

week 6

TABLES, ANATOMY OF A TABLE

topics of the week

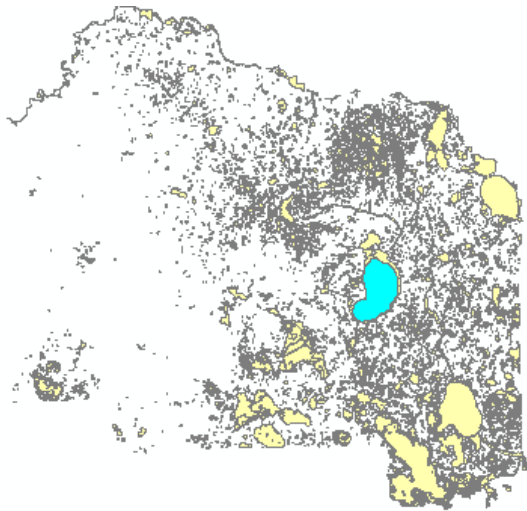
- ❑ **Table structure**
- ❑ **Working with tables**
- ❑ **Table relationships**
- ❑ **Cardinality, Joins and Relates**

Table Jargon

- ❑ **What is a Database?**
- ❑ **What is a Table?**
- ❑ **What is a Record/Row?**
- ❑ **What is a Field/Column?**
- ❑ **What is a Primary Key?**
- ❑ **What is a Query?**
- ❑ **What is a Query Language?**

Tables

- Descriptive information about geographic features
- Each geographic feature class has an associated table
- Each geographic feature has an associated row – data element



Feature Attribute Table

	OBJECTID*	Shape*	AREA
▶	1	Polygon	53233.35302
	2	Polygon	2246.91016
	3	Polygon	140.42082
	4	Polygon	383.77933
	5	Polygon	2424.9155
	6	Polygon	2744.96696
	7	Polygon	2910.46316
	8	Polygon	9585.07983
	9	Polygon	5258.15586
	10	Polygon	3709.66528
	11	Polygon	1157554.52887

