Advanced Queries: Moving Beyond the Select Query

Instructor: Edwin V. Bonilla

Based on slides by
Robert Grauer, Keith Mast, Mary Anne Poatsy

Objectives

- Determine when to use an action query
- Update data with an update query
- Add records to a table with an append query
- Create a table with a make table query
- Delete records with a delete query
- Create a parameter query to provide flexibility
- Summarize data with a crosstab query
- Find unmatched records with a query
- Find duplicate records with a query

Action Queries

- Alternative to the **Select** query, which fetches information for display
- Will perform an action to change data
- Start by making Select query, and then change type to:
  - Update
  - Append
  - Make table
  - Delete

Action Queries

- Can use criteria just as Select queries can
- Often run in the background (not always on command)
- Can cause problems with data loss

Action Queries: Examples

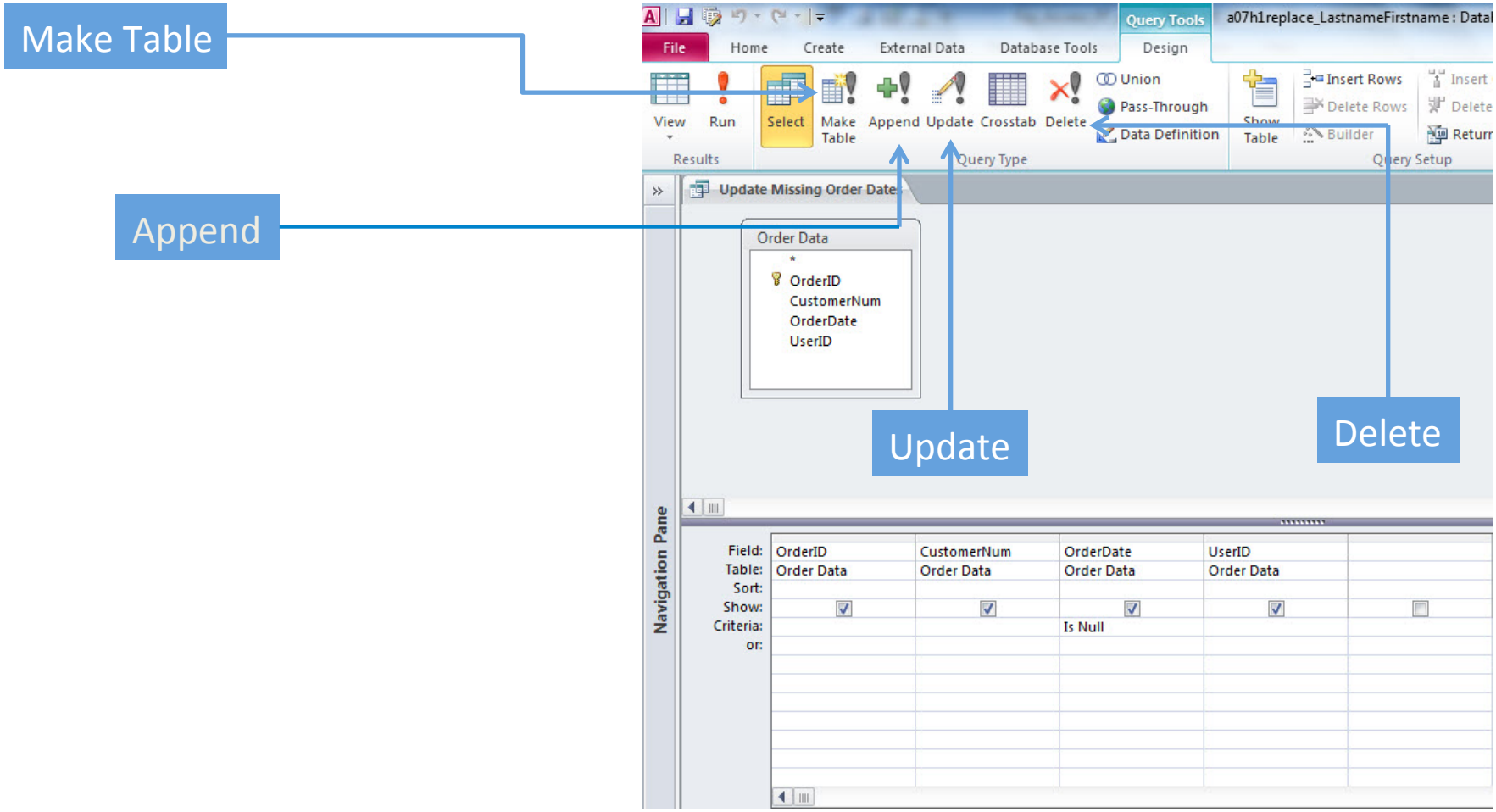
- **Append query** — used to copy records to an existing table
  - Example: Copy graduated students from Students table to Graduated table in a student database
- **Delete query** — used to remove records
  - Example: Delete graduated students from Students table after they are copied to Graduated table
- No “move” query; this is how we simulate a move

