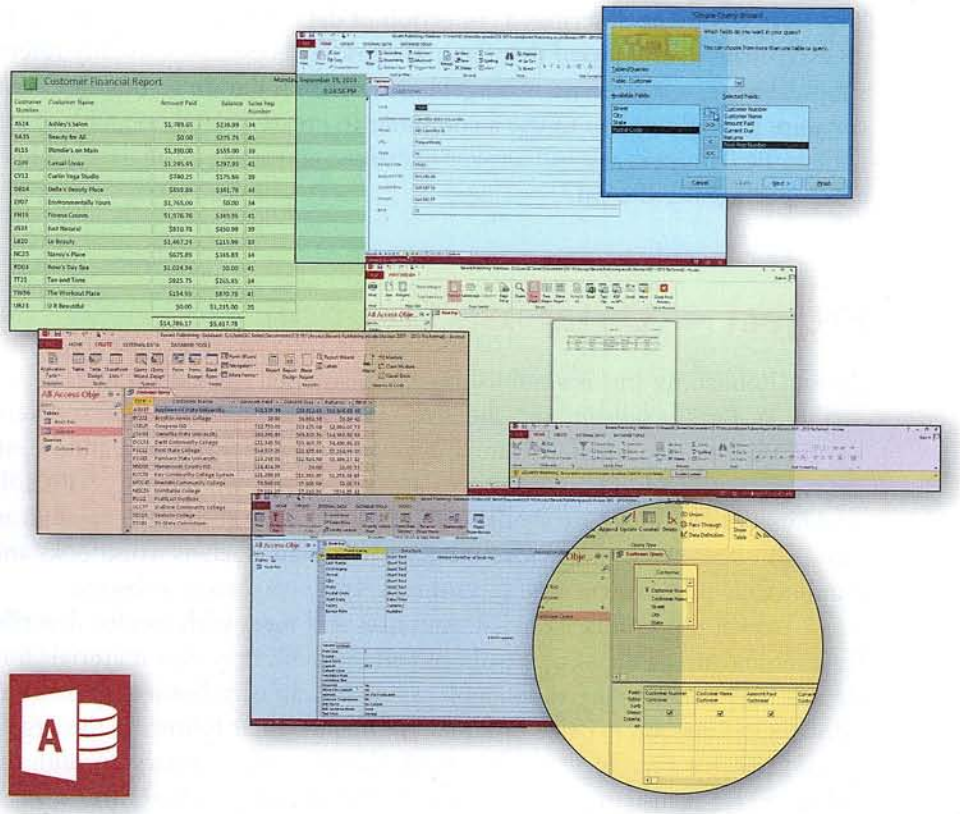
1 Databases and Database Objects: An Introduction



Microsoft product screenshots used with permission from Microsoft Corporation.

Objectives

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

- Describe the features of the Access window
- Create a database
- Create tables in Datasheet and Design views
- Add records to a table
- Close a database
- Open a database
- Print the contents of a table
- Create and use a query
- Create and use a form
- Create and print custom reports
- Modify a report in Layout view
- Perform special database operations
- Design a database to satisfy a collection of requirements

1 Databases and Database Objects: An Introduction

Introduction

The term **database** describes a collection of data organized in a manner that allows access, retrieval, and use of that data. Microsoft Access 2013, usually referred to as simply Access, is a database management system. A **database management system** is software that allows you to use a computer to create a database; add, change, and delete data in the database; ask and answer questions concerning the data; and create forms and reports using the data.

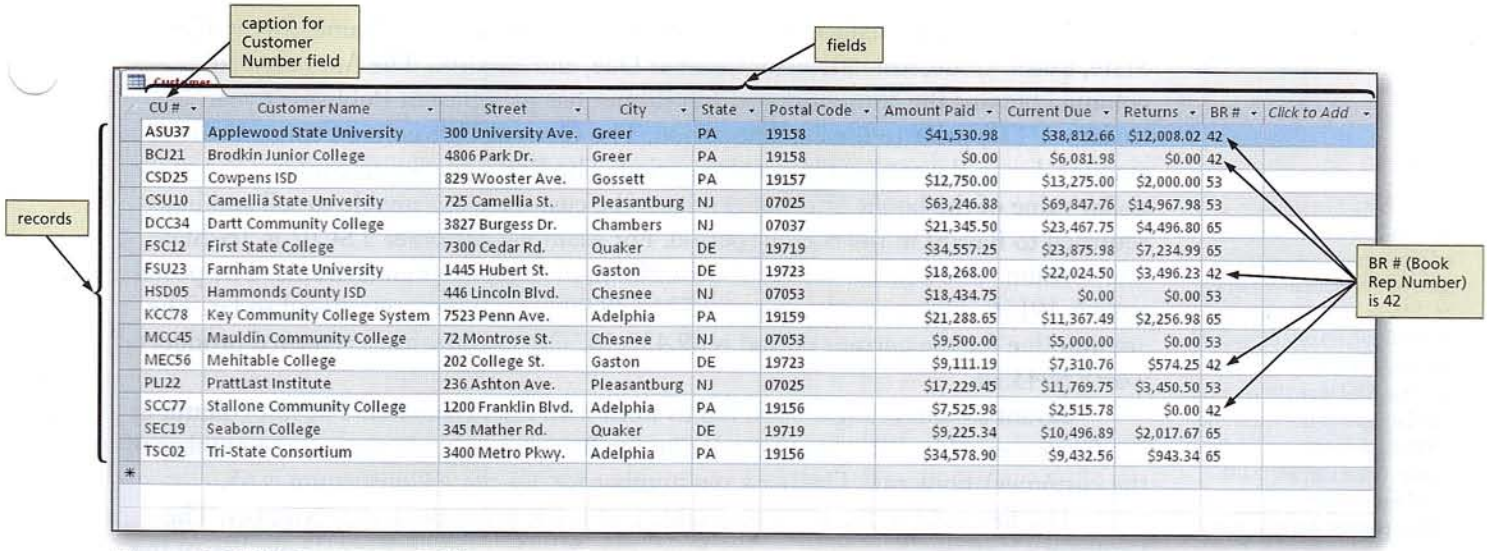
Project — Database Creation

Bavant Publishing Inc. is a publishing company that specializes in foreign language textbooks. Bavant sells in both the K-12 and the higher education markets. Recently, Bavant purchased a small, private publisher of Arabic, Russian, Chinese, and Japanese language textbooks. These languages are increasing in popularity with college students. All textbooks are available in hardcover and some are available as e-books. Bavant Publishing also provides ancillary materials, such as workbooks and laboratory manuals, video resources, audio resources, and companion websites.

Bavant representatives visit campuses and meet with faculty, describing the features and strengths of the textbooks and providing review materials for instructors. Bavant pays a base salary to its book reps, who can earn bonus pay based on exceeding sales goals. Customers place orders with the publisher following the organization's procedures; for example, colleges and universities place orders through their bookstores. Because institutions can cancel classes due to low enrollments, customers sometimes return unused books. At the end of an accounting period, these returns are subtracted from the current amount due.

Bavant wants to maintain records on the sales of textbooks from the newly acquired publisher separately from their other foreign language textbooks to better track profitability and market potential. Bavant organizes this data on its customers and book representatives in a database managed by Access. In this way, Bavant keeps its data current and accurate and can analyze it for trends and produce a variety of useful reports.

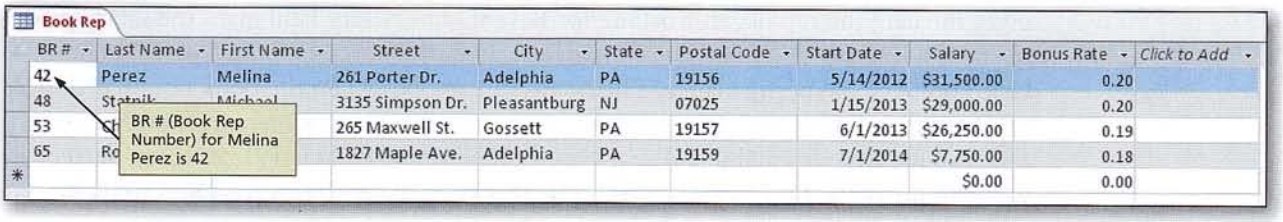
In a **relational database** such as those maintained by Access, a database consists of a collection of tables, each of which contains information on a specific subject. Figure 1–1 shows the database for Bavant Publishing. It consists of two tables: the Customer table (Figure 1–1a) contains information about Bavant customers, and the Book Rep table (Figure 1–1b) contains information about the book reps to whom these customers are assigned.



Customer

CU #	Customer Name	Street	City	State	Postal Code	Amount Paid	Current Due	Returns	BR #	Click to Add
ASU37	Applewood State University	300 University Ave.	Greer	PA	19158	$41,530.98	$38,812.66	$12,008.02	42	
BCJ21	Brodkin Junior College	4806 Park Dr.	Greer	PA	19158	$0.00	$6,081.98	$0.00	42	
CSD25	Cowpens ISD	829 Wooster Ave.	Gossett	PA	19157	$12,750.00	$13,275.00	$2,000.00	53	
CSU10	Camellia State University	725 Camellia St.	Pleasantburg	NJ	07025	$63,246.88	$69,847.76	$14,967.98	53	
DCC34	Dartt Community College	3827 Burgess Dr.	Chambers	NJ	07037	$21,345.50	$23,467.75	$4,496.80	65	
FSC12	First State College	7300 Cedar Rd.	Quaker	DE	19719	$34,557.25	$23,875.98	$7,234.99	65	
FSU23	Farnham State University	1445 Hubert St.	Gaston	DE	19723	$18,268.00	$22,024.50	$3,496.23	42	
HSD05	Hammonds County ISD	446 Lincoln Blvd.	Chesnee	NJ	07053	$18,434.75	$0.00	$0.00	53	
KCC78	Key Community College System	7523 Penn Ave.	Adelphia	PA	19159	$21,288.65	$11,367.49	$2,256.98	65	
MCC45	Mauldin Community College	72 Montrose St.	Chesnee	NJ	07053	$9,500.00	$5,000.00	$0.00	53	
MEC56	Mehitable College	202 College St.	Gaston	DE	19723	$9,111.19	$7,310.76	$574.25	42	
PLI22	PrattLast Institute	236 Ashton Ave.	Pleasantburg	NJ	07025	$17,229.45	$11,769.75	$3,450.50	53	
SCC77	Stallone Community College	1200 Franklin Blvd.	Adelphia	PA	19156	$7,525.98	$2,515.78	$0.00	42	
SEC19	Seaborn College	345 Mather Rd.	Quaker	DE	19719	$9,225.34	$10,496.89	$2,017.67	65	
TSC02	Tri-State Consortium	3400 Metro Pkwy.	Adelphia	PA	19156	$34,578.90	$9,432.56	$943.34	65	

Figure 1–1 (a) Customer Table



Book Rep

BR #	Last Name	First Name	Street	City	State	Postal Code	Start Date	Salary	Bonus Rate	Click to Add
42	Perez	Melina	261 Porter Dr.	Adelphia	PA	19156	5/14/2012	$31,500.00	0.20	
48	Statnik	Michael	3135 Simpson Dr.	Pleasantburg	NJ	07025	1/15/2013	$29,000.00	0.20	
53	Ch		265 Maxwell St.	Gossett	PA	19157	6/1/2013	$26,250.00	0.19	
65	Ro		1827 Maple Ave.	Adelphia	PA	19159	7/1/2014	$7,750.00	0.18	
								$0.00	0.00	

Figure 1–1 (b) Book Rep Table

The rows in the tables are called **records**. A record contains information about a given person, product, or event. A row in the Customer table, for example, contains information about a specific customer, such as the customer's name, address information, and other data.

The columns in the tables are called fields. A **field** contains a specific piece of information within a record. In the Customer table, for example, the fourth field, City, contains the name of the city where the customer is located.

The first field in the Customer table is CU #, which is an abbreviation for Customer Number. Bavant Publishing assigns each customer a number; the Bavant customer numbers consist of three uppercase letters followed by a two-digit number.

The customer numbers are unique; that is, no two customers have the same number. Such a field is a **unique identifier**. A unique identifier, as its name suggests, is a way of uniquely identifying each record in the database. A given customer number will appear only in a single record in the table. Only one record exists, for example, in which the customer number is TSC02. A unique identifier also is called a **primary key**. Thus, the Customer Number field is the primary key for the Customer table.

BTW

BTWs

For a complete list of the BTWs found in the margins of this book, visit the BTW resource on the Student Companion Site located on www.cengagebrain.com. For detailed instructions about accessing available resources, visit www.cengage.com/ct/studentdownload or contact your instructor for information about accessing the required files.

The next eight fields in the Customer table are Customer Name, Street, City, State, Postal Code, Amount Paid, Current Due, and Returns. The Amount Paid column contains the amount that the customer has paid Bavant Publishing year to date (YTD) prior to the current period. The Current Due column contains the amount due to Bavant for the current period. The Returns column contains the dollar value of the books or other products the customer was unable to sell and has returned to Bavant in the current period. For example, customer TSC02 is Tri-State Consortium. The address is 3400 Metro Pkwy., in Adelphia, Pennsylvania. The postal code is 19156. The customer has paid $34,578.90 for products purchased so far. The amount due for the current period is $9,432.56. The customer has returned products worth $943.34.

Bavant assigns a single book rep to work with each customer. The last column in the Customer table, BR # (an abbreviation for Book Rep Number) gives the number of the customer's book rep. The book rep number for Tri-State Consortium is 65.

The first field in the Book Rep table is also BR #, for Book Rep Number. The book rep numbers are unique, so the Book Rep Number field is the primary key of the Book Rep table.

The other fields in the Book Rep table are Last Name, First Name, Street, City, State, Postal Code, Start Date, Salary, and Bonus Rate. The Start Date field gives the date the rep began working for Bavant. The Salary field gives the salary paid to the rep thus far this year. The Bonus Rate gives the potential bonus percentage based on personal performance. The bonus rate applies when the book rep exceeds a predetermined sales goal. For example, book rep 65 is Tracy Rogers. Her address is 1827 Maple Ave., in Adelphia, Pennsylvania. The postal code is 19159. Tracy started working for Bavant on July 1, 2014. So far this year, she has been paid $7,750.00 in salary. Her bonus rate is 0.18 (18%).

The book rep number appears in both the Customer table and the Book Rep table, and relates customers and book reps. Book rep 48, Michael Statnik, recently transferred from another division of the company and has not yet been assigned any customers. His book rep number, therefore, does not appear on any row in the Customer table.

BTW

Naming Fields

Access 2013 has a number of reserved words, words that have a special meaning to Access. You cannot use these reserved words as field names. For example, Name is a reserved word and could not be used in the Customer table to describe a customer's name. For a complete list of reserved words in Access 2013, consult Access Help.

CONSIDER THIS

How would you find the name of the book rep for Tri-State Consortium?

In the Customer table, you see that the book rep number for customer Tri-State Consortium is 65. To find the name of this book rep, look for the row in the Book Rep table that contains 65 in the BR # column. After you have found it, you know that the book rep for Tri-State Consortium is Tracy Rogers.

CONSIDER THIS

How would you find all the customers assigned to Tracy Rogers?

First, look in the Book Rep table to find that her number is 65. You would then look through the Customer table for all the customers that contain 65 in the BR # column. Tracy's customers are DCC34 (Dartt Community College), FSC12 (First State College), KCC78 (Key Community College System), SEC19 (Seaborn College), and TSC02 (Tri-State Consortium).

Roadmap

In this chapter, you will learn how to create and use the database shown in Figure 1–1 on page AC 3. The following roadmap identifies general activities you will perform as you progress through this chapter:

1. CREATE the FIRST TABLE, Book Rep, using Datasheet view.
2. ADD RECORDS to the Book Rep table.
3. PRINT the CONTENTS of the Book Rep table.
4. IMPORT RECORDS into the second table, Customer.
5. MODIFY the SECOND TABLE using Design view.
6. CREATE a QUERY for the Customer table.
7. CREATE a FORM for the Customer table.
8. CREATE a REPORT for the Customer table.

At the beginning of step instructions throughout the chapter, you will see an abbreviated form of this roadmap. The abbreviated roadmap uses colors to indicate chapter progress: gray means the chapter is beyond that activity, blue means the task being shown is covered in that activity, and black means that activity is yet to be covered. For example, the following abbreviated roadmap indicates the chapter would be showing a task in the 3 PRINT CONTENTS activity.

1 CREATE FIRST TABLE | 2 ADD RECORDS | 3 PRINT CONTENTS | 4 IMPORT RECORDS | 5 MODIFY SECOND TABLE
6 CREATE QUERY | 7 CREATE FORM | 8 CREATE REPORT

Use the abbreviated roadmap as a progress guide while you read or step through the instructions in this chapter.

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

To Run Access

If you are using a computer to step through the project in this chapter and you want your screens to match the figures in this book, you should change your screen's resolution to 1366 × 768. For information about how to change a computer's resolution, refer to the Office and Windows chapter at the beginning of this book.

The following steps, which assume Windows is running, use the Start screen or the search box to run Access based on a typical installation. You may need to ask your instructor how to run Access on your computer. For a detailed example of the procedure summarized below, refer to the Office and Windows chapter.

1. Scroll the Start screen for an Access 2013 tile. If your Start screen contains an Access 2013 tile, tap or click it to run Access and then proceed to Step 5; if the Start screen does not contain the Access 2013 tile, proceed to the next step to search for the Access app.
2. Swipe in from the right edge of the screen or point to the upper-right corner of the screen to display the Charms bar, and then tap or click the Search charm on the Charms bar to display the Search menu.
3. Type `Access` as the search text in the Search box and watch the search results appear in the Apps list.
4. Tap or click Access 2013 in the search results to run Access.
5. If the Access window is not maximized, tap or click the Maximize button on its title bar to maximize the window.

For an introduction to Office and instruction about how to perform basic tasks in Office apps, read the Office and Windows chapter at the beginning of this book, where you can learn how to run an application, use the ribbon, save a file, open a file, exit an application, use Help, and much more.

One of the few differences between Windows 7 and Windows 8 occurs in the steps to run Access. If you are using Windows 7, click the Start button, type `Access` in the 'Search programs and files' box, click Access 2013, and then, if necessary, maximize the Access window. For detailed steps to run Access in Windows 7, refer to the Office and Windows chapter at the beginning of this book. For a summary of the steps, refer to the Quick Reference located at the back of this book.

Creating a Database

In Access, all the tables, reports, forms, and queries that you create are stored in a single file called a database. Thus, you first must create the database to hold the tables, reports, forms, and queries. You can use either the Blank desktop database option or a template to create a new database. If you already know the tables and fields you want in your database, you would use the Blank desktop database option. If not, you can use a template. Templates can guide you by suggesting some commonly used databases.

To Create a Database

Because you already know the tables and fields you want in the Bavant Publishing database, you would use the Blank desktop database option rather than using a template. The following steps assume you already have created folders for storing your files, for example, a CIS 101 folder (for your class) that contains an Access folder (for your assignments). Thus, these steps save the database in the Access folder in the CIS 101 folder on your desired save location. For a detailed example of the procedure for saving a file in a folder or saving a file on SkyDrive, refer to the Office and Windows chapter at the beginning of this book.

1. Tap or click the 'Blank desktop database' thumbnail to select the database type.
2. Type `Bavant Publishing` in the File Name text box to enter the new file name. Do not press the ENTER key after typing the file name because you do not want to create the database at this time.
3. Tap or click the 'Browse for a location to put your database' button to display the File New Database dialog box.
4. Navigate to the location for the database, for example, the Documents library, the My Documents folder, the folder identifying your class (CIS 101, in this case), and then to the Access folder.
5. Tap or click the OK button (File New Database dialog box) to select the location for the database and close the dialog box.
6. Tap or click the Create button to create the database on the selected drive in the selected folder with the file name, Bavant Publishing (Figure 1–2).

Q&A

The title bar for my Navigation Pane contains All Tables rather than All Access Objects, as in the figure. Is that a problem?
It is not a problem. The title bar indicates how the Navigation Pane is organized. You can carry out the steps in the text with either organization. To make your screens match the ones in the text, tap or click the Navigation Pane arrow and then tap or click Object Type.

I do not have the Search bar that appears on the figure. Is that a problem?
It is not a problem. If your Navigation Pane does not display a Search bar and you want your screens to match the ones in the text, press and hold or right-click the Navigation Pane title bar arrow to display a shortcut menu, and then tap or click Search Bar.

BTW
Organizing Files and Folders
You should organize and store files in folders so that you easily can find the files later. For example, if you are taking an introductory computer class called CIS 101, a good practice would be to save all Access files in an Access folder in a CIS 101 folder. For a discussion of folders and detailed examples of creating folders, refer to the Office and Windows chapter at the beginning of this book.

BTW
Q&As
For a complete list of the Q&As found in many of the step-by-step sequences in this book, visit the Q&A resource on the Student Companion Site located on www.cengagebrain.com. For detailed instructions about accessing available resources, visit www.cengage.com/ct/studentdownload or contact your instructor for information about accessing the required files.

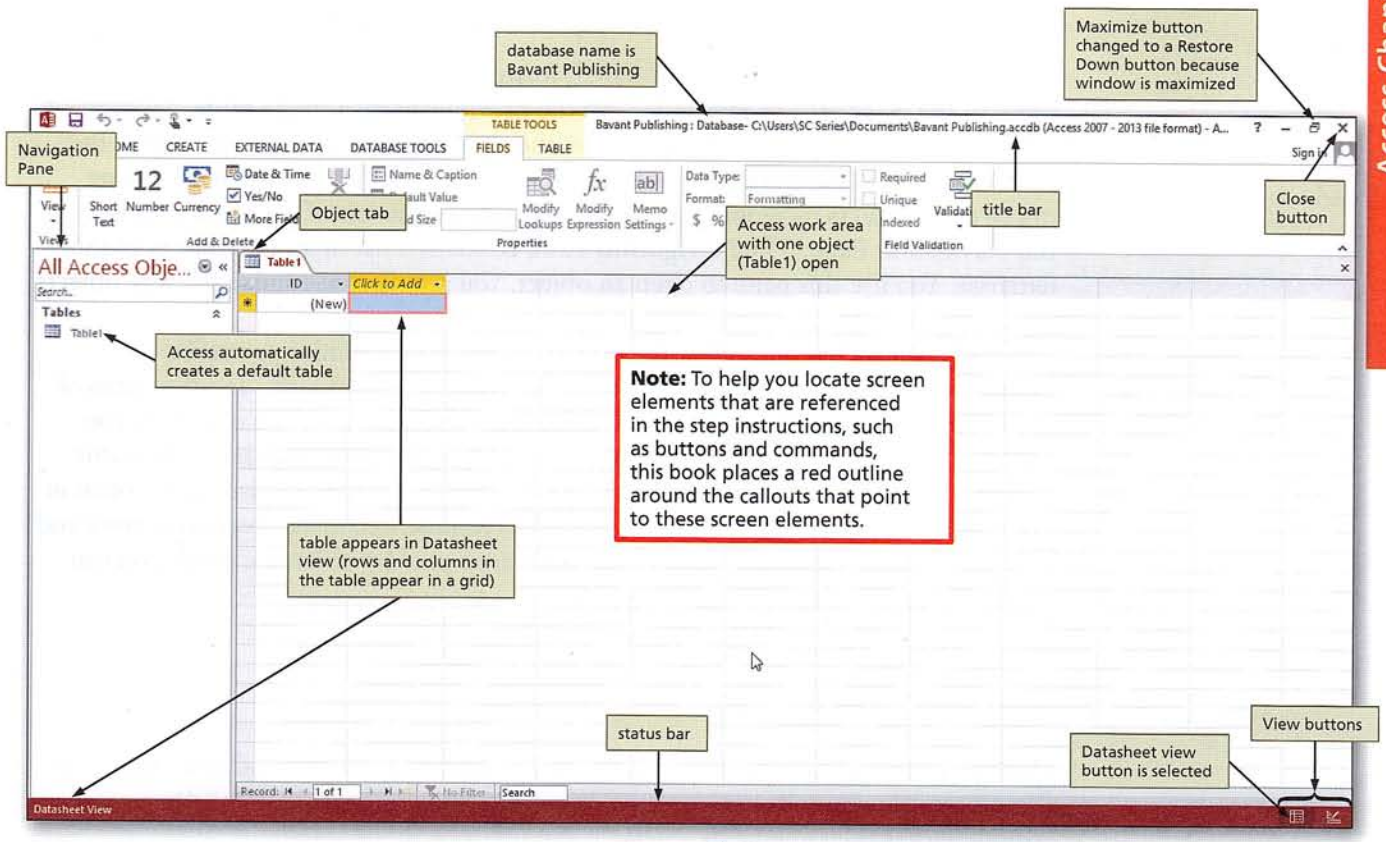


Figure 1–2

To Create a Database Using a Template

Ideally, you will design your own database, create a blank database, and then create the tables you have determined that your database should contain. If you are not sure what database design you will need, you could use a template. Templates can guide you by suggesting some commonly used databases. To create a database using a template, you would use the following steps.

1. If you have another database open, close it without exiting Access by tapping or clicking FILE on the ribbon to open the Backstage view and then tapping or clicking Close.
2. If you do not see a template that you want, you can search Microsoft Office online for additional templates.
3. Tap or click the template you want to use. Be sure you have selected one that indicates it is for a desktop database.
4. Enter a file name and select a location for the database.
5. Tap or click the Create button to create the database.

BTW

Naming Files

The following characters cannot be used in a file name: question mark (?), quotation mark ("), slash (/), backslash (\ ), colon (:), asterisk (*), vertical bar (|), greater than symbol (>), and less than symbol (<).

BTW

Available Templates

The templates gallery includes both desktop and web-based templates. If you are creating an Access database for your own use, select a desktop template. Web-based templates allow you to create databases that you can publish to a SharePoint server.

The Access Window

The Access window consists of a variety of components to make your work more efficient. These include the Navigation Pane, Access work area, ribbon, shortcut menus, and Quick Access Toolbar. Some of these components are common to other Microsoft Office apps; others are unique to Access.

Navigation Pane and Access Work Area

BTW
The Ribbon and Screen Resolution
Access may change how the groups and buttons within the groups appear on the ribbon, depending on the computer's screen resolution. Thus, your ribbon may look different from the ones in this book if you are using a screen resolution other than 1366 × 768.

You work on objects such as tables, forms, and reports in the **Access work area**. In the work area in Figure 1–2 on the previous page, a single table, Table1, is open in the work area. **Object tabs** for the open objects appear at the top of the work area. If you have multiple objects open at the same time, you can select one of the open objects by tapping or clicking its tab. To the left of the work area is the Navigation Pane. The **Navigation Pane** contains a list of all the objects in the database. You use this pane to open an object. You also can customize the way objects are displayed in the Navigation Pane.

The **status bar**, located at the bottom of the Access window, presents information about the database object, the progress of current tasks, and the status of certain commands and keys; it also provides controls for viewing the object. As you type text or perform certain commands, various indicators may appear on the status bar. The left edge of the status bar in Figure 1–2 shows that the table object is open in **Datasheet view**. In Datasheet view, the table is represented as a collection of rows and columns called a **datasheet**. Toward the right edge are View buttons, which you can use to change the view that currently appears.

Determining Tables and Fields

Once you have created the database, you need to create the tables and fields that your database will contain. Before doing so, however, you need to make some decisions regarding the tables and fields.

Naming Tables and Fields

BTW
Naming Tables
Database users typically have their own guidelines for naming tables. Some use the singular version of the object being described while others use the prefix tbl with a table name. This book uses the singular version of the object (Customer, Book Rep).

In creating your database, you must name tables and fields. Before beginning the design process, you must understand the rules Access applies to table and field names. These rules are:

1. Names can be up to 64 characters in length.
2. Names can contain letters, digits, and spaces, as well as most of the punctuation symbols.
3. Names cannot contain periods (.), exclamation points (!), accent graves (`), or square brackets ([ ]).
4. Each field in a table must have a unique name.

BTW
Multiple-Word Names
There are several ways to handle multiple word names. You can omit the space (CustomerNumber) or use an underscore in place of the space (Customer_Number). Another option is to use an underscore in place of a space, but use the same case for all letters (CUSTOMER_NUMBER or customer_number).

The approach to naming tables and fields used in this text is to begin the names with an uppercase letter and to use lowercase for the other letters. In multiple-word names, each word begins with an uppercase letter, and there is a space between words (for example, Customer Number).

Determining the Primary Key

For each table, you need to determine the primary key, the unique identifier. In many cases, you will have obvious choices, such as Customer Number or Book Rep Number. If you do not have an obvious choice, you can use the primary key that Access creates automatically. It is a field called ID. It is an autonumber field, which means that Access will assign the value 1 to the first record, 2 to the second record, and so on.

Determining Data Types for the Fields

For each field in your database, you must determine the field's **data type**, that is, the type of data that can be stored in the field. Four of the most commonly used data types in Access are:

1. **Short Text** — The field can contain any characters. A maximum number of 255 characters is allowed in a field whose data type is Short Text.
2. **Number** — The field can contain only numbers. The numbers can be either positive or negative. Fields assigned this type can be used in arithmetic operations. You usually assign fields that contain numbers but will not be used for arithmetic operations (such as postal codes) a data type of Short Text.
3. **Currency** — The field can contain only monetary data. The values will appear with currency symbols, such as dollar signs, commas, and decimal points, and with two digits following the decimal point. Like numeric fields, you can use currency fields in arithmetic operations. Access assigns a size to currency fields automatically.
4. **Date & Time** — The field can store dates and/or times.

Table 1–1 shows the other data types that are available in Access.

BTW
Text Data Types
Short Text replaces the Text data type in previous editions of Access. Long Text replaces the Memo data type in previous editions.

BTW
Data Types
Different database management systems have different available data types. Even data types that are essentially the same can have different names. The Currency data type in Access, for example, is referred to as Money in SQL Server.

Table 1–1 Additional Data Types

Data Type	Description
Long Text	Field can store a variable amount of text or combinations of text and numbers where the total number of characters may exceed 255.
AutoNumber	Field can store a unique sequential number that Access assigns to a record. Access will increment the number by 1 as each new record is added.
Yes/No	Field can store only one of two values. The choices are Yes/No, True/False, or On/Off.
OLE Object	Field can store an OLE object, which is an object linked to or embedded in the table.
Hyperlink	Field can store text that can be used as a hyperlink address.
Attachment	Field can contain an attached file. Images, spreadsheets, documents, charts, and other elements can be attached to this field in a record in the database. You can view and edit the attached file.
Calculated	Field specified as a calculation based on other fields. The value is not actually stored.

In the Customer table, because the Customer Number, Customer Name, Street, City, and State all can contain letters, their data types should be Short Text. The data type for Postal Code is Short Text instead of Number because you typically do not use postal codes in arithmetic operations; you do not add postal codes or find an average postal code, for example. The Amount Paid, Current Due, and Returns fields contain monetary data, so their data types should be Currency. The Book Rep Number field contains numbers, but you will not use these numbers in arithmetic operations, so its type should be Short Text.

Similarly, in the Book Rep table, the data type for the Book Rep Number, Last Name, First Name, Street, City, State, and Postal Code fields all should be Short Text. The Start Date field should be Date & Time. The Salary field contains monetary amounts, so its data type should be Currency. The Bonus Rate field contains numbers that are not dollar amounts, so its data type should be Number.

For fields whose type is Short Text, you can change the field size, that is, the maximum number of characters that can be entered in the field. If you set the field size for the State field to 2, for example, Access will not allow the user to enter more than two characters in the field. On the other hand, fields whose data type is Number often

BTW
AutoNumber Fields
AutoNumber fields also are called AutoIncrement fields. In Design view, the New Values field property allows you to increment the field sequentially (Sequential) or randomly (Random). The default is sequential.

require you to change the field size, which is the storage space assigned to the field by Access. Table 1–2 shows the possible field sizes for Number fields.

Table 1–2 Field Sizes for Number Fields

Field Size	Description
Byte	Integer value in the range of 0 to 255
Integer	Integer value in the range of -32,768 to 32,767
Long Integer	Integer value in the range of -2,147,483,648 to 2,147,483,647
Single	Numeric values with decimal places to seven significant digits — requires 4 bytes of storage
Double	Numeric values with decimal places to more accuracy than Single — requires 8 bytes of storage
Replication ID	Special identifier required for replication
Decimal	Numeric values with decimal places to more accuracy than Single or Double — requires 12 bytes of storage

CONSIDER THIS

What is the appropriate size for the Bonus Rate field?

If the size were Byte, Integer, or Long Integer, only integers could be stored. If you try to store a value that has decimal places, such as 0.18, in fields of these sizes, the portion to the right of the decimal point would be removed, giving a result of 0. To address this problem, the bonus rate should have a size of Single, Double, or Decimal. With such small numbers involved, Single, which requires the least storage of the three, is the appropriate choice.

Creating a Table

BTW

On Screen Keyboard

To display the on-screen touch keyboard, tap the Touch Keyboard button on the Windows taskbar. When finished using the touch keyboard, tap the X button on the touch keyboard to close the keyboard.

To create a table in Access, you must define its structure. That is, you must define all the fields that make up the table and their characteristics. You also must indicate the primary key.

In Access, you can use two different views to create a table: Datasheet view and Design view. In **Datasheet view**, the data in the table is presented in rows and columns, similar to a spreadsheet. Although the main reason to use Datasheet view is to add or update records in a table, you also can use it to create a table or to later modify its structure. The other view, **Design view**, is only used to create a table or to modify the structure of a table.

As you might expect, Design view has more functionality for creating a table than Datasheet view. That is, there are certain actions that only can be performed in Design view. One such action is assigning Single as the field size for the Bonus Rate field. In this chapter, you will create the first table, the Book Rep table, in Datasheet view. Once you have created the table in Datasheet view, you will use Design view to change the field size.

Whichever view you choose to use, before creating the table, you need to know the names and data types of the fields that will make up the table. You also can decide to enter a **description** for a particular field to explain important details about the field. When you select this field, this description will appear on the status bar. You also might choose to assign a **caption** to a particular field. If you assign a caption, Access will display the value you assign, rather than the field name, in datasheets and in forms. If you do not assign a caption, Access will display the field name.

CONSIDER THIS

When would you want to use a caption?

You would use a caption whenever you want something other than the field name displayed. One common example is when the field name is relatively long and the data in the field is relatively short. In the Book Rep table, the name of the first field is Book Rep Number, but the field contains data that is only two characters long. You will change the caption for this field to BR #, which is much shorter than Book Rep Number yet still describes the field. Doing so will enable you to greatly reduce the width of the column.

The results of these decisions for the fields in the Book Rep table are shown in Table 1–3. The table also shows the data types and field sizes of the fields as well as any special properties that need to be changed. The Book Rep Number field has a caption of BR #, enabling the width of the Book Rep Number column to be reduced in the datasheet.

