Module 3

Building Tables

Materials Required for Module 3

r   *Microsoft Access Getting Started*

        Chapter 3: *Creating a Table*

r   *Microsoft Access User's Guide*

        Chapter 3: *Changing and Customizing Tables*

r   Address Book database design from Module 2.

Materials Required for Instructor-Facilitated Class

r   Address Book database with at least two possible solutions to the lab

Module Objectives

Lesson 1 - Creating a Table

Upon completion of this lesson, you will be able to:

r   Create new tables and enter data.

r   Create primary keys and establish relationships between tables.

Lesson 2 - Changing and Customizing Tables

Upon completion of this lesson you will be able to:

r   Create defaults, validation rules, and format columns in a new table.

r   Create indexes for existing tables.

r   Create and modify multi-column Primary Keys.

Lesson 1

Creating A Table

Reading Assignment

r   *Microsoft Access Getting Started*
    Chapter 3: *Creating a Table*

As You Read

r   Many users may access a single database from a variety of
    front-ends and be using the data for different purposes.
    Therefore, it is important that you design your tables so that
    they are self-describing. For example, is it more likely that
    users will enter the correct data into a field called: "Part
    Number" or one entitled "num"?

    Which features of Microsoft Access allow you to teach the
    user about the tables you have created?

        Descriptive field names with spaces and capitalization.

        Field descriptions in table design

Status bar text

Exercises

1) Why shouldn't you include Employee Names in the Ping-Pong Players table?

See page 37 - If you repeated the Employee Name you would be wasting space in you database and might misspell it in one location.

2) What does Microsoft Access use for a field label if you leave the Caption property blank?
See page 40 - If you don't set the Caption property, MS Access uses the field name.

3) How does the Format property affect the value that Microsoft Access stores?
See page 40 - The Format property does not change the value stored by MS Access, just the way that value is displayed.

4) Can you resize only one row of a multiple row table?
See Page 53 - When you size a single row, MS Access will resize all rows.

5) When you close your table are your layout changes automatically saved?
See Page 53 - No, but MS Access will prompt you to save changes if you have not.

Try This:

1) Create a new table and do not add a primary key. Save the table. When prompted allow Access to create a primary key for you. What field type is the primary key?

2) Create a new table and add a field of type Counter. Do not add a primary key. Save the table and allow MS Access to create a primary key for you. Which field did it set as the primary key? Why?

Exercises

Try This

1) Open the NWIND database and create a new table.

2) Add a text field called Name and a counter field called ID.

3) Switch to Datasheet View. If you have not already saved your table, Microsoft Access will prompt you for a name.

4) Enter a value into the text field and move to the next record. Repeat for several records.

5) Can you change any of the entries in the column you defined as type Counter?

6) Delete the second record in your table.

7) Add a new record.

8) Are deleted values in a field of type Counter reused?
    Counter values are never reused - new records are always given a value one higher than the highest counter value in the table.

Points to Ponder

1) *A customer is building a table to store student's names. The only information they have on each student is last name, first name, and address. What would you recommend as a Primary Key?*
    As none of these fields are likely to be unique for all students, it would be best to use a Counter field.

2) *What happens when you join tables using a foreign key and primary key that are different data types?*
    If Access can successfully convert the data types, as with long and counter, the join will be successful. If not, as with text and counter, the join will fail.

Lesson 2

Changing and Customizing Tables

Reading Assignment

r   Microsoft Access *User's Guide*
     Chapter 3: *Changing and Customizing Tables*

As You Read

   *Keep in mind that the Field size of the Data Type number is
   what you are looking for here. On page 39, Chapter 3,
   discusses the ranges of the Field size that will help the
   students answer the question.*

r   It is important to consider the needs of the user when
     designing tables. If you were asked to create a table to store
     the amount of change in the water temperature of a local
     stream, what data type
     would you use for the temperature column?
     Number

     That question would be difficult to answer if you did not ask
     the user for more information. If the user's main concern was
     the speed that they could search for a specific percentage,
     which data type might you use?
     Integer

     If the user is more concerned with the accuracy of the data and
     wants to be able to indicate changes as small as 1/1000, which

data type would you use?
Single

Exercises

1) What would happen to the entry 125.7899 if you changed the FieldSize property to Integer?
   See page 39-The number is rounded to 126.

2) What is the default value for a field of type Yes/No ?
   See page 41- The default is No.

3) Are existing records affected when you add a default value to a field?
   See page 43- Setting the DefaultValue property has no effect on existing data. Additionally, when records are imported or added through queries, the default value is not set. Question -- How would you fix this?

4) If you specify =DATE() as the default for a field, is the value updated each time the field is accessed or the record is changed?
   See page 43- No, this only occurs when accessing the field on new records.

5) Can you use a Validation Rule to check data in an existing table?
   See page 44- No, Validation Rules apply only to new data entered in a form or datasheet. A query containing those fields with Validation Properties will use the settings.

