Executive Summary (1 page or less)

1) Briefly describe your proposed idea (paragraph or two, this can be an updated version of your proposal). What's the concept you'll be explaining?

A confusing aspect of US presidential elections is that the person with the most votes is not necessarily the winner of the election. This counterintuitive phenomenon is due to the fact the Electoral College system gives voters in some states more power than voters in other states. Though the system was designed to give representation to the states, in many ways it suppresses the voice of the people and challenges the notion of "one person, one voice".

My visualization will explain some of the quirks the Electoral College system. Namely, how electoral votes are distributed and the impact that population size and voter turnout can have on the relative voting power of citizens.

2) What level are you trying to teach for (high school? college? graduate school?). You should probably not be aiming at elementary school level, but if you have a great idea that's ok.

High school or above

Learning Objectives (1 page or less)

3-5 learning objectives for your project.

1. The student/viewer will be able to **explain** why the Electoral College challenges the idea of “one person, one vote”
2. Student’s will be able to **identify** states between which an imbalance of voting power exists.
3. Students will **demonstrate** how changing voting laws or voting turnout would affect an election

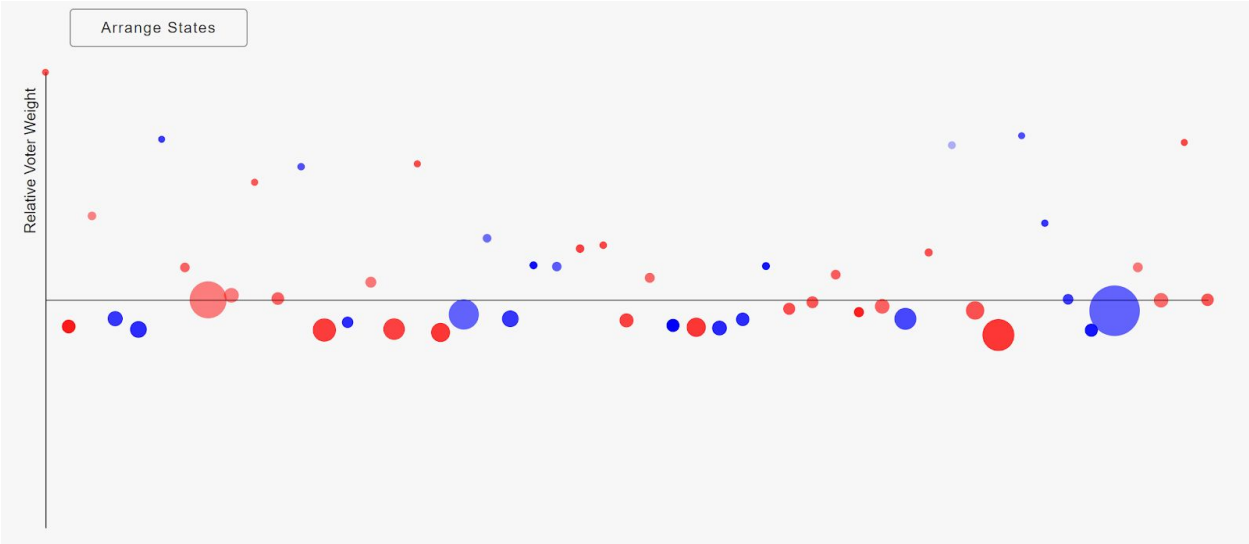
Create an Exam

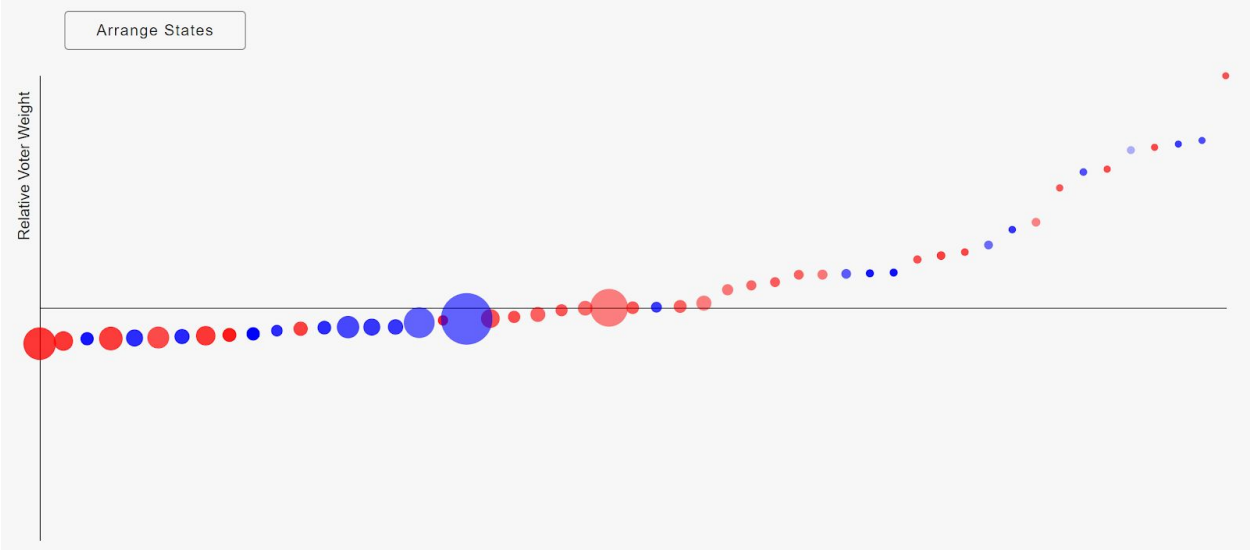
1. Which states are favored by the Electoral College system?
    a. Coastal States
    b. High population
    c. Low population
    d. High voter turnout

