Working with Access 2007
Fill in a name and where you want it saved.

Blank Database
Create a Microsoft Office Access database that does not contain any existing data or objects.

File Name: [Input Field]

Create | Cancel
I want to be in the design view so I change to that. It automatically sets the name, the key and the data type for the first field. I change the field name and the data type and sometimes the key if I want multiple fields together to be the key.
I also change the field size for the text field (the default is 155 and I do not need a field that big - note I made it 5.)
I added other text fields and next I will add numeric fields. With numeric I use single and double for decimals depending on size and integer and long integer for whole numbers depending on size.
When the structure is done, I want to enter the data so I click on view above. This is a toggle that lets me go back and forth between the design and the data.
To go back to the design I click on the design view above. Now I have entered data into the structure I designed.
I select query design and it asks me what table to use and I click on the only table I have. Note that I am now in the user interface for queries.
By clicking and dragging I bring down the fields (I can bring down some but not all of the fields and they can be in any order I decide on.)

Click here to see the results.
Note that under criteria I have CI - is means only records with major of CI will be displayed.
Click here to go back to the user interface where you designed the query.
Now I have two criteria in an AND relationship.
AND
Now I have two criteria in an OR relationship. Note that one criteria is on the criteria line and one is on the OR line.
Here I did not use an symbol for comparison in the gpa of 2.7 so it defaults to =.
The next query I want to do will have the criteria I wrote on the screen.
Note that I want CI to always be true so it is on both the criteria line and the or line. In addition I want condB or condC and one is on the criteria line and one is on the or line.
Now I am going to start to write my query using SQL. I start the same way and then close.
I am writing the SQL in notepad so you can see it better. On the next slide I use it. This slide simply shows the data that I get with this query.

SELECT * means select all fields and FROM first means from the table first.
I actually write the SQL in the area that comes up, but here I am showing both the code I copy to that area and the results.

```sql
SELECT idno, stuname, major, gpa, numcr 
FROM first 
WHERE major = "CI";
```
This shows two criteria in an AND relationship.

```
SELECT idno, stuname, major, gpa, numcr
FROM first
WHERE major = "CI" and gpa > 3;
```
Finally I am showing you where I copy the code - this is from the last query. Now I am going to change it. I am working out the changes in notepad. Note that when I have the criteria shown in notepad, the AND gets resolved before the OR which means the things around the OR get grouped and the thing after the OR stands alone.

```
SELECT idno, stuname, major, gpa, numcr
FROM first
WHERE major = 'CI' and gpa > 3 or numcr > 15;
```
```
SELECT idno, stuname, major, gpa, numcr
FROM first
WHERE major = "CI" and gpa > 3 or numcr > 15;
```
I change the order by using parenthesis. Now major = "CI" must be true and either of the other two criteria.

```
SELECT idno, stuname, major, gpa, numcr
FROM first
WHERE major = "CI" and (gpa > 3 or numcr > 15);
```
If you have more than one table you must relate them - this shows how to relate using the standard of third normal form.

A database can consist of multiple tables/files. These tables/files are related to each other in some way so that the programmer or developer can access information from multiple tables/files at the same time. A database management system is the database and its functionality. In today’s PC environment, the model of relating the table/files within a database is the relational database model. Things that must be considered in a relational database:

- Analyze the data and determine how to design the files - consider whether the data is in a one to one relationship, a one to many relationship or a many to many relationship.
- Consider functional dependence: An attribute B is functionally dependent on another attribute, A if a value for A determines a single value for B at any one time.
- The primary key has all attributes in the table functionally dependent upon it - to simplify you can think of the primary key as the minimum collection of fields that will get you one and only one record from the table/file.
- We must also consider the rules of normalization and establish the relationships so that the database is in third normal form.

