



Microsoft Excel: Analyzing Data

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Description: Learn how to sort, filter and print databases. Then students will explore the database functions that give them calculating options they may not realize exist. Then, dive into PivotTables and PivotCharts - some of Excel's most powerful, most underutilized tools. Lastly, look at how all of this is used if the data isn't in an Excel spreadsheet.

1. Course objectives.
 - a. To provide the class with an exploration of spreadsheet design.
 - b. To develop computer and spreadsheet literacy.
 - c. To address the class' questions.
2. Schedule
 - a. 12:30 Registration
 - b. 1:00 Session
 - c. 3:30 Departure
3. Handouts available in Adobe Portable Document Format (PDF) for download at www.crowleycomputers.com/handouts.htm

1. Data Basics: A database is a collection of data (that is, items of unstructured information) organized to make it easy to search and easy to retrieve in a useful, usable form.

See Data basics.ppt

- a. Table: A single store of related information. A table consists of records...
- b. Record: A single set of fields that relate to a specific "thing".
- c. Field: A single piece of information with a precise description.

Examples of everyday databases			
Table	Phone book	Check book	Favorites
Record	Your home listing	Each debit or credit entry	Each web page entered
Fields	Name, address, phone number	Date, check number, to, debit, credit, balance, memo...	Folder, description, URL, times visited, last visited, available offline

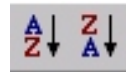
2. Creating Excel databases

See Pre evaluation listing 2.xls

- a. Excel can be used to create "flat" databases simply. Relational databases can be done with coding, but Access is a better tool.
- b. Tables tend to be a single sheet within a workbook, rows are records, columns are fields.

3. Sorting

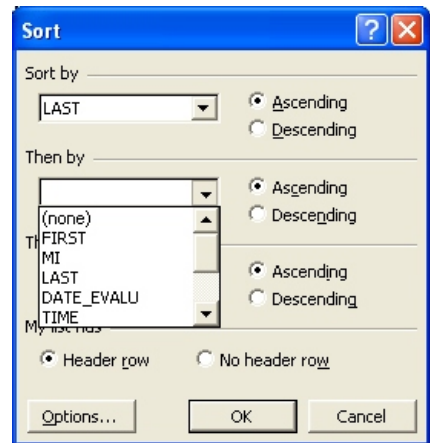
a. Basic sorting:



- (1) Performed on a single column.
- (2) For multi-field sorts, sort in reverse order. For example to sort people by name alphabetically, sort the First name field and then the Last name field.
- (3) Older versions of Excel tend not to "grab" the entire database. Select the area if this happens.

b. Advanced sorting:

- (1) Available from Data menu.
- (2) Works just like basic, but allows you to define three sorts and header rows.



4. Inserting and deleting rows, columns and cells

- a. Select ... you want new data on (data in the row will be pushed down)
- b. Right+click, Insert or Insert, ...
- c. Formulas will be adjusted, ranges on formulas will be expanded.
- d. When working on "edge" of a range, range will be moved, not expanded!
 - (1) Trick: Insert inside, copy "edge data", enter new "edge data."

5. Filtering

- a. Autofilter
- (1) Available from Data, Filter, Autofilter
 - (2) Use drop down menus to choose a unique entry in a field.
 - (a) Notice filtered fields have blue drop down arrows and rows headers turn blue.
 - (b) Choices in multiple fields have *and* relationships.
 - (3) Clear filter:
 - (a) On any field drop down, select (All).
 - (b) Clear all via Data, Filter, Show All
 - (4) More power with:
 - (a) (Top 10)
 - (b) (Blanks)
 - (c) (NonBlanks)
 - (d) (Custom...)
 - (i) Wildcard ? for single character: d?d = dad, did, dud
 - (ii) Wildcard * for multiple characters: d*d = above and dead

D	E	F
DATE EVALU	TIM	STAT
(All)	15	
(Top 10...)	14	
(Custom...)	16	
10/26/1993	09	
10/28/1993	13	
11/2/1993	14	
11/4/1993	11	
12/7/1993	08	
12/14/1993	11	
(Blanks)	08	
(NonBlanks)	11	
10/28/1993	08	
10/28/1993	10	

Custom AutoFilter

Show rows where:

DATE_EVALU equals

And Or

Use ? to represent any single character
Use * to represent any series of characters

OK Cancel

- b. Advanced Filter: not as convenient, but more powerful relationships.

