Lab 06: Exploratory spatial data analysis and visualization

Read the instructions COMPLETELY before starting the lab

This lab is intended to further develop your exploratory spatial data anlaysis skills, including visualization. This lab builds upon your in-class activities from this week, which themselves are inspired by the ENVS 363/563 course at the University of Liverpool (see https://darribas.org/gds_course/content/bC/lab_C.html). This lab ALSO gives you significant latitude to use datasets, methods, and visualizations of your own choosing and interests. There are limited tasks for this lab.

Tasks:

1. Select one of the datasets from the libpysal library (see https://pysal.org/libpysal/notebooks/examples.html for details). The dataset should include a polygon feature class, as you will make a choropleth map in a later task
2. If it is not projected, assign it a proper projection. Show this projection in the notebook.
3. Perform ESDA on the dataset, including at a minimum:
    - Basic summary statistics on at least one relevant attribute
    - Plot of numeric data (e.g., histogram, scatter plot, NOT A MAP)
    - A plot of the geometry, styled in some way that is *appropriate* (e.g., alpha, color)
4. Make a choropleth map of a *sensible* variable in your dataset. Choose an appropriate data classification scheme
5. Plot a kernel density estimation plot with the breaks included (see the Jupyter notbook that I provided on GitHub for examples)
6. Find ANOTHER dataset from the web *that overlaps spatially with your dataset.* For example, a streets file for the city of Chicago
7. Make another map, this time with multiple layers. The base layer is the choropleth map from above. The top layer is a visualization of the datset you found. Give it a title.

Questions:

1. Describe your dataset and the ESDA you performed. What did you learn?
2. What classification scheme did you use? How many classes? Why?
3. In your final multi-layer map, why did you choose your particular symbolization method?

What to turn in

- Your Jupyter notebook (or Python script). I must be able to run your code - do not turn in a screenshot or code pasted into a Microsoft Word document
- The answers to the above questions