

Shelly Cashman: Microsoft Access 2021

Module 1: Databases and Database Objects: An Introduction





Objectives (1 of 2)

- 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



Objectives (2 of 2)

- Open a database
- Create and use a query
- Create and use a form
- Create a report
- Perform special database operations



Introduction

- **What is a database?**
 - A collection of data organized in a way so that it can easily be accessed, managed and updated
 - Microsoft Access 2021 (or 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 about the data
 - Create forms and reports using the data
-



Access vs. Excel

- Access and Microsoft Excel possess many similarities
 - Both store large amounts of data, perform sophisticated calculations, run powerful queries and analysis tools
 - Access is better for managing data: helping you keep it organized, easy to search, and available to multiple simultaneous users
 - Excel is generally better for analyzing data: performing complex calculations, exploring possible outcomes, and producing high quality charts
-



CMF Vets Appointment System (1 of 2)

- CMF Vets wants to computerizes its appointment system with an Access database (the old system is manual)
 - To make the system easier to use and more efficient, CMF Vets needs to record all information about its practice, including the following:
 - 1) pet owners
 - 2) patients
 - 3) appointments
 - 4) treatment costs
 - 5) veterinarians
-



CMF Vets Appointment System (2 of 2)

- The database will consist of five tables to store these information
 - Each table will contain information about a specific subject
 - Tables can be related through a common value
 - A database consisting of a collection of tables which are related to each other is called a relational database
 - With the database management system such as Access, CMF Vets can easily track its patients and create a variety of useful reports
-

Project—Database Creation (1 of 2)

The columns in the tables are called fields.

The rows in the tables are called records.

O_ID	Owner First Name	Owner Last Name	Owner Street	Owner City	Owner State	Owner Postal Code	Home Phone	Mobile Phone	Email Address
O-1	Ted	Sabus	460 West Pioneer Road	Dolores	CO	81323	719-231-4411	719-888-7735	tsabus@cengage.com
O-2	Steven	Nguyen	9874 South Main Street	Blanding	UT	84511	435-991-5670	435-777-6219	snguyen@cengage.com

Figure 1-1a Owners Table

Patient ID	Patient Name	Animal Type	Breed	Owner ID	Click to Add
C-1	Paws	Feline	Calico	O-2	
C-2	Ranger	Canine	Labrador	O-1	
F-1	Fluffy	Feline	Tabby	O-1	

Figure 1-1b Patients Table

Appointment ID	Patient ID	Appointment Date	Appointment Time	Treatment Number	Veterinarian	Owner
1	F-1	6/30/2021	10:00:00 AM	T-3	B01	O-1
2	C-2	10/25/2021	9:00:00 AM	T-4	B01	O-1
3	C-2	1/10/2021	10:00:00 AM	T-2	B01	O-1
4	F-1	6/30/2021	10:00:00 AM	T-1	B01	O-1
5	C-1	8/23/2021	10:00:00 AM	T-4	G01	O-2

Figure 1-1c Appointments Table

Project—Database Creation (2 of 2)

Treatment Number	Treatment	Animal Type	Cost
T-1	Feline Rabies Shot	Feline	\$18.00
T-10	Neuter	Feline	\$25.00
T-11	Spay	Canine	\$35.00
T-12	Neuter	Canine	\$40.00
T-13	Microchip	Feline	\$10.00
T-14	Microchip	Canine	\$10.00
T-2	Dog Wellness Exam	Canine	\$50.00
T-3	Wellness Exam	Feline	\$20.00
T-4	Dog Rabies Shot	Canine	\$20.00
T-5	Feline Vaccinations	Feline	\$30.00
T-6	Canine Vaccinations	Canine	\$35.00
T-7	Heartworm	Canine	\$25.00
T-8	Heartworm	Feline	\$20.00
T-9	Spay	Feline	\$25.00

