PAM 6950 - Spring 2020 - Professor Rich
Homework #02

Instructions

This week we are beginning to work with GIS software. Remember that ArcGIS is available via CISER servers CL3. If you already have a familiarity with alternative GIS software, you can use that instead of ArcGIS. However, the class will be taught in ArcGIS.

In the Canvas > Homework > hw02 folder there are several file packages:

- "hw02_ltdb_2010.dta" is a Stata dataset with tract variables from 2010
- "tract 2010.zip" contains polygons for all census tracts (2010 boundaries)

In addition, you may use additional files from the Canvas > Classwork > week02 folder (but this is not required):

- "state 2010.zip" contains polygons for all states
- "msa 2010.zip" contains polygons for all CBSAs

Question 1

Choose one CBSA. It should be one of the 100 largest CBSAs as indicated by the cbsasamp1 variable (==1). For only your CBSA, create the following three tables:

Table 1. Population characteristics of your CBSA

- Number of persons (based on the sum of racial categories)
- Proportion Asian
- Proportion Black
- Proportion Hispanic
- Proportion White
- Poverty rate (proportion of persons in poverty)
- Single parenthood rate (proportion of households single parent)
- Proportion of persons 25+ with less than a High School degree

Table 2. Neighborhood attributes of your CBSA

- Number of neighborhoods
- For all variables above:
    - Neighborhood mean and standard deviation
    - Neighborhood minimum, 25^{th} percentile, median, 75^{th} percentile, maximum

Table 3. Neighborhood segregation in the CBSA

- Evenness index (your choice) to describe segregation between a) racial groups, b) persons in poverty vs not in poverty, c) single parents vs two-parent households, and d) low educated (less than a HS degree) vs all others. For racial groups, include White-Asian, White-Black, and White-Hispanic indices.

Question 2

You will be mapping race and one other variable of your choice (for Question 4). Before you do so, I want you to create two histograms. One should be for a race variable you will be mapping. The other should be for a non-racial variable you would like to map.

I recommend including the option "width(.01)" so that you can observe the distribution in detail. Copy and paste each histogram into your homework output.

Question 3

Export your dataset (just for your CBSA, not all the tracts!) as an Excel file. Make sure it has a command similar to:

. export excel using "filename.xls", replace firstrow(variables) missing("")

Now open ArcGIS and complete the following steps:

- Turn off rendering (the pause button), and load the "tract 2010" shapefiles
- "Add data" to import the excel data file you created
- Do a "table join" so that the "tract 2010" shapefiles are linked to the table by a common identifier. When you do the "table join," choose the "Keep only matching records" option so that you can work with a smaller file size (instead of 70k + tracts in the shapefile, you will have far fewer – just the number of neighborhoods in your chosen CBSA).
- Open your shapefile's attribute table to verify that you successfully brought in the data appropriately
- Save the joined shapefile as a new shapefile you can use independently (right click > Data > Export Data). Make sure to save as a shapefile and not as one of the other options.
- Now clean up what is left so that your computer runs faster. Remove the joins from the original "tract 2010" shapefile (right click > joins and relates > remove joins). Remove the original "tract 2010" shapefile from ArcGIS (right click > remove) and the excel table.
- You should just have a tract-level shapefile with the data variables you coded and cleaned in Stata. The file should have an observation for every tract in the CBSA you chose and no other tracts. Optional: you can add shapefiles from the state and the CBSA to help add perspective to your map.

Roughly how long did it take you to complete these tasks? Where there any issues that came up that you needed to redo?

Question 4

Following the steps covered in class, create choropleth maps of the neighborhoods in your CBSA. Create two maps.

Map 1. Illustrate the distribution of racial groups in neighborhoods across your chosen CBSA. You can include all racial groups or just 1-2. Write a brief (1-5 sentence) summary of the color scale you chose and how the categories are quantified (manually, natural breaks, quantiles, etc.). Then, interpret the map—what does it show?

Map 2. Reproduce Map 1 but for a different, non-race-based variable. Describe the color scale and quantification you chose. Interpret the map.

Note: All shapefiles were downloaded via nhgis.org