

Databases and Microsoft Access

Northern New York Library Network
Workshop

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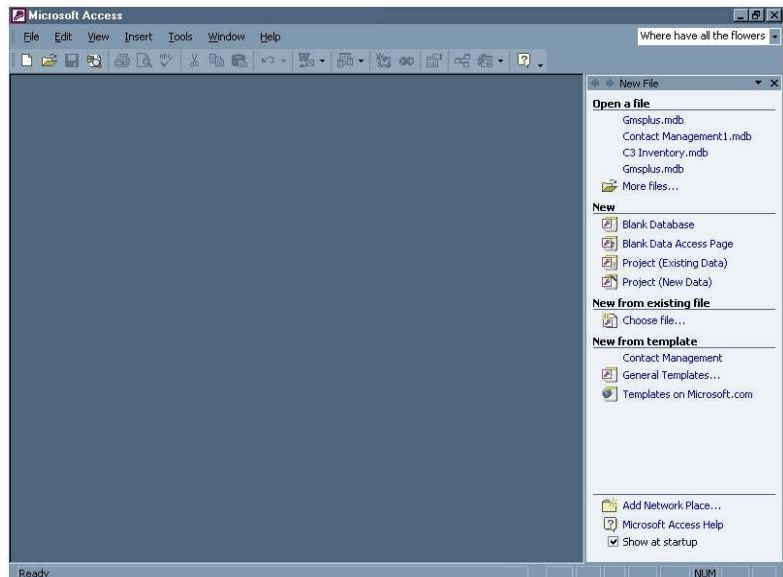
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1. Course objectives.
 - a. To provide the class with an exploration of database uses, design and normalization.
 - b. To assist class development of databases using Microsoft Access 2000.
 - c. To develop computer and database literacy.
 - d. To address the class' questions.
2. Schedule
 - a. 9:00 Registration
 - b. 9:30 Morning session
 - c. 12:00 Lunch
 - d. 1:00 Afternoon session
 - e. 3:00-3:30 Departure

1. Why do I want to learn to use and create databases?
 - a. Store huge quantities of information
 - b. Minimize data entry
 - c. Insure accurate data input
 - d. Create applications for novice end users
 - e. Export searchable data on web sites
 - f. Create distributable applications
 - i. without source code
 - ii. without Access (if you invest in the Developer version)
 - g. Because Access probably came with the Microsoft Office product on your PC!
 - h. Because your life isn't miserable enough!

2. Databases are...

- a. Definition - 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.
- b. Learning curve
 - i. Steeper start to using databases, so many never learn to.
 - ii. Many torture themselves maintaining databases in Word (tables usually) or Excel. These work okay, but are not designed to maintain integrity, easy development, automate and proof entry...
 - iii. You're here to learn to use the right tool for the right job.



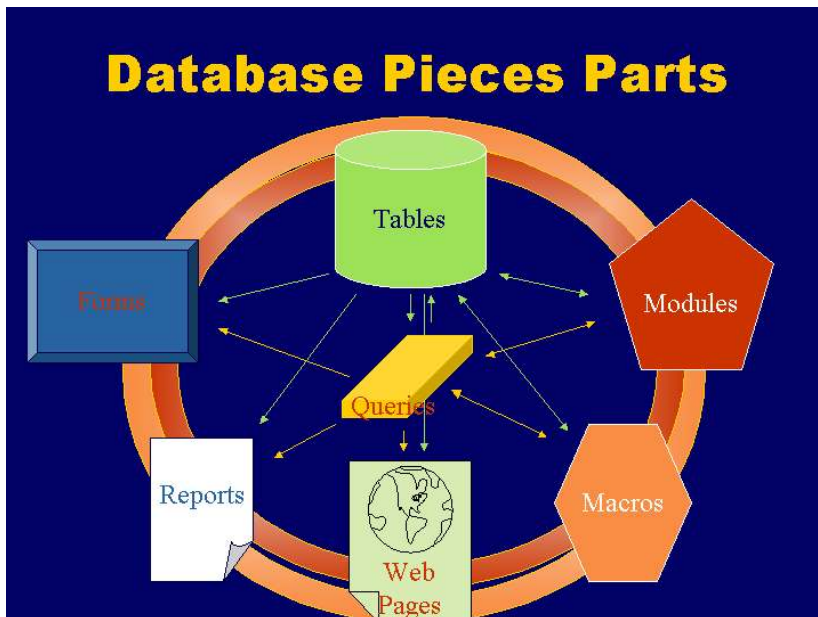
- c. Marketplace
 - i. Microsoft Access
 - (1) 95 and earlier - recommend upgrading or find an old Lotus Approach. Access was difficult to use and often "broke down."
 - (2) Access 97, 2000 and 2002 are all very good.
 - (a) Access 97 does a fine job, but later versions are more stable, have more automating wizards and have better development tools for programming.
 - (b) There are few differences between 2000 and 2002 that will matter to the end user. We will be instructing in Access 2002, but you will see few differences with 2000 until you get into advanced and Web functionality.
 - (c) Access 97 is version 8 and comes with some versions of Office 97, Access 2000 is version 9... Office 2000 and Access 2002 is version 10... Office Xp.
 - ii. Lotus Approach was a contender through the mid-nineties for its ease of use for the end user. It often comes on IBM PCs since Lotus was bought by IBM and is available as part of the SmartSuite.

