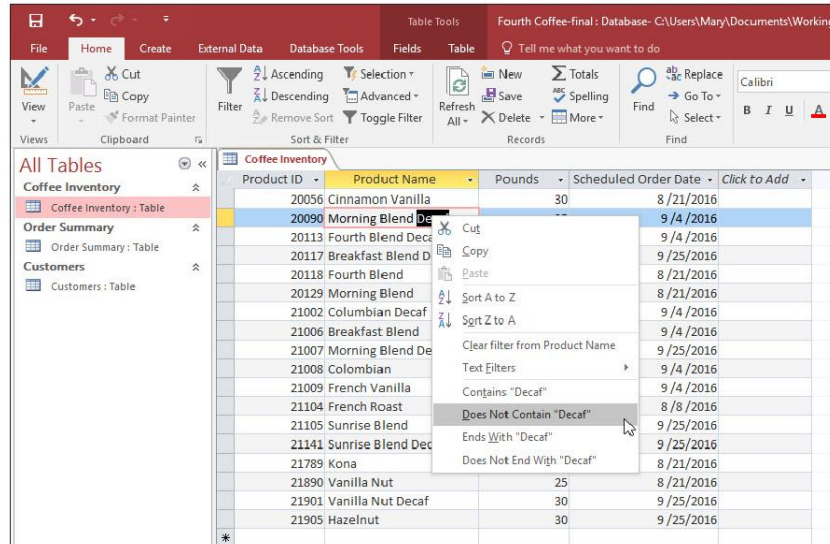
A **filter** is a set of rules for determining which records will be displayed. When you apply a filter, Access displays only the records that meet your filter criteria; the other records are hidden from view.

Once the filtered records are displayed, you can edit and navigate the records just as you would without a filter applied. Filters remain in effect until you close the object.

#### 3.5.2.1 Step by Step: Apply a Filter

- 1 **USE** the ***Fourth Coffee-final*** database that is still open from the previous exercise.
- 2 **OPEN** the Coffee Inventory table.
- 3 Select the **Product Name** field.
- 4 On the Home tab, in the Sort & Filter group, click the **Filter** button. A menu appears.
- 5 Point to **Text Filters**. A second menu appears. Select **Contains**. Click **Contains**.

- 6 The *Custom Filter* dialog box appears. Type **Decaf** and then click **OK**. Access filters the database to display only the records containing the word **Decaf**. A filter icon is displayed in the header row of the field.
- 7 Click the **Toggle Filter** button in the Sort & Filter group to display the records without the filter.
- 8 In the second record in the Product Name field, double-click the word **Decaf** to select it.
- 9 Right-click the word **Decaf** to display the shortcut menu and then select **Does Not Contain "Decaf"**. Click **Does Not Contain "Decaf"**. Notice that the records are filtered to show only those that do not contain the word **Decaf**.
- 10 Click in the **Pounds** field of the first record.
- 11 On the Home tab, in the Sort & Filter group, click the **Filter** button.
- 12 Click the check boxes to remove the check marks beside **(Blanks)**, **30**, **35**, **40**, and **50**. Only the check mark beside 25 should remain.



- 13 Click **OK**. Access filters the records to show only those containing the number 25 in the Pounds field.
- 14 Click the **Toggle Filter** button.
- 15 In the second row of the Scheduled Order Date field, highlight **9/4/2016** by clicking and dragging the mouse.
- 16 On the Home tab, in the Sort & Filter group, click the **Selection** button.
- 17 Select **On or After 9/4/2016**. The data is filtered to show only those records with content in the Scheduled Order Date field that matches the filter selection.
- 18 In the seventh row of the Pounds field, select **30**.
- 19 On the Home tab, in the Sort & Filter group, click the **Selection** button, and then select **Less Than or Equal to 30**. The records are filtered accordingly.
- 20 **LEAVE** the database open to use in the next exercise.

### 3.5.3 Removing a Filter

After applying a filter, you may need to return to records not displayed by the filter. The Toggle Filter button lets you toggle between viewing the filtered records and viewing the table without the filter.

#### 3.5.3.1 Step by Step: Remove a Filter

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.
- 2 Select the **Pounds** field and then on the Home tab, in the Sort & Filter group, click the **Filter** button. A menu appears.
- 3 Select Clear filter from Pounds.
- 4 On the Home tab, in the Sort & Filter group, click the **Advanced** button, and then select **Clear All Filters** from the menu.
- 5 **SAVE** and **CLOSE** the table.
- 6 **LEAVE** the database open to use in the next exercise.

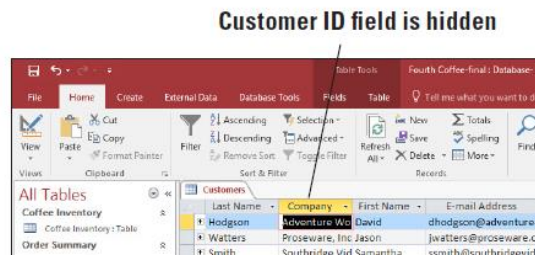
### 3.6 Freezing/Unfreezing and Hiding/Unhiding Fields

Sometimes you may need to change the view of a table's data to more efficiently find the information you are looking for. It may be helpful to freeze First Name and Last Name fields so you can keep them fixed on the screen and then horizontally scroll and view other pertinent fields, like E-mail or Telephone Number, to get a better view of your data.

#### 3.6.1 Step by Step: Freeze/Unfreeze and Hide/Unhide Fields

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.
- 2 **OPEN** the Customers table.
- 3 Select the **Last Name** field, and then on the Home tab, in the Records group, click the **More** button.
- 4 Select **Freeze Fields** from the menu that appears. Notice that the Last Name field moves to the first field position in the table.
- 5 Click the **Restore Down** button on the application window. The Restore Down button now becomes the Maximize button.
- 6 Press the **Right Arrow** key to scroll the table's fields to the left, and stop when you reach the ZIP/Postal Code field. Notice that the Last Name field stays fixed as the other fields scroll.
- 7 Click the **More** button again and then select **Unfreeze All Fields**. Notice how the Last Name field remains in the table's first field position.

- 8 Press the **Right Arrow** key several times until the Last Name field scrolls off from view. Notice how the Last Name field moved with the other fields when the Right Arrow key was pressed several times.
- 9 Click the **Maximize** button on the application window.
- 10 Select the **Customer ID** field. Click the **More** button and then select **Hide Fields**. Notice the Customer ID field is now hidden from view.
- 11 Click the **More** button and then select **Unhide Fields**. The *Unhide Columns* dialog box appears. Notice the check mark is missing from the Customer ID check box, signifying that it is hidden.
- 12 Deselect the check boxes next to all the other field representations except Last Name and Business Phone and then click the **Close** button in the *Unhide Columns* dialog box. Notice the only fields now displayed in Datasheet view are the Last Name and Business Phone fields.
- 13 **CLOSE** the Customers table without saving the changes to the layout.
- 14 **LEAVE** the database open to use in the next exercise.



## 3.7 Understanding Table Relationships

Most databases have more than one table.

Creating relationships among these tables allows Access to bring that information back together again through objects such as reports and queries so that you can display information from several tables at once.

It is much easier to create effective reports and queries when you start out with well-defined table relationships.

### 3.7.1 Defining Table Relationships

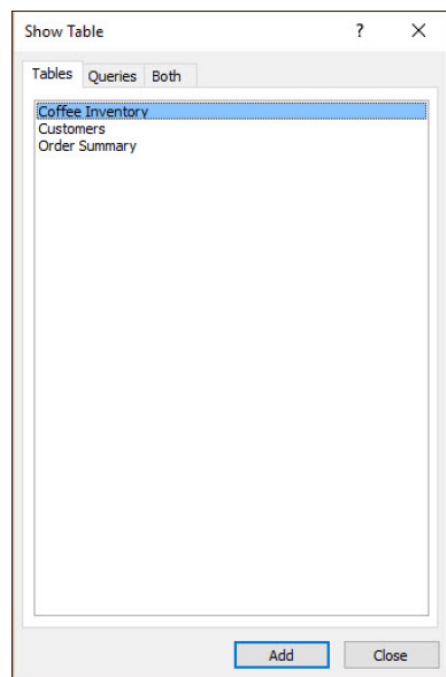
You define a table relationship in the Relationships window. To create that relationship, you place common fields in tables and define the relationships between the tables. Common fields used in different tables do not have to have the same names, but they usually do. They must have the same data type, though.

You can create three types of relationships in Access tables:

- **One-to-one:** Both tables have a common field with the same data. Each record in the first table can only have one matching record in the second table, and each record in the second table can have only one matching record in the first table. This type of relationship is not common, because information related in this way is usually stored in the same table.
- **One-to-many:** More common, because each record in the first table can have many records in the second table.
- **Many-to-many:** Many records in the first table can have many records in the second table.

### 3.7.1.1 Step by Step: Define Table Relationships

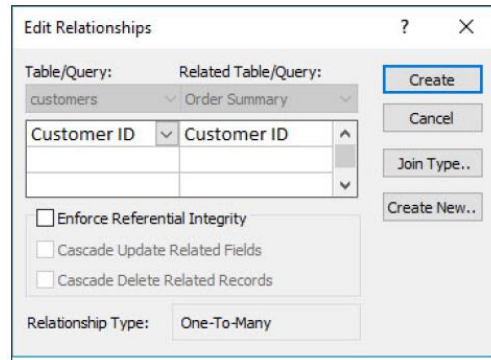
- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.
- 2 On the Database Tools tab in the Relationships group, click the **Relationships** button. The Relationships view appears with the Customers table represented.
- 3 Click the **Show Table** button in the Relationships group under the Relationship Tools Design tab. The *Show Table* dialog box appears.



- 4 Select **Order Summary** and then click **Add**.
- 5 Click **Close**. The Customer table and Order Summary table are represented in Relationships view.
- 6 Click the **Customer ID** primary key field in the Customers table, drag it to the Customer ID field of the **Order Summary** table, and then release the mouse button. The Customer ID field represents the common field between the two tables. The Customer ID field of the



Order Summary table is now set as the foreign key. The *Edit Relationships* dialog box appears.



- 7 Select the Enforce Referential Integrity, Cascade Update Related Fields, and Cascade Delete Related Records check boxes.
- 8 Click **Create**. A relationship line representing the one-to-many table relationship of the Customers and the Order Summary tables is displayed.
- 9 **LEAVE** the database open to use in the next exercise.

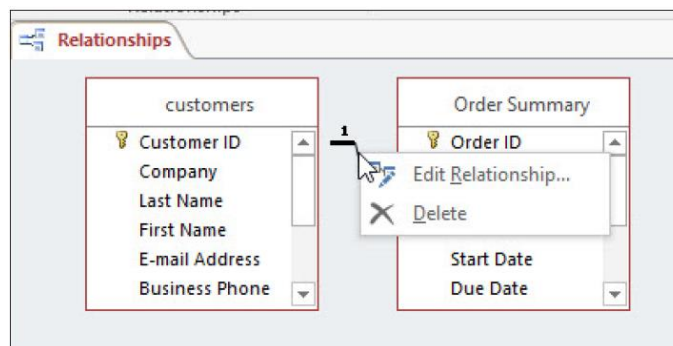
### 3.7.2 Modifying Table Relationships

A table relationship is represented by the line that connects the tables in the Relationships window. The Edit Relationships dialog box allows you to change a table relationship.

**Referential integrity** is an option that you can select in the Edit Relationships dialog box to prevent orphan records. An orphan record is a record in one table that references records in another table that no longer exist. Referential integrity ensures your tables contain logically related data.

#### 3.7.2.1 Step by Step: Modify Table Relationships

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.
- 2 Right-click the center section of the relationship line connecting the two tables. A shortcut menu appears.



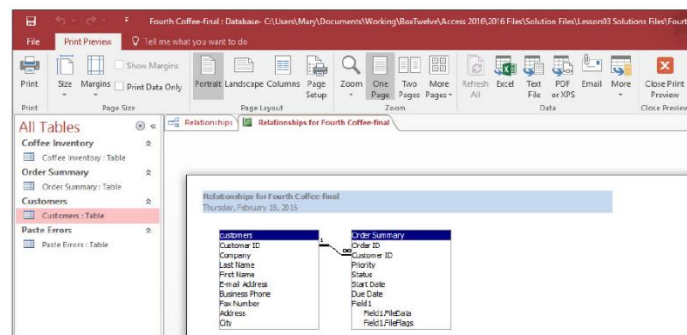
- 3 Select **Delete**. A message appears asking if you are sure you want to delete the relationship. Click **Yes**. The line disappears.
- 4 Select the **Customer ID** field in the first table. Drag the mouse to the Customer ID field in the second table and release the mouse button. The *Edit Relationships* dialog box appears.
- 5 Click the **Create** button. A line appears, creating the relationship.
- 6 Double-click the center section of the relationship line. The *Edit Relationships* dialog box appears again, listing the tables and the Customer ID fields on each side.
- 7 Click the **Enforce Referential Integrity** box and then click **OK**. The line appears thicker, with the number 1 beside the first table and the infinity symbol (∞) beside the second.
- 8 **LEAVE** the database open to use in the next exercise.

### 3.7.3 Viewing and Printing Table Relationships

You may want to print a table relationship to save for your records or to discuss with a colleague. The Relationship Report command makes this easy. When you choose to print the relationship report, the Print Preview tab appears with options for viewing and printing the report.

#### 3.7.3.1 Step by Step: Print Table Relationships

- 1 **USE** the *Fourth Coffee-final* database that is still open from the previous exercise.
- 2 In the Tools group of the Relationship Tools Design tab, click the **Relationship Report** button. The report is created and the Print Preview tab appears.
- 3 Click the **Print** button. The *Print* dialog box appears, allowing you to select the printer you want to use.
- 4 Click **OK** to keep the default settings, and then print the report or click **Cancel** to not print the report.
- 5 Click the **Close** button to close the Relationships for Fourth Coffee-final tab. A message appears asking if you want to save changes to the report. Click **No**.
- 6 **CLOSE** the Relationships tab.
- 7 **STOP. CLOSE** the database and then **EXIT** Access.



## 4 Modifying Tables and Fields

### 4.1 Modifying a Database Table

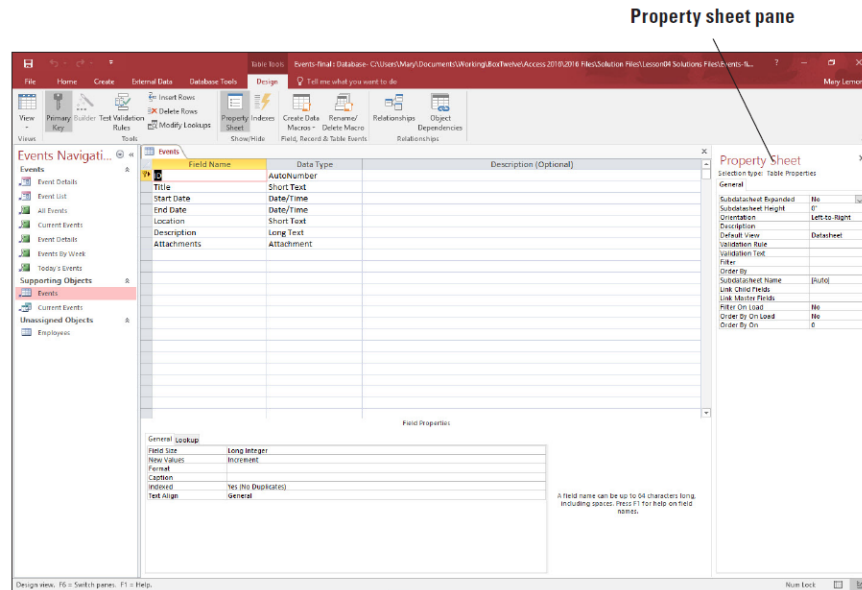
After a table has been created, you may need to modify it. You can make many changes to a table—or other database object—using its property sheet. You can also rename or delete a table. Such a change could possibly break the functionality of the database, because in a relational database the various components work together.

#### 4.1.1 Modifying Table Properties

You can set properties that control the appearance or behavior characteristics for an entire table in the table's property sheet. Describe the purpose of a table by modifying the table's Description property so others who view your table can obtain more information about its purpose. Other table properties are more advanced and used less often.

##### 4.1.1.1 Step by Step: Modify Table Properties

- 1 Before you begin these steps, make sure that your computer is on. Sign on, if necessary, and start Access.
- 2 **OPEN** the *Events* database from the data files for this lesson and then **SAVE** the database as *Events-final*.
- 3 In the Navigation Pane, double-click **Events** to open that table.
- 4 On the Home tab, in the Views group, click the bottom half of the **View** button and then click **Design View** from the menu that appears.
- 5 On the Design tab, in the Show/Hide group, click **Property Sheet**. The Property Sheet pane appears on the right of the Access window.



- 6 Place the insertion point in the property box for Description.
- 7 Press **Shift+F2** to open the *Zoom* dialog box to provide more space.
- 8 Type Most popular events for 2016.
- 9 Click **OK**.
- 10 Click the **Close** button on the Property Sheet pane to close it.
- 11 Click the **File** tab and then click **Save** to save the design changes you have made to the table.
- 12 Click the **Close** button to close the table.
- 13 **LEAVE** the database open to use in the next exercise.

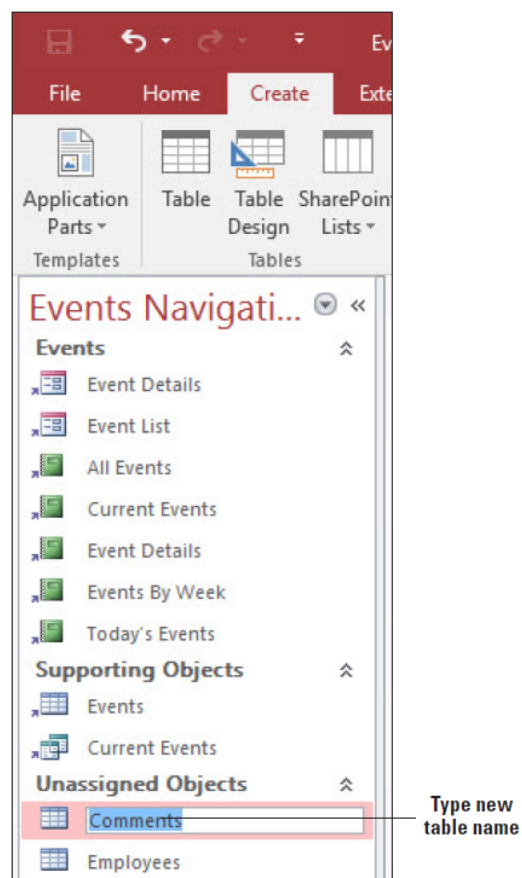
## 4.1.2 Renaming a Table

To rename a table or other database object, you must first close it. In the Navigation Pane, locate and right-click the object that you want to rename and then click **Rename** on the shortcut menu that appears. Or, select the table in the Navigation Pane, press **F2**, type a new name, and then press **Enter**.

### 4.1.2.1 Step by Step: Rename a Table

- 1 **USE** the *Events-final* database that is still open from the previous exercise.

- 2 On the Create tab, in the Templates group, click the **Application Parts** button and then click **Comments** to create a new table.
- 3 In the *Create Relationship* dialog box that appears, select **There is no relationship** and then click **Create**.
- 4 **OPEN** the Comments table, right-click **Comments** in the Navigation Pane, and then select **Rename** from the shortcut menu. A dialog box appears that states that you can't rename the database object 'Comments' while it's open. Close the dialog box.
- 5 **CLOSE** the Comments table.
- 6 Right-click **Comments** in the Navigation Pane to display the shortcut menu.



- 7 Click **Rename**. The table name is now selected for renaming.
- 8 Type **Event Comments** and then press **Enter**. The table has been renamed.
- 9 **LEAVE** the database open to use in the next exercise.

### 4.1.3 Deleting a Table

Deleting an entire table is not a complex process. When you delete an entire table, you might break the functionality of your database. Although you will be asked to confirm the deletion of a table, you can always undo the action.

#### 4.1.3.1 Step by Step: Delete a Table

- 1 **USE** the *Events-final* database that is still open from the previous exercise.
- 2 Right-click the **Event Comments** table in the Navigation Pane and then click **Delete**.
- 3 A confirmation message appears. Click **Yes** to delete the table.
- 4 **LEAVE** the database open to use in the next exercise.

## 4.2 Creating Fields and Modifying Field Properties

A field has certain defining characteristics such as a name that uniquely identifies the field within a table, and a data type that is chosen to match the information to be stored. Every field also has an associated group of settings called properties that define the appearance or behavior of the field. Access uses the field property settings when you view and edit data.

### 4.2.1 Setting Field Properties

Setting or modifying field properties allows you to:

- Control the appearance of information
- Prevent incorrect entries
- Specify default values
- Speed up searching and sorting
- Control other appearance or behavior characteristics

#### 4.2.1.1 Step by Step: Set a Field Property in Datasheet View and Design View

- 1 **USE** the *Events-final* database that is still open from the previous exercise.
- 2 Double-click the **Events** table in the Navigation Pane to open the table in Datasheet view, if it is not already open.
- 3 Click the **Location** column header to select that field.
- 4 Click the **Required** check box in the Field Validation group on the Table Tools Fields contextual tab. This setting determines that a value must be entered in the Location field for all records in the table.

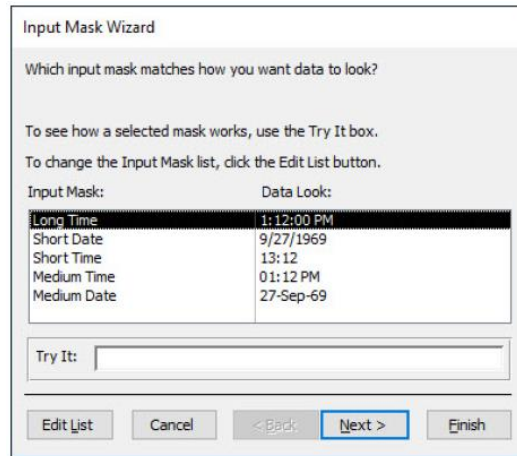
- 5 On the Home tab, in the Views group, click the bottom half of the **View** button and then click **Design View**.
- 6 In the Field Name column in the middle portion of the table design grid, click in the **Location** cell.
- 7 In the Default Value row in the lower portion of the table design grid, click in the property box and then type **To Be Announced** to specify a value that will be automatically entered in this field for new records.
- 8 In the Field Name column in the upper portion of the table design grid, click in the **Title** cell.
- 9 In the Field Size row in the lower portion of the table design grid, select **150** in the property box and then type **175** to change the maximum number of characters you can enter in the Title field.
- 10 Press **Enter**.
- 11 **LEAVE** the database open to use in the next exercise.

### 4.2.2 Defining Input Masks

An input mask can require users to enter dates in a specific format. An input mask is helpful because it can prevent users from entering invalid data (such as a phone number in a date field). Input masks can ensure that users enter data in a consistent way. You can add input masks to table fields by running the Input Mask Wizard or by manually entering masks in the Input Mask field property.

#### 4.2.2.1 Step by Step: Define Input Masks for Fields

- 1 **USE** the *Events-final* database and Events table that is still open from the previous exercise.
- 2 In the Field Name column in the upper portion of the table design grid, click in the **Start Date** cell.
- 3 Click the **Input Mask** property box in the lower portion of the table design grid to display the Input Mask Wizard button (...) on the far right of the cell.
- 4 Click the **Input Mask Wizard** button. A message box appears asking if you want to save the table now.
- 5 Click **Yes** to close the message box and display the Input Mask Wizard.



- 6 Click **Medium Date** to select the DD-MON-YR date format and then click **Next**. The next screen in the Input Mask Wizard appears. If you wanted to change the input mask, you would do so here. You can also test entering the values in the Try It text area.
- 7 Click **Next** to accept the default settings in this screen and display the final Input Mask Wizard screen.
- 8 Click **Finish**. The input mask appears in the Input Mask row.
- 9 **LEAVE** the database open to use in the next exercise.

### 4.2.3 Allowing Zero-Length Strings in a Field

When the Allow Zero Length field property is set to Yes, you can enter zero-length strings in a field. A **zero-length string** contains no characters. You use the string to indicate that you know no value exists for a particular field. You enter a zero-length string by typing two double quotation marks with no space between them ("").

#### 4.2.3.1 Step by Step: Allow Zero Length

- 1 **USE** the *Events-final* database and Events table that is still open from the previous exercise.
- 2 In the Field Name column in the upper portion of the table design grid, click in the **Description** cell.
- 3 Click the **Allow Zero Length** property box in the lower portion of the table design grid to display the down arrow on the far right of the cell.
- 4 Click the **down arrow** to display the menu.
- 5 Click **Yes**.



- 6 **LEAVE** the database open to use in the next exercise.

#### 4.2.4 Setting Data Validation Rules

A **validation rule** is an expression that limits the values that can be entered in the field. The maximum length for the Validation Rule property is 2,048 characters.

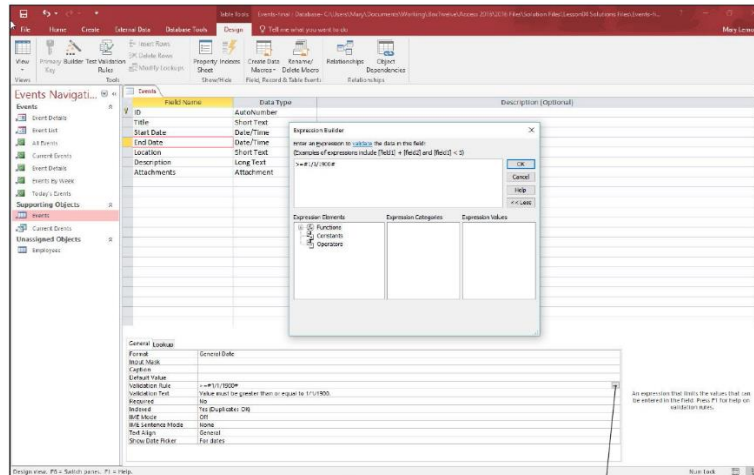
**Validation text** specifies the text in the error message that appears when a user violates a validation rule. The maximum length for the Validation Text property is 255 characters. Data can be validated in several ways, and you will often use multiple methods to define a validation rule.

Each of the following can be used to ensure that your users enter data properly:

- **Data types:** When you design a database table, you define a data type for each field in the table, and that data type restricts what users can enter.
- **Field sizes:** Provide another way to validate text. For example, if you create a field that stores first names, you can set it to accept a maximum of 15 characters. This can prevent a malicious user from pasting large amounts of text into the field or prevent an inexperienced user from mistakenly entering a first, middle, and last name in the field.
- **Table properties:** Provide very specific types of validation. For example, you can use the Order By property to select one or more fields to specify the default sort order of rows in Datasheet view.
- **Field properties:** Use field properties, such as the Validation Rule property to require specific values, and the Validation Text property to alert your users to any mistakes.

##### 4.2.4.1 Step by Step: Set Data Validation Rules

- 1 **USE** the *Events-final* database and Events table that is still open from the previous exercise.
- 2 In the Field Name column in the upper portion of the table design grid, click the **End Date** cell.
- 3 Click the **Validation Rule** property box in the lower portion of the table design grid to display the Expression Builder button (...) on the far right of the cell.
- 4 Click the **Expression Builder** button to display the *Expression Builder* dialog box.
- 5 Select the number **1900** and replace it by typing **2016**.
- 6 Click **OK**.



Click to open the Expression Builder

- 7 Click the **Validation Text** property box in the lower portion of the table design grid.
- 8 Select the number **1900** and then replace it by typing **2016**. The property boxes should look like those shown below.
- 9 **LEAVE** the database open to use in the next exercise.

## 4.2.5 Entering Captions

The Caption property field specifies the text displayed by default as column names in tables and in labels for forms, reports, and queries. The maximum length for the Caption property is 255 characters. If you do not specify a caption to be displayed, the field name is used as the label.