Action Queries: Examples

- **Update query** — used to make changes
  - Example: One customer service rep leaves, and all clients assigned to that rep must be changed to someone else
- **Make table query** — used to copy information to a new table
  - Example: Move all inactive customers to a new table
  - Pair with delete query to remove old records
  - Can help keep Customers table fast and efficient
    - Queries on smaller tables will be quicker

Action Queries: Locations

Locations of Action Queries on Query Tools Design Tab



Action Queries: Locations

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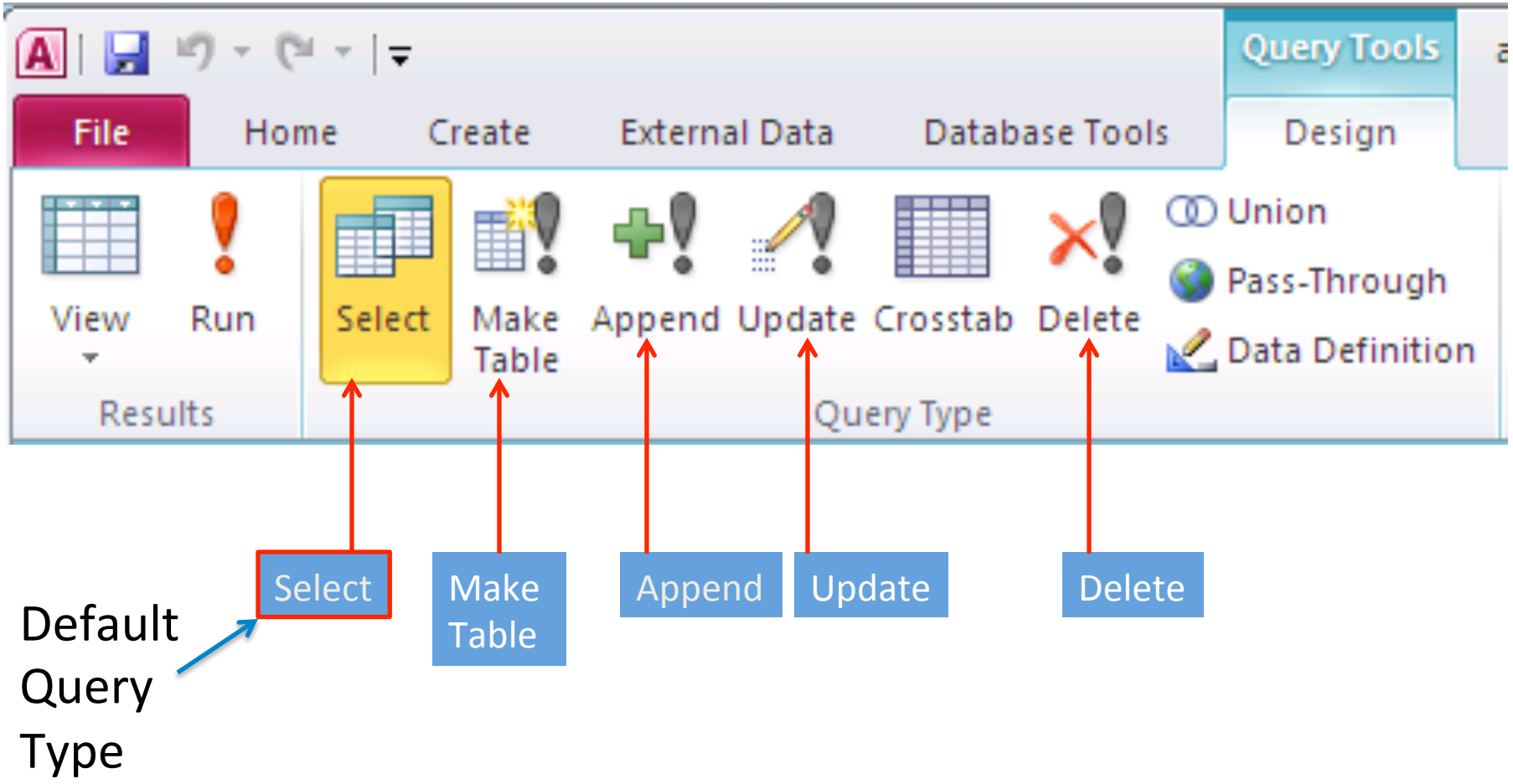