- iii. Corel Paradox is a long time player with a loyal following. It is perfectly capable but steadily losing ground. It also available as part of the WordPerfect Suite. C3 recommendation: if you don't need "Microsoft" go Corel. All pricing, especially "not for profit" pricing is excellent. WordPerfect remains the best word processor on the market.
- iv. FileMaker Pro has a checkered history, but new versions are fairly powerful, easy to use and do integrate with the Microsoft Office.
- v. StarBase is available only as part of the Star Office suite. It is a free download, but I could find no reviews on the database itself. The suite is supposed to be small and quick and flexible and free.
- vi. Old time hockey includes platforms such as dBASE, FoxPro and Clipper. These databases were very difficult for the end user and really meant as a programming platform. They still work wonderfully, but are not recommended.

3. Playing with databases

- a. Everyday databases: Address book, Calendar, Filing cabinets, Organizers, Recipe box, Telephone book
- b. Computer databases you already use: Accounting apps like Quicken, Email apps like Outlook, Messenger and Eudora, Gallery applications like photo albums or clipart
- c. Other computer databases you use: Favorites or Bookmarks, Web page history, Font listing, High scores for any game, Windows Explorer

A databases is a collection of data organized to make it easy to search and easy to retrieve in a useful, usable form.



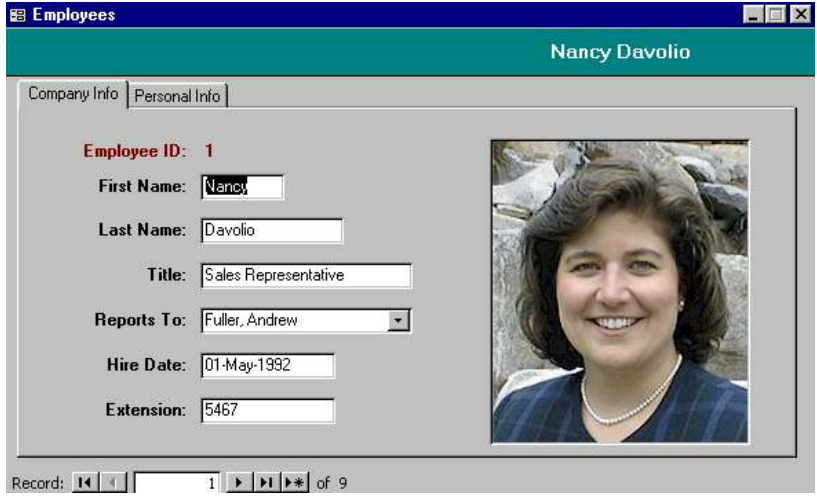
4. Pieces Parts and Definitions

- a. table: A single store of related information. A table consists of records, and each record is made up of a number of fields. You can think of the phone book as a table: It contains a record for each telephone subscriber, and each subscriber's details are contained in three fields – name, address and telephone.
- b. query: A view of your data showing information from one or more tables. For instance, you could query a Students database asking "Show me the first and last names of the students who take both history and

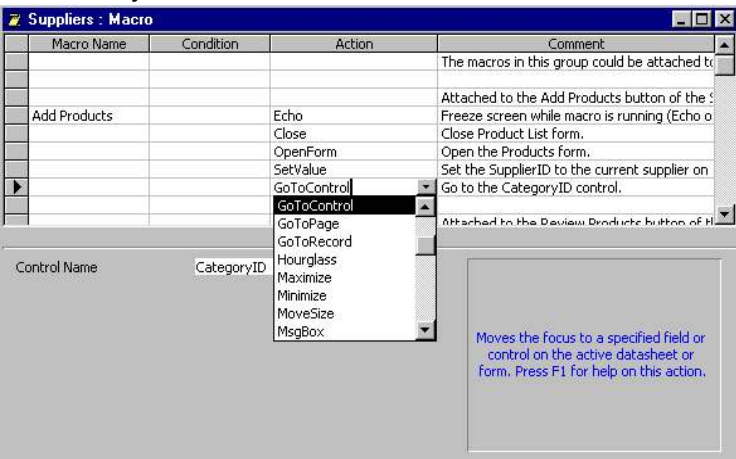
See Database intro.ppt

geography and have Alice Hernandez as their advisor" Such a query displays information from the Students table (firstname, lastname), Courses table (course description) and Advisor table (advisor name), using the keys (student ID, course ID, advisor ID) to find matching information.

