

# Proicere, Inc.

## MS Access: Design and Development

Lesson Notes

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### Designing a Database

#### Questions

What reports should come out of the database? (Hand draw reports)

Where is the source of the data? ie data entry, download, etc

Question the data? Can there be duplicates? Will data be missing? etc

Rough out tables to be used and how they will relate to each other.

Rough out queries to be sure they will pull the desired information.

Decide field types and sizes.

#### Naming Conventions

While MS Access allows great leeway in naming items/objects, the following recommendations will make working with the database easier.

The LESZYNSKI naming convention is now the internationally accepted standard, for MS Access object naming.

When naming tables, queries, etc., put in lower case at the beginning of the name, the following characters:

tbl = table i.e. tblOwners

qry = query i.e. qryAnimals

frm = form

sbf = subform (not part of the LESZYNSKI standard)

mcr = macro

rpt = report

sbr = subreport (not part of the LESZYNSKI standard)

lbs = labels (not part of the LESZYNSKI standard)

Avoid using the following characters: .,~!@#\$\$%^&\*()+-|=|:;<>?/'"[]{} To be safe, do not use any spaces nor symbols in a name.

Do use upper and lower case

i.e. a table holding Employee Names would be tblEmployeeNames

## Tables

Tables hold the data. Working in the Design mode will allow control of the type and properties of the individual fields.

### Fields

#### Field Name:

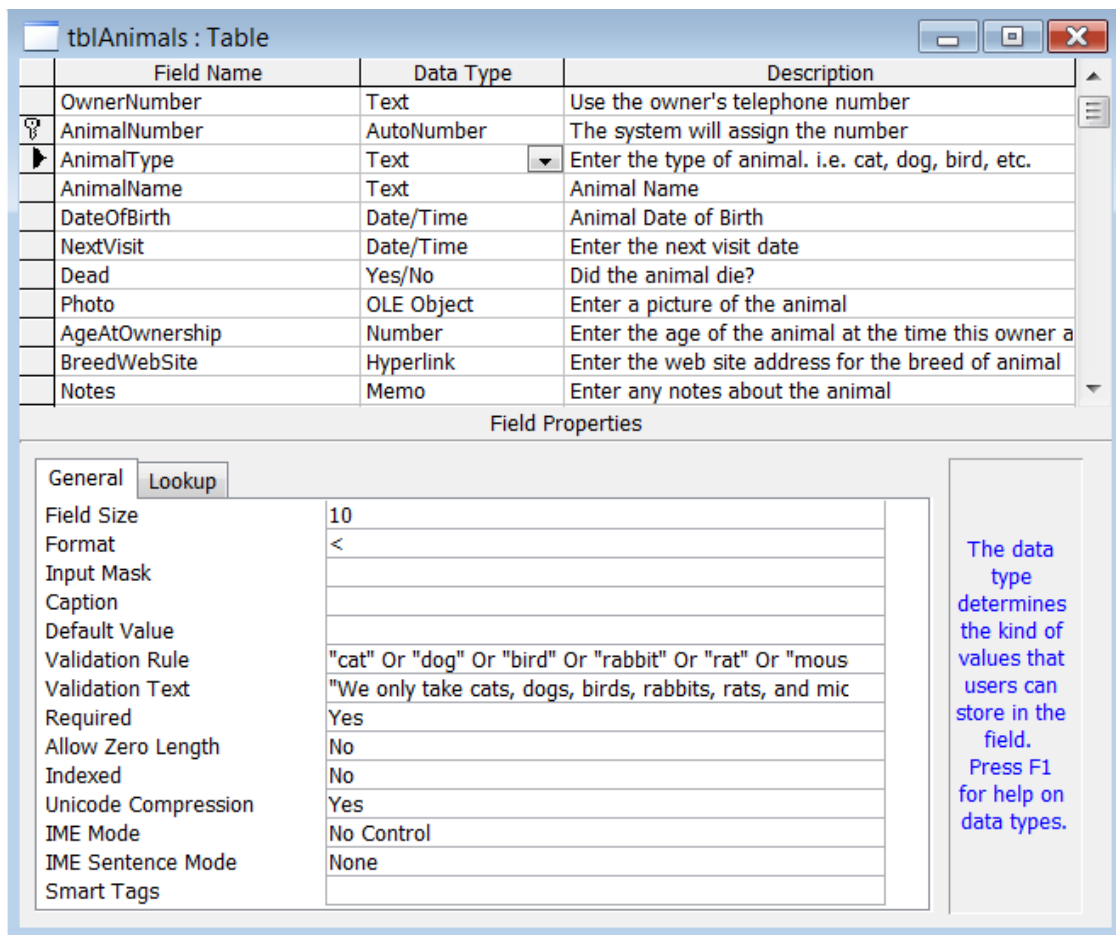
Avoid using the following characters: .~!@#\$\$%^&\*()+-=|:;<>?/'"[]{} To be safe, do not use any spaces nor symbols in a name. Do use upper and lower case.  
ie Last Name should be entered as LastName

