Today’s Topics

- M:M Relationships
  - Review: what they are
  - Example: creating the intermediate table
- More on Queries
  - Other Types - Select, Update, Append, Delete
  - Calculations with Queries
- Forms
  - Design and Use

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M:M Relationship

- Many-to-many relationship
- Many entities are related to many entities and the reverse is also true

Example:
- a Zoo animal could eat many types of food
  - and
- A food could be eaten by many different zoo animals
M:M Relationships can be tricky

- You need an intermediary between the two tables that would have a M:M relationship

Add a table between the existing tables

Add this table

Add relationships between the tables
Query Types

- The Queries we have been using in the course so far are called **Select Queries** because they select data from existing database tables based on criteria that we specify.
- There are also other types of queries available in Access.

Other Query Types

- **Make Table** – Creates a new table from query results
- **Append** – Records matching the query results are added to an existing table
- **Update** – Records matching the query results are updated in an existing table
- **Delete** – Records matching Query criteria are deleted from an existing table

Interactive Queries

- You can create *interactive queries* that prompt the user to enter a value each time the query is executed.
- If you put words in square brackets ([words]), Access will pop up a question box with these words and wait for user input each time the query is run.
- Whatever user types is substituted for the bracketed words
- The official Access term for these is "parameter queries"
Interactive Queries

- Example: you want to show all Pets below a maximum weight specified by the user.
- Form your query as usual, but in the Criteria box enter:
  
  \<[Enter maximum pet weight:]

- When query executes, it will prompt user and substitute the value typed by the user for the bracketed text.
- Let’s do this example….

Interactive Queries

- One more example: you want to show all Pets whose names start with a letter specified by the user.
- Form your query as usual, but in the Criteria box enter:
  
  Like [First letter of name:] & "*"
  (the ' & ' is a conjunction that combines user's answer with '*' wild card).

- Let’s do this example….

Queries That Calculate

- When performing a query, you can aggregate the data
- You can perform a Count, Sum, Avg, Max, Min, StDev, Var(iance), First, and Last
- Count, First, and Last can be performed on types counter, number, currency, date/time, yes/no, text, memo, and OLE object
- The others on counter, number, currency, date/time, and yes/no
Queries That Calculate

- How to do it: Click **Totals** button at top right of Access queries screen make sure it is selected.
- Now use the drop-down boxes in the Total rows to select an **aggregating operation** (Count, Sum, Avg, Max, Min, StDev, Var(iance), First, Last) for each column.
- Every column must have an aggregating operation chosen for this to work.
- Select **Group By** if you want results grouped together for equal values in this column.

Example

Say you have a database for a vet that treats dogs. Each dog treated has an entry including ID, weight, and height

- If you want to find the average weight and height of all pets:

<table>
<thead>
<tr>
<th>Field:</th>
<th>Weight</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
<td>Count</td>
<td>Avg</td>
</tr>
<tr>
<td>Show:</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Criteria:</td>
<td></td>
<td>“Dog”</td>
</tr>
</tbody>
</table>

Example

What if you want to find the average height and weight for all dogs?

<table>
<thead>
<tr>
<th>Field:</th>
<th>Weight</th>
<th>Height</th>
<th>Type of Animal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
<td>Avg</td>
<td>Avg</td>
<td>Group By</td>
</tr>
<tr>
<td>Show:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Criteria:</td>
<td></td>
<td></td>
<td>“Dog”</td>
</tr>
</tbody>
</table>
Example
- What if you want to find the minimum and maximum weight for all dogs?

<table>
<thead>
<tr>
<th>Field: Weight</th>
<th>Weight Type of Animal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: Min</td>
<td>Max</td>
</tr>
<tr>
<td>Show: X</td>
<td>X</td>
</tr>
<tr>
<td>Criteria:</td>
<td>&quot;Dog&quot;</td>
</tr>
</tbody>
</table>

More Examples
- You can also perform totals on groups of records.
- For example, suppose you want to count how many different types of pets the vet has on record

<table>
<thead>
<tr>
<th>Field: Type of Animal</th>
<th>Pet ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: Group By</td>
<td>Count</td>
</tr>
<tr>
<td>Show: X</td>
<td>X</td>
</tr>
</tbody>
</table>

Datasheet Features
- We have already been looking at a lot of data in "Datasheet View".
- Note that Datasheet View lets you
  - Display data
  - Sort / filter data
  - Add new data records
  - Modify data records
Datasheet Features

- At the bottom of each datasheet are buttons to move between records, add records, and search.

Forms

- Forms allow you to do all the same operations as Datasheets, but:
  - They usually show only one record at a time
  - You can use any format, color scheme, screen layout to show the record data.
  - You can show or hide fields
  - You can restrict values and operations for some fields
  - You can use data controls to create drop-down lists, buttons, and other cool graphical data entry and display items.

Forms

- Each form is associated with (“bound to”) the table or query that is highlighted when you create the new form.
- Each control on the form can be bound to a particular field of this table or query.
- All adds, deletes, changes you do to the data on the form is performed on the associated table or query data fields behind the scenes.
Access 2007 Form Types

- Access has 3 predefined forms:
  - Form button – creates form to show 1 data record at a time.
  - Split Form button – creates single-record form and datasheet on split screen
  - Multiple Items button – creates form that shows many records (like datasheet)
- Otherwise you can start with Wizard or blank form and build it yourself

Form Wizard
Forms
- Form Wizard
  - What table are you creating a form for?
  - What fields do you want on the form?
  - What layout (columnar, tabular,...)?
  - What style (background)?
  - What title do you want for the form?

Choose Layout View for Basic Edits
- Layout View lets you edit the form
  - Resize windows
  - Move fields around
  - Create and place data controls
  - Many more properties / controls available

- Or you can use Design View for complete flexibility

Forms Continued
- If you change the data on the form, you are changing it in the database!
- You can use the form for entering new data or modifying data
- Every time you move out of a data record shown on the form, Access adds or updates a corresponding record in the database!
Forms Continued

- Now go back into Design View to edit the form
- Resize windows
- Move fields around
- Many more properties / controls available

Toolbox Basic Controls

- **Label controls** – headings, labels, captions, instructions
- **Text box controls** – data is displayed or entered here
- **Toggle buttons, option / radio buttons, check boxes** – for Yes/No data
- **Option group** – contains multiple toggle buttons

Toolbox Basic Controls

- **List box** – a pull down menu which is always down
- **Combo box** – a pull down menu which also lets you add an option that is not on the list
Add Controls to Form
- Must be in Design View to add data controls to a form:
  - Make sure "Add Existing Fields" is selected at top so you see list of fields on the right.
  - Make sure "Use Control Wizard" is selected at top.
  - Select a data control icon at top of screen.
  - Click on data field at right and drag it onto form design space
  - Control wizard will then help you out.

Form Object Properties
- Pretty much everything in a Form has a list of properties associated with it
- To display properties, you can select Property Sheet at the top right.
- Or you can right click on an item
- Let’s look at some properties...

Form Properties
- At top of Properties Sheet window, select “Form” from the drop-down to get properties of the entire form - you can control what users can do with this form
  - Allow Additions – can user add records?
  - Allow Deletions – can user delete records?
  - Allow Edits – can user modify records?
SubForms

- If you are working on a form associated with a table that has a 1:M relationship with another table, you can include all associated records in a subform.
- Each time you select a record on your form, all associated records are brought up from the other table on the subform.

SubForms Example

Form Fields
(from CD Info table)

SubForm
(from SongInfo table)