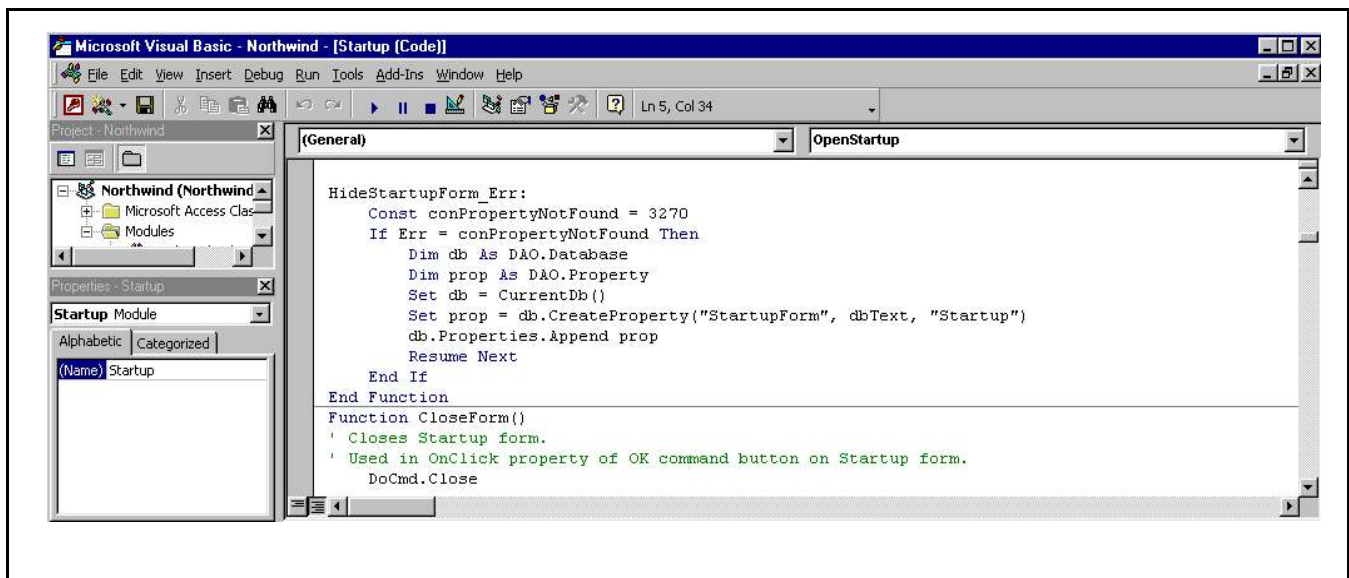
- c. form: designed to display information on screen, generally used for data entry, switchboard to launch other pieces of the database, or to create a custom dialog box. Forms can show and use data, graphics, descriptive text, calculations and controls.
- d. report: a form designed primarily print information from a database including traditional listings, labels and charts. Reports can usually be previewed on screen. Reports can use all elements as forms, but generally do not use controls.



- e. page or data access page: A data access page is a special type of Web page designed for viewing and working with data from an Internet or intranet — data that is stored in a Microsoft Access database or a Microsoft SQL Server database. The data access page may also include data from other sources, such as Microsoft Excel.



- f. macro: A macro is a set of one or more actions that each perform a particular operation, such as opening a form or printing a report. Macros can help you to automate common tasks. For example, you can run a macro that prints a report when a user clicks a command button.
- g. module: A module is a collection of Visual Basic for Applications declarations and procedures that are stored together as a unit.



5. Research before you start creating!!!

- a. Are there existing databases (electronic or paper) to use as a pattern?
 - i. What is good about them?
 - ii. Bad?
- b. Ask users for input.
 - i. What do you dis/like the most?
 - ii. I wish I could...
- c. Have reviewers to help along the way!

6. Tables

- a. The primary piece in a database are tables.
- b. Tables contain structured information.
- c. Our example table is the phone book!

table: A single store of related information. A table consists of records, and each record is made up of a number of fields. You can think of the phone book as a table: It contains a record for each telephone subscriber, and each subscriber's details are contained in three fields – name, address and telephone.

7. Records

- a. Tables are made of records.
- b. Each record contains the same structure as every other record.

record: A record contains all the information about a single 'member' of a table. In a students table, each student's details (name, date of birth, contact details, and so on) will be contained in its own record.

8. Fields

- a. Records are made of fields.
- b. A field is a single piece of information with a precise description.
- c. Example table
 - i. The entire grid is a table.
 - ii. Each row is a record
 - iii. Each column is a field

field: Fields describe a single aspect of each member of a table. A student record, for instance, might contain a last name field, a first name field, a date of birth field and so on. All records have exactly the same structure, so they contain the same fields. The values in each field vary from record to record, of course.

First	Middle	Last
James	D.	Crowley
Hillary		Rodham Clinton
Johnny		Appleseed
Mary Anne		Gruber

9. Examining fields

a. How much detail do you need?