#### Data Types:

Designates and restricts the type of data that the field will hold. If the Date/Time data type is selected, the date entered will have to be a valid date.

#### Description:

A description is optional, but the description will display on the status bar when the field is selected for data entry. Spaces and symbols may be used.



Field Name	Data Type	Description
OwnerNumber	Text	Use the owner's telephone number
AnimalNumber	AutoNumber	The system will assign the number
AnimalType	Text	Enter the type of animal. i.e. cat, dog, bird, etc.
AnimalName	Text	Animal Name
DateOfBirth	Date/Time	Animal Date of Birth
NextVisit	Date/Time	Enter the next visit date
Dead	Yes/No	Did the animal die?
Photo	OLE Object	Enter a picture of the animal
AgeAtOwnership	Number	Enter the age of the animal at the time this owner a
BreedWebSite	Hyperlink	Enter the web site address for the breed of animal
Notes	Memo	Enter any notes about the animal

Field Properties	
Lookup	
Field Size	10
Format	<
Input Mask	
Caption	
Default Value	
Validation Rule	"cat" Or "dog" Or "bird" Or "rabbit" Or "rat" Or "mous
Validation Text	"We only take cats, dogs, birds, rabbits, rats, and mic
Required	Yes
Allow Zero Length	No
Indexed	No
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Smart Tags	

The data type determines the kind of values that users can store in the field. Press F1 for help on data types.

## **Field Properties**

### ***Field Size:***

The field size area will only display for fields that allow the size to be changed. Field types of date/time and yes/no have preset field sizes.

### ***Format:***

Format is how the information will be displayed.

### ***Input Mask:***

The input mask forces the user to enter the data in a specific format and can be used to automatically enter information to save the user time. ie the slashed in dates, and the dashes in telephone numbers.

### ***Caption:***

Used to change the display name of the column headings.

### ***Default Value:***

Allows a value to be put into the field at the time the record is created. The Default Value can be overwritten in the record at any time.

### ***Validation Rule:***

Restricts the data that can be entered into a field.

### ***Validation Text:***

The message that pops up if the user tries to enter data that breaks the Validation Rule.

### ***Required:***

If the field is designated as required, data must be entered into the field before the record can be saved.

### ***Allow Zero Length:***

If Allow Zero Length is set to "Yes" then a single space will be accepted even if the field is required.

### ***Indexed:***

Indexing is used to make searches faster. It will slow down data entry since every entry will have to be added to not only the table, but also the index.

### ***Unicode Compression:***

If "Yes" is selected, the data will be compressed when saved and uncompressed when retrieved. This reduces the storage area needed for the data. The default is "Yes".

### ***IME Mode:***

The Input Method Editor is a program that allows you to enter Asian text in programs by converting your keystrokes into Asian characters. The default is "No Control".

### ***IME Sentence Mode:***

Used with the Asian characters. Default is "None".

### ***Smart Tags:***

Allows a Smart Tag to be associated with the field. (Data recognized and labeled as a particular type)

## Field Types

### **Text**

Text or combinations of text and numbers, as well as numbers that don't require calculations, such as phone numbers. Length 1 to 255 characters

### **Memo**

Lengthy text or combinations of text and numbers. Length up to 65,535 characters. Memo fields are searchable, but not sortable.

### **Number**

Numeric data used in mathematical calculations  
Byte, Integer and Long Integer are whole numbers  
Decimal, Single and Double can have decimals.  
Replica ID is a Globally unique identifier (GUID) used to identify replicas, replica sets, tables, records, and other objects.

### **Date/Time**

Date and time values for the years 100 through 9999.

