Advanced Queries:
Moving Beyond the Select Query
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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

- Make Table
- Append
- Update
- Delete
Action Queries: Locations

Locations of Action Queries on Query Tools Design Tab

![Diagram showing locations of action queries](image)
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 into 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 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 (2\(^{nd}\) one is 10.00)
- Return to Design view. Click Run. Click Yes to the warning.
- Switch to Datasheet view again, and check the values (2\(^{nd}\) 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 in 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 cannot 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.
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.
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