6) If your Validation Rule is IN ("WA","OR","CA"), would the user be allowed to leave the field null when adding new record in datasheet view?
   Page 12- Yes, if the user skipped over the field, leaving it null, that would be allowed. Another method is needed to test for nulls. Use the form view for data entry and use a macro to test using the Is Not Null parameter. If the user typed a space that would not be allowed.

Try this:

1) Open the NWIND database and create a new table called Format Test.

2) Add a text field called Test and a numeric field called NumTest. Set the following properties for the field NumTest: FieldSize: Double, Format: Fixed, Decimal: 0, Indexed: Yes. No Duplicates.

3) Switch to Datasheet View. Do not add a primary key.

4) Enter the following records: <u>Text</u>   <u>NumTest</u>
a	99.3
b	99.4
c	99.5

5) Does the formatting affect the value which Microsoft Access stores?

6) Delete the three records you just entered, switch to Design View, and change the FieldSize property of NumTest to Integer.

7) Switch to Form View and reenter the three records. Why do you get a warning this time?

Exercises

Try This

1) Open the NWIND database and create a new table with text field called State.

2) Switch to Form View and enter the following records: *Idaho, Texas, North Carolina*

3) Switch back to Design View.

4) Limit the field to two characters and switch back to Form View. What happened to the three existing records?

   Abreviated them to the first two characters.

5) Now limit the user to entering the three two-digit codes for the states that US Product Support Sites are in: *WA, TX, NC*

6) Switch to Form View. What effect did the new validation rule have on your existing records?

   There is no effect. The record has to be edited for the validation rule to take effect.

Points to Ponder

1) The international settings in Control Panel affect the default formatting in all Windows applications. What setting could you change if you wanted the following defaults:

17:00 *after entering* 5:00 PM*?*
1$ *after entering* 1
Tuesday, 1991, May 07 *for Long Date*

2) What is the difference in functionality of the keystroke sequences CTRL + ' and CTRL+ALT+SPACEBAR?
Last Value and Default Value

On-Your-Own Lab

You are ready to open a new database and create the tables that you designed in the previous lab.

1) Create a new database called <Your Name>.MDB.

   Example: JOHNDOE.MDB

2) Create and save the four tables you designed in the previous lab:

Hint: For future lab exercises you need to have the following four tables, fields, and primary keys (in bold). You may add additional tables and fields to customize your Address Book database.

Main Contacts	Dependents	Hobbies	Pets
Contact ID	**Dependent ID**	**Contact ID**	**Pet ID**
Last Name	Main Contact ID	**Hobby Name**	Pet Name
First Name	Relationship	Description	Owner ID
Address	Last Name		Pet Type
City	First Name		
State	Date of Birth		

Zip Code

Work Phone

Home Phone

Date of Birth

3) In the Main Contact Table enter the following records:

Contact ID	Last Name	First Name	Address	City	State	Zip Code	Home Phone	Work Phone	Date of Birth
	Francisco	Steve	2606 Fir Lane	Seattle	WA	98167	354-4321	635-5562	2/7/53
	Alright	Kim	901 E James	Renton	WA	98059	879-4646	635-3255	6/1/59
	Gunder	Mary	7787 13th SE	Seattle	WA	98151	546-2578	936-9552	2/7/51
	Townsend	Kimberly	111 Belver St	Renton	WA	98058	735-5868	635-5795	7/7/53
	Trent	Donald	6783 45th SW	Federal Way	WA	97212	254-8990	635-5550	9/28/48
	Smith	Michael	3434 145th St	Issaquah	WA	98567	243-5637	936-2555	3/7/65

On-Your-Own Lab

4) In the Pets Table enter the following records:

Pet ID	Owner ID	Pet Name	Pet Type
1	4	Ida	Cat
2	3	Wiskers	Cat
3	3	Badman	Cat
4	2	Jasmine	Cat
5	2	Cinnamon	Cat
6	5	Bugsy	Cat
7	5	Scampy	Cat

5) Open the Pets table in Design View.

6) Instead of using a Counter as the Primary Key for the Pets table we could use the pet's name. However, there is a chance that more than one person you know will have a cat named Jasmine. To guarantee that the Primary Key is unique, create a two-field primary key that consists of the Pet Name and the Owner ID. (First, you need to delete the existing Primary Key.)

Hint: You can delete, enter, or modify the field names in Table Properties to create the primary key or indexes for your table. Click the Table Properties button and clear the Primary Key field.

7) Now you can create a new Primary Key: Owner ID & Pet Name. Select the field Owner ID. Hold down the CTRL key and select the Pet Name field. Both fields should now be highlighted. Click the Key icon on the Toolbar.

8) Display the Table Properties. What order are the field names for your primary key listed in: table order or the order you selected them?