### **Currency**

Currency values and numeric data used in mathematical calculations involving data with one to four decimal places. Accurate to 15 digits on the left side of the decimal separator and to 4 digits on the right side.

### **AutoNumber**

A unique sequential (incremented by 1) number or random number assigned by Microsoft Access whenever a new record is added to a table. AutoNumber fields can't be updated. Only one AutoNumber can be assigned to a table. An AutoNumber is a Long Integer.

### **Yes/No**

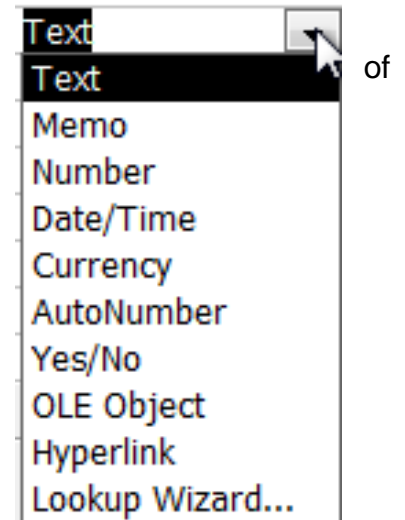
Yes and No values and fields that contain only one of two values (Yes/No, True/False, or On/Off). VBA recognizes 0 as Off and -1 as On.

### **OLE Object**

An object (such as a Microsoft Excel spreadsheet, a Microsoft Word document, graphics, sounds, or other binary data) linked to or embedded in a Microsoft Access table. Up to 1 gigabyte (limited by available disk space)

### **Hyperlink**

Hyperlinks can be to web address or to files stored on an accessible drive.



## Custom Formats

### Numbers

Custom number formats can have one to four sections with semicolons (;) as the list separator. Each section contains the format specification for a different type of number.

Section	Description
First	The format for positive numbers.
Second	The format for negative numbers.
Third	The format for zero values.
Fourth	The format for Null values.

For example, you could use the following custom Currency format:

`$#,##0.00[Green];($#,##0.00)[Red];"Zero";"Null"`

### Date/Time

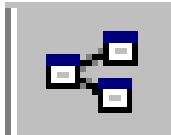
To custom format a date, in the format area key in a combination of the following.

MMMM      Month spelled out  
MMM        Month abbreviated  
MM         Month as two digits  
M          Month as one or two digits

DDDD      Day of the week spelled out  
DDD        Day of the week abbreviated  
DD         Day as two digit date  
D          Day as one or two digits date

YYYY      Year as four digits  
YY         Year as two digits

An example 6/5/97 can be changed to the following format  
DDDD, MMMM DD, YYYY    would display    Thursday, June 05, 1997  
DDD, MMM D, YY        would display    Thu, Jun 5, 97



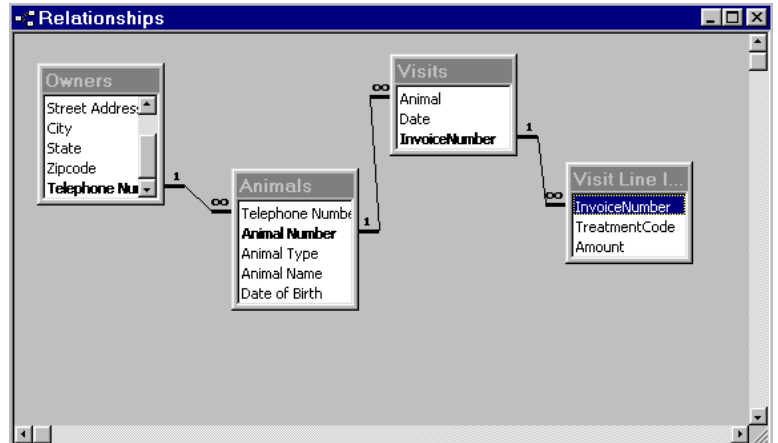
## Relationship

Setting the Relationship between tables tells MS Access how the information is related.

To create a relationship, from the menu choose Tools, Relationship.

Add the tables to the Relationships screen.

To create the relationship, drag the key field of one table and drop it on the matching field of another table. (Drag the one to the many.)



### **Enforce Referential Integrity**

Setting “Enforce Referential Integrity” forces the system to check any number/text entered into the field against the relating table. A number can not be entered into the second table unless it exists in the first table.

### **Cascade Update Related Fields**

If unchecked, the data in the field of the main table can not be changed once the corresponding records in the related table have been created. If checked, when the data in the field of the main table is changed, the corresponding data in the related table is also changed.