### 4.2.5.1 Step by Step: Enter Captions

- 1 **USE** the **Events-final** database and Events table that is still open from the previous exercise.
- 2 In the Field Name column in the upper portion of the table design grid, click the **Location** cell.
- 3 Click the **Caption** property box in the lower portion of the table design grid.
- 4 Type **Venue**. The caption property has now been set to Venue and will display as a column name in table Datasheet view, as well as labels for forms, reports, and queries.
- 5 **LEAVE** the database open to use in the next exercise.

## 4.2.6 Creating Fields

You can add fields to a table in Design view, or add fields in Datasheet view using the Click to Add column or Add & Delete group. Sometimes it is easier to choose from a predefined list of fields than to manually create a field.

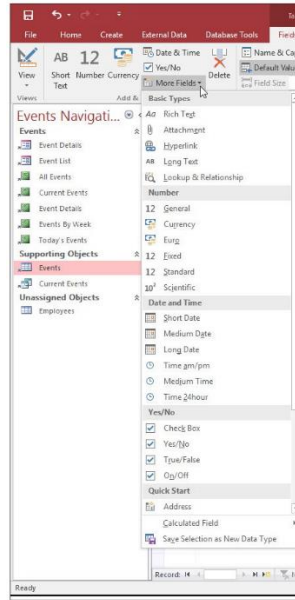
Access includes a quick and easy way for you to add fields to a table using the Add & Delete group on the Table Tools Fields contextual tab. It includes a collection of fields with associated data types and built-in Quick Start fields that can save you considerable time.

A **Quick Start field** is a predefined set of characteristics and properties that describes a field, including:

- Field name
- Data type
- Number of other field properties

### 4.2.6.1 Step by Step: Create Fields

- 1 **USE** the *Events-final* database and Events table that is still open from the previous exercise.
- 2 On the Home tab, in the Views group, click the bottom half of the **View** button and then click **Datasheet View**. Save the table, if required. If you get a message about data integrity, click **Yes**.
- 3 Scroll to the right of the Events table to display the last column and then click the **Click to Add** header. Click **Yes/No** from the menu of available data types that appear. You are going to add a new field with the Yes/No data type in which you can indicate whether events will have on-site staff. A new field named Field1 is added, and the Click to Add column becomes the last column in the table.
- 4 Right-click the **Field1** column header to display the shortcut menu and then click **Rename Field**.
- 5 Type **On-site staff?** as the column name.
- 6 Click the **More Fields** button in the Add & Delete group on the Table Tools Fields contextual tab. The More Fields menu appears.



- 7 In the Quick Start category, scroll down if necessary and click **Status**. A new Quick Start field named Status, in which you now have options to indicate the status of an event, appears to the left of the On-site staff? field.
- 8 Click the **Status** field drop-down box button to view the available options, and then select **Not Started**. Click **Not Started**.
- 9 **LEAVE** the database open to use in the next exercise.

#### 4.2.7 Deleting a Field

Before you delete a column from a datasheet, remember that doing so deletes all the data in the column and that the action cannot be undone. You should back up the table before you delete the column. Before you can delete a primary key or a lookup field, you must first delete the relationships for those fields.

##### 4.2.7.1 Step by Step: Delete a Field

- 1 **USE** the *Events-final* database and Events tablet that is still open from the previous exercise.
- 2 Click the **column header** for the Attachment field, located between the *Description* field and the *Status* field.
- 3 Right-click the **column header** to display the shortcut menu and then click **Delete Field**. In the dialog box that appears, click **Yes**.
- 4 In the confirmation message that appears, click **Yes**. The field is deleted.
- 5 Click the **column header** for the Status field.

- 6 Right-click in the **column** to display the shortcut menu and then click **Delete Field**. In the message box that appears, click **Yes** to delete the Status field.
- 7 **LEAVE** the database open to use in the next exercise.

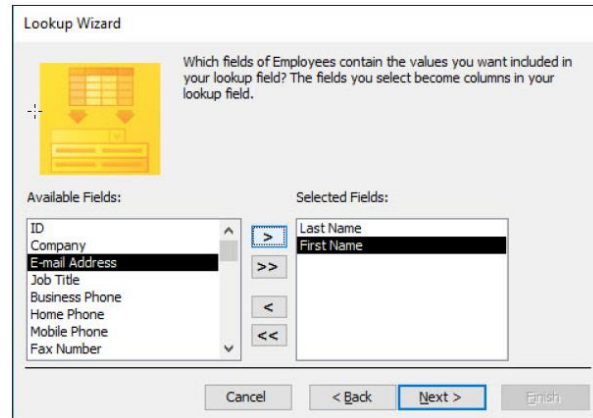
#### 4.2.8 Creating Multivalued Lookup Fields

You can create a **multivalued lookup field** that allows you to select more than one choice from a list—without having to create a more advanced database design. You can create a field that holds multiple values. Use the Lookup Wizard to create multivalued fields.

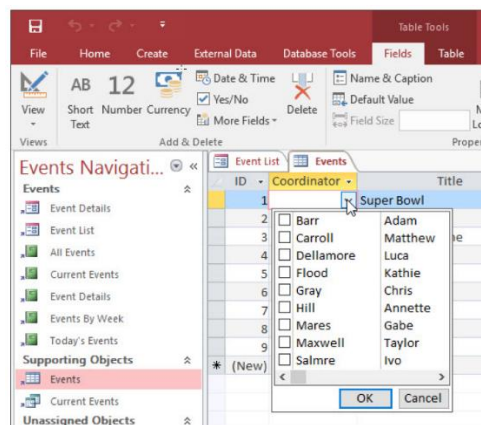
The Lookup Wizard guides you through the process of creating a field or lookup column that can “look up” data that exists in one or more tables to automate the complexity of manually relating tables.

##### 4.2.8.1 Step by Step: Create a Multivalued Lookup Field

- 1 **USE** the *Events-final* database and Events table that are still open from the previous exercise.
- 2 Place the insertion point in the first cell of the table. Click the **More Fields** button in the Add & Delete group on the Table Tools Fields contextual tab and then click the **Lookup & Relationship** button. The Lookup Wizard appears.
- 3 Click **Next** to accept the default setting (I want the lookup field to get the values from another table or query) and display the next screen in the Lookup Wizard. Notice you have a choice of two tables to provide the values for the lookup field you are creating. The first table, Employees, should already be selected for you.
- 4 Click **Next** to accept the default settings and display the next screen in the Lookup Wizard. The Available Fields scroll box contains all the fields of the Employees table, two of which you will select since they contain the values you want to eventually look up.
- 5 In the Available Fields list, select **Last Name** and then click the > button to move it to the Selected Fields box.
- 6 In the Available Fields list, select **First Name** and then click the > button to move it to the Selected Fields box.



- 7 Click **Next** to accept your settings and display the next screen in the Lookup Wizard.
- 8 Click the **down arrow** in the first box and then click **Last Name**. This will sort the Lookup column in alphabetical order by Last Name.
- 9 Click **Next** to accept your selection and to display the next screen in the Lookup Wizard.
- 10 Click **Next** to accept the default selection and to hide the primary key column to ensure only relevant and meaningful data displays in the lookup column later. The final screen of the Lookup Wizard displays.
- 11 In the What label would you like for your lookup field? box, type **Coordinator**. This will create a new label named Coordinator for your column.
- 12 Select the **Allow Multiple Values** check box to allow for the multiple selections of values.
- 13 Click the **Finish** button. A new column named Coordinator appears after the ID field. Click the **down arrow** in the first cell to display the list of names.
- 14 Click **Flood/Kathie** and **Mares/Gabe** on the list and then click **OK** to choose those multiple values for the field.
- 15 **CLOSE** the database and then **EXIT** Access.



## 5 Creating Forms

### 5.1 Creating Forms

A form is a database object that you can use to enter, edit, or display data from a table or query. You can use forms to control access to data by limiting which fields or rows of data are displayed to users. You can create forms in several different ways, depending on how much control you want over the form's design.

You can quickly create forms that include all fields in a table through a single mouse click using the Form tool, or you can control the number of fields you'd like to include on the form as well as the layout of the form using the Form Wizard. You have the most flexibility with the amount and placement of fields on the form when you use Layout or Design view, with Design view giving you the greatest control over field placement and properties.

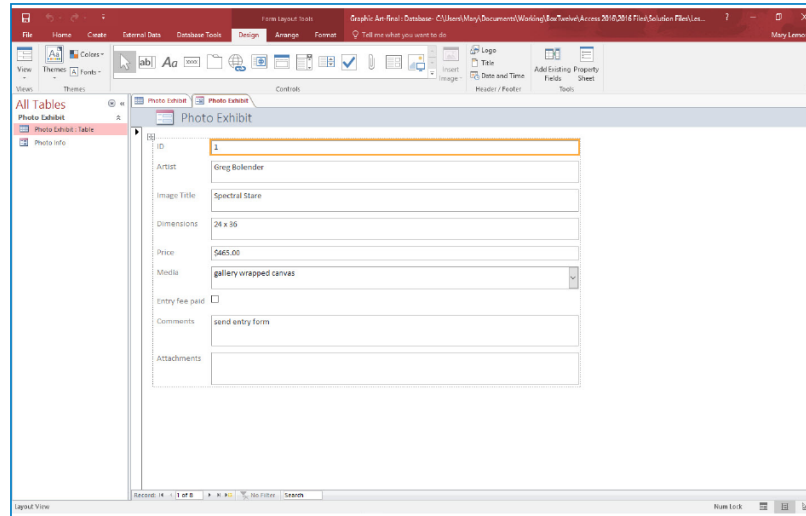
You can quickly apply a chosen theme to the form to modify its color and font scheme using the Themes command. You can delete any form using the Delete command.

#### 5.1.1 Creating a Simple Form and Deleting a Form

You can use the **Form tool** to create a form with a single mouse-click. When you use this tool, all the fields from the underlying data source are placed on the form. Access creates the form and displays it in Layout view. You can begin using the new form immediately, or you can modify it in Layout view or Design view to better suit your needs. You can also delete a form to remove it permanently from the database.

##### 5.1.1.1 Step by Step: Create a Simple Form and Delete a Form

- 1 Before you begin these steps, make sure that your computer is on. Sign on, if necessary, and start Access.
- 2 **OPEN** the **Graphic Art** database from the data files for this lesson and then **SAVE** the database as **Graphic Art-final**.
- 3 In the Navigation Pane, click the **Photo Exhibit** table. This is the table for which you will create a form.
- 4 On the Create tab, in the Forms group, click the **Form** button. Access creates the form and displays it in Layout view. Your form may be slightly different.



- 5 Click the **File** tab and then click **Save**. The *Save As* dialog box appears.
- 6 Click **OK** to accept the Photo Exhibit form name suggested by Access. The form name appears in the Navigation Pane.
- 7 Click the **Close** button on the Photo Exhibit form to close it.
- 8 In the Navigation Pane, click the **Photo Info** form. This is a form that you no longer need.
- 9 In the Records group, click the **Delete** button arrow and then click the **Delete** command on the menu that appears.
- 10 Click **Yes** on the dialog box asking you if you want to permanently delete the Photo Info form. The form is now permanently deleted from the database.
- 11 **LEAVE** the database open to use in the next exercise.

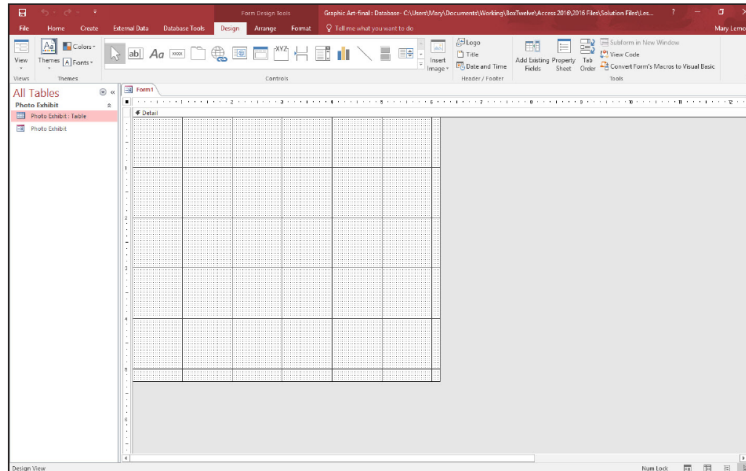
### 5.1.2 Creating a Form in Design View

When you click the **Form Design button**, a new blank form is created in Design view. Design view gives you a more detailed view of the structure of your form than Layout view. The form is not actually running when it is shown in Design view, so you cannot see the underlying data while you are making design changes. You can fine-tune your form's design by working in Design view.

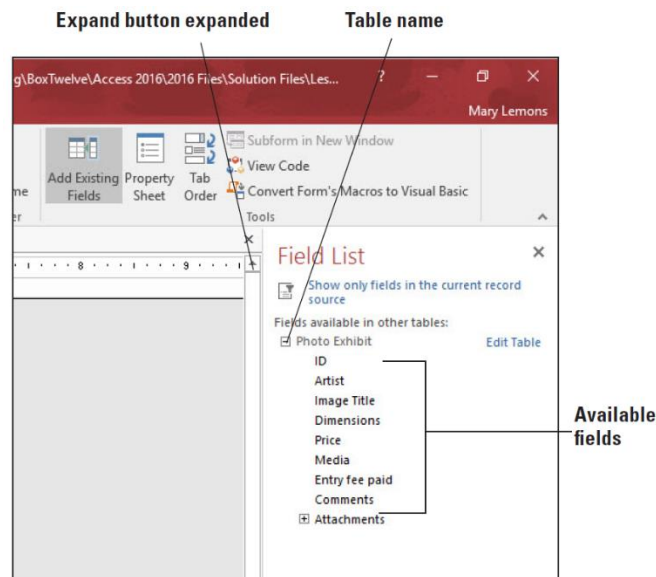
#### 5.1.2.1 Step by Step: Create a Form in Design View

- 1 **USE** the *Graphic Art-final* database that is open from the previous exercise.
- 2 On the **Create** tab, in the **Forms** group, click the **Form Design** button. A new blank form is created in Design view.

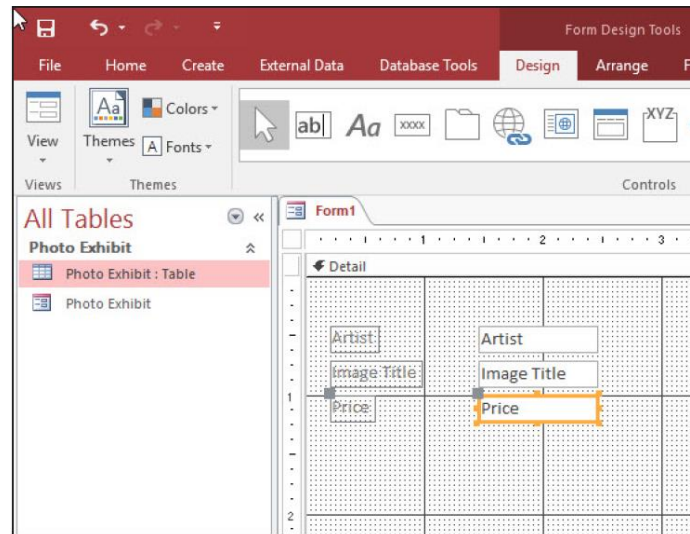




- 3 On the Form Design Tools Design contextual tab, in the Tools group, click the **Add Existing Fields** button. The Field List pane appears.
- 4 Click the **Show all tables** link, and then the **expand** button to the left of the table name. The available fields display from the Photo Exhibit table.



- 5 In the list of fields, double-click **Artist** to add it to the form.
- 6 Double-click **Image Title** to add it to the form.
- 7 Double-click **Price** to add it to the form. Click the **File** tab and then click **Save**.



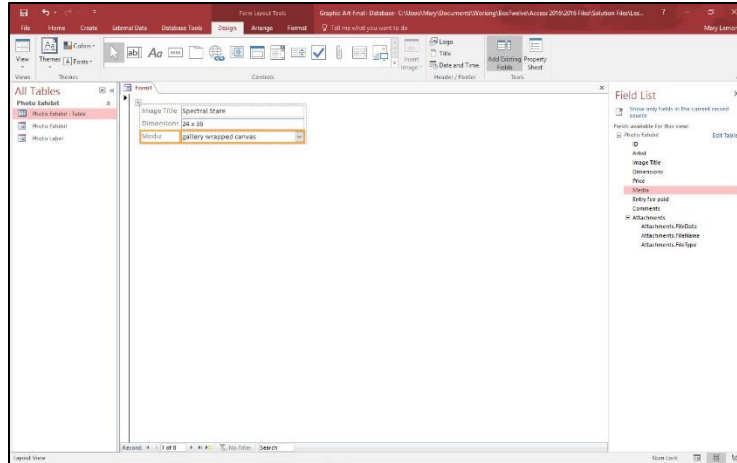
- 8 In the *Save As* dialog box, type **Photo Label** and then click **OK**.
- 9 On the Design menu, in the Views group, click the lower half of the **View** button and then click **Form View** to display the form in Form view.
- 10 Click the **Close** button on Photo Label to close the form.
- 11 **LEAVE** the database open to use in the next exercise.

### 5.1.3 Creating a Form in Layout View

If other form-building tools do not fit your needs, you can use the Blank Form tool to create a form. The **Blank Form tool** creates a new form in Layout view. This can be a very quick way to build a form, especially if you plan to put only a few fields on your form.

#### 5.1.3.1 Step by Step: Create a Form in Layout View

- 1 **USE** the *Graphic Art-final* database that is open from the previous exercise.
- 2 On the Create tab, in the Forms group, click the **Blank Form** button. A new blank form is created in Layout view.
- 3 Click the **Show all tables** link in the Field List pane to show the Photo Exhibit table name, if necessary.
- 4 If necessary, click the **expand** button next to the Photo Exhibit table name to show a list of fields related to the table, and then double-click **Image Title** to add it to the form.
- 5 Double-click **Dimensions** to add it to the form.
- 6 Double-click **Media** to add it to the form.



- 7 Click the **File** tab and then click **Save**.
- 8 In the *Save As* dialog box, type **Image Info** and then click **OK**.
- 9 Click the **Close** button to close the Field List.
- 10 Click the **Close** button on Image Info to close the form.
- 11 **LEAVE** the database open to use in the next exercise.

### 5.1.4 Using the Form Wizard

Another method of building a form is to use the **Form Wizard** tool.

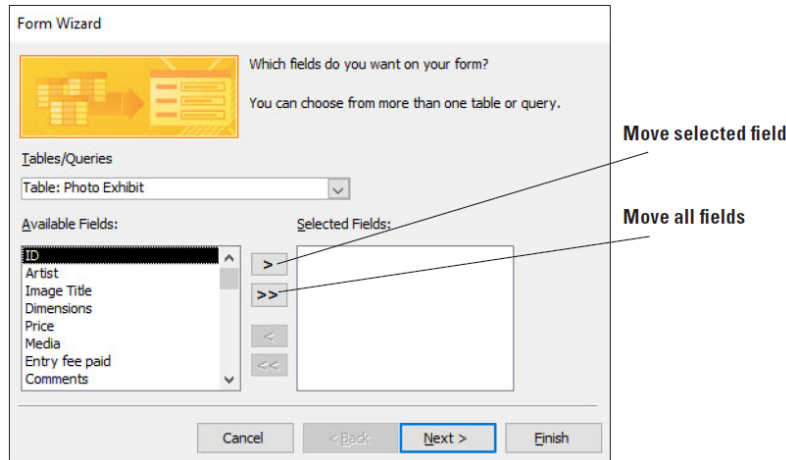
The Form Wizard allows you to:

- Select the fields that will appear on the form
- Choose the form layout (which determines the positioning of controls, objects, and data on a form)
- Choose a predefined style, if desired

A datasheet form looks very similar to the table upon which it is based and provides a way to enter data using columns and rows.

#### 5.1.4.1 Step by Step: Use the Form Wizard

- 1 **USE** the *Graphic Art-final* database that is open from the previous exercise.
- 2 On the **Create** tab, in the **Forms** group, click the **Form Wizard** button. The Form Wizard appears.



- 3 Click the >> button to move all the fields from the Available Fields box to the Selected Fields box.
- 4 Click the **Next** button to move to the next page in the Form Wizard
- 5 Click **Datasheet** as the layout for the form. Form layouts help determine the positioning of controls, objects, and data on a form.
- 6 Click the **Next** button to move to the final page in the Form Wizard.
- 7 Type **Photo Details** as the title of the form.
- 8 Click the **Finish** button. A datasheet form appears.
- 9 Click the **Close** button on Photo Details to close the form.
- 10 **LEAVE** the database open to use in the next exercise.

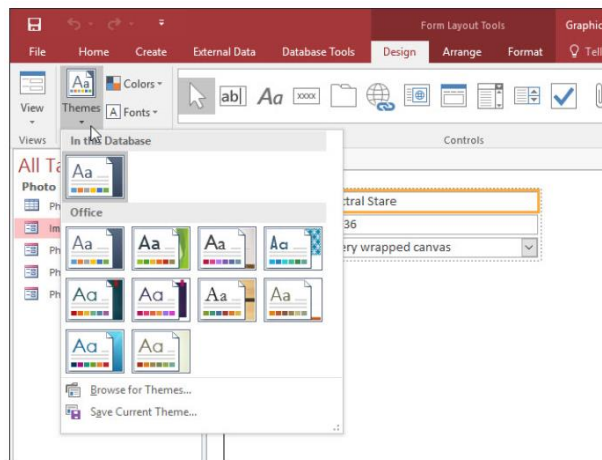
ID	Artist	Image Title	Dimensions	Price	Media	Entry fee paid
1	Greg Bolender	Spectral Stare	24 x 36	\$465.00	gallery wrapped canvas	<input type="checkbox"/>
2	Marc J. Ingie	Out of Nowhere	11 x 14	\$225.00	inkjet print	<input checked="" type="checkbox"/>
3	Karan Khanna	The Guardian	16 x 20	\$350.00	gelatin silver print	<input checked="" type="checkbox"/>
4	Julie Telf-Rider	Once in a Lifetime	30 x 40	\$800.00	gelatin silver print	<input checked="" type="checkbox"/>
5	Dragan Tomic	Saving Face	29 x 29	\$545.00	composite color photo	<input type="checkbox"/>
6	Pilar Ackerman	Twisting, Turning, Leaning, Burr	12 x 28	\$400.00	digital pigment print	<input checked="" type="checkbox"/>
7	Douglas Hite	Untitled	28 x 33	\$750.00	gelatin silver print	<input type="checkbox"/>
8	Zheng Mu	Illuminated	18 x 28	\$335.00	gallery wrapped canvas	<input checked="" type="checkbox"/>
(New)				\$0.00		<input type="checkbox"/>

### 5.1.5 Applying a Theme

The **Themes** command applies a predefined color and font scheme to a form or report. A theme modifies a form by controlling the color and fonts of its text.

#### 5.1.5.1 Step by Step: Apply a Theme

- 1 **USE** the *Graphic Art-final* database that is open from the previous exercise.
- 2 Double-click the **Image Info** form in the Navigation Pane to open it.
- 3 On the Home tab, in the Views group, click the lower half of the **View** button and then click **Layout View**.
- 4 On the Form Layout Tools Design contextual tab, in the Themes group, click the **Themes** button. A gallery of themes appears.



- 5 Click the **Integral theme** (fourth item in the first row) to apply it to the form. Notice how the form's text has changed.
- 6 Click the **Close** button on Image Info to close the form.
- 7 **LEAVE** the database open to use in the next exercise.

## 5.2 Sorting and Filtering Data within a Form

Sorting data in a form can help make it much more effective and easy to use. Sorting helps users review and locate the records they want without having to browse the data. To find one or more specific records in a form, you can use a filter.

A **filter** limits a view of data to specific records without requiring you to alter the design of the form. You also can use a tool called filter by form to filter on several fields in a form or to find a specific record.

## 5.2.1 Sorting Data within a Form

You can sort data in the Form view of a form. The order that is chosen when a form is designed becomes that object's default sort order.

### 5.2.1.1 Step by Step: Sort Data within a Form

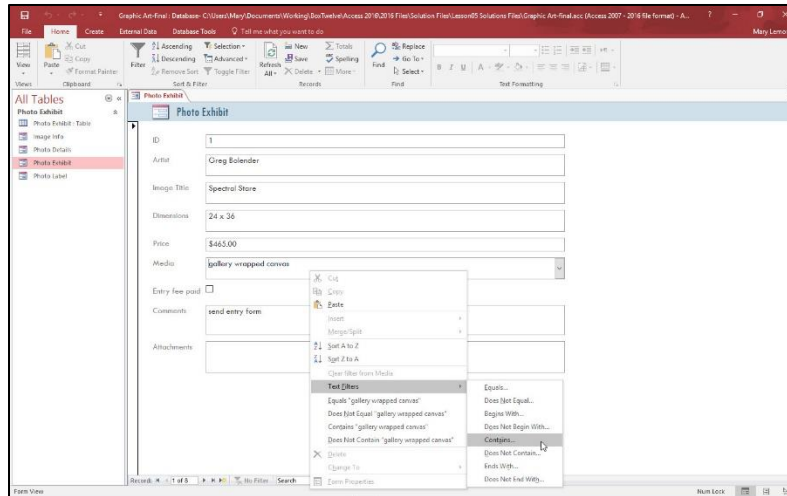
- 1 **USE** the *Graphic Art-final* database that is open from the previous exercise.
- 2 Double-click the **Photo Label** form in the Navigation Pane to open it in Form view.
- 3 Right-click the **Price** field to display the shortcut menu.
- 4 Click **Sort Smallest to Largest**. The form is sorted by price from smallest to largest. The record with the smallest price is displayed first.
- 5 Click the **Next record** button on the record navigator at the bottom of the form. Continue clicking through all the records to see the records in order according to price.
- 6 On the Home tab, in the Sort & Filter group, click the **Remove Sort** button. The records have resorted back to their original order.
- 7 Click the **Close** button on Photo Label to close the form.
- 8 **LEAVE** the database open to use in the next exercise.

## 5.2.2 Filtering Data within a Form

**Common filters** are built into every view that displays data. The filters available depend on the type and values of the field. When you apply the filter, only records that contain the values that you are interested in are included in the view. The rest are hidden until you remove the filter.

### 5.2.2.1 Step by Step: Filter Data with Common Filters

- 1 **USE** the *Graphic Art-final* database that is open from the previous exercise.
- 2 Double-click the **Photo Exhibit** form in the Navigation Pane to open it in Form view.
- 3 Right-click the **Media** field to display the shortcut menu, click **Text Filters**, and then select **Contains**. Click **Contains** to display the *Custom Filter* dialog box.



- 4 In the Media contains box, type **print** and then click **OK**.
- 5 Click the **Next record** button on the record navigator at the bottom of the form. Continue clicking to see the five records that contain the word “print” in the Media field.
- 6 Right-click the **Price** field to display the shortcut menu and then click **Number Filters**.
- 7 Click **Less Than** to display the *Custom Filter* dialog box.
- 8 In the Price is less than or equal to box, type **500** and then click **OK**.
- 9 Click the **Next record** button on the record navigator at the bottom of the form. Continue clicking to see the three photos that use print media and are less than \$500.
- 10 On the Home tab, in the Sort & Filter group, click the **Advanced Filter Options** button and then click **Clear All Filters**.
- 11 **LEAVE** the database open to use in the next exercise.

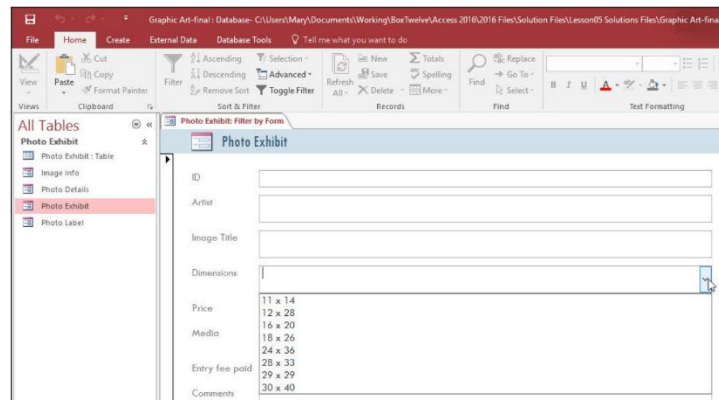
### 5.2.3 Using Filter by Form

**Filter by form** is useful when you want to filter several fields in a form or if you are trying to find a specific record. Access creates a blank form that is similar to the original form; you then complete as many of the fields as you want. When you are finished, Access finds the records that contain the specified values.