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Basic field breakdown	An advanced field breakdown	
Name Address Phone number	Last name First name Middle initial Street number Street Apartment	Town State Zip Area code Phone number

b. Field breakdown questions

- i. How might you need to sort? Last & First, Last & First & Middle, Last only
- ii. How might you need to display or print or use it?
 - (1) Lists, Forms, Form letters, Address labels
 - (2) Name examples:

James Crowley	James D. Crowley	Crowley, James	Crowley James	Dear James,
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iii. Examples for the two tables below:

- (1) Find rules to sort the names by last name & first name
- (2) Find rules to select just the first name

Name	First	Middle	Last
James D. Crowley	James	D.	Crowley
Hillary Rodham Clinton	Hillary		Rodham Clinton
Johnny Appleseed	Johnny		Appleseed
Mary Anne Gruber	Mary Anne		Gruber

10. Using databases

a. Review database parts

open Northwind

- i. Tables
 - (1) Products
 - (2) Records vs. Fields
 - (3) Data entry is usually via keyboard and mouse. It may be automatically captured, imported or done via voice entry!
- ii. Queries
 - (1) Product sales for 1997
 - (2) Products above average price
 - (3) Products by category
- iii. Forms
 - (1) Product
 - (2) Product list - sub form of
 - (3) Suppliers
- iv. Reports
 - (1) Products by category
- v. Pages
 - (1) View products
- vi. Macros
- vii. Modules

Table navigation:

- Standard navigation keystrokes
- Window buttons: First, Previous, #, Next, Last, New
- Sorting by column
- New, Delete
- Find
- Filter by selection (current field)
- Apply / Remove filter
- Filter by form

** work in queries and forms **

- b. Switchboard - "central form," see Main Switchboard"
 - i. Generally switchboards contain buttons to run forms, reports...
 - ii. Semi automated construction
 - iii. Switchboard is only as good as the programmer. Yes, you are a database programmer if you get to this point! See employee form.

11. Table

- a. See Table navigation box
- b. Format
 - i. Column size
 - (1) Drag separator or from shortcut menu use Column Width
 - (2) Standard width
 - (3) Hide
 - ii. Change your font and font size to make it larger / smaller. Find a balance for comfort of reading and amount of information displayed.



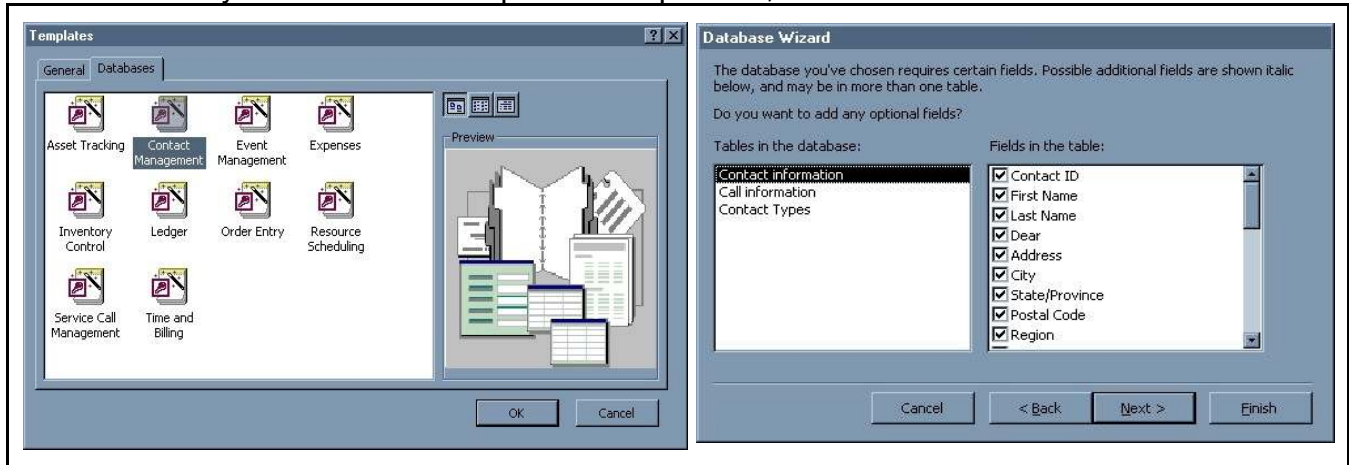
- (1) Open table
- (2) Right click on title bar
- (3) Font

- iii. Colors and layout - same as Font, but use datasheet. Alter colors, grids and appearances.

12. Create new database

- a. Create using Contact Management wizard.
 - i. Explore tables and fields

- ii. Explore styles.
- iii. Explore switchboard.
- iv. Explore database window.
- b. Create using New Database - blank!
 - i. Name database Mayberry Library. For our example, let's create a very simplified library database that keeps track of patrons, books and check outs!