Action Queries: Warnings

- Important to backup database first
  - Can make changes that cause unintended changes
- Access prompts with the number of records to change
  - Ensure number sounds correct
- Verify table data afterwards
  - Did it change what you thought it would change?
- Do not re-run
  - Especially with Update queries, updates that are calculations can cause unintended changes

Update Query

- Used to automate changes to a database
  - No need to do by hand
- Change the value of one or more fields automatically
- Can be based on criteria (single or multiple)

Update Query: Examples

- All athletes with grade point averages greater than 2.5 should have the Eligible field set to Yes
- West Paterson, NJ changed their name to Woodland Park
  - All customers who have a City field of West Paterson and a State of NJ should have the City field changed to Woodland Park

Append Query

- Selects records from one or more tables and adds them to existing table
- Destination table must exist
  - If not, use a Make Table query

Append Query

- Must match source fields with destination fields
- Data types must match
  - Cannot append a date field in to a numeric field
  - Exceptions: Numeric and Date fields can both be appended to a Text field

Append Query

- Validation rules in the destination table still apply
  - Could not duplicate primary key
- Any non-required, missing fields will be blank
  - If you append four fields to a five-field table, fifth field will be blank
- Destination table should NOT contain an Autonumber

Make Table Query

- Selects records from one or more tables
- Uses results to create a new table
  - Similar to append query, except results go to new table
  - Avoids issues with having to match data types
- If destination table exists, Access will prompt you to delete the existing table

Delete Query

- Selects records and then removes them from a table
- Permanently removes records
  - Use with caution
  - Backup database first
- May be done after a Make Table or Append query to simulate a move

Delete Query

- You need to know the following to create a Delete query:
  - What are the criteria that should be met for to records to be deleted

Action Query Demo 1

- Open *a07h1replace.accdb*, save as *a07h1replace_demo.accdb*

Backup database before testing an action query!

- File > Save & Publish > double-click Back Up Database
- Paranoia rules here: check backup exists and size is sensible.

Create an Update Query

- Click Create > Query Design
- Double-click Inventory, Pattern, Manufacturer tables, close dialogue
- Add SKU, OnHandQty, & Retail fields from Inventory, MfgID from Pattern, & Alias from Manufacturer.
- Type 801190 in Criteria row of MfgID
- Switch to Datasheet view – should be 1129 Spode China records.
- In Design view; click MfgID column, & Query Setup > Insert Columns
- Type Value: [OnHandQty]*[Retail] in new column top row, make it Currency
- Switch to Datasheet, Click Records > Totals, click in Total row & Value column, select Sum
- Total should be $911,415.88. This, times 1.05, would be $956,986.67.
- Click View, click Query Type > Update. Change Update To row under Retail to [Retail]*1.05. Set it to Currency.