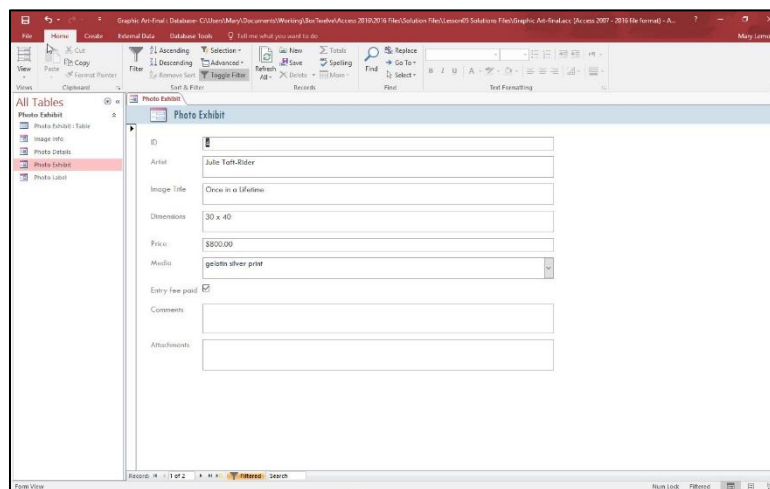
#### 5.2.3.1 Step by Step: Use Filter by Form

- 1 **USE** the *Graphic Art-final* database that is open from the previous exercise.
- 2 On the Home tab, in the Sort & Filter group, click the **Advanced Filter Options** button and then click **Filter By Form**. A form filter appears.

- Place the insertion point in the Dimensions box and then click the **down arrow** on the right to display the list of options.



- Click **30 X 40**.
- Click the **Or** tab at the bottom of the form.
- Place the insertion point in the Dimensions box, click the **down arrow** and then click **12 X 28**.
- On the Home tab, in the Sort & Filter group, click the **Toggle Filter** button to apply the filter. The records containing either the dimensions **30 X 40** or **12 X 28** are displayed.
- Click the **Next record** button on the record navigator at the bottom of the form to see the second record in the form filter results.
- On the Home tab, in the Sort & Filter group, click the **Toggle Filter** button again to remove the filter, click the **Advanced** button and then click **Clear All Filters**.
- Click the **File** tab and then click **Close**.
- CLOSE** the database and then **EXIT** Access.





## 6 Creating Reports

### 6.1 Creating Reports

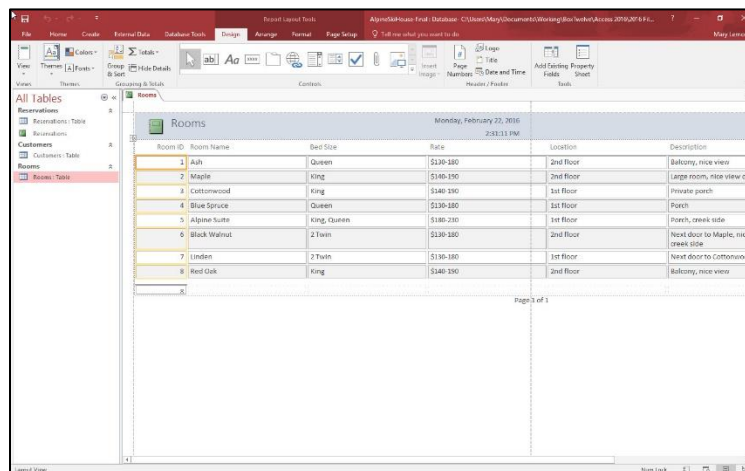
A **report** is a database object that is used to organize and display data pulled from tables and queries. You can create a report using the Report button, Report Wizard button, Report Design button, and Blank Report button, depending on the amount of customization desired.

#### 6.1.1 Creating a Simple Report and Deleting a Report

You can use Access 2016 to create simple or complex reports. When creating a complex report, you might spend quite a bit of time choosing which fields you want to include from various tables or queries. A report's **record source** is the table or query that provides the data used to generate a report.

##### 6.1.1.1 Step by Step: Create and Delete a Report

- 1 Before you begin these steps, make sure that your computer is on. Sign on, if necessary, and start Access.
- 2 **OPEN** *AlpineSkiHouse* from the data files for this lesson and then **SAVE** the database as *AlpineSkiHouse-final*.
- 3 In the Navigation Pane, click the **Rooms** table to select it. This is your record source.
- 4 On the Create tab, in the Reports group, click the **Report** button. The report appears in Layout view. Notice the Report Layout tools that appear in the Ribbon.



- 5 Click the **Room ID** header to select it. Position the pointer over the right border until you see a double-sided arrow.
- 6 Click and drag, resizing the column to remove excess white space.

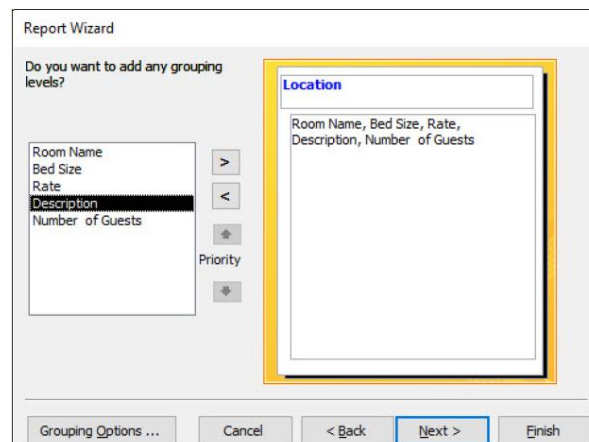
- 7 Click the **Save** button on the Quick Access Toolbar. The *Save As* dialog box appears with Rooms in the Report Name box. Click **OK**.
- 8 Click the **Close** button to close the Rooms report.
- 9 In the Navigation Pane, click the **Reservations** report to select it.
- 10 On the Home tab, in the Records group, click the **Delete** button arrow and then click the **Delete** command on the menu that appears.
- 11 Click **Yes** on the dialog box asking you if you want to permanently delete the Reservations report. The report is now permanently deleted from the database.
- 12 **LEAVE** the database open to use in the next exercise.

### 6.1.2 Using the Report Wizard

The Report Wizard displays a series of questions about the report you want, and then it creates the report for you based on your answers. The Report Wizard knows what makes a good report, so the questions are designed to help you create a professional report with little effort.

#### 6.1.2.1 Step by Step: Use the Report Wizard

- 1 **USE** the *AlpineSkiHouse-final* database that is open from the previous exercise.
- 2 On the Create tab, in the Reports group, click the **Report Wizard** button. The first screen of the Report Wizard appears.
- 3 Select the **Rooms table** in the Tables/Queries menu.
- 4 Click the >> button to move all the fields into the Selected Fields list.
- 5 Click the **Room ID** field to select it and then click the < button to move it back to the Available Fields list. Click the **Next** button.
- 6 Click the **Location** field to select it and then click the > button to add it as a grouping level.



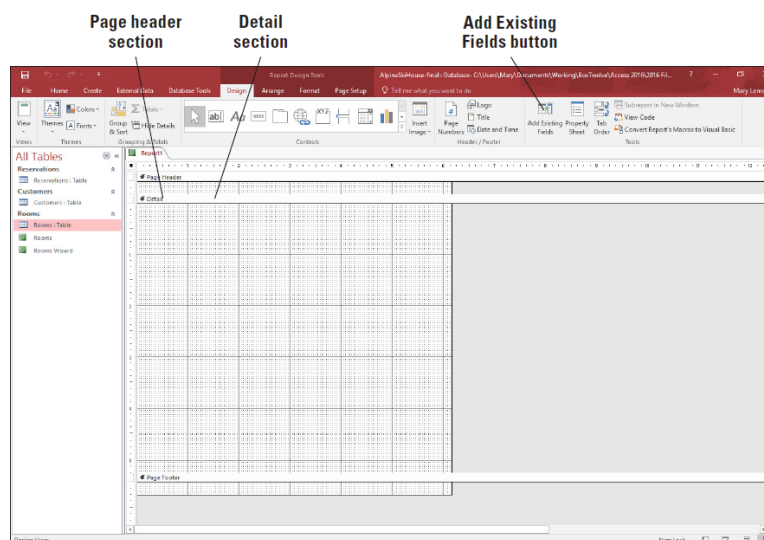
- 7 Click the **Next** button.
- 8 Select **Room Name** from the fields menu to sort in ascending order and then click the **Next** button.
- 9 In the Layout section, click the **Outline** button. In the Orientation section, click the **Landscape** button. Click **Next**.
- 10 Type **Rooms Wizard** as the title of the report.
- 11 Click **Finish**. The Rooms Wizard report appears on the screen.
- 12 **CLOSE** the report. Notice that the new report is listed in the Navigation Pane.
- 13 **LEAVE** the database open to use in the next exercise.

### 6.1.3 Creating a Report in Design View

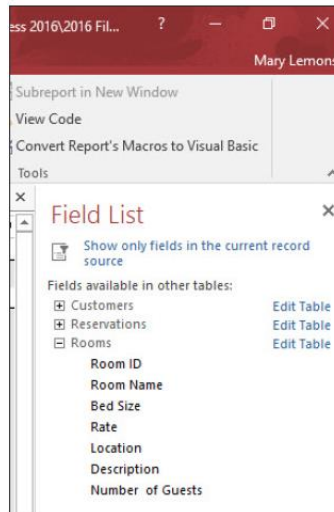
When you want a customized report, you can create it in Design view, which offers you many options for creating the report exactly the way you want it. Design view gives you the most options for creating a report, because it shows you the underlying structure of the report. It also provides you with more design tools and capabilities.

#### 6.1.3.1 Step by Step: Create a Report in Design View

- 1 **USE** the *AlpineSkiHouse-final* database that is open from the previous exercise.
- 2 If necessary, click the **Rooms** table in the Navigation Pane to select it.
- 3 On the Create tab, in the Reports group, click the **Report Design** button. A new blank report is displayed in Design view.



- 4 If the Field List pane is not already displayed, click the **Add Existing Fields** button on the Design tab in the Tools group. The Show All Tables link appears.
- 5 Click the **Show all tables link** and then the **plus (+)** box beside Rooms to display the fields in the table.



- 6 Double-click **Room ID**. The field is inserted onto the design grid.
- 7 Double-click **Room Name**, **Bed Size**, and **Rate** to add them to the design grid.
- 8 Click the **Close** button on the Field List pane.
- 9 Click the **Bed Size** label. The border around the label changes to orange, indicating that it is selected. Position the insertion point over the top of the border until the pointer changes to a four-sided arrow.
- 10 Click and drag the label to position it about one-half inch to the right of the Room ID field and release the mouse button. The field is moved along with the label.
- 11 In the same manner, move the **Rate** label and field to position it below the Bed Size field.
- 12 Click the **Room ID** field to select it. Position the mouse pointer on the square handle in the middle of the right-side border. Click and drag the field to the left to decrease the size by about one-quarter inch.
- 13 On the Ribbon, in the Views group, click the bottom half of the **View** button and then select **Report View** from the menu. The report is shown in Report view. Scroll down to see all the records.
- 14 Click the **Save** button on the Quick Access Toolbar.
- 15 Type **Report Design** in the Report Name box and then click **OK**.
- 16 **CLOSE** the report.

17 **LEAVE** the database open to use in the next exercise.

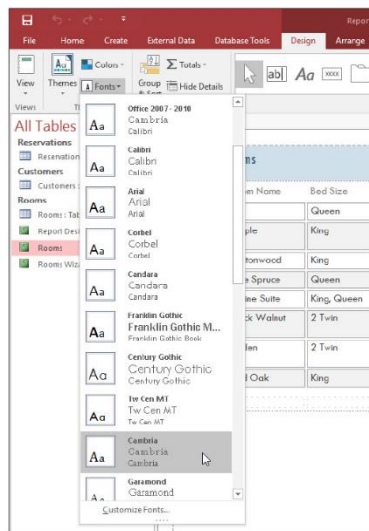
## 6.2 Applying a Theme

A theme applies a set of predefined fonts, colors, and design to a report. You can apply a theme to any report in Layout view or Design view. The Themes gallery displays a variety of designs.

After you click the design you want, it is applied to the report.

### 6.2.1 Step by Step: Apply a Theme

- 1 **USE** the *AlpineSkiHouse-final* database that is open.
- 2 Double-click the **Rooms** report in the Navigation Pane to open it.
- 3 On the Ribbon, in the Views group, click the bottom half of the **View** button and then select **Layout View** from the menu.
- 4 On the Report Layout Tools Design contextual tab, in the Themes group, click the **Themes** button. The Themes gallery of predefined report themes appears.
- 5 In the Office section, click the **Integral** design. The format is applied to the report.
- 6 In the Themes group, click the **Fonts** button. Select **Cambria** from the menu. Click the font and the new Font theme is applied. (Be sure to select the Cambria font and not the Office 2007-2010 Cambria font.)



- 7 **SAVE** the report.
- 8 **LEAVE** the report open to use in the next exercise.

## 6.3 Working with Reports

Reports help group and summarize data in different ways. After a report is created, you can use Layout view as well as Report view to help locate data.

### 6.3.1 Grouping and Sorting Data within a Report

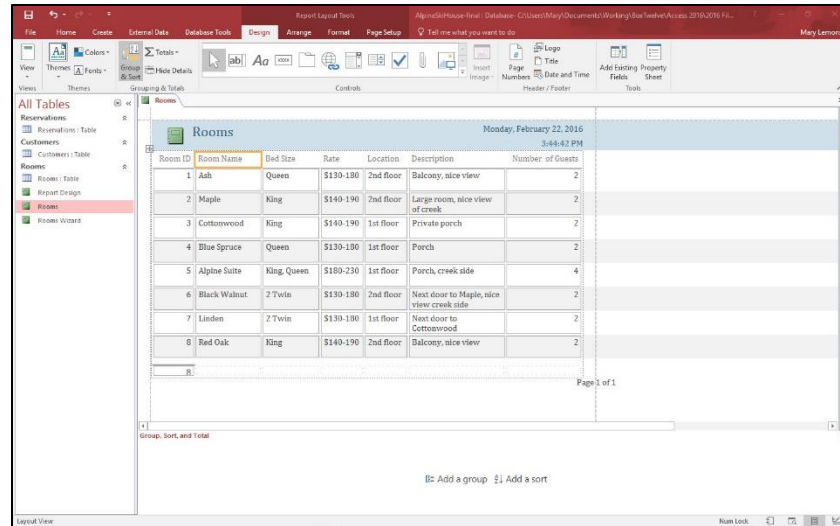
Sorting organizes data into a particular sequence. You can sort data by clicking the buttons on the Ribbon, right-clicking and choosing commands from the shortcut menu, or by using the Group, Sort, and Total pane. Sorting data in a report is similar to sorting in a table.

The sort commands vary depending on the type of data in the field.

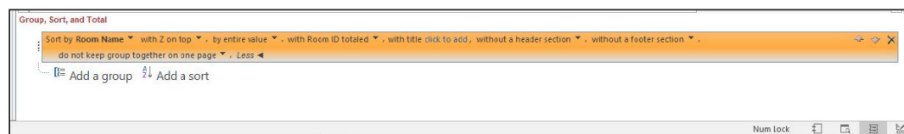
- For text: Choose Sort A to Z or Sort Z to A
- For numbers: Choose Sort Smallest to Largest or Sort Largest to Smallest
- For dates: Choose Sort Oldest to Newest or Sort Newest to Oldest.

#### 6.3.1.1 Step by Step: Group and Sort Data within a Report

- 1 **USE** the *AlpineSkiHouse-final* database that is open.
- 2 On the Home tab in the Views group, click the bottom half of the **View** button. Select **Layout View** from the menu.
- 3 Click the **Room Name** header.
- 4 On the Home tab, in the Sort & Filter group, click the **Ascending** button. The column is sorted in ascending alphabetic order.
- 5 On the Home tab, in the Sort & Filter group, click the **Remove Sort** button.
- 6 Right-click the **Room Name** header. The shortcut menu appears.
- 7 Select **Sort Z to A**. The column is sorted.
- 8 On the Home tab, in the Sort & Filter group, click the **Remove Sort** button. The Sort is cleared.
- 9 On the Report Layout Tools Design contextual tab, in the Grouping & Totals group, click the **Group & Sort** button. The Group, Sort, and Total pane appears at the bottom of the screen.



- 10 Click the **Add a sort** button in the Group, Sort, and Total pane.
- 11 Select **Room Name** from the select field list. Notice that the field was sorted in ascending order by default and a line was added describing the sort.
- 12 Click the **down arrow** beside *with A on top* and then select **with Z on top** from the menu. The field is sorted in descending order.
- 13 Click the **More Options** button in the Sort line. Notice the options available for customizing a sort.



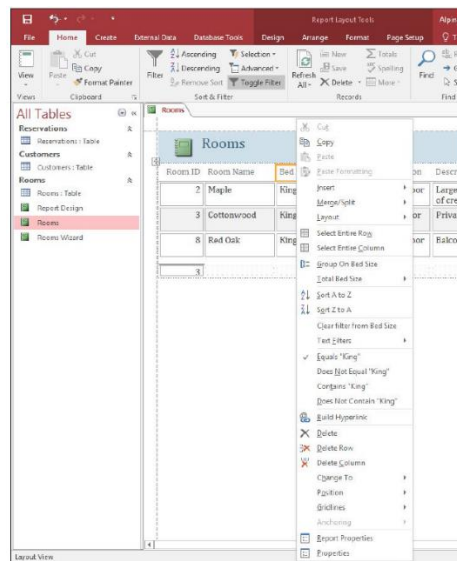
- 14 Click the **Delete** button. The sort is cleared.
- 15 In the Grouping & Totals group on the Ribbon, click the **Group & Sort** button. The Group, Total, and Sort pane is removed.
- 16 **SAVE** the report.
- 17 **LEAVE** the database open to use in the next exercise.

### 6.3.2 Filtering Data within a Report

A filter displays only data that meets the criteria you have specified and hides the rest. It does not modify the table data or the design of the report. After you remove a filter, all the records are displayed again. Filtering data in Layout view of a report is very similar to filtering data in a table.

### 6.3.2.1 Step by Step: Filter Data within a Report

- 1 **USE** the *AlpineSkiHouse-final* database that is open from the previous exercise.
- 2 Click the **Location** header to select it.
- 3 On the Home tab, in the Sort & Filter group, click the **Filter** button. A menu appears.
- 4 Select **Text Filters** and then click **Begins With**. The *Custom Filter* dialog box appears.
- 5 Type **1** into the *Custom Filter* dialog box and then click **OK**. The data is filtered to show only the rooms on the first floor.
- 6 Click the **Toggle Filter** button on the Ribbon. The report returns to its unfiltered state.
- 7 In the Bed Size field, click **King** in the second row.
- 8 On the Home tab, in the Sort & Filter group, click the **Selection** button, and then select **Equals "King"** from the menu. The data is filtered to show only the rooms with King-sized beds.
- 9 Right-click the **Bed Size** header. A shortcut menu appears. Notice that the Equals "King" filter and the other filters from the Selection menu are also available in the shortcut menu.



- 10 Select **Clear filter from Bed Size** from the menu. The filter is cleared.
- 11 **CLOSE** and **SAVE** the report.
- 12 **LEAVE** the database open to use in the next exercise.



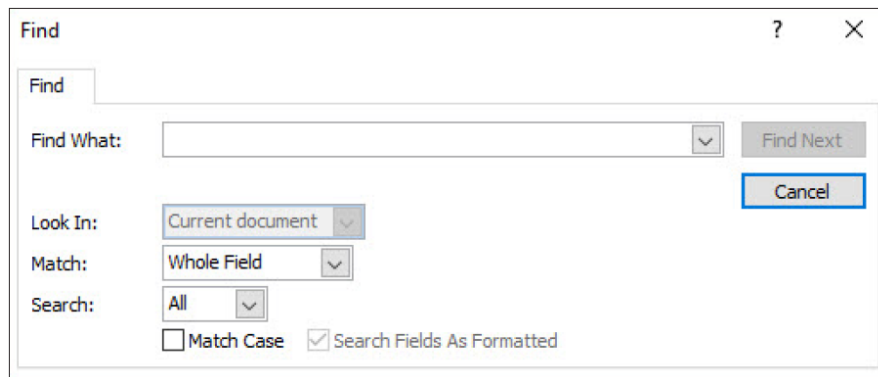
### 6.3.3 Finding Data within a Report

Sometimes, you may need to quickly find records within a report while in Report view or Report Layout view. To accomplish this, you can use the Find command in the Find group on the Home tab.

Once the Find command is clicked, the Find dialog box appears where you can enter search criteria, set options for where you would like Access to look for the data, and set data matching and other search options. You can quickly locate records that match your search term and view multiple occurrences.

#### 6.3.3.1 Step by Step: Find Data within a Report

- 1 **USE** the *AlpineSkiHouse-final* database that is open from the previous exercise.
- 2 Double-click the Rooms report in the Navigation Pane to open it.
- 3 On the Home tab, in the Find group, click the **Find** button. The *Find* dialog box appears.



- 4 Type **King** in the Find What drop-down box.
- 5 Click the **Find Next** button. Access highlights the first occurrence of 'King' in the report. Continue clicking the **Find Next** button until Access reports that it has finished searching the records.
- 6 Click **OK** and then click **Cancel**.
- 7 **CLOSE** the report and the database.
- 8 **EXIT** Access.

## 7 Creating and Modifying Queries

### 7.1 Creating a Query

A query is a set of instructions used for working with data. Creating a query is similar to asking the database a question. Running a query performs these instructions and provides the answers.

A **select query** is the most basic type of Access query. It creates subsets of data that you can use to answer specific questions or to supply data to other database objects such as forms and reports.

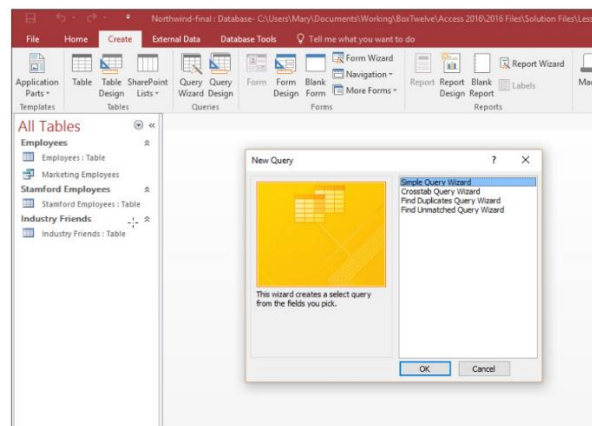
#### 7.1.1 Creating a Query from a Table

A query can get its data from one or more tables, from existing queries, or from a combination of the two. The tables or queries from which a query gets its data are referred to as its **record source**.

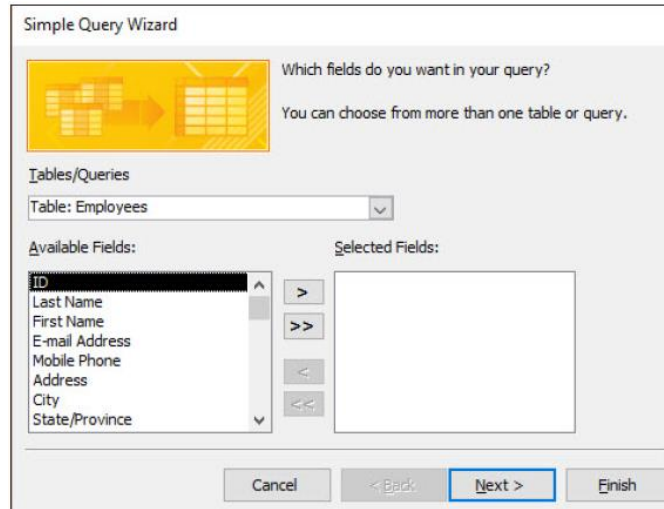
When one table provides the information that you need, you can create a simple select query using the Query Wizard. Use a query to find records with duplicate field values in a single table.

##### 7.1.1.1 Step by Step: Create a Simple Query

- 1 **OPEN** the *Northwind* file from the data files for this lesson and then **SAVE** the database as *Northwind-final*.
- 2 On the Create tab, in the Queries group, click the **Query Wizard** button. The *New Query* dialog box appears.



- 3 Click **Simple Query Wizard** and then click **OK**. The Simple Query Wizard appears.
- 4 In the Tables/Queries drop-down list, *Table: Employees* should be selected by default. If it is not, select it.



- 5 Under Available Fields, double-click **Last Name**, **First Name**, **E-mail Address**, **Mobile Phone**, and **Position** to move them to the Selected Fields box.
- 6 Click the **Next** button. The second screen in the Simple Query Wizard appears.
- 7 Name the query **Employees Contact Query** and then select **Open the query to view information** if it is not already selected.
- 8 Click the **Finish** button to accept the default selection and complete the query. The Employees Contact Query is displayed. The results show all of the records, but show only the five fields that you specified in the Query Wizard.

Last Name	First Name	E-mail Address	Mobile Phone	Position
Busch	Patricia	pbusch@northwindtrade	203.555.1455	Customer Serv
Coleman	Pat	pcoleman@northwindtra	203.555.4312	Customer Serv
Daniels	David	ddaniels@northwindtrad	203.555.0979	Product Line D
DeOliveira	Jose	jdeoliveira@northwindtr	430.555.7542	Graphic Design
Fatima	Suroor	sfatima@northwindtrade	203.555.8652	Product Line M
Hanson	Mark	mhanson@northwindtrac	406.555.2333	Sales Associate
Holliday	Nicole	nholliday@northwindtra	203.555.7319	Assistant Sales
Johnson	Willis	wjohnson@northwindtra	203.555.0034	Director of Sale
Laszlo	Rebecca	rlaszlo@northwindtrader	918.555.3488	Marketing Coo
Lee	Frank	flee@northwindtraders.c	203.555.2831	Director of Mar
Lee	Mark	mlee@northwindtraders	203.555.2632	Marketing Mar
Reiter	Tsvi	treiter@northwindtrader	203.555.7335	Sales Operatio
Su	Min	smin@northwindtraders	203.555.2341	Business Oper

- 9 Click the **Close** button on the Employees Contact Query window to close the query.
- 10 In the Navigation Pane, double-click the **Employees Contact Query** to run it. The query results are displayed in Datasheet view.
- 11 Click the **Close** button on the Employees Contact Query window to close the query.

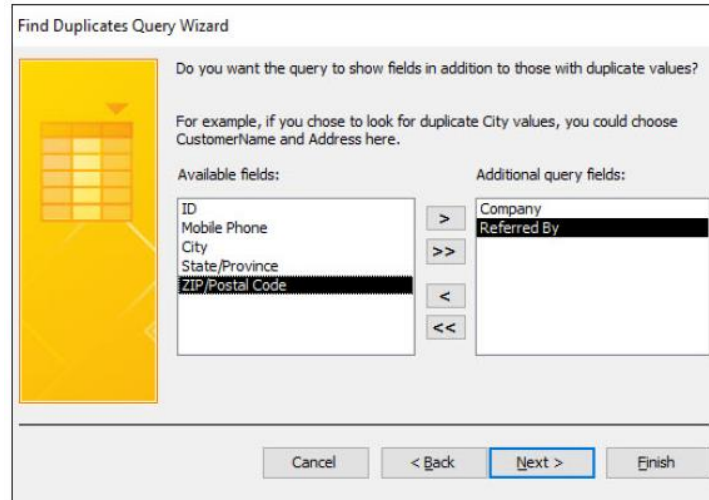
- 12 In the Navigation Pane, right-click to select the **Employees Contact Query**.
- 13 On the shortcut menu that appears, click the **Rename** command.
- 14 In the query name box, type **Employees Contact Info Query** to rename it and then click **Enter**. The query has been renamed.
- 15 In the Navigation Pane, click the **Marketing Employees** query to select it.
- 16 On the Home tab, in the Records group, click the **Delete** button arrow and then click the **Delete** command on the menu that appears.
- 17 Click **Yes** on the dialog box asking you if you want to permanently delete the Marketing Employees query. The query is now permanently deleted from the database.
- 18 **LEAVE** Access open to use in the next exercise.