- A relation is in **first normal form** if it does not contain repeating groups.
- A relation is in **second normal form** if it is in first normal form and no non-key attribute is dependent on only a portion of the primary key. (Note: an attribute is a non-key attribute if it is not a part of the primary key).
- A relation is in **third normal form** if it is in second normal form and if the only determinants it contains are candidate keys. (Note: any attribute that determines another attribute is called a determinant).
I recommend listing to the audio.
An example of a many to many relationship where one movie has many stars and one star has many movies so a bridge table is created to hold the information about a particular movie and a particular star in that movie. Note salary on the bridge table relates to both movie and star.
I am setting up a second table that simply has major information.
<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>major</td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>majorname</td>
<td>Text</td>
<td></td>
</tr>
</tbody>
</table>
I am starting to write a query. If a field appears on multiple tables use table.field.

```sql
SELECT idno, stuname, first.major, majorname
FROM first
WHERE major = "CI" and (gpa > 3 or numcr > 15);
```
I am linking the two tables based on the major field. The major field on both tables must be the same. Therefore the CI majors will link to the CI record on the majortable.
SELECT idno, stuname, first.major, majorname
FROM first, majortable
WHERE first.major = majortable.major;
<table>
<thead>
<tr>
<th>idno</th>
<th>stuname</th>
<th>major</th>
<th>majormode</th>
<th>majorname</th>
</tr>
</thead>
<tbody>
<tr>
<td>11111</td>
<td>Jane Smith</td>
<td>Ci</td>
<td></td>
<td>Computer Info</td>
</tr>
<tr>
<td>22222</td>
<td>John Doe</td>
<td>Ci</td>
<td></td>
<td>Computer Info</td>
</tr>
<tr>
<td>33333</td>
<td>Mary Jones</td>
<td>BU</td>
<td>Business</td>
<td></td>
</tr>
<tr>
<td>44444</td>
<td>Bob Costa</td>
<td>Ci</td>
<td></td>
<td>Computer Info</td>
</tr>
<tr>
<td>55555</td>
<td>Susan Ash</td>
<td>Ci</td>
<td></td>
<td>Computer Info</td>
</tr>
<tr>
<td>66666</td>
<td>Linda Jones</td>
<td>BU</td>
<td>Business</td>
<td></td>
</tr>
<tr>
<td>77777</td>
<td>David Brown</td>
<td>BU</td>
<td>Business</td>
<td></td>
</tr>
<tr>
<td>88888</td>
<td>Larry Souza</td>
<td>Ci</td>
<td></td>
<td>Computer Info</td>
</tr>
</tbody>
</table>
If I do this using the user interface note the line from major to major that shows the link.
This is in response to the how do I handle three tables. Essentially I need to link them both and I need to list all three in the FROM.

\[ \text{student, idno = first.idno} \]
I honestly do not know why first is in square brackets. Square brackets are usually used when the field has an embedded space. I suspect that first may be a reserved word meaning it has another meaning to Access.
Another way of doing the link.

```sql
SELECT first.idno, first.stuname, first.major, majortable.majorname
FROM [first] INNER JOIN majortable ON first.major=majortable.major;
```
<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>idno</td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>stuname</td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>major</td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>gpa</td>
<td>Number</td>
<td></td>
</tr>
<tr>
<td>numcr</td>
<td>Number</td>
<td></td>
</tr>
</tbody>
</table>
In answer to a question about setting up a primary key made up of multiple fields. Hold down shift or control, highlight the three fields and click the primary key. I did it on this table but note that it makes no sense in this context.
<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>idno</td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>stuname</td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>major</td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>gpa</td>
<td>Number</td>
<td></td>
</tr>
<tr>
<td>numcr</td>
<td>Number</td>
<td></td>
</tr>
</tbody>
</table>

The data type determines the kind of values that users can store in the field. Press F1 for help on data types.
```sql
SELECT idno, stuname, first.major, majorname
FROM first, majortable
WHERE first.major = majortable.major;
```
Visual Basic
CIS156 56

About This Course:
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College Policies

Site Resources:
Notes and Handouts
Blog
VB 2010/2008/2005:
Examples 2010
Smartboard 2010/08/05
Audio VB 2010/08/05

VB.NET (previous version):
Programs VB.NET
Presentations VB.NET
Smartboard VB.NET
Audio lectures VB.NET

VB.6 (previous version):
Programs written in VB.6
Programs written in VB.6
(Excel/Access)
Presentations for VB.6
Smartboard for VB.6

Week #9
Week of March 28th

something is confusing, give them a try.
This week my CIS120 class at 11:00 will have a guest speaker on Thursday from Medtech who will talk about some of the careers available in his company. You are welcome to attend - I have no idea how seating will hold up but there is definitely standing room.

In class we will continue with arrays and start to look at files. Please look over the material in chapter 49.

This Thursday, we are going to look at developing an Access Database and also at SQL
Assignments:
First: Convert my bubble sort program so it does the sort using the top down method. These two methods are covered in PowerPoint presentations at my site.

Second: I want you to experiment some more with arrays. Write a program of your own design that uses a two dimension table. Also set up an array that has an element containing both the number and the name and extract the number so you can compare it to user input (for example, in one of my soup programs I had 03 Seafood Chowder as an element in the table and I used a function to extract 03 to compare in a search). I want you to do something similar.

Week #8
Week of March 21st

I am willing to stay and help on Thursday (from 2 to 7 or 8), however, you need to let me know if you plan to come because if very few are coming I will not stay as late.

Note that this is a hybrid class. The week of April 4th we will probably be doing the class online instead of the combination of in-class and online that we have used for all other classes.

This week we will work on chapter #8 dealing with arrays. You should look at my examples under 2010 and also my examples under VB.NET that were developed in 2005/2008 etc.

Assignments:
I want you to write a program that will meet the following specifications:
1) Set up a structure with multiple types of data that will be used as the type for an array - the structure should have a dept number, a dept name and a dept budget

2) The dept numbers should be something like 11, 18, 29, 33, 36, 38, 41, 44, 47 (note there are significant gaps between the numbers)

3) You should take in a dept number from the user and use it to access the department name and the