Database Queries
Finding the information needed

What is a query
- Queries assist with finding the right data for the task – displaying only the data needed
  - only certain records
  - only particular fields
  - or both
- Queries generally need a criteria to select the correct data
- Queries can also
  - Create calculated fields
  - temporary data generated from a calculation
  - Allow certain ACTION on the database

Queries into Reports & Queries
- Reports generally need only certain data rather than all the data
  - Base reports on the queries
  - Only the data from the query will show in the report.
- Queries can be used to create more sophisticated reports and forms
  - Calculated fields
  - Data from multiple tables
  - Data meeting certain criteria.
- Create a query first, then base the form or report on the query.

Types of Queries
- Select queries
  - Select data based on a criteria
  - Create calculated fields
- Parameter queries
  - Same as a select query, but the criteria is entered whenever the query is run
  - Different criteria can be entered each time
- Cross-tab queries
  - Cross-tabulates using multiple criteria
- Action queries
  - Update queries
    - Update records quickly.
    - Sometimes using a calculation
  - Global updates based on criteria
- Deletion queries
  - Delete sets of records based on criteria
- Append queries
  - Add records from one table into another table

Criteria
- Queries select data based on a specified criteria.
- Criteria are specified for particular fields
- Criteria specified must match the type of field.
  - Text field must have text criteria (numbers can be part of a text field, too.
  - Number fields must have number criteria
    - Leave off formatting such as dollar signs and commas.
  - Date fields must have date criteria

Criteria Qualifiers

<table>
<thead>
<tr>
<th>To specify</th>
<th>Use Symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal to (same as)</td>
<td>=</td>
</tr>
<tr>
<td>Greater than (after)</td>
<td>&gt;</td>
</tr>
<tr>
<td>Less than (before)</td>
<td>&lt;</td>
</tr>
<tr>
<td>Greater than or equal to (on or after)</td>
<td>=&gt;</td>
</tr>
<tr>
<td>Less than or equal to (on or before)</td>
<td>&lt;=</td>
</tr>
<tr>
<td>Not equal to</td>
<td>&lt;&gt;</td>
</tr>
</tbody>
</table>
Boolean Criteria

- Boolean logic can also be used
  - AND
  - OR
  - NOT

In the next software assignment you will be asked to enter a code for this lesson. The code is **Criteria**. Make note of it.

Example Criteria

- Find all records where location is Kailua = Kailua
- Find all records where location is not Kailua <> Kailua
- Find all records where salary is equal to or over $20,000 > 20000

- Logic Criteria
  - Yes - finds all records where this field is checked
  - No - finds all records which are not checked

Multiple Criteria

- Multiple Criteria can be used with Boolean Logic
  - Find all records where location is Kailua OR Kaneohe OR Waimanalo
  - Find all records where locations is Kailua AND salary is over $20,000
    - Location field criteria: Kailua
    - Salary field criteria: > 20000
    - Criteria must be placed on the same line or becomes an OR and returns more items
      - all records where location is Kailua and
      - All records where salary is >20000
        - no matter where the location is

Logic Criteria

- Only two options:
  - Yes – finds all records where this field is yes (checked)
  - No – finds all records which this field is no (unchecked)

Date Criteria

- Dates are stored as whole numbers that counts the days from 1/1/1900.
  - Dates before a specified date are considered less than
  - Dates after a specified date are considered greater than
- Example find people who are less than 30 on January 1, 2011.
  - Birthday is GREATER THAN 1/1/1981
    >1/1/1981

Logical Thinking Required

- To specify correct criteria, you need to THINK!
  - Which field is needed
  - What information is stored in that field
  - Which qualifier is needed.
Logical Thinking Example

- Example: Find everyone in the database who lives in Hawaii.
  - Which field would this information be stored?
    - State (or some other similarly named field)
  - What information is stored in that field?
    - Two letter abbreviation -- for Hawaii we query for HI
  - What qualifier?
    - = (equal is the default, so you don’t need to enter it)

Example cont.

- Be sure to enter criteria on the criteria line under the correct field.

More Critical Thinking

- Find people who are less than 30 on January 31, 2013.
  - What field is needed?
    - Birthdate
  - What type of information is stored there?
    - dates
    - Query must match the type of data so do not use <30 as that is not a date!
    - THINK! What birthday do people have who are less than 30 on January 31, 2013?
    - Born after 1/31/1983. For dates AFTER use >
    - >1/31/1983

More Critical Thinking

- Find everyone from out of state
  - Can list all of the other states, but that would be too tedious
  - Critical thinking, if someone is from out of state then they are not in Hawaii
  - Use the Not Criteria
    - <>"HI"
  - USE CRITICAL THINKING!!!! You have to translate the request into something the database can compute.

Calculated Fields

- Calculated fields allow for calculation of information.
  - For example for a sales order, a calculated field can multiply the quantity times the price to come up with a total for a given item.
  - Instead of storing the total, which would be redundant, we store just the quantity and price, then use a calculated field to provide the total when needed.
  - Many functions, such as used in Excel, are also available to help calculate information.

More on calculated fields

- Some functions help us deal with text such as displaying a first and last name together.
  - In Access, use the Builder tool to create a calculated field within a query
    - Click on fields to refer to these fields
    - Use functions and mathematical formulas to create calculated field
Design Mode & Wizards

- **Wizards** allow quick generation of tables, queries, forms and reports.
- **Design mode** allows individual customization of tables, queries, forms and reports.
- Forms and reports generated by wizard can be customized in design mode.
- Instructor recommends
  - Using Wizards for reports and forms
  - Using Design mode for queries
  - The wizard does not ask for criteria and criteria is the backbone of queries!

Hands-on Training

- Use Salesclub.accdb to follow along with this video.
- After the video, complete additional practice.
- Submit both files on Laulima when finished.