Criterion A - Planning

Client and Problem

The client is Mr. Krueger, my AP European History teacher, who wanted a way to visualize population changes in Europe over time. He was looking for a tool to help his students see how historical events shaped demographic shifts, but couldn't find anything online or in textbooks that showed this clearly. Animated cartograms can show these changes by resizing countries based on data like population, but they are complex to implement.

After talking with Mr. Krueger about what he needed, I offered to build the visualization myself. The goal was to create a stable, readable animation that illustrates how European populations grew and shrank across different time periods. Since the map must distort shapes to reflect population, keeping countries recognizable while showing accurate data was the main challenge.

Rationale for Solution

I chose to create an animated cartogram instead of a more conventional visualization like an animated bar graph, because bar graphs—while clear—are overused and don't communicate the spatial relationships between countries. I also considered using bubble maps or simplified circle-based representations, but those lost too much of the geographical context, which was important for helping students connect the data to real-world locations. I built the project in p5.js because it gave me easy access to low-level graphics functionality, which was essential for drawing and manipulating complex polygon shapes. Additionally, p5.js offers strong support for vector math through the `p5.Vector` class, which made it easier to calculate forces and transitions during the animation process. This setup allowed me to keep the project

browser-based, interactive, and visually engaging while maintaining a sense of the underlying geography.

Success Criteria

1. The cartogram should accurately reflect population data with the size of each country.

2. The animation between years should be smooth and stable, with no visual glitches or abrupt changes.

3. Countries should remain recognizable in shape and position despite distortion.

4. The visualization should clearly show how populations have changed over time.

5. The controls for interacting with the animation should be easy to understand and use.

6. It should perform well in a web browser, running smoothly without crashing or slowing down.