Action Query Demo 1 (cont'd)

Test an Update Query

- Switch to Datasheet view, and note values before update (2nd one is 10.00)
- Return to Design view. Click Run. Click Yes to the warning.
- Switch to Datasheet view again, and check the values (2nd one is now 10.50)
- Return to Design view. Click Query Type > Select. Switch to Datasheet view.
- Total at bottom of Retail column is now $956,986.67 (cf. previous slide)
- Return to Design view, Click Update to change back to an update.
- Save query as Spode China Price Upgrade. Close all open objects.

Action Query Demo 2

Create an Append Query

- File > Save & Publish > Back Up Database
- Open New Employees table in Datasheet mode, add a new record: 8966000, 0626266, name, address, phone, and 9/11/2012 as HireDate. Close table.
- Open Employees: note 115 records, close.
- Click Create > Query Design. Double-click New Employees, close dialogue.
- Click Query Type > Append. Click Table Name, choose Employees, check that Current Database option is chosen, click OK. Append To row appears.
- Double-click title bar of New Employees, drag all fields to 1st field of grid.
- Click View, should be 4 rows, 10 fields. Click View. Click Run, click Yes.
- Open Employees, sort in decreasing order of Hire Date, now 119 records.
- Click Query1 tab, click Save, save as Append New Employees. Close all open objects.

Action Query Demo 3

Create a Make Table Query

- File > Save & Publish > Back Up Database.
- Click Create > Query Design. Double-click Employees, close dialogue box.
- Double-click title bar of Employees table, drag all fields to query grid.
- Type Is Not Null in Criteria row of TermDate field. Go to Datasheet view. There are 9 terminated employees.
- Click View. Click Make Table. Type "Former Employees" in Table Name box. Check Current Database option is selected. Click OK. Click Run.
- Check Navigation pane for new table (Former Employees), open new table and confirm there are 9 former employees in it.
- Save query as Former Employees Make Table
- Close query.

Action Query Demo 4

Create a Delete Query to delete the former employees from Employees

- File > Save & Publish > Back Up Database.
- Click Create > Query Design. Double-click Employees, close dialogue box.
- Drag the * from the Employees table to the first column of the query design grid. Takes up one column, but represents all fields.
- Drag the TermDate field to column 2. Type Is Not Null I the Criteria row of the TermDate field.
- Click View. Check there are 9 former employee records there.
- Switch to Design view. Click Query Design > Delete. Click Run. Click Yes to warning. Save query as Delete Former Employees, close.
- Open Employees table, check there are now 110 (not 119) records.
- Compact and Repair Database.

Queries for Special Conditions

- Four more specialised queries that can help a user (or DBA) make decisions (or maintain the DB):
  - Parameter query
  - Crosstab query
  - Find Unmatched Records query
  - Find Duplicate Records query

Queries for Special Conditions

- **Parameter query**
  - Will prompt the user for a criterion
    - Example: Prompt user to enter a state code, return all customers living in that state
- **Crosstab query**
  - Similar to PivotTable, but no filters
  - Displays aggregate data across two dimensions
  - Specify row field, column field, value field, what statistic to compute for the value field (sum, count, average, …)

Queries for Special Conditions

- **Find Unmatched Records query**
  - Example: Finds **child records** with no matching **parent records**
    - In a one-to-many relationship, the “one” is the parent record and the “many” is the child record
    - In an Orders database, if one customer places many orders, customer is the parent record and an order is the child record

Queries for Special Conditions

- **Find Duplicate Records query**
  - Can analyze data to find repeated information
  - Can find accidental replication of data
    - Example: Customers can sign up for supermarket store cards, to find people who have signed up for two you can find people with the same name, address, etc.

Parameter Query

- Create regular Select query
- Add prompt to Criteria line, surrounded by brackets

