

Will Merrow
Programming Interactive Visualizations
11/11/20

Final Project Proposal

My final project will use data on the partisan lean of states and congressional districts to show how the U.S. presidency, House of Representatives, and Senate are all structurally biased against Democrats. The user will be able to try different popular vote scenarios and see how Republicans can win control of all three branches of government even while losing the popular vote by a substantial margin.

Data Sources

I will use the [Partisan Lean](#) dataset from FiveThirtyEight, which includes the partisan lean for all states and congressional districts relative to the national average. This is calculated by averaging the vote in the 2016 and 2012 presidential elections as well as state legislature votes, weighting the 2016 election results most heavily. If the 2020 results are complete in the next month and the presidential results are available by congressional district, I will swap in the new data.

I will also use data on the number of electoral votes of each state, and possibly state and congressional district [shapefiles](#) from the U.S. Census.

Visualization

The user will be able to adjust the popular vote scenario using a slider and see how the selected margin of victory translates to different outcomes in the presidency, House, and Senate. The default state will show how if the national popular vote is tied 50% to 50%, Republicans win the presidency, (because of the electoral college), the House (because of gerrymandering and Democrats clustering in cities) and the Senate (because there are more Republican-leaning states than Democrat-leaning states). By interacting with the slider, the user will be able to explore different popular vote scenarios and see how large of a popular vote margin Democrats need in order to win.

Below the slider will be visualizations of the outcome in the presidency, House, and Senate. Each of the three sections will show the seats or electors won by each party under the chosen scenario, through a stacked bar chart and likely a map. The bars and maps will include the same information – the bars will emphasize which party wins control, and the map will show geography. Given the large number of House seats, the stacked bar chart for the House may be a grid of squares rather than a traditional bar chart.

My current thinking is the three maps will resemble this [election map](#) from Le Monde where electoral votes or seats are shown as squares or other shapes so they are

comparable regardless of geography. I plan to overlay these on a standard geographic map of the U.S. using the Albers USA projection, although this may prove difficult for the House map where there will be crowding in the cities.

Below the visualizations I will include text explaining the calculation methodology, as well as why the rules of the electoral college, gerrymandering, etc. which bias the institutions against Democrats.

Calculation

Rather than take into account the variability of elections or which seats parties currently control, I will do a simple calculation: if there were an election, which states and congressional districts would each party win based purely on the partisan lean of each state or district, and the partisan lean of the national popular vote. I will assume that the vote split in each state and district will be equal to the same popular vote split plus the partisan lean of that state or district.

For example, if the national popular vote is D+2 percentage points and a state's partisan lean is D+1, the state is counted as D+3, meaning Democratic control for the purposes of calculating the number of Democratic senators and electoral college votes. I will assume that all senators and representatives are up for election in addition to the president, even though the offices up for election vary by year.

This does not account for incumbency or random variability, but the goal of the visualization is to show the structural bias in the system if each state and district voted exactly according to their partisan lean. I will need to determine how to treat ties in election outcomes.

Technical Plan

I do not know yet whether the map data will be part of the map (using lat/lon), or simply overlaid on top of SVG maps (using a simple coordinate system to position the visual elements).

Performance is another question, as I would like for the user to be able see changes instantaneously as they use the slider, without any lag, and I would like to include a large number of scenarios, e.g. D+0.1, D+0.2, D+0.3, etc. This will either involve doing a large amount of calculations on the fly in the JavaScript or including a large number of columns so that all of the scenarios are included in the data file. I imagine the latter solution could result in a longer load time on arrival but faster performance when changing the slider.