See Pre evaluation listing 3.xls

Use:

- (1) Recreate headers
- (2) Rows beneath create filters
- (3) Items in same row are *and* relationship
- (4) Items in different rows are *or* relationship

Advanced Filter

Action

Filter the list, in-place
 Copy to another location

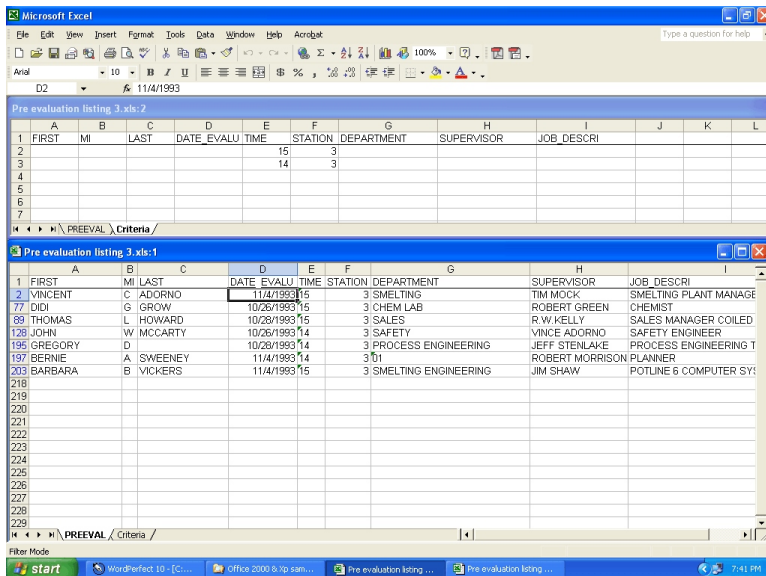
List range: \$A\$1:\$I\$217

Criteria range: [Criteria]\$A\$1:\$I\$3

Copy to:

Unique records only

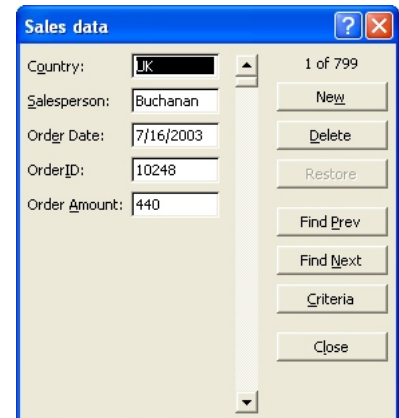
OK Cancel



6. Forms: simplify entry by showing a single record

- a. New: adds a record to the bottom of the table
- b. Delete: deletes a record (row)
- c. Restore: undoes unsaved changes to a record
- d. Find Prev: previous record matching criteria
- e. Find Next: next record matching criteria
- f. Criteria: allows typing of filtered data into each field. Criteria button becomes Form to return to data entry screen. Criteria does not effect Auto or Advanced Filters.

See International sales.xls



7. Calculating from databases, functions are similar to standard functions, see Autosum, with filtering capability!

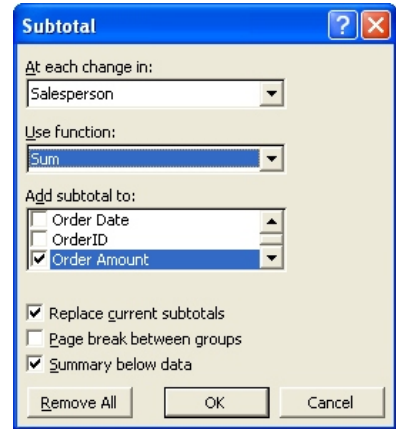
- a. Use:
 - (1) Database - selects entire database including field headers
 - (2) Field - selects the field that contains the values you want to calculate on
 - (3) Criteria - area where you mimic the database field headers and add filtering criteria, much like advanced filters
- b. SUM() vs. DSUM()
- c. AVERAGE() vs. DAVERAGE()

See Monthly weather averages.xls!D functions

8. Subtotals: Excel automatically inserts rows with titles and SUBTOTAL() functions into the table, giving sub and grand totals.