### **Cascade Delete Related Records**

If unchecked, the record in the main table can not be deleted if there are corresponding records in the related table. If checked, when the record is deleted in the main table, the corresponded records in the related table are also deleted.

Table/Query:	Related Table/Query:
Owners	Animals
Telephone Number	Telephone Number

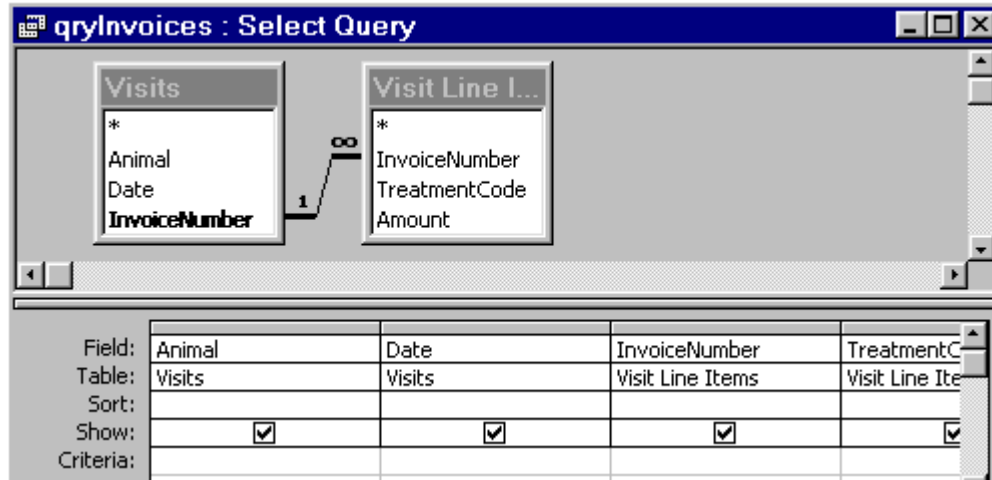
Enforce Referential Integrity  
 Cascade Update Related Fields  
 Cascade Delete Related Records

Relationship Type: One-To-Many

## Queries

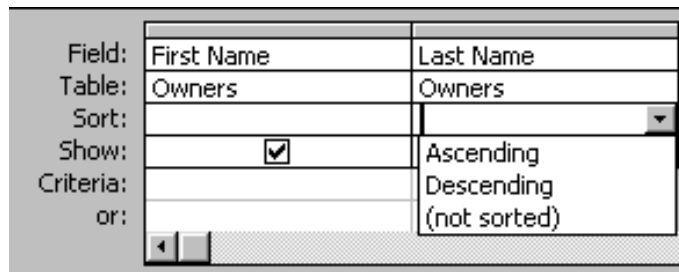
Queries allow information in a table to be displayed in any order, or based on any criteria. Changing data through a query, changes the data in the underlying table.

Several tables can be brought into a query. Other queries can be used instead of tables.