Figure 1-1d Treatment Cost Table

Veterinarian ID	First Name	Last Name	Office Phone	Cell Phone	Email Address	Street Address	City	State	ZIP Code
B01	William	Black	719-238-6682	719-334-9856	wblack@newmail.com	9887 Dover	Dolores	CO	81323
G01	Teresa	Gomez	435-222-4545	435-229-5612	tgomez@newmail.com	6214 Lansing	Blanding	UT	84511

Figure 1-1e Veterinarians Table



Creating a Database (1 of 4)

- A database is a structure that can store information about multiple types of objects, the properties of those objects, and the relationships among the objects
- **To Create a Database**
 - Run Access
 - If you know what the tables and fields you want in the database, use “Blank database” option
 - If not, use a template to guide you through the process



Creating a Database (2 of 4)

- **To Create a Database Using a Template**

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



Creating a Database (3 of 4)

- **To Create a Database Using Blank Database Option**
 - Click the **Blank database** button
 - Type “**CMF Vets**” in the File Name text box
 - Click the **Create button** to create the database

Creating a Database (4 of 4)



database name is CMF Vets

Maximize button changed to Restore Down button because window is maximized

Access work area with one object (Table1) open

Navigation Pane

Object tab

Fields

Table

Table1

Click to Add

Access automatically creates default table

table appears in Datasheet view (rows and columns in table appear in a grid)

title bar

Close button

status bar

View buttons

Datasheet view button is selected

Record: 1 of 1

Search

Num Lock

11:04 AM 10/9/2016



The Access Window

- **Navigation Pane and Access Work Area**
 - Define the following (see the figure on the previous slide)
 - *Access work area*
 - *Object tabs*
 - *Navigation Pane*
 - *Status bar*
 - *Datasheet view (vs design view)*
 - *Datasheet (a collection of rows and columns)*
-



Determining Tables and Fields (1 of 2)

- **Naming Tables and Fields**

- Names can be up to 64 characters in length
- Names can contain letters, digits, and spaces, as well as most of the punctuation symbols
- Names cannot contain periods (.), exclamation points (!), grave accent (`), or square brackets ([])
- Each field in a table must have a unique name
- In this book all names begin with an uppercase letter



Determining Tables and Fields (2 of 2)

- **Determining the Primary Key for Each Table**

- A unique identifier (e.g. Patient ID, Owner ID, etc.)
- If not determined, Access will create one field called ID
 - An autonumber field (will be “1” for the 1st record, “2” for the 2nd record,)

- **Determining Data Types for the Fields**

- Data types:
 - Short Text (up to 255 characters)
 - Number
 - Currency
 - Date & Time
 - Other Data Types
-



Creating a Table in Datasheet View

(1 of 18)

- **Datasheet view**—rows and columns, like a spreadsheet; shows each data record
 - **Design view**—only used to create a table or to modify the structure of a table and has more functionality for creating a table; shows the fields, data types, properties and the primary key
 - **Caption**—an assigned value to a field; when used the value of the caption will be displayed rather the field name
 - When a database is created, Access automatically creates a table. We can then **define all the fields**.
-



Creating a Table in Datasheet View

(2 of 18)

- **To Modify the Primary Key**
 - Right-click the column heading for the ID field to display a shortcut menu
 - Click Rename Field to highlight the current name
 - Type “Owner ID” to assign a name to the new field
 - Click the white space below to complete the name change
 - Click Table Tools Fields tab
 - Click Data Type arrow (Formatting group) to display a menu
 - Click “Short Text” to select the data type
-

Creating a Table in Datasheet View (3 of 18)



- **To Modify the Primary Key (Continued)**
 - Click the **Field Size** text box (Table Tools Fields tab | Properties group) to select the current field size (255), use either the DELETE or BACKSPACE key to erase the current field size, and then type the new field size (**5**)
 - Click the **Name & Caption button** (same tab & group as above) to display the Enter Field Properties dialog box
 - Click the **Caption** text box (Enter Field Properties dialog box), and then type the desired caption (**O_ID**)
 - Click the **Description** text box, and then type the desired description (**“Unique identifier of pet owner”**)
 - Click the **OK** button to change the caption and description
-

