Ira A. Fulton Schools of Engineering
Arizona State University

CSE 578: Data Visualization

Geographic Data Analysis Assignment

Purpose

The purpose of this assignment is to familiarize you with the geographic data analysis techniques with the help of Python libraries of geopandas and libpysal. You will gain practical experience in creating choropleth maps, proportional symbol maps, and also computing Moran's I for geographic datasets.

Technical Requirements

If you choose to work on your assignment locally, you can use the following versions:

- Python 3.12
- Sqlite3
- Pandas == 1.5.3
- Matplotlib == 3.8.3
- Numpy == 1.26.4
- Libpysal == 4.11.0
- ESDA == 2.4.3
- Geopandas == 0.14.3

Assignment Description

In this assignment, you will be using a database of geographic data provided for you in the LibPySal library to create two plots: a choropleth map and a proportional symbol map.

In addition to these two plots, you will compute the value of Moran's I for this data.

Directions

Accessing Ed Lessons

You will complete and submit your work through Ed Lessons. Follow the directions to correctly access the provided workspace:

1. Go to the Canvas Assignment, "**Submission: Geographic Data Analysis Assignment**".
2. Click the "**Load Submission…in new window**" button.
3. Once in Ed Lesson, select the assignment titled "**Geographic Data Analysis Assignment**".
4. Review the resources provided in the demonstration.
5. When ready, click on the code challenge and start working in the notebook titled "**Assignment5.ipynb**".

Assignment Directions

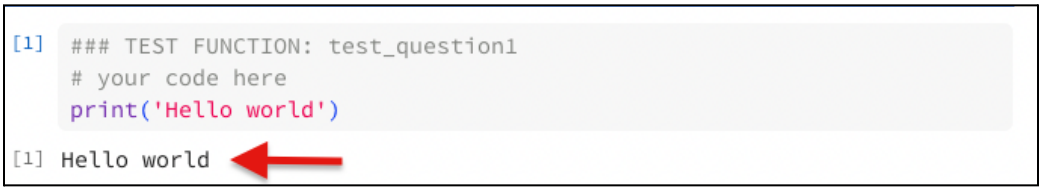
The data for this assignment includes the United States' lower 48 states (usjoin.csv). In addition to the state-by-state data, the dataset contains shape files(us48.shp) for each state that you can use to create the choropleth and proportional symbol maps.

Using the data provided, perform the required analyses and create the requested maps.

Submission Directions for Assignment Deliverables

This assignment will be auto-graded. You must complete and submit your work through Ed Lesson's code challenge to receive credit for the course:

1. In order for your answers to be correctly registered in the system, you must place the code for your answers in the cell indicated for each question.
    a. You should submit the assignment with the output of the code in the cell's display area. The display area should contain only your answer to the question with no extraneous information, or else the answer may not be picked up correctly.
    b. Each cell that is going to be graded has a set of comment lines (ex: ### TEST FUNCTION: test_question1) at the beginning of the cell. **This line is extremely important and must not be modified or removed.**
2. After completing the notebook, run each code cell individually or click "**Run All**" at the top to print the outputs.



3. When you are ready to submit your completed work, click on "**Mark**" at the bottom right of the screen.

4. You will know you have successfully completed the assignment when feedback appears for each test case with a score.
5. If needed: to resubmit the assignment in Ed Lesson
    a. Edit your work in the notebook
    b. Run the code cells again
    c. Click "**Mark**" at the bottom of the screen

Your submission will be reviewed by the course team and then, after the due date has passed, your score will be populated from Ed Lesson into your Canvas grade.

Evaluation

There are three parts in the grading, and each part has one test case where the total number of points for all parts is 50. If the submission fails, we will return the corresponding error messages. If the submission is correct, you will see "Correct" or "The plot is valid with scores for each part.