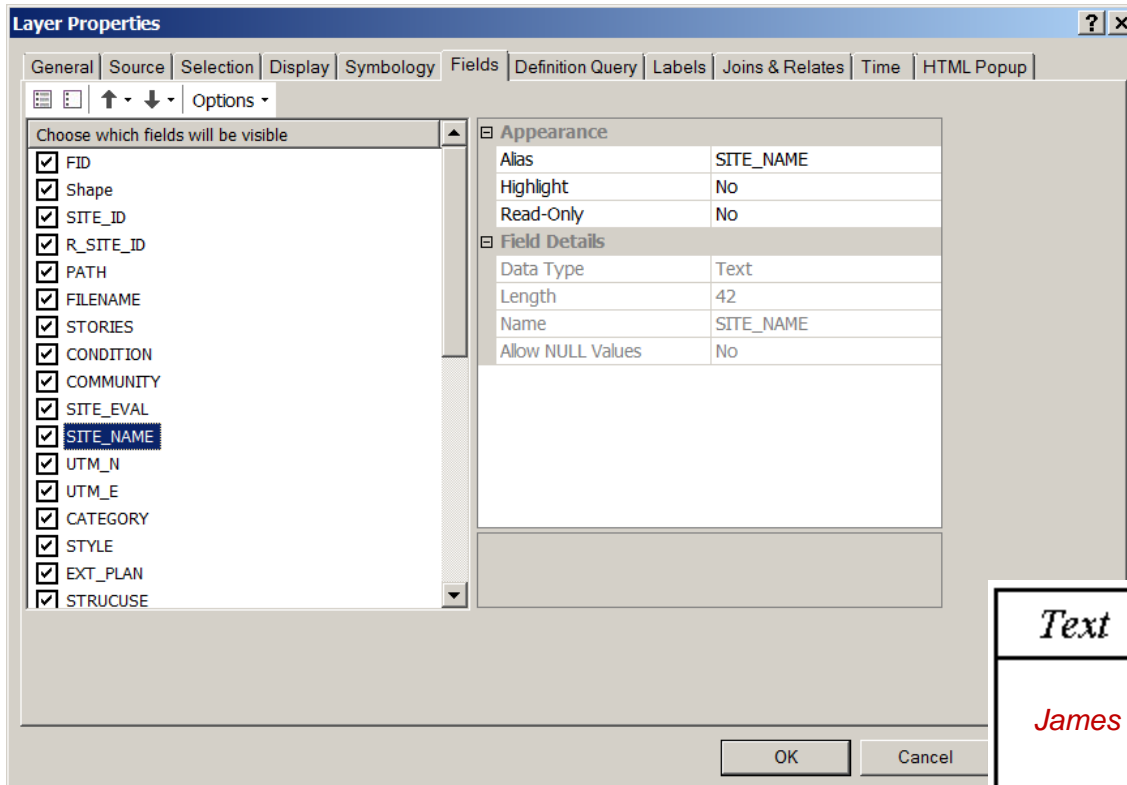
Table structure

- Records/rows - fields/columns
- Value – cross of a field & a row
- Fields/columns definition – field types
- Fields/columns types can store numbers, text, dates
- Each field/column name must be unique

FID	Shape	ID	ADDR1	NAME	
0	Point	00676-001-000	PO BOX 1008	sta-29	col
1	Point	02041-000-000		sta-28	col
2	Point	03036-001-001	PO BOX FF	med-5	col
3	Point	03376-000-000		sta-21	col
4	Point	04341-001-001	PO BOX FF	sta-17	col
5	Point	04963-000-000	3000 NW 83RD ST	sta-27	col
6	Point	05565-000-000		sta-22	col
7	Point	06324-000-000	PO BOX FF	sta-16	col
8	Point	06680-008-000	PO BOX FF	sta-19/med-3	col
9	Point	07051-004-002	8100 SW ARCHER RD	sta-15	col
10	Point	10515-010-001	PO BOX 490	med-2	col
11	Point	10125-005-001	PO BOX FF	sta-12	col

Tabular data - field data types

- Different field data types store different kinds of values
- Choose the right field type for the right value
- Field types vary according to the file format of the table