Creating a Table in Datasheet View (4 of 18)



- **To Define the Remaining Fields in a Table**
 - Click the “Click to Add” column heading to display a menu of available data types
 - Click the desired data type (“Short Text”)
 - Type the desired field name (“Owner First Name”)
 - Click the blank space below the field name to complete the change of the name. Click the blank space a second time to select the field
 - If necessary, enlarge the field to display the entire name by double clicking between Owner First Name and the Click to Add box
 - Change the field size (50)
-

Creating a Table in Datasheet View (5 of 18)



- **To Define the Remaining Fields in a Table (Continued)**
 - Use the same technique to add the remaining fields:
 - Owner Last name (Short Text, 50)
 - Owner Street (Short Text, 255)
 - Owner City (Short Text, 50)
 - Owner State (Short Text, 2)
 - Owner Postal Code (Short Text, 9)
 - Home Phone (Short Text, 25)
 - Mobile Phone (Short Text, 25)
 - Email Address (Short Text, 50)
-

Creating a Table in Datasheet View (6 of 18)



- **Making Changes to the Structure**
 - **Undo** (Quick Access Toolbar)
 - **Delete a field** (right-click the column heading)
 - **Change the name of a field** (right-click the column heading)
 - **Insert a field as the last field** (click the “*Click to Add*” column heading)
 - **Insert a field between existing fields** (right-click the column heading of the field that follows the new field)
 - **Move a field** (click the column heading and drag to the desired the position)
-

Creating a Table in Datasheet View (7 of 18)

- **To Save a Table**

- Click the **Save button** on the Quick Access Toolbar to display the Save As dialog box
- Type the desired table name ("**Owners**")
- Click the OK button (Save As dialog box) to save the table

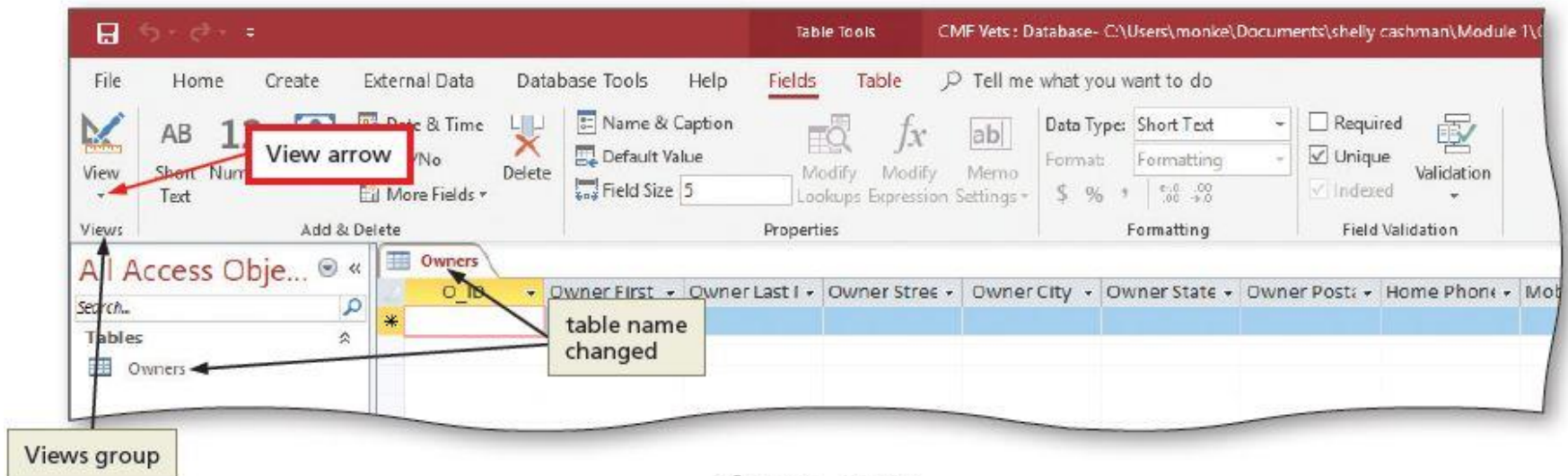


Figure 1-13

Creating a Table in Datasheet View (8 of 18)