### 7.1.2 Creating a Find Duplicates Query

As a general rule, duplicate data should be eliminated from a database whenever possible to minimize redundancy and increase accuracy. The first step in this process is finding duplicate data. Two or more records are considered duplicates only when all the fields in your query results contain the same values. If the values in even a single field differ, each record is unique.

#### 7.1.2.1 Step by Step: Create a Find Duplicates Query

- 1 **USE** the *Northwind-final* database that is open from the previous exercise.
- 2 On the Create tab, in the Queries group, click the **Query Wizard** button. The *New Query* dialog box appears.
- 3 Click **Find Duplicates Query Wizard** and then click **OK**. The Find Duplicates Query Wizard appears.
- 4 Click **Table: Industry Friends** and then click **Next**. The next screen in the Find Duplicates Query Wizard appears.
- 5 Double-click **Last Name**, **First Name**, and **E-mail Address** to move them to the Duplicate-value fields box. These are the fields that you think may include duplicate information.
- 6 Click **Next** to display the next screen in the Find Duplicates Query Wizard. This screen asks if you want to show other fields of the duplicate record besides just the ones with the duplicate data.
- 7 Double-click **Company** and **Referred By** to move them to the Additional query fields box.



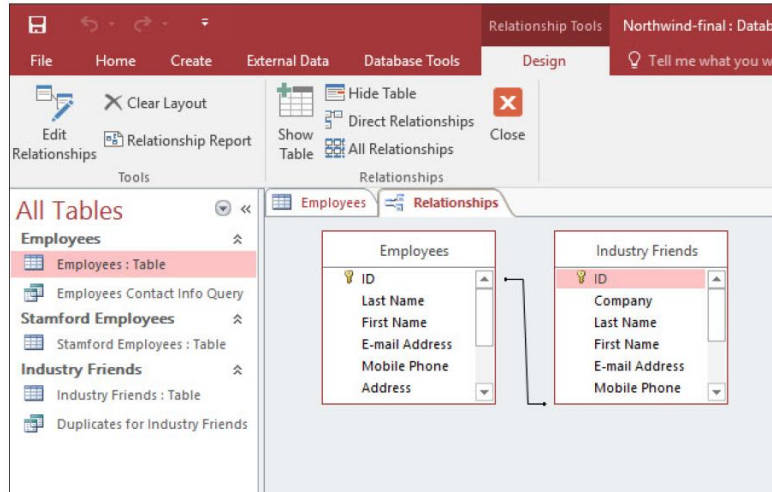
- 8 Click **Next** to display the final screen in the Find Duplicates Query Wizard.
- 9 Name the query **Duplicates for Industry Friends** and then click **Finish**. The query showing duplicate records in the table is displayed.
- 10 Click the **Close** button on the Duplicates for Industry Friends tab to close the query.
- 11 **LEAVE** Access open to use in the next exercise.

### 7.1.3 Creating a Query from Multiple Tables

If the data you need is in more than one table, build a query that combines information from multiple sources. You can create a query that finds records in one table that have no related records in another table. When you need to include multiple tables in your query, use the Simple Query Wizard to build a query from a primary table and a related table. Before creating a query from multiple tables, ensure that the tables have a defined relationship in the Relationships window.

#### 7.1.3.1 Step by Step: Create a Query from Multiple Tables

- 1 **USE** the *Northwind-final* database that is open from the previous exercise.
- 2 In the Navigation Pane, double-click **Employees: Table** to open the table.
- 3 On the Database Tools tab, in the Relationships group, click the **Relationships** button to display the table relationship. The Employees table has a defined relationship with the Industry Friends table as indicated by the relationship line connecting the two tables.



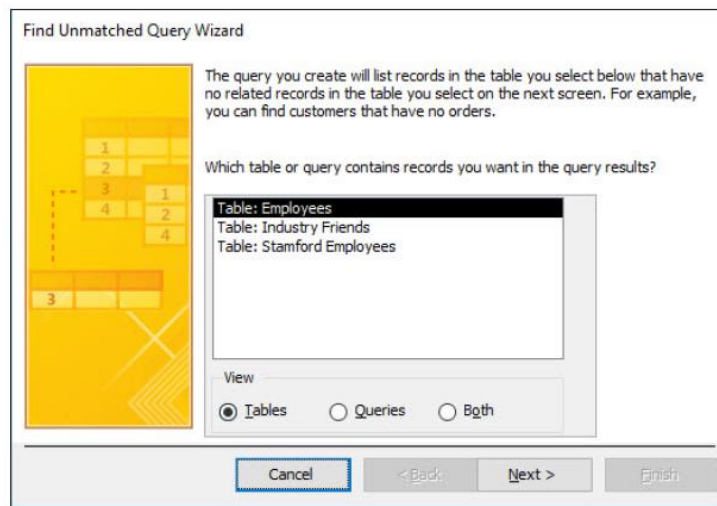
- 4 Click the **Close** button in the Relationships group on the Ribbon to close the Relationships window, and then click the **Close** button on the Employees tab to close the Employees table.
- 5 On the Create tab, in the Queries group, click the **Query Wizard** button to display the *New Query* dialog box.
- 6 Click **Simple Query Wizard** and then click **OK** to display the Simple Query Wizard.
- 7 In the Tables/Queries drop-down list, click **Table: Industry Friends**.
- 8 Under Available Fields, double-click **Last Name**, **First Name**, and **Referred By** to move them to the Selected Fields box.
- 9 In the Tables/Queries drop-down list, click **Table: Employees**.
- 10 Under Available Fields, double-click **Position** and **E-mail Address** to move them to the Selected Fields box.
- 11 Click the **Next** button to display the next screen. The Detail option should be selected by default.
- 12 Click the **Next** button to display the final screen, and then click the **Finish** button to accept the default settings in this screen and display the query. This query shows the name, position, and email address of the employee who referred each industry friend.
- 13 Click the **Close** button on the Industry Friends Query tab to close the query and then **SAVE** the query if prompted.
- 14 **LEAVE** the database open to use in the next exercise.

## 7.2 Finding Unmatched Records

To view only the records in one table that do not have a matching record in another table, you can create a Find Unmatched query.

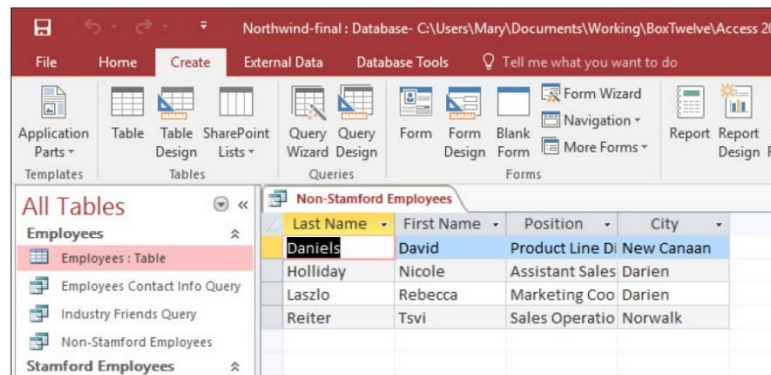
### 7.2.1 Step by Step: Find Unmatched Records

- 1 **USE** the **Northwind-final** database that is open from the previous exercise.
- 2 On the Create tab, in the Queries group, click the **Query Wizard** button. The *New Query* dialog box appears.
- 3 Click **Find Unmatched Query Wizard** and then click **OK**. The Find Unmatched Query Wizard appears.



- 4 Table: Employees is the default selection in this screen. This table will contain the records you'll want to display. Click the **Next** button to display the next screen in the Find Unmatched Query Wizard.
- 5 Select **Table: Stamford Employees** to select the table that is related to the Employees table and contains the records you *don't* want to display. Click the **Next** button to display the next screen in the Find Unmatched Query Wizard.
- 6 Click **E-mail Address** in the Fields in "Employees" list. Click **E-mail Address** in the Fields in "Stamford Employees" list. Click the **<=>** button to display them in the Matching fields box. These fields contain data that is in both tables.
- 7 Click the **Next** button to display the next screen in the Find Unmatched Query Wizard.
- 8 In the Available fields box, double-click **Last Name**, **First Name**, **Position**, and **City** to move them to the Selected fields box.
- 9 Click the **Next** button to display the final screen in the Find Unmatched Query Wizard.

- 10 Click in the text box at the top of this screen, type **Non-Stamford Employees** to name your query, and then click the **Finish** button. The query is displayed (see right).
- 11 Click the **Close** button on the Non-Stamford Employees tab.
- 12 **LEAVE** the database open.

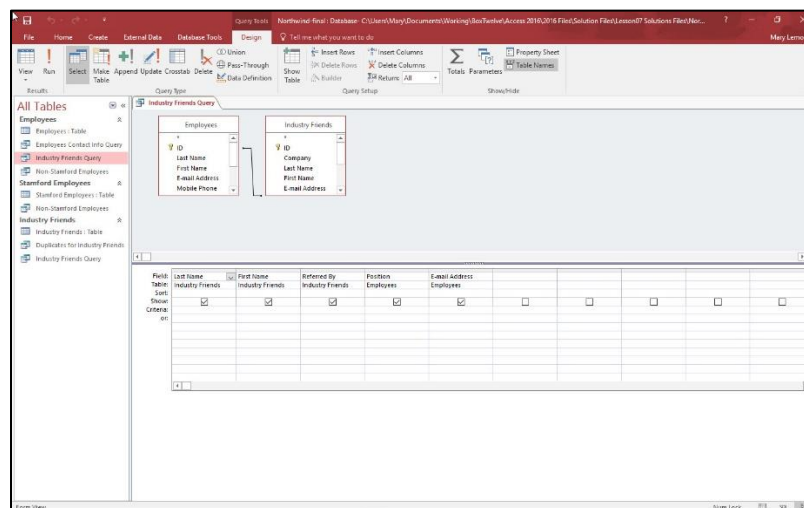


## 7.3 Adding a Table to a Query

To add a table to a query, you must be in Design view. Run the query and then click Design View on the lower half of the View button.

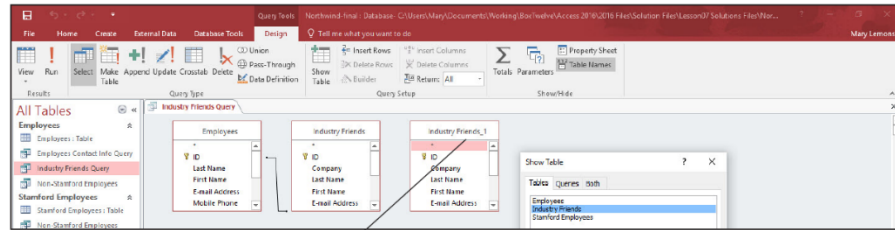
### 7.3.1 Step by Step: Add a Table to a Query

- 1 **USE** the **Northwind-final** database that is open from the previous exercise.
- 2 Double-click the **Industry Friends Query** in the Navigation Pane to open it.
- 3 On the Home tab, in the Views group, click the lower half of the **View** button and then click **Design View**. The query appears in Design view.





- 4 On the Query Tools Design tab, in the Query Setup group, click the **Show Table** button to display the *Show Table* dialog box.
- 5 Click **Industry Friends** and then click the **Add** button. A second copy of the Industry Friends table is added to the query, as indicated by the “1” in the title.



The 1 indicates a second copy of the table has been added to the query

- 6 Click **Stamford Employees** and then click the **Add** button. The table is added to the query.
- 7 Click the **Close** button in the *Show Table* dialog box.
- 8 Click anywhere in the **Industry Friends\_1** field list.
- 9 Press the **Delete** key to remove the table.
- 10 Click anywhere in the **Stamford Employees** field list.
- 11 Press the **Delete** key to remove the table.
- 12 Click the **Close** button on the Industry Friends Query tab to close the query. If a message asks you if you want to save the changes, click **Yes**.
- 13 **LEAVE** the database open to use in the next exercise.

## 7.4 Adding Criteria to a Query

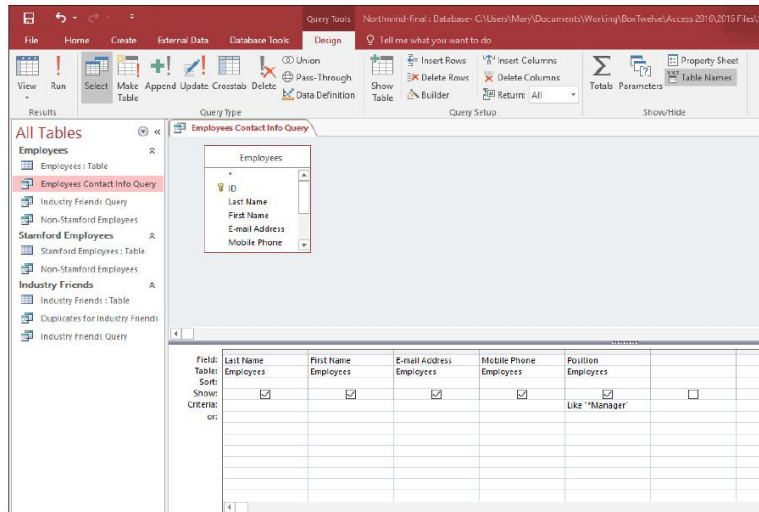
Not all queries must include criteria, but if you are not interested in seeing all the records that are stored in the underlying record source, you can add criteria to a query when designing it. A **query criterion** is a rule that identifies the records you want to include in the query result. A criterion is similar to a formula.

You can also run a **parameter query**, in which the user interactively specifies one or more criteria values. This is not a separate query; it extends the flexibility of another type of query, by prompting the user for a parameter value when it is run.

### 7.4.1 Step by Step: Add Criteria to a Query

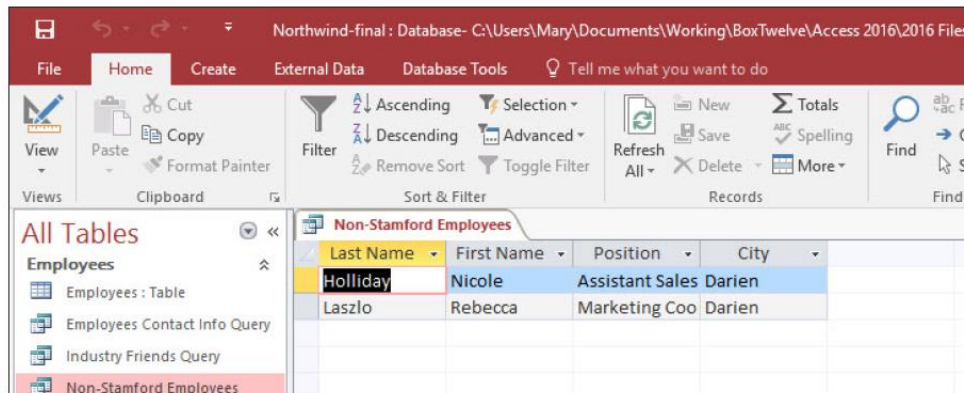
- 1 **USE** the *Northwind-final* database that is open from the previous exercise.
- 2 In the Navigation Pane, double-click the **Employees Contact Info Query** to open it.

- 3 On the Home tab, in the Views group, click the lower half of the **View** button and then click **Design View**.
- 4 In the Criteria row of the Position field, type **Like “\*Manager”**, to display all records that end with the string “Manager” in the Position field (for example, Assistant Manager, Sales Manager, Product Manager, and so on).



- 5 On the Query Tools Design tab, in the Results group, click the lower half of the **View** button and then click **Datasheet View**. The query results display all records that end with the string “Manager” in the Position field. (You may have to increase the width of the Position field to completely view the data within it.)
- 6 On the Home tab, in the Views group, click the lower half of the **View** button and then click **Design View**.
- 7 In the Show row, under the First Name field, click the **Show** check box to deselect it. The First Name field data will not appear in the query results.
- 8 On the Home tab, in the Views group, click the lower half of the **View** button and then click **Datasheet View**. Notice that the First Name field doesn’t appear.
- 9 Click the **Close** button on the Employees Contact Info Query tab to close the query. When prompted to save, click **Yes**.
- 10 In the Navigation Pane, double-click the **Non-Stamford Employees Query** under the Employees section to open it.
- 11 On the Home tab, in the Views group, click the lower half of the **View** button and then click **Design View**.
- 12 In the Criteria row of the City field, type **[City?]**. This will create the parameter and require you to enter a city name when the query is run.

- 13 On the Home tab, in the Views group, click the lower half of the **View** button and then click **Datasheet View**. The prompt appears in the *Enter Parameter Value* dialog box.
- 14 Type **Darien** in the City? box.
- 15 Click **OK**. The records for non-Stamford employees who live in Darien are displayed in the results.
- 16 Click the **Close** button on the Non-Stamford Employees tab to close the query. When prompted to save, click **Yes**.
- 17 **LEAVE** the database open to use in the next exercise.

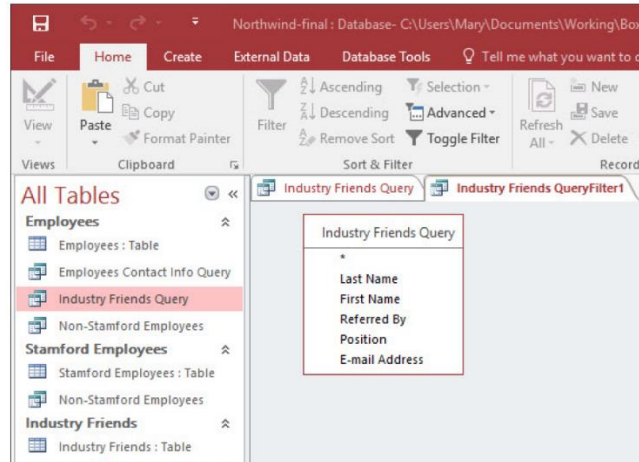


## 7.5 Sorting Data within a Query

Sorting and filtering data within a query allows you to display only the records you want and/or display records in a particular order. Sorting data in a query can help organize data efficiently and make it easier for users to review and locate the records they want without having to browse the data. Data can be sorted in the Datasheet view of a query.

### 7.5.1 Step by Step: Sort Data within a Query

- 1 **USE** the *Northwind-final* database that is open.
- 2 In the Navigation Pane, double-click to open the **Industry Friends Query**.
- 3 Right-click the **Referred By** field and then select **Sort A to Z** from the shortcut menu that is displayed. The field is sorted in alphabetical order from A to Z.
- 4 On the Home tab, in the Sort & Filter group, click the **Remove Sort** button. The sort order is removed from the Referred By field.
- 5 On the Home tab, in the Sort & Filter group, click the **Advanced** button, and then select **Advanced Filter/Sort** from the menu. An Industry Friends QueryFilter1 tab appears.



- 6 Click the **Field cell** in the first column, click the **down arrow** and then click **Referred By** on the drop-down menu.
- 7 Click the **Sort cell** in the first column, click the **down arrow** and then click **Ascending** on the drop-down menu.
- 8 Click the **Field cell** in the second column, click the **down arrow** and then click **Last Name** on the drop-down menu.
- 9 Click the **Sort cell** in the second column, click the **down arrow** and then click **Ascending** on the drop-down menu. Your screen should look similar the figure on the right.
- 10 On the Home tab, in the Sort & Filter group, click the **Advanced** button and then click **Apply Filter/Sort**. The query is sorted by the Referred By field in ascending order and then by the Last Name field in ascending order.
- 11 On the Home tab, in the Sort & Filter group, click the **Remove Sort** button.
- 12 **LEAVE** the database open to use in the next exercise.

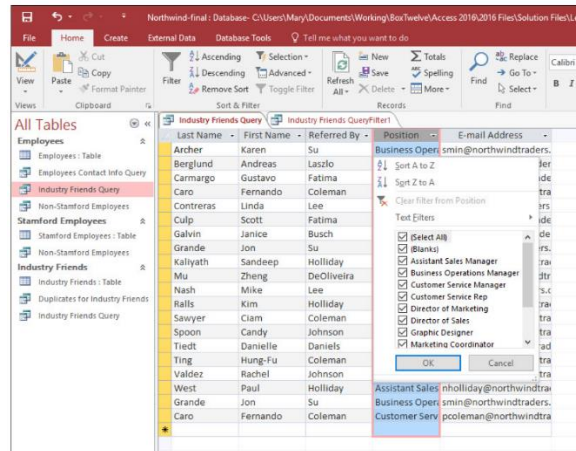
## 7.6 Filtering Data within a Query

A filter limits a view of data to specific records without requiring you to alter the design of the underlying query. If the criteria are temporary or change often, you can filter the query results instead of frequently modifying the query criteria. A filter is a temporary criterion that changes the query result without altering the design of the query.

### 7.6.1 Step by Step: Filter Data within a Query

- 1 **USE** the *Northwind-final* database that is open from the previous exercise. The Industry Friends Query should be open.
- 2 Click the **Position header** to select the field.

- On the Home tab, in the Sort & Filter group, click the **Filter** button. A menu appears on the field.



- On the menu, click **Text Filters** and then click **Contains** on the submenu. A *Custom Filter* dialog box appears.
- In the Position contains box, type **Marketing** and then click **OK**. The records are filtered to show only those results containing the word “Marketing” in the Position field. Adjust the fields to display the entire position name if necessary.
- On the Home tab, in the Sort & Filter group, click the **Toggle Filter** button to remove the filter.
- Click the **Close** button on the Industry Friends Query tab to close the query and then click **Yes** to save changes when prompted.
- Click the **Close** button on the Industry Friends QueryFilter1 tab to close the query.
- CLOSE** the database and then **EXIT** Access.

## 8 Using Controls in Reports and Forms

### 8.1 Adding Controls

A **control** is an object that:

- Displays data
- Performs actions
- Lets you improve the look and usability of a form or report

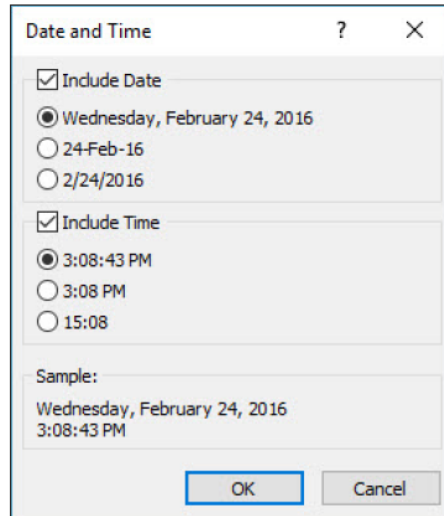
Access uses three different types of controls: bound, unbound, and calculated. Controls add functionality to a report or form. You can insert bound, unbound, and calculated controls using the tools in the Controls and Header/Footer groups.

#### 8.1.1 Adding Unbound Controls

An **unbound\_control** does not have a data source. It displays information such as lines, shapes, or pictures. Unbound controls are not connected to a field, but they display information that is important for reports and forms, some of which will appear in report and form header and footer sections.

##### 8.1.1.1 Step by Step: Add Unbound Controls

- 1 **OPEN** *Wingtip Inventory* from the data files for this lesson and then **SAVE** the database as *Wingtip Inventory-final*.
- 2 Double-click the **Toy Summary** report in the Navigation Pane.
- 3 On the Home tab, in the Views group, click the lower half of the **View** button, and then select **Design View**.
- 4 On the Design tab, in the Header/Footer group, click the **Logo** button. The *Insert Picture* dialog box appears.
- 5 Navigate to the data files for this lesson and select **Toys.jpg**. Click **OK**. The picture is inserted in the Report Header section.
- 6 On the Design tab, in the Header/Footer group, click the **Title** button. The title control with the title Toy Summary is inserted in the Report Header section. The text in the title is selected.
- 7 Type Inventory Summary by Toy and then press the Enter key.
- 8 On the Design contextual tab, in the Header/Footer group, click the **Date and Time** button. The *Date and Time* dialog box appears.



- 9 Click **OK** to accept the default date and time formats. The Date and Time controls are inserted in the Report Header section of the report.
- 10 On the Design contextual tab, in the Header/Footer group, click the **Page Numbers** button. The *Page Numbers* dialog box appears.
- 11 In the Position section of the *Page Numbers* dialog box, select the **Bottom of Page [Footer]** option and then click **OK**. If necessary, scroll to the bottom of the report window. The Page number control is inserted in the Page Footer section near the bottom of the report.
- 12 Click the **Save** button on the Quick Access Toolbar.
- 13 **LEAVE** the report open to use in the next exercise.

### 8.1.2 Adding Bound Controls

A **bound control** uses a field in a table or query as the data source. Bound controls, such as text boxes, display information such as text, dates, numbers, pictures, or graphs from a field in a table or query. You can bind a control to a field by moving it from the Field List pane or by using the Property Sheet. When you bind a control to a field, you connect it to that field.

When you click the Hyperlink and Insert Image buttons in the Controls group, a dialog box appears requesting additional information before these unbound controls are created.

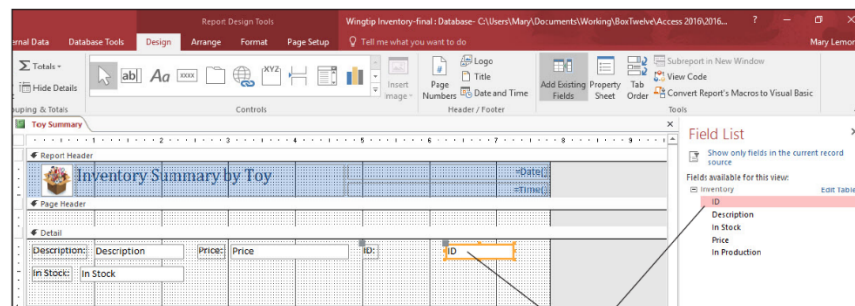
The Insert Image button displays a submenu with two selections:

- One that allows you to browse your computer for images to add to the report or form
- One that allows you to view a gallery of images you have already included on your report or form so you can easily add them again

You can use the Controls group to add other unbound controls like lines and page breaks to forms and reports. To move a control and its label simultaneously, select the control, position the mouse pointer over the orange selection border until you see a four-sided arrow, and then drag it to the new position. To delete a control from the grid, select it, right-click the control to display the shortcut menu, and then choose Delete.

### 8.1.2.1 Step by Step: Add a Bound Control to a Report

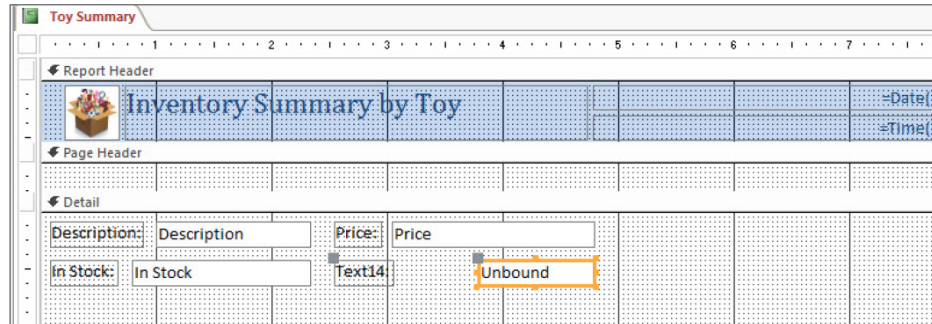
- 1 **USE** the *Wingtip Inventory-final* database and *Toy Summary* report that are open from the previous exercise.
- 2 On the Design contextual tab, in the Tools group, click the **Add Existing Fields** button. The Field List pane appears. Click the **Show all tables** link. The fields for the Inventory table appear.
- 3 Click the **ID** field and drag it to the right of the Price control.