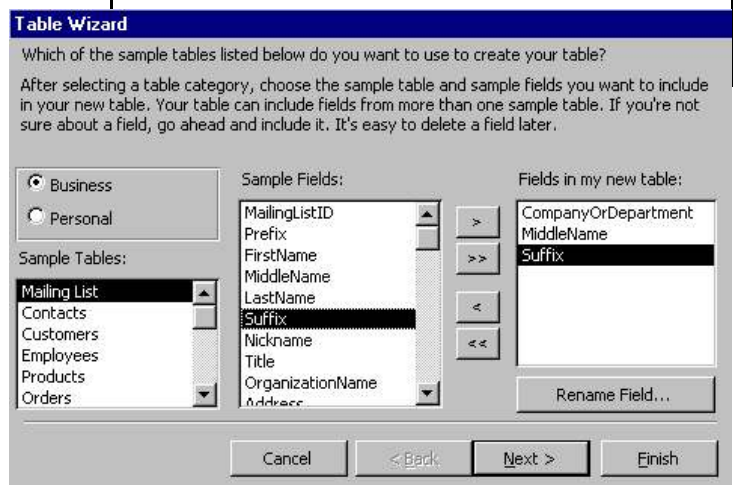
13. Creating tables via wizards
 - a. Create a patron table using the business tables, customers and add fields CustomerID, ContactFirstName, ContactLastName, BillingAddress, City, StateOrProvince, PostalCode, PhoneNumber, EmailAddress?
 - b. Rename a few fields.
 - c. Enter some "patrons."
 - d. Close table.
 - e. Rename table "Patrons".

Field naming tips:

- 64 characters including letters, numbers, spaces and characters except ! ' [] "
- You may want to avoid spaces or you will end up putting [] around it.
- Long enough to understand.
- Short enough that it doesn't take a English Lit degree to read.
- Free form comments?
- Extra characters for names? IE A. Charles Gierke

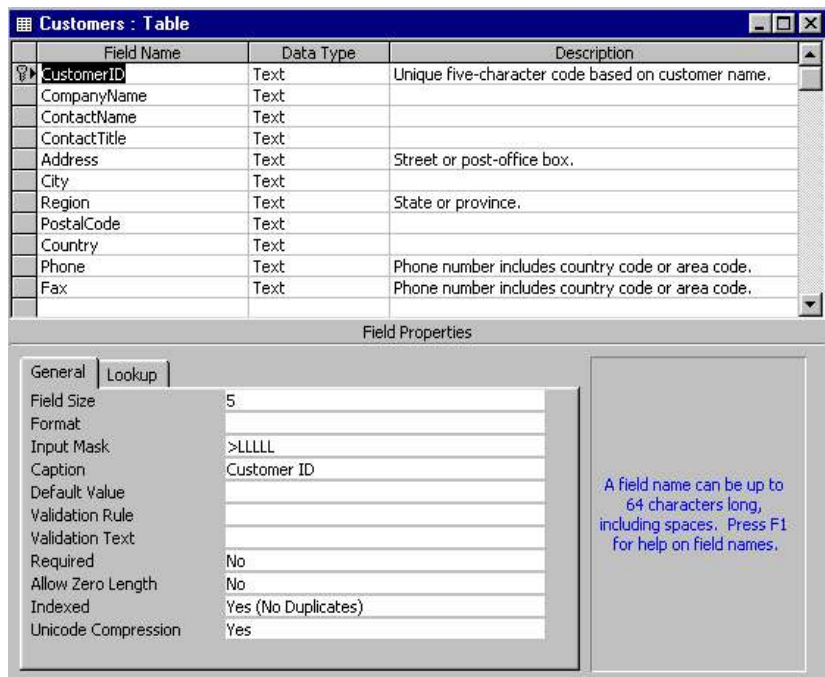
14. Creating queries via wizards
 - a. Select table or query and fields to display
 - b. Name the query and open it

15. Creating forms via wizards
 - a. Select table or query and fields to display
 - b. Select layout: columnar, tabular, datasheet, justified
see Mayberry examples
 - c. Select style



- d. Name the form and open it.
16. Creating reports via wizards
- a. Select table or query and fields to display
 - b. Add grouping, IE everyone in Ogdensburg together, followed by Potsdam
 - c. Add sorting (within the grouping), IE Lastname, Firstname
 - d. Select layout: columnar, tabular, justified see Mayberry examples
 - i. Paper orientation
 - ii. Field widths
 - e. Select style
 - f. Name the report and preview it.

17. Create a new table with New button, Design view
- a. Waste of time? NO! If your tables are not structured properly, your database has no chance of serving properly. It is the basis for the rest of your database.
 - b. Table is defined by the fields it contains. You must provide:
 - i. Field Name: defines how you refer to a field
 - ii. Data Type: what does the field store?



Field type	Description	Size
Text -	Text or combinations of text and numbers, as well as numbers that don't require calculations, such as phone numbers.	255
Memo	Lengthy text or combinations of text and numbers.	65,535 or hard drive size
Number	Numeric data used in mathematical calculations. For more information on how to set the specific Number type, see the FieldSize property topic.	Up to 16 bytes
Date/Time	Date and time values for the years 100 through 9999.	8 bytes
Currency	Currency values and numeric data used in mathematical calculations involving data with one to four decimal places. Accurate to 15 digits on the left side of the decimal separator and to 4 digits on the right side.	8 bytes
Auto number	A unique sequential (incremented by 1) number or random number assigned by Microsoft Access whenever a new record is added to a table. AutoNumber fields can't be updated. For more information, see the NewValues property topic.	4 bytes, 16 bytes if replication ID
Yes/No	Yes and No values and fields that contain only one of two values (Yes/No, True/False, or On/Off).	1 byte
OLE Object	An object (such as a Microsoft Excel spreadsheet, a Microsoft Word document, graphics, sounds, or other binary data) linked to or embedded in a Microsoft Access table.	Up to 1Gb.
Hyperlink	Text or combinations of text and numbers stored as text and used as a hyperlink address.	
Lookup Wizard...	Creates a field that allows you to choose a value from another table or from a list of values by using a list box or combo box. Clicking this option starts the Lookup Wizard, which creates a Lookup field. After you complete the wizard, Microsoft Access sets the data type based on the values selected in the wizard.	The same size as the primary key field used to perform the lookup, typically 4 bytes.

iii. Description: six months from now, you will be happy you filled this in.