- SUBTOTAL() functions
- 1 AVERAGE
 - 2 COUNT
 - 3 COUNTA
 - 4 MAX
 - 5 MIN
 - 6 PRODUCT
 - 7 STDEV
 - 8 STDEVP
 - 9 SUM
 - 10 VAR
 - 11 VARP

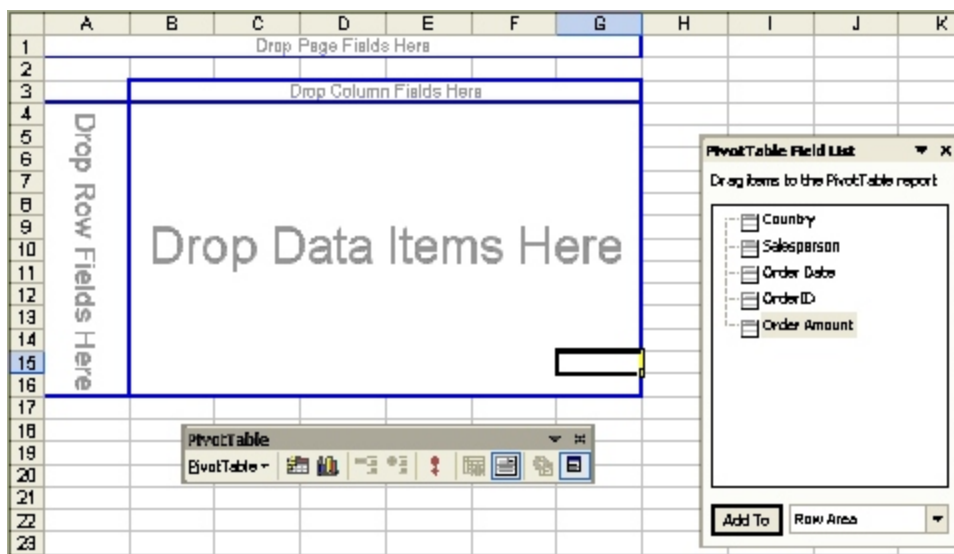
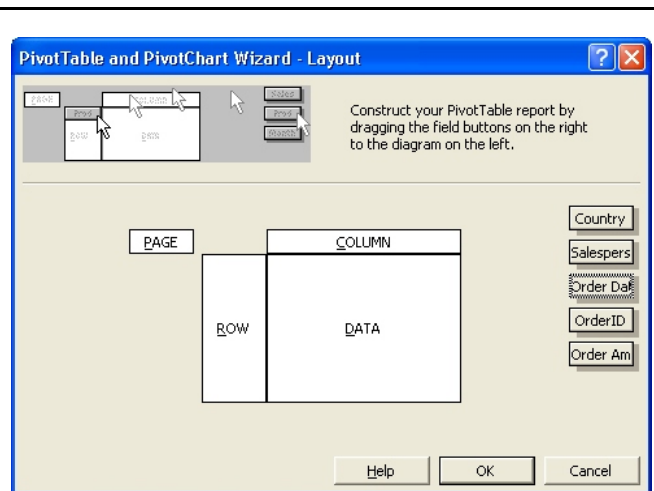
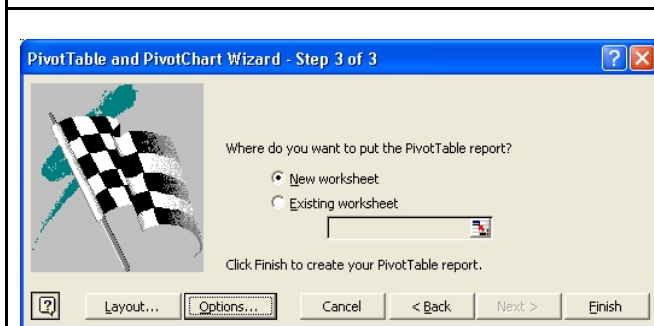
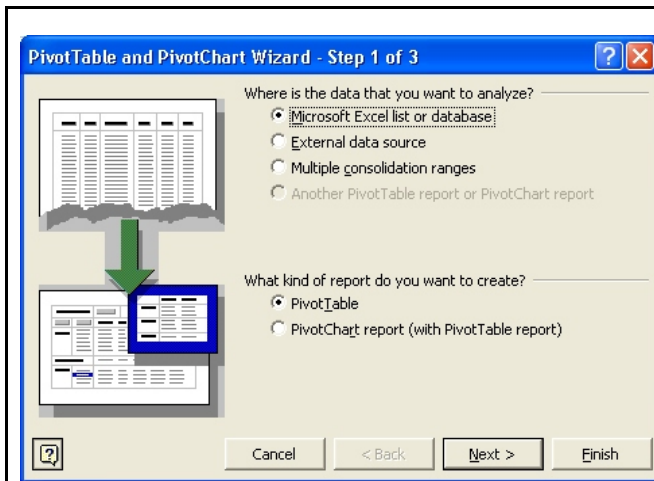
- a. Be sure to sort the list based on what you want to subtotal.
- b. Use:
 - (1) At each change in: defines what to subtotal
 - (2) Select sum, count, average, maximum, minimum, product, standard deviation, standard deviation product, variance or variance product.
- c. SUBTOTAL(function, range/s)
- d. Hide data using created nests:
 - (1) Use 1 2 3 buttons to show and hide detail levels.
 - (2) Use + - buttons to show and hide individual groups of detail.