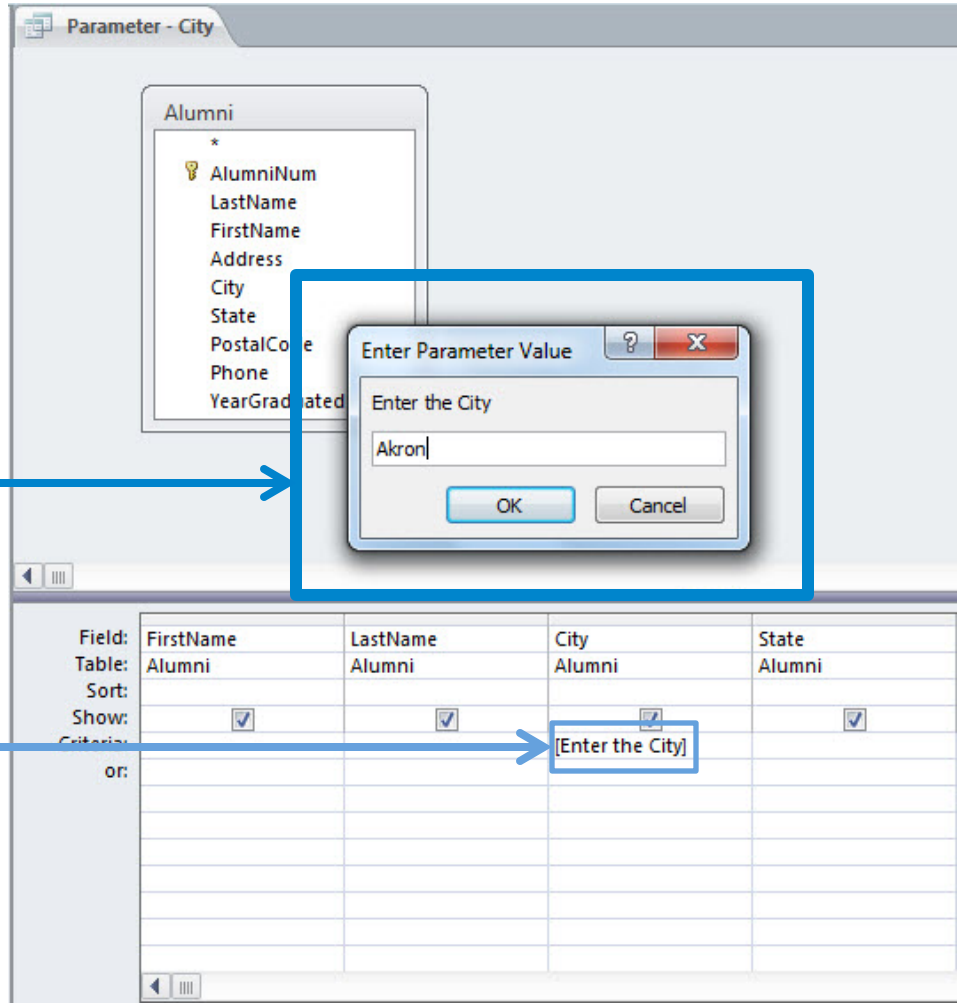
  [Instructions]

  e.g. [Enter a year]
- User will be prompted with your Instructions text and given a dialog box to enter data
- If multiple parameters exist, Access will start from the leftmost field and move right

Parameter Query

Access will prompt the user to fill in a value for the parameter in a dialog box when the query is executed.

The parameter – [Enter the City] - in this example is in square brackets, as required.



Parameter Query

- Can be used for partial matches as well
- Example: Area Code
  - Prompt user for an area code
  - Return all phone numbers in that area code
  - Enter criterion as

    Like [Enter Area Code] & '*'
  - & is a concatenation operator
  - Results will be all phone numbers starting with whatever the user enters

Parameter Reports

- Reports can be based on queries
- To create a **Parameter Report**, create a Parameter query and then base the report on the query

Crosstab Query

- Summarizes a data source using a grid of rows and columns
- Uses aggregate functions to summarize data (sum, count, average, etc)
- Resembles a PivotTable, but without filters
- Advantages:
  - Source can be tables, queries, or a combination of both
  - Can create many of them and save them
    - Each table can only have one PivotTable

