SOC 4650/5650: Lab-05 - Mapping Structures at Risk of Severe Weather Using R

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Directions

Using data from the `data/lab-05/` folder available in the `lecture-06` repository, create several maps using RStudio. Your entire project folder system should be uploaded to GitHub by Monday, February 25th at 4:15pm.

Analysis Development

The goal of this section is to create a self contained project directory with all of the data, code, map documents, results, and documentation a project needs.

Download Data

a. **Clone** the `lecture-06` repository from GitHub using GitHub Desktop.[1]

[1] If you are not sure where your GitHub Desktop data has download to on the computer, you can right click on the repo's entry in GitHub Desktop and have it take you to the repo in Windows File Explorer. By default, this should be within your `Documents/` directory.

Create a Project Folder System

b. Using RStudio, add an R Project to the *existing* directory in your assignments repository named `Lab-05`. To do this, you will want to go to: File ▷ New Project ▷ Existing Directory and find your *existing* `Lab-05` folder.

c. In the Files tab on the lower right-hand side of RStudio's screen, add a New Folder using the New Folder button right below Files. Name this new folder `docs`. Add two others named `data` and `results`.

d. Reduce RStudio for a moment. Using the Windows File Explorer app, find your project as well as the repository you cloned previously. It is easiest if these are in two separate windows.

e. Drag the lab data from `lecture-06/data/lab-05/` into your RStudio Project's `data/` subdirectory. Verify using RStudio that all of these data are accessible from within your project.

f. Back in RStudio, create a README.md text file (File ▷ New File ▷ Text File). Add a quick description of your project and outline the key directories and files that are included.

Create an R Markdown File

f. Create a new notebook by going to File ▷ New File ▷ R Markdown. Choose the SLU Sociology template and save it within that docs/ subdirectory you just created. The notebook should be named lab-05.

g. Expand the YAML heading by adding your name and the assignment title "Lab 05".

h. Use RMarkdown syntax to create your assignment notebook. Make sure it has an introductory section, a section for loading packages, a section for loading data, and a section for part 2 below. These sections should be second-level headings (e.g. ## Introduction). Within Parts 1 through 3, use third level headings to designate question numbers (e.g. ### Question 1).

i. When you are done, "knit" your document by clicking the Knit button in the toolbar at the top of the notebook.

Load Data

j. Import the files METRO_STRUCTURE_PctMobileHome.shp and METRO_BOUNDARY_Counties.shp into your global environment.

Part 1: Data Exploration

The goal of this section is to create an interactive map using leaflet.

1. List the variables in the mobile home data using str().

2. Produce an interactive visual preview of the data using the mapview package.

Part 2: Static Mapping for Digital Use

The goal of this section is to create a static map using `ggplot2`.

3. Using a color ramp of your choice, symbolize the percentage of mobile homes in each county. Use the metro counties boundary layer overlaid on your choropleth layer to more clearly mark the county boundaries. Make sure you edit your legend's title and add a title, subtitle, and a caption to the plot. Your caption should include your name.

4. Export your map as a `.png` file (suitable for use online or in another digital medium) at `500` dots per inch. Make sure your map is saved to the `results` subfolder of your project.

Part 3: Static Mapping for Print Use

The goal of this section is to create a static map using `tmap`.

5. Using a color ramp of your choice (though it should be different than your prior map), symbolize the percentage of mobile homes in each county. Use the metro counties boundary layer overlaid on your choropleth layer to more clearly mark the county boundaries. Make sure you edit your legend's title and add a title, and scalebar to the plot.

6. Export your map as a `.pdf` file (suitable for print) at `500` dots per inch. Make sure your map is saved to the `results` subfolder of your project.

7. Adapt the code from Question 7 and add a histogram to your legend. Again, use a different color ramp for your data than you have used previously. If you have yet to use `RColorBrewer` or `viridis`, use a palette from the unused package here.

8. Export your map as a `.pdf` file (suitable for print) at `500` dots per inch. Make sure your map is saved to the `results` subfolder of your project.

Analysis Development Follow-up

Don't forget to knit your document when you are done! Also be sure to go back and update your `README.md` file with any changes to your project's organization or contents.