Name: **James**

Age: **46**

Height: **5.6**

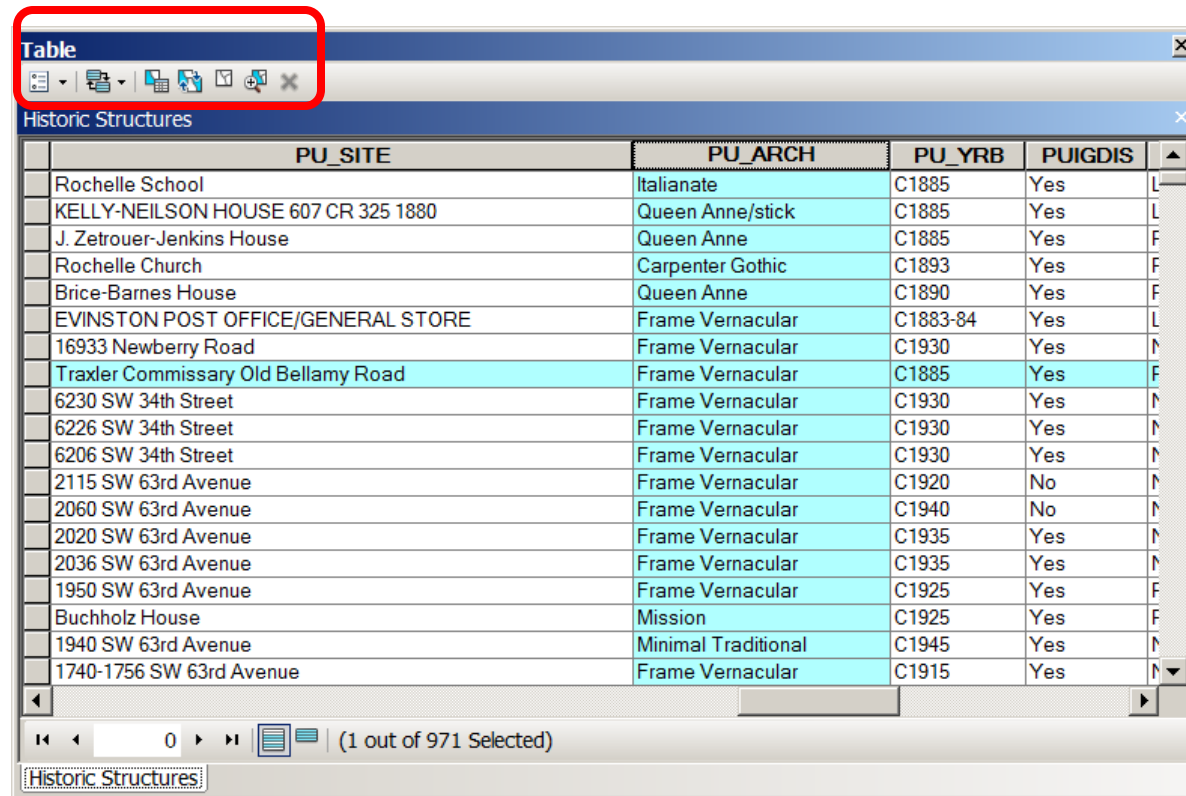
Date of birth: **2.12.00**

Picture: **jpg**

<i>Text</i>	<i>Short</i>	<i>Float</i>	<i>Date</i>	<i>Blob</i>
<i>James</i>	<i>46</i>	<i>5.6</i>	<i>2.12.00</i>	<i>picture</i>

Working with tables in ArcGIS

- In ArcCatalog – preview, edit existing, create new
 - Sort ascending or descending
 - Freeze/Unfreeze columns
 - Run statistics
- In ArcMap
 - Select records
 - Edit existing values
 - Set up relationships
 - Make field calculations
 - etc.