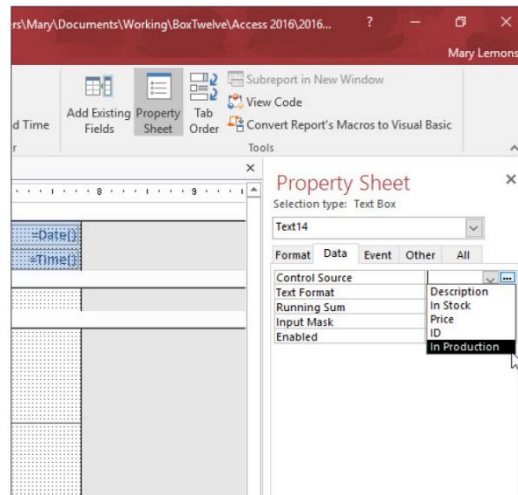
- 4 Drag the **In Production** field to the design grid below the ID control.
- 5 Click **Close** on the Field List pane.
- 6 Click the **ID field control** until you see the orange border with selection handles on the borders and corners.
- 7 Right-click in the control and select **Delete** from the menu. The control and label are removed from the design grid.
- 8 Select the **In Production** control, right-click and then select **Delete** from the menu.
- 9 On the Design contextual tab, in the Controls group, click the **Text Box** button. The mouse pointer changes to the move pointer with a plus sign (+) when you place it over the report.
- 10 Position the pointer under the Price control and then click to create the text box control. If you need to move the control, select it and move the mouse pointer over the selection border until it appears as a four-sided pointer, and then click and drag it to the appropriate location. Notice that the word Unbound is shown in the control and the word



Text and a number (depending on the number of controls you have created in this session) appear in the label.



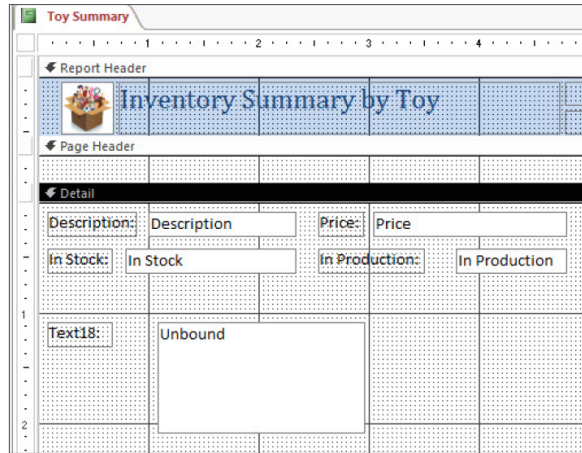
- 11 Select the text box control if it isn't already selected.
- 12 On the Design contextual tab, in the Tools group, click the **Property Sheet** button. The Property Sheet appears.
- 13 In the Data tab, click the down arrow on the **Control Source** row and then select the **In Production** field. Click **In Production** field. Notice the control now displays the field name In Production, which means that it is now bound to the control.



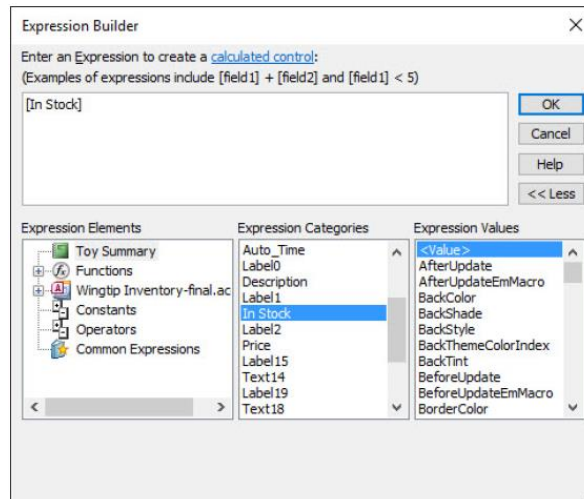
- 14 Click **Close** on the Property Sheet.
- 15 Click the **In Production** control label (that says Text and a number) and then select the text in the label.
- 16 Type **In Production:** and then press **Enter**. Your screen should look similar to the figure here.
- 17 Go to Report view to view your changes. When finished, change back to Design view.
- 18 Click the **Save** button on the Quick Access Toolbar.
- 19 **LEAVE** the report open to use in the next exercise.

### 8.1.2.2 Step by Step: Add a Calculated Control

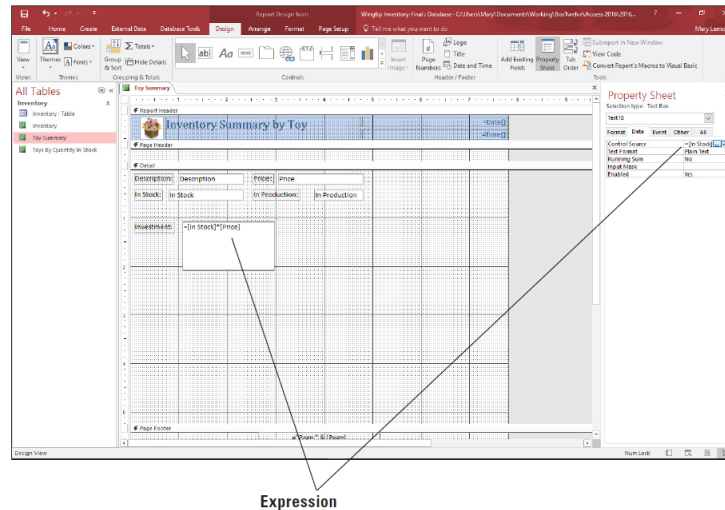
- 1 **USE** the **Wingtip Inventory-final** database and the **Toy Summary** report that are open from the previous exercise.
- 2 On the Design tab, in the Controls group, click the **Text Box** button.
- 3 Position the mouse pointer on the design grid and drag down and to the right to create and position a control the size. Reposition as necessary to get it to match the figure.



- 4 Select the text in the label and then type **Investment:**.
- 5 Select the control, right-click and then select **Properties** from the menu to display the Property Sheet if it isn't already displayed.
- 6 On the Data tab, in the Control Source row, click the **Build** button (looks like three periods, ...). The *Expression Builder* dialog box appears.
- 7 In the Expression Categories list, scroll down and double-click **In Stock**. The In Stock field is inserted in the expression box.



- 8 In the Expression Elements section, click the **Operators** element, and then double-click the \* (asterisk) value in the Expression Values section to select the multiplication operator.
- 9 In the Expression Elements section, click the **Toy Summary** element, and then find and double-click the **Price** field in the Expression Categories section.
- 10 Click **OK**. The expression appears in the Control Source row of the Property Sheet as well as in the control box in the Detail section of the report.



- 11 Click **Close** on the Property Sheet.
- 12 Change to Report view and scroll through the report records to view the calculated totals.
- 13 Click the **Save** button on the Quick Access Toolbar.
- 14 **CLOSE** the report.
- 15 **LEAVE** the database open to use in the next exercise.

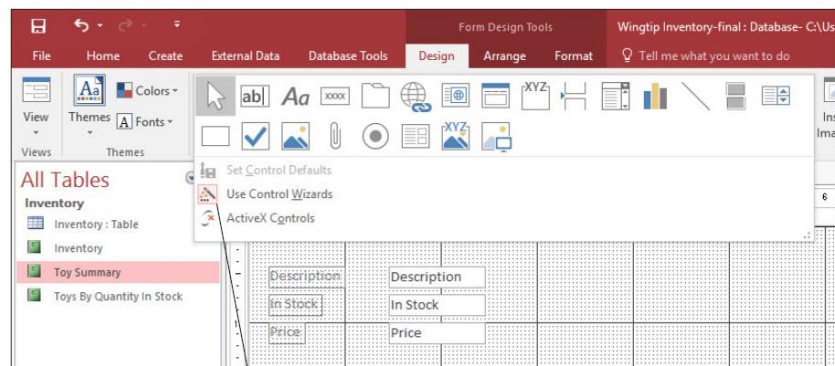
### 8.1.3 Adding Controls Using a Wizard

A **Control Wizard** can help you create controls such as command buttons, list boxes, combo boxes, and option groups. Some of these types of controls can modify underlying table data sources. Like other wizards you have used, a Control Wizard asks you questions about how you want the control to look and operate, and then it creates the control based on your answers.

#### 8.1.3.1 Step by Step: Use the Control Wizard

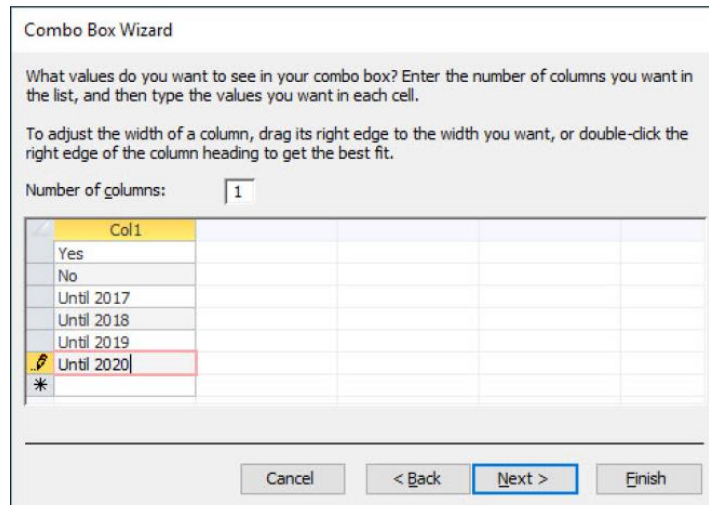
- 1 **USE** the *Wingtip Inventory-final* database that is open from the previous exercise.
- 2 On the Create tab, in the Forms group, click the **Form Design** button. A new, blank form is created, and the Field List pane is displayed. (If it isn't, click the **Add Existing Fields** button in the Tools group on the Ribbon.)

- 3 If necessary, click **Show all tables** link in the Field List pane and then click the **expand** button next to Inventory to display the fields of the Inventory table.
- 4 Double-click the **Description** field to add it to the form.
- 5 Double-click the **In Stock** field to add it to the form.
- 6 Double-click the **Price** field to add it to the form.
- 7 Double-click the **In Production** field to add it to the form.
- 8 Select the **In Production** control that you just added, right-click it and then select **Delete** from the shortcut menu.
- 9 On the Design tab, click the **More** arrow in the Controls group, and then locate the **Use Control Wizards** command and make sure it is turned on. The image to the left of the command should be highlighted.



Control Wizards command selected in Controls group

- 10 On the Design tab, in the Controls group, locate and then click the **Combo Box** button. (Hover your mouse pointer over each control button to view its ScreenTip until you find the Combo Box button.)
- 11 Position the mouse pointer and drag to draw a rectangle.
- 12 When you release the mouse button, the Combo Box Wizard appears. Click the button beside *I will type in the values that I want* and then click **Next**.
- 13 In the empty cell below the Col1 header, type **Yes**. Continue typing values in the column as shown on the right using the down arrow key to move to the next row. (If you press Enter, the wizard advances to the next screen so be sure to use the down arrow key.)



- 14 Click **Next**.
- 15 Click the button beside *Store that value in this field*, click the down arrow to display the menu, and then select **In Production**.
- 16 Click **Next**.
- 17 Type **In Production** in the text box and reposition the control to fix spacing if necessary.
- 18 Click **Finish**.
- 19 Change to Form view, scroll through the records, and modify the In Production field by selecting an item in the combo box for one or more records.
- 20 **SAVE** the form as **Inventory**.
- 21 **LEAVE** the form open to use in the next exercise.

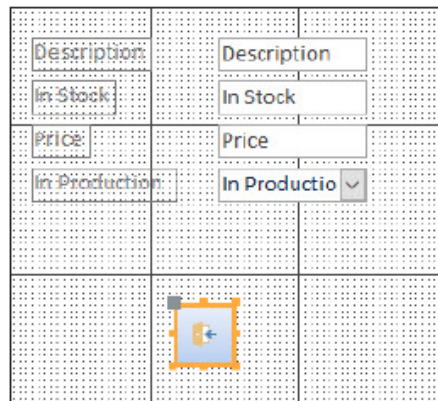
### 8.1.4 Adding Button Controls Using the Wizard

You can also use Control Wizards to add Button controls to forms. You create Button controls using the Command Button Wizard and assign the controls certain tasks that are created by macros. Macros are useful since they add additional functionality to a database by automating a series of tasks to create an action. For example, Button controls can be created on a form to perform many different actions. The code that enables this functionality is automatically created as a macro by the Command Button Wizard.

#### 8.1.4.1 Step by Step: Use the Control Wizard to Add Button Controls

- 1 **USE** the *Wingtip Inventory-final* database and the *Inventory* form that are open from the previous exercise.
- 2 Change to Design view, if necessary.

- 3 On the Design tab, in the Controls group, click the **Button** button (a rectangle with xxx in it).
- 4 Position the mouse pointer on the design grid and drag down and to the right to create a control the size of the one shown on the right.
- 5 When you release the mouse button, the Command Button Wizard appears. In the Categories: section, click **Form Operations**, and in the Actions section, click **Close Form**.
- 6 Click **Next**.
- 7 On the next screen, keep the default settings to have the button contain the Exit Doorway picture displayed in the dialog box. Click **Next**.
- 8 On the final screen, type **Exit\_Inventory\_Form** as the default button name and then click **Finish**. (The default button name indicated on your screen may differ depending on how many controls you have previously attempted to include.) Notice that the image on the Button control on the form has changed to the Exit Doorway picture.



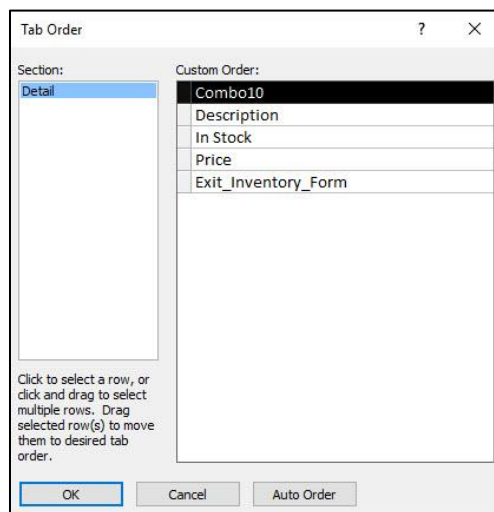
- 9 Click the **Save** button on the Quick Access Toolbar.
- 10 Click the **Button** control on the form. On the Design tab, in the Tools group, click the **View Code** button. The Microsoft Visual Basic for Applications window appears. If you're fluent in VBA, you can use this window to add VBA code to customize the function of this control.
- 11 Click the **Close** button on the Visual Basic for Applications window to return to Access.
- 12 Change to Form view and then click the newly created **Close Form** button to close the form. If a dialog box appears asking you if you want to save the changes to the form, click **Yes**.
- 13 **LEAVE** the database open to use in the next exercise.

## 8.2 Defining Control Tab Order

**Control tab order** refers to the order in which the selection, or focus, moves from field to field in a form or report. When entering data in a form, it is helpful to set the control tab order to a sequence that matches the order of the data you are entering.

### 8.2.1 Step by Step: Define Control Tab Order

- 1 USE the *Wingtip Inventory-final* database that is open.
- 2 Double-click the **Inventory** form in the Navigation pane to open it in Form view.
- 3 Press the **Tab** key several times to see the order in which the controls are selected each time you press it. Notice that the tab order begins with the Description field, moves to the In Stock field, the Price field, the In Production field, and then the Close Form button.
- 4 Change to Design view.
- 5 On the Design tab, in the Tools group, click the **Tab Order** button. The *Tab Order* dialog box appears, displaying the tab order in the Custom Order list. Notice that the In Production combo box field is referred to as Combo10 since Access stores this name to use as a coding reference in Visual Basic for Applications. (You may have a different number, depending on how many controls you have had and removed previously on the form.)
- 6 Click the row selector to the left of the Combo10 field to select it.
- 7 Click and hold the row selector. The mouse pointer changes to a move pointer with an empty rectangle. Drag up a row and notice the black horizontal line moves with you. Drag up until the black horizontal line is in place at the top of the Description field; release the mouse button. The Combo10 field should be the first item in the list.



- 8 Click the **Auto Order** button. The order of the fields automatically resets based on the order that they appear on the form or report.
- 9 Click the row selector to the left of the Combo10 field to select it. Click and hold the row selector and drag it up until the black horizontal line is in place above the In Stock field; release the mouse button. The Combo10 field should now be the second item in the list.
- 10 Click **OK**.
- 11 **SAVE** the form design.
- 12 Change to Form view.
- 13 Press the **Tab** key several times to see the new tab order.
- 14 **CLOSE** the form.
- 15 **LEAVE** the database open to use in the next exercise.

## 8.3 Formatting Controls

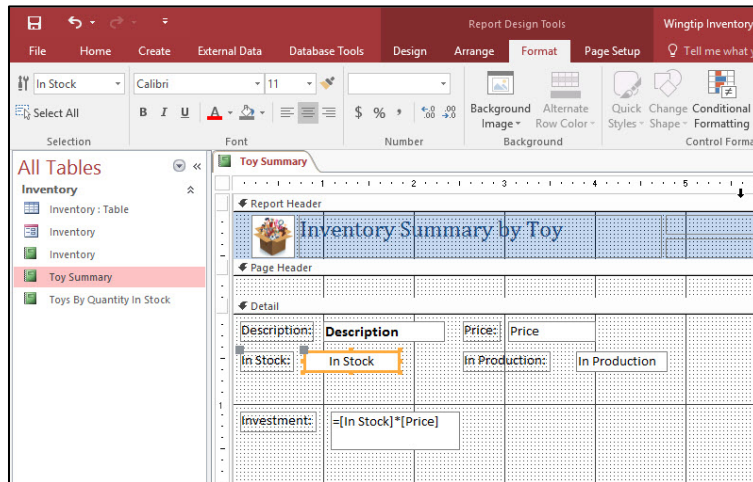
Formatting professional-looking reports and forms not only projects a high-quality image, but it also improves the form or report's readability. Display formatting allows you to refine the look of your reports and forms. You can change the font, font size, font color, alignment, and other attributes of text and numbers in controls and their associated labels. You can also change the background images of your reports and forms as well as change the shapes of certain controls.

### 8.3.1 Step by Step: Format Controls on a Report

- 1 **USE** the *Wingtip Inventory-final* database that is open from the previous exercise.
- 2 Double-click the **Toy Summary** report in the Navigation pane to open it and then change to Design view.
- 3 Click the **In Stock** control. Position the mouse pointer over the resize handle on the right border. The mouse pointer changes to a double-sided arrow. Using the horizontal ruler at the top of the report as a guide, drag to the left to resize the control until its right side is at the 1 3/4" mark.
- 4 In the same manner, reduce the width of the Price control until its right side is at the horizontal ruler's 4" mark.
- 5 In the same manner, reduce the size of the Investment control until its right side is at the horizontal ruler's 2 1/2" mark and its bottom is at the vertical ruler's 1 1/2" mark.
- 6 Click the **Description** control to select it.



- 7 On the Format tab, in the Font group, click the **Bold** button. The Description control is bolded.
- 8 Click the arrow on the Font Size menu and select **12** from the menu. The font size becomes 12.
- 9 Click the **In Stock** control to select it.
- 10 On the Format tab, in the Font group, click the **Center** button. The In Stock text is centered in the control box.

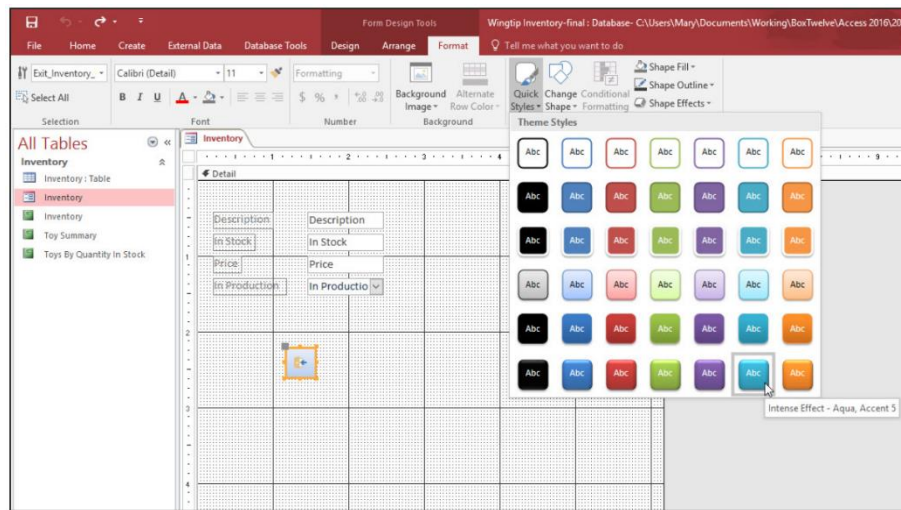


- 11 Click the **Investment** control that contains the formula you entered in an earlier exercise.
- 12 On the Format tab, in the Number group, click the **Apply Currency Format** command.
- 13 Click the **Price** control.
- 14 On the Format tab, in the Number group, click the **Apply Currency Format** command.
- 15 **SAVE** the report.
- 16 Change to Report view to see the changes you've made. Notice the text formatting changes as well as the currency formats for the Investment and Price fields.
- 17 **CLOSE** the report.
- 18 Double-click the **Toys By Quantity In Stock** report in the Navigation pane and change to Design view.
- 19 In the Report Header section, click the **Print Report** Button control to select it.
- 20 On the Format tab, in the Control Formatting group, click the **Change Shape** button to display the menu. Click the **Oval** option. The Button control's shape changes to an oval.
- 21 Click the In Stock Header.
- 22 Click the **Alternate Row Color** menu and select **Automatic**. Click **Automatic** to apply it.

- 23 Click the **Detail** row. Click the **Alternate Row Color** menu and then select **Automatic**.
- 24 Change to Report View and see that the button has been changed and the rows are now separated by alternate colors.
- 25 **SAVE** and then **CLOSE** the report.
- 26 **LEAVE** the database open to use in the next exercise.

### 8.3.2 Step by Step: Format Controls on a Form

- 1 **USE** the *Wingtip Inventory-final* database that is open from the previous exercise.
- 2 Double-click the **Inventory** form in the Navigation pane to open it if it's not open already and then change to Design view.
- 3 Click the **Button** control on the form. On the Format tab, in the Control Formatting group, click the **Quick Styles** button and then select **Intense Effect – Aqua, Accent 5** from the Theme Styles. Click the style to apply it; the Button control's style changes to the chosen Quick Style.



- 4 Click the **Description** label to select it.
- 5 On the Format tab, in the Font group, click the **Font Color** button and then select **Black** from the Theme Colors menu. The Description label displays in black. Change the font color to black for the In Stock, Price, and In Production labels.
- 6 On the Format tab, in the Background group, click the **Background Image** button, click the **Browse** command to locate the *Winter Theme Background.jpg* image file, and then click **OK**. Notice the form's background image is now that of the image.
- 7 Change to Form view to see the changes you made.

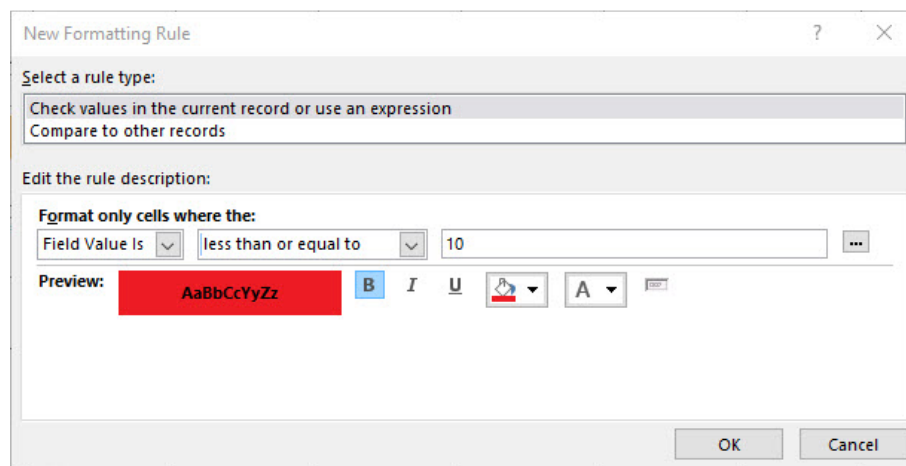
- 8 **SAVE** and then **CLOSE** the form.
- 9 **LEAVE** the database open to use in the next exercise.

## 8.4 Creating Conditional Formatting on Controls

**Conditional formatting** changes the appearance of a control or the value in a control when certain conditions are met. You can change the color of text or numbers in the control or the background color. You can create conditional formatting based on a value or expression.

### 8.4.1 Step by Step: Create Conditional Formatting

- 1 **USE** the *Wingtip Inventory-final* database that is open from the previous exercise.
- 2 Double-click the **Toy Summary** report in the Navigation pane to open it, if necessary, and then change to Design view.
- 3 Click the **In Stock** control to select it.
- 4 On the Format tab, in the Control Formatting group, click the **Conditional Formatting** button. The *Conditional Formatting Rules Manager* dialog box appears.
- 5 Click the **New Rule** button. The *New Formatting Rule* dialog box appears. You will create a new rule based on criteria you will enter.
- 6 In the Edit the rule description section, keep Field Value Is in the first menu. Click the drop-down arrow to the right of *between* and scroll to the bottom of the list to select **less than or equal to**. Click in the empty text box and then type **10**. Click the **Bold** button in the Preview section.
- 7 Click the down arrow on the **Background Color** button and select **Red** from the menu that appears.



- 8 Click the **OK** button. A formatting rule for the In Stock field is added to the dialog box. Now, when the report is viewed in Report view, the value for the In Stock field will appear bold and the control background color will appear red if the formatting rule applies.
- 9 Click **OK**.
- 10 **SAVE** the report.
- 11 Change to Report view and scroll through the records to see the conditional formatting at work.
- 12 **CLOSE** the report.
- 13 **LEAVE** the database open to use in the next exercise.

## 8.5 Arranging Control Layout

After you have created a form or report, you can arrange the controls on it to fit the data or to best display the data. Access provides commands for arranging the layout, alignment, position, and size of controls. **Control layouts** align your controls horizontally and vertically to give your report or form a uniform appearance.

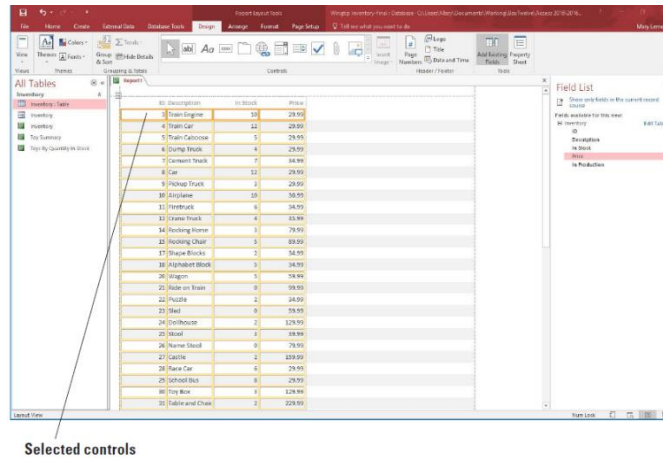
The two types of control layouts are:

- **Stacked:** Controls are arranged vertically with a label on the left and the control on the right. Stacked layouts are contained in one report or form section.
- **Tabular:** Controls are arranged in rows and columns like a spreadsheet, with labels across the top. Tabular layouts use two sections of a report or form. The labels are displayed in one section and the fields are arranged in the section below.