- To View the Table in Design View
 - Click the **View button arrow** (Table Tools Fields tab | Views group) to display the View menu
 - Click **Design View** on the View menu to view the table in Design view

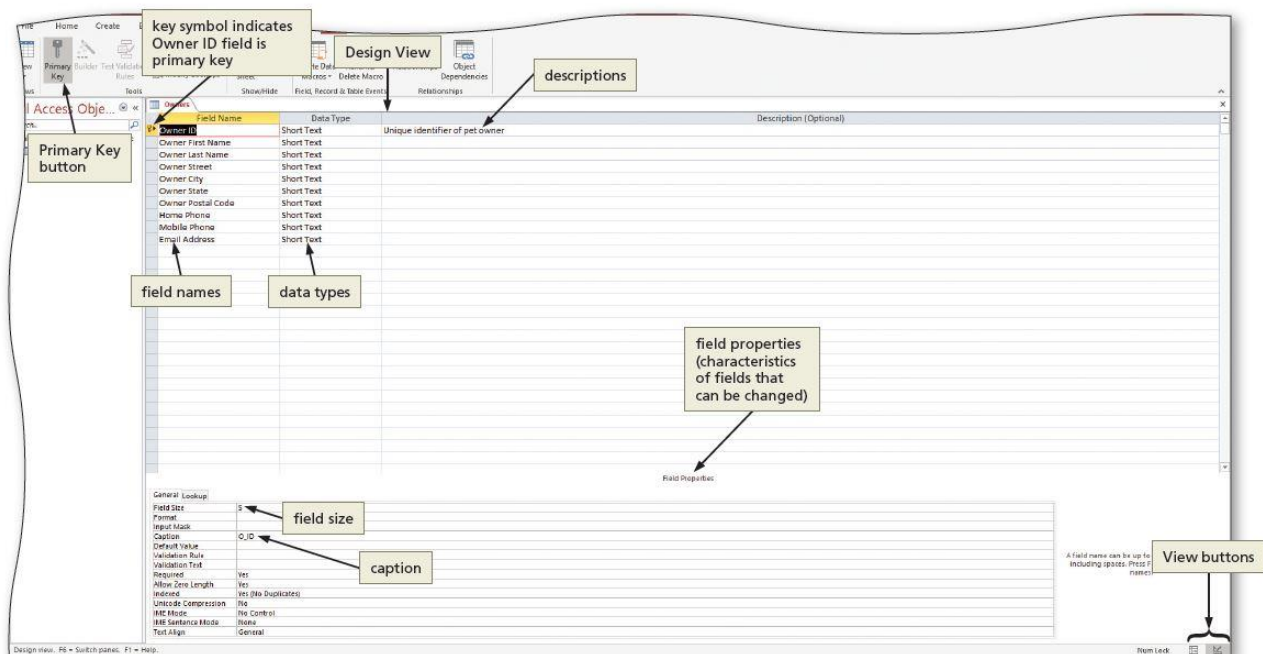


Figure 1-15



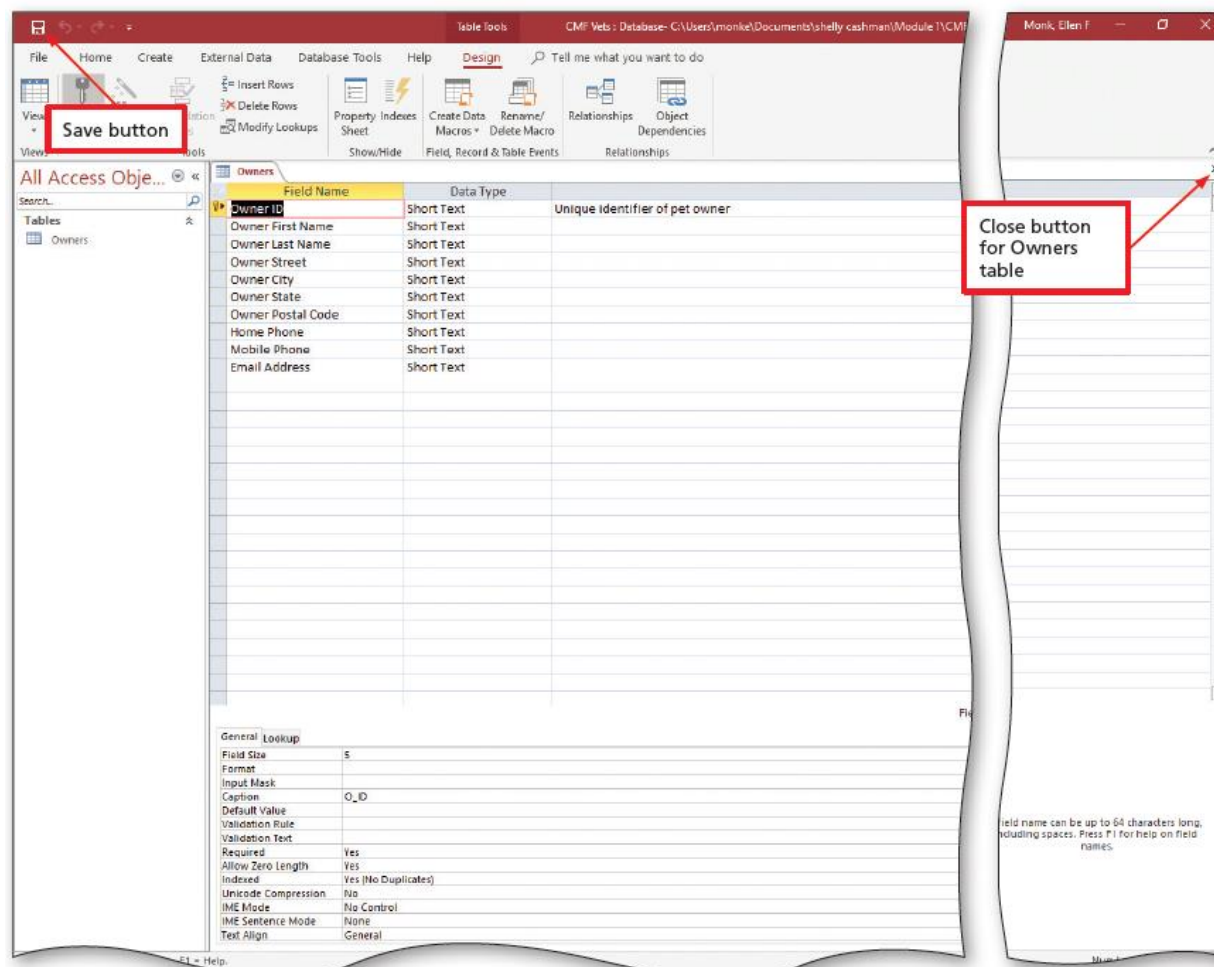
Creating a Table in Datasheet View (9 of 18)

- **Checking the Structure in Design View**
 - Carefully check the **entries** made
 - Use the row selector to display **field properties**
 - Make necessary changes
 - Remember to save if changes are made
 - For example, **the key symbol** indicates Owner ID is the primary key of the table. Clicking Owner ID field's **row selector** will show the properties of that field, such as its caption is **O_ID**
-