Table 1–3 Structure of Book Rep Table

Field Name	Data Type	Field Size	Notes
Book Rep Number	Short Text	2	Primary Key **Description:** Unique identifier of book rep **Caption:** BR #
Last Name	Short Text	15	
First Name	Short Text	15	
Street	Short Text	20	
City	Short Text	20	
State	Short Text	2	
Postal Code	Short Text	5	
Start Date	Date/Time		(This appears as Date & Time on the menu of available data types)
Salary	Currency		
Bonus Rate	Number	Single	Format: Fixed Decimal Places: 2

If you are using your finger on a touch screen and are having difficulty completing the steps in this chapter, consider using a stylus. Many people find it easier to be precise with a stylus than with a finger. In addition, with a stylus you see the pointer. If you still are having trouble completing the steps with a stylus, try using a mouse.

CONSIDER THIS

How do you determine the field size?

You need to determine the maximum number of characters that can be entered in the field. In some cases, it is obvious. Field sizes of 2 for the State field and 5 for the Postal Code field are certainly the appropriate choices. In other cases, you need to determine how many characters you wish to allow. In the list shown in Table 1–3, Bavant evidently decided allowing 15 characters was sufficient for last names. This field size can be changed later if it proves to be insufficient.

CONSIDER THIS

What is the purpose of the Format and Decimal Places properties?

The format guarantees that bonus rates will be displayed with a fixed number of decimal places. Setting the decimal places property to 2 guarantees that the rates will be displayed with precisely two decimal places. Thus, a bonus rate of 0.2 will be displayed as 0.20.

To Modify the Primary Key

1 CREATE FIRST TABLE | 2 ADD RECORDS | 3 PRINT CONTENTS | 4 IMPORT RECORDS | 5 MODIFY SECOND TABLE | 6 CREATE QUERY | 7 CREATE FORM | 8 CREATE REPORT

When you first create your database, Access automatically creates a table for you. You can immediately begin defining the fields. If, for any reason, you do not have this table or inadvertently delete it, you can create the table by tapping or clicking CREATE on the ribbon and then tapping or clicking the Table button (CREATE tab | Tables group). In either case, you are ready to define the fields.

The steps on the next page change the name, data type, and other properties of the first field to match the Book Rep Number field in Table 1–3, which is the primary key. ***Why?*** *Access has already created the first field as the primary key field, which it has named ID. Book Rep Number is a more appropriate choice.*

1

- Press and hold or right-click the column heading for the ID field to display a shortcut menu (Figure 1–3).

Q&A Why does my shortcut menu look different?
You displayed a shortcut menu for the column instead of the column heading. Be sure you press and hold or right-click the column heading.

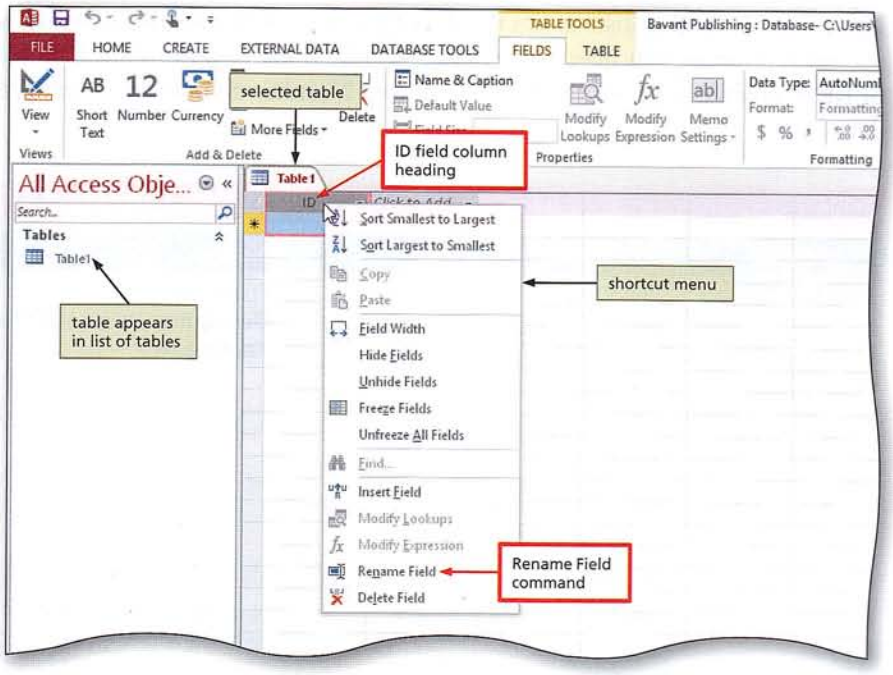


Figure 1–3

2

- Tap or click Rename Field on the shortcut menu to highlight the current name.
- Type `Book Rep Number` to assign a name to the new field.
- Tap or click the white space immediately below the field name to complete the addition of the field (Figure 1–4).

Q&A Why does the full name of the field not appear?
The default column size is not large enough for Book Rep Number to be displayed in its entirety. You will address this issue in later steps.

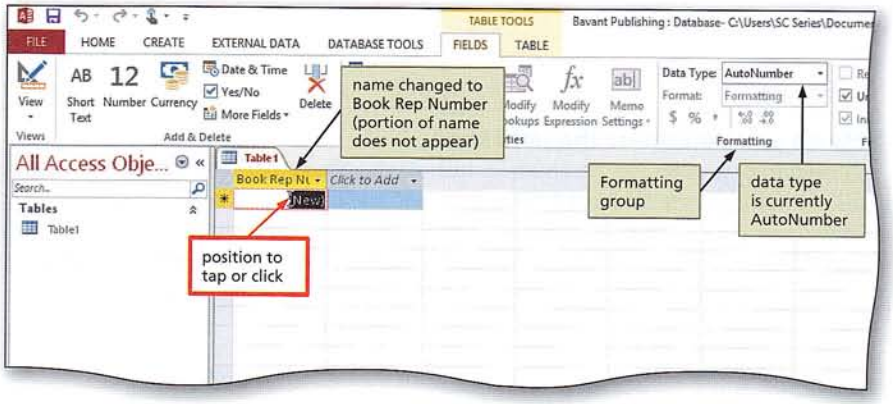


Figure 1–4

3

- Because the data type needs to be changed from AutoNumber to Short Text, tap or click the Data Type arrow (TABLE TOOLS FIELDS tab | Formatting group) to display a menu of available data types (Figure 1–5).

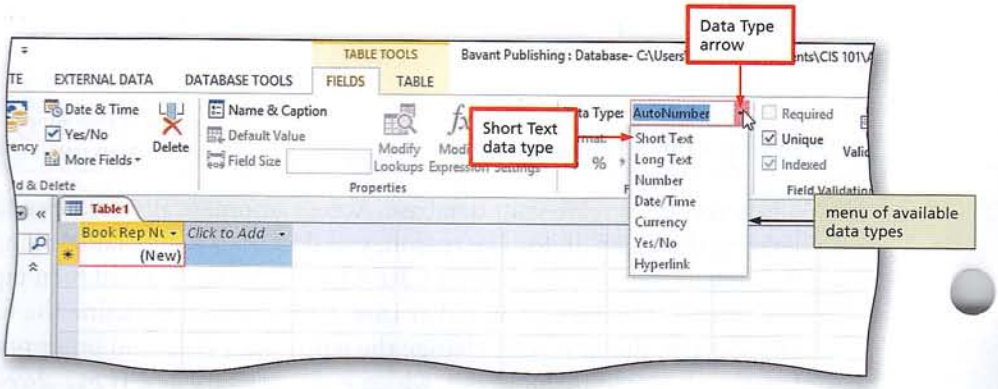


Figure 1–5

4

- Tap or click Short Text to select the data type for the field (Figure 1–6).

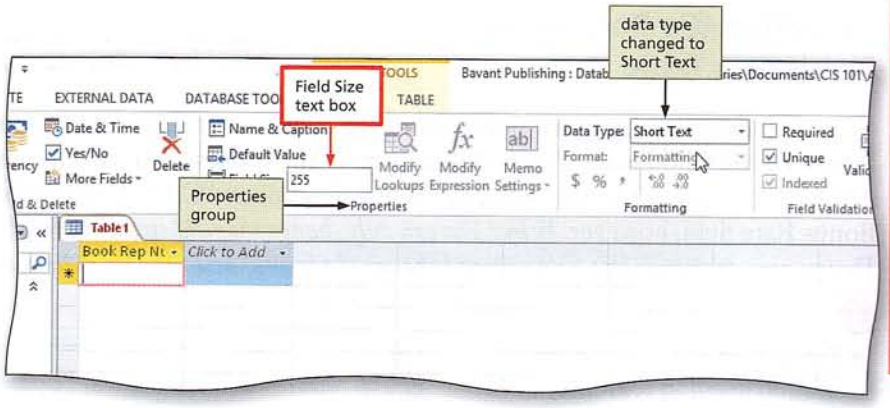


Figure 1–6

5

- Tap or click the Field Size text box (TABLE TOOLS FIELDS tab | Properties group) to select the current field size, use either the DELETE or BACKSPACE keys to erase the current field size, if necessary, and then type `2` as the new field size.
- Tap or click the Name & Caption button (TABLE TOOLS FIELDS tab | Properties group) to display the Enter Field Properties dialog box.
- Tap or click the Caption text box (Enter Field Properties dialog box), and then type `BR #` as the caption.
- Tap or click the Description text box, and then type `Unique identifier of book rep` as the description (Figure 1–7).

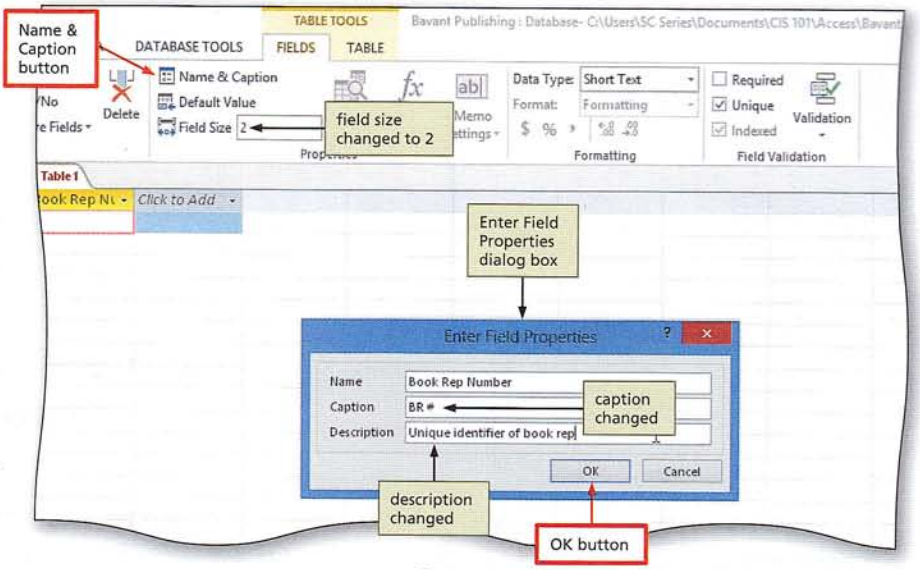


Figure 1–7

6

- Tap or click the OK button (Enter Field Properties dialog box) to change the caption and description (Figure 1–8).

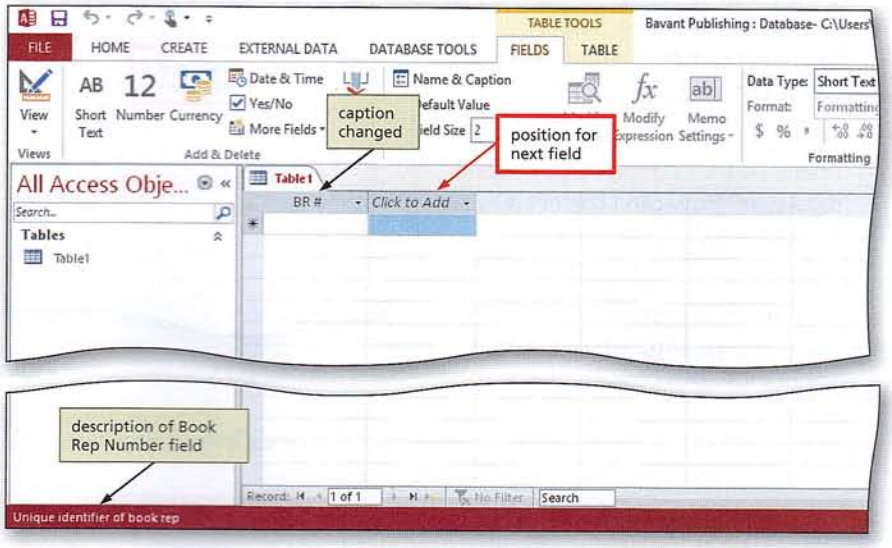


Figure 1–8

To Define the Remaining Fields in a Table

To define an additional field, you tap or click the Click to Add column heading, select the data type, and then type the field name. This is different from the process you used to modify the ID field. The following steps define the remaining fields shown in Table 1–3 on page AC 11. These steps do not change the field size of the Bonus Rate field, however. ***Why?*** *You can only change the field size of a Number field in Design view. Later, you will use Design view to change this field size and change the format and number of decimal places.*

1

- Tap or click the 'Click to Add' column heading to display a menu of available data types (Figure 1–9).

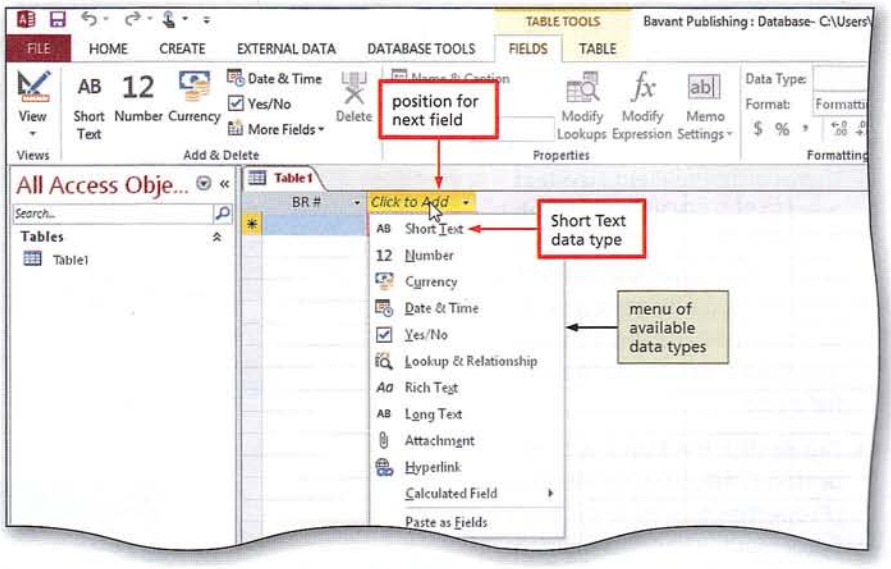


Figure 1–9

2

- Tap or click Short Text in the menu of available data types to select the Short Text data type.
- Type `Last Name` to enter a field name.
- Tap or click the blank space below the field name to complete the change of the name. Tap or click the blank space a second time to select the field (Figure 1–10).

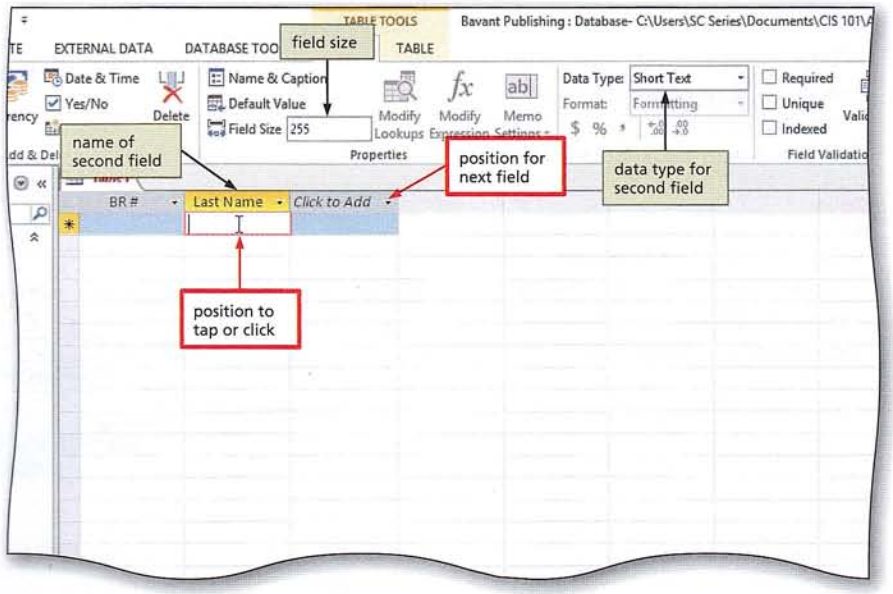


Figure 1–10

Q&A

After entering the field name, I realized that I selected the wrong data type. How can I correct it?

Tap or click the Data Type arrow, and then select the correct type.

I inadvertently clicked the blank space before entering the field name. How can I correct the name?

Press and hold or right-click the field name, tap or click Rename Field on the shortcut menu, and then type the new name.

3

- Change the field size to 15 just as you changed the field size of the Book Rep Number field.
- Using the same technique, add the remaining fields in the Book Rep table. For the First Name, Street, City, State, and Postal Code fields, use the Short Text data type, but change the field sizes to match Table 1–3 on page AC 11. For the Start Date field, change the data type to Date & Time. For the Salary field, change the data type to Currency. For the Bonus Rate field, change the data type to Number (Figure 1–11).

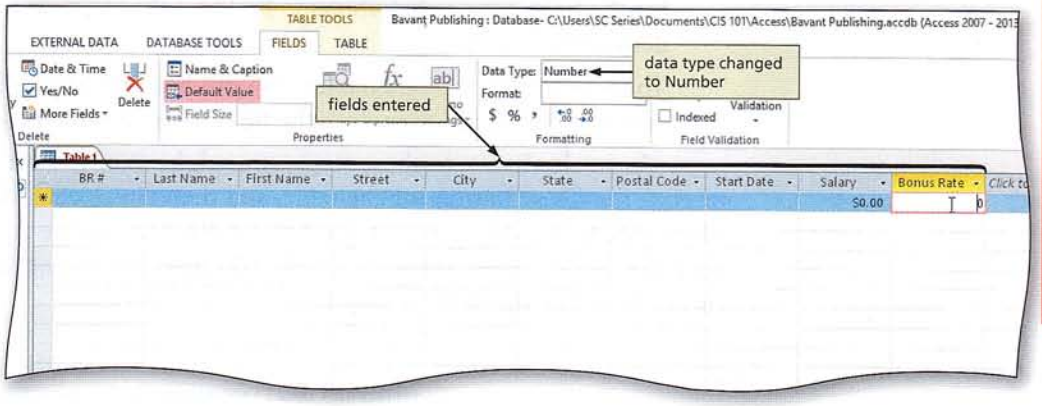


Figure 1–11

Q&A

I have an extra row between the row containing the field names and the row that begins with the asterisk. What happened? Is this a problem? If so, how do I fix it?
You inadvertently added a record to the table by pressing a key. Even pressing the SPACEBAR would add a record. You now have an unwanted record. To fix it, press the ESC key or tap or click the Undo button to undo the action. You may need to do this more than once.

When I try to move on to specify another field, I get an error message indicating that the primary key cannot contain a null value. How do I correct this?
First, tap or click the OK button to remove the error message. Next, press the ESC key or tap or click the Undo button to undo the action. You may need to do this more than once.

BTW

Currency Symbols

To show the symbol for the Euro (€) instead of the dollar sign, change the Format property for the field whose data type is currency. To change the default symbols for currency, change the settings in Windows.

Making Changes to the Structure

When creating a table, check the entries carefully to ensure they are correct. If you discover a mistake while still typing the entry, you can correct the error by repeatedly pressing the BACKSPACE key until the incorrect characters are removed. Then, type the correct characters. If you do not discover a mistake until later, you can use the following techniques to make the necessary changes to the structure:

- To undo your most recent change, tap or click the Undo button on the Quick Access Toolbar. If there is nothing that Access can undo, this button will be dim, and tapping or clicking it will have no effect.
- To delete a field, press and hold or right-click the column heading for the field (the position containing the field name), and then tap or click Delete Field on the shortcut menu.
- To change the name of a field, press and hold or right-click the column heading for the field, tap or click Rename Field on the shortcut menu, and then type the desired field name.
- To insert a field as the last field, tap or click the 'Click to Add' column heading, tap or click the appropriate data type on the menu of available data types, type the desired field name, and, if necessary, change the field size.
- To insert a field between existing fields, press and hold or right-click the column heading for the field that will follow the new field, and then tap or click Insert

BTW

Touch Screen Differences

The Office and Windows interfaces may vary if you are using a touch screen. For this reason, you might notice that the function or appearance of your touch screen differs slightly from this chapter's presentation.

Field on the shortcut menu. Press and hold or right-click the column heading for the field, tap or click Rename Field on the shortcut menu, and then type the desired field name.

- To move a field, tap or click the column heading for the field to be moved to select the field, and then drag the field to the desired position.

As an alternative to these steps, you might want to start over. To do so, tap or click the Close button for the table, and then tap or click the No button in the Microsoft Access dialog box. Tap or click CREATE on the ribbon, and then tap or click the Table button to create a table. You then can repeat the process you used earlier to define the fields in the table.

To Save a Table

The Book Rep table structure is complete. The final step is to save the table within the database. As part of the process, you will give the table a name. The following steps save the table, giving it the name Book Rep. *Why? Bavant has decided that Book Rep is an appropriate name for the table.*

1

- Tap or click the Save button on the Quick Access Toolbar to display the Save As dialog box (Figure 1–12).

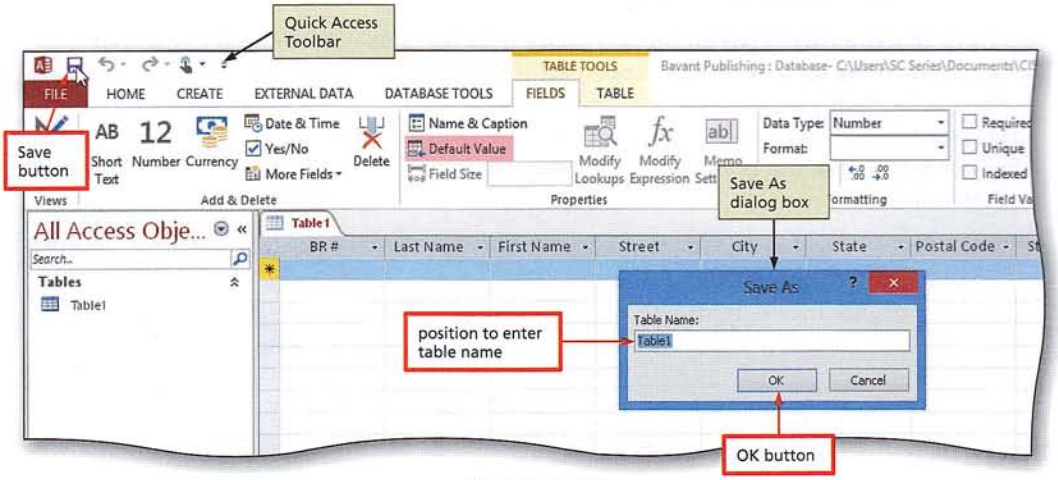


Figure 1–12

2

- Type `Book Rep` to change the name assigned to the table.
- Tap or click the OK button (Save As dialog box) to save the table (Figure 1–13).

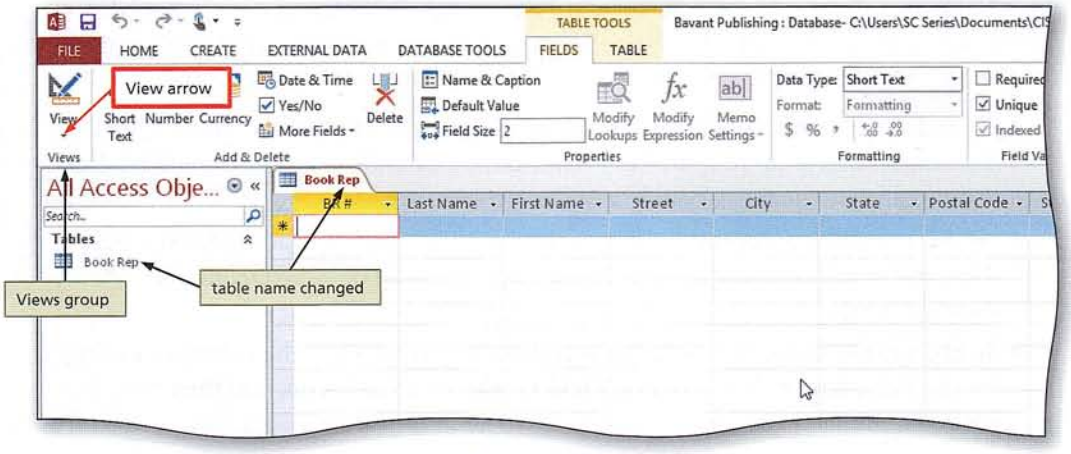


Figure 1–13

Other Ways

1. Tap or click FILE on the ribbon, tap or click Save in the Backstage view
2. Press and hold or right-click tab for table, tap or click Save on shortcut menu
3. Press CTRL+S

To View the Table in Design View

Even when creating a table in Datasheet view, Design view can be helpful. ***Why?*** *You easily can view the fields, data types, and properties to ensure you have entered them correctly. It is also easier to determine the primary key in Design view.* The following steps display the structure of the Book Rep table in Design view so that you can verify the design is correct.

1

- Tap or click the View arrow (TABLE TOOLS FIELDS tab | Views group) to display the View menu (Figure 1–14).

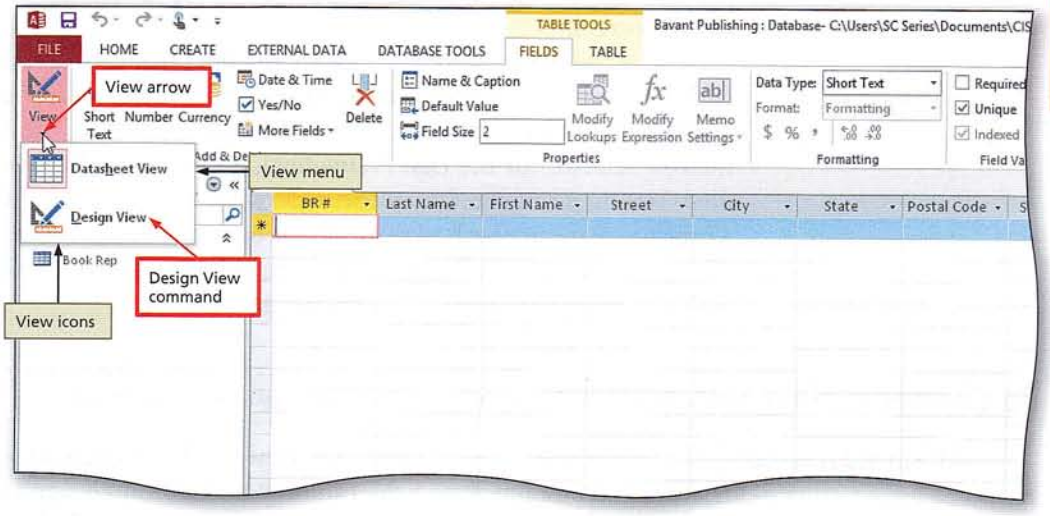


Figure 1–14

Q&A Could I just tap or click the View button rather than the arrow?

Yes. Tapping or clicking the button is equivalent to tapping or clicking the command represented by the icon currently appearing on the button. Because the icon on the button in Figure 1–14 is for Design view, tapping or clicking the button would display the table in Design view. If you are uncertain, you can always tap or click the arrow and select from the menu.

2

- Tap or click Design View on the View menu to view the table in Design view (Figure 1–15).

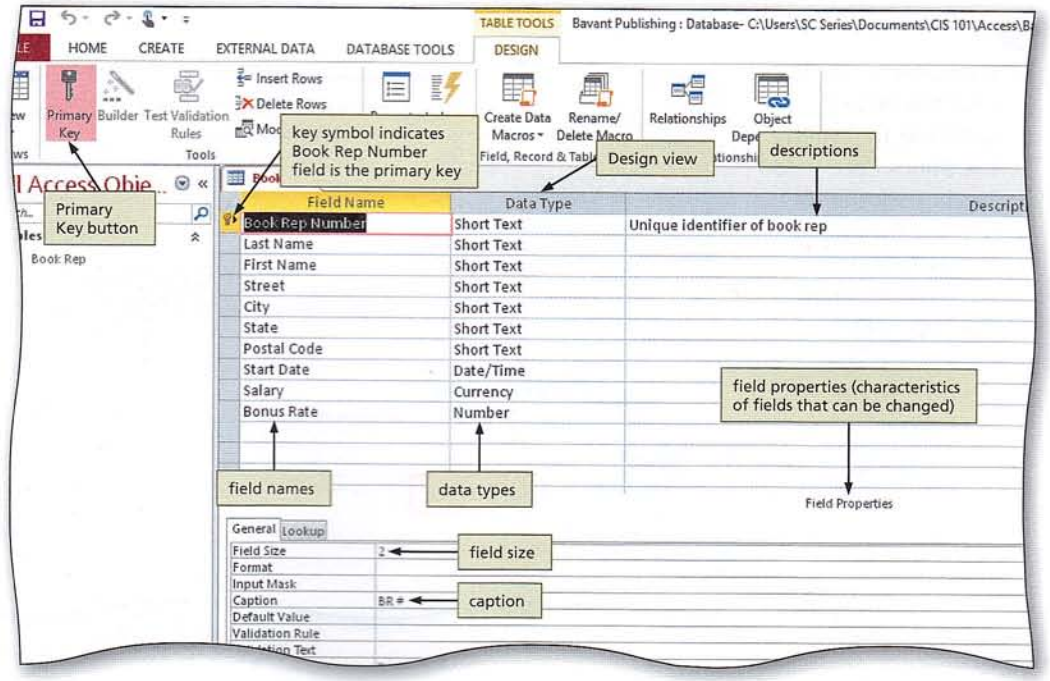


Figure 1–15

Other Ways

1. Tap or click Design View button on status bar

Checking the Structure in Design View

You should use Design view to carefully check the entries you have made. In Figure 1–15 on the previous page, for example, you can see that the Book Rep Number field is the primary key of the Book Rep table by the key symbol in front of the field name. If your table does not have a key symbol, you can tap or click the Primary Key button (TABLE TOOLS DESIGN tab | Tools group) to designate the field as the primary key. You also can check that the data type, description, field size, and caption are all correct.

For the other fields, you can see the field name, data type, and description without taking any special action. To see the field size and/or caption for a field, tap or click the field's **row selector**, the small box that precedes the field. Tapping or clicking the row selector for the Last Name field, for example, displays the properties for the field. You then can check to see that the field size is correct. In addition, if the field has a caption, you can check to see if that is correct. If you find any mistakes, you can make the necessary corrections on this screen. When you have finished, you would tap or click the Save button to save your changes.

To Change a Field Size in Design View

Most field size changes can be made in either Datasheet view or Design view. However, changing the field size for Number fields, such as the Bonus Rate field, can only be made in Design view. Because the values in the Bonus Rate field have decimal places, only Single, Double, or Decimal would be possible choices for the field size. The difference between these choices concerns the amount of accuracy. Double is more accurate than Single, for example, but requires more storage space. Because the rates are only two decimal places, Single is an acceptable choice.

The following steps change the field size of the Bonus Rate field to Single, the format to Fixed, and the number of decimal places to 2. ***Why change the format and number of decimal places?*** *To ensure that each value will appear with precisely two decimal places.*

1

- If necessary, tap or click the vertical scroll bar to display the Bonus Rate field. Tap or click the row selector for the Bonus Rate field to select the field (Figure 1–16).

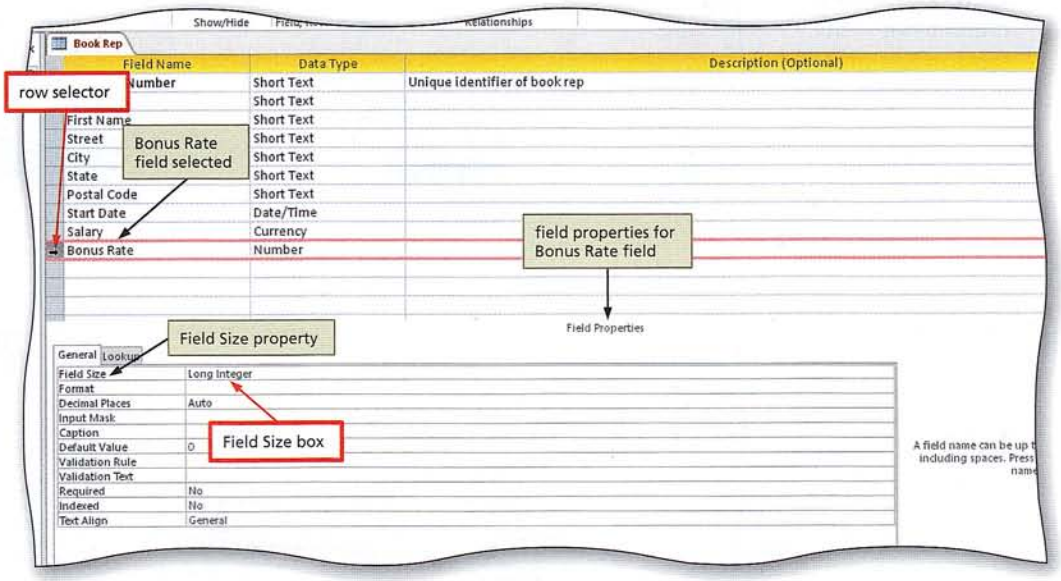


Figure 1–16

2

- Tap or click the Field Size box to display the Field Size arrow.
- Tap or click the Field Size arrow to display the Field Size menu (Figure 1–17).

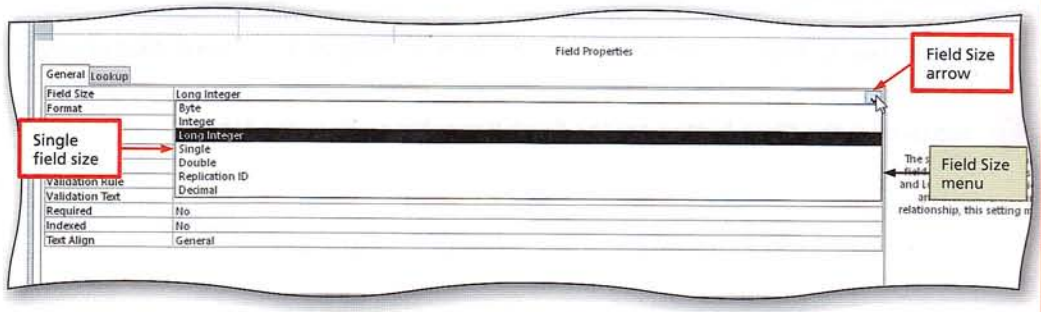


Figure 1–17

Q&A What would happen if I left the field size set to Long Integer?
If the field size is Long Integer, Integer, or Byte, no decimal places can be stored. For example, a value of .10 would be stored as 0. If you enter rates and the values all appear as 0, chances are you did not change the field size property.