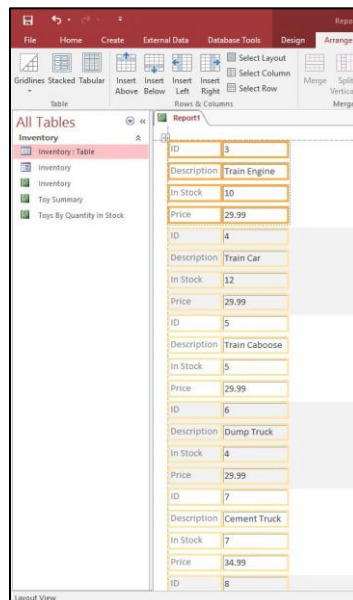
### 8.5.1 Step by Step: Arrange Control Layout

- 1 **USE** the *Wingtip Inventory-final* database that is open from the previous exercise.
- 2 Click the **Inventory** table in the Navigation Pane to select it.
- 3 On the Create tab, in the Reports group, click the **Blank Report** button. A new, blank report is created and the Field List pane is displayed. (If it isn't, click the **Add Existing Fields** button in the Tools group on the Design tab.)
- 4 Double-click the **ID** field to add it to the report.
- 5 Double-click the **Description** field to add it to the report.
- 6 Double-click the **In Stock** field to add it to the report.
- 7 Double-click the **Price** field to add it to the report.

- 8 Press and hold the **Shift** key and then click each of the four controls to select them all. Be sure you select the controls and not the labels.



- 9 On the Arrange tab, in the Table group, click the **Stacked** button. The controls and labels are arranged in a 2-column stacked layout.
- 10 On the Arrange tab, in the Table group, click the **Tabular** button. The controls and labels are arranged back in a tabular layout. The tabular format indents the position of the columns by default.
- 11 On the Arrange tab, in the Table group, click the **Stacked** button to change it back to a stacked layout.



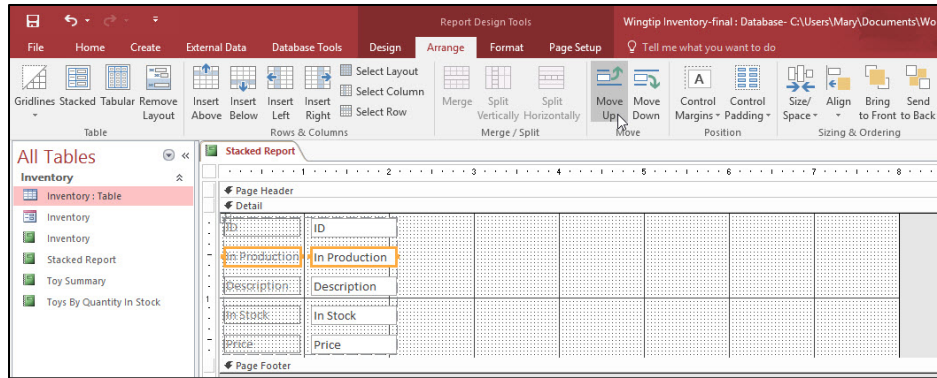
- 12 **SAVE** the report as **Stacked Report** and leave it open for use in the next exercise.
- 13 **LEAVE** the database open to use in the next exercise.

## 8.6 Adding, Moving, and Removing a Control

When you want to add a new field from the Field List to an existing control layout, just drag the field from the Field List pane to the grid. To add it to the layout, select all the controls in the layout and the new control, and then click the Stacked or Tabular button to integrate the new field into the control layout. Removing a control from a control layout allows you to place it anywhere on the report or form without affecting the positioning of any other controls.

### 8.6.1 Step by Step: Add, Move, and Remove a Control from a Layout

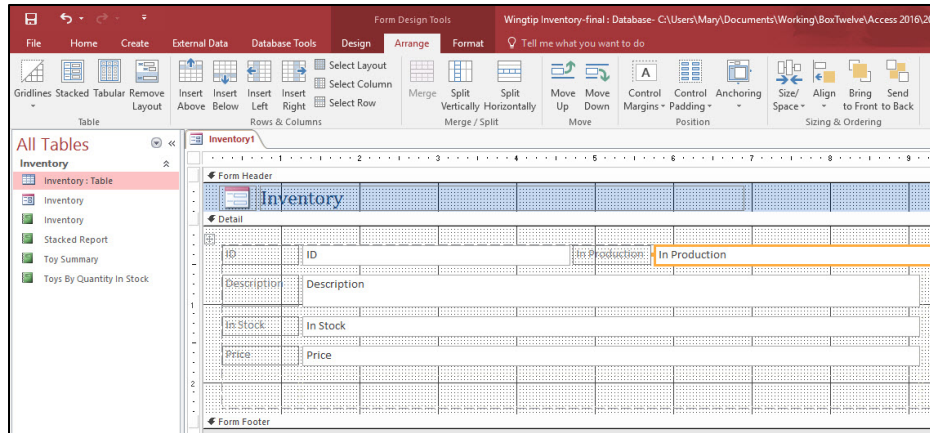
- 1 **USE** the *Wingtip Inventory-final* database and **Stacked Report** report that are open from the previous exercise.
- 2 Change to Report Design view, if necessary.
- 3 Click the **Show all tables** link in the Field List pane, if necessary, to view all the available fields in the Inventory table.
- 4 Click the **In Production** field in the Field List pane. Drag it to the grid and place it in any location on the design grid to the right of the four controls.
- 5 Press and hold the **Shift** key and then select the **ID** field control. Still holding the **Shift** key, select the **Description**, **In Stock**, and **Price** field controls so that all five (In Production, ID, Description, In Stock, and Price) are selected.
- 6 On the Arrange tab, in the Table group, click the **Stacked** button. The In Production control is added to the bottom of the stacked layout.
- 7 With all five controls still selected, click the **Control Margins** button on the Arrange tab in the Position group and then select **Narrow** from the menu. The text within the field controls and labels is formatted by the Narrow option.
- 8 On the Arrange tab, in the Position group, click the **Control Padding** button and select **Medium** from the menu.
- 9 Click anywhere on a blank area of the design grid to deselect the field controls, select the **In Production** field control and then click **Select Row** in the Rows & Columns group. Notice the In Production label and field control are both outlined in orange. In the Move group on the Ribbon, click the **Move Up** button three times to move it under the ID label and field control.



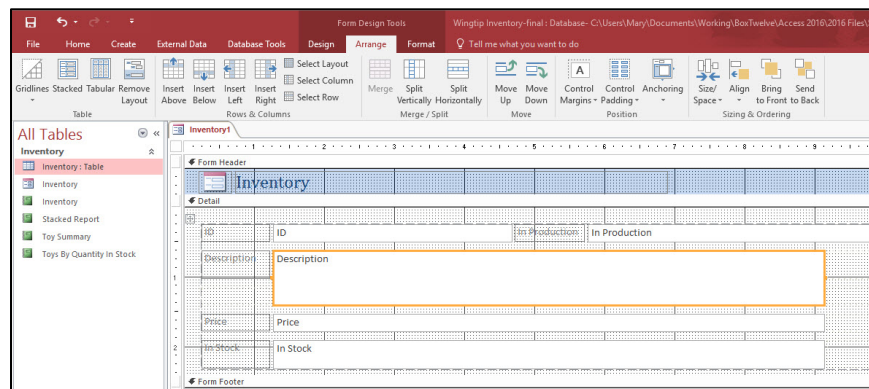
- 10 Click and drag the **ID** control out of the layout. It will not move out of the layout.
- 11 Click anywhere on a blank area of the design grid to deselect the field controls. Press and hold the **Shift** key and then select the **Price** label and control.
- 12 In the Table group on the Ribbon, click the **Remove Layout** button.
- 13 Click and drag the **Price** field control to the right of the ID field control.
- 14 **SAVE** the report and then change to Report view to view your changes.
- 15 **CLOSE** the report.
- 16 **LEAVE** the database open to use in the next exercise.

### 8.6.2 Step by Step: Arrange and Anchor Controls within a Layout

- 1 **USE** the *Wingtip Inventory-final* database that is open from the previous exercise.
- 2 Click the **Inventory** table in the Navigation Pane to select it.
- 3 On the Create tab, in the Forms group, click the **Form** button. A new form containing all the fields from the Inventory table is created in Layout view. Notice the stacked control layout is the default.
- 4 Change to Design view.
- 5 Click the **ID** control to select it.
- 6 On the Arrange tab, in the Merge/Split group, click the **Split Horizontally** button. Click to the right of the ID field control and notice the orange border of the new column created after the split.
- 7 Click the **In Production** field control and drag it to the right of the ID field control to place it next to it. The In Production label and field control is now in the column. Notice the new additional space automatically created to the right of the other field controls.



- 8 Click the **In Stock** field control to select it. Press and hold the **Shift** key and then select the **In Stock** control label.
- 9 On the Arrange tab, in the Move group, click the **Move Down** button once. The In Stock field control and label move to the bottom of the layout.
- 10 Click the **Description** field control to select it. Press and hold the **Shift** key and then click the empty space below the Description field control to select the cell. Both the Description field control and cell below should be outlined in orange.
- 11 On the Arrange tab, in the Merge/Split group, click the **Merge** button. The Description field control and cell have now merged into one.



- 12 Click the **In Stock** field control to select it. On the Arrange tab, in the Rows & Columns group, click the **Insert Below** button twice. Two empty cells are added under the In Stock control. The In Stock field control should still be selected.
- 13 On the Arrange tab in the Rows & Columns group, click the **Select Row** button. Both the In Stock label and field control should be selected as well as an empty column created when we dragged the In Production field control to the right of the ID field control.
- 14 On the Arrange tab, in the Move group, click **Move Down** twice to move the In Stock control to the last cell row at the bottom of the layout.



- 15 Click the **Description** field control to select it. On the Arrange tab in the Position group, click the **Anchoring** button and then select **Stretch Down and Across** from the Anchoring menu that appears. The Description field control as well as all the others will now automatically resize to display all their contained text, if necessary, when the Access window is made larger.
- 16 Click the **In Stock** field control and increase its height by positioning the pointer over the top-right corner of the control until a diagonal two-sided arrow appears, and then clicking and dragging upward until the text is no longer obstructed.
- 17 Change to Form view to display the new arrangement of the controls and resize the Access application window (not the form window) to see the controls stretch and shrink in conjunction with the window size.
- 18 SAVE the form as *Modified Inventory Form* and then CLOSE it.
- 19 LEAVE the database open to use in the next exercise.

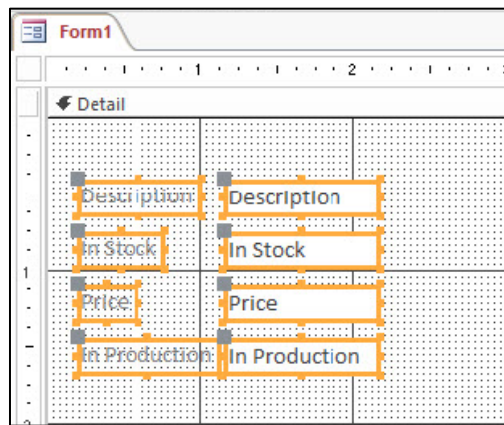
## 8.7 Arranging Control Alignment, Size, and Position

You can change the alignment, size, or position of controls and associated labels. Aligning, sizing, and positioning commands using the Arrange tab gives you more options for improving the look of controls and labels in forms and reports. The Sizing & Ordering group, which is available only on the Arrange tab in report or form Design view, has commands for aligning labels and controls to the grid (the intersecting horizontal and vertical lines and points that appear in Design view) to allow for precise position.

### 8.7.1 Step by Step: Arrange Control Alignment, Size, and Position

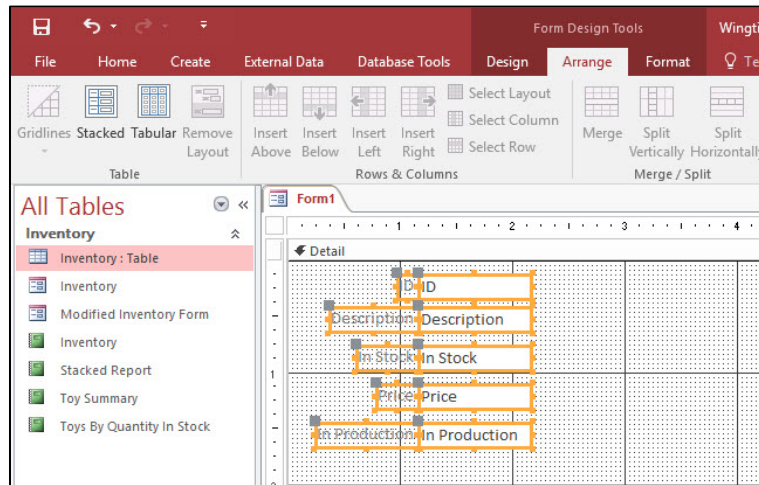
- 1 USE the *Wingtip Inventory-final* database that is open from the previous exercise.
- 2 Click the **Inventory** table in the Navigation Pane to select it.
- 3 On the Create tab, in the Forms group, click the **Form Design** button. A new, blank form is created, and the Field List pane is displayed. (If it isn't displayed, click the **Add Existing Fields** button in the Tools group on the Design tab.)
- 4 Double-click the **Description** field to add it to the form.
- 5 Double-click the **In Stock** field to add it to the form.
- 6 Double-click the **Price** field to add it to the form.
- 7 Double-click the **In Production** field to add it to the form.

- 8 Press and hold the **Shift** key and then click the **Description**, **In Stock**, and **Price** field controls to select them. The **In Production** field control should already be selected.
- 9 On the **Arrange** tab, in the **Table** group, click the **Stacked** button. The controls and labels are arranged in a stacked layout.
- 10 Click on a blank space on the design grid, and then select the **In Production** field control and label.
- 11 On the **Arrange** tab, in the **Sizing & Ordering** group, click the **Size/Space** button. In the **Size** category on the menu that appears, click **To Fit**. Notice all the field controls and labels are slightly resized in the layout based on the best fit of the text within the **In Production** field control and label since the layout forces all fields to conform to this action.
- 12 Select all the controls in the stacked layout (the labels and controls for the **Description**, **In Stock**, **Price**, and **In Production** controls).
- 13 On the **Arrange** tab, in the **Table** group, click the **Remove Layout** button.
- 14 All the controls and labels should still be selected. On the **Arrange** tab, in the **Sizing & Ordering** group, click the **Size/Space** button and then select **To Fit** from the menu that appears. Notice that all the field controls independently change their width to best fit their text since they are no longer part of a layout.



- 15 With the controls and labels still selected, on the **Arrange** tab, in the **Sizing & Ordering** group, click the **Align** button and then select **Right** from the menu that appears. The labels are right-aligned to the controls.
- 16 Click and drag the **ID** field from the **Field List** pane to any blank spot on the design grid above the **Description** field.
- 17 Select the **ID** label and control and in the **Sizing & Ordering** group, click the **Align** button, and then select **Right** from the menu that appears.

- 18 Press and hold the **Shift** key and then click both the labels and controls for all the controls. In the Sizing & Ordering group, click the **Align** button, and then select **Left** from the menu that appears. All the controls are left-aligned as a group.
- 19 In the Sizing & Ordering group, click the **Align** button and then select **Right** from the menu that appears. All the controls are now right-aligned as a group.



- 20 Select all the labels and controls, if necessary.
- 21 On the Arrange tab, in the Sizing & Ordering group, click the **Size/Space** button and then select **Equal Vertical** from the Spacing category on the menu that appears. Notice that the vertical space between the controls is now equal.
- 22 Click any blank space on the design grid.
- 23 On the Arrange tab, in the Sizing & Ordering group, click the **Size/Space** button and then select **Grid** from the Grid category on the menu that appears. The design grid disappears.
- 24 Click **Size/Space** and then select **Grid** again. The design grid appears.
- 25 Click any blank space on the design grid and drag to draw a box around the labels and controls so they are all selected, or press and hold the **Shift** key and then select each label and control.
- 26 On the Arrange tab, in the Sizing & Ordering group, click the **Align** button. In the menu that appears, click the **To Grid** button. Notice the control and labels slightly move. The upper-left corners of all the labels are now aligned to their nearest grid points.
- 27 On the Arrange tab, in the Sizing & Ordering group, click the **Size/Space** button. In the Grid category on the menu that appears, click the **Ruler** button. The rulers disappear.
- 28 Click **Size/Space** and then select **Ruler** again. The rulers reappear.
- 29 SAVE the form as Arranged Inventory Form.

30 **CLOSE** the Field List and the form.

31 **LEAVE** the database open to use in the next exercise.

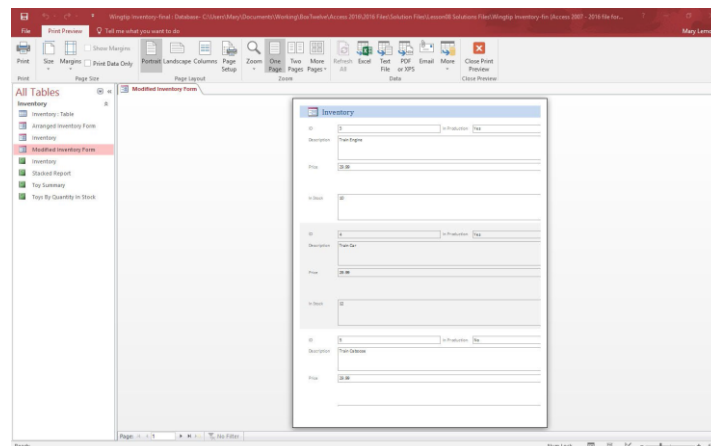
## 8.8 Adjusting Page Margins and Changing Page Orientation for Forms and Reports

Forms and reports can be printed to easily communicate data to others in a hardcopy format. The Print Preview tab provides options that allow you to adjust page margins and/or change orientation to ensure data fits appropriately on a page. When you are satisfied with the page layout, you can click the Print button to send the page to the printer.

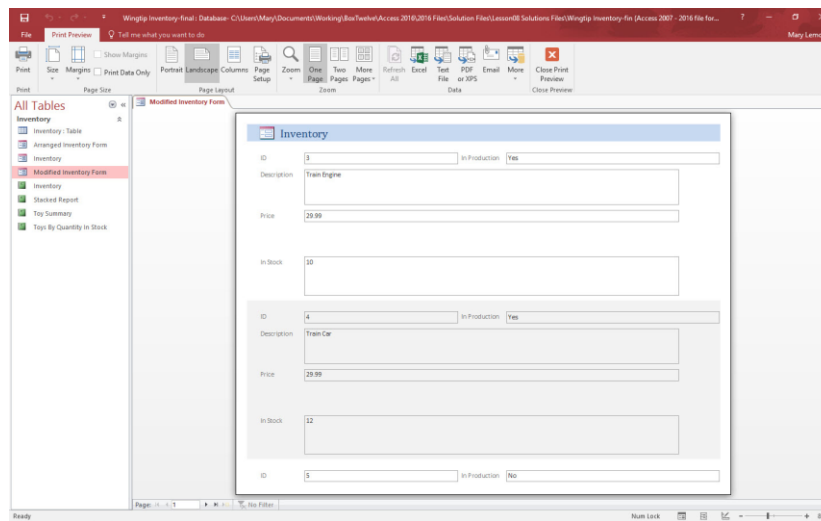
Access gives you the option of printing all other database objects. The Page Size group on the Print Preview tab contains commands for controlling page size and margins. The Print Data Only checkbox gives you the option of printing only object data without the corresponding structure (like gridlines and borders). The Show Margins checkbox allows you to view an object's margins on the preview of the object to help you better adjust them. The Page Layout group allows you to change the page orientation of an object, either by choosing the Portrait (vertical) or Landscape (horizontal) options.

### 8.8.1 Step by Step: Adjust Page Margins & Change Page Orientation for Forms & Reports

- 1 **USE** the *Wingtip Inventory-final* database that is open from the previous exercise.
- 2 Click the **Modified Inventory Form** in the Navigation Pane and then click the **File** tab.
- 3 On the File tab, click the **Print** button to display the Print menu, with the options Quick Print, Print, and Print Preview.
- 4 Click the **Print Preview** command. The Print Preview screen appears with a preview of the form. Notice the form's field borders exceed the width of the right margin.



- 5 In the Page Layout group, click the **Landscape** button to display the form in landscape view. Notice some of the form's field borders still exceed the width of the right margin.
- 6 In the Page Size group, click the **Margins** button. On the Margins menu that appears, click the **Narrow** option. The form's field borders have been adjusted and should now be within the right margin. The print layout now appears complete.
- 7 In the Close Preview group, click the **Close Print Preview** button to return to the Access database screen.
- 8 Double-click the **Toys By Quantity In Stock** report to open it.



- 9 On the Home tab, in the Views group, click the lower half of the **View** button and then select **Print Preview** from the menu. The report is displayed in Print Preview. The Price field header and data in the last column exceed the width of the right margin.
- 10 On the Print Preview tab, in the Page Size group, click the **Margins** button and then select **Narrow** from the menu that appears. The Price field header and data are now completely visible.
- 11 On the Print Preview tab, click the **Close Print Preview** button to return to Report view.
- 12 **CLOSE** the reports.
- 13 **STOP. CLOSE** the database and then **EXIT** Access.

## 9 Advanced Tables

### 9.1 Creating a Custom Table

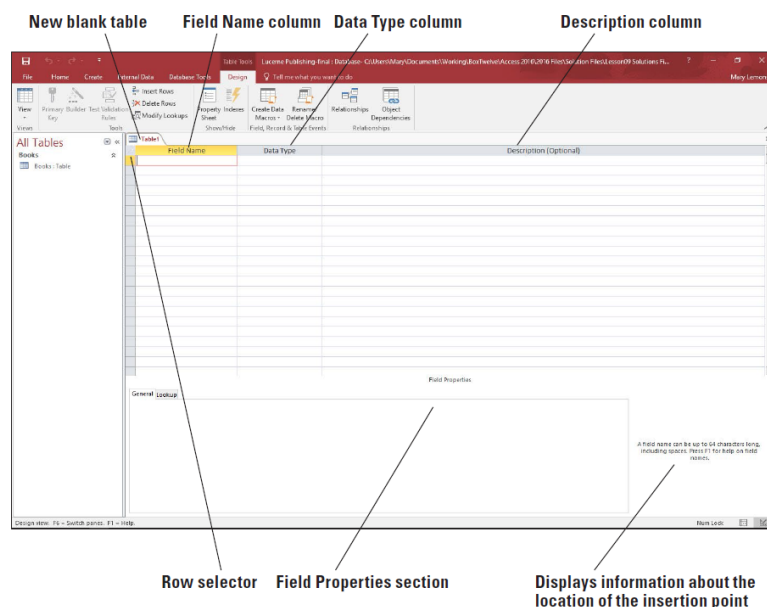
When a table template doesn't suit your needs, you can create a custom table in Design view.

In Design view, you can:

- Insert fields
- Set data types
- Perform other advanced table design tasks.
- Adding fields
- Setting data types
- Defining field properties
- Defining a primary key

#### 9.1.1 Step by Step: Create a Custom Table in Design View

- 1 **OPEN *Lucerne Publishing*** from the data files for this lesson and then **SAVE** the database as ***Lucerne Publishing-final***.
- 2 On the Create tab, in the Tables group, click the **Table Design** button. A new blank table is created in Design view.



- 3 Type **ID** in the Field Name column.

- 4 Press the **Tab** key to move to the Data Type column.
- 5 Click the **down arrow** in the Data Type column and then select **AutoNumber** from the menu. The AutoNumber data type will automatically number your records starting at 1.
- 6 Press the **Tab** key to move to the Description field.
- 7 Type **Record Number** and then press **Tab** again to move to the next blank field row.
- 8 Type **Gross Sales** and then press the **Tab** key.
- 9 Click the **down arrow** on the Data Type column and then select **Currency** from the menu.
- 10 Click in the **Decimal Places** row in the Field Properties section. Click the **down arrow** and then select **0** from the menu.
- 11 Enter the remaining fields, formatting each with the **Currency** data type and **0** decimal places.
- 12 Click the row selector to the left of the ID field to select the row.
- 13 On the Design tab, in the Tools group, click the **Primary Key** button.
- 14 Click the **Save** button on the Quick Access Toolbar. The *Save As* dialog box appears.
- 15 Type **Sales** and then click **OK**.
- 16 **LEAVE** the database and Sales table open.

## 9.1.2 Inserting and Deleting Rows

When creating a custom table in Design view, you can insert and delete rows as needed using the Insert Rows and Delete Rows commands in the Tools group on the Table Tools Design contextual tab. When you click the Insert Rows button, a new row is inserted above the selected row. The field order from top to bottom in Design view will be displayed from left to right in Datasheet view.

### 9.1.2.1 Step by Step: Insert and Delete Rows in Design View

- 1 **USE** the *Lucerne Publishing-final* database and the **Sales** table that are open from the previous exercise.
- 2 Click the row selector to the left of the Gross Sales field to select the entire row.
- 3 In the Tools group on the Table Tools Design contextual tab, click the **Delete Rows** button. The field row is deleted from the table.
- 4 Click the **Undo** button on the Quick Access Toolbar. The field row reappears.

- 5 In the Tools group on the Table Tools Design contextual tab, click the **Insert Rows** button. A blank row is inserted above the Gross Sales field.
- 6 In the Field Name column, type **Area** and then press the **Tab** key.
- 7 Press the **Tab** key again to accept the **Short Text** data type.
- 8 Leave the Description field blank and then press **Tab** again to move to the next field.
- 9 Click the **Save** button on the Quick Access Toolbar.
- 10 Change to Datasheet view and enter the records shown in Figure 9-3 in the table. The ID field will be automatically generated, so just press **Tab** to get past it.
- 11 **SAVE** and **CLOSE** the table.
- 12 **LEAVE** the database open to use in the next exercise.

ID	Area	Gross Sales	Cost of Goods	Net Sales	Click to Add
1	East	\$423,098	\$69,039	\$354,059	
2	West	\$434,432	\$75,987	\$358,445	
3	North	\$533,424	\$66,765	\$466,659	
4	South	\$516,323	\$86,876	\$429,447	
*	(New)	\$0	\$0	\$0	

### 9.1.3 Using the Table Analyzer

The **Table Analyzer** is a wizard that performs the normalization process for you by examining a table design and suggesting a way to divide the table for maximum efficiency. It helps you design efficient tables. It suggests primary keys for the new tables or allows you to determine the primary keys. It inserts a unique identifier field.

Normalization is the process of applying rules to a database design to ensure that you have divided your data into the appropriate tables. In the Books table, contact information for authors has to be entered for each book the author wrote. The Table Analyzer Wizard will determine that a more efficient database would split the table into two tables:

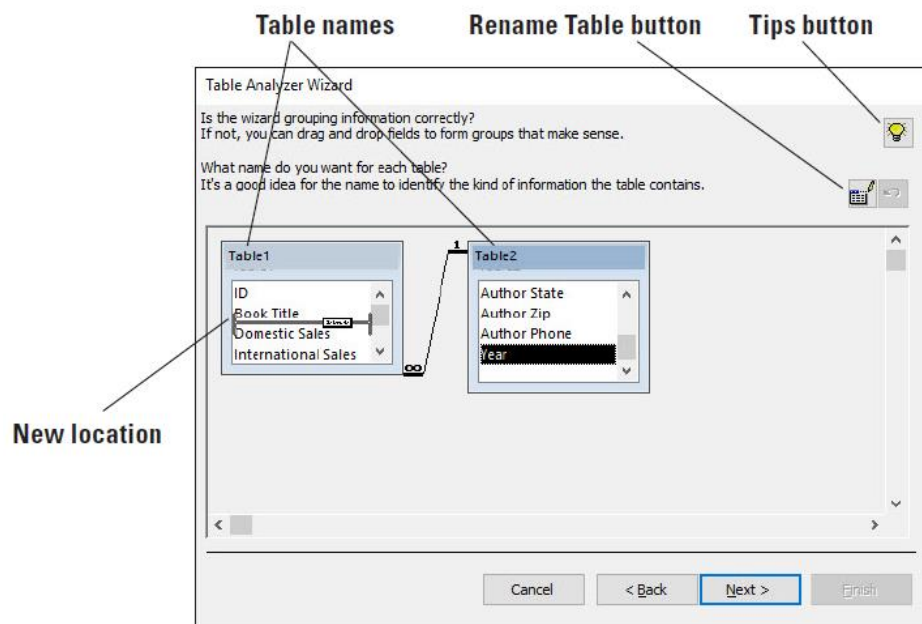
- one with author contact information
- one with book sales data

#### 9.1.3.1 Step by Step: Use the Table Analyzer

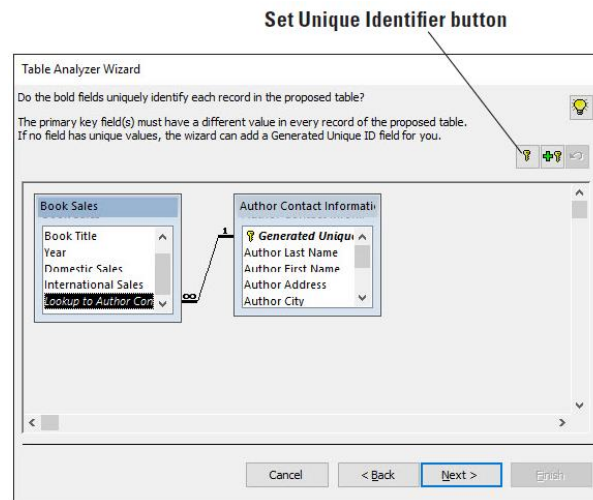
- 1 **USE** the *Lucerne Publishing-final* database that is open from the previous exercise.
- 2 Double-click the **Books** table in the Navigation Pane to open it.