2. What ways could the current Electoral College system be adjusted to give more pairity to voters in different states?

3. Which factors could you adjust to manipulate the power individual voters have in presidential elections? Select all that apply
    a. State population
    b. Voter turnout
    c. Voting hours
    d. Quality of the candidates

Your sketch/screenshots (as many pages as you need)





Voter Age Population: 10,000,000

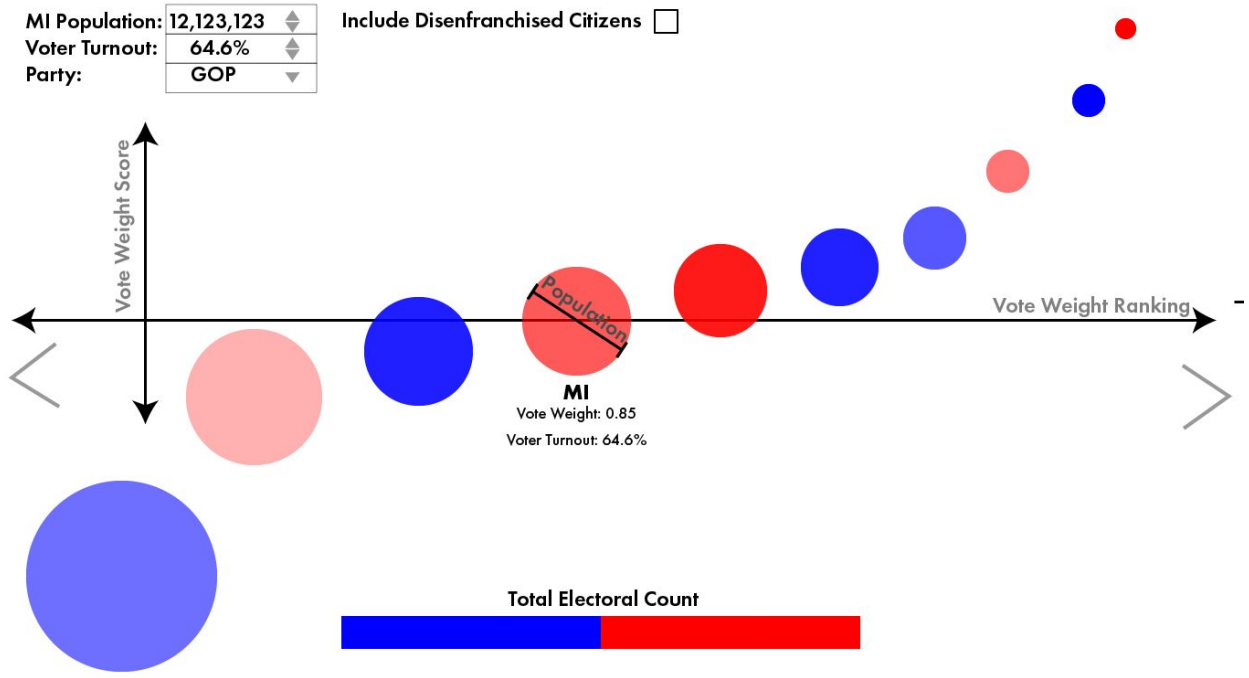
Voter Turnout: 68%

Number of Electoral Votes: 3

Relative Voter Weight: 1.0

In these screenshots you see the states aligned alphabetically along the x axis, when the button is clicked, states are colored by their party affiliation and their y position changes based on their relative voter weight. Finally the states are reordered based on their relative voter weight.