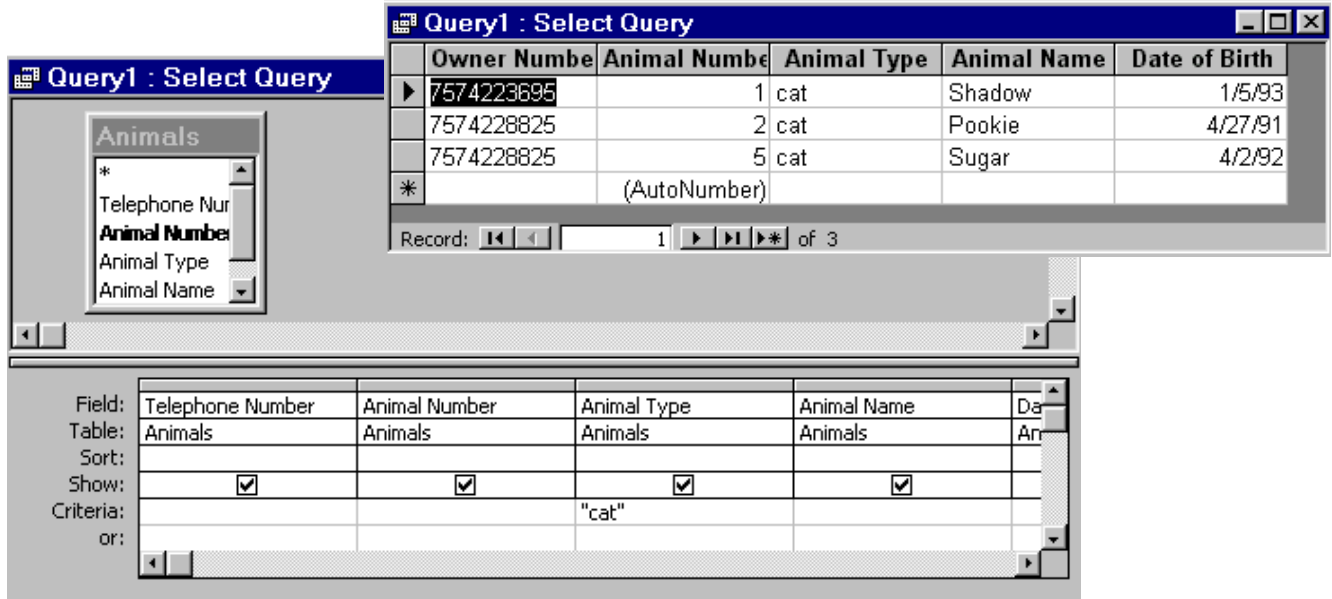
## Sorting in a Query

The first column to the left that is selected for sorting is considered the primary sort.



## Criteria

Setting criteria allows only the desired records to be displayed.



### Criteria examples

Field Type	criteria	pulls
Text	"Virginia"	Virginia only
Text	Like "Virginia*" <i>Note: an * is a wild card</i>	Anything with Virginia at the beginning: Virginia, Virginia Beach
Text	Like "*ith"	Anything with ith anywhere in the field: Smith, Ithaca, Smithfield
Text	Like "?ill"	First letter can be anything, but the rest of the word has to be "ill" Bill, Jill, Dill, but not Billy nor Dillard
Text	null	Pulls only records with the field blank
Text	not null	Pulls all records with data in the field
Yes/No	Yes or True	Pulls only records with a check in the field.
Yes/No	No or False	Pulls only records without a check in the field
Number or Date/Time	between #01/01/01# and #01/31/01#	All dates for the year 2001

Quotes should be put around text to be pulled.

Pound signs should be put around dates to be pulled.

### Parameter Query (Stopping for User Input)

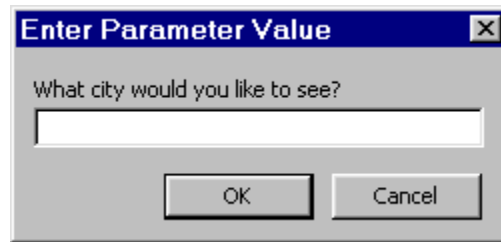
Placing square brackets in the criteria will force the system to stop for operator input. The text within the brackets will display in the dialog box that is displayed.

Example:

Entered into the criteria field

### [What city would you like to see?]

User would see the following display:



### Date Ranges

To pull a specific date range, key in:  
Between *start date* and *end date*

Field:	Date of Birth
Table:	Animals
Sort:	
Show:	<input checked="" type="checkbox"/>
Criteria:	Between #1/1/90# And #12/31/99#
or:	

**OR**

Criteria listed on separate lines are considered an “or”.

Animal Type	
Animals	
	<input checked="" type="checkbox"/>
"cat"	
"dog"	

Owner Numbe	Animal Numbe	Animal Type	Animal Name	Date of Birth
7574223695	1	cat	Shadow	1/5/93
7574228825	2	cat	Pookie	4/27/91
7574269932	3	dog	Rex	3/28/92
7574228825	5	cat	Sugar	4/2/92
7574281515	6	dog	Rover	6/8/93
7574223695	9	dog	Rex	8/9/96
7574281515	11	dog	Sugar	3/6/98
	(AutoNumber)			

Record: 8 of 8

Animal Type	Animal Name
Animals	Animals
	<input checked="" type="checkbox"/>
"cat"	
	"sugar"

Owner Numbe	Animal Numbe	Animal Type	Animal Name	Date of Birth
7574223695	1	cat	Shadow	1/5/93
7574228825	2	cat	Pookie	4/27/91
7574228825	5	cat	Sugar	4/2/92
7574228825	10	bird	Sugar	4/1/90
7574281515	11	dog	Sugar	3/6/98
	(AutoNumber)			

Record: 1 of 5

**And**

Criteria on the same line is considered an “And”.