18. **Exercise:** Create a phone book table!

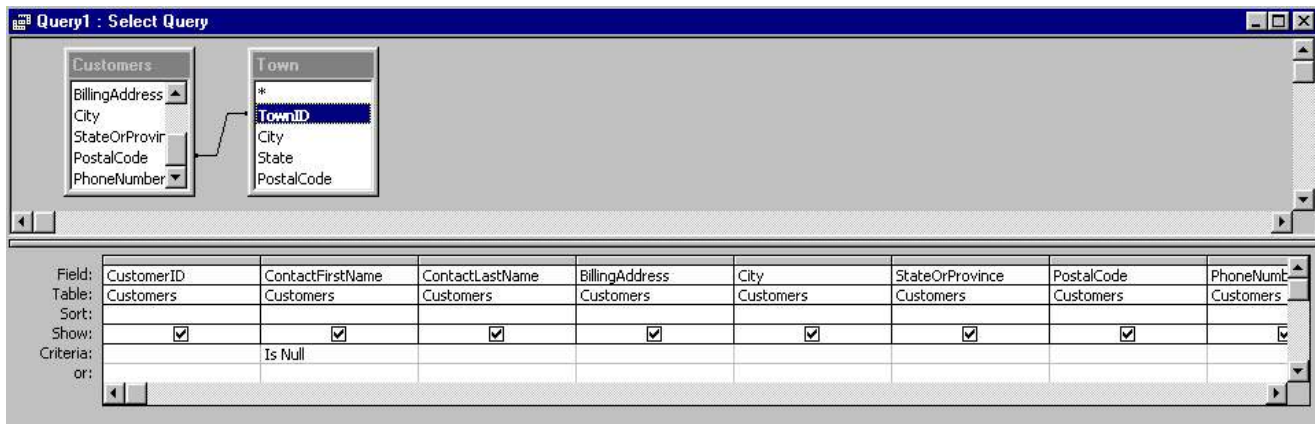
19. General field options

Data type	Description	Text	Memo	Number / Currency	Date / Time	Auto number	Yes/No	OLE Object	Hyperlink
a. Field size	big enough to handle the data but not waste space.	x		x		x			
b. Format	appearance when displayed	x	x	x	x	x	x		x
c. Decimal places	how many decimals to display, calculations carried to 15 places			x					
d. New values	increment or random					x			
e. Input mask	pattern for input	x		x	x			x	
f. Caption	label used on forms and reports	x	x	x	x	x	x		x
g. Default value	entry for new record	x	x	x	x		x		x
h. Validation rule	insures a particular range of values	x	x	x	x		x		x
i. Validation text	error message when validation rule is violated	x	x	x	x		x		x
j. Required	is it required?	x	x	x	x		x	x	x
k. Allow zero length		x	x						x
l. Indexed	speeds searches and sorting, but slows updates, can also eliminate duplicates	x		x	x	x	x		
m. Unicode compression	can save space	x	x						x

20. Primary keys

- a. Should be generated automatically as much as possible to insure they are unique.
 - i. If you use a unique identifier and it has to change, major problems result. IE. Social Security Numbers are unique identifiers, but what if someone refuses to have one, give one or gets entered incorrectly? Altering it becomes a major hassle.
- b. Should not be user editable.
- c. Be wary of using "descriptive" keys. IE. "Ogdenburg" or Can an ISBN be changed?

21. Query - creating a new query via design view



- a. Add tables
 - i. Removing tables
- b. Add fields
 - i. * indicates all
 - ii. shift & ctrl+click
- c. Sort - via ascending or descending in the sort row
- d. Show - you can have a field as part of the query, but not display
- e. Criteria
 - i. Examples
 - (1) "Ogdensburg"
 - (2) "Ogdensburg" Or "Potsdam"
 - (3) Between #1/1/2000# And #12/31/2000#
 - (4) Not "Ogdensburg"
 - (5) Like "Og*"
 - (6) >="O"
 - (7) Is Null, Is Not Null
 - (8) You can use formulas (much like Excel) to select
 - (a) Left([Zipcode],3)="136"
 - (b) Len([Zipcode])<5
 - ii. Use multiple lines for OR, stay on the same line for AND

22. Normalize - eliminate the redundancy of data in a database by insuring all fields in a table are atomic.
 - a. Guaranteeing accuracy
 - b. Simplify entry
 - c. Example of non-use- Voter registration tables.
 - d. Don't over-normalize. There are times when too much doesn't allow users to add information for unusual circumstances or makes the database more complex. K.I.S.S.