Below users can adjust the population of a made up state and see how it changes voter weight and electoral votes distributed.



In this screenshot states are represented as bubbles along a set of axis. The states are reverse ordered along the x axis according to their Voter Weight ranking, meaning the state with the highest voter ranking is the furthest right. The X axis remains still, but viewers can use the arrows to adjust the bubble in focus and effectively change the origin right now MI is in focus and the origin is (44, .85).

As users adjust the state population, voter turnout or party, the bubble size, opacity, color and ultimately order in the ranking will change. When users select “Include Disenfranchised Citizens” bubbles will increase in size and possibly change positions.

Why will your vis help? (2 page or less)

The difficulty with understanding the Electoral College is two fold. On the one hand it is not immediately clear what causes the discrepancy in voting power in states when the concept presents itself as being a vehicle for better representation. Second it is difficult to understand the tipping points in the variables - ie in our current system how dramatic must the changes to individual states be to reach some kind of parity?

For the first issue, my visualizations allows students to clearly understand the interplay of state population size and voting power. In the first visualization viewers can start to recognize trends of population size emerging. Presented as a scatter plot allows users to see the large discrepancies between state's relative voting powers. Finally, by starting the states off at the median voting weight the weakness of the current system become immediately salient.

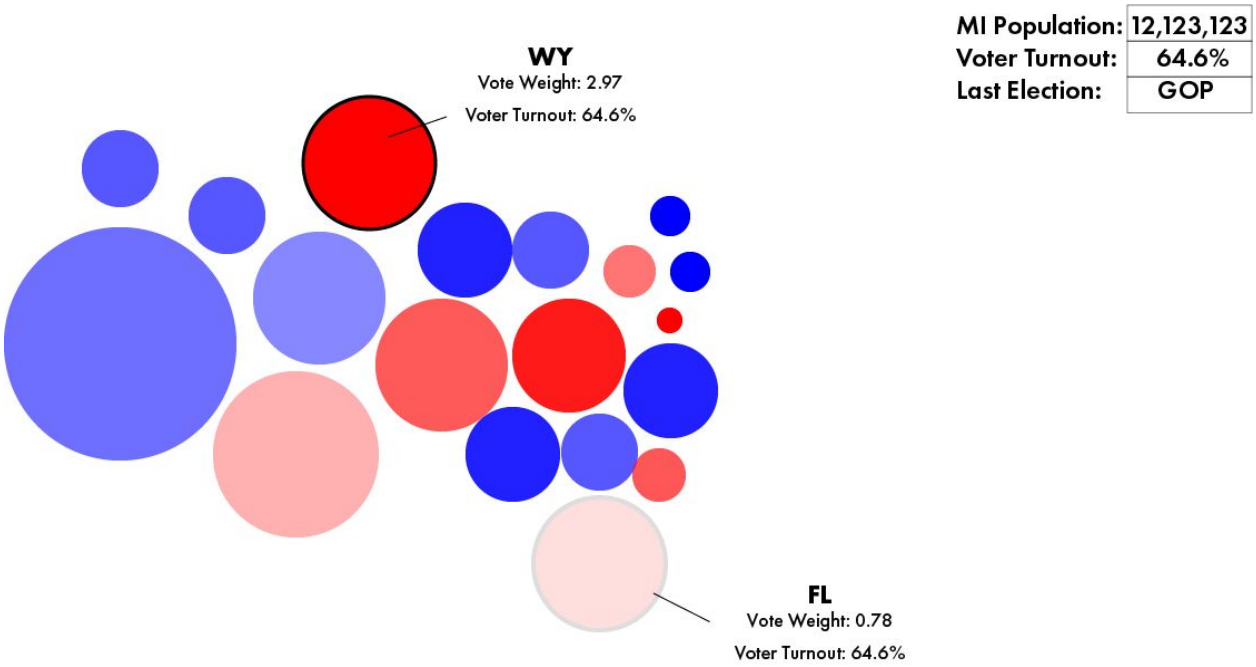
My second visualization aims to address the second issue by giving users the ability to interact with an imaginary state's population. Students can manipulate the states population and see how that directly affects the voting power and electoral college votes distributed.