Crosstab Query

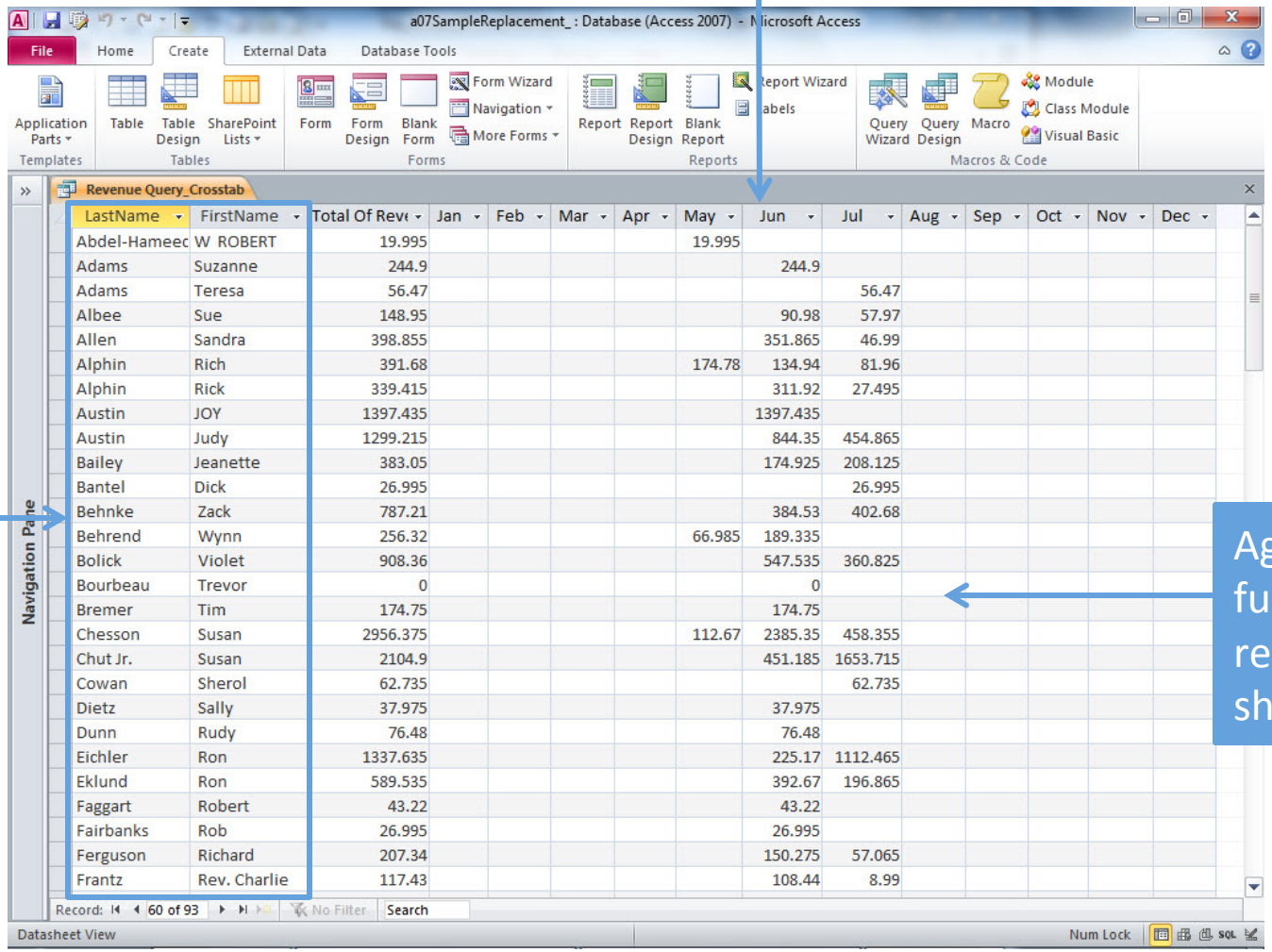
- **Column headings** display field values along the top side
- **Row headings** display field values along the left side
- Once completed, it can be edited easily to add fields, change order, etc.

