Technical Demo Flight Plan

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TEAM: <u>FairyMander</u>

1 Overview

The main purpose of the "Technical Demos" is to very clearly communicate the extent to which the team has identified key challenges in the project, and has proven solutions to those challenges. Grading is based on how complete/accurate the list of challenges is, and how convincingly and completely the given demos cover the given challenges.

This template is fleshed out by the team, approved by CS mentor, and brought to demo as a grading sheet.

2 Risky Technical Challenges

Based on our requirements acquisition work and current understanding of the problem and envisioned solution, the following are the key technical challenges that we will need to overcome in implementing our solution:

2.1 C1: Displaying Folium and GeoPandas map(s) on the Web Application

With the usage of Geopandas data storage and visuals using Folium, the challenge will be encountered on how accurate the visualization will be on the web application and how to implement the data taken from Geopandas using Folium onto the web application. In contrast, it is being able to provide a seamless user experience and satisfaction. To achieve this, it is essential to have accurate data visualization and be able to display the map within the web application correctly.

2.2 C2: Obtaining Relevant Census and Demographic Data

Our algorithm will need to utilize accurate demographic and geographic data that works seamlessly with Geopandas. To achieve this we must obtain shapefiles from a reputable source, such as the census website and the redistricting data hub. To prove feasibility we will obtain a shapefile, then use this file to perform meaningful calculations.

2.3 C3: Use Geopandas to Visualize Geographic Data

Geopandas is a python library used for geographic data handling and visualization. To ensure its functionality is suitable for our needs, we will need to create visualizations that express voting district borders and interactively provide insights into relevant district data.

2.4 C4: Use Acquired Data to Compute Redistricting Metrics

We must be able to analyze the data that we have acquired by calculating certain metrics that will be used to evaluate district fairness. For the demo, we simulate districts and go through three different calculations that can be used to evaluate district fairness.

3 Challenges Covered by Demos:

In this section, we outline the demonstrations we have prepared, and exactly which of the challenge(s) each one of them proves a solution to.

3.1 Demonstration 1: Displaying Districts on Web Application Using Folium

3.1.1 Challenges Addressed: C1

3.1.2 Flight Plan: Step-by-Step Overview of Demo

1. Data from shapefiles is gathered using Geopandas to implement an algorithm
2. Geopandas passes that data onto Folium which is used to enhance visualization
3. Folium is used to display the map within a web application

3.1.3 Evaluation:

✓ Convincingly demoed each of the listed challenges?

✓ Other evaluative comments:

3.2 Demonstration 2: Redistricting Data Operations

3.2.1 Challenges Addressed: C2, C4

3.2.2 Flight Plan: Step-by-Step Overview of Demo

1. Data is pulled from the data source files.
2. Pulled data is displayed in a formatted output, such as a table.
3. Table data is used to calculate and display a measure of compactness for a sample district via a Polsby-Popper score.
4. Table data is used to calculate and display a measure of partisanship via an Efficiency Gap calculation.
5. Table data is used to calculate and display a measure of minority representation through determining whether a district is minority-opportunity.

3.2.3 Evaluation:

- ✓ Convincingly demoed each of the listed challenges?

- ✓ Other evaluative comments:

3.3 Demonstration 3: District Visualization in Geopandas

3.3.1 Challenges Addressed: C3

3.3.2 Flight Plan: Step-by-Step Overview of Demo
1. Data is pulled from data source files.
2. Data is displayed in an interactable map.
3. Map consists of current voting districts, with accurate population/demographic information.
4. Pie chart infographic accompanies numerical data to display demographic info.

3.3.3 Evaluation:

- ✓ Convincingly demoed each of the listed challenges?

- ✓ Other evaluative comments:

4 Other Challenges Recognized by not Addressed by Demo:

All of the stated challenges are being addressed in the given demos.