	1	2	3	A	B	C	D	E
	1			Country	Salesperso	Order Date	OrderID	Order Amount
-	2			Grand Total				\$1,228,327.40
+	46			Dodsworth Total				
+	88			King Total				\$116,962.99
-	156			Suyama Total				\$72,527.63
•	157	UK		Suyama	7/10/2003	10249		\$1,863.40
•	158	UK		Suyama	8/23/2003	10264		\$695.62
•	159	UK		Suyama	8/30/2003	10271		\$48.00

9. PivotTables: A PivotTable report is an interactive table that quickly combines and compares large amounts of data. You can rotate its rows and columns to see different summaries of the source data, and you can display the details for areas of interest. Think Subtotal function on super-steroids.

- a. Usage
 - (1) Prepare your source data using the techniques we've discussed.
 - (2) Create your PivotTable: Data, PivotTable.



b. Areas

- (1) Data Items: subtotaled items. Displayed to left of Column Fields.
- (2) Column Fields: vertical, field grouping and filtering
- (3) Row Fields: horizontal, record grouping and filtering
- (4) Page Fields: allows filtering of data

c. Techniques:

- (1) Multiple fields may be dropped into each area for more extensive totaling.
- (2) Not perfect? Drag it around!
- (3) Undo works!
- (4) Run with ! button to refresh data from external data source.

d. Further commands

- (1) Autoformat applies templates for appearance.
- (2) Select a field and use hide / show detail.
- (3) Field list display.



Order Date	(All)		
Sum of Order Amount	Country		
Salesperson	UK	USA	Grand
Buchanan	68792.25		687
Callahan		123032.67	1230
Davolio		182500.09	1825
Dodsworth	75048.04		750
Fuller		162503.78	1625
King	116962.99		1169
Leverling		201196.27	2011
Peacock		225763.68	2257
Suyama	72527.63		725
Grand Total	333330.91	894996.49	1228

PivotTable Options

Name: PivotTables

Format options

- Grand totals for columns
- Grand totals for rows
- AutoFormat table
- Subtotal hidden page items
- Merge labels
- Preserve formatting
- Repeat item labels on each printed page
- Mark Totals with *

Page layout: Down, Then Over

Fields per column: 0

For error values, show: []

For empty cells, show: []

Set print titles: []

