More on MS Access queries

BSAD 141
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Topics Covered
- MS Access query capabilities
  - Aggregate queries
  - Different joins
  - Review: AND and OR
  - Parameter query
  - Exact match criteria versus range
  - Formatting calculated fields
  - Reports
  - Importing and exporting data to/from Access
  - Pivot tables

Aggregate Queries
- Use Northwind DB you downloaded last class
- Aggregate Query: For each of your customers, what is the total Quantity of Sasquatch Ale ordered from you?
  - Need Customer.CompanyName and Products.Category info
  - Note that the Customer table is not linked to the Products table
  - Need to add all intersection tables to associate customers to products

Aggregate Queries
- In your newly created “Customer Orders” query select:
  - Customers.CompanyName
  - Products.CategoryID
  - Products.ProductName
  - Order Details.Quantity

  What is the query returning exactly?
  - Sort ascending order by CompanyName

Aggregate Queries
- Find this by looking at the relationships
  - Show table
  - Add Orders and Order Details
  - Name query “Customer Orders”

Aggregate Queries
- What is the query returning exactly?
  - Sort ascending order by CompanyName

- Return all Customers who have ordered Sasquatch ale from you
  - Produce a summary count of the orders by customer
  - Produce a summary count of the total quantity ordered from you, regardless of how many orders the customer has placed
Aggregate Queries

- In Query Design View, on the ‘Design’ Ribbon, click on the Totals button
- This will show the ‘Totals’ row in the Criteria area
- Toggle to SQL view
- Notice the Inner Joins

Join Types – Inner and Outer

- INNER JOINS (default) only return results where there is a match between the Foreign key and the primary key
  - Null Foreign Key values will be ignored
  - Primary Key values that do not have an instance in the foreign key set will be ignored
- OUTER JOINS when you want ‘all’ from one table or the other’ or both

SQL Join Types

- INNER JOIN: Return rows when there is at least one match in both tables (default join)
- LEFT OUTER JOIN: Return all rows from the left table, even if there are no matches in the right table
- RIGHT OUTER JOIN: Return all rows from the right table, even if there are no matches in the left table
- FULL OUTER JOIN: Return rows when there is a match in one of the tables

Aggregate Queries

- How many orders did each customer have?
- Which customers have ordered the most? The least?

Left & Right Outer Joins

- In Query Design, you can change the ‘behavior’ of the join relationship between the tables depending on desired results.
  - Double click the relationship to open the Join options
  - Read the Options…

![Diagram of Left and Right Outer Joins]

- INNER JOIN (Default) of Customers and Orders: JUST B (where FK value isn’t NULL)
- RIGHT OUTER JOIN of Customers and Orders: B and C (all Orders even if NOT assigned to a Customer)
- LEFT OUTER JOIN of Customers and Orders: A and B (All Customers even if NO order associated to them)
- FULL OUTER JOIN of Customers and Orders: A and B and C (Customers who have ordered, customers who haven’t ordered and orders not associated to customers)
Types of Queries Continued

- **Query Criteria Or vs. And in QBE.**
  - List all companies who ordered a total Quantity of any product greater than 50 (regardless of product)
  - Sort by Company Name then quantity
  - What if we just want to return the absolute total quantity of products ordered by each customer where the TOTAL is greater than 50?

Types of Queries Continued

- **Query Criteria Or vs. And in QBE**
  - Go back to the Customer Orders query
  - Return a list all companies who ordered a total Quantity of any product greater than 50 **AND** had a Total Price greater than $5000 by product
  - Need to create the calculated field Total Price
  - Which company has the highest order total in terms of dollars spent on a particular product?

Parameter Queries

- **Parameter Query.** Prompts Users for a value at the time the query is run.
  - Quite Common in home grown DBs
  - Place what you want the User to see when prompted in Brackets in the Criteria Field:
    - [What year would you like results for?]
  - Be sure your prompt text is NOT an available field name
  - When query is executed, the user entered value is passed through to the criteria of the query

Defining Record Selection Criteria for Queries

- Just as you can display selected fields from a database in a query datasheet, you can display selected records
- To tell Access which records you want to select, you must specify a condition as part of the query
- A **comparison operator** asks Access to compare the value in a database field to the condition value and to select all the records for which the relationship is true
Specifying an Exact Match

- With an **exact match**, the value in the specified field must match the condition exactly in order for the record to be included in the query results.

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
<th>Field</th>
<th>Value</th>
<th>Field</th>
<th>Value</th>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Name</td>
<td>X</td>
<td>First Name</td>
<td>X</td>
<td>Last Name</td>
<td>X</td>
<td>Phone</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Enter condition here**

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Defining Record Selection Criteria for Queries

- Text versus some type of numeric field

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Using a Comparison Operator to Match a Range of Values

- **Between operator**
  - Between 5 and 10

**Criteria entered for Contract Amt field**

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
<th>Field</th>
<th>Value</th>
<th>Field</th>
<th>Value</th>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Name</td>
<td>X</td>
<td>Contract Amt</td>
<td>X</td>
<td>Opening Date</td>
<td>X</td>
<td>Contract Type</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**New condition entered**

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Defining Multiple Selection Criteria for Queries

- Or logical operator

**Query window with the Or logical operator**

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
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<th>Value</th>
<th>Field</th>
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<td>Contract Amt</td>
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<td>Opening Date</td>
<td>X</td>
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<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Or logical operator conditions entered in different rows**

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Formatting Calculated Results

- Click in calculated field
- Right click and choose properties
- The “Property Sheet” menu will appear on the right side of the screen
- Use pulldown menu

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Defining Record Selection Criteria for Queries

- Between operator
- Between 5 and 10
Formatting Calculated Results
- Change the column heading for the Total Price field to “Dollars Spent”

Creating Reports
- Using the automatic report generator

Importing and Exporting
- Export the Products table to Excel
  - Open Products.xlsx
  - Insert → Recommended Pivot Tables
    - Some will be useful, some not
  - Can explore options using drag and drop GUI
- Importing data into Access

Summary
- Using queries in MS Access
  - Aggregate queries
  - Different joins
  - Review: AND and OR
  - Parameter query
  - Exact match criteria versus range
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  - Reports
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  - Pivot tables