3

- Tap or click Single to select single precision as the field size.
- Tap or click the Format box to display the Format arrow.
- Tap or click the Format arrow to open the Format menu (Figure 1–18).

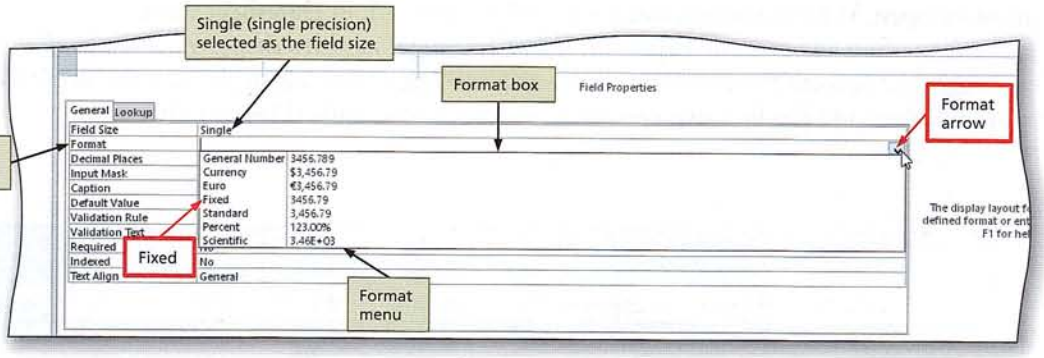


Figure 1–18

4

- Tap or click Fixed to select fixed as the format.
- Tap or click the Decimal Places box to display the Decimal Places arrow.
- Tap or click the Decimal Places arrow to enter the number of decimal places.
- Tap or click 2 to assign the number of decimal places.
- Tap or click the Save button to save your changes (Figure 1–19).

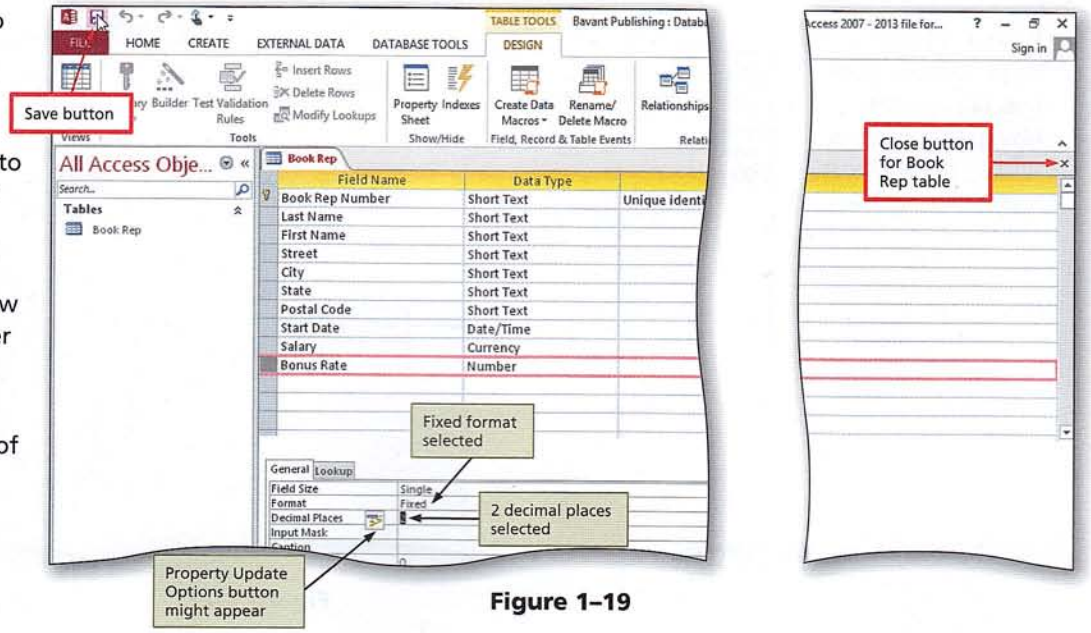


Figure 1–19

Q&A Why did the Property Update Options button appear?
You changed the number of decimal places. The Property Update Options button offers a quick way of making the same change everywhere Bonus Rate appears. So far, you have not added any data or created any forms or reports that use the Bonus Rate field, so no such changes are necessary.

To Close the Table

Once you are sure that your entries are correct and you have saved your changes, you can close the table. The following step closes the table.

1. Tap or click the Close button for the Book Rep table to close the table.

Other Ways

1. Press and hold or right-click tab for table, tap or click Close on shortcut menu

To Add Records to a Table

Creating a table by building the structure and saving the table is the first step in the two-step process of using a table in a database. The second step is to add records to the table. To add records to a table, the table must be open. When making changes to tables, you work in Datasheet view.

You often add records in phases. ***Why?*** *You might not have enough time to add all the records in one session, or you might not have all the records currently available.* The following steps open the Book Rep table in Datasheet view and then add the first two records in the Book Rep table (Figure 1–20).

BR #	Last Name	First Name	Street	City	State	Postal Code	Start Date	Salary	Bonus Rate
53	Chin	Robert	265 Maxwell St.	Gossett	PA	19157	6/1/2013	$26,250.00	0.19
42	Perez	Melina	261 Porter Dr.	Adelphia	PA	19156	5/14/2012	$31,500.00	0.20

Figure 1–20

1. Press and hold or right-click the Book Rep table in the Navigation Pane to display the shortcut menu (Figure 1–21).

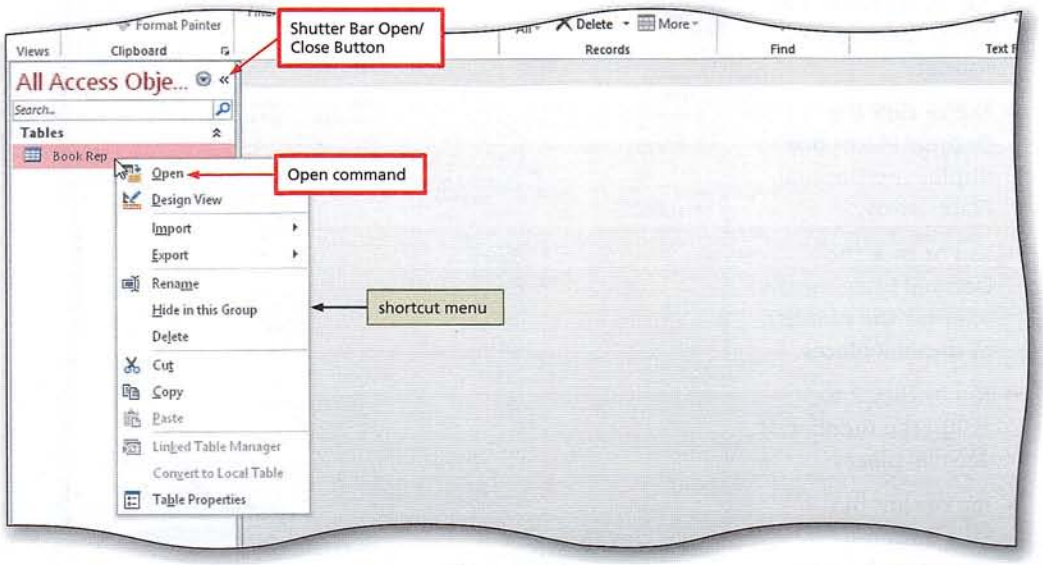


Figure 1–21

2

- Tap or click Open on the shortcut menu to open the table in Datasheet view.
- Tap or click the Shutter Bar Open/Close Button to close the Navigation Pane (Figure 1–22).

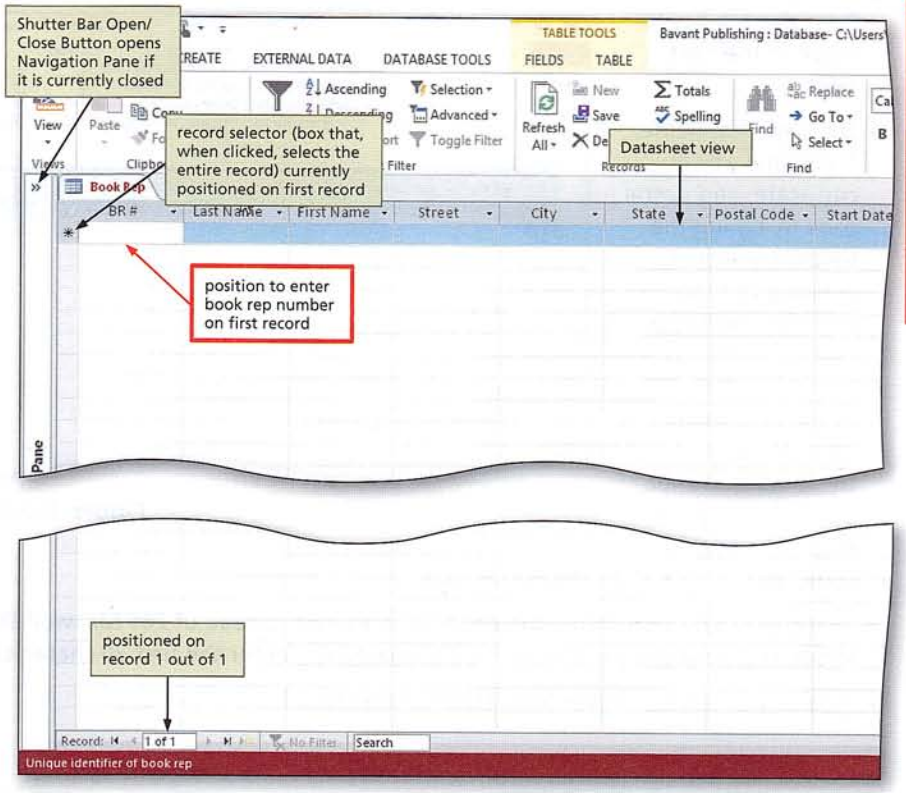


Figure 1–22

3

- Tap or click the first row in the BR # field if necessary to display an insertion point, and type 53 to enter the first book rep number (Figure 1–23).

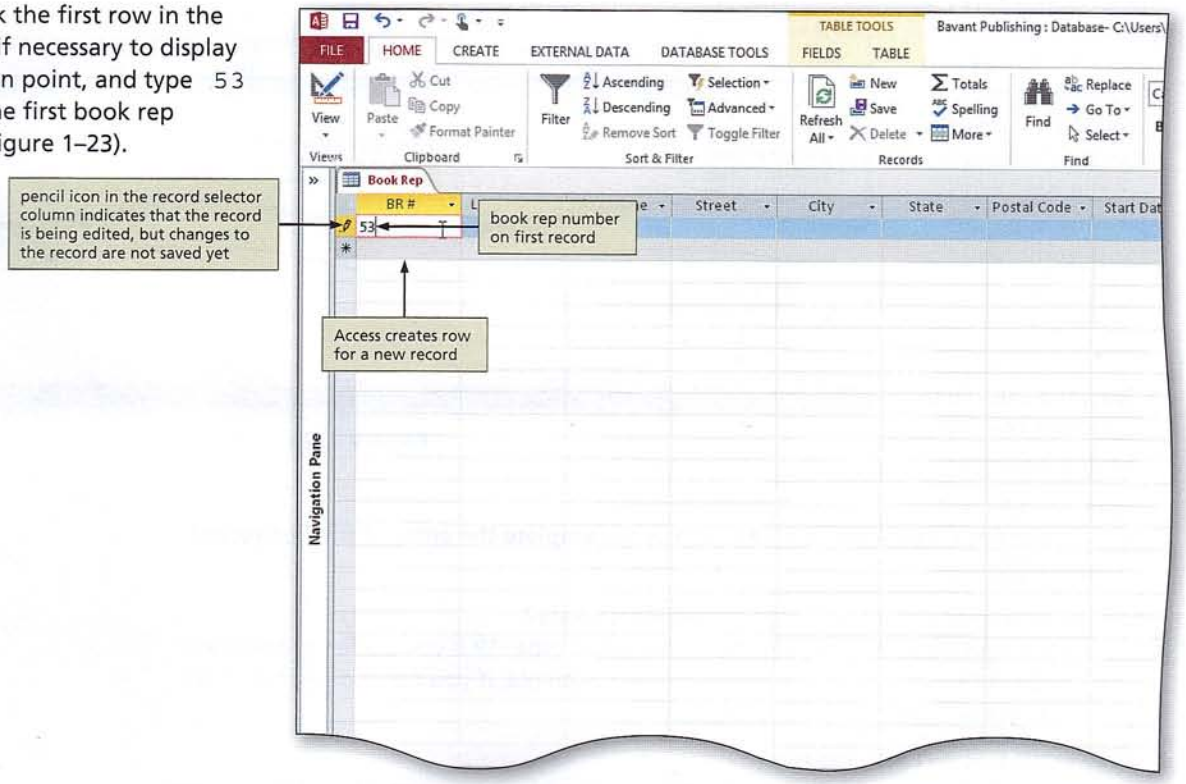


Figure 1–23

4

- Press the TAB key to move to the next field.
- Enter the last name, first name, street, city, state, and postal code by typing the following entries, pressing the TAB key after each one: `Chin` as the last name, `Robert` as the first name, `265 Maxwell St.` as the street, `Gossett` as the city, `PA` as the state, and `19157` as the postal code.

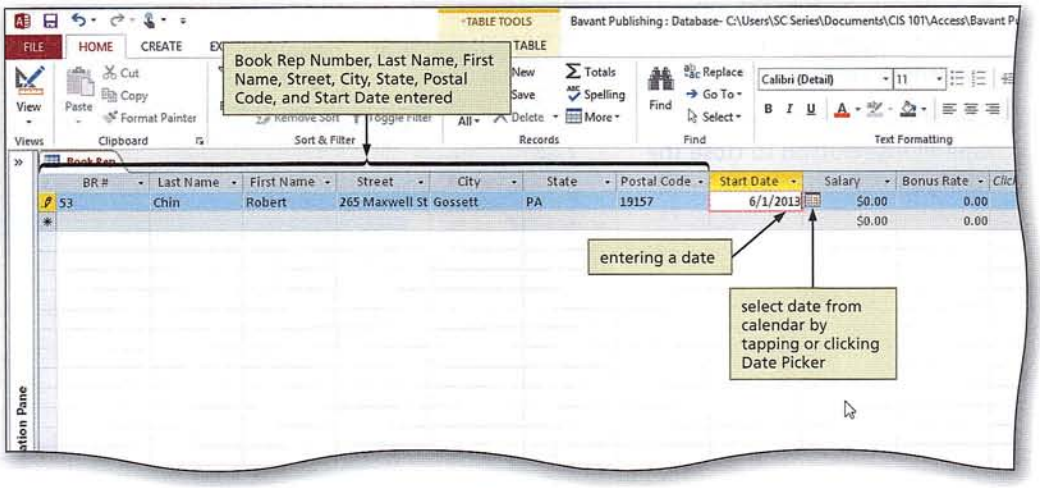


Figure 1–24

- If requested by your instructor, enter your address instead of 265 Maxwell St. as the street. If your address is longer than 20 characters, enter the first 20 characters.
- Type `6/1/2013` in the Start Date field (Figure 1–24).

5

- Press the TAB key and then type `26250` in the Salary field.

Q&A Do I need to type a dollar sign?
You do not need to type dollar signs or commas. In addition, because the digits to the right of the decimal point are both zeros, you do not need to type either the decimal point or the zeros.

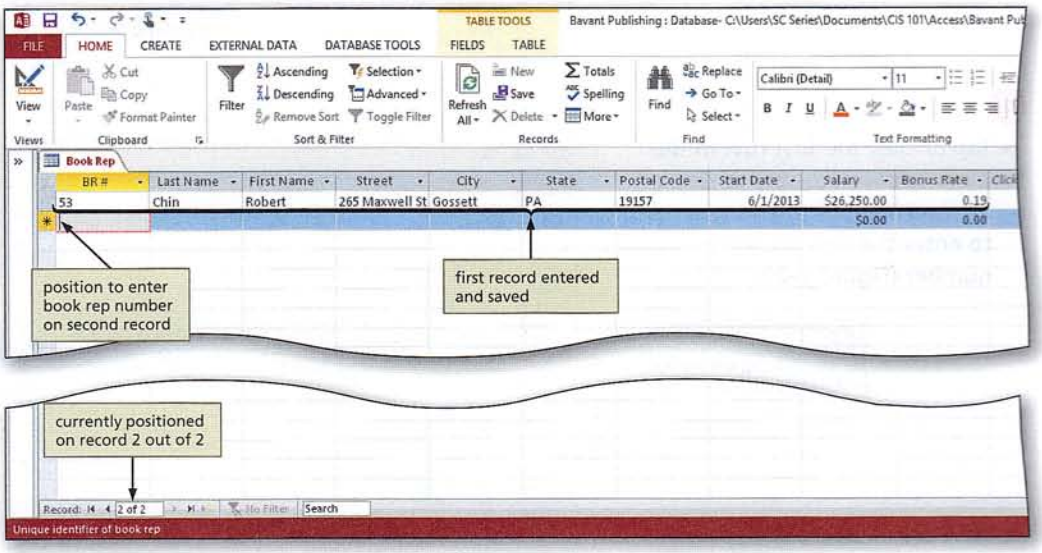


Figure 1–25

- Press the TAB key to complete the entry for the Salary field.
- Type `0.19` in the Bonus Rate field, and then press the TAB key to complete the entry of the first record (Figure 1–25).

Q&A Do I need to type the leading zero for the Bonus Rate?
Typing the leading zero is not necessary. You could type .19 if you prefer. In addition, you would not have to type any final zeros. For example, if you needed to enter 0.20, you could simply type .2 as your entry.

How and when do I save the record?
As soon as you have entered or modified a record and moved to another record, Access saves the original record. This is different from other applications. The rows entered in an Excel worksheet, for example, are not saved until the entire worksheet is saved.

6

- Use the techniques shown in Steps 3 through 5 to enter the data for the second record (Figure 1–26).

Figure 1–26

Q&A Does it matter that I entered book rep 42 after I entered book rep 53? Should the book rep numbers be in order?

The order in which you enter the records is not important. When you close and later reopen the table, the records will be in book rep number order, because the Book Rep Number field is the primary key.

When I entered the Salary field and changed the data type to Currency, I noticed that the word Currency appeared twice. Why?

The second Currency is the format, which indicates how the data will be displayed. For the Currency data type, Access automatically sets the format to Currency, which is usually what you would want. You could change it to something else, if desired, by tapping or clicking the arrow and selecting the desired format.

Experiment

- Tap or click the Salary field on either of the records. Be sure the TABLE TOOLS FIELDS tab is selected. Tap or click the Format arrow, and then tap or click each of the formats in the Format box menu to see the effect on the values in the Salary field. When finished, tap or click Currency in the Format box menu.

Making Changes to the Data

As you enter data, check your entries carefully to ensure they are correct. If you make a mistake and discover it before you press the TAB key, correct it by pressing the BACKSPACE key until the incorrect characters are removed, and then type the correct characters. If you do not discover a mistake until later, you can use the following techniques to make the necessary corrections to the data:

- To undo your most recent change, tap or click the Undo button on the Quick Access Toolbar. If there is nothing that Access can undo, this button will be dimmed, and tapping or clicking it will have no effect.
- To add a record, tap or click the New (blank) record button, tap or click the position for the Book Rep Number field on the first open record, and then add the record. Do not worry about it being in the correct position in the table. Access will reposition the record based on the primary key, in this case, the Book Rep Number.
- To delete a record, tap or click the record selector, shown in Figure 1–26, for the record to be deleted. Then press the DELETE key to delete the record, and tap or click the Yes button when Access asks you to verify that you want to delete the record.
- To change the contents of one or more fields in a record, the record must be on the screen. If it is not, use any appropriate technique, such as the UP ARROW and DOWN ARROW keys or the vertical scroll bar, to move to the record. If the field you want to correct is not visible on the screen, use the horizontal scroll bar along the bottom of the screen to shift all the fields until the one you want appears. If the value in the field is currently highlighted, you can simply type the new value. If you would rather edit the existing value, you must have an insertion point in the field. You can place the insertion point by tapping or clicking in the field or by pressing the F2 key. You then can use the arrow keys, the DELETE key, and the BACKSPACE key for making the correction. You also can use the INSERT key to switch between Insert and Overtype mode. When you have made the change, press the TAB key to move to the next field.

BTW

AutoCorrect Feature

The AutoCorrect feature of Access corrects common data entry errors. AutoCorrect corrects two capital letters by changing the second letter to lowercase and capitalizes the first letter in the names of days. It also corrects more than 400 commonly misspelled words.

BTW

Other AutoCorrect Options

Using the Office AutoCorrect feature, you can create entries that will replace abbreviations with spelled-out names and phrases automatically. To specify AutoCorrect rules, tap or click FILE on the ribbon to open the Backstage view, tap or click Options, and then tap or click Proofing in the Access Options dialog box.

If you cannot determine how to correct the data, you may find that you are "stuck" on the record, in which case Access neither allows you to move to another record nor allows you to close the table until you have made the correction. If you encounter this situation, simply press the ESC key. Pressing the ESC key will remove from the screen the record you are trying to add. You then can move to any other record, close the table, or take any other action you desire.

To Close a Table

Now that you have created and saved the Book Rep table, you can close it. The following step closes the table.

1. Tap or click the Close button for the Book Rep table, shown in Figure 1–26 on the previous page, to close the table (Figure 1–27).

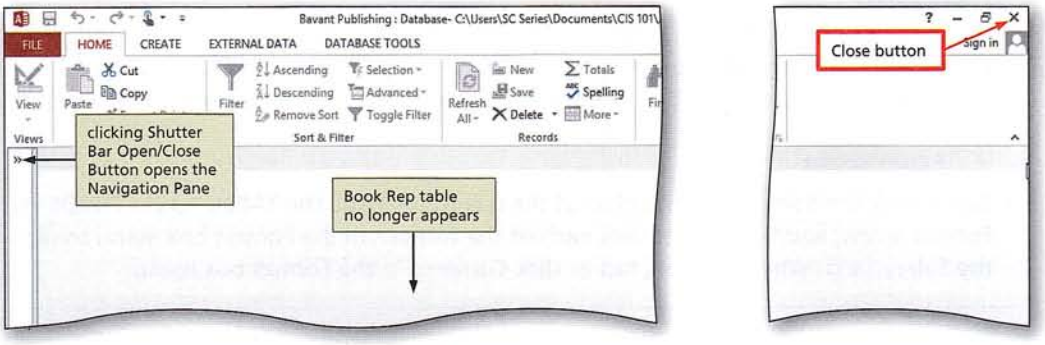


Figure 1–27

To Exit Access

The following steps exit Access. For a detailed example of the procedure summarized below, refer to the Office and Windows chapter at the beginning of this book.

1. Tap or click the Close button on the right side of the title bar to exit Access.
2. If a Microsoft Access dialog box appears, tap or click the Save button to save any changes made to the object since the last save.

Break Point: If you wish to take a break, this is a good place to do so. To resume later, continue following the steps from this location forward.

Starting Access and Opening a Database

Once you have created and later closed a database, you will need to open it in the future in order to use it. Opening a database requires that Access is running on your computer.

To Run Access

1. Scroll the Start screen for an Access 2013 tile. If your Start screen contains an Access 2013 tile, tap or click it to run Access. If the Start screen does not contain the Access 2013 tile, proceed to the next step to search for the Access app.
2. Swipe in from the right edge of the screen or point to the upper-right corner of the screen to display the Charms bar, and then tap or click the Search charm on the Charms bar to display the Search menu.
3. Type `Access` as the search text in the Search text box and watch the search results appear in the Apps list.
4. Tap or click Access 2013 in the search results to run Access.

To Open a Database from Access

Earlier in this chapter, you created the Bavant Publishing database in an appropriate storage location. The following steps open the database from the location you specified when you first created it (for example, the Access folder in the CIS 101 folder). For a detailed example of the procedure summarized below, refer to the Office 2013 and Windows chapter at the beginning of this book.

1. Tap or click FILE on the ribbon to open the Backstage view, if necessary.
2. If the database you want to open is displayed in the Recent list, tap or click the file name to open the database and display the opened database in the Access window; then skip to Step 7. If the database you want to open is not displayed in the Recent list or if the Recent list does not appear, tap or click 'Open Other Files' to display the Open Gallery.
3. If the database you want to open is displayed in the Recent list in the Open gallery, tap or click the file name to open the database and display the opened database in the Access window; then skip to Step 7.
4. Tap or click Computer, SkyDrive, or another location in the left pane and then navigate to the location of the database to be opened (for example, the Access folder in the CIS 101 folder).
5. Tap or click Bavant Publishing to select the database to be opened.
6. Tap or click the Open button (Open dialog box) to open the selected file and display the opened database in the Access window (Figure 1–28).
7. If a Security Warning appears, tap or click the Enable Content button.

BTW

Enabling Content

If the database is one that you created, or if it comes from a trusted source, you can enable the content. You should disable the content of a database if you suspect that your database might contain harmful content or damaging macros.

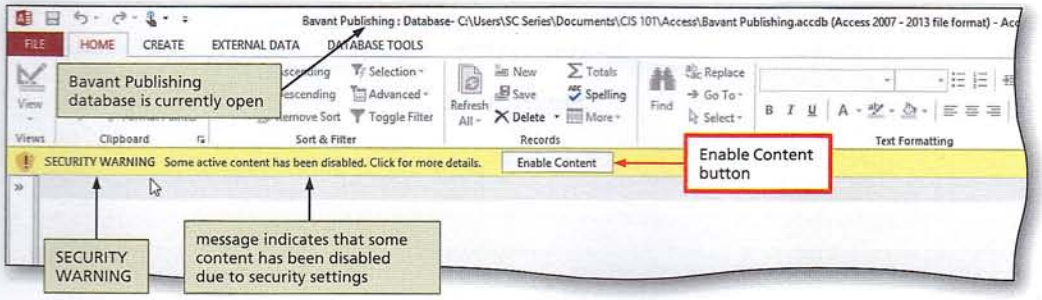


Figure 1–28

To Add Records to a Table that Contains Data

You can add records to a table that already contains data using a process almost identical to that used to add records to an empty table. The only difference is that you place the insertion point after the last record before you enter the additional data. To position the insertion point after the last record, you can use the **Navigation buttons**, which are buttons used to move within a table, found near the lower-left corner of the screen when a table is open. ***Why not just tap or click the Book Rep Number (BR #) on the first open record?*** *You could do this, but it is a good habit to use the New (blank) record button. Once a table contains more records than will fit on the screen, it is easier to tap or click the New (blank) record button.* The purpose of each Navigation button is described in Table 1–4.

Table 1–4 Navigation Buttons in Datasheet View

Button	Purpose
First record	Moves to the first record in the table
Previous record	Moves to the previous record
Next record	Moves to the next record
Last record	Moves to the last record in the table
New (blank) record	Moves to the end of the table to a position for entering a new record

The following steps add the remaining records (Figure 1–29) to the Book Rep table.

BR #	Last Name	First Name	Street	City	State	Postal Code	Start Date	Salary	Bonus Rate
65	Rogers	Tracy	1827 Maple Ave.	Adelphia	PA	19159	7/1/2014	$7,750.00	0.18
48	Statnik	Michael	3135 Simpson Dr.	Pleasantburg	NJ	07025	1/15/2013	$29,000.00	0.20

Figure 1–29

1. If the Navigation Pane is closed, tap or click the Shutter Bar Open/Close Button, shown in Figure 1–27 on page AC 24, to open the Navigation Pane (Figure 1–30).

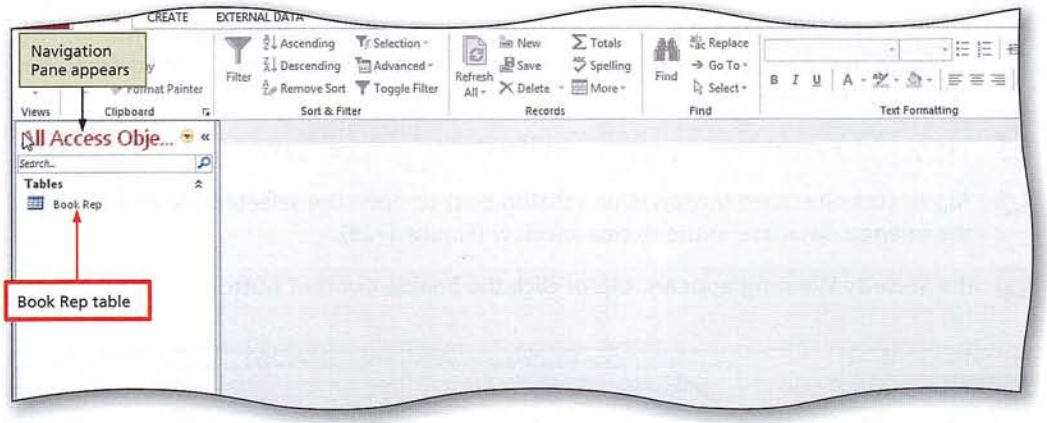


Figure 1–30

2

- Press and hold or right-click the Book Rep table in the Navigation Pane to display a shortcut menu.
- Tap or click Open on the shortcut menu to open the table in Datasheet view.

Q&A Why do the records appear in a different order than the order in which I entered them?
When you open the table, they are sorted in the order of the primary key. In this case, that means they will appear in Book Rep Number order.

- Close the Navigation Pane by tapping or clicking the Shutter Bar Open/Close Button (Figure 1–31).

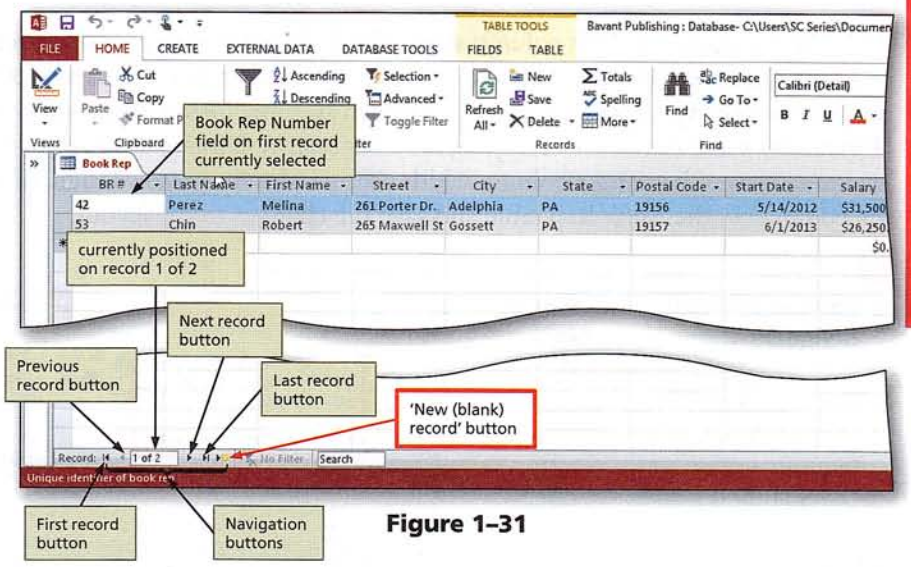


Figure 1–31

3

- Tap or click the 'New (blank) record' button to move to a position to enter a new record (Figure 1–32).

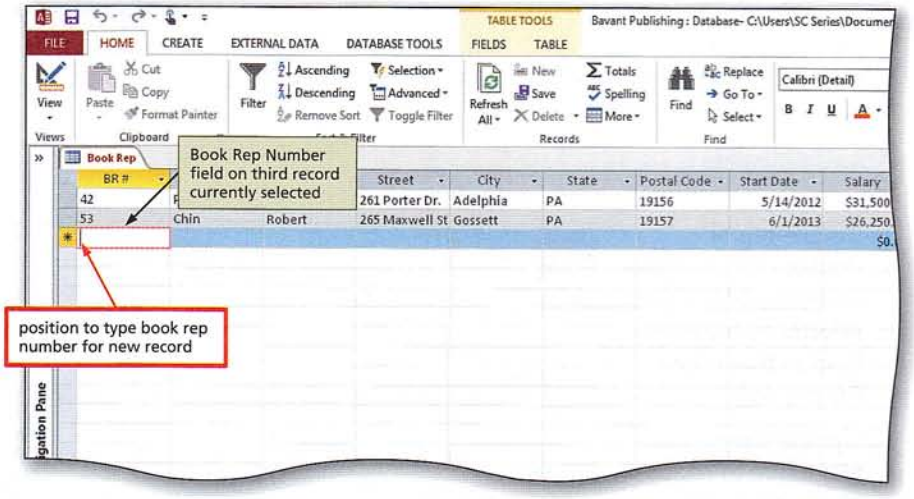


Figure 1–32

4

- Add the records shown in Figure 1–29 using the same techniques you used to add the first two records (Figure 1–33).

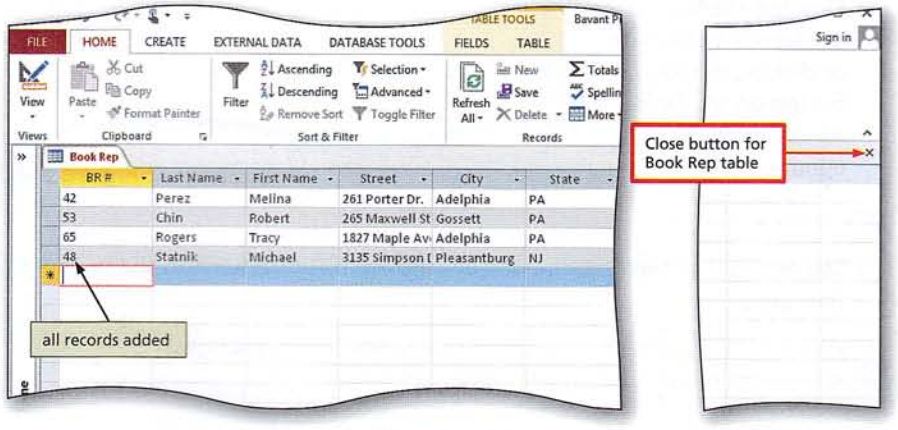


Figure 1–33

Other Ways

1. Tap or click New button (HOME tab | Records group)
2. Press CTRL+PLUS SIGN (+)

To Resize Columns in a Datasheet

Access assigns default column sizes, which do not always provide space to display all the data in the field. In some cases, the data might appear but the entire field name will not. You can correct this problem by **resizing** the column (changing its size) in the datasheet. In some instances, you may want to reduce the size of a column. ***Why?*** *Some fields, such as the State field, are short enough that they do not require all the space on the screen that is allotted to them.* Changing a column width changes the **layout**, or design, of a table. The following steps resize the columns in the Book Rep table and save the changes to the layout.

1

- Point to the right boundary of the field selector for the Book Rep Number (BR #) field (Figure 1–34) so that the pointer becomes a two-headed arrow.