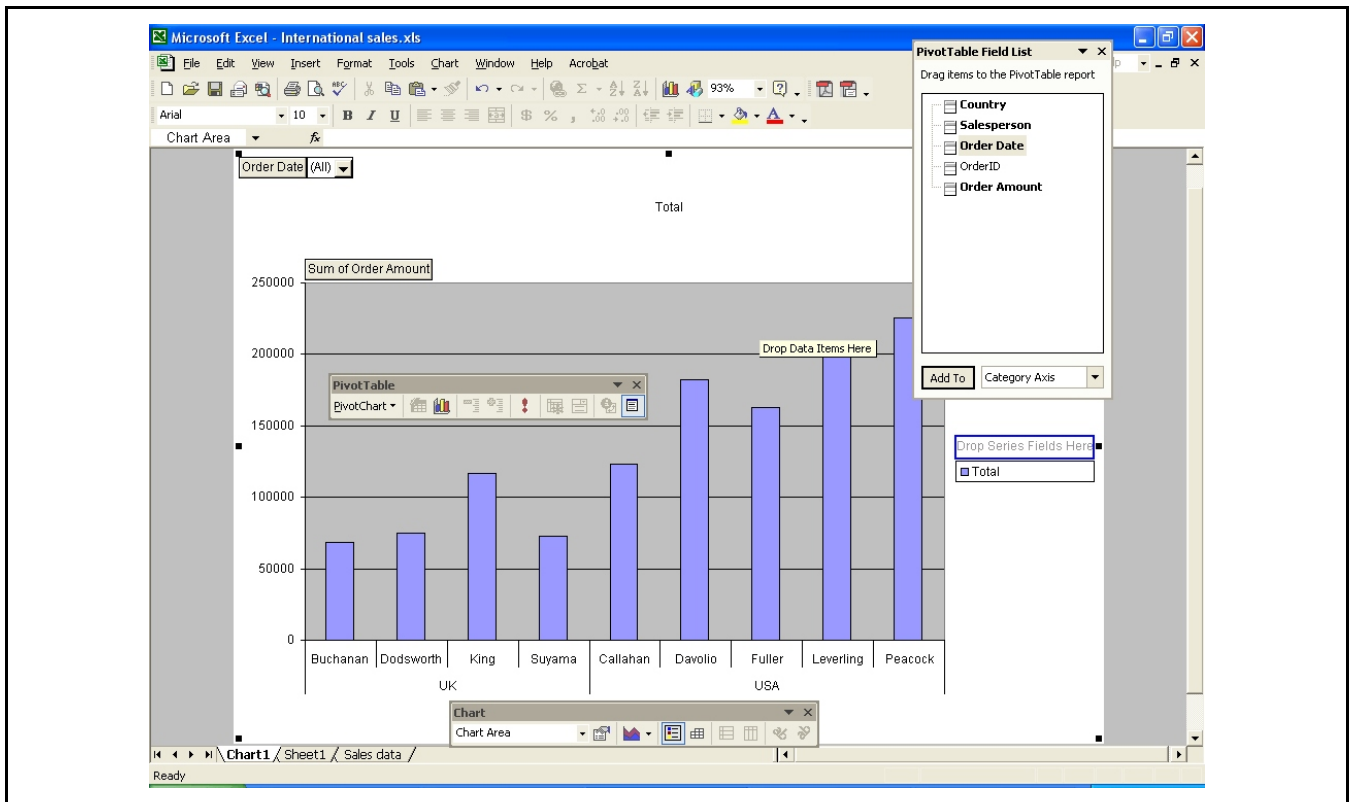
Data source options

- Save data with table layout
- Enable drill to details
- Refresh on open
- Refresh every 60 minutes

External data options

- Save password
- Background query
- Optimize memory

OK Cancel



10. PivotChart

- a. PivotCharts can be created with PivotTables, but the corresponding table always has to exist.
- b. Chart formatting is like standard charting.
- c. The data is arranged like the PivotTable.