- 3 Scroll through the table to become familiar with the fields in the table.
- 4 On the Database Tools tab, in the Analyze group, click the **Analyze Table** button. The *Table Analyzer Wizard* dialog box, screen 1, appears. This first dialog box provides more information about the types of problems the wizard will find. Click the two **Show me an example** buttons to read more about how duplicating information can lead to problems.
- 5 Click the **Next** button. The *Table Analyzer Wizard* dialog box, screen 2, appears. This dialog box provides more information about what the wizard will do. Click the two **Show me an example** buttons to read more about how splitting the table is helpful.
- 6 Click the **Next** button. The *Table Analyzer Wizard* dialog box, screen 3, appears.
- 7 The **Books** table should be selected in the list; if it is not, select it. Click the **Next** button. The *Table Analyzer Wizard* dialog box, screen 4, appears.
- 8 The **Yes, let the wizard decide** button should be selected; if it is not, select it. Click the **Next** button. The *Table Analyzer Wizard* dialog box, screen 5, appears.
- 9 Scroll through each table. Notice that the Table2 box contains the Year, which should be in Table1 with the sales information. Click the **Year** field to select it.
- 10 Drag the selected field to the Table1 box, positioning the horizontal black line below the Book Title field, and releasing the mouse button to place the Year field in its new location.
- 11 Click the **Table1** name to select it. Click the **Rename Table** button. If you receive a message stating that an expression you entered is the wrong data type for one of the arguments, click **OK**. The *Table Analyzer Wizard* dialog box appears.



- 12 Type **Book Sales** and then click **OK**.
- 13 Click the **Table2** name and then click the **Rename Table** button. If you receive a message stating that an expression you entered is the wrong data type for one of the arguments, click **OK**. The *Table Analyzer Wizard* dialog box appears.
- 14 Type Author Contact Information and then click OK.
- 15 Scroll down to the bottom of the Book Sales table. Notice that the Lookup to Author Contact Information field was added.
- 16 Scroll through the Author Contact Information table. Notice that the Generated Unique ID field was added as a primary key. Click the **Next** button. The *Table Analyzer Wizard* dialog box, screen 6, appears.



- 17 Click the **ID** field in the Book Sales table to select it. Click the **Set Unique Identifier** button. A primary key is inserted.
- 18 Click **Next**. The *Table Analyzer Wizard* dialog box, screen 7, appears.
- 19 Notice that the Table Analyzer Wizard has detected two similar records, one with an incorrect zip code and phone number. Click the **down arrow** in the first row of the Correction field and then select **Leave as is**. This is the correct record.
- 20 Click the **down arrow** on the second row of the Correction field and select the **Tomic** correction from the menu to replace the incorrect record. Click to select it.

Table Analyzer Wizard

**Correcting typographical errors for table 'Author Contact Information'.**

The wizard has found some records with very similar values. Records referring to the same information should be identical, so that they will be combined into one unique record.

The wizard has identified likely corrections. To change a correction, choose a value from the Correction list. The wizard will make the corrections as it creates your new tables. To keep the record as it is, choose 'Leave as is' from the list or leave the correction blank.

Author Last	Author First	Author Address	Author City	Author State	Author Zip	Author Phone	Correction
Tonic	Dragan	7890 First St	Little Rock	AR	56724	(678) 555-0190	(Leave as is)
Tonic	Dragan	7890 First St	Little Rock	AR	90890	(123) 555-0190	

Record: 1 of 2

Cancel < Back Next > Finish

- 21 Click **Next**. The final *Table Analyzer Wizard* dialog box appears.
- 22 The **Yes, create the query** option button should be selected. Click the **Finish** button.
- 23 A message saying that the wizard couldn't rename your table because it's open and the new query will be saved as Books\_NEW appears. Click **OK**.
- 24 If Access Help appears on your screen, close it.
- 25 **SAVE** and **CLOSE** all tables and queries.
- 26 **LEAVE** the database open to use in the next exercise.

## 9.2 Summarizing Table Data

Tables that contain columns of sales figures or other numbers need to be summed, averaged, or counted to be more useful. The Total row makes these tasks easy. **Aggregate functions** are functions that calculate values across a range of data, such as in a column. You can use these functions in queries or in Visual Basic for Applications (VBA) code. The **Total row** is a row inserted at the bottom of a table that provides a menu of functions for each column in the row.

### 9.2.1 Step by Step: Insert a Total Row

- 1 **USE** the *Lucerne Publishing-final* database that is open from the previous exercise.
- 2 Double-click the **Book Sales** table in the Navigation Pane to open it.
- 3 On the Home tab, in the Records group, click the **Totals** button. The Total row appears below the row with the asterisk (\*) in the record selector box.
- 4 Click the **down arrow** in the Book Title column of the Total row. Select **Count** from the menu. The number of records in the column is counted, and the number 11 is displayed.
- 5 Click the **down arrow** in the Domestic Sales column of the Total row and then select **Sum** from the menu. Click **Sum** to apply it.

ID	Book Title	Year	Domestic Sales	International Sales	Lookup to Author	Click to Add
1	Inside Contoso	2016	12365	9236	Wilson, Dan, 1	
2	Seeking Adven	2016	12321	6712	Tomic, Dragan,	
3	The Coho Fami	2016	13734	5432	Steiner, Alan, 5	
4	Fourth Coffee:	2016	15098	4575	Diaz, Brenda, 3	
5	Litware vs. Pro	2016	14994	9087	Wilson, Dan, 1	
6	Flying with Blu	2016	20890	8912	Diaz, Brenda, 3	
7	Outside Conto:	2016	21846	10987	Wilson, Dan, 1	
8	Researching Tr	2016	14534	10172	Steiner, Alan, 5	
9	Buying and Sel	2016	17983	2987	Tomic, Dragan,	
10	Traveling with	2016	23423	9091	Diaz, Brenda, 3	
11	The Birth of Co	2016	16347	1098	Wilson, Dan, 1	
* (New)						
Total			11			

Available functions for column:

- None
- Sum
- Average
- Count
- Maximum
- Minimum
- Standard Deviation
- Variance

- 6 Click the **down arrow** in the International Sales column of the Total row and then select **Sum** from the menu.
- 7 **SAVE** the table.
- 8 On the Home tab, in the Records group, click the **Totals** button. The Total row is hidden.
- 9 On the Home tab, in the Records group, click the **Totals** button again. The Total row reappears.
- 10 **SAVE** and **CLOSE** the table.
- 11 **STOP. CLOSE** the database and then **EXIT** Access.

## 10 Advanced Forms

### 10.1 Creating Advanced Forms

Access provides tools to help you create forms quickly, including advanced forms with features that can improve the usability of your database. The **Multiple Items tool** creates a customizable form that displays multiple records. A **split form** gives you two views of your data at the same time—in both Form view and Datasheet view. A **subform** is a form that is inserted into another form.

#### 10.1.1 Creating a Multi-Item Form

When you create a simple form using the Form tool, Access creates a form that displays a single record at a time. To create a form that displays multiple records but that is more customizable than a datasheet, use the Multiple Items tool. When you use the Multiple Items tool, the form that Access creates resembles a datasheet. The data is arranged in rows and columns, and you see more than one record at a time. Multiple Items form gives you more customization options than a datasheet, such as the ability to add graphical elements, buttons, and other controls.

##### 10.1.1.1 Step by Step: Create a Multi-Item Form

- 1 **GET READY.** Before you begin these steps, make sure that your computer is on. Sign on, if necessary, and start Access.
- 2 **OPEN** the **Contoso** database from the data files for this lesson and then **SAVE** it as **Contoso-final**.
- 3 In the Navigation Pane, double-click the **Doctors** table to open it.
- 4 On the Create tab, in the Forms group, click the **More Forms** button. On the menu that appears, click the **Multiple Items** button. Access creates the form and displays it in Layout view.
- 5 Scroll down to view the multiple records on the form.
- 6 Click the **File** tab and then click **Save**.
- 7 In the *Save As* dialog box, type **Doctors Multiple** and then click **OK**.
- 8 **CLOSE** the Doctors Multiple form and the Doctors table.
- 9 **PAUSE. LEAVE** the database open to use in the next exercise.

ID	Last Name	First Name	Specialty	Hospital
1	Smith	Brian	Dermatology	United Medical Center
2	Yyer	Naman	Respirology	Community Medical Center
3	Lysaker	Jenny	Anesthesiology	Southeast County Hospital
4	Mikovsky	Jan	Anesthesiology	Covenant Hospital
5	Nata	Miner	Dermatology	United Medical Center
6	Osakberry	Chris	Pediatrics	Covenant Hospital
7	Yellow	Franc	Gastroenterology	Lakeside Clinic
8	Phillips	Carol	Pediatrics	Memorial Regional Hospital
9	Ruth	Andy	Anesthesiology	Covenant Hospital
10	Sands	Patrick	Respirology	Memorial Regional Hospital
11	Shen	Alan	Dermatology	United Medical Center

## 10.1.2 Creating a Split Form

Creating a split form allows you to see two views of your data at the same time—in Form view and in Datasheet view. The two views are connected to the same data source and are completely synchronized with each other. Working with split forms gives you the benefits of both types of forms in a single form.

### 10.1.2.1 Step by Step: Create a Split Form

- 1 **GET READY. USE** the *Contoso-final* database that is open from the previous exercise.
- 2 In the Navigation Pane, double-click the **Sales Reps** table to open it.
- 3 On the Create tab, in the Forms group, click the **More Forms** button. On the menu that appears, select **Split Form**. Access creates the form and displays it in Form view and Datasheet view at the same time.

ID	Last Name	First Name	Email Address	Mobile Phone
1	Abbas	Syed	sabbas@contoso.com	405-555-2302
2	Buchanan	Nancy	nrbuchan@contoso.com	800-525-3167
3	Cooper	Scott	scooper@contoso.com	405-555-8731
4	Ihrig	Ryan	rihrig@contoso.com	405-555-9119
5	Moseley	Julia	jmosely@contoso.com	405-555-0405
6	Simon	Britta	bsimon@contoso.com	800-555-6136
(new)				

- 4 Click the **Next Record** navigation button to display the next record in Form view.
- 5 In the Datasheet view on the bottom, place the insertion point in the **Mobile Phone** field for Nancy Buchanan. Notice that the same field is selected in the Form view at the top.
- 6 Change the number for Nancy Buchanan in the Mobile Phone field to **806-555-4489**.
- 7 Click anywhere on the Form view above the datasheet and notice that the mobile phone number has been changed there as well.
- 8 On the Home tab, in the Views group, click the lower half of the **View** button and then select **Design View**.
- 9 Press **F4** to display the Property Sheet.
- 10 Click **Form** in the drop-down list at the top of the Property Sheet, if necessary, and then click the **Format** tab.
- 11 Scroll down to the Split Form Orientation property, click the **down arrow** and then select **Datasheet on Top**.



- 12 Click the **Close** button to close the Property Sheet.
- 13 On the Home tab, in the Views group, click the lower half of the **View** button and then select **Layout View**. The split form is displayed with the datasheet on top.
- 14 Click the **File** tab and then click **Save**.
- 15 In the *Save As* dialog box, type **Sales Reps Split** and then click **OK**.

16 **CLOSE** the Sales Reps Split form and the Sales Reps table.

17 **LEAVE** the database open to use in the next exercise.

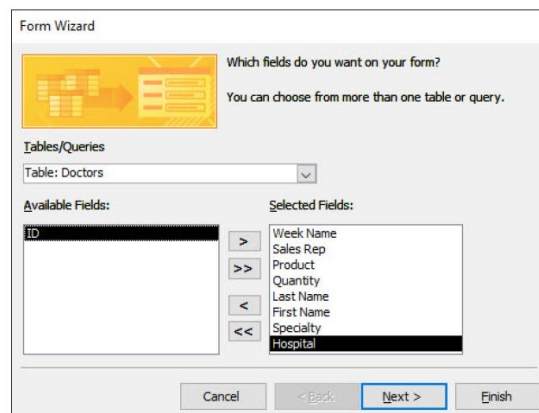
### 10.1.3 Creating a Subform

A subform is a form that is inserted into another form. The primary form is called the **main form**. The form within the form is called the **subform**. A form/subform combination is sometimes referred to as a hierarchical form, a master/detail form, or a parent/child form.

Subforms are especially effective when you want to show data from tables or queries that have a one-to-many relationship—the main form shows data from the “one” side of the relationship and the subform shows the data from the “many” side of the relationship.

#### 10.1.3.1 Step by Step: Create a Subform

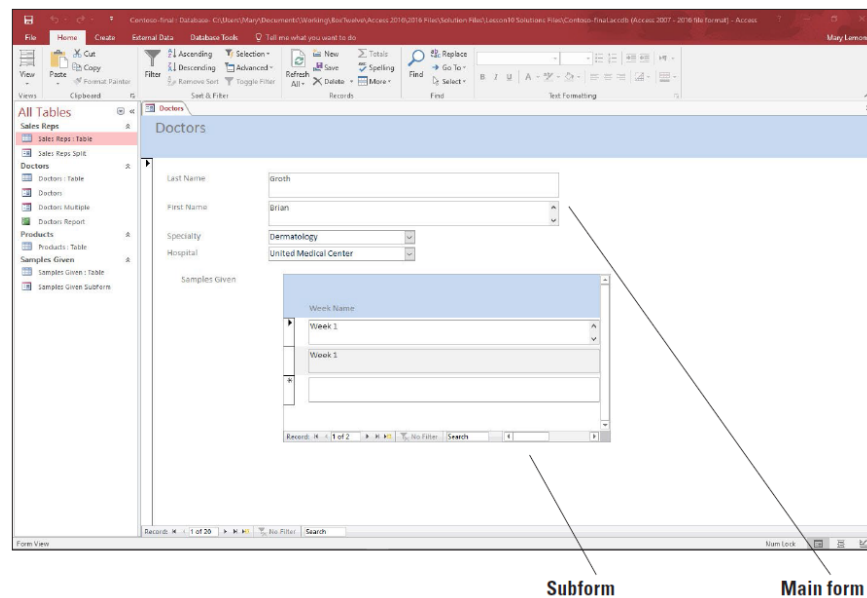
- 1 **GET READY. USE** the *Contoso-final* database that is open from the previous exercise.
- 2 On the Create tab, in the Forms group, click **Form Wizard**.
- 3 In the first screen on the Form Wizard, click the **down arrow** in the Tables/Queries box and then click **Table: Samples Given**.
- 4 In the Available Fields box, double-click the **Week Name**, **Sales Rep**, **Product**, and **Quantity** fields to move them to the Selected Fields box.
- 5 Click the **down arrow** in the Tables/Queries box and then click **Table: Doctors**.
- 6 In the Available Fields box, double-click the **Last Name**, **First Name**, **Specialty**, and **Hospital** fields to move them to the Selected Fields box.



- 7 Click the **Next** button.
- 8 In the How do you want to view your data? box, click **by Doctors**.
- 9 Click the **Next** button.



- 10 Click the **Tabular** option button to select that as the layout for your subform.
- 11 Click the **Next** button. Access has suggested titles for the forms (Doctors and Samples Given Subform). Keep the default selection to open the form.
- 12 Click the **Finish** button to create the forms. The Doctors form appears with the Samples Given subform.
- 13 In the Navigation Pane, double-click the **Samples Given Subform** to open it.
- 14 Scroll down and to the right, if necessary, to see the data contained in the records.
- 15 **CLOSE** the Samples Given Subform and the Doctors form.
- 16 **PAUSE. LEAVE** the database open to use in the next exercise.



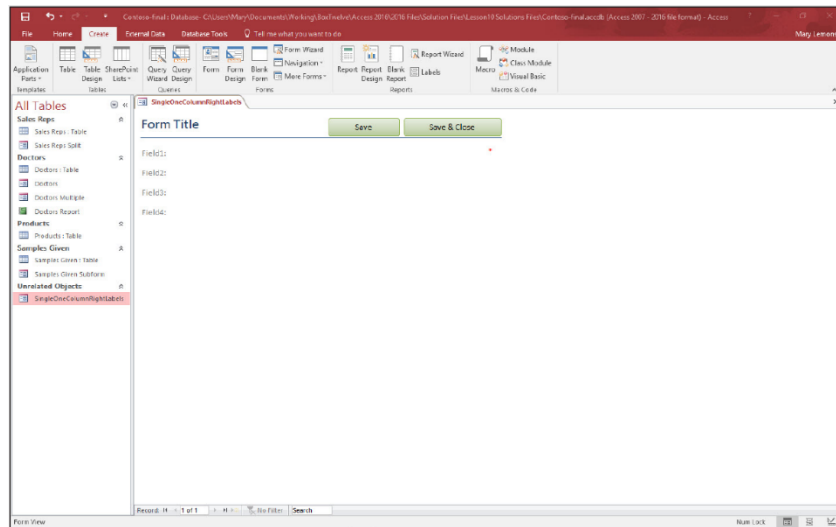
## 10.2 Using Application Parts to Create Blank Forms

The Application Parts gallery consists of two categories: Blank Forms and Quick Start. The Blank Forms category contains a collection of 10 form parts that allow you to add predefined forms to a database. Application Parts Blank Forms are created as unbound forms and provide a prearranged control layout.

### 10.2.1 Step by Step: Use Application Parts to Create Blank Forms

- 1 **GET READY. USE** the *Contoso-final* database that is open from the previous exercise.
- 2 On the Create tab, in the Templates group, click the **Application Parts** button and then select **1 Right**. A new form object named SingleOneColumnRightLabels appears in the Navigation Pane in the Unrelated Objects category.

- 3 Double-click the **SingleOneColumnRightLabels** form to open it. The form is displayed in Form view.



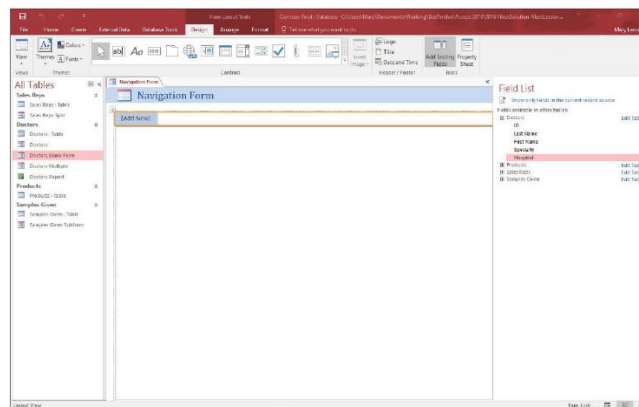
- 4 Change to Layout view and then press **Shift** while clicking on the label control placeholders titled **Field1**, **Field2**, **Field3**, and **Field4** to select them all. Press the **Delete** key on the keyboard to delete the label controls. Also delete the label control placeholder that contains the red asterisk, which could be used to denote an important field, like a key field.
- 5 Click the **Add Existing Fields** button in the Tools group. The Field List pane appears. If necessary, click the **Show all tables** link.
- 6 In the Field List pane, expand the **Doctors** table.
- 7 In the Field List pane, click and drag each **Last Name**, **First Name**, **Specialty**, and **Hospital** field to the form and to the right placeholder of the original locations of the Field1, Field2, Field3, and Field4 label controls that you just deleted.
- 8 Resize the label and field controls that you just added.
- 9 Click the **Form Title** label, delete Form Title and then type **Doctors**.
- 10 Change to Form view and cycle through the records. Click the **Save & Close** button on the form to close the form.
- 11 Click **Yes** in the dialog box prompting you to save design changes to the form.
- 12 Rename the SingleOneColumnRightLabels form to **Doctors Blank Form**.
- 13 **PAUSE. LEAVE** the database open to use in the next exercise.

## 10.3 Creating and Modifying a Navigation Form

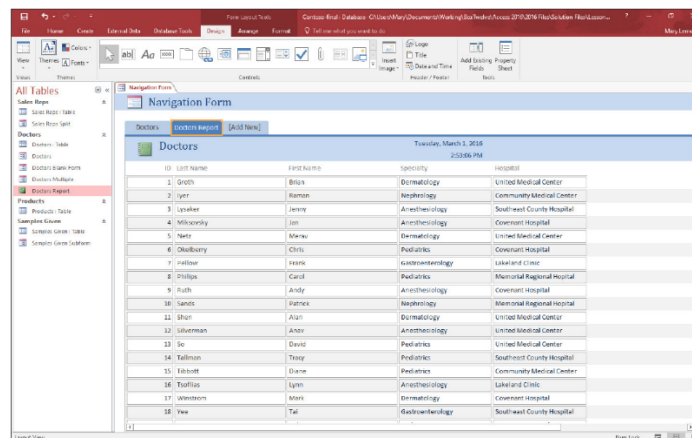
A Navigation form includes a set of navigation tabs that you can click to display forms and reports. Navigation forms can also be used from within the Access application window to simplify your interaction with database objects.

### 10.3.1 Step by Step: Create a Navigation Form

- 1 **GET READY. USE** the *Contoso-final* database that is open from the previous exercise.
- 2 On the Create tab, in the Forms group, click the **Navigation** button and then click **Horizontal Tabs**. A new Navigation form appears in Layout view.



- 3 Click and drag the **Doctors** form object from the Navigation Pane to the Add New tab near the top of the form. The form tab is renamed Doctors and all the Doctors form's controls appear. A new [Add New] tab appears next to the Doctors tab.
- 4 Click and drag the **Doctors Report** object from the Navigation Pane to the [Add New] tab near the top of the form. The form tab has been renamed **Doctors Report** and all the Doctors report controls appear. A new [Add New] tab appears next to the Doctors Report tab.



- 5 Double-click the **Doctors** tab and then type **Doctors Form** to rename the tab.
- 6 Click the **File** tab and then click **Save**.
- 7 In the Save As dialog box, type **Doctors Navigation Form** and then click **OK**.
- 8 Change to Design View, and on the Doctors Form Tab Layout View, resize the columns in the Samples Given section so they all fit mostly in the window.
- 9 Change back to Form View and view the changes.

- 10 **SAVE** and **CLOSE** the Doctors Navigation Form.
- 11 **CLOSE** the database and then **EXIT** Access.

## 11 Advanced Reports

### 11.1 Defining Groups

A **group** is a collection of records separated visually with any introductory or summary information displayed with it. Reports can be grouped on fields or expressions. A **grouping field** is a field by which data is grouped. **Grouping levels** are the nested arrangement of the groups in a report.

**Grouping intervals** establish the way that records are grouped together. They can be very useful in arranging a large number of records in a group. You can group on the first character of a text field so that all of the records are visually separated alphabetically.

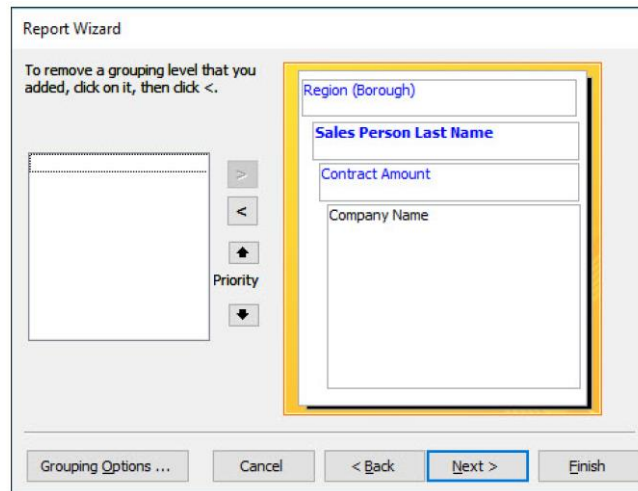
#### 11.1.1 Using the Report Wizard

You can easily specify groups with the Report Wizard when creating a new report. The Report Wizard lets you specify how you would like data to be grouped as you create the report. You can also add grouping to an existing report using the Group, Sort, and Total pane. Grouping options let you further specify how you want the groups to appear in your report.

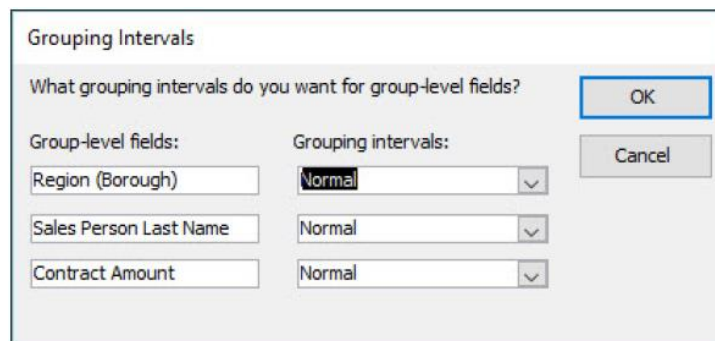
##### 11.1.1.1 Step by Step: Use the Report Wizard

- 1 **OPEN** *Messenger* database from the data files for this lesson and then **SAVE** it as *Messenger-final*.
- 2 In the Navigation Pane, double-click the **Corporate Sales** table to open it.
- 3 On the Create tab, in the Reports group, click the **Report Wizard** button. The first *Report Wizard* dialog box appears.
- 4 Click the > button or double-click each item to move the **Region (Borough)**, **Sales Person Last Name**, **Company Name**, and **Contract Amount** fields from the Available Fields list to the Selected Fields list.
- 5 Click the **Next** button. The second *Report Wizard* dialog box appears.
- 6 Select the **Region (Borough)** field and then click the > button to move it to the grouping levels box.
- 7 Select the **Contract Amount** field and then click the > button to move it to the grouping levels box.
- 8 Select the **Sales Person Last Name** field and then click the > button to move it to the grouping levels box.

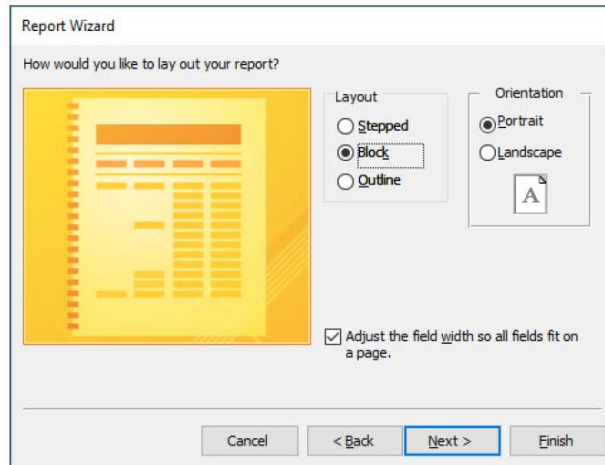
- 9 Notice that the Sales Person Last Name field is the active field in bold type. Click the **Priority** up arrow to move the Sales Person Last Name field to the second level of grouping.



- 10 Click the **Grouping Options** button at the bottom of the dialog box. The *Grouping Intervals* dialog box appears.



- 11 Click the down arrow on the first Grouping intervals menu to see the choices available. Select **Normal** from the menu and then click **OK**.
- 12 Click the **Next** button. The third *Report Wizard* dialog box appears. You can sort in either ascending or descending order and by up to four fields.
- 13 Click the down arrow on the Sort menu and then select **Company Name** to sort in ascending order by Company Name.
- 14 Click the **Next** button. The fourth *Report Wizard* dialog box appears. You can choose from three different layouts for your report as well as two different orientations.
- 15 In the Layout section, click the **Block** option button. Keep the default orientation as **Portrait** and keep the selection so all fields fit on one page.