Animal Type	Animal Name
Animals	Animals
	<input checked="" type="checkbox"/>
"cat"	"sugar"

Owner Numbe	Animal Numbe	Animal Type	Animal Name	Date of Birth
7574228825	5	cat	Sugar	4/2/92
	(AutoNumber)			

Record: 1 of 1

## Forms

Forms allow a graphical interface for the user to enter and change data. A form can be attached to a table or a query.

**Columnar** will show one record per screen.

**Tabular** will show several records per screen.

**Datasheet** looks like a table layout.

**Justified** looks similar to columnar, but the fields are fixed length. (this layout does not have as much flexibility as the others.)

### Creating a Form

On the Form tab click on the “New” button.

*Note: The Form Wizard will walk the user through the steps in creating the form.*

Choose the table or query to attach the form.

Choose the fields to be placed on the form. All fields do not need to be on each form.

The form may be used as is, or modified.

### Controls

A form consists of controls. Anything that is placed on a form is a control.

#### Unbound Control

An unbound control is any static text (does not change) that is placed on a form. i.e. Labels, headings, etc.

#### Bound Control

A control that pulls information from another source such as a field in a table or query.

## Modify a Form

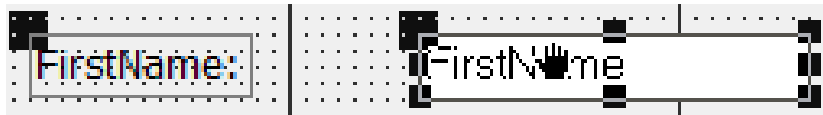
To modify the form, change to the design mode.



### Moving Controls

To move a control, click and drag the control. A hand will appear.

If the hand shows five fingers, a bound control and its attached unbound control will move together.



If the hand is pointing, it will only move the one control (either bound or unbound). You must be over the large square in the upper left hand corner of the control to move just the one control.



### Resizing Controls

To resize the control, click on the control. Handles will appear.

Click and drag the arrow that appears when the mouse is moved over one of the handles.



### Formatting a Control

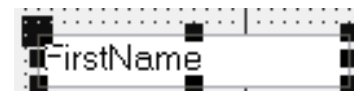
The text in labels can be changed. Do not change the name of fields in bound controls.

Any control can be formatted to change the font, order, and background of a control.

The formatting toolbar can be used to change the formatting of a control.



*Note: The format of a control can not be changed unless the whole control is selected. The handles will display when the control is selected.*



### Format Painter

Use the Format Painter tool to copy the formatting of one control to another control.

Format Painter tool on the toolbar (looks like a paintbrush)

Click on desired control

Click on the Format Painter tool

Go to the destination control and click



*Hint: double clicking on the Format Painter tool will allow the formatting to be copied to several controls.*

### Changing Tab Order

Moving controls does not change the tab order. To change the tab order, right click on the ruler. From the menu that appears, choose “tab order”.

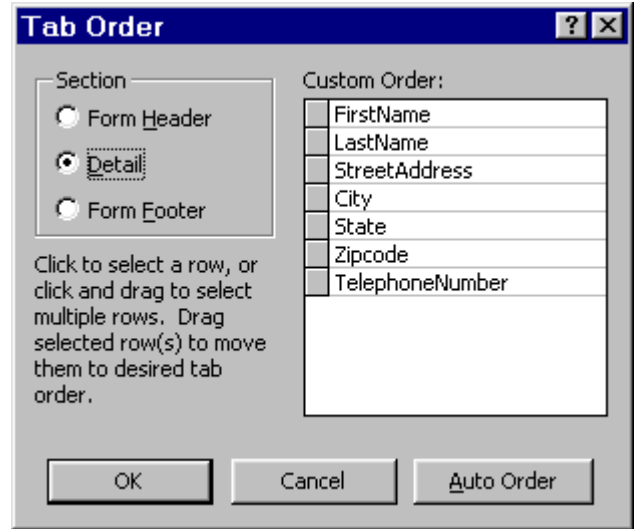
The dialog box that appears will allow the tab order of the controls to be re-ordered.

The “auto order” button will reorder the tabs for each control from left to right.

The tab order for each control can be moved individually.

