IE6600 Computation and Visualization for Analytics
Summer 1 Semester 2024
Project 3

Project Assignment:
Geospatial Data Analysis and Interactive Visualization

Objective:
This project centers on analyzing geospatial data and creating interactive visualizations using the Plotly library. Students will select geospatial datasets from **data.gov**, focusing on diverse sectors like urban planning, environmental monitoring, or transportation. The aim is to develop skills in handling geospatial data and craft interactive maps and visualizations that provide insightful geographical context and analysis. The final results must be saved and presented as HTML files.

Preparation:
- Select a geospatial dataset from **data.gov** and get it confirmed by the teaching assistant to ensure its uniqueness.
- Gain proficiency in Plotly for interactive visualization.

Tasks:
1. **Dataset Selection and Confirmation:**
    - Choose a geospatial dataset from **data.gov**.
    - Obtain approval from the teaching assistant to ensure no other group is working on the same dataset.

2. **Data Acquisition and Inspection:**
    - Download the selected dataset and import it into your analysis environment.
    - Conduct an initial inspection to understand its geospatial structure and attributes.

3. **Data Cleaning and Preparation:**
    - Address any issues with missing data, duplicates, or inconsistencies.
    - Ensure the geospatial data is correctly formatted and projected for accurate mapping and analysis.

4. **Geospatial Data Analysis and Interactive Visualization:**
    - Use Plotly to create interactive visualizations and maps.
    - Analyze and interpret geospatial patterns, trends, and anomalies in the data.
    - Save all visualizations as HTML files for easy viewing and sharing.

5. **Reporting:**
    - Develop a report that effectively showcases your interactive visualizations and key findings. **Create a website for an optional.**

6. Advanced Analysis (Optional):
    - Explore more complex geospatial analysis techniques or integrate additional datasets for richer insights.
    - Include these advanced analyses in your report.

Deliverables:

- A Jupyter Notebook containing all code, data cleaning steps, geospatial analysis, and visualization processes.
- Interactive visualizations and maps are saved as HTML files.
- A comprehensive project report in PDF format.
- A website (Optional)

Grading Criteria:

- Originality and relevance of the chosen geospatial dataset.
- Effectiveness and innovation in using Plotly for interactive visualization.
- Accuracy and depth of geospatial data analysis.
- Quality and completeness of the project report.
- Professionalism and impact of the website, particularly the demonstration of interactive elements. (Extra Points)
- Complexity and insightfulness in advanced analysis (if attempted).

Due Date:

- June 17, 2024

For any inquiries or further clarifications, please feel free to reach out. We eagerly anticipate your innovative and insightful geospatial analyses and visualizations!