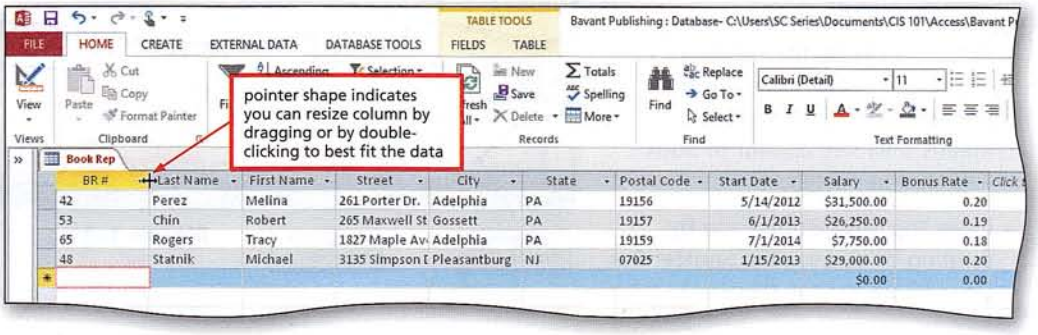


Figure 1–34

Q&A I am using touch and I cannot see the pointer. Is this a problem?
It is not a problem. Remember that if you are using your finger on a touch screen, you will not see the pointer.

2

- Double-tap or double-click the right boundary of the field selector to resize the field so that it best fits the data.
- Use the same technique to resize all the other fields to best fit the data.
- Save the changes to the layout by tapping or clicking the Save button on the Quick Access Toolbar (Figure 1–35).

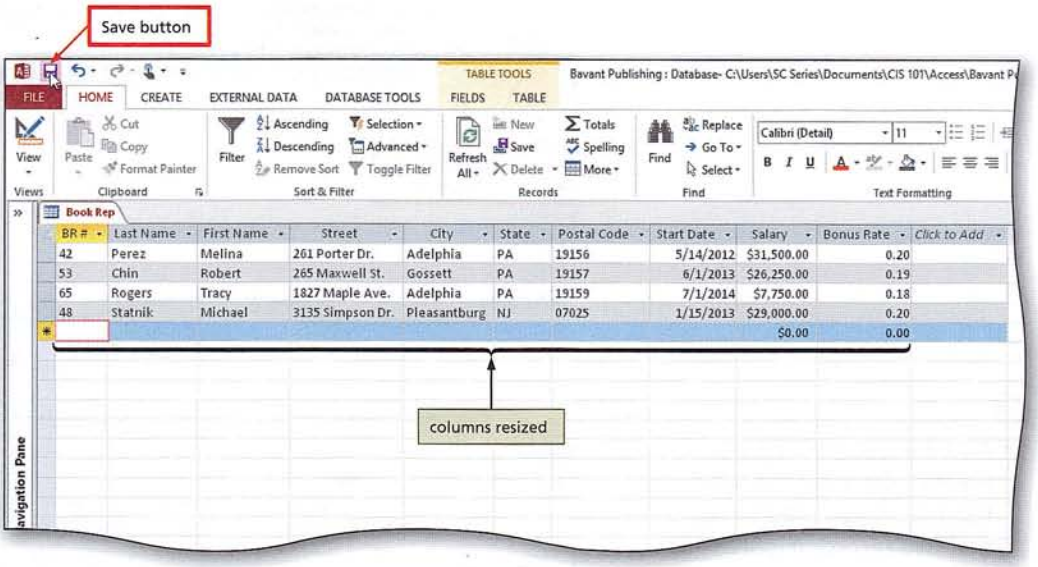


Figure 1–35

3

- Tap or click the table's Close button (shown in Figure 1–33 on the previous page) to close the table.

Q&A What if I closed the table without saving the layout changes?
You would be asked if you want to save the changes.

Other Ways

1. Press and hold or right-click field name, tap or click Field Width

CONSIDER THIS

What is the best method for distributing database objects?

The traditional method of distributing database objects such as tables, reports, and forms uses a printer to produce a hard copy. A **hard copy** or **printout** is information that exists on a physical medium such as paper. Hard copies can be useful for the following reasons:

- Some people prefer proofreading a hard copy of a document rather than viewing it on the screen to check for errors and readability.
- Hard copies can serve as a backup reference if your storage medium is lost or becomes corrupted and you need to recreate the document.

Instead of distributing a hard copy, users can distribute the document as an electronic image that mirrors the original document's appearance. The electronic image of the document can be emailed, posted on a website, or copied to a portable storage medium such as a USB flash drive. Two popular electronic image formats, sometimes called fixed formats, are PDF by Adobe Systems and XPS by Microsoft. In Access, you can create electronic image files through the EXTERNAL DATA tab on the ribbon. Electronic images of documents, such as PDF and XPS, can be useful for the following reasons:

- Users can view electronic images of documents without the software that created the original document (e.g., Access). Specifically, to view a PDF file, you use a program called Adobe Reader, which can be downloaded free from Adobe's website. Similarly, to view an XPS file, you use a program called XPS Viewer, which is included in the latest versions of Windows and Internet Explorer.
- Sending electronic documents saves paper and printer supplies. Society encourages users to contribute to **green computing,** which involves reducing the electricity consumed and environmental waste generated when using computers, mobile devices, and related technologies.

Previewing and Printing the Contents of a Table

When working with a database, you often will need to print a copy of the table contents. Figure 1–36 shows a printed copy of the contents of the Book Rep table. (Yours may look slightly different, depending on your printer.) Because the Book Rep table is substantially wider than the screen, it also will be wider than the normal printed page in portrait orientation. **Portrait orientation** means the printout is across the width of the page. **Landscape orientation** means the printout is across the height of the page. To print the wide database table, you might prefer to use landscape orientation. A convenient way to change to landscape orientation is to preview what the printed copy will look like by using Print Preview. This allows you to determine whether landscape orientation is necessary and, if it is, to change the orientation easily to landscape. In addition, you also can use Print Preview to determine whether any adjustments are necessary to the page margins.

BTW

Changing Printers

To change the default printer that appears in the Print dialog box, tap or click FILE on the ribbon, tap or click the Print tab in the Backstage view, tap or click Print in the Print gallery, then tap or click the Name arrow and select the desired printer.

Book Rep 9/15/2014

BR #	Last Name	First Name	Street	City	State	Postal Code	Start Date	Salary	Bonus Rate
42	Perez	Melina	261 Porter Dr.	Adelphia	PA	19156	5/14/2012	$31,500.00	0.20
48	Statnik	Michael	3135 Simpson Dr.	Pleasantburg	NJ	07025	1/15/2013	$29,000.00	0.20
53	Chin	Robert	265 Maxwell St.	Gossett	PA	19157	6/1/2013	$26,250.00	0.19
65	Rogers	Tracy	1827 Maple Ave.	Adelphia	PA	19159	7/1/2014	$7,750.00	0.18

Figure 1–36

To Preview and Print the Contents of a Table

The following steps use Print Preview to preview and then print the contents of the Book Rep table. ***Why?*** *By previewing the contents of the table in Print Preview, you can make any necessary adjustments to the orientation or to the margins before printing the contents.*

1

- If the Navigation Pane is closed, open the Navigation Pane by tapping or clicking the Shutter Bar Open/Close Button.
- Be sure the Book Rep table is selected.

Q&A Why do I have to be sure the Book Rep table is selected? It is the only object in the database. When the database contains only one object, you do not have to worry about selecting the object. Ensuring that the correct object is selected is a good habit to form, however, to make sure that the object you print is the one you want.

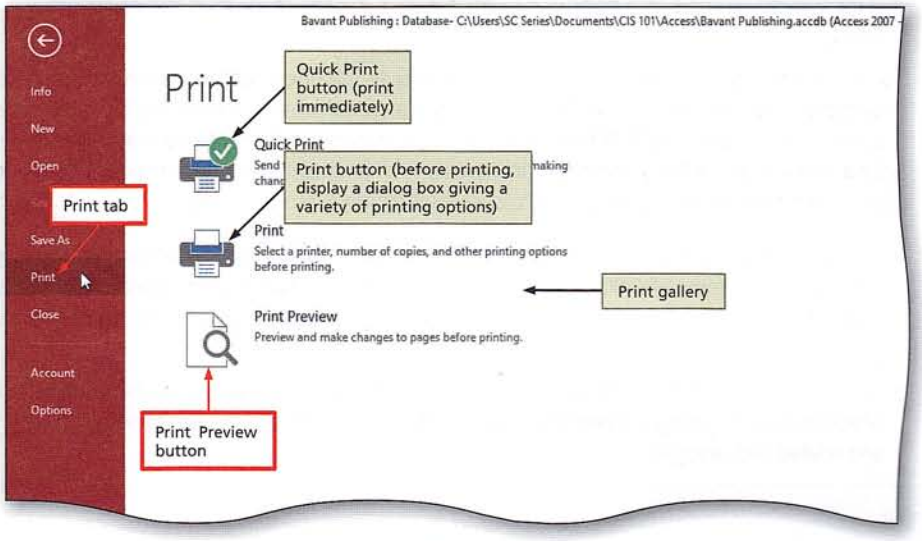


Figure 1–37

- Tap or click FILE on the ribbon to open the Backstage view.
- Tap or click the Print tab in the Backstage view to display the Print gallery (Figure 1–37).

2

- Tap or click the Print Preview button in the Print gallery to display a preview of what the table will look like when printed (Figure 1–38).

Q&A I cannot read the table. Can I magnify a portion of the table?
Yes. Point the pointer, whose shape will change to a magnifying glass, at the portion of the table that you want to magnify, and then tap or click. You can return to the original view of the table by tapping or clicking a second time.

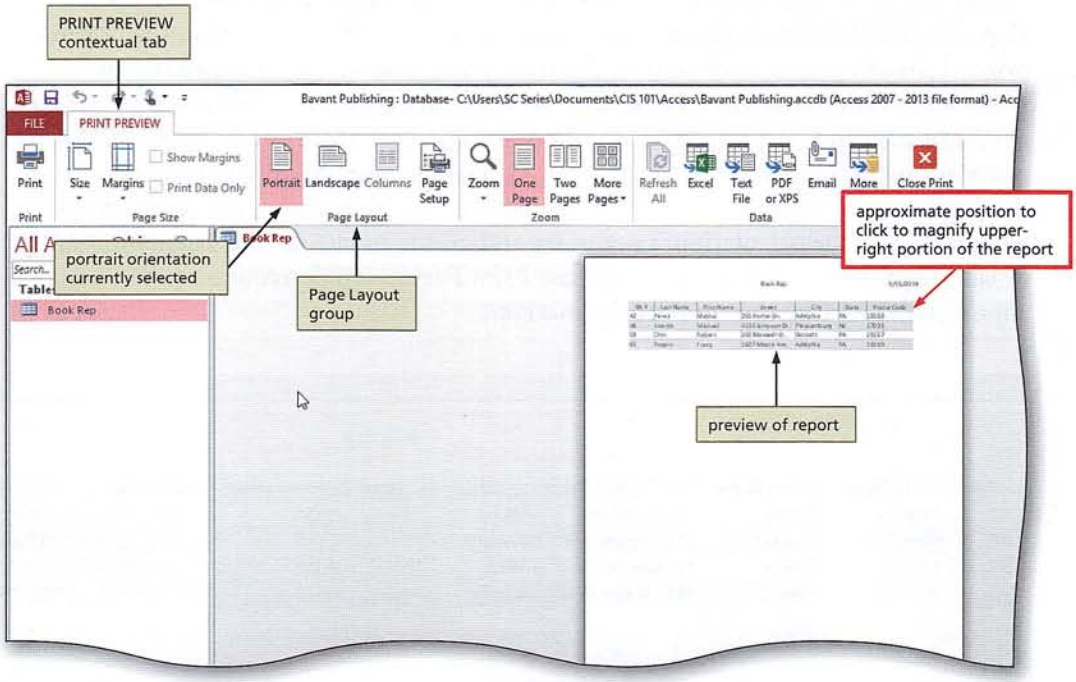


Figure 1–38

3

- Tap or click the pointer in the position shown in Figure 1–38 to magnify the upper-right section of the table (Figure 1–39).

Q&A My table was already magnified in a different area. How can I see the area shown in the figure? One way is to use the scroll bars to move to the desired portion of the table. You also can tap or click the pointer anywhere in the table to produce a screen like the one shown in Figure 1–38, and then tap or click in the location shown in the figure.

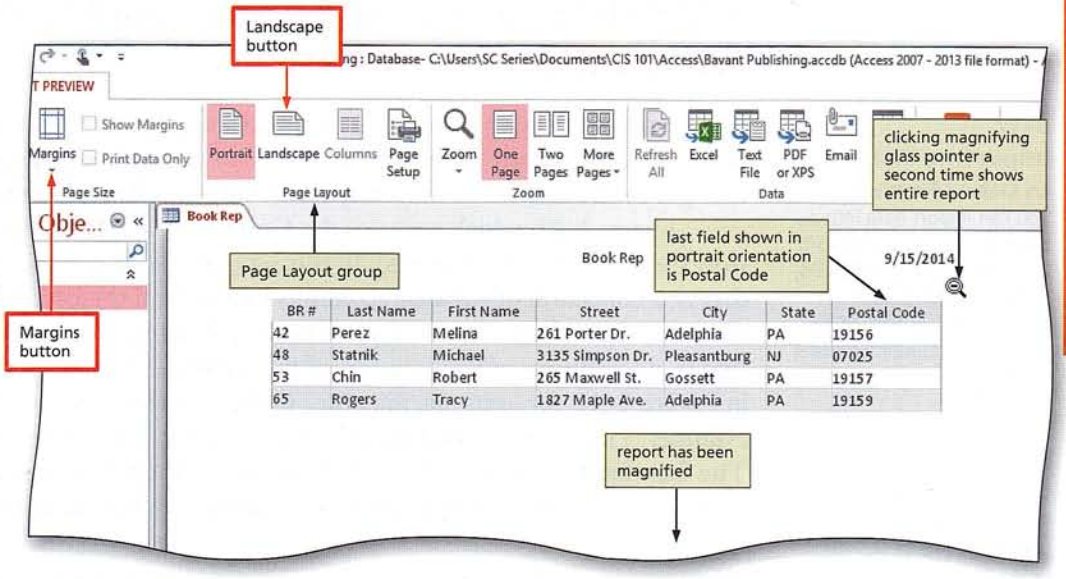


Figure 1–39

4

- Tap or click the Landscape button (PRINT PREVIEW tab | Page Layout group) to change to landscape orientation.
- Tap or click the Margins button (PRINT PREVIEW tab | Page Size group) and then click Normal if necessary to display all the fields (Figure 1–40).

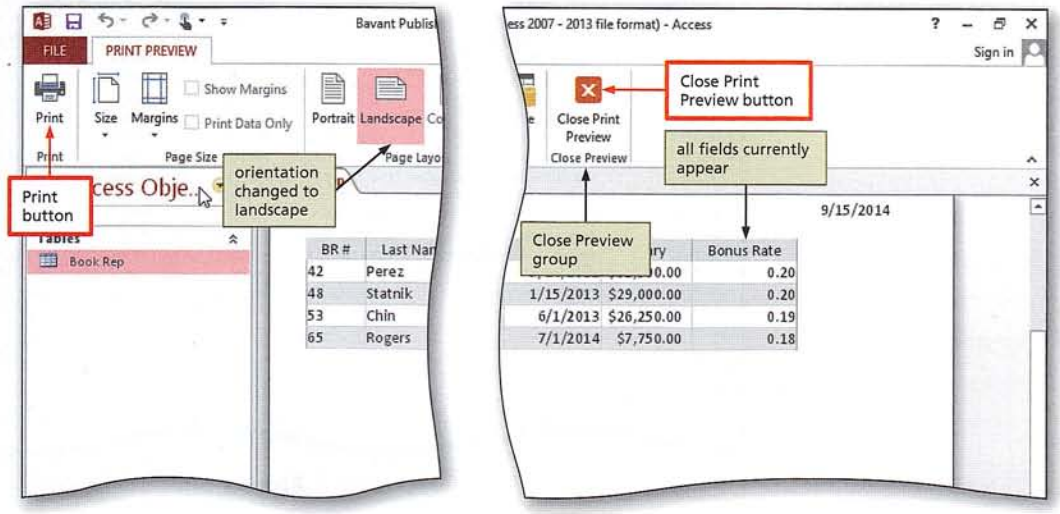


Figure 1–40

5

- Tap or click the Print button (PRINT PREVIEW tab | Print group) to display the Print dialog box.
- Tap or click the OK button (Print dialog box) to print the table.
- When the printer stops, retrieve the hard copy of the Book Rep table.
- Tap or click the Close Print Preview button (PRINT PREVIEW tab | Close Preview group) to close the Print Preview window.

Q&A Do I have to select Print Preview before printing the table?
No. If you wish to print without previewing, you would select either Print or Quick Print rather than Print Preview.

Other Ways

1. Press CTRL+P, tap or click OK button in Print dialog box

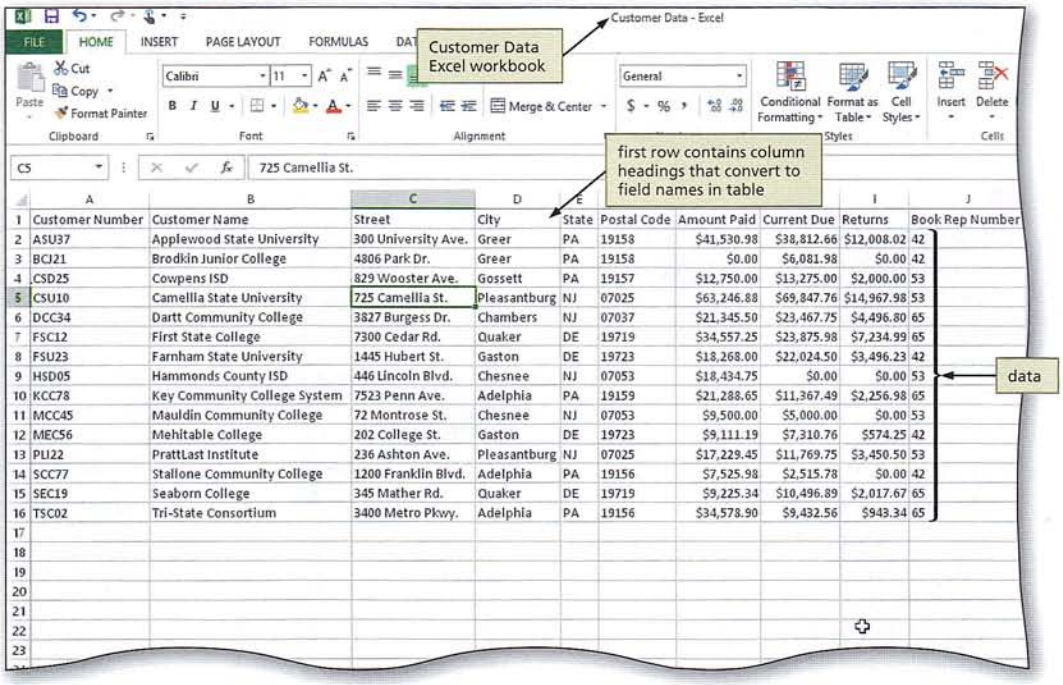
Importing or Linking Data from Other Applications to Access

BTW
Importing Data in Other Formats
You can import data into a table from Excel workbooks, Access databases, XML files, ODBC databases such as SQL Server, text files, HTML documents, Outlook folders, and SharePoint lists.

BTW
Linking Versus Importing
When you link to the data in the worksheet, the data appears as a table in the Access database but it is maintained in its original form in Excel. Any changes to the Excel data are reflected when the linked table is viewed in Access. In this arrangement, Access would typically be used as a vehicle for querying and presenting the data, with actual updates being made in Excel.

If your data for a table is stored in an Excel worksheet, you can **import** the data, which means to make a copy of the data as a table in the Access database. In this case, any changes to the data made in Access would not be reflected in the Excel worksheet.

Figure 1–41, which contains the Customer data, is an example of the type of worksheet that can be imported. In this type of worksheet, the data is stored as a **list**, that is, a collection of rows and columns in which all the entries in a column represent the same type of data. In this type of list, the first row contains **column headings**, that is, descriptions of the contents of the column, rather than data. In the worksheet in Figure 1–41, for example, the entry in the first column of the first row is Customer Number. This indicates that all the other values in this column are customer numbers. The fact that the entry in the second column of the first row is Customer Name indicates that all the other values in the second column are customer names.



	A	B	C	D	E	F	G	H	I	J
1	Customer Number	Customer Name	Street	City	State	Postal Code	Amount Paid	Current Due	Returns	Book Rep Number
2	ASU37	Applewood State University	300 University Ave.	Greer	PA	19158	$41,530.98	$38,812.66	$12,008.02	42
3	BCJ21	Brodkin Junior College	4806 Park Dr.	Greer	PA	19158	$0.00	$6,081.98	$0.00	42
4	CSD25	Cowpens ISD	829 Wooster Ave.	Gossett	PA	19157	$12,750.00	$13,275.00	$2,000.00	53
5	CSU10	Camellia State University	725 Camellia St.	Pleasantburg	NJ	07025	$63,246.88	$69,847.76	$14,967.98	53
6	DCC34	Dartt Community College	3827 Burgess Dr.	Chambers	NJ	07037	$21,345.50	$23,467.75	$4,496.80	65
7	FSC12	First State College	7300 Cedar Rd.	Quaker	DE	19719	$34,557.25	$23,875.98	$7,234.99	65
8	FSU23	Farnham State University	1445 Hubert St.	Gaston	DE	19723	$18,268.00	$22,024.50	$3,496.23	42
9	HSD05	Hammonds County ISD	446 Lincoln Blvd.	Chesnee	NJ	07053	$18,434.75	$0.00	$0.00	53
10	KCC78	Key Community College System	7523 Penn Ave.	Adelphia	PA	19159	$21,288.65	$11,367.49	$2,256.98	65
11	MCC45	Mauldin Community College	72 Montrose St.	Chesnee	NJ	07053	$9,500.00	$5,000.00	$0.00	53
12	MEC56	Mehitable College	202 College St.	Gaston	DE	19723	$9,111.19	$7,310.76	$574.25	42
13	PLI22	PrattLast Institute	236 Ashton Ave.	Pleasantburg	NJ	07025	$17,229.45	$11,769.75	$3,450.50	53
14	SCC77	Stallone Community College	1200 Franklin Blvd.	Adelphia	PA	19156	$7,525.98	$2,515.78	$0.00	42
15	SEC19	Seaborn College	345 Mather Rd.	Quaker	DE	19719	$9,225.34	$10,496.89	$2,017.67	65
16	TSC02	Tri-State Consortium	3400 Metro Pkwy.	Adelphia	PA	19156	$34,578.90	$9,432.56	$943.34	65

Figure 1–41

CONSIDER THIS

Does it matter how the data in the Excel workbook is formatted? If so, how can you be sure the Excel data is formatted in such a way you can import it?

The format of data in an Excel workbook is important when you want to import it into Access. To ensure the data is in an appropriate format:

1. Make sure the data is in the form of a list, a collection of rows and columns in which all the entries in a column represent the same type of data.
2. Make sure there are no blank rows within the list. If there are, remove them prior to importing or linking.
3. Make sure there are no blank columns within the list. If there are, remove them prior to importing or linking.
4. Determine whether the first row contains column headings that will make appropriate field names in the resulting table. If not, you might consider adding such a row. In general, the process is simpler if the first row in the worksheet contains appropriate column headings.

The Import process will create a table. In this table, the column headings in the first row of the worksheet become the field names. The rows of the worksheet, other than the first row, become the records in the table. In the process, each field will be assigned the data type that seems the most reasonable, given the data currently in the worksheet. When the Import process is finished, you can use Datasheet or Design view to modify these data types or to make any other changes to the structure you feel are necessary.

To Import an Excel Worksheet

You import a worksheet by using the Import Spreadsheet Wizard. In the process, you will indicate that the first row in the worksheet contains the column headings. ***Why?*** *You are indicating that Access is to use those column headings as the field names in the Access table.* In addition, you will indicate the primary key for the table. As part of the process, you could, if appropriate, choose not to include all the fields from the worksheet in the resulting table.

The following steps import the Customer worksheet.

1

- Tap or click EXTERNAL DATA on the ribbon to display the EXTERNAL DATA tab (Figure 1–42).

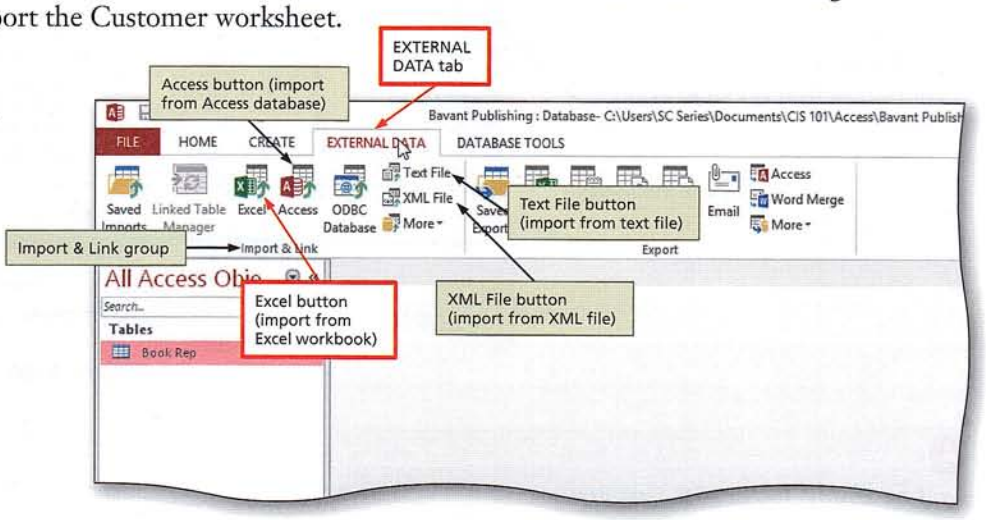


Figure 1–42

2

- Tap or click the Excel button (EXTERNAL DATA tab | Import & Link group) to display the Get External Data - Excel Spreadsheet dialog box.
- Tap or click the Browse button in the Get External Data - Excel Spreadsheet dialog box.
- Navigate to the location containing the workbook (for example, the Access folder in the CIS 101 folder). For a detailed example of this procedure, refer to Steps 4a – 4b in the To Save a File in a Folder section in the Office and Windows chapter at the beginning of this book.
- Tap or click the Customer Data workbook, and then tap or click the Open button to select the workbook (Figure 1–43).

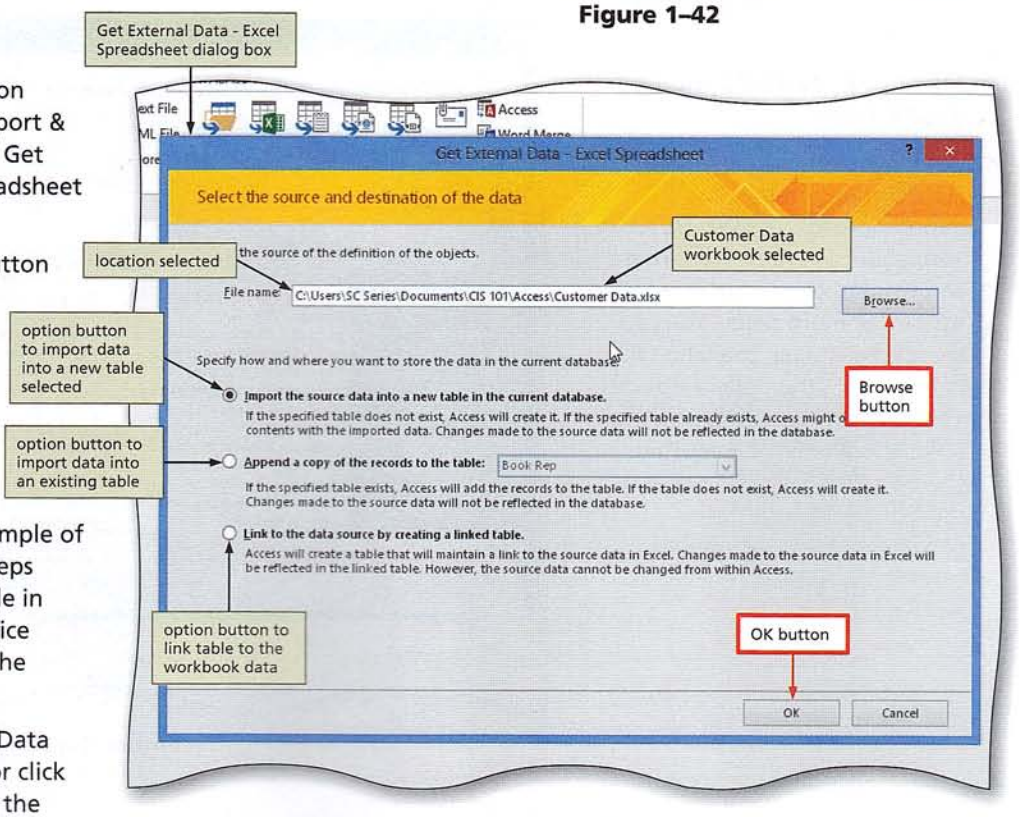


Figure 1–43

3

- With the option button to import the data to a new table selected, tap or click the OK button to display the Import Spreadsheet Wizard dialog box (Figure 1–44).

Q&A What happens if I select the option button to append records to an existing table?
Instead of the records being placed in a new table, they will be added to an existing table that you specify, provided the value in the primary key field does not duplicate that on an existing record.

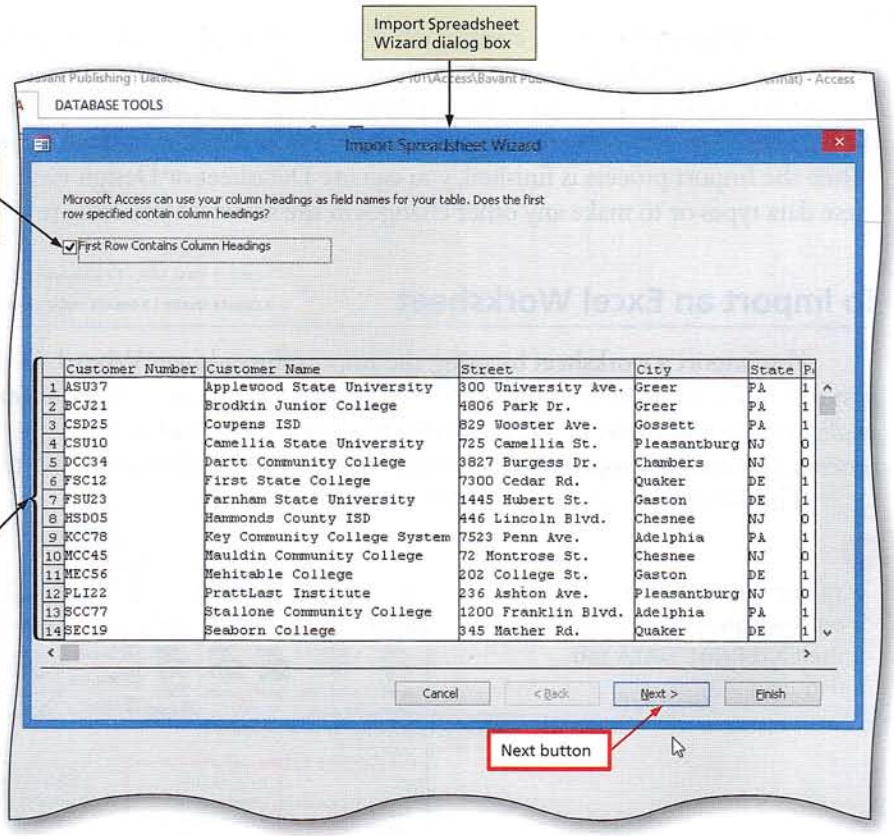


Figure 1–44

4

- If necessary, tap or click First Row Contains Column Headings to select it.
- Tap or click the Next button (Figure 1–45).

Q&A When would I use the Field Options on the Import Spreadsheet Wizard?
You would use these options if you wanted to change properties for one or more fields. You can change the name, the data type, and whether the field is indexed. You also can indicate that some fields should not be imported.

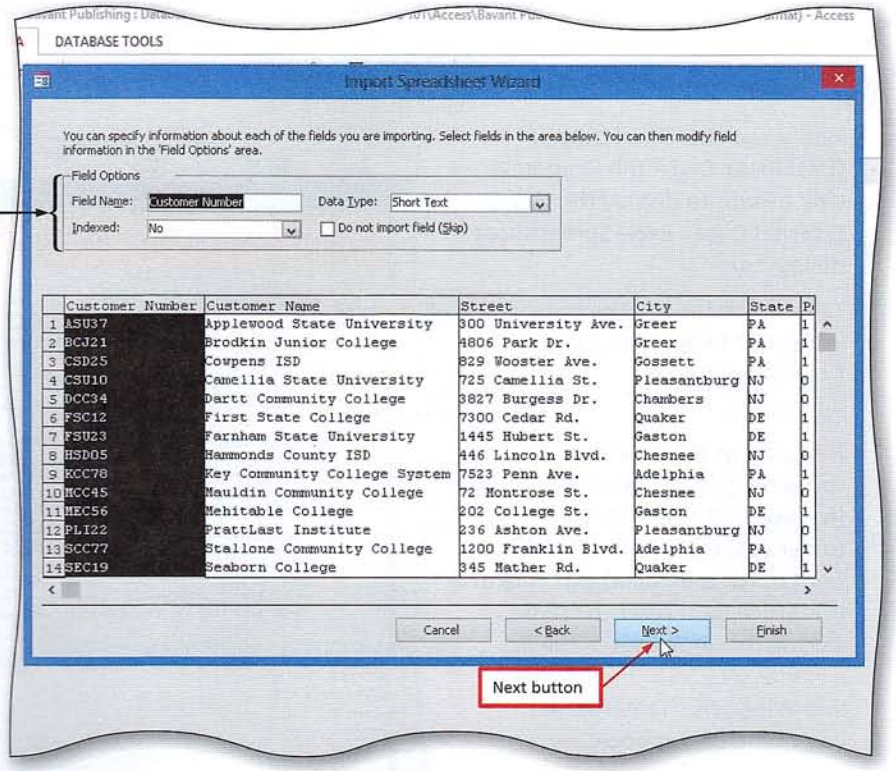


Figure 1–45

5

- Because the Field Options need not be specified, tap or click the Next button (Figure 1–46).