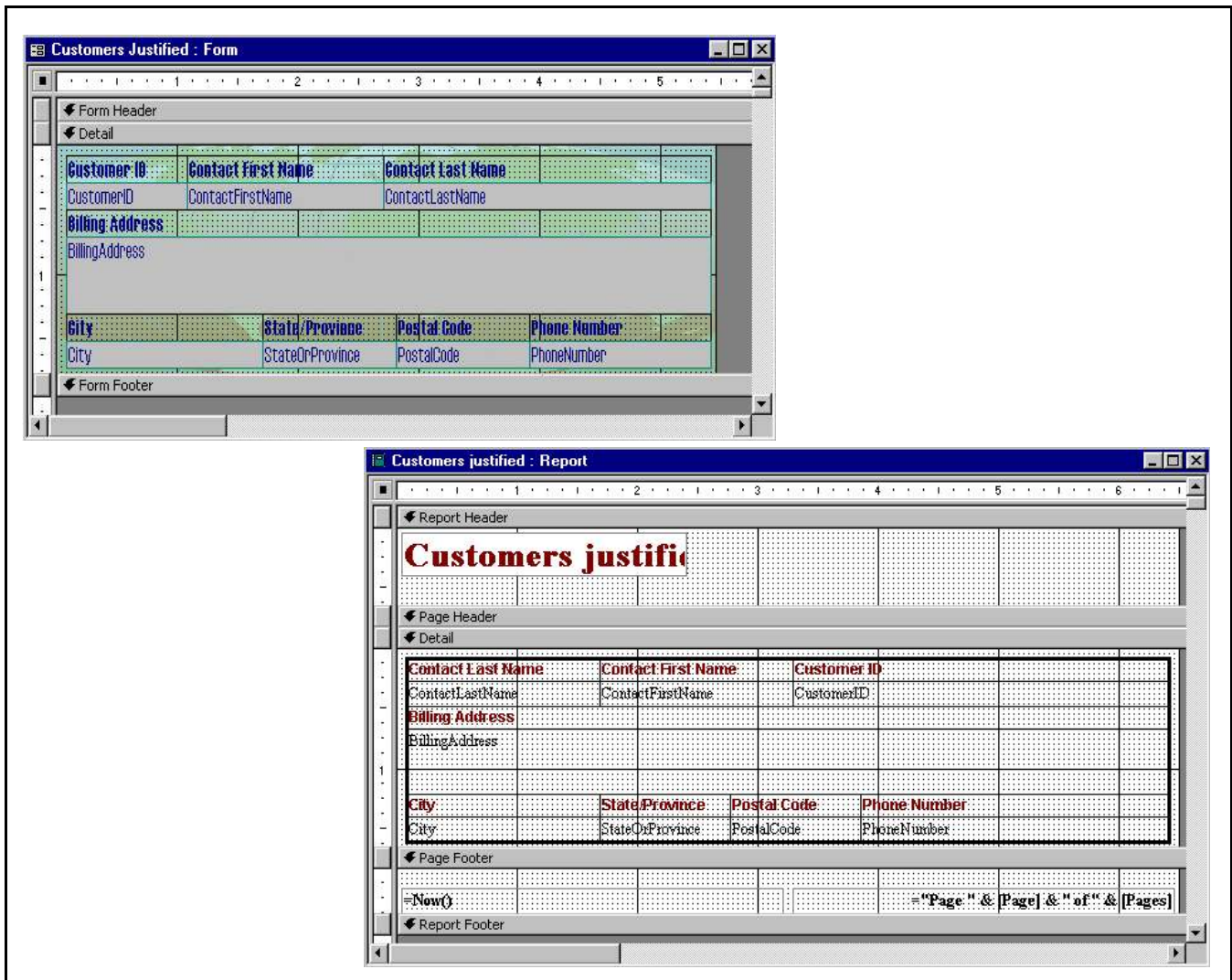
Third Normal Form

- Each value in a table is to be represented once and only once.
- Each row in a table should be uniquely identifiable.
- No non-key information that relies upon another key should be stored in the table. Or don't duplicate what you've already got.

23. Normalize Mayberry Patrons Zipcodes!
- a. Create town table containing: TownID, Town, State, Zip
 - b. Enter some towns
 - c. Redesign "Patrons" table.
 - i. Remove State and Zip
 - ii. Use Lookup Wizard to create relationship between City and Town table!
 - d. Edit records.
 - e. Further notes:
 - i. What is actually stored???
 - ii. Notice your towns are not in alpha order on your pull down list! You probably want to create a Town Alphabetic Order query and use the lookup wizard to connect through that!!!
 - iii. View Relationships
 - (1) Notice links
 - (2) Can be ENFORCED
 - (3) Handy as your table list grows!
24. Forms and reports
- a. Wizard is often a great way to start creating forms.