Creating a Table in Datasheet View (10 of 18)

- To Close the Table
 - Click the **Close button** for the open table to close the table





Creating a Table in Datasheet View

(11 of 18)

- **To Add Records to a Table**
 - Run Access, open desired database, open Navigation Pane
 - Open the table (Owners) in Datasheet view
 - Click the “Shutter Bar Open/Close Button” to close the Navigation Pane
 - Click the first row to enter data, pencil icon indicates record is being edited, but not saved yet
 - Enter data, use the TAB key to move to the next field
O-1, Ted, Sabus, 460 West Pioneer Road, Dolores, CO, 81323,
719-231-4411, 719-888-7735, tsabus@cengage.com
O-2, Steven, Nguyen, 9874 South Main Street, Blanding, UT, 84511
435-991-5670, 435-777-6219, snguyen@cengage.com
 - Close the table, Exit Access

Creating a Table in Datasheet View (12 of 18)



- **Making Changes to the Data**
 - Undo
 - Add a record { click the “New” button (Home tab | Records group) }
 - Delete a record (click the record selector and DELETE)
 - Change the contents of a field (select the field and update)



Creating a Table in Datasheet View (13 of 18)

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 navigation buttons are located near the **lower-left corner** of the screen when a table is open.



Creating a Table in Datasheet View

(14 of 18)

- Design view is the most efficient way to create a table because you can specify field name, data type, and size all in one view
 - **To Create a Table in Design View**
 - Display the **Create tab** then click the **Table Design** button (Tables group) to display the table in Design view
 - Click the **1st empty field** and start to enter the field names:
Patient ID, Patient Name, Animal Type, Breed, Owner ID: all short text
 - Click the **Patient ID row selector**, if necessary, then click **Primary Key** (Table Tools Design tab | Tools group)
 - Click the **Save** button and enter the name ("**Patients**")
-



Creating a Table in Datasheet View (15 of 18)

- **Correcting Errors in the Structure (Design View)**
 - **Deleting fields**
 - Right-click the row selector and select Delete Rows
 - **Inserting fields**
 - Right-click the row selector after the new row and select Insert Rows
 - **Correcting primary keys**
 - Click the correct primary key entry and click the Primary Key button
 - **Moving fields**
 - Click the row selector of the field and drag it to the desired position
-



Creating a Table in Datasheet View (16 of 18)

- **Populating the Patients Table**
 - It means **entering data** into the table
 - Click the **View button** to change to **Datasheet view**
 - Enter patient data

Patients Data

Patient ID	Patient Name	Animal Type	Breed	Owner ID
C-1	Paws	Feline	Calico	O-2
C-2	Ranger	Canine	Labrador	O-1
F-1	Fluffy	Feline	Tabby	O-1

Creating a Table in Datasheet View (17 of 18)

- **To Resize Columns in a Datasheet**
 - Double-click the **right boundary** of the field selectors of each of the fields to resize the columns to best fit the data
 - Save the changes to the layout by clicking the **Save button** on the Quick Access Toolbar
- **To Close the Table**
 - Click the **Close button** for the open table to close the table