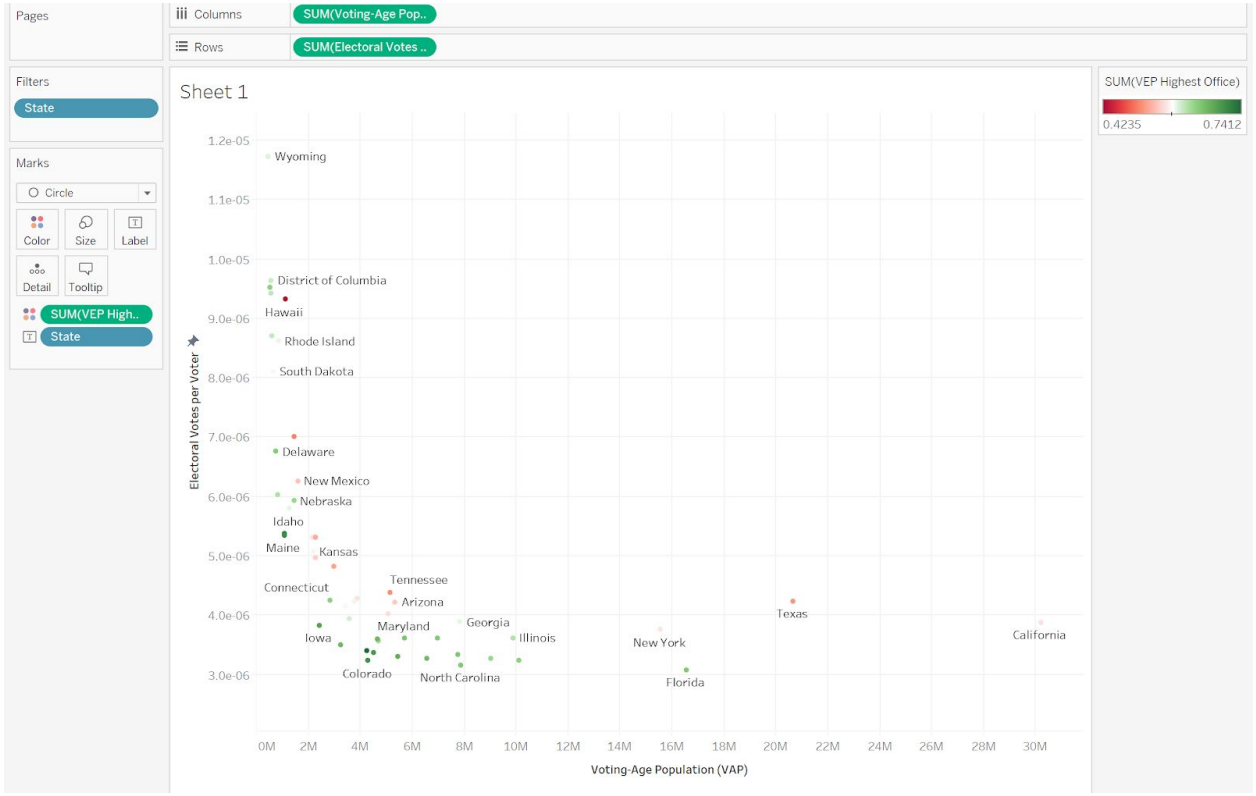
For this visualization I have encoded my data to make the most important factors most salient. X and Y axis represent rank and voting power respectively because position encoding allows for the greatest possible accuracy for perception. Essentially, the voting weight is double encoded because it is an vital part of this visualization and I want to ensure its encoding has high effectiveness. Next I have chosen to encode population into bubble size because while area is less accurate, this comparison will oftentimes be dramatic enough for viewers to perceive the differences. I used color to encode party as it will be familiar to those with some knowledge of US politics. Finally, opacity was used for voter turnout because it enabled a metaphor for the degree to which a state was present. In summary, my visualization is expressive on the following factors: voter weight, voter weight rank, population and voter turnout. My visualization chooses encodings to maximize the expressiveness of the most important of these factors and moves from there.