- 16 Click the **Next** button. The fifth *Report Wizard* dialog box appears.
- 17 Type **Corporate Sales by Region/Salesperson** as the title of your Report, replacing the default title of Corporate Sales1.
- 18 Click the **Finish** button to accept the settings. The Report Wizard creates the report, with the groups you specified.
- 19 **CLOSE** the report and the table.
- 20 **LEAVE** the database open to use in the next exercise.

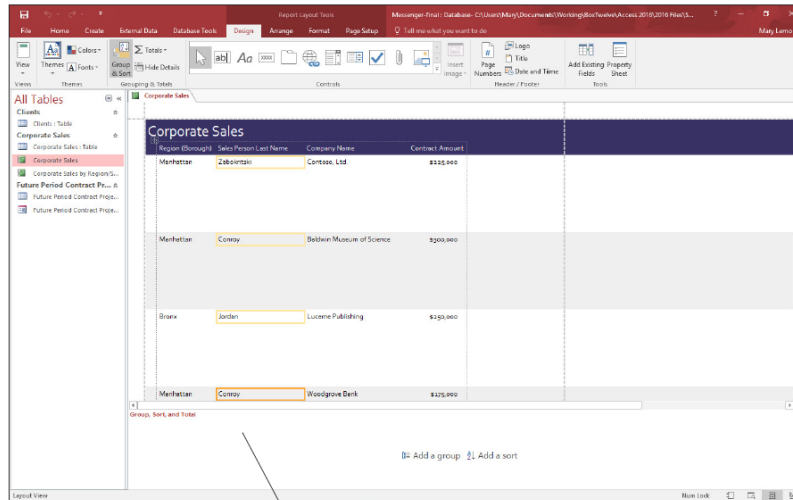
### 11.1.2 Adding Group Headers and Footers

You can add group headers and footers to a report using the Group, Sort, and Total pane. When you select a field from the Group On menu, the group header is added to the report.

The **group header** is the section of a report where the name of a grouped field is displayed and printed. Group headers take on the name of the group, so you will see [Fieldname] Header. A **group footer** is the section of the report where the data in the group is summarized. It is optional.

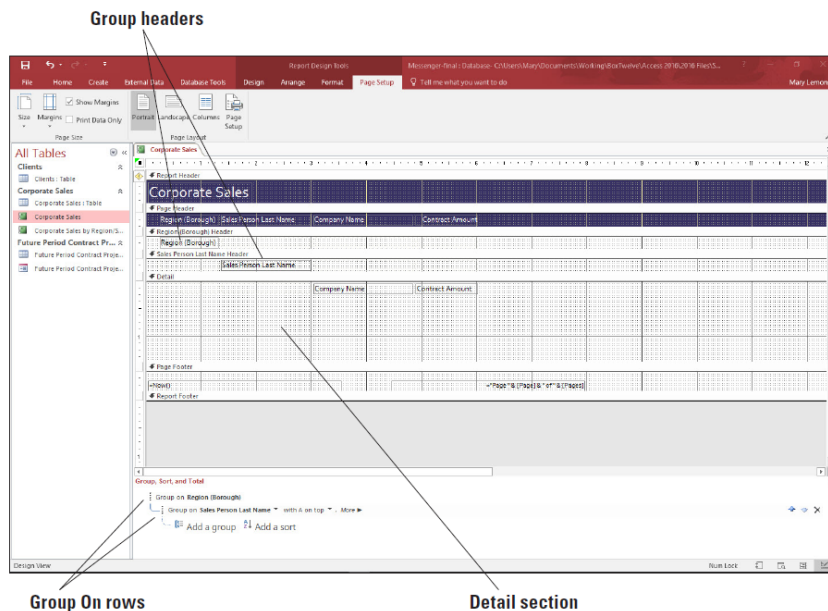
#### 11.1.2.1 Step by Step: Use the Group, Sort, and Total Pane

- 1 **USE** the *Messenger-final* database that is open from the previous exercise.
- 2 In the Navigation Pane, double-click the **Corporate Sales** report to open it. Notice that the report is not arranged by groups.
- 3 Change to Layout view and close the Field List pane if it opens.
- 4 On the Design tab, in the Grouping & Totals group, click the **Group & Sort** button. The Group, Sort, and Total pane appears at the bottom of the screen.



Group, Sort, and Total pane

- 5 Click the **Add a group** button. Select **Region (Borough)** from the Group On menu. The report is now grouped on the Region (Borough) field.
- 6 Click the **Add a group** button again and then select **Sales Person Last Name** from the Group On menu. The report is now also grouped on the Sales Person Last Name field.
- 7 Change to Design view. Notice that there is a Region (Borough) Header for that group and a Sales Person Last Name header for that group. The Company Name and Contract Amount fields are arranged in the Detail section.
- 8 **SAVE** the report.
- 9 **LEAVE** the database and the report open to use in the next exercise.





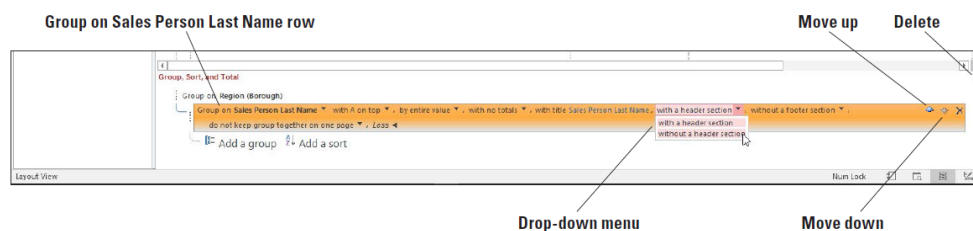
### 11.1.3 Changing Grouping Options

Access gives you options for displaying grouped data. Grouping options include:

- **Sort order:** Choose ascending or descending
- **Group interval:** Change the way records are grouped together
- **Totals:** Add totals to fields
- **Title:** Change the label of a column heading or summary field
- **With/without header:** Add or remove the header section
- **With/without footer:** Add or remove footer section
- **Do not keep group together on one page:** Groups can be broken up by page breaks
- **Keep whole group together on one page:** Minimizes the number of page breaks in a group on one page
- **Keep header and first record together on one page:** Ensures a group header is not printed by itself at the bottom of a page

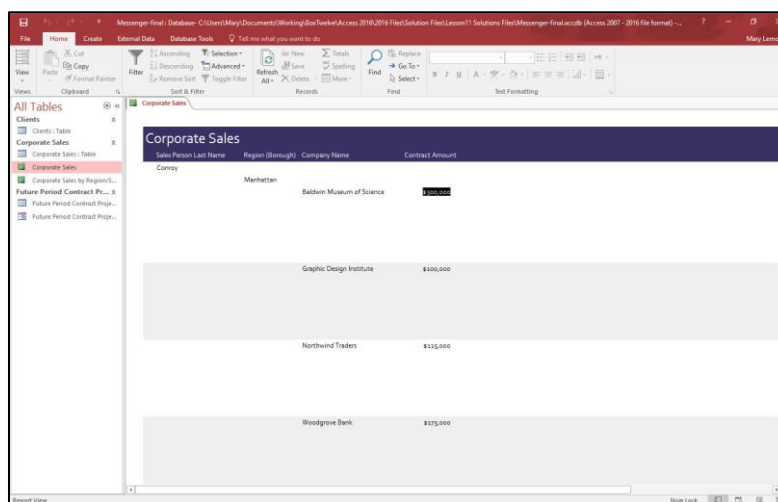
#### 11.1.3.1 Step by Step: Change Grouping Options

- 1 USE the *Messenger-final* database and *Corporate Sales* report that are open from the previous exercise.
- 2 Change to Layout view.
- 3 Click the **Group On Sales Person Last Name** row in the Group, Sort, and Total pane, and then click the **More** button to view the available grouping options.



- 4 Click the **down arrow** beside with a header section and then select **without a header section** from the drop-down menu.
- 5 Change to Design view. Notice that the Sales Person Last Name Header has been deleted from the grouping area.
- 6 Change back to Layout view.

- 7 Click the **down arrow** beside the without a header section (if the without a header section option doesn't appear, click the **More** button) and then select **with a header section** from the drop-down menu.
- 8 Click the **Move up** arrow at the end of the Group On Sales Person Last Name row. Notice that the Sales Person Last Name group is now the top level group in the report.
- 9 Click the **Add a group** button and then select **Company Name** from the menu. A new group level is added to the report.
- 10 On the Design tab, in the Grouping & Totals group, click the **Hide Details** button. The data in the Contract Amount field is hidden.
- 11 On the Design tab, in the Grouping & Totals group, click the **Hide Details** button. The data in the Contract Amount field is displayed.
- 12 Click the **More** button next to Group On Company Name in the Group, Sort, and Total pane.
- 13 Click the **with A on top** down arrow on the Group On Company Name row in the Group, Sort, and Total Pane. Select **with Z on top** from the drop-down menu. The sort order is changed from ascending to descending order.
- 14 Click the **with Z on top** down arrow and then select **with A on top**.
- 15 Click the **Delete** button on the right side of the Group On Company Name row in the Group, Sort, and Total pane. The row is deleted, as is the Company Name header section.
- 16 Change to Report view to see the report.
- 17 **SAVE** the report.
- 18 **LEAVE** the database and the report open to use in the next exercise.



### 11.1.4 Creating Aggregate Fields

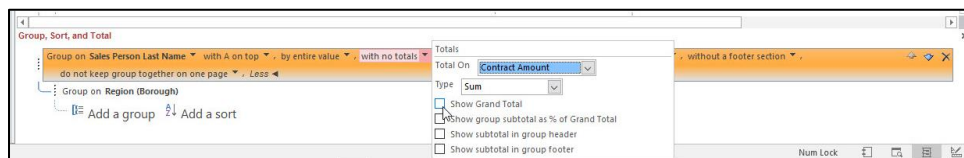
A report that lists sales for each month in a quarter but does not total all the sales for the quarter is incomplete. **Aggregate fields** use functions to provide summary information of numbers that need to be totaled.

The aggregate functions you can use are:

- Sum
- Average
- Count Records
- Count Values
- Maximum, Minimum
- Standard Deviation
- Variance

#### 11.1.4.1 Step by Step: Create Aggregate Fields

- 1 **USE** the *Messenger-final* database and *Corporate Sales* report that are open from the previous exercise.
- 2 Change to Layout view.
- 3 Click the **Group On Sales Person Last Name** row in the Group, Sort, and Total pane, and then click **More**.
- 4 Click the **with no totals** down arrow. The Totals menu appears.
- 5 Click the **Total On** menu down arrow and then select **Contract Amount**.
- 6 Click the **Type** menu down arrow and then select **Sum** if it isn't selected already.
- 7 Point to the **Show Grand Total** box. Click the **Show Grand Total** check box. The menu disappears and the grand total appears in the Contract Amount column at the bottom of the report.



- 8 Click the Group On Sales Person Last Name row again, click More, and then click the with Contract Amount totaled down arrow.

- 9 Click the **Total On** menu down arrow, select **Contract Amount**, and then click the **Show subtotal in group footer** box. The settings are applied, and the subtotals are now shown in each group's footer.
- 10 Select the **Sales Person Last Name** field header on the report.
- 11 On the Design tab, in the Grouping & Totals group, click the **Totals** button and then select **Count Records** from the menu.
- 12 Change to Report view. The total number of records appears at the bottom of the report.
- 13 **SAVE** the report.
- 14 **LEAVE** the database and report open.

## 11.2 Creating a Subform on a Report

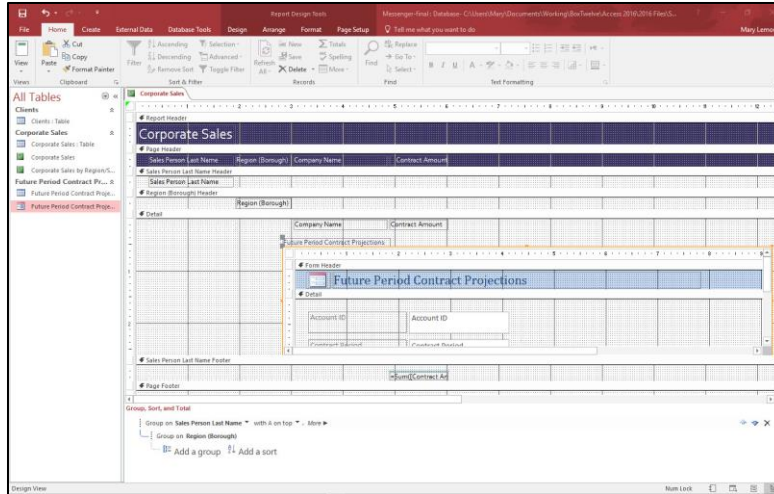
A subform can be inserted into a report and used in the same way to view data on a report.

The primary report is called the main report. The form within the report is called the subform.

Subforms can be effectively used on reports to show data from tables or queries that have a one-to-many relationship.

### 11.2.1 Step by Step: Create a Subform on a Report

- 1 USE the Messenger-final database and Corporate Sales report.
- 2 Change to Design view.
- 3 Click and drag the **Future Period Contract Projections** form object from the Navigation Pane to the Report Detail section under the Company Name and Contract Amount controls.
- 4 Change to Report View to view the Report and related subform, and cycle through the two records in the top subform using the record navigation buttons on the subform.
- 5 **SAVE** and **CLOSE** the report.
- 6 **LEAVE** the database open to use in the next exercise.



## 11.3 Creating the Print Layout

You can print a report from any view: Report, Layout, Design, or Print Preview.

### 11.3.1 Using Print Preview to Create a Print Layout

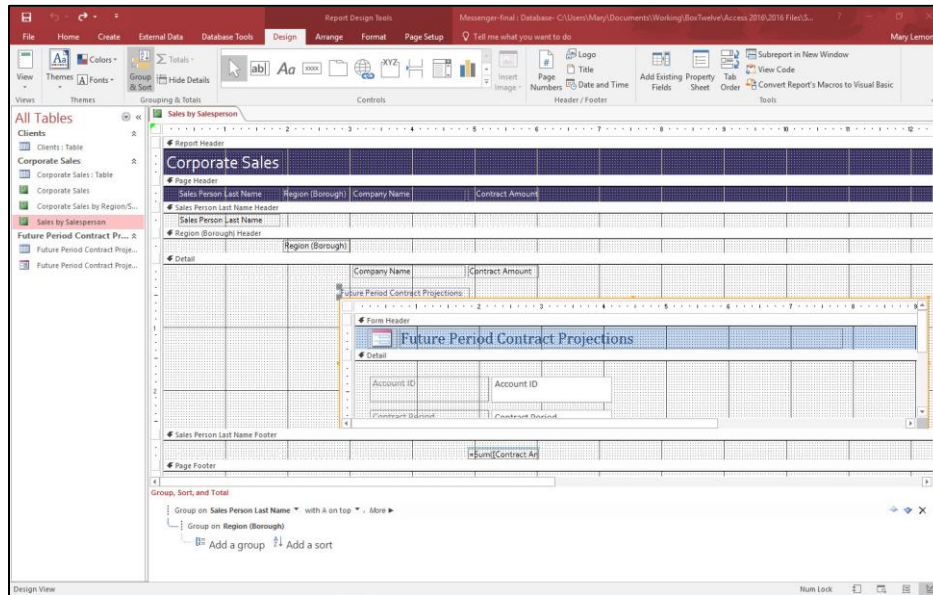
The Print Preview tab has commands for:

- Printing
- Changing the page size and layout
- Zooming in or out to view the pages
- Exporting report data to a variety of formats like Excel and Word

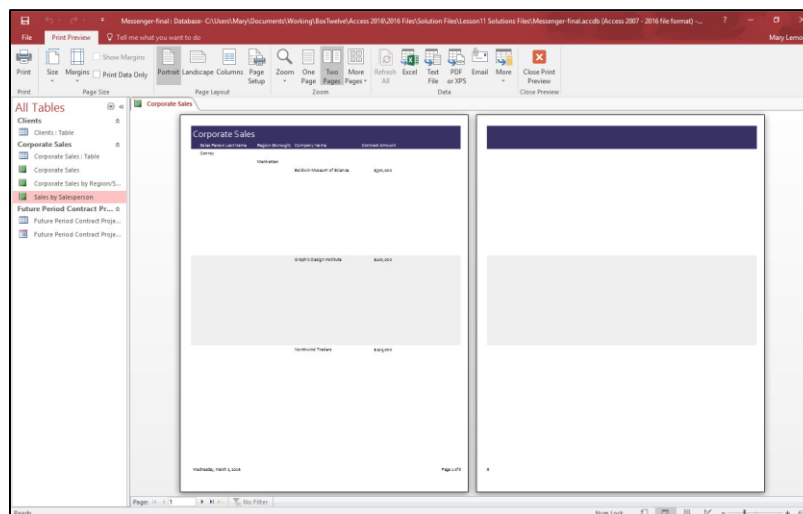
#### 11.3.1.1 Step by Step: Create the Print Layout

- 1 **USE** the *Messenger-final* database that is open from the previous exercise.
- 2 Right-click the **Corporate Sales** report in the Navigation Pane and then select **Copy** from the shortcut menu that appears.
- 3 Right-click in a blank area in the Navigation Pane and then select **Paste** from the menu. The *Paste As* dialog box appears.
- 4 In the *Paste As* dialog box, replace the name of the report in the Report Name field with **Sales by Salesperson** and then click **OK**.
- 5 Double-click the **Sales by Salesperson** report in the Navigation pane and then change to Design view. You want to remove the subform from the report and keep only the sales related to each salesperson.

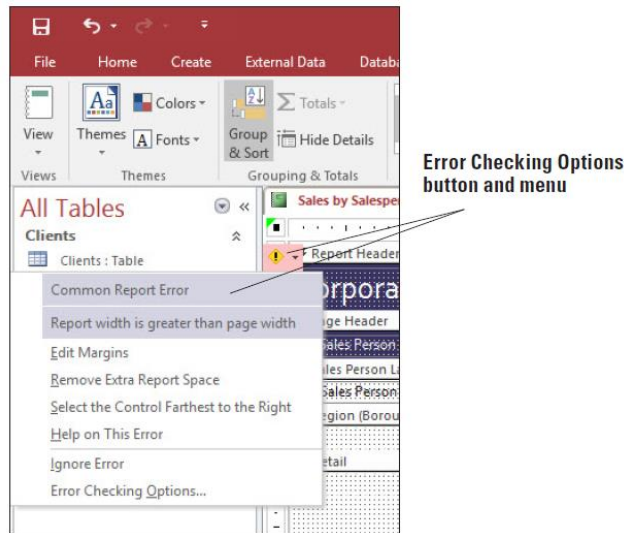
- 6 In the Detail section, click the **Future Period Contract Projections** subform, and then press **Delete** on the keyboard to delete the subform.



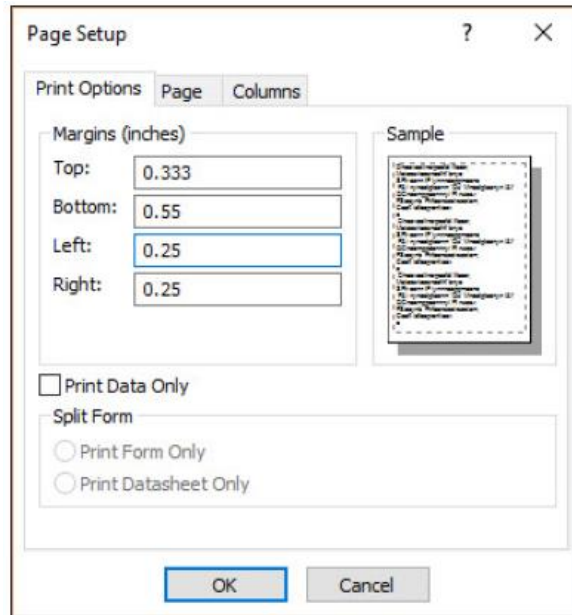
- 7 On the Home tab, in the Views group, click the lower half of the **View** button and then select **Print Preview** from the menu. The report is displayed in Print Preview. Notice the large area of blank space between company names in the detail section.
- 8 On the Print Preview tab, in the Zoom group, click the **Two Pages** button. The first two pages of the report are displayed on the screen. Notice the second page has no report data on it. You need to correct these issues in Report Design view to ensure the report print layout is appropriate before printing.
- 9 On the Print Preview tab, click the **Close Print Preview** button to return to Report Design view.



- 10 Click the **Error Checking Options** button next to the Report Header section title to view the Error Checking Options menu. Notice the menu text that states *Report width is greater than page width*. Click the **Remove Extra Report Space** menu option. The report's width is automatically adjusted; however, the issue is not entirely corrected and the Error Checking Option button still appears.



- 11 Scroll to the bottom of the report, if necessary, and place the pointer over the top of the **Sales Person Last Name** footer until it turns into a two-headed vertical pointer. Click and drag the Sales Person Last Name Footer and place it below the Company Name and Contract Amount controls. This removes the excess blank space between company names in the Detail section.
- 12 Change to Print Preview view. Notice the report layout still appears on two pages. The Remove Extra Report Space didn't entirely fix the issue. The page number control is exceeding the width of the page in Design view as evident by the page numbering text appearing in the footer section of the second page. On the Print Preview tab, in the Page Layout group, click the **Landscape** button. The report is displayed in landscape orientation and the formatting appears correctly.
- 13 On the Print Preview tab, in the Page Layout group, click the **Portrait** button. The report is displayed in portrait orientation again.
- 14 On the Print Preview tab, in the Page Layout group, click the **Page Setup** button. The *Page Setup* dialog box appears. Notice it contains many of the same options that are available in the Page Layout group but also includes additional options and details that can be modified.
- 15 On the Print Options tab, change the Left margin from 0.333 to 0.25.



- 16 Click **OK**. Notice that all the report data now fits and will print on two pages.
- 17 On the Print Preview tab, in the Zoom group, click the **Zoom** button arrow and then select **50%** from the menu.
- 18 Click the **Close Print Preview** button. You are back in Design view.
- 19 **SAVE** the report design and go back to Print Preview.
- 20 On the Print Preview tab, click the **Print** button. The *Print* dialog box appears. Click **OK** to print or click **Cancel** to close the dialog box. (Notice that you can access the *Setup* dialog box from here as well.)
- 21 **CLOSE** Print Preview and the report.
- 22 **LEAVE** the database open to use in the next exercise.

### 11.3.2 Using the Label Wizard

The **Label Wizard** helps you create a label-sized report that you can use to print labels. You can choose from a wide variety of sizes, including sizes to fit label sheets that you purchase at the office supply store or custom-created labels.

### 11.3.3 Creating Labels Using the Label Wizard

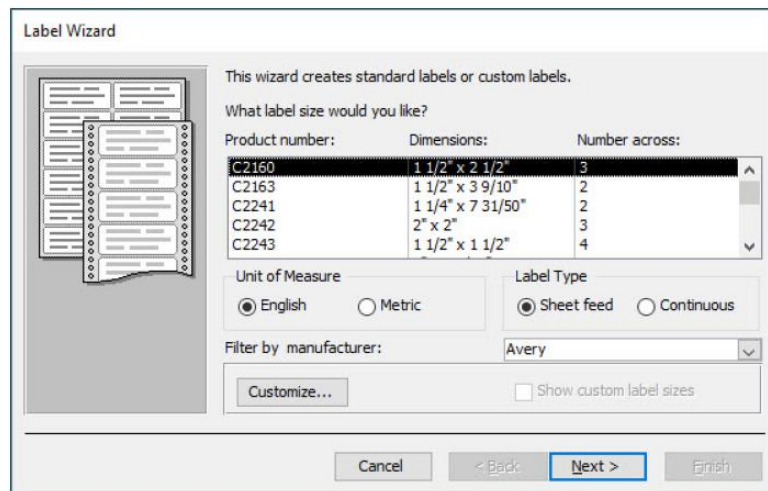
You can create mailing labels or other types of labels from an Access table or query. Access allows you to choose the font name, font size, font weight, and text color for your labels.



If you don't know the manufacturer of your label sheets, you can choose a sheet with similar dimensions and with the correct number of labels across the sheet. If you don't see the size you need, you can customize the size and create a new label using the Customize button.

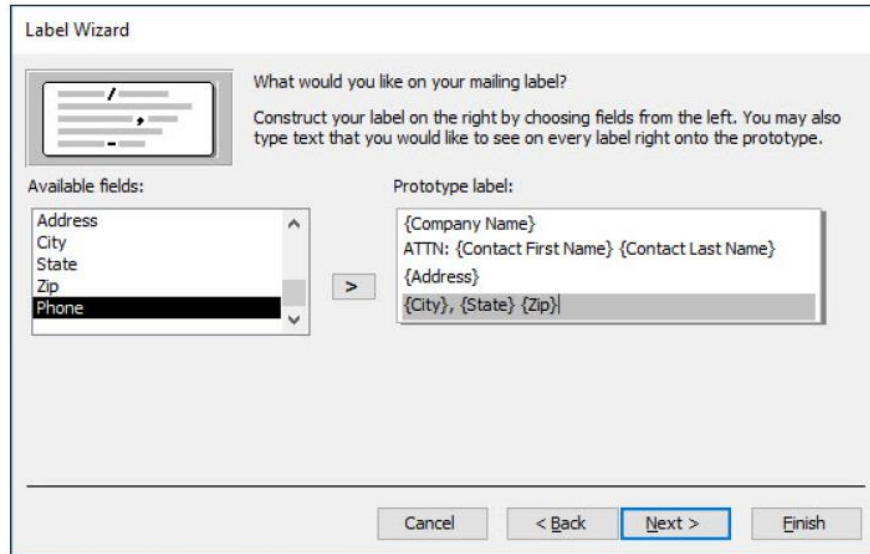
### 11.3.3.1 Step by Step: Use the Label Wizard

- 1 **USE** the *Messenger-final* database that is open.
- 2 Select the **Clients** table in the Navigation Pane.
- 3 On the Create tab, in the Reports group, click the **Labels** button. The first *Label Wizard* dialog box appears.



- 4 Scroll down in the Product Number box, select **Avery USA 5160** and then click the **Next** button. The second *Label Wizard* dialog box appears.
- 5 Click the **Font name:** down arrow and scroll down to select **Times New Roman**. Notice the preview sample displays the new font.
- 6 Click the **Font size:** down arrow and then select **9**.
- 7 Click the **Font weight:** down arrow and then select **Normal**.
- 8 In the *Text color* section, click the **Ellipses** button to display the *Color* dialog box. Notice the options available, then click **Cancel** to close it.
- 9 Click the **Next** button. The third *Label Wizard* dialog box appears.
- 10 Select the **Company Name** field in the Available Fields list and then click the > button to place it on the Prototype label. Press **Enter**.
- 11 Type **ATTN:** and then press the **Spacebar**.
- 12 Select the **Contact First Name** field and then click the > button.
- 13 Press the **Spacebar** to insert a blank space between fields.

- 14 Select the **Contact Last Name** field and then click the > button. Press **Enter**.
- 15 Select the **Address** field and then click the > button. Press **Enter**.
- 16 Select the **City** field and then click the > button. Type, (a comma) and then press the **Spacebar**.
- 17 Select the **State** field and then click the > button. Press the **Spacebar**.
- 18 Select the **Zip** field and then click the > button.



- 19 Click **Next**. The fourth *Label Wizard* dialog box appears. It provides you with Sort by options.
- 20 Select the **Zip** field and then click the > button.
- 21 Click **Next**. The fifth *Label Wizard* dialog box appears.
- 22 Leave the default name, click the **Modify the label design** option button, and then click **Finish**.
- 23 On the Home tab, in the Views group, click the lower half of the **View** button and then select **Print Preview** from the menu.
- 24 Click the **Print** button. The *Print* dialog box appears. Click **OK** to print or click **Cancel** to close the dialog box.
- 25 **CLOSE** Print Preview and then **CLOSE** the report.
- 26 **CLOSE** the database and then **EXIT** Access.