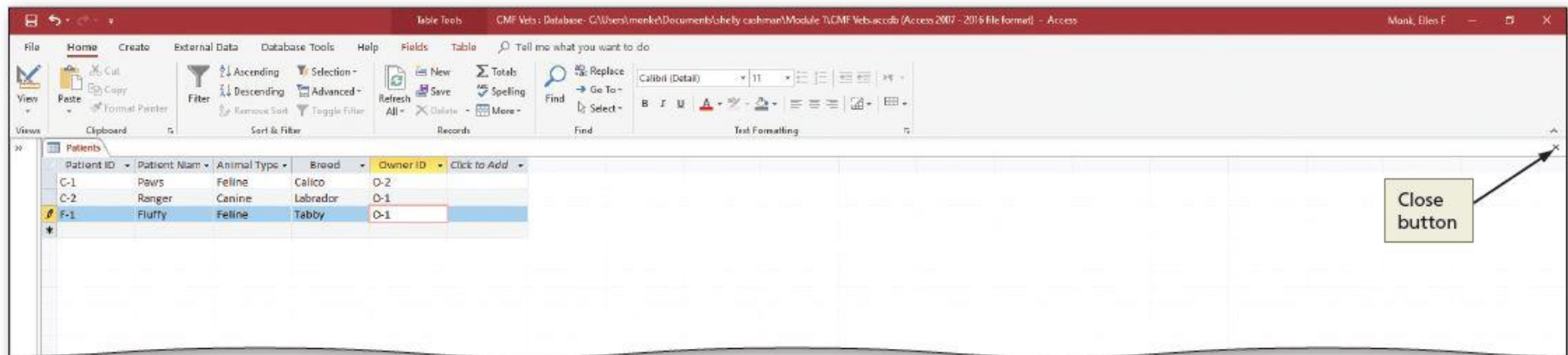


Figure 1-33



Creating a Table in Datasheet View (18 of 18)

- **Importing Additional Access Database Tables into an Existing Database**
 - Open the desired database (CMF Vets)
 - Click on **External data** on the ribbon to display the External Data tab
 - Click the **“New Data Source”** button (import & Link group)
 - Point to **From Database** to display a menu and then click **Access** to display the “Get External Data - Access Database” dialog box
 - Click the Browse button and navigate to the desired source file (**“Support_AC_CMF Vets Extra Tables”**) and then click **Open**
 - Click “Import tables, queries, forms, reports, macros, and modules into the current database” **option box**
 - Click **OK**, then **Select All**, then **OK**
 - Click **Close** (don’t check “Save import steps”)
- Open the table and explore the data



Additional Database Objects (1 of 8)

- Query – a simple question about the database
 - The *Simple Query Wizard* is the quickest and easiest way to create a query.
 - The following query displays the Owners' first and last name, the street address, city, state, and postal code
 - **To Use the Simple Query Wizard to Create a Query**
 - If necessary, open the Navigation Pane
 - Select the table you wish to query ("Owners")
 - Click **Create** on the ribbon to display the Create tab
 - Click the **Query Wizard button** (Create tab | Queries group) to display the New Query dialog box
-



Additional Database Objects (2 of 8)

- **To Use the Simple Query Wizard to Create a Query (Continued)**
 - Be sure **Simple Query Wizard** is selected, and then click the **OK** button (New Query dialog box) to display the Simple Query Wizard dialog box
 - Select **Owner First Name** field and click **Add Field (>)** button
 - Select **Owner Last Name** and click **Add Field (>)** button
 - Using the same technique, add **Owner Street, Owner City, Owner State, and Owner Postal Code**
 - Click **Next** to move to the next screen
 - **Confirm** that the title of the query is “**Owners Query**” and “**Open the query to view information**” is *selected*
 - Click the **Finish button** to create the query
 - Click the **Close button** for the Owners Query to remove the query results from the screen.



Additional Database Objects (3 of 8)

- **Using Queries**

- To change the design of the query, **right-click** the query (**Owners Query**) in the Navigation Pane and click **Design View** in the shortcut menu
- To view the results of the query, click the **Run button** (Design tab | Results group) to run the query and display the results in Datasheet view
- To view results from the Navigation pane, right-click the query (**Owners Query**) and click **Open** from the shortcut menu



Additional Database Objects (4 of 8)

- A form displays all the fields but only for one record
 - **To Create a Form**
 - Select the table (**Owners**) in the Navigation Pane for which you want to create a form
 - If necessary, click **Create** on the ribbon to display the Create tab
 - Click the **Form button** (Create tab | Forms group) to create a simple form
 - Click the Form View button on the **Access status bar** to display the form in **Form view** (*Form view allows changes to the data. Layout view allows changes to the look. Design view allows changes to the form.*)
-



Additional Database Objects (5 of 8)

- **To Create a Form (Continued)**

- Click the **Next record** button to move to the next record
- Click the **Save button** on the Quick Access Toolbar to display the Save As dialog box
- Type the desired form name ("**Owners Form**"), and then click the **OK** button to save the form
- Click the **Close** button for the form to close the form

- **Using a Form**

- After saving, **right-click** the form in the Navigation Pane and then click **Open**
- You can now view, enter, or update the data.
- If you want to revise the data, view in **Form view**.