To change the tab order of a control, click on the gray square to the left of the control name.

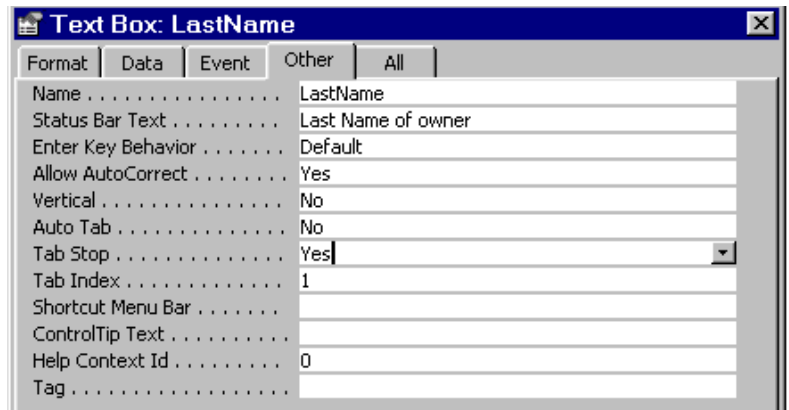
Grab the dark gray square that appears and drag to desired position.



### Remove from Tab Order

To remove a control from the tab order, in the design mode of the form, click on the control with the right mouse button. Select properties.

On the “Other” tab, change the “Tab Stop” to “NO”.



### Reports

Reports allow the information to be displayed or printed in an organized manner.

#### Creating a Report

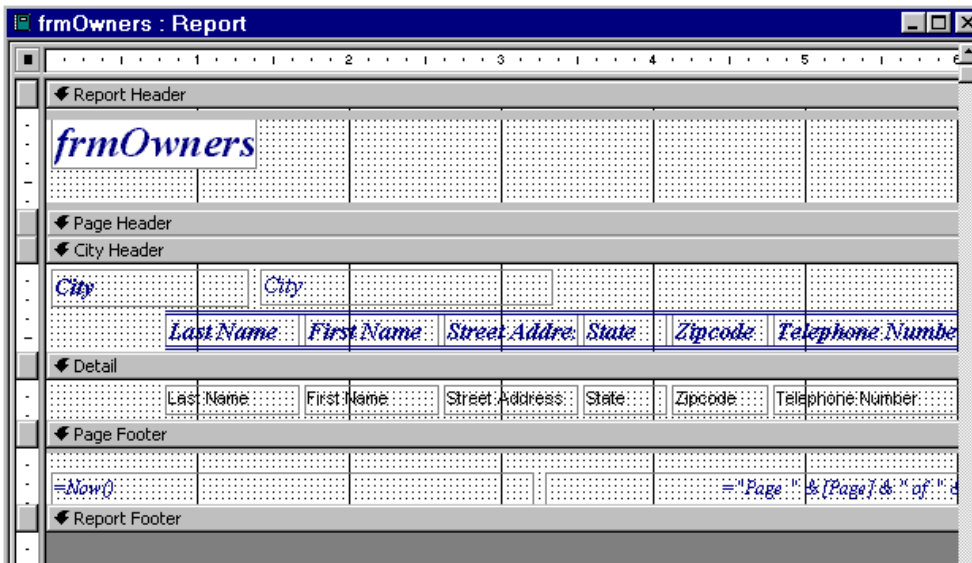
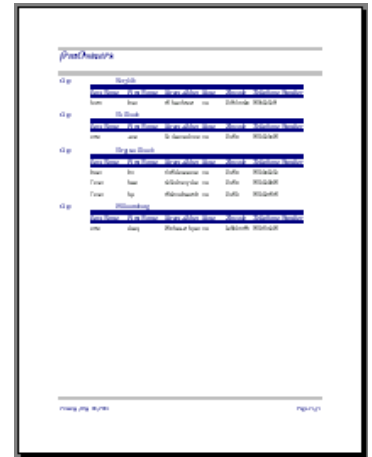
On the Report tab, click on the “New” button.

*Note: The Report Wizard will walk the user through the steps in creating the report.*

Choose the fields to be placed on the report.

#### Modify a Report

The report may be modified in the design mode. The manipulation of controls in the report is the same as that of the forms.