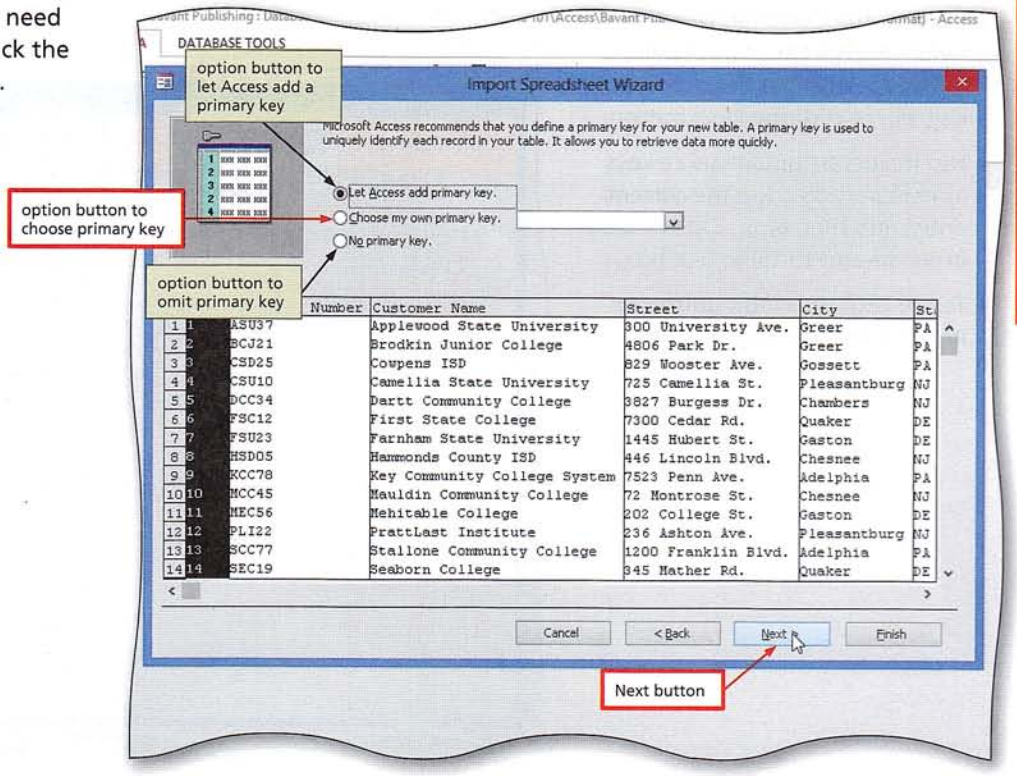


Figure 1–46

6

- Tap or click the 'Choose my own primary key' option button (Figure 1–47).

Q&A

How do I decide which option button to select?

If one of the fields is an appropriate primary key, choose your own primary key from the list of fields. If you are sure you do not want a primary key, choose No primary key. Otherwise, let Access add the primary key.

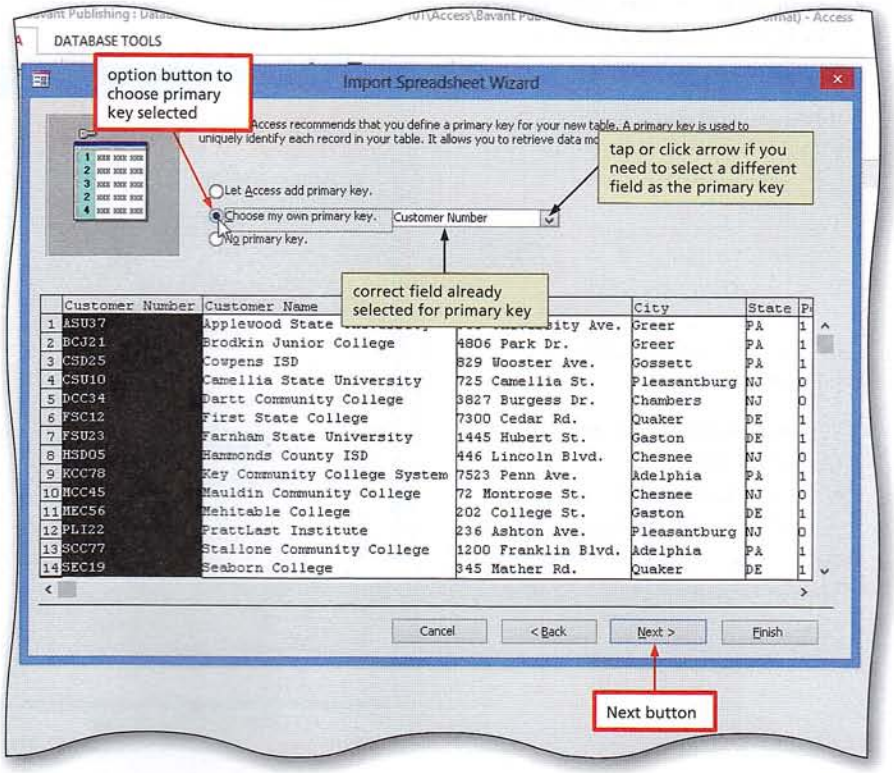


Figure 1–47

7

- Because the Customer Number field, which is the correct field, is already selected as the primary key, tap or click the Next button.
- Use the DELETE or BACKSPACE keys as necessary to erase the current entry, and then type `Customer` in the Import to Table text box.
- Tap or click the Finish button to import the data (Figure 1–48).

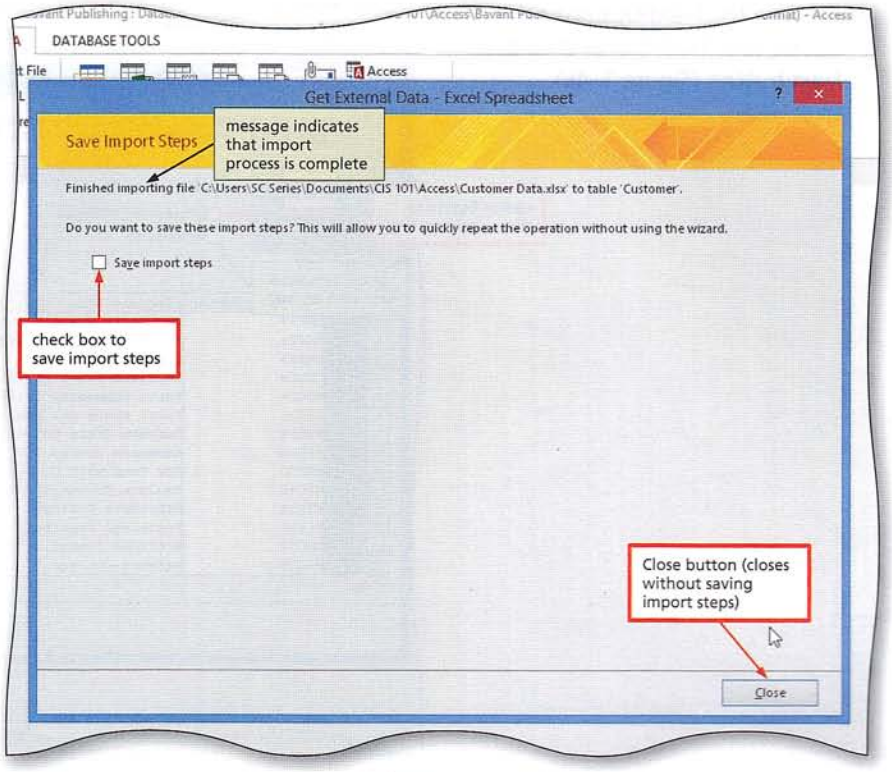


Figure 1–48

8

- Tap or click the 'Save import steps' check box to display the Save import steps options.
- If necessary, type `Import-Customer Data` in the Save as text box.
- Type `Import data from Customer Data workbook into Customer table` in the Description text box (Figure 1–49).

Q&A When would I create an Outlook task?
If the import operation is one you will repeat on a regular basis, you can create and schedule the import process just as you can schedule any other Outlook task.

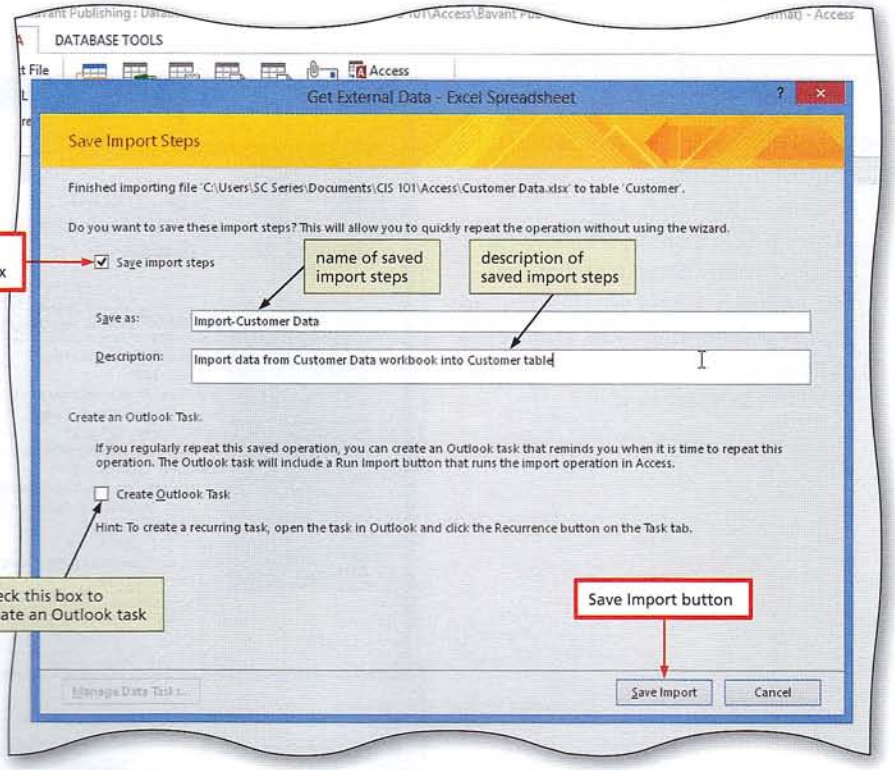


Figure 1–49

9

- Tap or click the Save Import button to save the import steps (Figure 1–50).

Q&A I saved the table as Customer Data. How can I change the name?

Press and hold or right-click the table name in the Navigation Pane. Click Rename on the shortcut menu and change the table name to Customer.

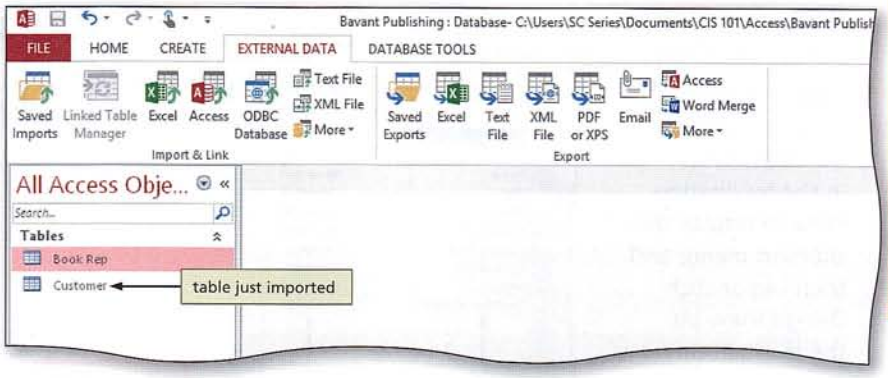


Figure 1–50

Modifying the Table

The import process has created the Customer table. The table has the correct fields and records. There are some details the process cannot handle, however. These include field sizes, descriptions, and captions. You will use Design view to make the necessary changes. The information you need is shown in Table 1–5.

Table 1–5 Structure of Customer Table

Field Name	Data Type	Field Size	Notes
Customer Number	Short Text	5	Primary Key **Description:** Customer Number (three uppercase letters followed by 2-digit number) **Caption:** CU #
Customer Name	Short Text	30	
Street	Short Text	20	
City	Short Text	20	
State	Short Text	2	
Postal Code	Short Text	5	
Amount Paid	Currency		
Current Due	Currency		
Returns	Currency		
Book Rep Number	Short Text	2	**Description:** Book Rep Number (number of book rep for customer) **Caption:** BR #

BTW

Creating a Table in Design View

To create a table in Design view, display the CREATE tab, and then tap or click the Table Design button (CREATE tab | Tables group). You will then see the same screen as in Figure 1–51 on the following page, except that there will be no entries. Make all the necessary entries for the fields in your table, save the table, and assign the table a name.

To Modify a Table in Design View

1 CREATE FIRST TABLE | 2 ADD RECORDS | 3 PRINT CONTENTS | 4 IMPORT RECORDS | 5 MODIFY SECOND TABLE | 6 CREATE QUERY | 7 CREATE FORM | 8 CREATE REPORT

You will usually need to modify the design of a table created during the import process. ***Why?*** *Some properties of a table are not specified during the import process, such as descriptions, captions, and field sizes. You also might need to change a data type.* The steps on the next page make the necessary modifications to the design of the Customer table.

1

- Open the Navigation Pane, if necessary.
- Press and hold or right-click the Customer table in the Navigation Pane to display the shortcut menu, and then tap or click Design View on the shortcut menu to open the table in Design view (Figure 1–51).

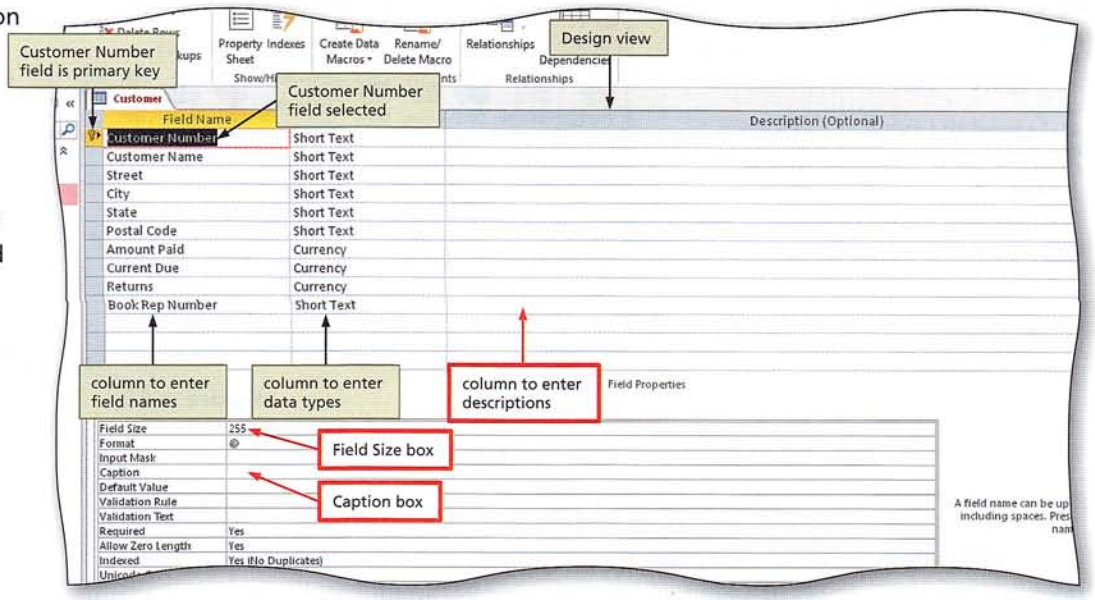


Figure 1–51

2

- Tap or click the Description (Optional) box for the Customer Number field, and then type `Customer Number (three uppercase letters followed by 2-digit number)` as the description.
- With the Customer Number field selected, tap or click the Field Size box, erase the current field size, and type `5` as the new field size.

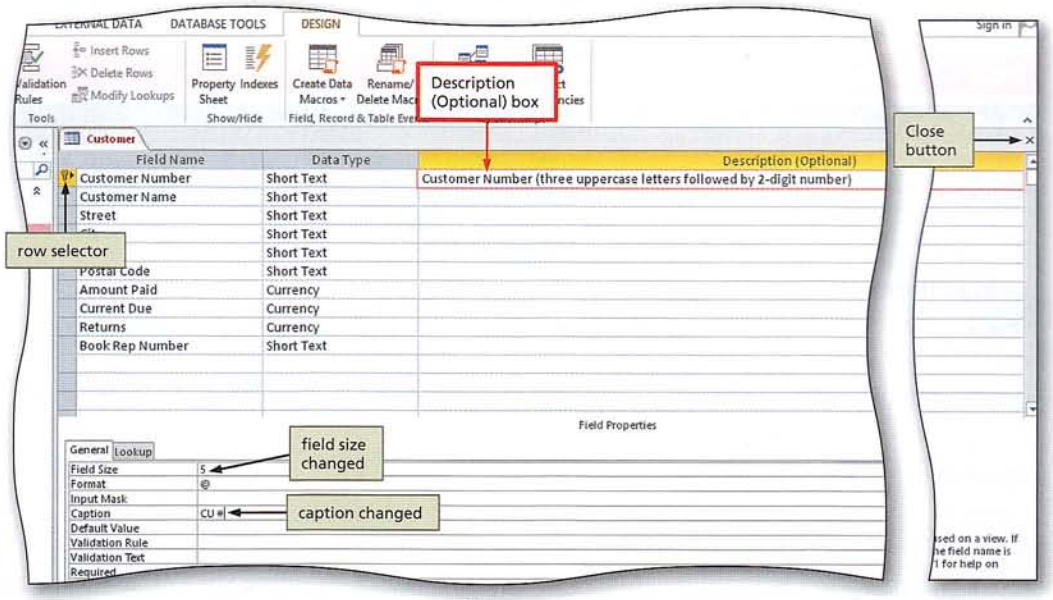


Figure 1–52

- Tap or click the Caption box, and type `CU #` as the caption (Figure 1–52).

3

- Make the other changes shown in Table 1–5 on the previous page. To select a field to be changed, tap or click the field's row selector. For most fields, you only need to change the field size. For the Book Rep Number field, you also need to change the description and caption.
- Tap or click the Save button on the Quick Access Toolbar to save your changes.
- Because you know the data will satisfy the new field sizes, click the Yes button when given a message about the possibility of data loss.

Other Ways

1. Press F6 to move between upper and lower panes in Table Design window

Correcting Errors in the Structure

Whenever you create or modify a table in Design view, you should check the entries carefully to ensure they are correct. If you make a mistake and discover it before you press the TAB key, you can correct the error by repeatedly pressing the BACKSPACE key until the incorrect characters are removed. Then, type the correct characters. If you do not discover a mistake until later, you can tap or click the entry, type the correct value, and then press the ENTER key. You can use the following techniques to make changes to the structure:

- If you accidentally add an extra field to the structure, select the field by tapping or clicking the row selector (the leftmost column on the row that contains the field to be deleted). Once you have selected the field, press the DELETE key. This will remove the field from the structure.
- If you forget to include a field, select the field that will follow the one you want to add by tapping or clicking the row selector, and then press the INSERT key. The remaining fields move down one row, making room for the missing field. Make the entries for the new field in the usual manner.
- If you made the wrong field a primary key field, tap or click the correct primary key entry for the field and then tap or click the Primary Key button (TABLE TOOLS DESIGN tab | Tools group).
- To move a field, tap or click the row selector for the field to be moved to select the field, and then drag the field to the desired position.

As an alternative to these steps, you may want to start over. To do so, tap or click the Close button for the window containing the table, and then tap or click the No button in the Microsoft Access dialog box. You then can repeat the process you used earlier to define the fields in the table.

BTW

Importing Data to an Existing Table

When you create a new table in Design view, you can import data from other sources into the table using the EXTERNAL DATA tab.

To Close the Table

Now that you have completed and saved the Customer table, you can close it. The following step closes the table.

1. Tap or click the Close button for the Customer table (see Figure 1–52) to close the table.

To Resize Columns in a Datasheet

You can resize the columns in the datasheet for the Customer table just as you resized the columns in the datasheet for the Book Rep table. The following steps resize the columns in the Customer table to best fit the data.

1. Open the Customer table in Datasheet view.
2. Double-tap or double-click the right boundary of the field selectors of each of the fields to resize the columns so that they best fit the data.
3. Save the changes to the layout by tapping or clicking the Save button on the Quick Access Toolbar.
4. Close the table.

BTW

Resizing Columns

To resize all columns in a datasheet to best fit simultaneously, select the column heading for the first column, hold down the SHIFT key and select the last column in the datasheet. Then, double-tap or double-click the right boundary of any field selector.

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

Additional Database Objects

BTW
Tabbed Documents Versus Overlapping Windows
By default, Access 2013 displays database objects in tabbed documents instead of in overlapping windows. If your database is in overlapping windows mode, tap or click FILE on the ribbon, tap or click Options in the Backstage view, tap or click Current Database in the Access Options dialog box, and select the Display Document Tabs check box and the Tabbed Documents option button.

A database contains many types of objects. Tables are the objects you use to store and manipulate data. Access supports other important types of objects as well; each object has a specific purpose that helps maximize the benefits of a database. Through queries (questions), Access makes it possible to ask complex questions concerning the data in the database and then receive instant answers. Access also allows the user to produce attractive and useful forms for viewing and updating data. Additionally, Access includes report creation tools that make it easy to produce sophisticated reports for presenting data.

Creating Queries

Queries are simply questions, the answers to which are in the database. Access contains a powerful query feature that helps you find the answers to a wide variety of questions. Once you have examined the question you want to ask to determine the fields involved in the question, you can begin creating the query. If the query involves no special sort order, restrictions, or calculations, you can use the Simple Query Wizard.

To Use the Simple Query Wizard to Create a Query

1 CREATE FIRST TABLE | 2 ADD RECORDS | 3 PRINT CONTENTS | 4 IMPORT RECORDS | 5 MODIFY SECOND TABLE
6 CREATE QUERY | 7 CREATE FORM | 8 CREATE REPORT

The following steps use the Simple Query Wizard to create a query that Bavant Publishing might use to obtain financial information on its customers. ***Why?*** *The Simple Query Wizard is the quickest and easiest way to create a query.* This query displays the number, name, amount paid, current due, returns, and book rep number of all customers.

1

- If the Navigation Pane is closed, tap or click the Shutter Bar Open/Close Button to open the Navigation Pane.
- Be sure the Customer table is selected.
- Tap or click CREATE on the ribbon to display the CREATE tab.
- Tap or click the Query Wizard button (CREATE tab | Queries group) to display the New Query dialog box (Figure 1–53).

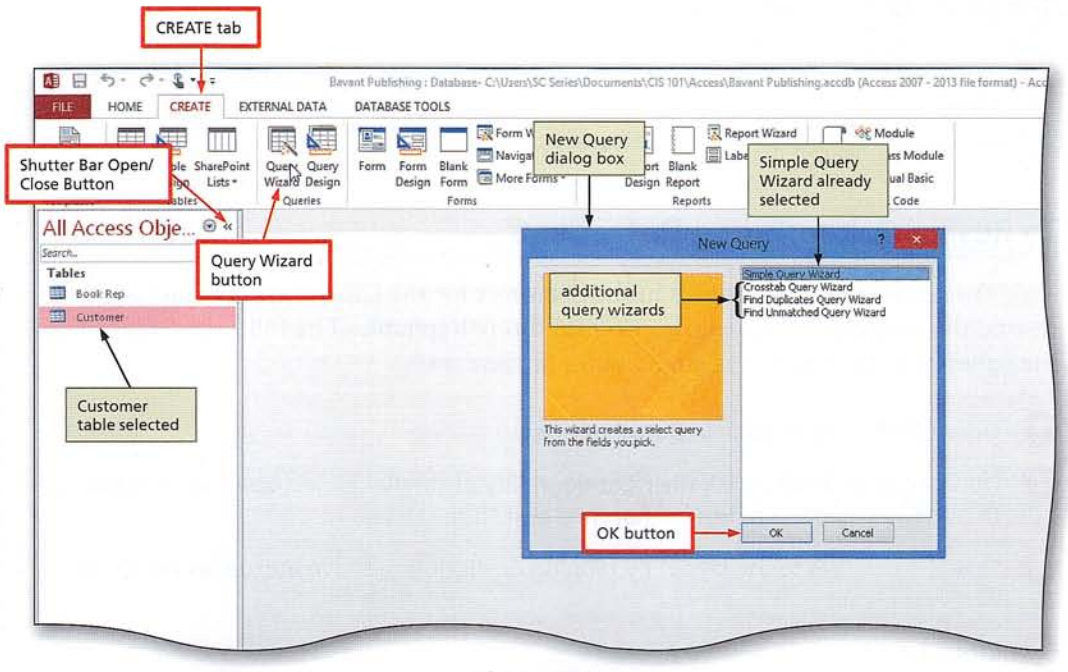


Figure 1–53

2

- Be sure Simple Query Wizard is selected, and then tap or click the OK button (New Query dialog box) to display the Simple Query Wizard dialog box (Figure 1–54).

Q&A

What would happen if the Book Rep table were selected instead of the Customer table?
The list of available fields would contain fields from the Book Rep table rather than the Customer table.

If the list contained Book Rep table fields, how could I make it contain Customer table fields?
Tap or click the arrow in the Tables / Queries box, and then tap or click the Customer table in the list that appears.

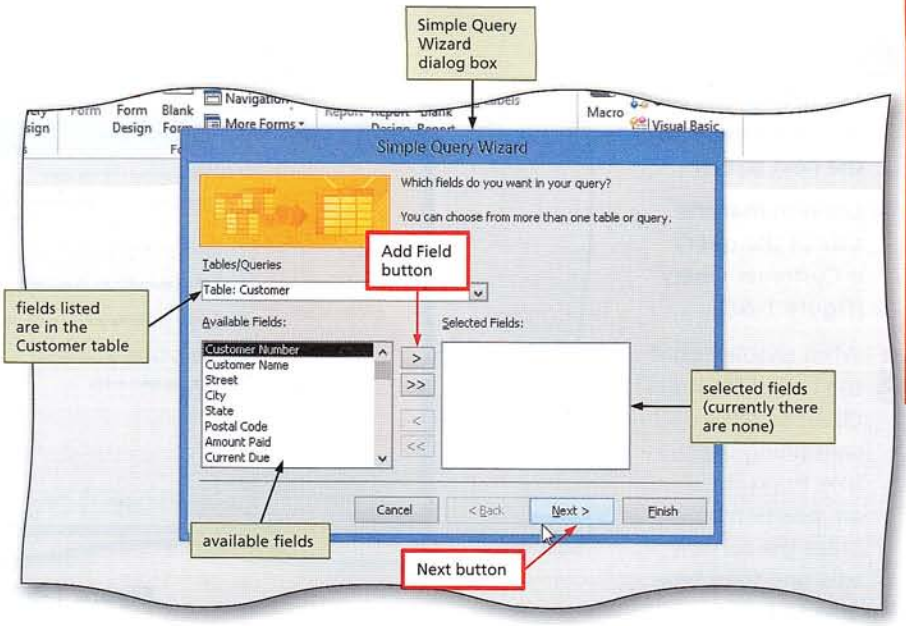


Figure 1–54

3

- With the Customer Number field selected, tap or click the Add Field button to add the field to the query.
- With the Customer Name field selected, tap or click the Add Field button a second time to add the field.
- Tap or click the Amount Paid field, and then tap or click the Add Field button to add the field.
- In a similar fashion, add the Current Due, Returns, and Book Rep Number fields (Figure 1–55).

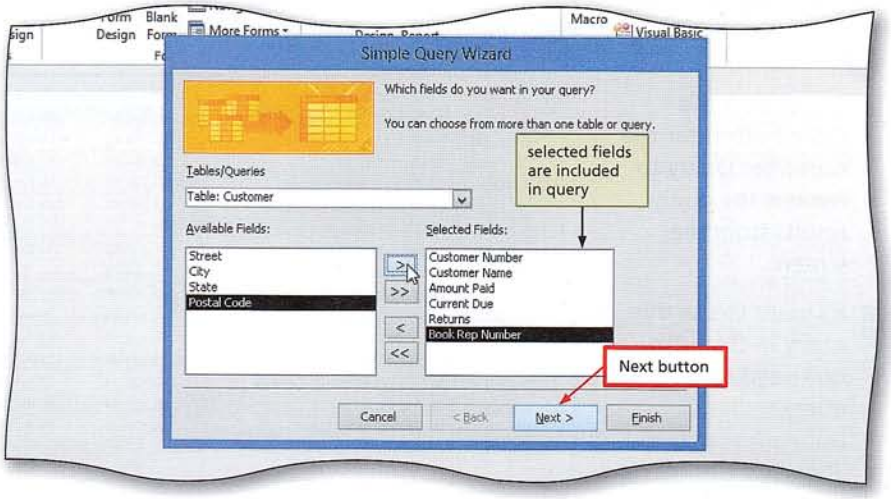


Figure 1–55

4

- Tap or click the Next button to move to the next screen.
- Ensure that the Detail (shows every field of every record) option button is selected (Figure 1–56).

Q&A

What is the difference between Detail and Summary?
Detail shows all the records and fields. Summary only shows computations (for example, the total amount paid).

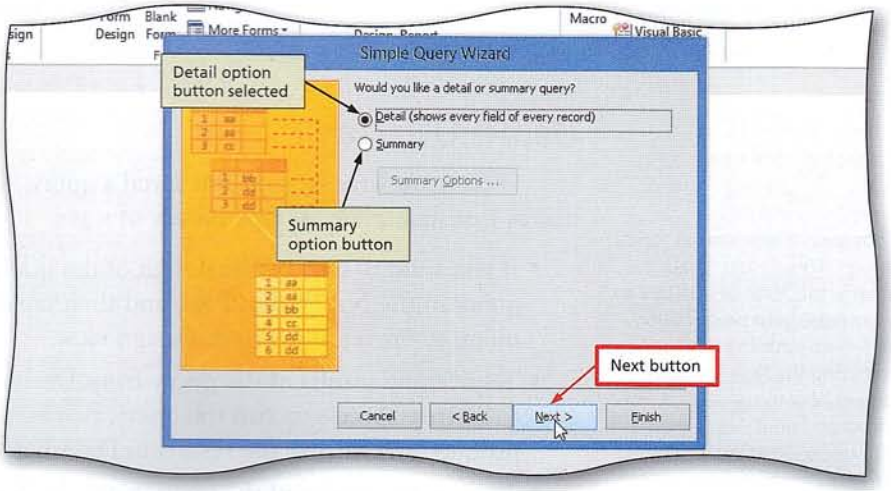


Figure 1–56

5

- Tap or click the Next button to move to the next screen.
- Confirm that the title of the query is Customer Query (Figure 1–57).

Q&A What should I do if the title is incorrect?
Click the box containing the title to produce an insertion point. Erase the current title and then type Customer Query.

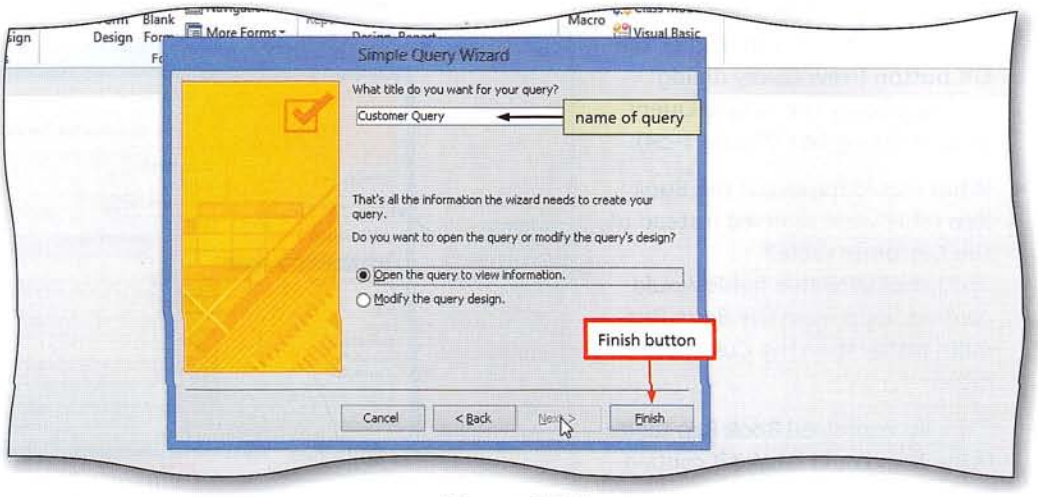


Figure 1–57

6

- Tap or click the Finish button to create the query (Figure 1–58).

7

- Tap or click the Close button for the Customer Query to remove the query results from the screen.

Q&A If I want to use this query in the future, do I need to save the query?
Normally you would. The one exception is a query created by the wizard. The wizard automatically saves the query it creates.

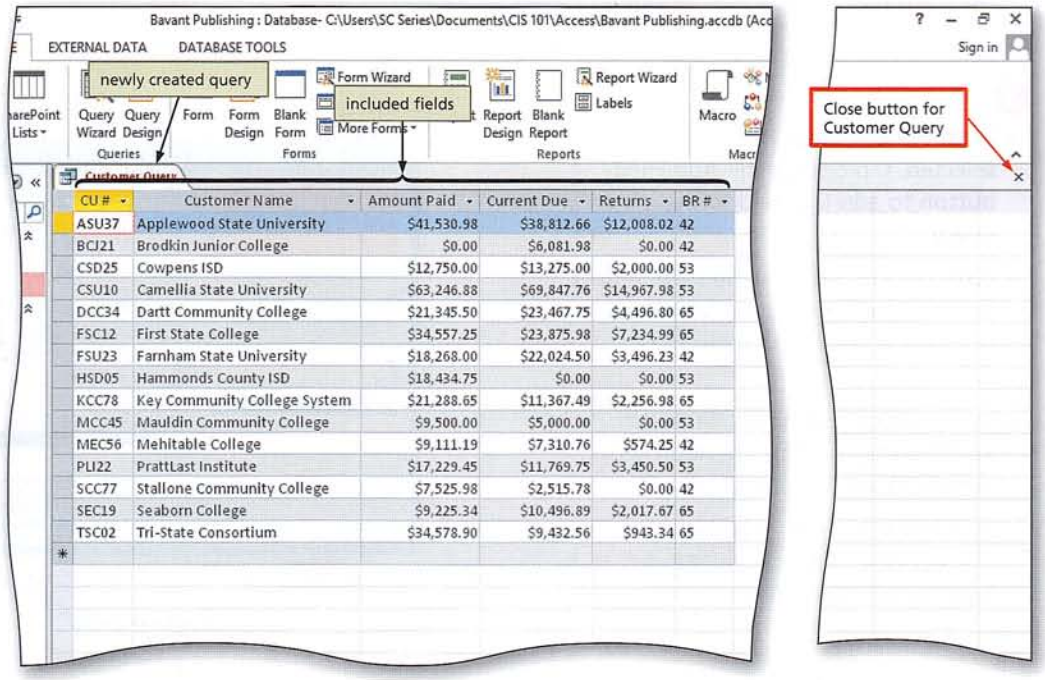


Figure 1–58

BTW
Access Help
At any time while using Access, you can find answers to questions and display information about various topics through Access Help. Used properly, this form of assistance can increase your productivity and reduce your frustrations by minimizing the time you spend learning how to use Access. For instruction about Access Help and exercises that will help you gain confidence in using it, read the Office and Windows chapter at the beginning of this book.