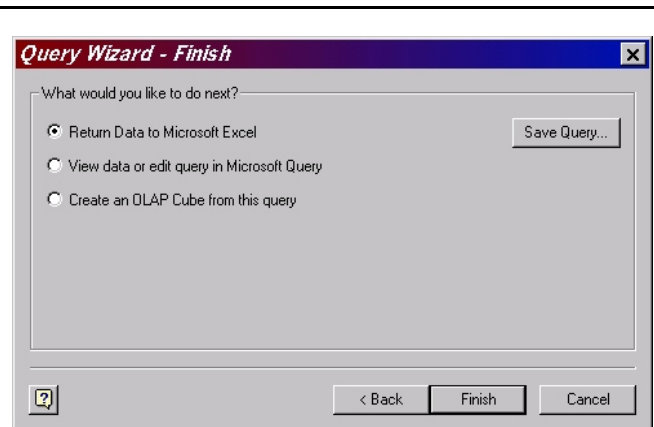
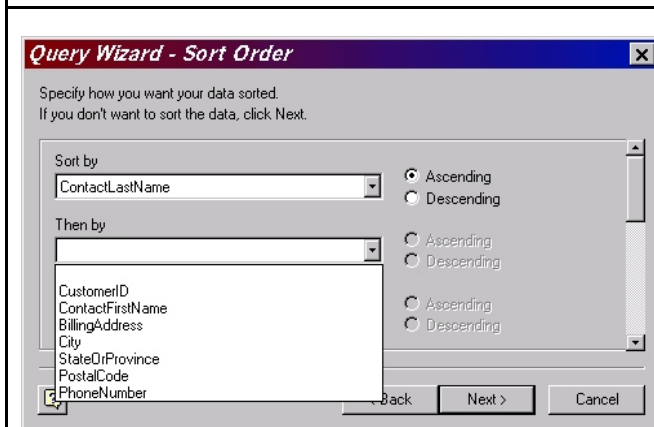
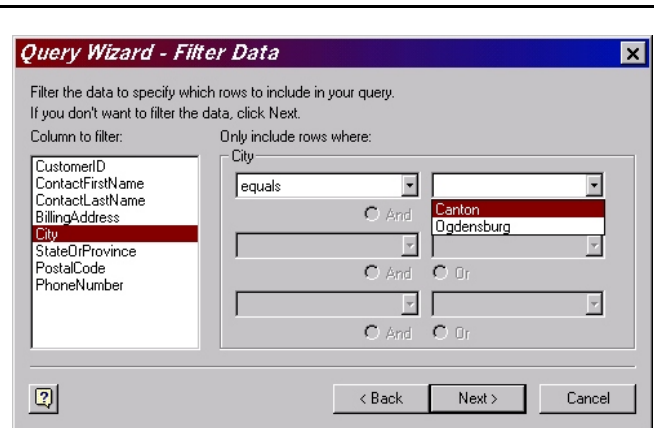
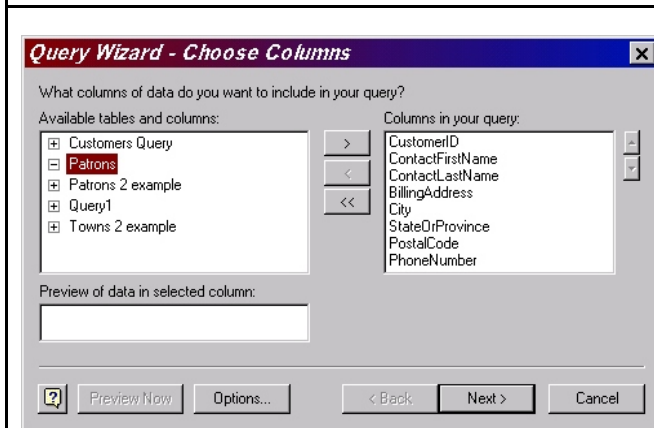
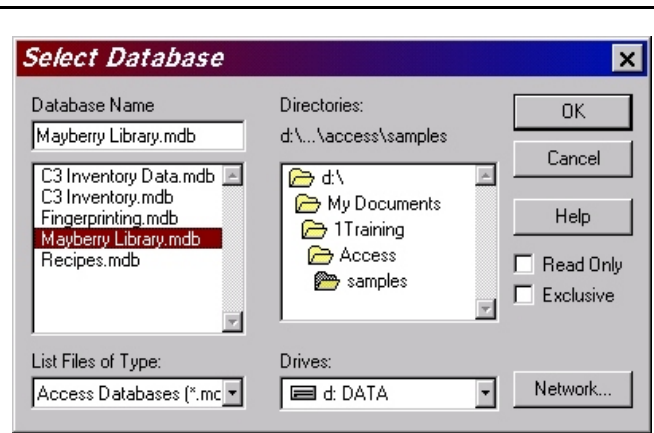
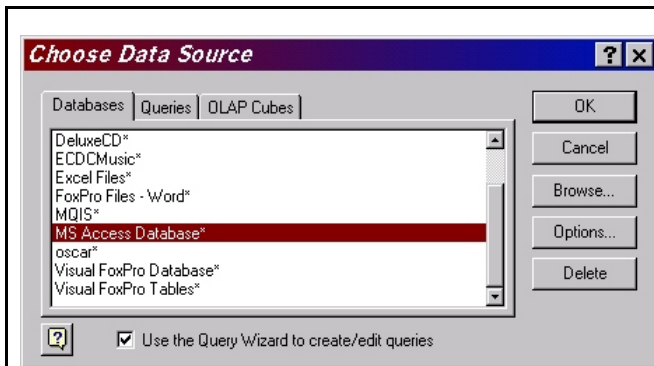
11. Data importing / exporting

- a. Importing wizard accessed via
 - (1) File, Open
 - (2) Data, Get External Data, Import Text File
 - (3) Data, Get External Data, New Database Query
 - (a) Must have MS Query installed
 - (b) Refresh?

See C3 customers.txt



See Mayberry Library.mdb



b. Export accessed via File, Save As