Additional Database Objects (6 of 8)

- Reports show the data in a format easily distributed as hardcopy or other formats
 - **To Create a Report Using the Report Wizard**
 - Select the table (**Owners**) in the Navigation Pane for which you want to create the report
 - Click **Create** on the ribbon to display the Create tab
 - Click the **Report Wizard** button (Create tab | Reports group)
 - In **Available Fields**, select desired fields, then click Add Field button (>) to add the fields to the **Selected Fields** area
 - **Owner First Name, Owner Last Name, Owner Street, Owner City, Owner State**
-



Additional Database Objects (7 of 8)

- **To Create a Report Using the Report Wizard (Continued)**
 - Click **Next**, and select fields (**Owner State**) for grouping, click Add Field button (**>**) {report will be grouped on Owner State}
 - Click **Next** and **Next** again (*no sort is specified*)
 - Click the **Stepped** layout option to indicate the layout style, then click **Portrait** Orientation, **leave** Adjust the field width **checked** (so all fields fit on a page)
 - Click **Next**, change the report title to **Owners Report**
 - Leave the “**Preview the report**” option checked, then click **Finish** to complete the creation of the report
 - Close the report by clicking the Close button
-



Additional Database Objects (8 of 8)

- **Viewing a Report Using Different Views**
 - **Report view**—shows on the screen
 - **Print Preview**—shows how the report will appear when printed
 - **Layout view**—shows on the screen, but you can make changes to field names
 - **Design view**—allows you to make complex changes, but does not show report data



Database Properties

- Database properties are details about a file
 - project author, title, subject, keywords
 - date you create or change a file, file size, etc.
 - **To Change Database Properties**
 - Click **FILE** on the ribbon to open the **Backstage** view
 - If necessary, click the **Info tab** in the Backstage view to display the Info gallery
 - Click the “**View and edit database properties**” link in the right pane of the **Info gallery**
 - Enter the desired database properties
 - Click the OK button to save your changes
-



Special Database Operations (1 of 3)

- **To Back Up a Database**

- Open the database (“CMF Vets”) to be backed up
 - Click FILE on the ribbon to open the **Backstage view**, and then tap or click the **Save As** tab
 - With **Save Database As selected** in the File Types area, click “**Back Up Database**” in the Save Database As area, and then click the **Save As** button
 - 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
 - Click the **Save** button to back up the database
-



Special Database Operations (2 of 3)

- When you delete objects, the released space may not become available to the other objects. To remove the empty space from the database, we must compact the database. This process also repairs problems that might have occurred in the database.
 - **To Compact and Repair a Database**
 - Open the database (“CMF Vets”) to be compacted
 - Click FILE on the ribbon to open the Backstage view, and then, if necessary, select the Info tab
 - Click the “Compact & Repair Database” button in the Info gallery to compact and repair the database
-



Special Database Operations (3 of 3)

- **Additional Operations**

- **Closing a database without exiting Access**

- File -> Close

- **Saving a database with another name**

- File -> Save As (Save Database As & Access Database) -> Save As -> (New database name) -> Save

- **Deleting a table or other object in the database**

- Right-click the object in the Navigation Pane

- Click Delete on the menu and Click Yes in the dialog box

- **Renaming an object in the database**

- Right-click the object in the Navigation Pane

- Click Rename on the menu and type the new name and press ENTER