Using Queries

After you have created and saved a query, Access stores it as a database object and makes it available for use in a variety of ways:

- If you want to change the design of the query, press and hold or right-click the query in the Navigation Pane and then tap or click Design View on the shortcut menu to open the query in Design view.
- To view the results of the query from Design view, tap or click the Run button to instruct Access to **run** the query, that is, to perform the necessary actions to produce and display the results in Datasheet view.
- To view the results of the query from the Navigation Pane, open it by pressing and holding or right-clicking the query and tapping or clicking Open on the

shortcut menu. Access automatically runs the query and displays the results in Datasheet view.

- To print the results with the query open in either Design view or Datasheet view, tap or click FILE on the ribbon, tap or click the Print tab, and then tap or click either Print or Quick Print.
- To print the query without first opening it, be sure the query is selected in the Navigation Pane and tap or click FILE on the ribbon, tap or click the Print tab, and then tap or click either Print or Quick Print.

You can switch between views of a query using the View button (HOME tab | Views group). Tapping or clicking the arrow in the bottom of the button produces the View button menu. You then tap or click the desired view in the menu. The two query views you will use in this chapter are Datasheet view (which displays the query results) and Design view (for changing the query design). You also can tap or click the top part of the View button, in which case, you will switch to the view identified by the icon on the button. In the figure, the button contains the icon for Design view, so tapping or clicking the button would change to Design view. For the most part, the icon on the button represents the view you want, so you can usually simply tap or click the button.

BTW

Creating Queries

Although the Simple Query Wizard is a convenient way to create straightforward queries, you will find that many of the queries you create require more control than the wizard provides. In Chapter 2, you will use Design view to create customized queries.

To Use a Criterion in a Query

1 CREATE FIRST TABLE | 2 ADD RECORDS | 3 PRINT CONTENTS | 4 IMPORT RECORDS | 5 MODIFY SECOND TABLE
6 CREATE QUERY | 7 CREATE FORM | 8 CREATE REPORT

After you have determined the fields to be included in a query, you will determine whether you need to further restrict the results of the query. For example, you might want to include only those customers whose book rep number is 53. In such a case, you need to enter the number 53 as a criterion for the book rep field. ***Why?*** *A criterion is a condition that the records must satisfy in order to be included in the query results.* To do so, you will open the query in Design view, enter the criterion below the appropriate field, and then view the results of the query. The following steps enter a criterion to include only the customers of book rep 53 and then view the query results.

1

- Press and hold or right-click the Customer Query in the Navigation Pane to produce a shortcut menu (Figure 1–59).

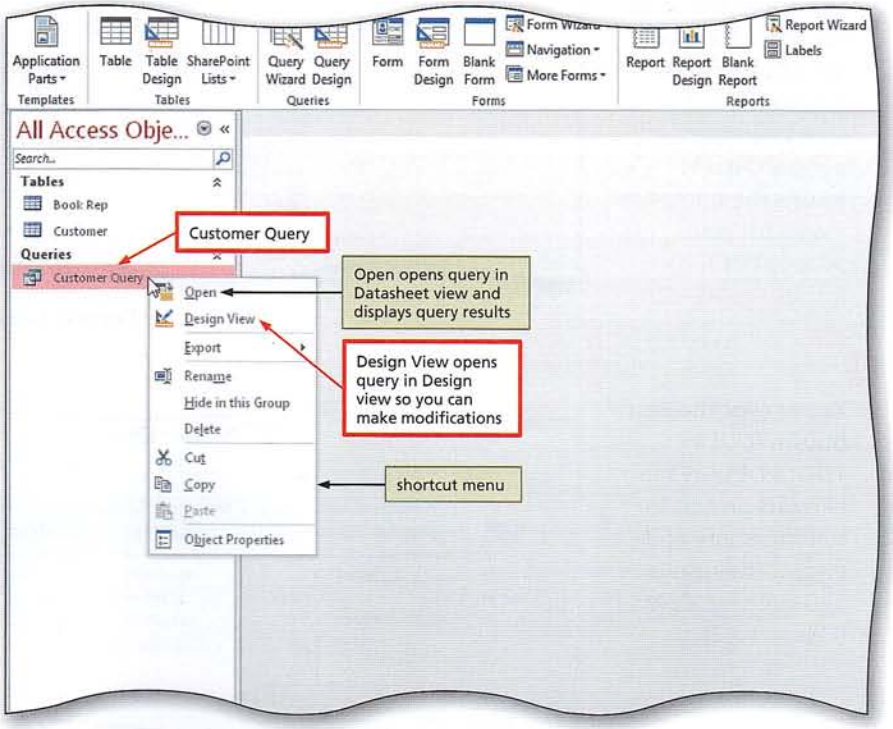


Figure 1–59

2

- Tap or click Design View on the shortcut menu to open the query in Design view (Figure 1–60).

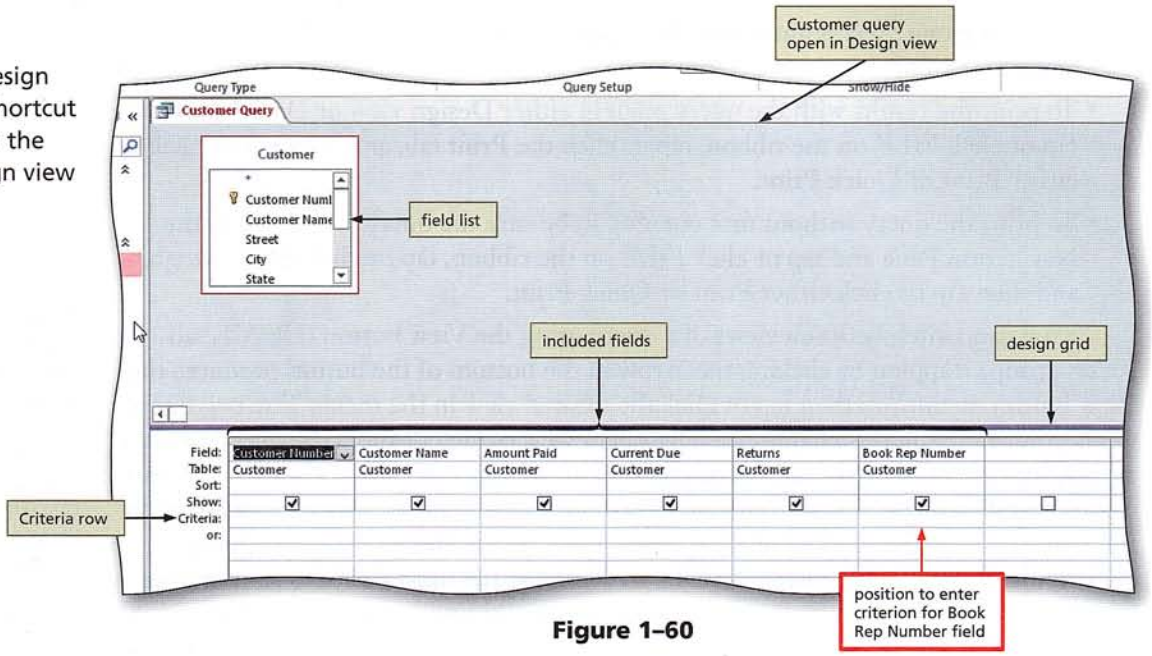


Figure 1–60

3

- Tap or click the Criteria row in the Book Rep Number column of the grid, and then type 53 as the criterion (Figure 1–61).

Q&A The Book Rep Number field is a text field. Do I need to enclose the value for a text field in quotation marks? You could, but it is not necessary, because Access inserts the quotation marks for you automatically.

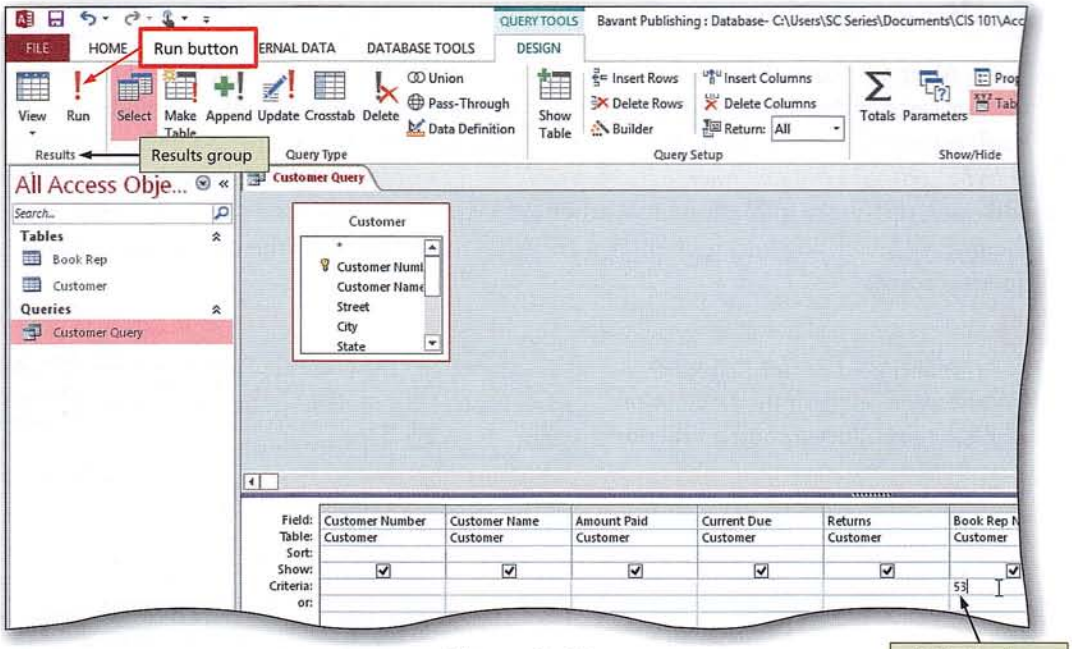


Figure 1–61

4

- Tap or click the Run button (QUERY TOOLS DESIGN tab | Results group) to run the query and display the results in Datasheet view (Figure 1–62).

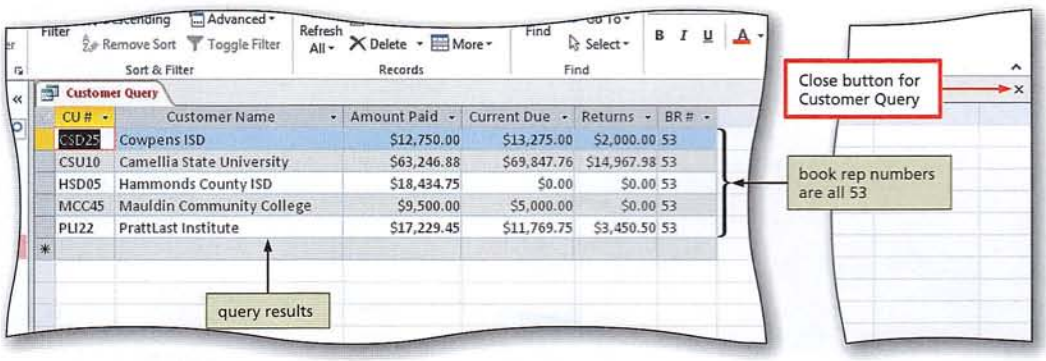


Figure 1–62

5

- Tap or click the Close button for the Customer Query to close the query.
- When asked if you want to save your changes, tap or click the No button.

Q&A

If I saved the query, what would happen the next time I ran the query?
You would see only customers of book rep 53.

Could I save a query with another name?
Yes. To save a query with a different name, tap or click FILE on the ribbon, tap or click the Save As tab, tap or click Save Object As, tap or click the Save As button, enter a new file name in the Save As dialog box, and then tap or click the OK button (Save As dialog box).

Other Ways

1. Tap or click View button (QUERY TOOLS DESIGN tab | Results group)
2. Tap or click Datasheet View button on status bar

To Print the Results of a Query

The following steps print the results of a saved query.

1. With the Customer Query selected in the Navigation Pane, tap or click FILE on the ribbon to open the Backstage view.
2. Tap or click the Print tab in the Backstage view to display the Print gallery.
3. Tap or click the Quick Print button to print the query.

Creating and Using Forms

In Datasheet view, you can view many records at once. If there are many fields, however, only some of the fields in each record might be visible at a time. In **Form view**, where data is displayed in a form on the screen, you usually can see all the fields, but only for one record.

To Create a Form

1 CREATE FIRST TABLE | 2 ADD RECORDS | 3 PRINT CONTENTS | 4 IMPORT RECORDS | 5 MODIFY SECOND TABLE | 6 CREATE QUERY | 7 CREATE FORM | 8 CREATE REPORT

Like a paper form, a **form** in a database is a formatted document with fields that contain data. Forms allow you to view and maintain data. Forms also can be used to print data, but reports are more commonly used for that purpose. The simplest type of form in Access is one that includes all the fields in a table stacked one above the other. The following steps use the Form button to create a form. ***Why?*** *Using the Form button is the simplest way to create this type of form.* The steps then use the form to view records and then save the form.

1

- Select the Customer table in the Navigation Pane.
- If necessary, tap or click CREATE on the ribbon to display the CREATE tab (Figure 1–63).

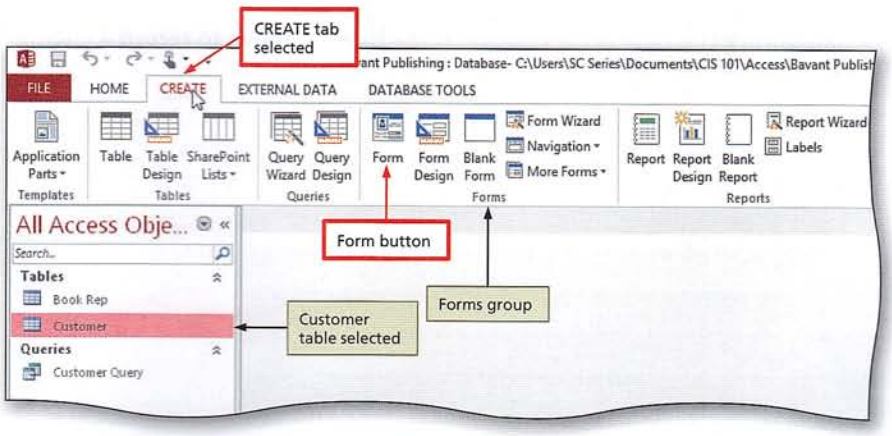


Figure 1–63

2

- Tap or click the Form button (CREATE tab | Forms group) to create a simple form (Figure 1–64).

Q&A A Field list appeared on my screen. What should I do?
Tap or click the Add Existing Fields button (FORM LAYOUT TOOLS DESIGN tab | Tools group) to remove the Field list from the screen.

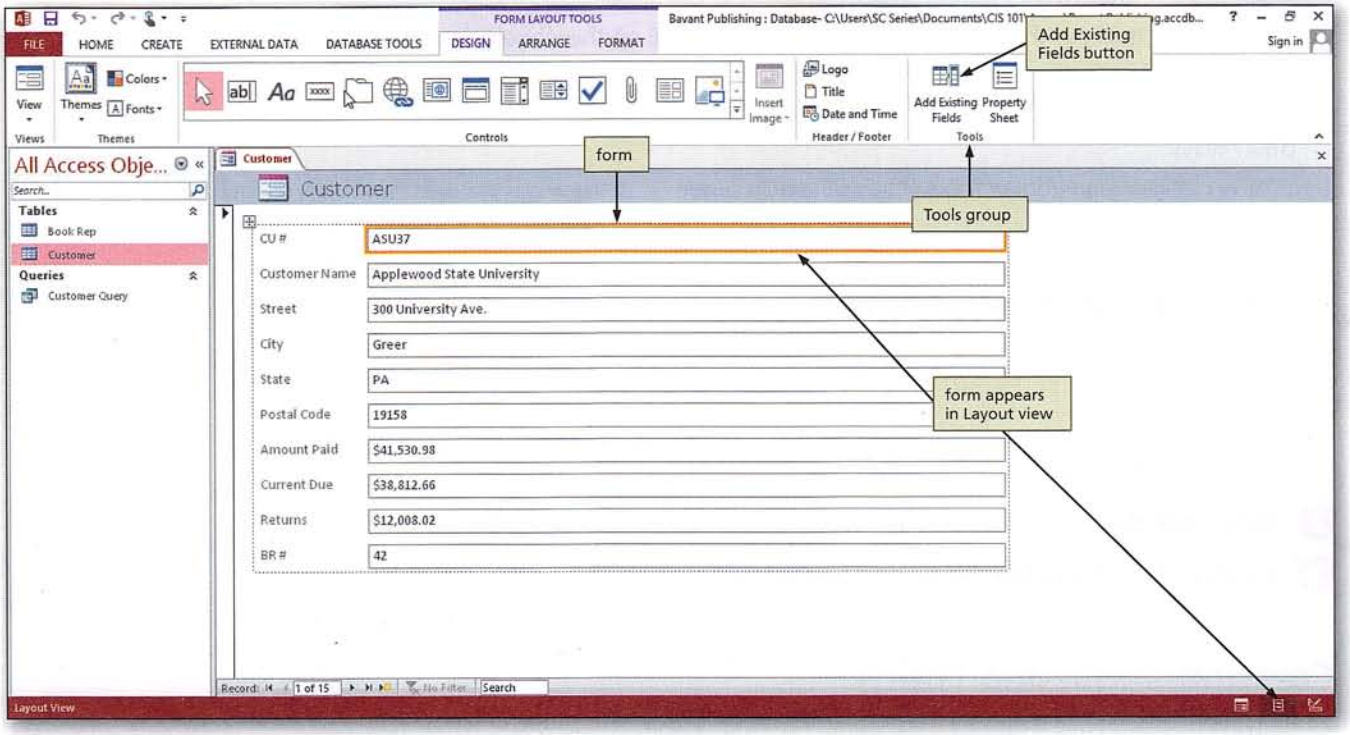


Figure 1–64

3

- Tap or click the Form View button on the Access status bar to display the form in Form view rather than Layout view.

Q&A What is the difference between Layout view and Form view?
Layout view allows you to make changes to the look of the form. Form view is the view you use to examine or make changes to the data.

How can I tell when I am in Layout view?
Access identifies Layout view in three ways. The left side of the status bar will contain the words Layout View; shading will appear around the outside of the selected field in the form; and the Layout View button will be selected on the right side of the status bar.

- Tap or click the Next record button three times to move to record 4 (Figure 1–65).

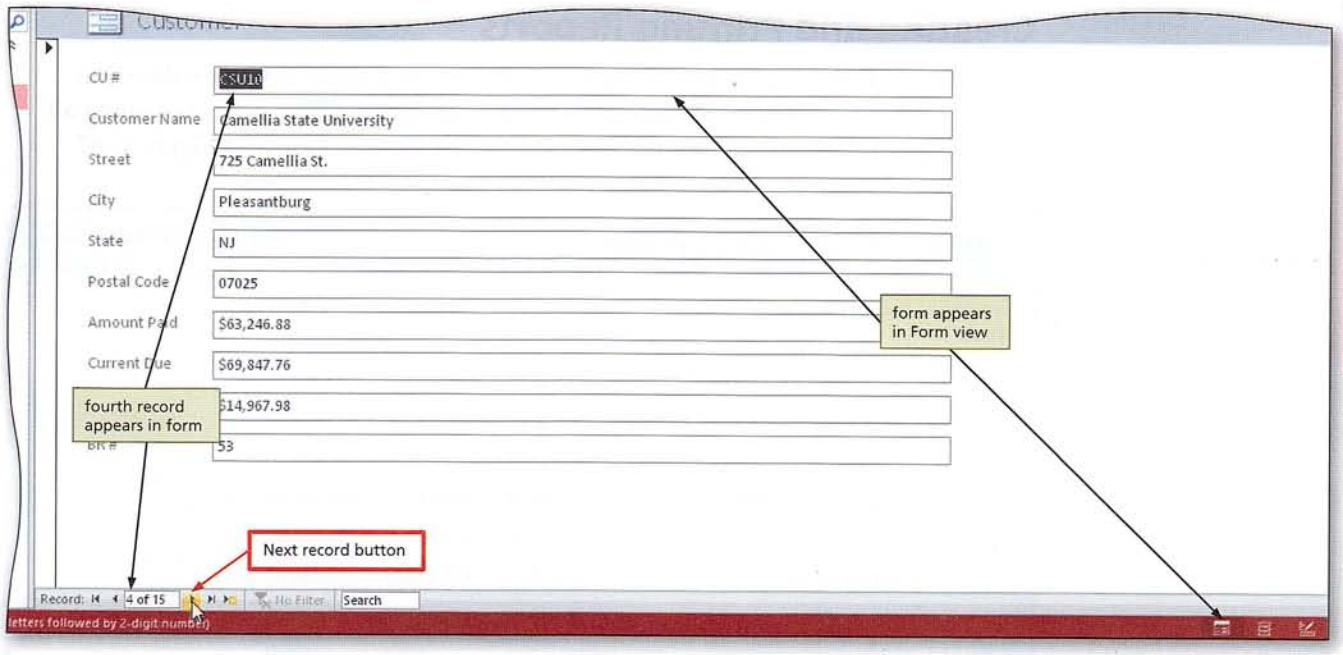


Figure 1–65

4

- Tap or click the Save button on the Quick Access Toolbar to display the Save As dialog box (Figure 1–66).

Q&A Do I have to tap or click the Next record button before saving?
No. The only reason you were asked to tap or click the button was so that you could experience navigation within the form.

5

- Type `Customer Form` as the form name, and then tap or click the OK button to save the form.

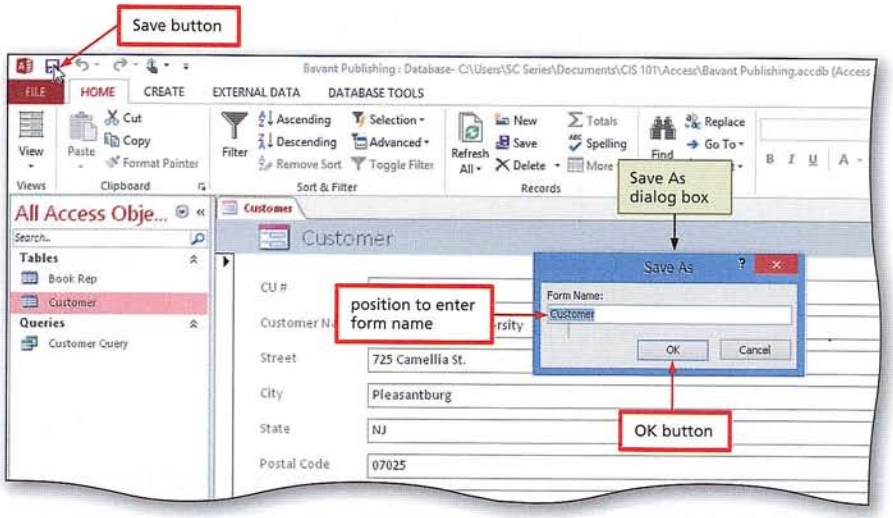


Figure 1–66

- Tap or click the Close button for the form to close the form.

Other Ways

1. Tap or click View button (FORM LAYOUT TOOLS DESIGN tab | Views group)

Using a Form

After you have saved a form, you can use it at any time by pressing and holding or right-clicking the form in the Navigation Pane and then tapping or clicking Open on the shortcut menu. In addition to viewing data in the form, you also can use it to enter or update data, a process that is very similar to updating data using a datasheet. If you plan to use the form to enter or revise data, you must ensure you are viewing the form in Form view.

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

Creating and Printing Reports

Bavant Publishing wants to create the Customer Financial Report shown in Figure 1–67. To create this report, you will first create a simple report containing all records. Then, you will modify the report to match the one shown in Figure 1–67.

Customer Financial Report

Monday, September 15, 2014
2:23:09 PM

Customer Number	Customer Name	Amount Paid	Current Due	Returns	Book Rep Number
ASU37	Applewood State University	$41,530.98	$38,812.66	$12,008.02	42
BCJ21	Brodkin Junior College	$0.00	$6,081.98	$0.00	42
CSD25	Cowpens ISD	$12,750.00	$13,275.00	$2,000.00	53
CSU10	Camellia State University	$63,246.88	$69,847.76	$14,967.98	53
DCC34	Dartt Community College	$21,345.50	$23,467.75	$4,496.80	65
FSC12	First State College	$34,557.25	$23,875.98	$7,234.99	65
FSU23	Farnham State University	$18,268.00	$22,024.50	$3,496.23	42
HSD05	Hammonds County ISD	$18,434.75	$0.00	$0.00	53
KCC78	Key Community College System	$21,288.65	$11,367.49	$2,256.98	65
MCC45	Mauldin Community College	$9,500.00	$5,000.00	$0.00	53
MEC56	Mehitable College	$9,111.19	$7,310.76	$574.25	42
PLI22	PrattLast Institute	$17,229.45	$11,769.75	$3,450.50	53
SCC77	Stallone Community College	$7,525.98	$2,515.78	$0.00	42
SEC19	Seaborn College	$9,225.34	$10,496.89	$2,017.67	65
TSC02	Tri-State Consortium	$34,578.90	$9,432.56	$943.34	65
		$318,592.87	$255,278.86	$53,446.76	

Figure 1–67

To Create a Report

1 CREATE FIRST TABLE | 2 ADD RECORDS | 3 PRINT CONTENTS | 4 IMPORT RECORDS | 5 MODIFY SECOND TABLE | 6 CREATE QUERY | 7 CREATE FORM | 8 CREATE REPORT

You will first create a report containing all fields. ***Why?*** *It is easiest to create a report with all the fields and then delete the fields you do not want.* The following steps create and save the initial report. They also modify the report title.

1

- Be sure the Customer table is selected in the Navigation Pane.
- Tap or click CREATE on the ribbon to display the CREATE tab (Figure 1–68).

Q&A Do I need to select the Customer table prior to tapping or clicking CREATE on the ribbon?
You do not need to select the table at that point. You do need to select a table prior to tapping or clicking the Report button, because Access will include all the fields in whichever table or query is currently selected.

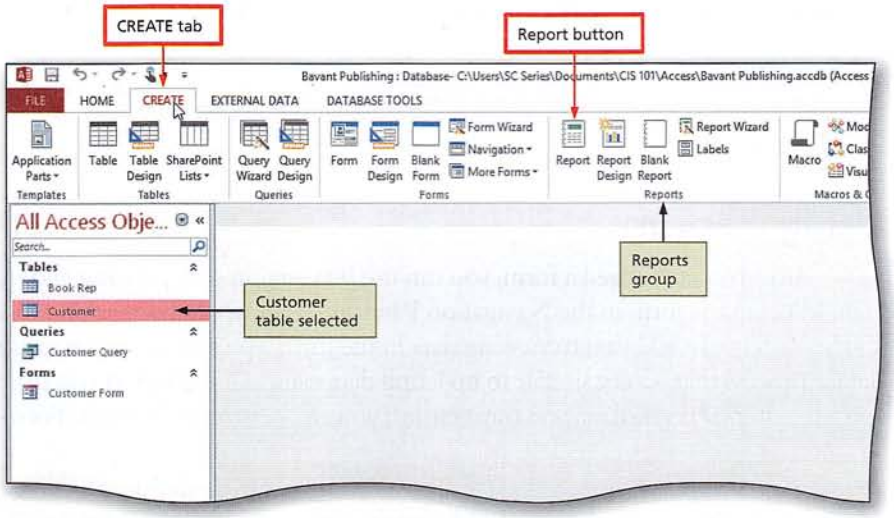


Figure 1–68

2

- Tap or click the Report button (CREATE tab | Reports group) to create the report (Figure 1–69).

Q&A Why is the report title Customer?
Access automatically assigns the name of the table or query as the title of the report. It also automatically includes the date. You can change either of these later.

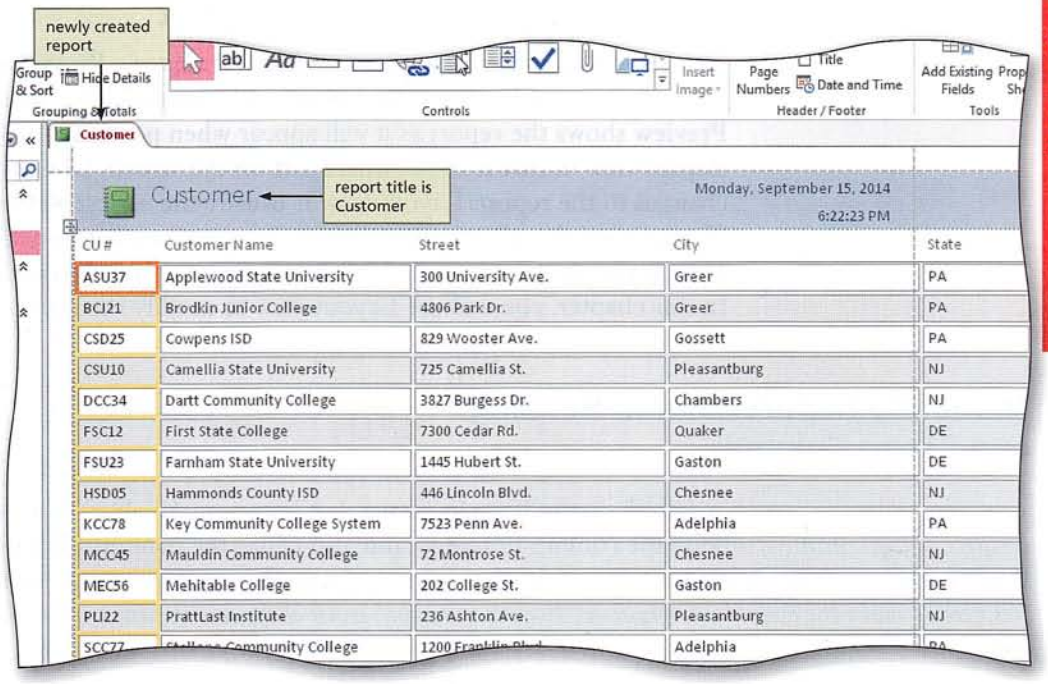


Figure 1–69

3

- Tap or click the Save button on the Quick Access Toolbar to display the Save As dialog box, and then type `Customer Financial Report` as the name of the report (Figure 1–70).

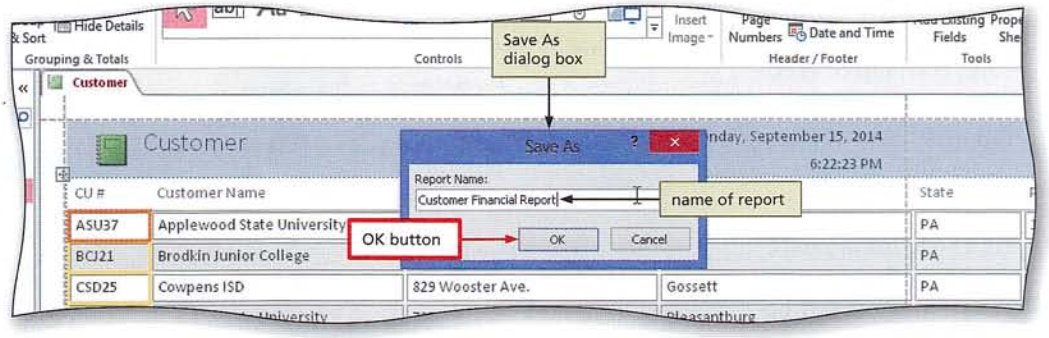


Figure 1–70

4

- Tap or click the OK button (Save As dialog box) to save the report (Figure 1–71).

Q&A The name of the report changed. Why did the report title not change?
The report title is assigned the same name as the report by default. Changing the name of the report does not change the report title. You can change the title at any time to anything you like.

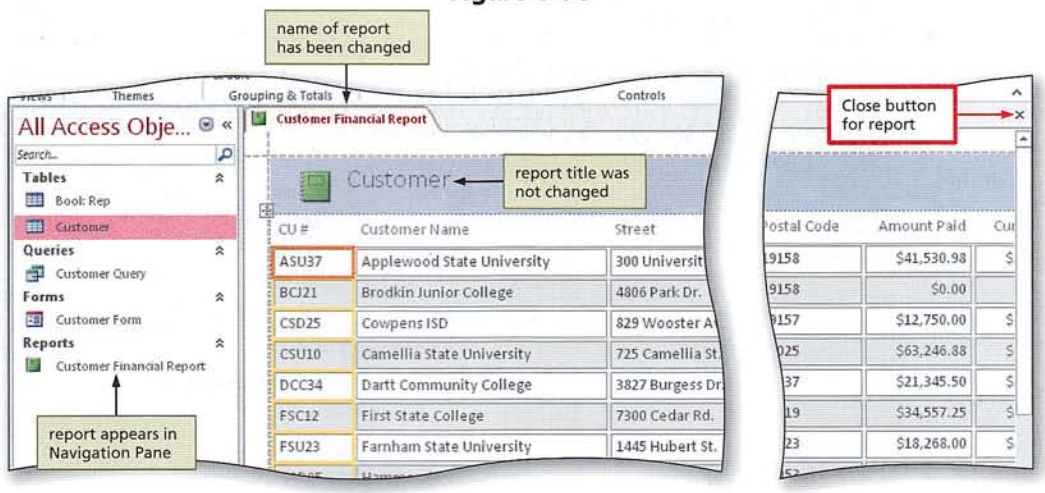


Figure 1–71

5

- Close the report by tapping or clicking its Close button.

Using Layout View in a Report

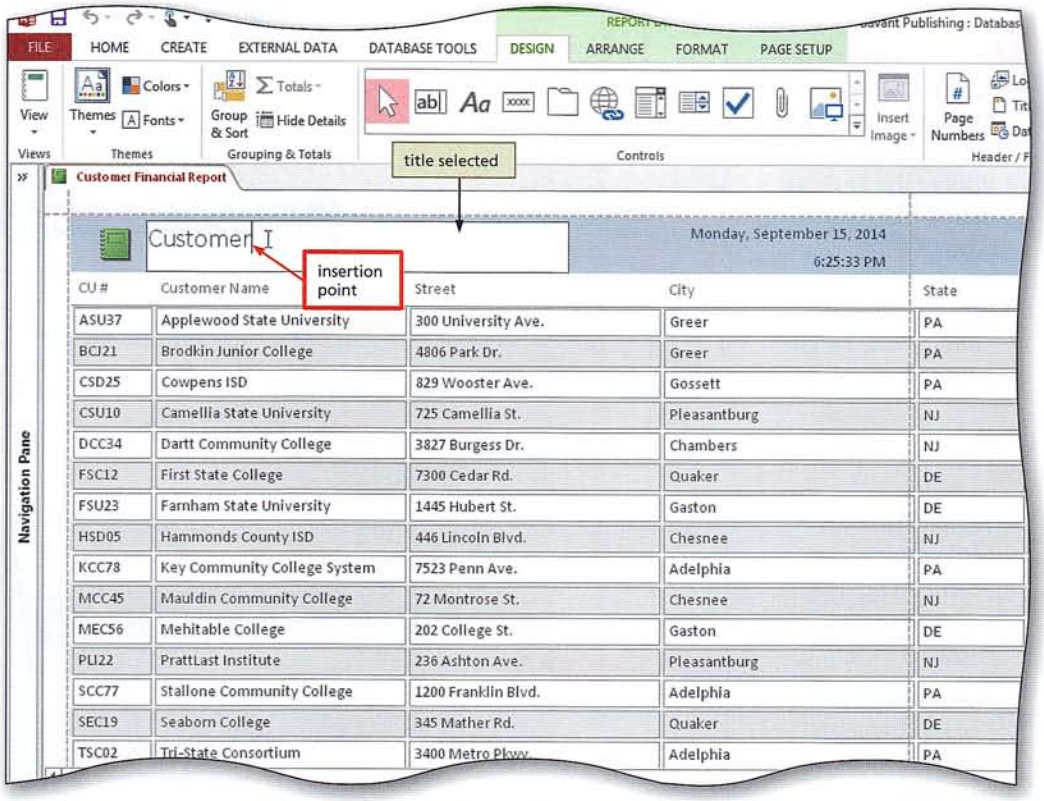
Access has four different ways to view reports: Report view, Print Preview, Layout view, and Design view. Report view shows the report on the screen. Print Preview shows the report as it will appear when printed. Layout view is similar to Report view in that it shows the report on the screen, but also allows you to make changes to the report. Layout view is usually the easiest way to make such changes. Design view also allows you to make changes, but does not show you the actual report. Design view is most useful when the changes you need to make are especially complex. In this chapter, you will use Layout view to modify the report.