Table

Historic Structures

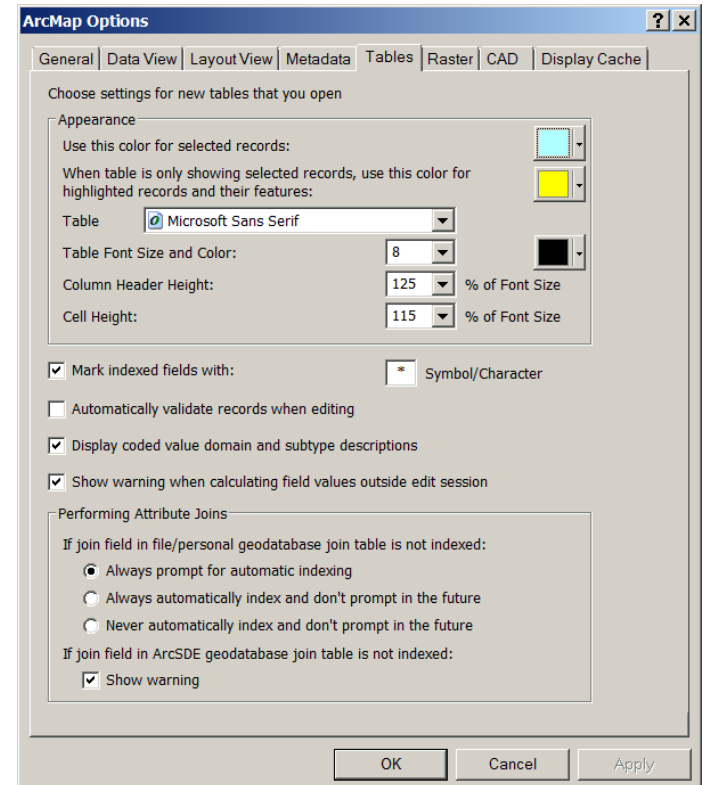
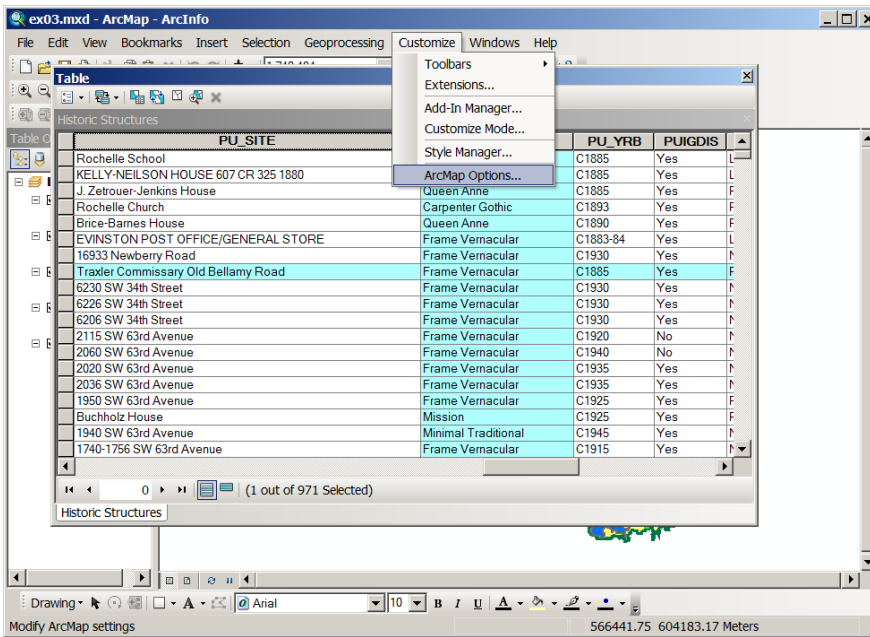
PU_SITE	PU_ARCH	PU_YRB	PUIGDIS
Rochelle School	Italianate	C1885	Yes
KELLY-NEILSON HOUSE 607 CR 325 1880	Queen Anne/stick	C1885	Yes
J. Zetrouer-Jenkins House	Queen Anne	C1885	Yes
Rochelle Church	Carpenter Gothic	C1893	Yes
Brice-Barnes House	Queen Anne	C1890	Yes
EVINSTON POST OFFICE/GENERAL STORE	Frame Vernacular	C1883-84	Yes
16933 Newberry Road	Frame Vernacular	C1930	Yes
Traxler Commissary Old Bellamy Road	Frame Vernacular	C1885	Yes
6230 SW 34th Street	Frame Vernacular	C1930	Yes
6226 SW 34th Street	Frame Vernacular	C1930	Yes
6206 SW 34th Street	Frame Vernacular	C1930	Yes
2115 SW 63rd Avenue	Frame Vernacular	C1920	No
2060 SW 63rd Avenue	Frame Vernacular	C1940	No
2020 SW 63rd Avenue	Frame Vernacular	C1935	Yes
2036 SW 63rd Avenue	Frame Vernacular	C1935	Yes
1950 SW 63rd Avenue	Frame Vernacular	C1925	Yes
Buchholz House	Mission	C1925	Yes
1940 SW 63rd Avenue	Minimal Traditional	C1945	Yes
1740-1756 SW 63rd Avenue	Frame Vernacular	C1915	Yes

(1 out of 971 Selected)

Historic Structures

Table options in ArcGIS

There are many options for table manipulations which can be accessed from the virtual table interface.