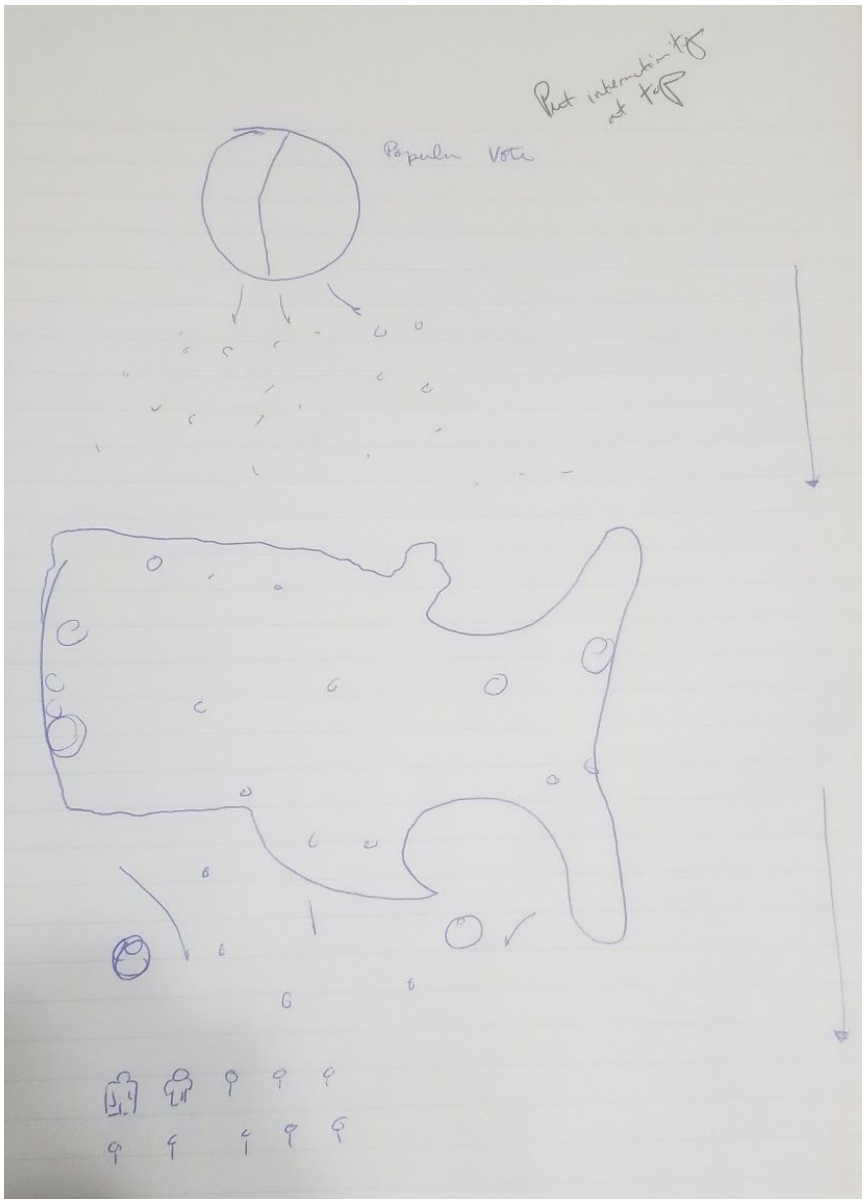
My design is limited because currently it only allows users to modify the population of our imaginary state, it does not allow them to modify other variables or to modify variables of the real states. Further, my design uses an approximation of the electoral distribution system rather than recreate it. I chose to use an approximation because the focus of this visualization was not on the method by which states are allocated electoral votes, but rather the effect that that allocation has.

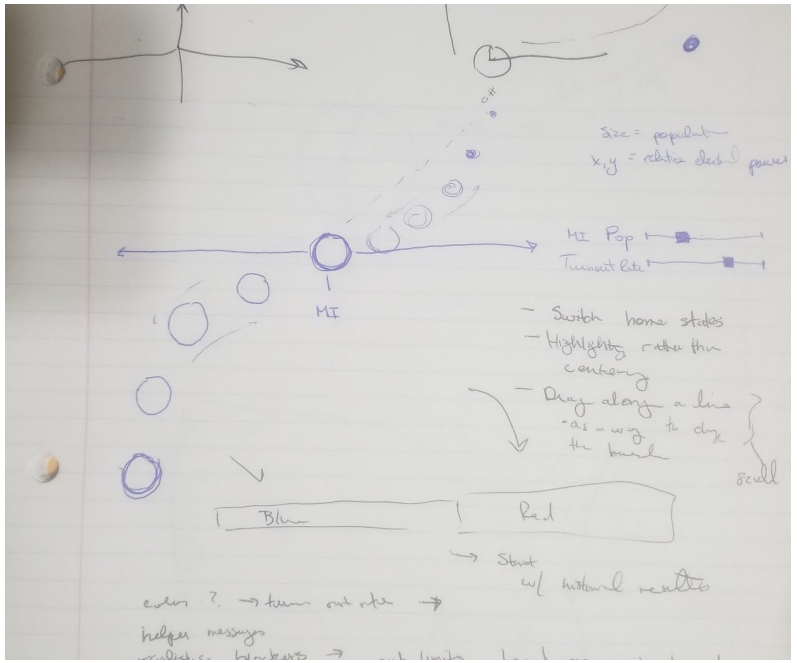
I think my interaction will help students understand the relative voting power differences between states and gain a sense of how drastic the differences can be.