To Modify Report Column Headings and Resize Columns

To make the report match the one shown in Figure 1–67 on page AC 48, you need to change the title, remove some columns, modify the column headings, and also resize the columns. The following steps use Layout view to make the necessary modifications to the report. ***Why?*** *Working in Layout view gives you all the tools you need to make the desired modifications. You can view the results of the modifications immediately.*

1

- Press and hold or right-click Customer Financial Report in the Navigation Pane, and then tap or click Layout View on the shortcut menu to open the report in Layout view.
- If a Field list appears, tap or click the Add Existing Fields button (REPORT LAYOUT TOOLS DESIGN tab | Tools group) to remove the Field list from the screen.
- Close the Navigation Pane.
- Tap or click the report title once to select it.
- Tap or click the report title a second time to produce an insertion point (Figure 1–72).



CU #	Customer Name	Street	City	State
ASU37	Applewood State University	300 University Ave.	Greer	PA
BCJ21	Brodkin Junior College	4806 Park Dr.	Greer	PA
CSD25	Cowpens ISD	829 Wooster Ave.	Gossett	PA
CSU10	Camellia State University	725 Camellia St.	Pleasantburg	NJ
DCC34	Dartt Community College	3827 Burgess Dr.	Chambers	NJ
FSC12	First State College	7300 Cedar Rd.	Quaker	DE
FSU23	Farnham State University	1445 Hubert St.	Gaston	DE
HSD05	Hammonds County ISD	446 Lincoln Blvd.	Chesnee	NJ
KCC78	Key Community College System	7523 Penn Ave.	Adelphia	PA
MCC45	Mauldin Community College	72 Montrose St.	Chesnee	NJ
MEC56	Mehitable College	202 College St.	Gaston	DE
PLI22	PrattLast Institute	236 Ashton Ave.	Pleasantburg	NJ
SCC77	Stallone Community College	1200 Franklin Blvd.	Adelphia	PA
SEC19	Seaborn College	345 Mather Rd.	Quaker	DE
TSC02	Tri-State Consortium	3400 Metro Pkwy	Adelphia	PA

Figure 1–72

Q&A My insertion point is in the middle of Customer. How do I produce an insertion point at the position shown in the figure?

You can use the RIGHT ARROW key to move the insertion point to the position in the figure, or you can tap or click the desired position.

2

- Press the SPACEBAR to insert a space, and then type `Financial Report` to complete the title.
- Tap or click the column heading for the Street field to select it.
- Hold the SHIFT key down and then tap or click the column headings for the City, State, and Postal Code fields to select multiple column headings.

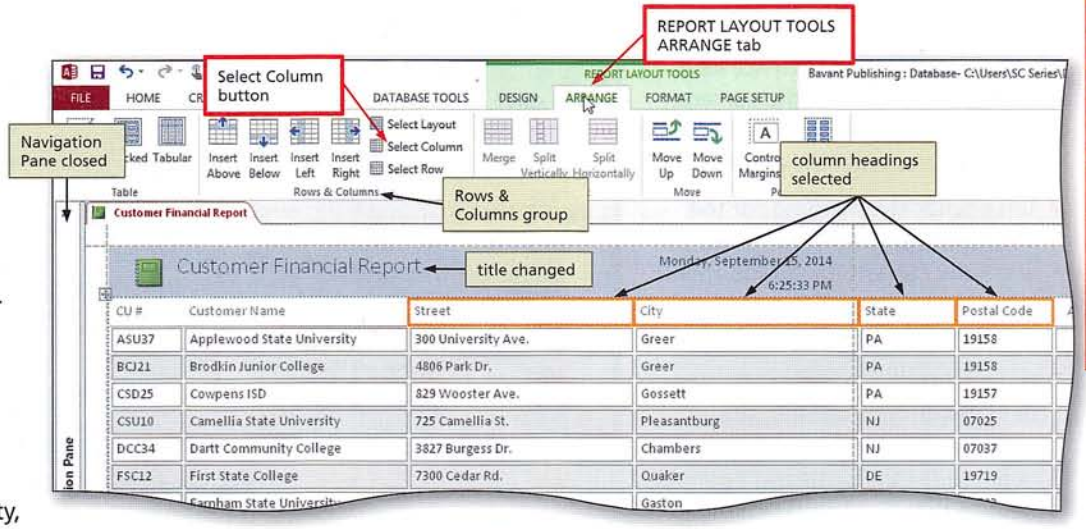


Figure 1–73

Q&A What happens if I do not hold down the SHIFT key?
When you tap or click another column heading, it will be the only one that is selected. To select multiple objects, you need to hold the SHIFT key down for every object after the first selection.

I selected the wrong collection of objects. What should I do?
You can tap or click somewhere else on the report so that the objects you want are not selected, and then begin the process again. Alternatively, you can repeatedly tap or click the Undo button on the Quick Access Toolbar to undo your selections. Once you have done so, you can select the objects you want.

- Tap or click ARRANGE on the ribbon to display the REPORT LAYOUT TOOLS ARRANGE tab (Figure 1–73).

3

- Tap or click the Select Column button (REPORT LAYOUT TOOLS ARRANGE tab | Rows & Columns group) to select the entire columns corresponding to the column headings you selected in the previous step.
- Press the DELETE key to delete the selected columns.
- Tap or click the column heading for the Customer Number field twice, once to select it and the second time to produce an insertion point (Figure 1–74).

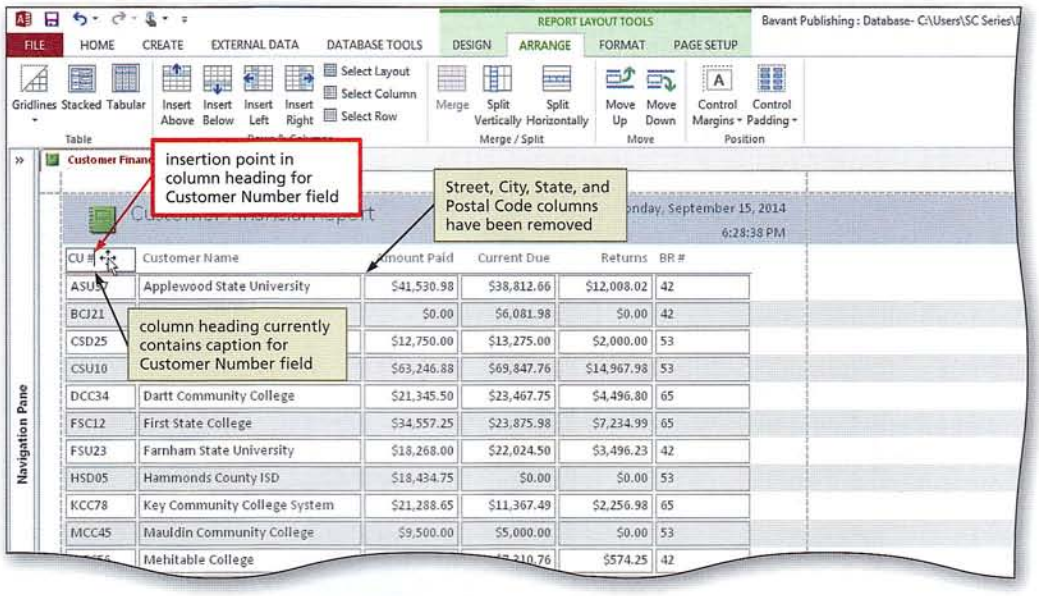


Figure 1–74

Q&A I selected the wrong field. What should I do?
Tap or click somewhere outside the various fields to deselect the one you have selected. Then, tap or click the Customer Number field twice.

4

- Use the DELETE or BACKSPACE keys as necessary to erase the current entry, and then type `Customer Number` as the new entry.
- Tap or click the heading for the Book Rep Number field twice, erase the current entry, and then type `Book Rep Number` as the new entry.
- Tap or click the Customer Number field heading to select it, point to the lower boundary of the heading for the Customer Number field so that the pointer changes to a two-headed arrow, and then drag the lower boundary to the approximate position shown in Figure 1–75 to expand the column headings.

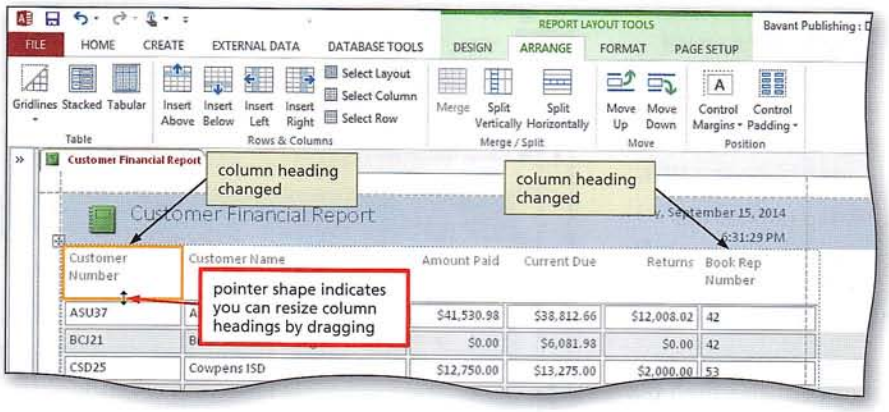


Figure 1–75

Q&A

I did something wrong when I dragged and now my report looks strange. What should I do?
Tap or click the Undo button on the Quick Access Toolbar to undo the change. Depending on the specific action you took, you may need to tap or click it more than once.

My screen displays Book Rep Number on one line not two. Is this a problem?
No. You will adjust the column heading in a later step.

5

- Point to the right boundary of the heading for the Customer Number field so that the pointer changes to a two-headed arrow, and then drag the right boundary to the approximate position shown in Figure 1–76 to reduce the width of the column.

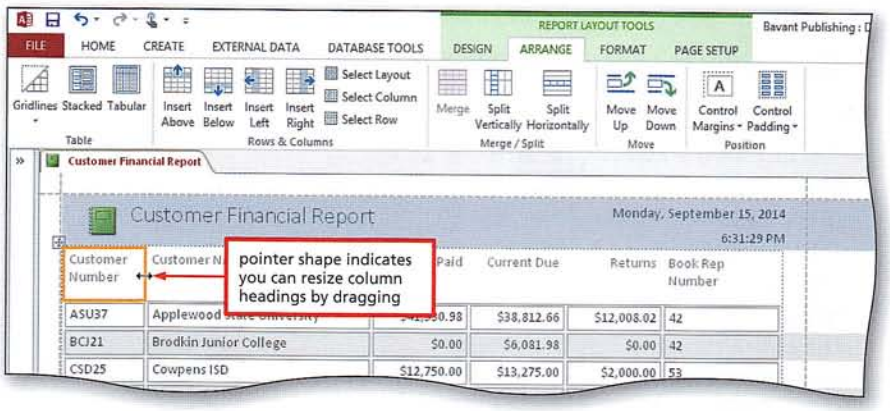


Figure 1–76

6

- Using the same technique, resize the other columns to the sizes shown in Figure 1–77.

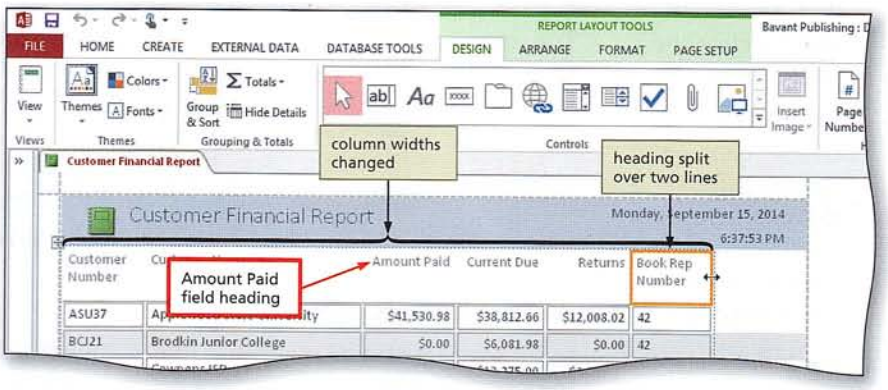


Figure 1–77

To Add Totals to a Report

The report in Figure 1–67 contains totals for the Amount Paid, Current Due, and Returns columns. You can use Layout view to add these totals. The following steps use Layout view to include totals for these three columns. ***Why?*** *In Layout view you can tap or click a single button to add totals. This button sums all the values in the field.*

1

- Tap or click the Amount Paid field heading (shown in Figure 1–77) to select the field.

Q&A Do I have to tap or click the heading? Could I tap or click the field on one of the records?
You do not have to tap or click the heading. You also could tap or click the Amount Paid field on any record.

- Tap or click DESIGN on the ribbon to display the DESIGN tab.
- Tap or click the Totals button (REPORT LAYOUT TOOLS DESIGN tab | Grouping & Totals group) to display the Totals menu containing a list of available calculations (Figure 1–78).

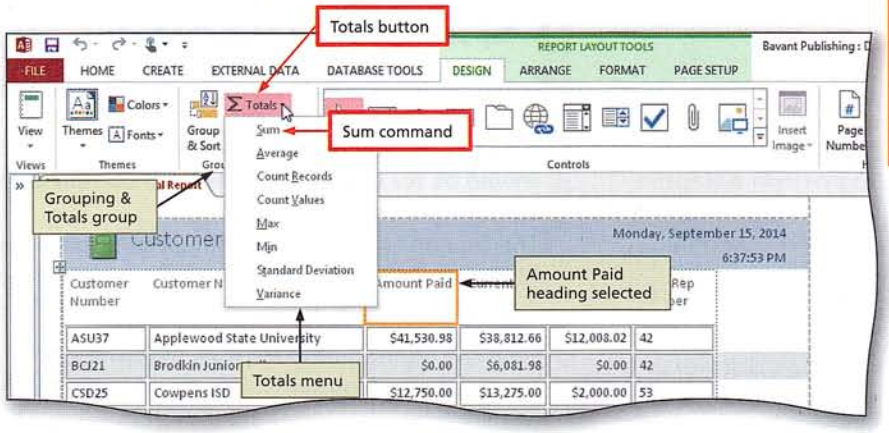


Figure 1–78

2

- Tap or click Sum to calculate the sum of the amount of paid values.
- Using the same technique, add totals for the Current Due and Returns columns.

Q&A When I clicked the Totals button after selecting the Returns field heading, Sum was already checked. Do I still need to tap or click Sum?
No. In fact, if you do tap or click it, you will remove the check mark, which will remove the total from the column.

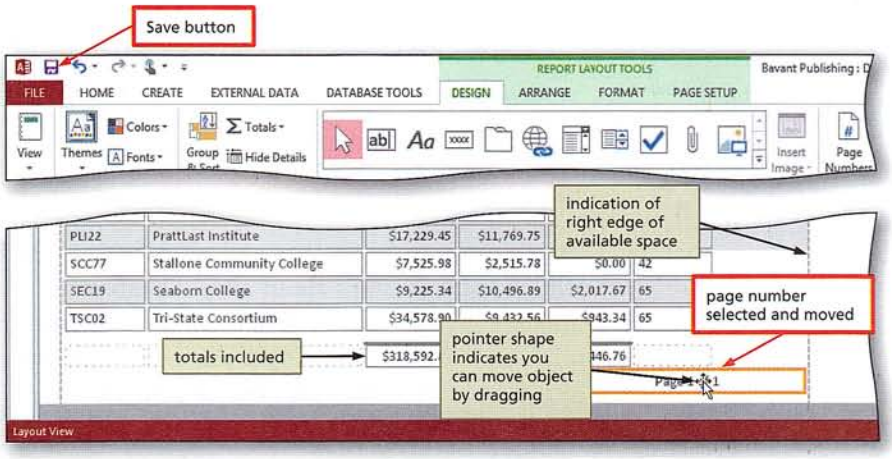


Figure 1–79

- Scroll down to the bottom of the report to verify that the totals are included. If necessary, expand the size of the total controls so they appear completely by dragging the lower boundary of the controls to the approximate position shown in Figure 1–79.
- Tap or click the page number to select it, and then drag it to the approximate position shown in Figure 1–79.

Q&A Why did I need to move the page number?
The dotted line near the right-hand edge of the screen indicates the right-hand border of the available space on the printed page, based on whatever margins and orientation are currently selected. A portion of the page number extends beyond this border. By moving the page number, it no longer extends beyond the border.

3

- Tap or click the Save button on the Quick Access Toolbar to save your changes to the report layout.
- Close the report.

To Print a Report

The following steps print the report.

1. Open the Navigation Pane if necessary, confirm that the Customer Financial Report is selected, and then tap or click FILE on the ribbon to open the Backstage view.
2. Tap or click the Print tab in the Backstage view to display the Print gallery.
3. Tap or click the Quick Print button to print the report.

Q&A

When I print the report, I have pound signs (####) rather than numbers where the totals should be for the Amount Paid and Current Due columns. The report looked fine on the screen. How can I correct it?
The columns are not wide enough to display the complete number. Open the report in Layout view and slightly increase the width of the Amount Paid and Current Due columns by dragging the right boundary of the column headings.

How can I print multiple copies of my report?
Tap or click FILE on the ribbon to open the Backstage view. Tap or click the Print tab, tap or click Print in the Print gallery to display the Print dialog box, increase the number in the Number of Copies box, and then tap or click the OK button (Print dialog box).

How can I print a range of pages rather than printing the whole report?
Tap or click FILE on the ribbon to open the Backstage view. Tap or click the Print tab, tap or click Print in the Print gallery to display the Print dialog box, tap or click the Pages option button in the Print Range area, enter the desired page range, and then tap or click the OK button (Print dialog box).

BTW
Exporting a Report as a PDF or XPS File
To export a report as a PDF or XPS file, display the EXTERNAL DATA tab, and then tap or click the PDF or XPS button (EXTERNAL DATA tab | Export group). Enter the appropriate information in the Publish to PDF or XPS dialog box and tap or click the Publish button.

BTW
Report Navigation
When previewing a report, you can use the Navigation buttons on the status bar to move from one page to another.

Database Properties

Access helps you organize and identify your databases by using **database properties,** which are the details about a file. Database properties, also known as **metadata,** can include such information as the project author, title, or subject. **Keywords** are words or phrases that further describe the database. For example, a class name or database topic can describe the file's purpose or content.

Five different types of database properties exist, but the more common ones used in this book are standard and automatically updated properties. **Standard properties** are associated with all Microsoft Office documents and include author, title, and subject. **Automatically updated properties** include file system properties, such as the date you create or change a file, and statistics, such as the file size.

CONSIDER THIS

Why would you want to assign database properties to a database?
Database properties are valuable for a variety of reasons:

- Users can save time locating a particular file because they can view a file's database properties without opening the database.
- By creating consistent properties for files having similar content, users can better organize their databases.
- Some organizations require Access users to add database properties so that other employees can view details about these files.

To Change Database Properties

To change database properties, you would follow these steps.

1. Tap or click FILE on the ribbon to open the Backstage view and then, if necessary, tap or click the Info tab in the Backstage view to display the Info gallery.
2. Click the 'View and edit database properties' link in the right pane of the Info gallery to display the Bavant Publishing Properties dialog box.

Q&A Why are some of the database properties already filled in?
The person who installed Office 2013 on your computer or network might have set or customized the properties.

3. If the property you want to change is displayed in the Properties dialog box, click the text box for the property and make the desired change. Skip the remaining steps.
4. If the property you want to change is not displayed in the Properties dialog box, click the appropriate tab so the property is displayed and then make the desired change.
5. Click the OK button in the Properties dialog box to save your changes and remove the dialog box from the screen.

To Sign Out of a Microsoft Account

If you are signed in to a Microsoft account and are using a public computer or otherwise wish to sign out of your Microsoft account, you should sign out of the account from the Account gallery in the Backstage view before exiting Access. Signing out of the account is the safest way to make sure that nobody else can access SkyDrive files or settings stored in your Microsoft account. The following steps sign out of a Microsoft account from Access. For a detailed example of the procedure summarized below, refer to the Office and Windows chapter at the beginning of this book.

1. If you wish to sign out of your Microsoft account, tap or click FILE on the ribbon to open the Backstage view and then tap or click the Account tab to display the Account gallery.
2. Tap or click the Sign out link, which displays the Remove Account dialog box. If a Can't remove Windows accounts dialog box appears instead of the Remove Account dialog box, click the OK button and skip the remaining steps.

Q&A Why does a Can't remove Windows accounts dialog box appear?
If you signed in to Windows using your Microsoft account, then you also must sign out from Windows, rather than signing out from within Access. When you are finished using Windows, be sure to sign out at that time.

3. Tap or click the Yes button (Remove Account dialog box) to sign out of your Microsoft account on this computer.

Q&A Should I sign out of Windows after signing out of my Microsoft account? [End Q]
When you are finished using the computer, you should sign out of your account for maximum security.

4. Tap or click the Back button in the upper-left corner of the Backstage view to return to the database.

To Exit Access

The following steps exit Access.

1. Tap or click the Close button on the right side of the title bar to close the open database, if there is one, and exit Access.
2. If a Microsoft Access dialog box appears, tap or click the Save button to save any changes made to the database since the last save.

Special Database Operations

Additional operations involved in maintaining a database are backup, recovery, compacting, and repairing.

Backup and Recovery

It is possible to damage or destroy a database. Users can enter data that is incorrect; programs that are updating the database can end abnormally during an update; a hardware problem can occur; and so on. After any such event has occurred, the database may contain invalid data or it might be totally destroyed.

Obviously, you cannot allow a situation in which data has been damaged or destroyed to go uncorrected. You must somehow return the database to a correct state. This process is called recovery; that is, you **recover** the database.

The simplest approach to recovery involves periodically making a copy of the database (called a **backup copy** or a **save copy**). This is referred to as **backing up** the database. If a problem occurs, you correct the problem by overwriting the actual database — often referred to as the **live database** — with the backup copy.

To back up the database that is currently open, you use the Back Up Database command on the Save As tab in the Backstage view. In the process, Access suggests a name that is a combination of the database name and the current date. For example, if you back up the Bavant Publishing database on October 20, 2014, Access will suggest the name, Bavant Publishing_2014-10-20. You can change this name if you desire, although it is a good idea to use this name. By doing so, it will be easy to distinguish between all the backup copies you have made to determine which is the most recent. In addition, if you discover that a critical problem occurred on October 18, 2014, you may want to go back to the most recent backup before October 18. If, for example, the database was not backed up on October 17 but was backed up on October 16, you would use Bavant Publishing_2014-10-16.

To Back Up a Database

You would use the following steps to back up a database to a file on a hard disk or high-capacity removable disk.

1. Open the database to be backed up.
2. Tap or click FILE on the ribbon to open the Backstage view, and then tap or click the Save As tab.
3. With Save Database As selected in the File Types area, tap or click 'Back Up Database' in the Save Database As area, and then tap or click the Save As button.
4. Navigate to the desired location in the Save As box. If you do not want the name Access has suggested, enter the desired name in the File name text box.
5. Tap or click the Save button to back up the database.

Access creates a backup copy with the desired name in the desired location. Should you ever need to recover the database using this backup copy, you can simply copy it over the live version.

Compacting and Repairing a Database

As you add more data to a database, it naturally grows larger. When you delete an object (records, tables, forms, or queries), the space previously occupied by the object does not become available for additional objects. Instead, the additional objects are given new space; that is, space that was not already allocated. To remove this empty space from the database, you must **compact** the database. The same option that compacts the database also repairs problems that might have occurred in the database.

To Compact and Repair a Database

You would use the following steps to compact and repair a database.

1. Open the database to be compacted.
2. Tap or click FILE on the ribbon to open the Backstage view, and then, if necessary, select the Info tab.
3. Tap or click the Compact & Repair Database button in the Info gallery to compact and repair the database.

The database now is the compacted form of the original.

Additional Operations

Additional special operations include opening another database, closing a database without exiting Access, and saving a database with another name. They also include deleting a table (or other object) as well as renaming an object.

When you open another database, Access will automatically close the database that previously was open. Before deleting or renaming an object, you should ensure that the object has no dependent objects; that is, other objects that depend on the object you want to delete.

To Close a Database without Exiting Access

You would use the following steps to close a database without exiting Access.

1. Tap or click FILE on the ribbon to open the Backstage view.
2. Tap or click Close.

To Save a Database with Another Name

To save a database with another name, you would use the following steps.

1. Tap or click FILE on the ribbon to open the Backstage view, and then select the Save As tab.
2. With Save Database As selected in the Database File Types area and Access Database selected in the Save Database As area, tap or click the Save As button.
3. Enter a name and select a location for the new version.
4. Tap or click the Save button.

CONSIDER THIS

If you want to make a backup, could you just save the database with another name?
You could certainly do that. Using the backup procedure discussed earlier has the advantage that it automatically includes the current database name and the date in the name of the file it creates.

To Delete a Table or Other Object in the Database

You would use the following steps to delete a database object.

1. Press and hold or right-click the object in the Navigation Pane.
2. Tap or click Delete on the shortcut menu.
3. Tap or click the Yes button in the Microsoft Access dialog box.

To Rename an Object in the Database

You would use the following steps to rename a database object.

1. Press and hold or right-click the object in the Navigation Pane.
2. Tap or click Rename on the shortcut menu.
3. Type the new name and press the ENTER key.

Database Design

BTW
Database Design Language (DBDL)
Database Design Language (DBDL) is a commonly accepted shorthand representation for showing the structure of a relational database. You write the name of the table and then within parentheses you list all the columns in the table. If the columns continue beyond one line, indent the subsequent lines.

This section illustrates the **database design** process, that is, the process of determining the tables and fields that make up the database. It does so by showing how you would design the database for Bavant Publishing from a set of requirements. In this section, you will use commonly accepted shorthand to represent the tables and fields that make up the database as well as the primary keys for the tables. For each table, you give the name of the table followed by a set of parentheses. Within the parentheses is a list of the fields in the table separated by commas. You underline the primary key. For example,

Product (Product Code, Description, On Hand, Price) represents a table called Product. The Product table contains four fields: Product Code, Description, On Hand, and Price. The Product Code field is the primary key.

Database Requirements

BTW
Determining Database Requirements
The determination of database requirements is part of a process known as systems analysis. A systems analyst examines existing and proposed documents, and examines organizational policies to determine exactly the type of data needs the database must support.

The Bavant Publishing database must maintain information on both customers and book reps. The business currently keeps this data in two Word tables and two Excel workbooks, as shown in Figure 1–80. They use Word tables for address information and Excel workbooks for financial information.

- For customers, Bavant needs to maintain address data. It currently keeps this data in a Word table (Figure 1–80a).
- Bavant also maintains financial data for each customer. This includes the amount paid, current amount due, and return amount for the customer. It keeps these amounts, along with the customer name and number, in the Excel worksheet shown in Figure 1–80b.
- Bavant keeps book rep address data in a Word table, as shown in Figure 1–80c.
- Just as with customers, it keeps financial data for book reps, including their start date, salary, and bonus rate, in a separate Excel worksheet, as shown in Figure 1–80d.

Customer Number	Customer Name	Street	City	State	Postal Code
ASU37	Applewood State University	300 University Ave.	Greer	PA	19158
BCJ21	Brodkin Junior College	4806 Park Dr.	Greer	PA	19158
CSD25	Cowpens ISD	829 Wooster Ave.	Gossett	PA	19157
CSU10	Camellia State University	725 Camellia St.	Pleasantburg	NJ	07025
DCC34	Dartt Community College	3827 Burgess Dr.	Chambers	NJ	07037
FSC12	First State College	7300 Cedar Rd.	Quaker	DE	19719
FSU23	Farnham State University	1445 Hubert St.	Gaston	DE	19723
HSD05	Hammonds County ISD	446 Lincoln Blvd.	Chesnee	NJ	07053
KCC78	Key Community College System	7523 Penn Ave.	Adelphia	PA	19159
MCC45	Mauldin Community College	72 Montrose St.	Chesnee	NJ	07053
MEC56	Mehitable College	202 College St.	Gaston	DE	19723
PLI22	PrattLast Institute	236 Ashton Ave.	Pleasantburg	NJ	07025
SCC77	Stallone Community College	1200 Franklin Blvd.	Adelphia	PA	19156
SEC19	Seaborn College	345 Mather Rd.	Quaker	DE	19719
TSC02	Tri-State Consortium	3400 Metro Pkwy.	Adelphia	PA	19156

Figure 1–80 (a) Customer Address Information (Word Table)

	A	B	C	D	E	F	G	H
1	Customer Number	Customer Name	Amount Paid	Current Due	Returns			
2	ASU37	Applewood State University	$41,530.98	$38,812.66	$12,008.02			
3	BCJ21	Brodkin Junior College	$0.00	$6,081.98	$0.00			
4	CSD25	Cowpens ISD	$12,750.00	$13,275.00	$2,000.00			
5	CSU10	Camellia State University	$63,246.88	$69,847.76	$14,967.98			
6	DCC34	Dartt Community College	$21,345.50	$23,467.75	$4,496.80			
7	FSC12	First State College	$34,557.25	$23,875.98	$7,234.99			
8	FSU23	Farnham State University	$18,268.00	$22,024.50	$3,496.23			
9	HSD05	Hammonds County ISD	$18,434.75	$0.00	$0.00			
10	KCC78	Key Community College System	$21,288.65	$11,367.49	$2,256.98			
11	MCC45	Mauldin Community College	$9,500.00	$5,000.00	$0.00			
12	MEC56	Mehitable College	$9,111.19	$7,310.76	$574.25			
13	PLI22	PrattLast Institute	$17,229.45	$11,769.75	$3,450.50			
14	SCC77	Stallone Community College	$7,525.98	$2,515.78	$0.00			
15	SEC19	Seaborn College	$9,225.34	$10,496.89	$2,017.67			
16	TSC02	Tri-State Consortium	$34,578.90	$9,432.56	$943.34			

Figure 1–80 (b) Customer Financial Information (Excel Worksheet)

Book Rep Number	Last Name	First Name	Street	City	State	Postal Code
42	Perez	Melina	261 Porter Dr.	Adelphia	PA	19156
48	Statnik	Michael	3135 Simpson Dr.	Pleasantburg	NJ	07025
53	Chin	Robert	265 Maxwell St.	Gossett	PA	19157
65	Rogers	Tracy	1827 Maple Ave.	Adelphia	PA	19159

Figure 1–80 (c) Book Rep Address Information (Word Table)

	A	B	C	D	E	F	G	H	I	J
1	Book Rep Number	Last Name	First Name	Start Date	Salary	Bonus Rate				
2	53	Chin	Robert	6/1/2013	$26,250	0.19				
3	42	Perez	Melina	5/14/2012	$31,500	0.20				
4	65	Rogers	Tracy	7/1/2014	$7,750	0.18				
5	48	Statnik	Michael	1/15/2013	$29,000	0.20				
6										
7										

Figure 1–80 (d) Book Rep Financial Information (Excel Worksheet)

- Finally, Bavant keeps track of which customers are assigned to which book reps. Each customer is assigned to a single book rep, but each book rep might be assigned many customers. Currently, for example, customers ASU37 (Applewood State University), BCJ21 (Brodkin Junior College), FSU23 (Farnham State University), MEC56 (Mehitable College), and SCC77 (Stallone Community College) are assigned to book rep 42 (Melina Perez). Customers CSD25 (Cowpens ISD), CSU10 (Camellia State University), HSD05 (Hammonds County ISD), MCC45 (Mauldin Community College), and PLI22 (PrattLast Institute) are assigned to book rep 53 (Robert Chin). Customers DCC34 (Dartt Community College), FSC12 (First State College), KCC78 (Key Community College System), SEC19 (Seaborn College), and TSC02 (Tri-State Consortium) are assigned to book rep 65 (Tracy Rogers). Bavant has an additional book rep, Michael Statnik, whose number has been assigned as 48, but who has not yet been assigned any customers.

Database Design Process

The database design process involves several steps.

CONSIDER THIS

What is the first step in the process?

Identify the tables. Examine the requirements for the database to identify the main objects that are involved. There will be a table for each object you identify.

In a database for one organization, for example, the main objects might be departments and employees. This would require two tables: one for departments and the other for employees. In the database for another organization, the main objects might be customers and book reps. In this case, there also would be two tables: one for customers and the other for book reps. In still another organization's database, the main objects might be books, publishers, and authors. This database would require three tables: one for books, a second for publishers, and a third for authors.

Identifying the Tables

For the Bavant Publishing database, the main objects are customers and book reps. This leads to two tables, which you must name. Reasonable names for these two tables are:

Customer
Book Rep

CONSIDER THIS

After identifying the tables, what is the second step in the database design process?

Determine the primary keys. Recall that the primary key is the unique identifier for records in the table. For each table, determine the unique identifier. In a Department table, for example, the unique identifier might be the Department Code. For a Book table, the unique identifier might be the ISBN (International Standard Book Number).

Determining the Primary Keys

The next step is to identify the fields that will be the unique identifiers, or primary keys. Customer numbers uniquely identify customers, and book rep numbers uniquely identify book reps. Thus, the primary key for the Customer table is the customer number, and the primary key for the Book Rep table is the book rep number. Reasonable names for these fields would be Customer Number and Book Rep Number, respectively. Adding these primary keys to the tables gives:

Customer (Customer Number)
Book Rep (Book Rep Number)

What is the third step in the database design process after determining the primary keys?
Determine the additional fields. The primary key will be a field or combination of fields in a table. A table typically will contain many additional fields, each of which contains a type of data. Examine the project requirements to determine these additional fields. For example, in an Employee table, additional fields might include Employee Name, Street Address, City, State, Postal Code, Date Hired, and Salary.