ArcGIS tabular data formats

- **Each spatial format has a native tabular format**
 - **Coverages:** INFO - closed
 - **Shapefiles:** dbf – open, interoperable
 - **Geodatabases:** mdb – somewhat operable
- **Can convert among the three or text format**
- **Some can create links between them, independent on the format**
- **Can all be created in ArcGIS, but for the INFO which can only be created in ArcInfo and ArcEditor**

Associating tables

- ❑ Spatial data store attributes in their *feature table*
- ❑ Sometimes one or more *separate tables* exist that have more information about our spatial data
- ❑ An association can be made between the *feature table* and the *separate tables*, to tie this additional information to the spatial data
- ❑ This association of tables is based on common column key values
- ❑ For this association to occur, the nature of the relationships (*cardinality*) of these tables MUST BE KNOWN

Table Relationships - Cardinality

Four types of cardinality:

One-to-one

a unique value in one table associates to a unique record with same value in the other

One-to-many

a unique value in one table associates to many records with same value in the other

Examples:

One parcel – one owner i.e. one record

One parcel – multiple owners i.e. many records

Table Relationships – Cardinality

Four types of cardinality

Many-to-one

many unique values in one table associate to same value in the other

Many-to-many

many unique values in one table associate to many same values in the other

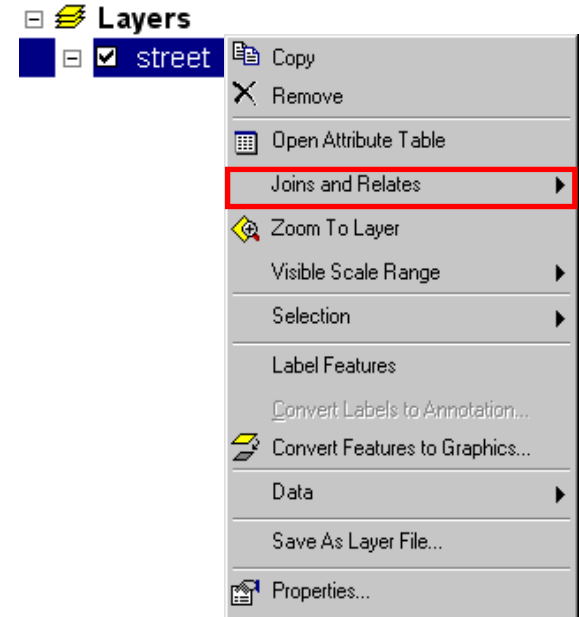
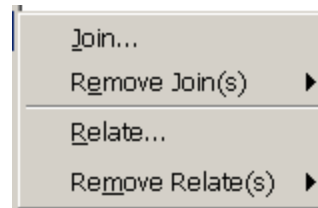
Examples:

Multiple parcels – one owner

Multiple parcels – multiple owners

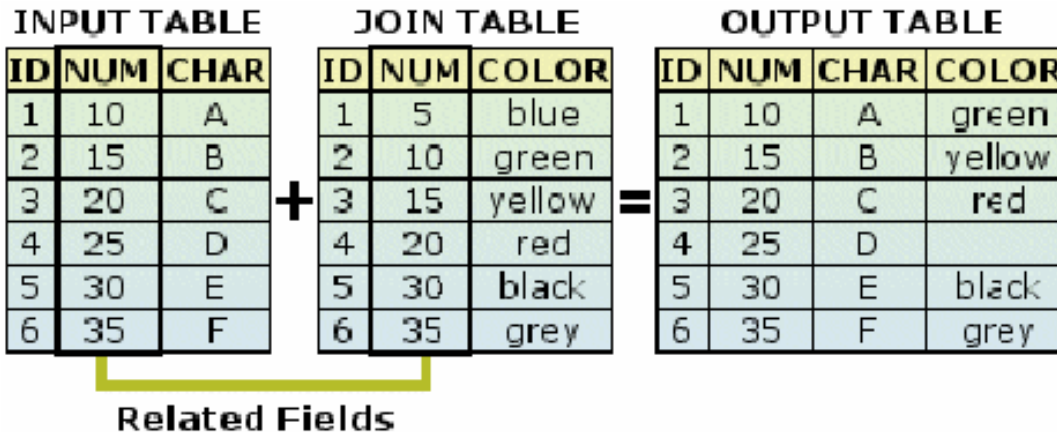
Joins and Relates

- Two ways are available in ArcMap for associating tables
- *Join* - appends the attributes from one table onto the other based on a common field, physically merges the two tables
- *Relate* - defines a relationship between two tables
- Use one or the other based on cardinality type



