CHAPTER 7

Working with attribute tables

Manipulating data tables (or attribute tables in ArcGIS) includes such things as adding and deleting columns in a table and editing values or performing calculations. You will do this frequently when working with GIS. Although the bulk of data manipulation is best achieved outside of ArcGIS, it is important to learn the fundamentals of data manipulation within ArcGIS. The ability to edit data will greatly strengthen analysis and improve maps.

Exercise goal

Learn common ways to manipulate data within an attribute table. 1

1

Table

AgeJoined

FID	Shape *	STATEFP	COUNTYFP	COUNTYNS	CNTYIDFP	NAME	NAMELSAD	LSAD	CI
0	Polygon	01	113	00161583	01113	Russell	Russell County	06	H1
1	Polygon	01	067	00161559	01067	Henry	Henry County	06	H1
2	Polygon	01	029	00161540	01029	Cleburne	Cleburne County	06	H1
3	Polygon	01	037	00161544	01037	Coosa	Coosa County	06	H1
4	Polygon	01	093	00161573	01093	Marion	Marion County	06	H1
5	Polygon	01	099	00161576	01099	Monroe	Monroe County	06	H1

Exercise file locations

Chapter directions: Follow the exercise as it appears in this book

This exercise uses the same AgeJoined.shp file used in chapters 5 and 6.

CD: Use the CD included with this book

All files needed for this exercise are included on the book's CD. Files are organized by chapter.

Personal files: Use files you've gathered from other sources

In order to complete this exercise, you will need a shapefile with an attribute table that has several columns of data that you can edit.

1 Add a shapefile and open the attribute table

1. Open ArcGIS.
2. To add a shapefile to the ArcGIS window, click the Add Data icon .
3. Either open Folder Connections or select the Connect to Folder icon and navigate to **AgeJoined.shp**.
4. To open the attribute table, right-click the shapefile in the table of contents and select Open Attributes Table. You should see your data in spreadsheet format.

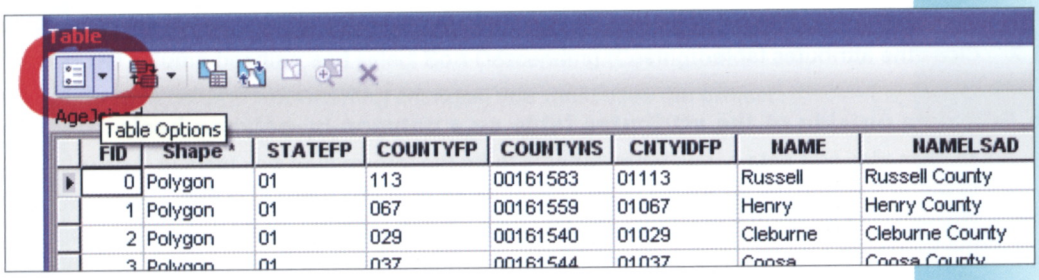
NUMERIC COLUMN TYPES CAN BE CONFUSING

Generally, you should use float or double (also known as a double float) as the column type.

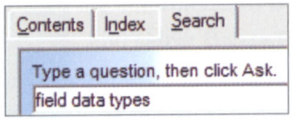
The double float is beneficial because you can have the maximum number of digits for the number, with no rounding (after 15 digits, plain old floats start to round, but doubles don't).

2 Add a column to the attributes table

1. Click the drop-down arrow for the Table Options on the Table toolbar (the first icon) and select Add Field. 2



2. Type the name of the new column. Let's call it **NewColumn**. For the Type, select Float. Float is a very flexible column type, so it is often used. Float (as well as Double) is useful because the number can be in decimal format or a whole number.



3. You can leave the Precision and Scale as zeros for the maximum digits.
4. Click OK.
5. The column will be added to the end of attributes table. You can move the column by selecting the column and dragging it to where you want it in the table.

3 Edit existing data in an attribute table

If you try to edit any of the data in the table, you'll notice the values cannot be changed. You must first make the table editable.

1. Click the Editor Toolbar button.

   In ArcGIS 10 this button should already be visible as it's a part of the default ArcGIS interface. In older versions of the software, you must go to the View menu, select Toolbars, and then select Editor. The icon will look the same.

2. Once you click the Editing icon, a new Editor toolbar should be visible. Dock the toolbar.
3. Click Editor and select Start Editing. Notice that the top row of the attributes table turns white, which means that the table is now editable.

GOOD TO KNOW

If multiple shapefiles are open, the Editor tool needs to know which files to edit. In this case, another dialog box would display asking you to start editing, and it would be necessary to pick which layer or which geodatabase with several files to edit. Here we are only working with one file, so it doesn't ask this.

4. Now let's edit some data. Go to any of your data values and type over the text to change the number to something else. For example, change the percentage of seniors in Cherokee County from 16 percent to **0** percent.
5. After you are finished editing data, click Editor again, and then select Stop Editing.
6. Save Edits when prompted.
7. Close the attributes table.