See C3 Inventory



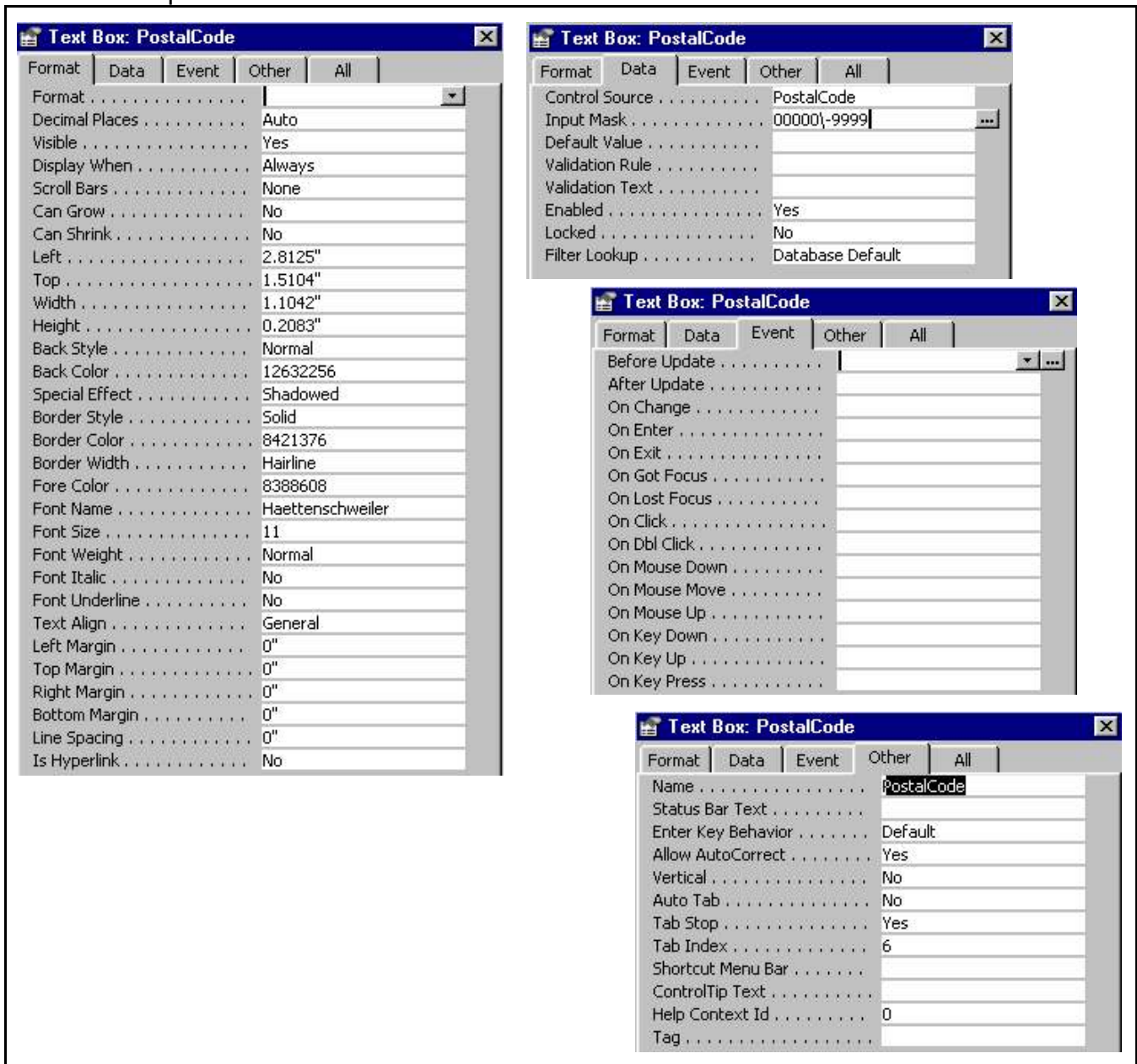
- b. Switching between Design and View and Datasheet views
- c. Fields
 - i. Moving and resizing
 - ii. General editing

See Patrons Justified form

	Field		Bold		fill color
	Font		Italic		font color
	Size		Underline		outline color
			Left		border
			Center		special effects
			Right		

iii. Displaying

- (1) field lists
- (2) toolboxes
- iv. Properties



d. Toolbar objects

	select		control wizard
	label		text box
	option group		button
	option		check box
	combo box		list box
	command button		image
	unbound object		bound object
	page break		tab
	sub form / report		line
	rectangle		more

- e. Sorting and Grouping reports
- f. Autoformatting
- g. Printing

25. Tools

a. Utilities

i. Compact databases

- (1) Deleted materials are still there! All changes made during programming are still there!
- (2) Condenses files to minimal size

ii. Replication - allows you to take a replica of the database.

- (1) Master can be modified in most ways.
- (2) Replicas can have data added, modified and removed.
- (3) Replicas are then reconciled with the master!

b. Options

- i. Do you want "Windows in Taskbar?"
- ii. Single or Double click?

Leonhard, Woody and Deegan, Peter. "Get down the "databasics" of Access. "
www.zdnet.com April 2, 2001.

Vines, Rose. "Databasics: A Database Dictionary." www.geekgirls.com 1999.