Lab 1, Part B: Tour of ArcView 3.1

Name _______________________________

This part of the lab will be a quick tour of some features of ArcView. In this lab, you will examine some demographic data for the Atlanta metro region, and create choropleth thematic maps of census data about that city. Then, as a special bonus before you finish, you will create a very simple Avenue script.

Your glossary for this lab:

- **Project Window**
- **View Window**
- **Theme**
- **Table of Contents**
- **Active window**
- **Visible theme**
- **Representative Fraction**
- **Choropleth map**
- **Legend Editor**
- **Palette Window**
- **Query**
- **Query Builder**

**Large- and Small-scale maps**

1. Start ArcView. Use the same instructions as in Lab 1, part A. When asked if you'd like to create a new project, check 'with a new view' and click **OK**. When asked if you'd like to add data to the View, say **No**.

2. You now have a window open called "**View1**." Underneath that window is one called "**Untitled**." Click on the window that says "**Untitled**." This is called your **project window**, and it is the main window from which most of your operations will be managed. The **view window** (here, called **View1**) is a place where you can display and manipulate a collection of user-defined maps.

3. Watch the various buttons and menus in the interface as you click from one window (**Untitled**) to the other (**View1**). Note that they change. It is particularly important in ArcView which of the subwindows (like **Untitled** and **View1**) is **active**, that is, which window has the colored (not grey) title bar (that is, which was the latest window to be clicked). The functions that are visible in the interface depend on which window is active.

Which type of window (view or project) is active when a pull-down menu called Edit appears in the menu bar? ________________
4. Save your project as "lab1.apr." Click on the Project Window (Untitled) and select File/Save Project... . Make sure that the directory listed is your turn-in directory on the J: drive. In the file name: text box, type "lab1.apr" and click OK.

Now what is the title of the Project window (pardon the banality of these questions, I just want you to notice these things)? ______________________

5. Add some data to your view. Click on the View Window (View1) and then click on the Add Theme button. A Theme is a collection of features drawn on a view. A Theme has an associated legend that defines the symbolization of the features. Navigate to g:\avgis30\avtutor\arcview\qstart (you will have to switch drives to g:\INSTRUCTIONAL\esri). Select "attract.shp" and click OK. The Theme "Attract.shp" appears in the table of contents of the view, the list of themes along the left side of the view window. Yet you will not see anything until you make that theme visible by clicking the checkbox to the left of the word Attract.shp in the table of contents. Do this. Voilá, you see your first ArcView map – of the Atlanta metro region.

6. This is a map of census tracts, which are each, roughly, composed of equal numbers of people. Knowing this basic fact about census tracts, where on the map would you say is the most densely populated region? __________________________________________

7. There is a representative fraction (1:something) scale in the upper right of the interface. What is the scale of this map? ______________________________

8. Resize the window by moving the cursor to the bottom right of the View window and dragging down and right. Note that the scale of the map has changed. Has the value of the denominator (that part after the colon) of the representative fraction increased or decreased? ______________________

9. Thus, has the fraction itself increased or decreased? ______________________

10. If a "small-scale" map has a relatively small representative fraction (like 1:1 million), and a "large-scale" map has a relatively large representative fraction (like 1:24,000), has your map gotten smaller or larger in scale?

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11. These census tracts are polygon features, in that they are objects that cover a certain area. We shall now create a choropleth map of a demographic (i.e. about the population) variable about the Atlanta metro region, which is mapped here. A choropleth map is a type of thematic map that represents a variable as constant over some pre-defined areal unit, like a state, county, or census tract. We'll talk much more about choropleth maps later in the course. For now, double-click on the name of the theme (Attract.shp) in the table of contents to bring up the Legend editor, with which you can manipulate what is represented in the theme and how it is represented.

12. In the Legend Type pull down menu, select "Graduated Color," which is ArcView's term for choropleth map. Your options have changed now in the Legend Editor. In the Classification Field pull-down, select one of the following variables:

Pct_white: percent of population of the tract that is white

Pct_black: percent of population of the tract that is black

Pct_hisp: percent of population of the tract that is Hispanic

Pct_asian: percent of population of the tract that is Asian

Pct_male: percent of population of the tract that is male

Pct_female: percent of population of the tract that is female

Pct_a_byr: percent of population of the tract that is between the ages of $a$ and $b$.