CONSIDER THIS

Determining Additional Fields

After identifying the primary keys, you need to determine and name the additional fields. In addition to the customer number, the Customer Address Information shown in Figure 1–80a on page AC 59 contains the customer name, street, city, state, and postal code. These would be fields in the Customer table. The Customer Financial Information shown in Figure 1–80b on page AC 59 also contains the customer number and customer name, which are already included in the Customer table. The financial information also contains the amount paid, current due, and returns. Adding the amount paid, current due, and returns fields to those already identified in the Customer table and assigning reasonable names gives:

Customer (Customer Number, Customer Name, Street, City, State, Postal Code, Amount Paid, Current Due, Returns)

Similarly, examining the Book Rep Address Information in Figure 1–80c on page AC 59 adds the last name, first name, street, city, state, and postal code fields to the Book Rep table. In addition to the book rep number, last name, and first name, the Book Rep Financial Information in Figure 1–80d on page AC 59 would add the start date, salary, and bonus rate. Adding these fields to the Book Rep table and assigning reasonable names gives:

Book Rep (Book Rep Number, Last Name, First Name, Street, City, State, Postal Code, Start Date, Salary, Bonus Rate)

BTW
Additional Data for Bavant Publishing
Bavant could include other types of data in the database. The Customer table could include data on a contact person at each organization, such as, name, telephone number, and email address. The Book Rep table could include the mobile telephone number, email address, and emergency contact information for the book rep.

What happens as the fourth step, after determining additional fields?
Determine relationships between the tables. A relationship is an association between objects. In a database containing information about departments and employees, there is an association between the departments and the employees. A department is associated with all the employees in the department, and an employee is associated with the department to which he or she is assigned. Technically, you say that a department is related to all the employees in the department, and an employee is related to his or her department.

The relationship between department and employees is an example of a **one-to-many relationship** because one employee is associated with one department, but each department can be associated with many employees. The Department table would be the "one" table in the relationship. The Employee table would be the "many" table in the relationship.

When you have determined that two tables are related, follow these general guidelines:

Identify the "one" table.

Identify the "many" table.

Include the primary key from the "one" table as a field in the "many" table.

CONSIDER THIS

BTW
Certification
The Microsoft Office Specialist (MOS) program provides an opportunity for you to obtain a valuable industry credential — proof that you have the Access 2013 skills required by employers. For more information, visit the Certification resource on the Student Companion Site located on www.cengagebrain.com. For detailed instructions about accessing available resources, visit www.cengage.com/ct/studentdownload or contact your instructor for information about accessing the required files.

Determining and Implementing Relationships Between the Tables

According to the requirements, each customer has one book rep, but each book rep can have many customers. Thus, the Book Rep table is the "one" table, and the Customer table is the "many" table. To implement this one-to-many relationship between book reps and customers, add the Book Rep Number field (the primary key of the Book Rep table) to the Customer table. This produces:

Customer (Customer Number, Customer Name, Street, City, State, Postal Code, Amount Paid, Current Due, Returns, Book Rep Number)
Book Rep (Book Rep Number, Last Name, First Name, Street, City, State, Postal Code, Start Date, Salary, Bonus Rate)

CONSIDER THIS

After creating relationships between tables, what is the fifth step in the database design process?
Determine data types for the fields, that is, the type of data that can be stored in the field.

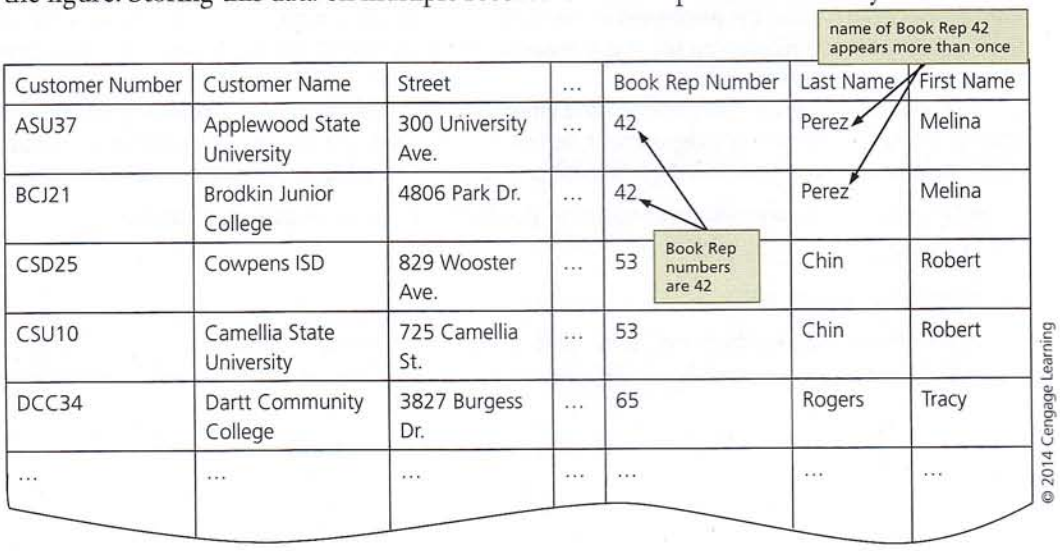
Determining Data Types for the Fields

See Pages AC 9 through AC 10 for a discussion of the available data types and their use in the Bavant Publishing database. That section also discusses other properties that can be assigned, such as captions, field size, and the number of decimal places.

Identifying and Removing Redundancy

BTW
Quick Reference
For a table that lists how to complete the tasks covered in this book using touch gestures, the mouse, ribbon, shortcut menu, and keyboard, see the Quick Reference Summary at the back of this book, or visit the Quick Reference resource on the Student Companion Site located on www.cengagebrain.com. For detailed instructions about accessing available resources, visit www.cengage.com/ct/studentdownload or contact your instructor for information about accessing the required files.

Redundancy means storing the same fact in more than one place. It usually results from placing too many fields in a table — fields that really belong in separate tables — and often causes serious problems. If you had not realized there were two objects, such as customers and book reps, you might have placed all the data in a single Customer table. Figure 1–81 shows an example of a table that includes both customer and book rep information. Notice that the data for a given book rep (number, name, address, and so on) occurs on more than one record. The data for rep 42, Melina Perez, is repeated in the figure. Storing this data on multiple records is an example of redundancy.



Customer Number	Customer Name	Street	...	Book Rep Number	Last Name	First Name
ASU37	Applewood State University	300 University Ave.	...	42	Perez	Melina
BCJ21	Brodkin Junior College	4806 Park Dr.	...	42	Perez	Melina
CSD25	Cowpens ISD	829 Wooster Ave.	...	53	Chin	Robert
CSU10	Camellia State University	725 Camellia St.	...	53	Chin	Robert
DCC34	Dartt Community College	3827 Burgess Dr.	...	65	Rogers	Tracy
...	...	...	...	...	...	...

Figure 1–81

CONSIDER THIS

What problems does this redundancy cause?

Redundancy results in several problems, including:

1. Wasted storage space. The name of book rep 42, Melina Perez, for example, should be stored only once. Storing this fact several times is wasteful.
2. More complex database updates. If, for example, Melina Perez's name is spelled incorrectly and needs to be changed in the database, her name would need to be changed in several different places.
3. Possible inconsistent data. Nothing prohibits the book rep's last name from being Perez on customer ASU37's record and Perret on customer BCJ21's record. The data would be inconsistent. In both cases, the book rep number is 42, but the last names are different.

CONSIDER THIS

How do you eliminate redundancy?

The solution to the problem is to place the redundant data in a separate table, one in which the data no longer will be redundant. If, for example, you place the data for book reps in a separate table (Figure 1–82), the data for each book rep will appear only once.

Customer Number	Customer Name	Street	...	Book Rep Number
ASU37	Applewood State University	300 University Ave.	...	42
BCJ21	Brodkin Junior College	4806 Park Dr.	...	42
CSD25	Cowpens ISD	829 Wooster Ave.	...	53
CSU10	Camellia State University	725 Camellia St.	...	53
DCC34	Dartt Community College	3827 Burgess Dr.	...	65

Book Rep numbers are 42

Book Rep Number	Last Name	First Name	...
42	Perez	Melina	...
48	Statnik	Michael	...
53	Chin	Robert	...
65	Rogers	Tracy	...

name of Book Rep 42 appears only once

Figure 1–82

Notice that you need to have the book rep number in both tables. Without it, there would be no way to tell which book rep is associated with which customer. The remaining book rep data, however, was removed from the Customer table and placed in the Book Rep table. This new arrangement corrects the problems of redundancy in the following ways:

1. Because the data for each book rep is stored only once, space is not wasted.
2. Changing the name of a book rep is easy. You need to change only one row in the Book Rep table.
3. Because the data for a book rep is stored only once, inconsistent data cannot occur.

Designing to omit redundancy will help you to produce good and valid database designs. You should always examine your design to see if it contains redundancy. If it does, you should decide whether you need to remove the redundancy by creating a separate table.

If you examine your design, you will see that there is one area of redundancy (see the data in Figure 1–1 on page AC 3). Cities and states are both repeated. Every customer whose postal code is 19158, for example, has Greer as the city and PA as the state. To remove this redundancy, you would create a table with the primary key Postal Code and City and State as additional fields. City and State would be removed from the Customer table. Having City, State, and Postal Code in a table is very common, however, and usually you would not take such action. No other redundancy exists in your tables.

BTW

Postal Codes

Some organizations with customers throughout the country have a separate table of postal codes, cities, and states. When placing an order, you typically are asked for your postal code (or ZIP code), rather than city, state, and postal code. You then are asked to confirm that the city and state correspond to that postal code.

Chapter Summary

In this chapter you have learned to create an Access database, create tables and add records to a database, print the contents of tables, import data, create queries, create forms, create reports, and change database properties. You also have learned how to design a database. The items listed below include all the new Access skills you have learned in this chapter, with tasks grouped by activity.

Database Object Management

Delete a Table or Other Object in the Database (AC 58)
Rename an Object in the Database (AC 58)

Database Properties

Change Database Properties (AC 55)

File Management

Run Access (AC 5)
Create a Database (AC 6)
Create a Database Using a Template (AC 7)
Exit Access (AC 24)
Open a Database from Access (AC 25)
Back Up a Database (AC 56)
Compact and Repair a Database (AC 57)
Close a Database without Exiting Access (AC 57)
Save a Database with Another Name (AC 57)

Form Creation

Create a Form (AC 45)

Import Data

Import an Excel Worksheet (AC 33)

Print Objects

Preview and Print the Contents of a Table (AC 30)
Print the Results of a Query (AC 45)
Print a Report (AC 54)

Query Creation

Use the Simple Query Wizard to Create a Query (AC 40)
Use a Criterion in a Query (AC 43)

Report Creation

Create a Report (AC 48)
Modify Report Column Headings and Resize Columns (AC 50)
Add Totals to a Report (AC 53)

Table Creation

Modify the Primary Key (AC 11)
Define the Remaining Fields in a Table (AC 14)
Save a Table (AC 16)
View the Table in Design View (AC 17)
Change a Field Size in Design View (AC 18)
Close the Table (AC 20)
Resize Columns in a Datasheet (AC 28)
Modify a Table in Design View (AC 37)

Table Update

Add Records to a Table (AC 20)
Add Records to a Table that Contains Data (AC 26)

CONSIDER THIS

What decisions will you need to make when creating your next database?

Use these guidelines as you complete the assignments in this chapter and create your own databases outside of this class.

1. Identify the tables that will be included in the database.
2. Determine the primary keys for each of the tables.
3. Determine the additional fields that should be included in each of the tables.
4. Determine relationships between the tables.
    a) Identify the "one" table.
    b) Identify the "many" table.
    c) Include the primary key of the "one" table as a field in the "many" table.
5. Determine data types for the fields in the tables.
6. Determine additional properties for fields.
    a) Determine if a special caption is warranted.
    b) Determine if a special description is warranted.
    c) Determine field sizes.
    d) Determine formats.
7. Identify and remove any unwanted redundancy.
8. Determine a storage location for the database.
9. Determine the best method for distributing the database objects.

How should you submit solutions to questions in the assignments identified with a symbol?

Every assignment in this book contains one or more questions identified with a symbol. These questions require you to think beyond the assigned database. Present your solutions to the questions in the format required by your instructor. Possible formats may include one or more of these options: write the answer; create a document that contains the answer; present your answer to the class; discuss your answer in a group; record the answer as audio or video using a webcam, smartphone, or portable media player; or post answers on a blog, wiki, or website.

CONSIDER THIS

Apply Your Knowledge

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

Adding a Caption, Changing a Data Type, Creating a Query, a Form, and a Report

Note: To complete this assignment, you will be required to use the Data Files for Students. Visit www.cengage.com/ct/studentdownload for detailed instructions or contact your instructor for information about accessing the required files.

Instructions: Cosmetics Naturally Inc. manufactures and sells beauty and skin care products made with only natural ingredients. The company's products do not contain any synthetic chemicals, artificial fragrances, or chemical preservatives. Cosmetics Naturally has a database that keeps track of its sales representatives and customers. Each customer is assigned to a single sales rep, but each sales rep may be assigned to many customers. The database has two tables. The Customer table contains data on the customers who purchase Cosmetics Naturally products. The Sales Rep table contains data on the sales reps. You will add a caption, change a data type, create two queries, a form, and a report, as shown in Figure 1–83 on the next page.

Perform the following tasks:

1. Start Access, open the Apply Cosmetics Naturally database from the Data Files for Students, and enable the content.
2. Open the Sales Rep table in Datasheet view, add SR # as the caption for the Sales Rep Number field, and resize all columns to best fit the data. Save the changes to the layout of the table and close the table.
3. Open the Customer table in Design view and change the data type for the Postal Code field to Short Text. Change the field size for the field to 5. Save the changes to the table and close the table.
4. Use the Simple Query Wizard to create a query for the Customer table that contains the Customer Number, Customer Name, Amount Paid, Balance, and Sales Rep Number. The query is a detail query. Use the name Customer Query for the query and close the query.
5. Create a simple form for the Sales Rep table. Save the form and use the name Sales Rep for the form. Close the form.
6. Create the report shown in Figure 1–83 for the Customer table. The report includes totals for both the Amount Paid and Balance fields. Be sure the totals appear completely. You might need to expand the size of the total controls. Move the page number so that it is within the margins. Save the report as Customer Financial Report.
7. If requested by your instructor, add your last name to the title of the report, that is, change the title to Customer Financial Report LastName where LastName is your actual last name.
8. Compact and repair the database.
9. Submit the revised database in the format specified by your instructor.
10. How would you change the field name of the Balance field in the Customer table to Current Balance?

Continued >

Apply Your Knowledge *continued*

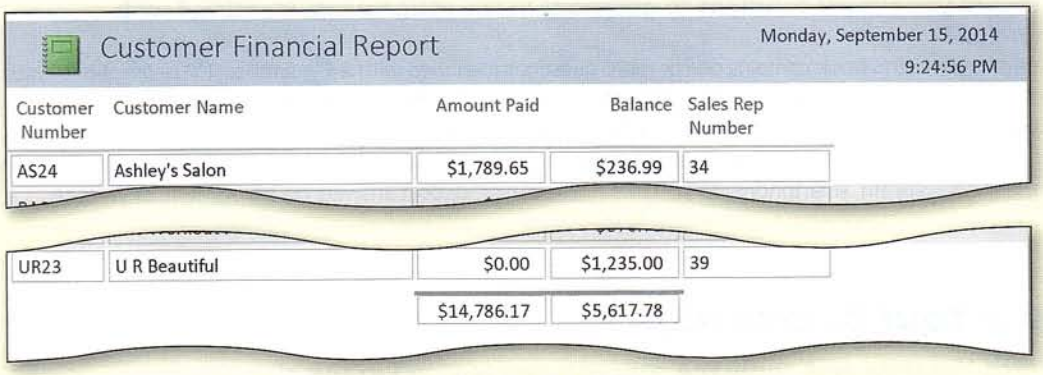


Figure 1–83

Extend Your Knowledge

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

Using a Database Template to Create a Contacts Database

Note: To complete this assignment, you will be required to use the Data Files for Students. Visit www.cengage.com/ct/studentdownload for detailed instructions or contact your instructor for information about accessing the required files.

Instructions: Access includes both desktop database templates and web-based templates. You can use a template to create a beginning database that can be modified to meet your specific needs. You will use a template to create a Contacts database. The database template includes sample tables, queries, forms, and reports. You will modify the database and create the Contacts Query shown in Figure 1–84.

Perform the following tasks:

1. Start Access.
2. Select the Desktop contacts template in the template gallery and create a new database with the file name Extend Contacts.
3. Enable the content. If requested to do so by your instructor, watch the videos in the Getting Started with Contacts dialog box. Close the Getting Started with Contacts dialog box.
4. Close the Contact List form.
5. Open the Contacts table in Datasheet view and delete the Fax Number field and the Attachments field in the table. The Attachments field has a paperclip as the column heading.
6. Change the data type for the ID field to Short Text, change the field name to Contact ID, and change the field size to 4. Change the column width so that the complete field name is displayed.
7. Save the changes to the Contacts table and close the table.
8. Use the Simple Query Wizard to create the Contacts Query shown in Figure 1–84. Close the query.

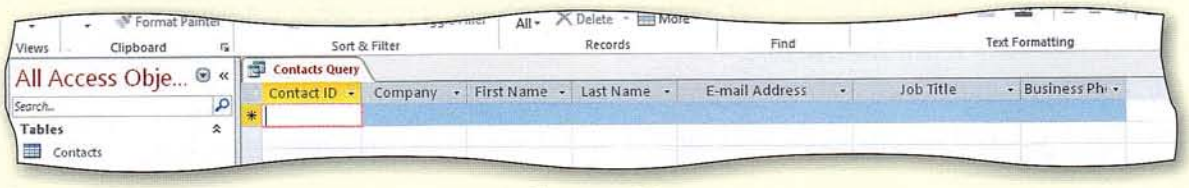


Figure 1–84

9. Open the Phone Book report in Layout view. Delete the control containing the date. Change the title of the report to Contact Phone List.
10. Save the changes to the report.
11. If requested to do so by your instructor, add your first and last names to the end of the title and save the changes to the report.
12. Submit the revised database in the format specified by your instructor.
13. a. Why would you use a template instead of creating a database from scratch with just the fields you need?

    b. The Attachment data type allows you to attach files to a database record. If you were using this database for a job search, what specific documents might you attach to a Contacts record?

Analyze, Correct, Improve

Analyze a database, correct all errors, and improve the design.

Correcting Errors in the Table Structure

Note: To complete this assignment, you will be required to use the Data Files for Students. Visit www.cengage.com/ct/studentdownload for detailed instructions or contact your instructor for information about accessing the required files.

Instructions: Analyze SciFi Movies is a database containing information on classic science fiction movies that your film professor would like to use for teaching. The Movie table shown in Figure 1–85 contains errors to the table structure. Your professor has asked you to correct the errors and make some improvements to the database. Start Access and open the Analyze SciFi Movies database from the Data Files for Students.

Figure 1–85

1. Correct Movie Number should be the primary key for the Movie table. The ID field should not be a field in the table. The Rating field represents a numerical rating system of one to four to indicate the quality of the movie. Your instructor wants to be able to find the average rating for films directed by a particular director. Only integers should be stored in both the Rating and the Length (Minutes) fields.

2. Improve The default field size for Short Text fields is 255. Changing the field size to more accurately represent the maximum number of characters that can be stored in a field is one way to improve the accuracy of the data. The Movie Number, Director Number, and Awards fields should have a maximum size of 3 characters. The Year Made field should have a maximum field size of 4. The Movie Name and Studio fields should have a maximum field size of 50. If instructed to do so by your instructor, rename the Movie table as Movie Last Name where Last Name is your last name. Submit the revised database in the format specified by your instructor.

3. The Awards field currently has a data type of Short Text, but the only values that will be stored in that field are Yes and No to indicate whether the movie won any awards. What would be a more appropriate data type for this field?

In the Labs

Design, create, modify, and/or use a database following the guidelines, concepts, and skills presented in this chapter. Labs are listed in order of increasing difficulty. Labs 1 and 2, which increase in difficulty, require you to create solutions based on what you learned in the chapter; Lab 3 requires you to create a solution, which uses cloud and web technologies, by learning and investigating on your own from general guidance.

Lab 1: Creating Objects for the Dartt Offsite Services Database

Problem: Dartt Offsite Services is a local company that provides offsite data services and solutions. The company provides remote data backup, disaster recovery planning and services, website backup, and offsite storage of paper documents for small businesses and nonprofit organizations. Service representatives are responsible for communicating data solutions to the client, scheduling backups and other tasks, and resolving any conflicts. The company recently decided to store its client and service rep data in a database. Each client is assigned to a single service rep, but each service rep may be assigned many clients. The database and the Service Rep table have been created, but the Monthly Salary field needs to be added to the table. The records shown in Table 1–6 must be added to the Service Rep table. The company plans to import the Client table from the Excel worksheet shown in Figure 1–86. Dartt would like to finish storing this data in a database and has asked you to help.

	A	B	C	D	E	F	G	H	I	J	K
1	Client Number	Client Name	Street	City	State	Postal Code	Amount Paid	Balance Due	Service Rep Number		
2	BBF32	Babbage CPA Firm	464 Linnell Dr.	Austin	SC	28796	$3,524.00	$567.85	24		
		Theon Veterinary Services					$2,750.00	$1,200.00			
15	WEC05	Walburg Energy Company	12 Polk St.	Walburg	NC	28819	$1,567.45	$1,100.50	24		
16	WSC01	Wood Sports Complex	578 Central Ave.	Walburg	NC	28819	$2,250.00	$1,600.00	24		
17											

Figure 1–86

Note: To complete this assignment, you will be required to use the Data Files for Students. Visit www.cengage.com/ct/studentdownload for detailed instructions or contact your instructor for information about accessing the required files.

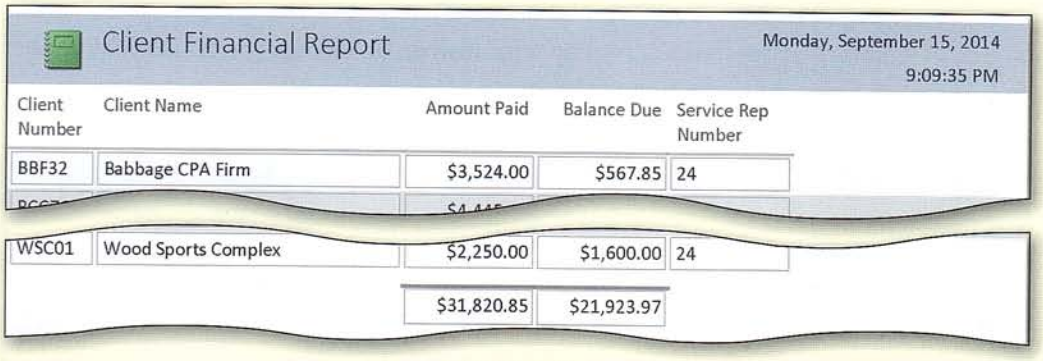
Instructions: Perform the following tasks:

1. Start Access and open the Lab 1 Dartt Offsite Services database from the Data Files for Students.
2. Open the Service Rep table in Datasheet view and add the Monthly Salary field to the end of the table. The field has the Currency data type. Assign the caption SR # to the Service Rep Number field.
3. Add the records shown in Table 1–6.
4. Resize the columns to best fit the data. Save the changes to the layout of the table.

Table 1–6 Data for Service Rep Table

Service Rep Number	Last Name	First Name	Street	City	State	Postal Code	Start Date	Monthly Salary
21	Kelly	Jenna	25 Paint St.	Kyle	SC	28797	5/14/2012	$3,862.45
45	Scott	Josh	1925 Pine Rd.	Byron	SC	28795	4/28/2014	$3,062.08
24	Liu	Mia	265 Marble Dr.	Kyle	SC	28797	1/7/2013	$3,666.67
37	Martinez	Mike	31 Steel St.	Georgetown	SC	28794	5/13/2013	$3,285.00

5. Import the Lab 1–1 Client Data workbook shown in Figure 1–86 into the database. The first row of the workbook contains the column headings. Client Number is the primary key for the new table. Assign the name Client to the table. Save the Import steps, and assign the name Import-Client Data to the steps. Assign Import Client Data as the description.
6. Open the Client table in Design view and make the following changes:
   a. Change the field size for the Client Number field to 5. Change the field size for the Client Name field to 30. Change the field size for the Street and City fields to 20. Change the field size for the State field to 2 and the field size for the Postal Code field to 5. Change the field size for the Service Rep Number field to 2.
   b. Add the caption CL # to the Client Number field.
   c. Add the caption SR # to the Service Rep Number field.
7. Save the changes to the Client table. If a Microsoft Access dialog box appears with the 'Some data may be lost' message, click the Yes button.
8. Open the Client table in Datasheet view and resize all columns to best fit the data. Save the changes to the layout of the table.
9. Create a query using the Simple Query Wizard for the Client table that displays the Client Number, Client Name, Amount Paid, Balance Due, and Service Rep Number. Save the query as Client Query.
10. Create the report shown in Figure 1–87 for the Client table. The report should include the Client Number, Client Name, Amount Paid, Balance Due, and Service Rep Number fields. Include totals for the Amount Paid and Balance Due fields. Be sure to change the column headings to those shown in Figure 1–87. Save the report as Client Financial Report.
11. If requested to do so by your instructor, change the address for Jenna Kelly in the Service Rep table to your address. If your address is longer than 20 characters, simply enter as much as you can.
12. Submit the revised database in the format specified by your instructor.
13. You entered the records for the Service Rep table in the order shown in Table 1–6 on the previous page, that is service reps 21, 45, 24, 37. What order will the records be in after you close and reopen the Service Rep table? Why?



Client Financial Report — Monday, September 15, 2014 9:09:35 PM

Client Number	Client Name	Amount Paid	Balance Due	Service Rep Number
BBF32	Babbage CPA Firm	$3,524.00	$567.85	24
WSC01	Wood Sports Complex	$2,250.00	$1,600.00	24
		$31,820.85	$21,923.97	

Figure 1–87

Lab 2: Creating the Tennis Logos Database

Problem: Tennis Logos supplies customized tennis clothing and accessories for clubs and tournaments. The company purchases these items from suppliers at wholesale prices and adds the customer's logo. The final item price is determined by marking up the wholesale price and adding a fee that is based on the complexity of the logo. Tennis Logos also does graphic design work for customers. Currently, the information about the items and the suppliers is stored in two Excel workbooks. Each item is assigned to a single supplier, but each supplier may be assigned many items. You are to create a database that will store the item and supplier information. You already have determined that you need two tables, a Supplier table and an Item table, in which to store the information.

Note: To complete this assignment, you will be required to use the Data Files for Students. Visit www.cengage.com/ct/studentdownload for detailed instructions or contact your instructor for information about accessing the required files.

Continued >

In the Labs *continued*

Instructions: Perform the following tasks:

1. Use the Blank desktop database option to create a new database in which to store all objects related to the items for sale. Call the database Lab 2 Tennis Logos.
2. Import the Lab 1–2 Supplier Data Excel workbook into the database. The first row of the workbook contains the column headings. Supplier Code is the primary key for the new table. Assign the name Supplier to the table. Do not save the Import steps.
3. Open the Supplier table in Datasheet view. Change the field size for the Supplier Code field to 2; the field size for the Supplier Name field to 30; and the field size for the Telephone Number field to 12.
4. Import the Lab 1–2 Item Data Excel workbook into the database. The first row of the workbook contains the column headings. Item Number is the primary key for this table. Assign the name Item to the table. Save the Import steps, and assign the name Import-Item Data to the steps. You do not need a description.
5. Open the Item table in Design view. Change the field size for the Item Number field to 4. Change the field size for the Description field to 30. Add the caption Wholesale for the Wholesale Price field. The On Hand field should be an Integer field. Be sure that the field size for the Supplier Code in the Item table is identical to the field size for the Supplier Code in the Supplier table. Save the changes to the table and close the table.
6. Open the Item table in Datasheet view and resize the columns to best fit the data. Save the changes to the layout of the table and close the table.
7. Create a query for the Item table. Include the Item Number, Description, Wholesale Price, Base Cost, and Supplier Code. Save the query as Item Query.
8. Create a simple form for the Item table. Use the name Item for the form.
9. Create the report shown in Figure 1–88 for the Item table. Do not add any totals. Save the report as Inventory Status Report.
10. If requested to do so by your instructor, change the telephone number for Last Merchandisers to your telephone number.

Inventory Status Report — Monday, September 15, 2014 9:37:32 PM

Item Number	Description	On Hand	Wholesale Price
3363	Baseball Cap	110	$4.87
3673	Cotton Visor	150	$4.59
4543	Crew Sweatshirt	75	$7.29
4583			

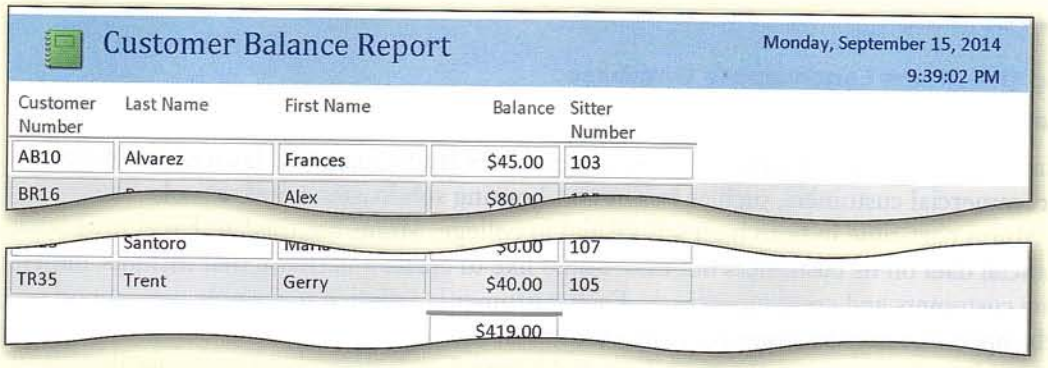
Figure 1–88

11. Submit the database in the format specified by your instructor.
12. If you had designed this database, could you have used the field name, Name, for the Supplier Name? If not, why not?

Lab 3: Expand Your World: Cloud and Web Technologies
Exporting Query Results and Reports

Problem: You and two of your friends have started a pet sitting business. You want to be able to share query results and reports, so you have decided to store the items on the SkyDrive. You are still learning Access, so you are going to create a sample query and the report shown in Figure 1–89, export the results, and save to the SkyDrive.

Note: To complete this assignment, you will be required to use the Data Files for Students. Visit www.cengage.com/ct/studentdownload for detailed instructions or contact your instructor for information about accessing the required files.



Customer Balance Report

Monday, September 15, 2014
9:39:02 PM

Customer Number	Last Name	First Name	Balance	Sitter Number
AB10	Alvarez	Frances	$45.00	103
BR16		Alex	$80.00	
	Santoro		$0.00	107
TR35	Trent	Gerry	$40.00	105
			$419.00	

Figure 1–89

Instructions:

1. Open the Lab 3 Pet Sitters database from the Data Files for Students.
2. Use the Simple Query Wizard to create a query that includes the Customer Number, First Name, Last Name, Balance, and Sitter Number. Save the query as Customer Query.
3. Export the Customer Query as an XPS document to your SkyDrive in the Access folder.
4. Create the report shown in Figure 1–89. Save the report as Customer Balance Report.
5. Export the Customer Balance Report as a PDF document to your Sky Drive in the Access folder. For information about how to use the Sky Drive, refer to the Office and Windows chapter at the beginning of this book.
6. If requested to do so by your instructor, open the Sitter table and change the last name and first name for sitter 103 to your last name and your first name.
7. Submit the assignment in the format specified by your instructor.
8. Based on your current knowledge of XPS and PDF documents, which one do you think you would use most frequently? Why?

Consider This: Your Turn

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

1. Creating the Craft Database

Note: To complete this assignment, you will be required to use the Data Files for Students. Visit www.cengage.com/ct/studentdownload for detailed instructions or contact your instructor for information about accessing the required files.

Personal/Academic

Part 1: You attend a college that is renowned for its school of arts and crafts. Students who major in arts and crafts can sell their designs online through the college bookstore. The bookstore has used an Excel workbook to store data on wood-crafted items as well as the students who created the items. Because you are a major in computer science and also are studying woodworking, your senior project is to create a database of these wood-crafted items. The database must keep track of the wood-crafted items for sale and maintain data on the students who created the items. Each item is created by a single student, but each student may have created several items.

Based on the information in the Your Turn 1–1 Craft workbook, use the concepts and techniques presented in this chapter to design and create a database to store the craft data. Create a Wood Crafts for Sale report that lists the item number, description, price, and student code. Submit your assignment in the format specified by your instructor.

Part 2: You made several decisions while determining the table structures and adding data to the tables in this assignment. What method did you use to add the data to each table? Are there any other methods that also would have worked?

Continued >

Consider This: Your Turn *continued*

2. Creating the Mums Landscaping Database

Professional

Part 1: Mums Landscaping is a local company that provides landscaping and lawn maintenance services to commercial customers, such as businesses, housing subdivisions, and schools. You worked for Mums part-time in both high school and in college. Mums has used an Excel workbook to store financial data on its customers but now would like to create a database that includes information on its customers and crew supervisors. Each customer is assigned to a single crew supervisor, but each supervisor may be assigned many customers.

Based on the information in the Your Turn 1–2 Mums Landscaping workbook, use the concepts and techniques presented in this chapter to design and create a database to store the data that Mums needs. Submit your assignment in the format specified by your instructor.

Part 2: You made several decisions while creating the Mums Landscaping database in this assignment. What did you decide to use as the primary key for each table? Why?

3. Creating an Electronic Assets Database

Research and Collaboration

Part 1: In today's world, most college students will own at least one electronic device, such as a cell phone. Many students have multiple electronic devices. Microsoft Access includes a desktop Asset tracking template that you can modify to keep track of your electronic devices, such as cell phone, MP3 player, and computer. Get together with your group and make a list of the electronic devices that each of you own. Use the desktop Asset tracking template to create an Electronic Assets database. Watch the video to learn how the database works. As a team, review the fields in the Assets table and decide which fields to include in the database. Delete any unwanted fields. Decide how you will describe each device, for example, will you use the term cell phone, smartphone, or mobile phone? Have each team member enter at least two devices. Create a query to find one type of device, such as cell phone. Submit your assignment in the format specified by your instructor.

Part 2: You made several decisions while creating the Electronic Assets database. Which fields did you decide to delete from the Assets table? What terms did you use to describe each device? What was the rationale for these decisions?

Learn Online

Reinforce what you learned in this chapter with games, exercises, training, and many other online activities and resources.

Student Companion Site Reinforcement activities and resources are available at no additional cost on www.cengagebrain.com. Visit www.cengage.com/ct/studentdownload for detailed instructions about accessing the resources available at the Student Companion Site.

SAM Put your skills into practice with SAM! If you have a SAM account, go to www.cengage.com/sam2013 to access SAM assignments for this chapter.