#### Areas of a Report

Report Header – shows only on first page of report

Page Header – shows at the top of every page

Group Header – shows at the top of each new grouping

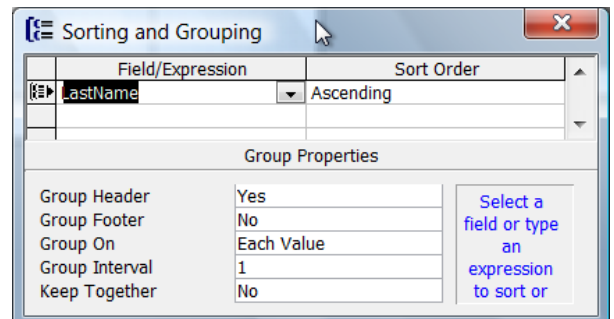
Group Footer – shows at the bottom of each group

Page Footer – shows at the bottom of every page

Report Footer – shows only on the last page of report

#### Grouping and Sorting

Use the Sorting and Grouping tool on the Report Design toolbar to turn on the dialog box.

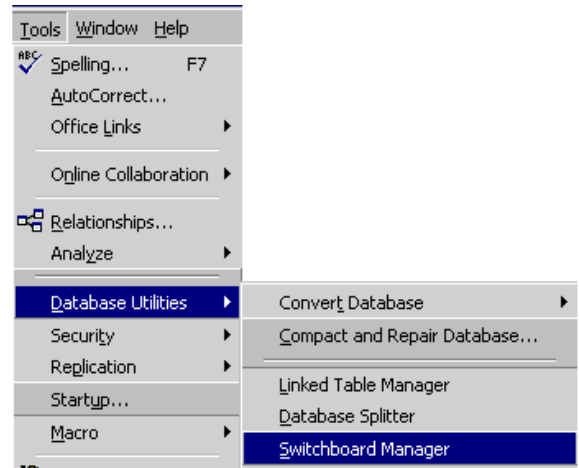


## Menu (Switchboard)

A menu can be created using the switchboard.

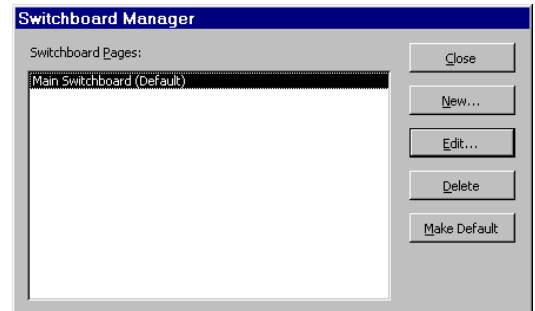
From the menu choose Tools, Database Utilities, Switchboard Manager

*Note: If this is the first switchboard for the database, a message will appear asking if one should be created.*



The dialog box for the switchboard manager will appear.

Choose “edit” to add items to the switchboard, then choose “new” to add the actual item to this list.

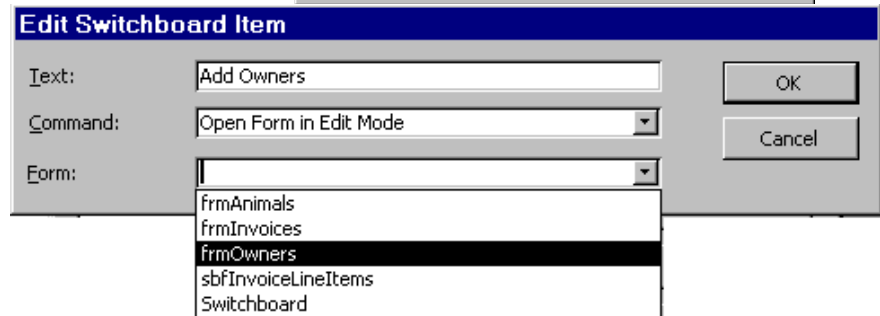


In the text box, enter the text to be displayed on the menu.

In the Command box, choose the appropriate action from the drop down menu.

Choose the form, report, switchboard, etc. to run.

Repeat the steps to add additional items to the menu.



When all items have been added to the list, choose the close button to close the edit screen. Then close the switchboard manager.

On the forms tab, open the switchboard to see the menu.

*Note: the switchboard form can be modified by switching to the design mode. The fields and buttons may be modified, but not deleted.*

*Note: there are only eight buttons on a switchboard that show when needed, but multiple switchboards may be created. Type multiple switchboards together by adding menu options going from one to the other.*