4 Edit data outside of the attributes table on a polygon-by-polygon basis

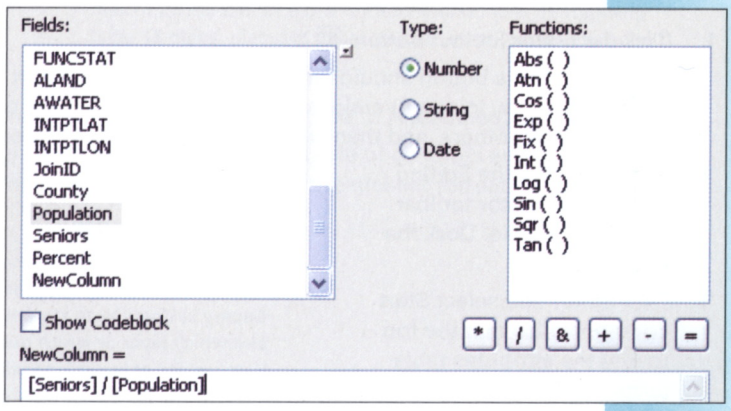
You can also edit data within what appears to be the information box instead of doing it within the attributes table. One advantage of this method is that you can click individual polygons and edit data for that polygon. To do this, do the following:

1. On the Editing toolbar, click the Editor button and select Start Editing.
2. On the Editing toolbar, click the Attributes icon.
3. On the map, click any county. Notice that a new window opens on the right with all the information from the underlying attributes table.
4. Click any field to edit the values.
5. Select Editor, Save Edits, and Stop Editing.

5 Make calculations

Calculations can be performed in or out of an editing session. Let's pretend we have not calculated the percentage of senior population. For the purpose of this exercise, let's recalculate the percentage of senior population.

1. Right-click the NewColumn header.
2. Select Field Calculator.
3. The formula to calculate the percentage of seniors is "seniors divided by population." Double-click Seniors from the list of variables, type / (the division symbol), and then double-click Population from the variables list. The formula is autofilled as you go (see right). Click OK. 3



4. The software calculates the percentage, but the column represents a fraction; we would like it to display as a percentage. You will need to reformat the column.
5. Right-click the column heading and select Properties. Click the ellipsis to change the column type.

6. Select Percentage (on the left) then select the second option (on the right), The number represents a fraction. Adjust it to show as a percentage.
7. Click Numeric Options. Change the decimal places from 6 to **1**.
8. Click OK three times.
9. Now let's sort the column to see which counties had the highest rates of seniors. Right-click the column heading and select Sort Descending (Covington).
10. (Optional) To save column reformatting changes, you must save the project.

6 Delete columns

You may notice several prebuilt columns when you download your shapefiles from the census. Some columns are useful for understanding what geography is within the shapefile, but many of these columns can be deleted as they are rarely used. There are two ways to delete columns. The method you use depends on how many columns of data you want to delete. If it's only one or a few columns, you would use one method. However, for several columns, a different method must be employed.

To delete a few columns of data, do the following:

1. Highlight the column LSAD by clicking the column header.
2. Right-click and select Delete Field.
3. Select Yes to delete the column LSAD.
4. Now highlight the six columns: ClassFP, CSAFP, CBSAFP, METDIVFP, FUNCSTAT, JoinID. Right-click and select Delete Field. Notice that only the first field was deleted. To delete multiple columns, see the next step.

To delete multiple columns of data, do the following:

5. Close the attribute table.
6. In the table of contents, right-click the shapefile name, select Properties, and then click the Fields tab (center).
7. Click the Turn All Fields Off button and notice that the check boxes next to all the columns become unchecked.
8. Now, select only those columns that you want to keep. The essential columns to keep are CNTYIDFP, County, and NewColumn.
9. Click OK.
10. In the table of contents, right-click the layer name and open the attributes table. Notice that now only three columns are displayed. The other columns are still there but hidden. Just hiding the columns might work for some projects, but for many other projects you really may only want these three columns.
11. Close the attributes table.
12. Let's essentially make a copy of this file, and in so doing, capture only these three columns. Right-click the layer name in the table of contents, select Data, and then select Export Data.
13. Click the yellow file folder and navigate to where you would like to save what will be your new, slimmer file. Give it a new name, such as **MiniFile**.

14. Click Save.
15. Click OK and Yes to add the file to the map as a layer.
16. Open the attributes table to verify you have only the columns you exported (plus a couple of others that are standard).

7 Work with multiple attribute tables

Attribute tables are handled slightly differently in ArcGIS 10. You can open multiple attribute tables and toggle between them using tabs in the lower right corner of the table window.

1. Open both attribute tables (AgeJoined and MiniFile) if they aren't already. 4
2. Click on each of the tabs in the lower left corner of the table's window and notice how you can switch between tables. The tabs are also movable, by dragging and dropping.
3. You can also dock the tables (new to ArcGIS 10) to create a split screen. Left-click and drag the MiniFile tab to the center of the tables window. A blue circle with four arrows will appear. Drop the tab on the right arrow. The screen should split with one table on each side. 5
4. To undo the split screen, simply drag and drop the table back in the tab position.

4

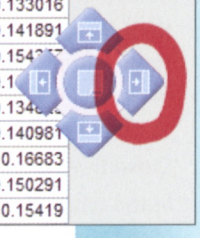
01127	Walker	14.7%
01043	Cullman	14.6%
01023	Choctaw	14.4%
01031	Coffee	14.3%
01095	Marshall	14.3%
01037	Coosa	14.2%
01133	Winston	14.2%

1

MiniFile AgeJoined

5

Butler	0.164307
Choctaw	0.144077
Fayette	0.161828
Jackson	0.133016
Winston	0.141891
Baldwin	0.154
Autauga	0.1
Barbour	0.134
Calhoun	0.140981
Clay	0.16683
Greene	0.150291
Colbert	0.15419



GOOD TO KNOW

You can also click the query icon in the table toolbar to write an attribute query. Attribute queries will be covered in chapter 15.