Archive of Experiments (as many pages as you need)





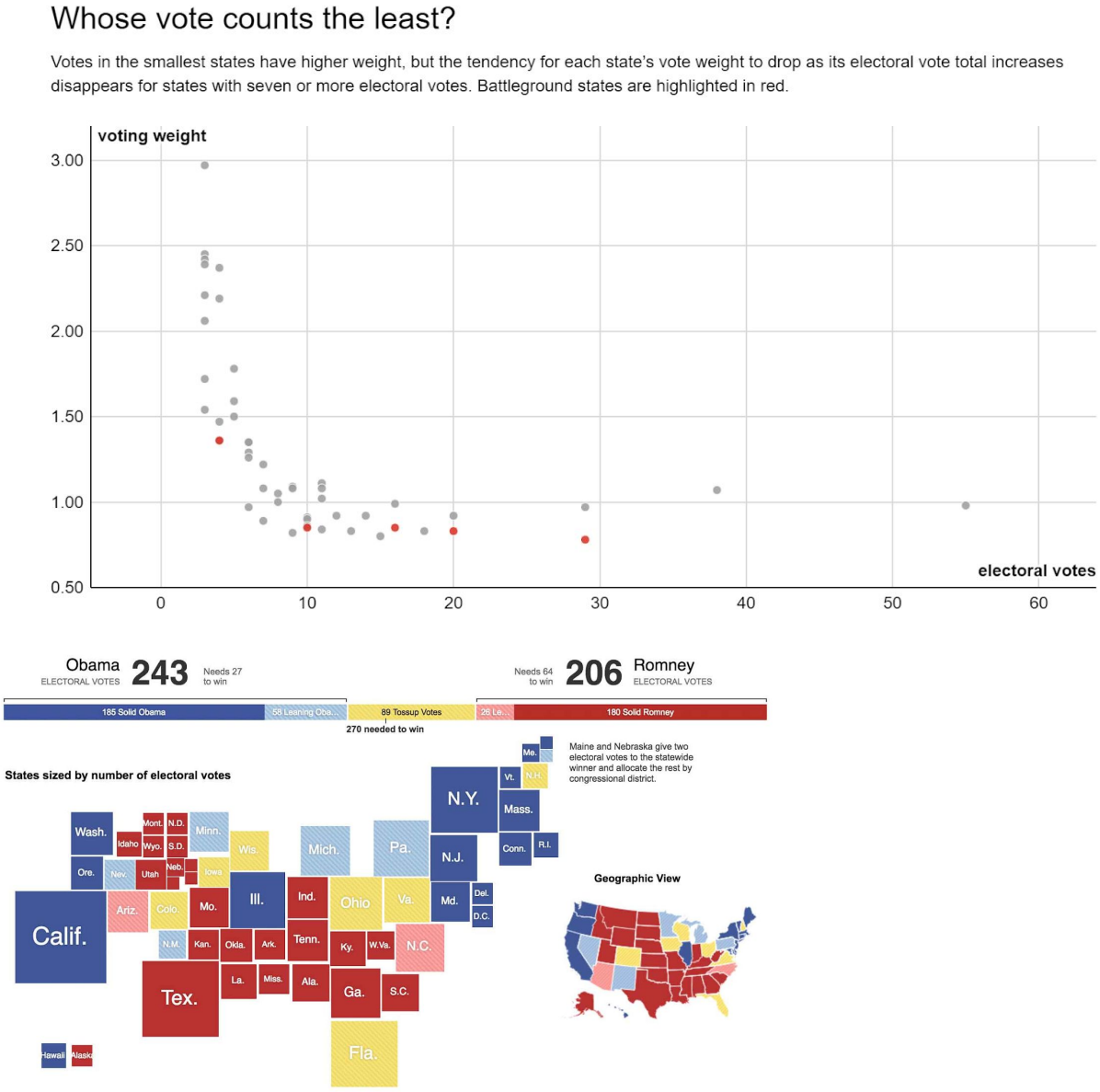

Popular Vote

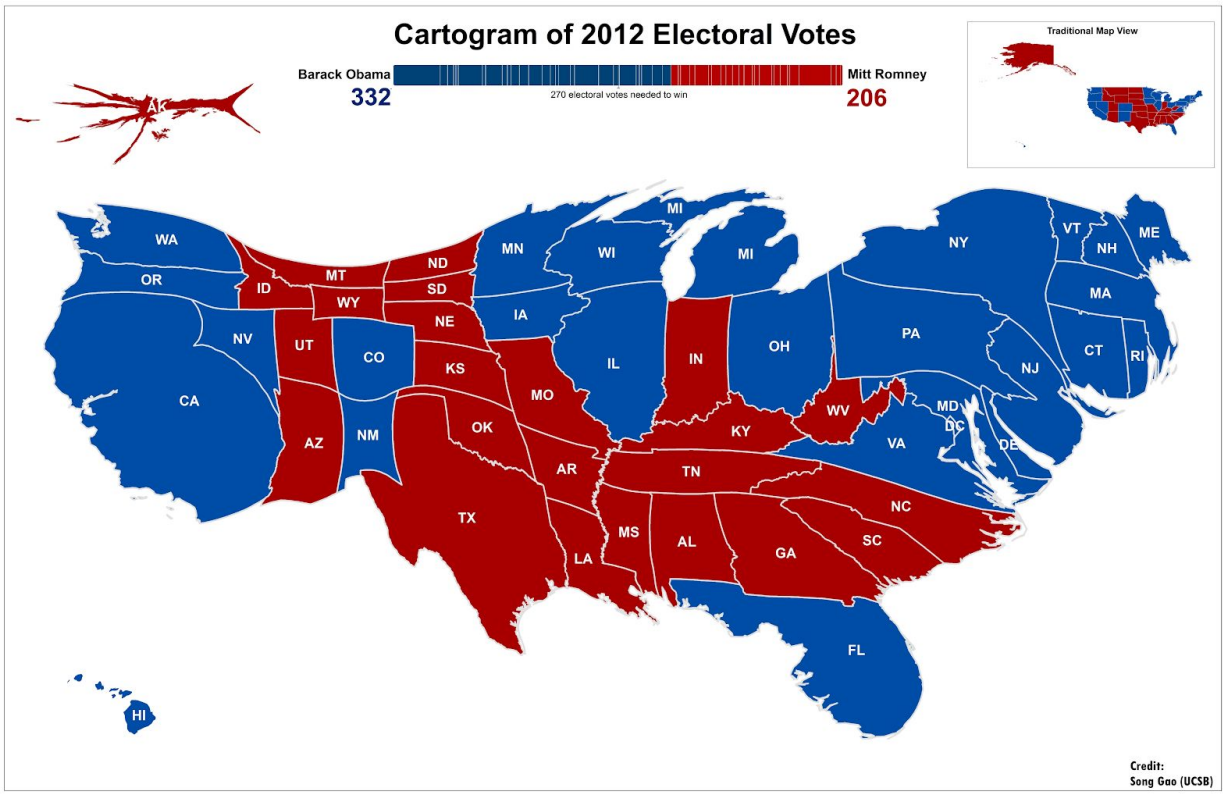

size = population
x,y = relative electoral power
MI Pop
Turnout Rate
MI
- Switch home states
- Highlighting rather than centering
- Drag along a line as a way to clip the bounds
scroll
Blue
Red
Start w/ historical results
helper messages