Crosstab Query: Example

- Example:
  - We want to summarize the revenue generated by each salesperson
  - We want to see totals for each month
  - We also want to see totals for the entire year

Crosstab Query

The months of the year are the column headings



Two row headings exist: Last Name and First Name

Aggregate function results show here

Find Unmatched Records Query

- Compares records in two related tables and displays the records found in one table, but not the other
- Requires a common field
- Example: Find all applicants to a college (stored in Student table) who have never registered for a class (found in Registration table)

Find Duplicate Records Query

- Useful to find duplicate values in a table
- Can be useful if there may be duplication of fields that should not exist
  - Want to add a primary key field
  - Duplicates exist, so primary key can not be added
  - Use query to find these duplicates
- Will find duplicates, but it is still up to Database Administrator to review manually

"Special" Queries Demo 1

Create a Parameter Query

- Work with *07h1replace_demo.accdb* as before
- Click Create > Query Design
- Double-click Employee Titles & Employees tables. Close dialogue.
- Double-click Description from Employee Titles. Double-click FirstName, LastName, HireDate, Phone from Employees.
- Click the Criteria row for Description, type *[Enter the position]*.
- Click Run. Enter Parameter Value box opens: type *Sales Associate 1*, click OK. There should be 33 records in the result.
- Save query as Employee Phone List by Position. Back to Design view
- Click Sort row of LastName, choose Ascending, click Run again, type Sales Associate 1 again, OK.
- Close query, save changes. Double-click Employee Phone List by Position query to run it again, enter Customer Service Representative, OK. Should be 11 records. Close query.

"Special" Queries Demo 2

Create a Parameter Report

- Select Employee Phone List by Position query in Nav pane.
- Click Create > Reports > Report.
- Type Supervisor, Sales, then OK.
- Click the Description column heading to select it. Use mouse to reduce column width. Repeat with other fields, so all data fits on page (horizontally). Check in Print Preview.
- Click Design > Grouping & Totals > Group & Sort.
- Click Add a Sort, then LastName
- Check again in Print Preview. Close Print Preview.
- Close and save report with the name Employee Phone List by Position.

"Special" Queries Demo 3

Use the Crosstab Query Wizard

- Click Create > Queries > Query Wizard.
- Select Crosstab Query Wizard, click OK.
- Click Queries in the View section of the dialogue box. Then click Query: Revenue Query. Click Next
- Row headings: double-click LastName field in Available Fields box, click Next.
- Column headings: click the State field, click Next
- Value field: click Revenue in the Fields box, click Sum in the Functions box, click Next
- Change query name to Revenue by Salesperson and State. Ensure View the query option is selected, click Finish.
- Examine results … too much information …

"Special" Queries Demo 4

Edit a Crosstab Query

- Click File > Save Object As, type Revenue by LongPatName and State, click OK. This makes a copy of the query, to modify.
- Switch to Design view.
- Click arrow in Field row of first column, and then select LongPatName.
- Click third column (Revenue) then Property Sheet, set format to Currency.
- Click in "Total of Revenue" field, change format field property on the General tab to Currency. Close Property Sheet.
- Click Run. Widen LongPatName field so you can see the names properly.
- Save the changes, then close the query.

"Special" Queries Demo 5

Create a "Find Unmatched" Query using the Wizard

- Click Create > Query Wizard > Find Unmatched Query Wizard, OK
- Click Table: Customer, Next
- Click Table: Order Data, Next
- Check CustomerNum is Matching field on both tables
- Click Next again.
- Click >> button to add all fields to the query, Next
- Click Finish. 456 customers have not placed an order.
- Close Customers Without Matching Order Data query.
- Save the changes.

"Special" Queries Demo 6

Create a "Find Duplicate Records" Query using the Wizard

- Click Create > Query Wizard > Find Duplicate Query Wizard, OK
- Click Table: Pattern, Next
- Double-click LongPatName in Available Fields box to move it to the Duplicate-value fields box, Next.
- Click >> button to move rest of fields to the Additional Fields box, click Next.
- Click Finish, accepting default name for query.
- Result shows 4 records showing two duplicate LongPatName fields.
- Save query, close query.
- Compact and Repair Database
- Close database.

Summary

In this section, you learned that the Select query is just one type of query. You now know how to use

- make table queries
- append queries
- update queries, and
- delete queries

to modify the database.

You also learned how to use special types of queries to help make decisions and increase the flexibility of your database.

Reference

Grauer, Mast & Poatsy: *Access 2010 Comprehensive*, chapter 7: Advanced Queries.