9) Enter the following data in the Dependents table:

Dependent ID	Main Contact ID	Relationship	Last Name	First Name	Date of Birth
1	6	Fiancee	Jones	Melanie	
2	4	Husband	Townsend	Daniel	3/4/54
3	5	Wife	Trent	Marie	
4	1	Wife	Francisco	Nancy	2/18/58
5	1	Daughter	Francisco	Candice	3/16/87
6	2	Husband	Alright	Chris	
7	2	Son	Alright	Kevin	4/17/86
8	2	Daughter	Alright	Kathy	8/2/90
9	3	Husband	Burke	Reginold	

On-Your-Own Lab

11) Before you fill in the Hobbies table, what are the two main problems with this design?

Main Contact ID	Hobby Name	Description
	Music	Plays the trumpet
	Quilting	
	Off-Road Racing	
	Running	
	Plays in a band	Plays the guitar
	Mystery Novels	
	Remodeling Old Houses	
	Diving	

a) In the existing design, you must repeat the Hobby Name and Description for each person who enjoys that hobby. If you have 40 people in your database who enjoy collecting bugs, you are going to quickly tire of typing "entomology."

b) Because you may describe a hobby in a variety of ways, you might not be able to group the contacts in your database by their hobbies. In the table above both Steve and Donald enjoy music. The Hobby Name for Steve was entered as "music". The Hobby Name for Donald was entered as "Plays in a Band".

Like the example tables discussed in the User's Guide, Products and Orders, the Main Contacts and the Hobbies in your database have a Many-To-Many relationship. One person may have many hobbies. One hobby may be shared by many people.

A better design for tracking this information would be to use two tables:

Hobby Assignments

Main Contact ID	Hobby ID	Comment
1	6	Plays the trumpet
2	3	
6	7	
4	5	
5	6	Plays the Guitar
3	1	
3	2	
4	4	

Hobbies

Hobby ID	Hobby
1	Mystery Novels
2	Restoring Old Houses
3	Quilting
4	Running
5	Diving
6	Music
7	Off-Road Racing

On-Your-Own Lab

12) Creating Relationships.

Hint: You will only see this option when the Database Window is active (F11). Menu bars will change relative to the area you are working. Keep this in mind if a customer is not seeing the same menu options as you are.

Now you are ready to create relationships between your tables. You know by looking at the information in the tables Main Contact and Dependents, that Kim Alright has a son named Kevin. To Microsoft Access, and to others who might use your database, this information may not be apparent. To avoid having to specify this relationship each time, assign a relationship between the tables Main Contact and Dependents.

13) Set the following One-To-Many Relationships. Make sure that **Enforce Referential Integrity** is checked.

Primary Table	Primary Key		Related Table	Foreign Key
Main Contacts	Contact ID		Dependents	Main Contact ID
Main Contacts	Contact ID		Pets	Owner ID
Main Contacts	Contact ID		Hobby Assignments	Main Contact ID
Hobbies	Hobby ID		Hobby Assignments	Hobby ID

The PSS Challenge

Appendix B has a diagram of the relationships among tables in the NWIND database. Create a schematic like this for your database. How would you print this if you needed to send it to someone?

Dump all the tables into a query and print the query using Print Screen.

Open the NWIND database and delete the relationship between Orders and Order Details. Add a new record to the Order Details table with an Order ID of 6 and a Product ID of 3. Now try to recreate the relationship, using the Order ID, with Enforce Relational Integrity checked. Delete the record you just added and then recreate the relationship. Attempt to add the record again.

Can't Create relationship. Existing data in table 'Order details' violates relationship.

Can't perform operation. No referenced key exists in relationship.

Is Referential Integrity enforced when Importing data?
Create the following 2 x 5 table in Word for Windows. Highlight the table and choose Convert Table to Text from the Table menu. Choose commas as your delimiters. Save the document as TEST_REF.TXT and select Text Only for the File Type. Import Append TEST_REF.TXT to the Order Details Table.

Order ID	Product ID	Unit Price	Quantity	Discount
6	3	40	1	0

Yes, it's enforced.

Instructor Led Module Review

1)   *Answer Questions*

       When does MS Access write a record to disk?

       Are existing records affected if you add a default to a field?

       How do you set a field to the default?

2) Review As You Read and Points to Ponder

Which features of MS Access allow you to teach the user about the tables you have created?

       Descriptive field names with spaces and capitalization.

       Field descriptions in table design

       Status bar text

What happens when you join tables using a foreign key and primary key that are different data types?

       If MS Access can successfully convert the data types, as with number and counter, the join will be successful. If not, as with text and counter, the join will fail.

The international settings in Control Panel affect the default formatting in all Windows applications. What setting could you change if you wanted the following defaults:

17:00 *after entering* 5:00 PM*?*
1$ *after entering* 1
Tuesday, 1991, May 07 *for Long Date*

3) Present one or two possible lab solutions.

4) Discuss various participant solutions