Joins

- A *Join* insures a physical connection between the two tables into one
- A *Join* appends the attributes of the two tables
- A *Join* assumes cardinality *one-to-one* or *many-to-one*
- A *Join* is only virtual, does not change the data source
- A *Join* can be removed at any time



One to one
matching records

Relates

- ❑ *Relates* define a relationship between the two tables
- ❑ Both tables remain independent, no physical merge
- ❑ *Relates* assume cardinality *one-to-many* or *many-to-many*
- ❑ A *Relate* is only virtual, does not change the datasource
- ❑ A *Relate* can be removed at any time
- ❑ The related table can be updated separately

One to many matching records

Input Table

ID	NUM	CHAR
1	10	A
2	15	B
3	20	C
4	25	D
5	30	E
6	35	F

+

Relate Table

Name	NrParcels	Use
Juna	10	
Tim	10	Res
Nia	15	Inst
Sam	15	Ag
July	15	Res
Amanda	20	Cons
Linda	20	Ag

Related Fields

Creating charts and graphs

- From data to information
- Graph Wizard in ArcMap

The screenshot displays the ArcMap interface with the 'Create Graph Wizard' dialog box open. The wizard is configured for a Pie chart. The 'Layer/Table' is set to 'Historic Structures' and the 'Value field' is 'PU_NEW'. The 'Total Pie angle (degree)' is 360, 'Rotate Pie (degree)' is 0, and 'Explode the biggest slice (%)' is 0. The 'Show border' checkbox is checked. The 'Color' is set to 'Match with Layer'. The 'Add to legend' checkbox is checked, and 'Show labels (marks)' is unchecked. The 'Pie' tab is selected, and the 'Add' button is visible. The map in the background shows a geographic area with various colored regions and points. The status bar at the bottom indicates 'Creates a new Graph' and '502023.18 674244.25 Meters'.

More on charts and graphs

- ❑ Dynamically summarize tabular information in a graph
- ❑ ArcGIS supports a variety of graph types
- ❑ ArcGIS allows for a variety of graphic properties to be set
- ❑ ArcGIS graphs can tie to all or subsets of fields/records
- ❑ ArcGIS graphs can be added to a map - Data View & Layout View
- ❑ Graphs created outside of ArcGIS can be added to a map

Graphs update automatically as attributes or selections change in the layer source, but they can also be made static i.e. disconnect from the layer source.

What are reports?

- ❑ A way to synthesize your results automatically and store them in a commonly known format such as *html*, *pdf*, etc.
- ❑ A report may contain
 - ❑ tabular data
 - ❑ graphs and charts
 - ❑ maps
 - ❑ plain text
- ❑ Reporting in ArcGIS
 - ❑ ArcMap > View > Reports > Create, Load, Run

The ArcMap Report Writer

Only tabular info, export in: .rdf format

Can add back to your map layout

The screenshot displays the ArcMap interface with the Report Wizard dialog box open. The dialog box is titled "Report Wizard" and contains the following elements:

- Which fields do you want on your report?**
- Layer/Table:** A dropdown menu showing "Historic Structures".
- Report View Contents Field:** A dropdown menu showing "GM_STYLE".
- Available Fields:** A list of fields including PUGIND, PUGLOC, PUNREG, PUVERN, PUTHRT, PU_NEW, and GM_CAT.
- Report Fields:** A list of fields showing "GM_STYLE".
- Dataset Options...** button.
- Buttons:** Cancel, < Back, Next >, and Finish.

The ArcMap interface in the background shows the "Reports" menu open, with options for "Create Report...", "Load Report...", and "Run Report...". The map area displays a yellow background with red dots and green lines, representing the data being used in the report.