13. Choose a Color Ramp (default setting is "Red Monochromatic") of your liking (click "Apply" after you choose a different one).

14. Reclassify the data. You’ll notice that the lowest class of your classification is –99 (see figure). This is called a "null" value: information about the census tract doesn’t exist, or has been corrupted. The symbolization for a null value should be fundamentally different from that of "real" values. In the Legend Editor, double-click on the symbol for that –99 class (should be a block of color). Up comes the Palette window, where you can change the colors and patterns of the symbolization. Select the paintbrush button and choose a color that is significantly different from the rest of the colors in the symbolization. Click “apply”, and close the Legend Editor. There are four null-value regions. With the View Window active, use the zoom icons and the pan tool to locate one of the regions and draw its general shape here:
15. Sometimes, you will want to change the way your data are classified. You can do
this in one of two ways. You can click on the “Classify…” button, and select
from a list of pre-defined classification schemes. Or you can manually change the
class breaks. The data that you are looking at now are percentile values, and thus
have a potential range from 0-100. ArcView uses a default classification scheme
called “natural breaks”. Let’s try a quantile scheme, and see what that looks like.
Use the “Classify…” button to access the different classification schemes, and
choose the “Quantile” type. The choose “d” for “Rounded at values”. This will
set the class breaks on integers. Hit the “apply” button, and check out the map.

Notice that –99 is the bottom edge of the lowest class.
Click in the value column (see image at right) and
change the lowest class to just –99. Then go to the next
class and make it 0-25. Change all of the classes to be
equal intervals of 25 percentage points. When your
done, your class values should read from top to bottom:
-99, 0-25, 25-50, 50-75, 75-100. Note that if you change
the upper value in one class, it does not automatically change the lower value of
the next class. You have to do this manually.

16. Close the Legend Editor. Click on the "Zoom to Active Theme" button
(see figure), which should show you the entire metro Atlanta region.
Now be a geographer and think about what spatial patterns you see.
Where is the rate of the variable that you mapped high? Where is it low? Is there a
region that stands out as particularly unusual? Relate the patterns that you see to
the population density assumption you made earlier? Is there a relationship?
Create a hypothesis (I don't care if it's right or wrong) about the relationships you
see.
17. Query your data. Let’s say you’re interested in a bivariate relationship: that is, discovering something about two variable at once. For example, say you’re a young parent looking to buy a home in Atlanta and you’d like to find those census tracts that have a lot of children from age 0 to 4 and that have a low to middle per capita income. Those tracts can be highlighted on your map as follows:

- Click the Query Builder button. 
- Scroll down the "Field" list until you see Pct_0_4yrs, and double-click that field.
- That field appears in your query box in the bottom half of the window. Click the "greater than" symbol.
- type 10 at the cursor. This will now query the data set and choose those tracts with more than 10% small children.
- click "and," then double-click the field Per_capinc. Click "greater than," and type 15000.
- click "and," then double-click the Per_capinc field again. Click "less than, and type 20000.
- click "New Set", and the selected tracts will appear highlighted in yellow on the map.

18. What can you say, in general, about the location of these selected tracts relative to the downtown area?

19. Use the information tool (see image at right) to select the region just to the west of downtown. What is its population in 1998 (Pop_98)?

20. Your first Avenue script. Return to the project window. Double-click on the Scripts icon to bring up a new script window. With that script window active (blue title bar), go to the Script pull-down menu and select Properties… Click in the Name: text box and rename the script "Bex the Dog," and click OK. Type the following in the script window:

MsgBox.Info("Bark!", "Bex the Dog says:")

Push the check button to have ArcView look for errors (compile). If you’ve typed this correctly, the check box should grey out and the running guy should become active. Push the running guy. Click OK when the box appears.

21. Change what Bex says in your script. Remember the quotation marks. You’ll have to recompile the script after each edit. In an upcoming lab, we will associate Bex’s script with a button with Bex’s picture on it.

22. Save your project in your turn-in directory with a name that indicates to us that you are finished (like lab1_done.apr)