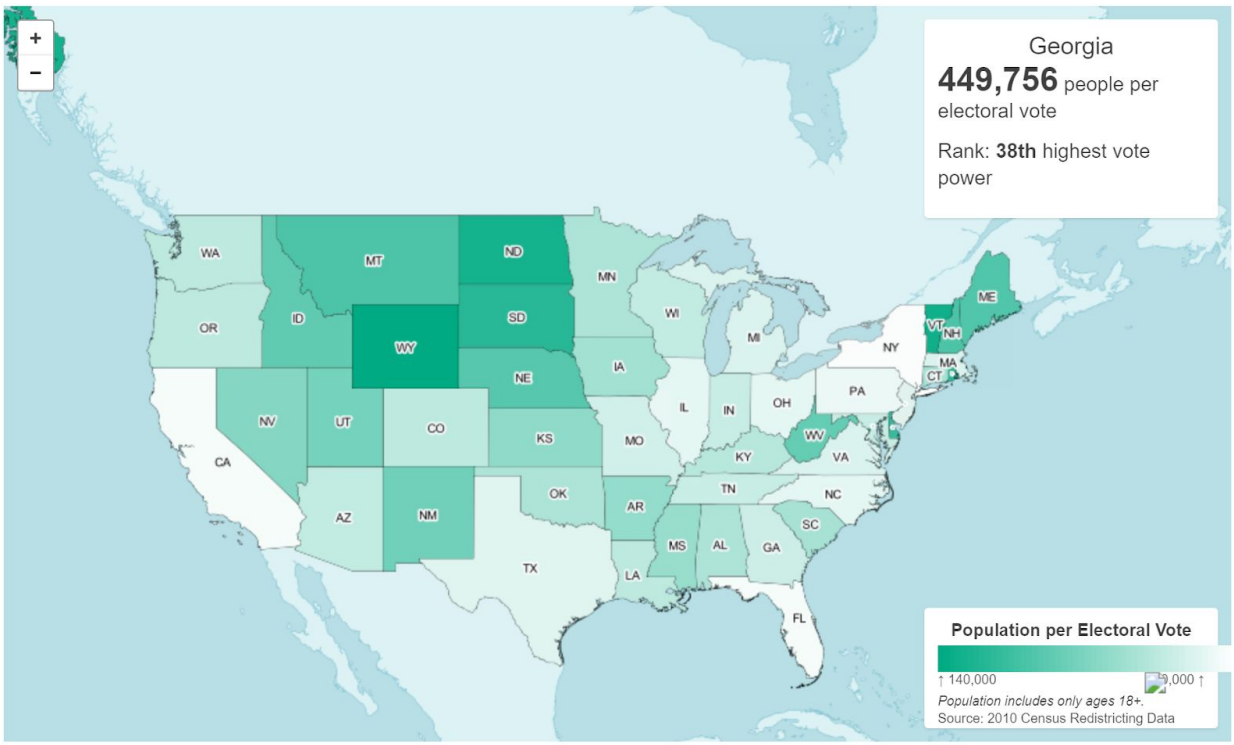
Inspiration/Competitive Analysis

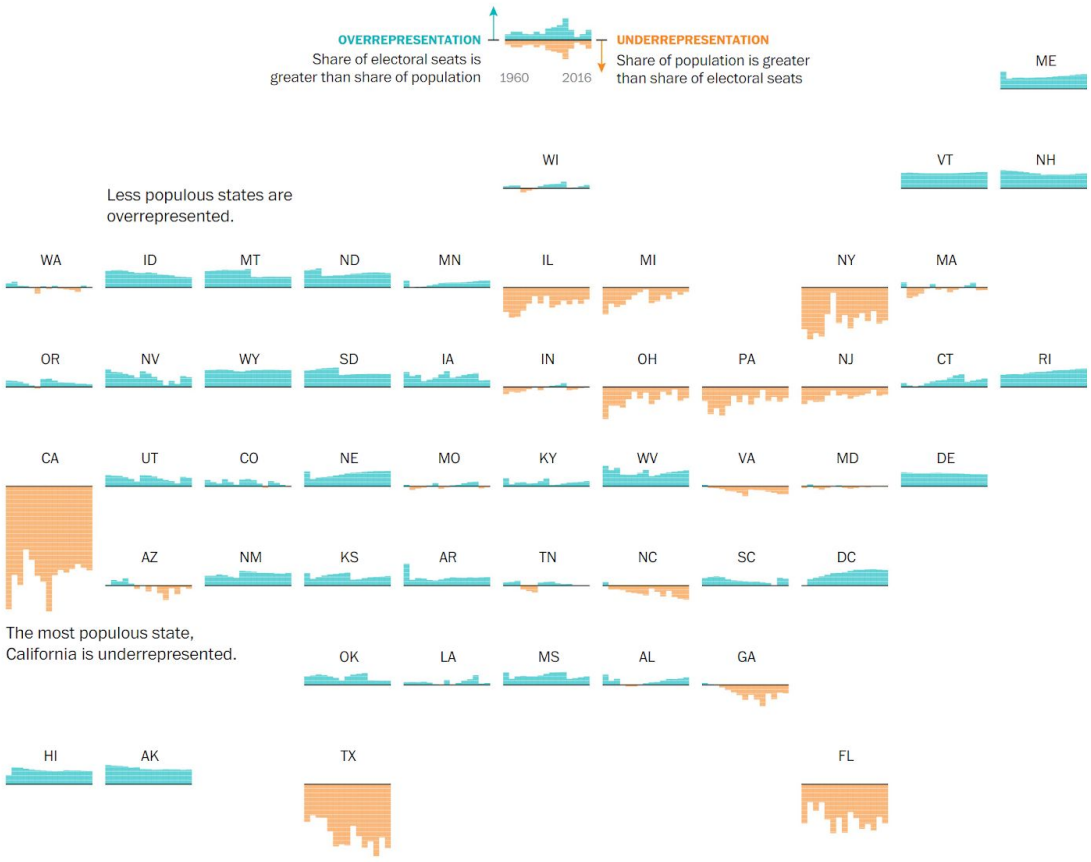
Start by October 23rd, and updated as you go

Keep screenshots (and references) to other solutions that you're using as inspiration for your solution (things you found on the Web, in books, in papers, etc.). Keep notes about what works/doesn't. Keep adding to this as you work. Do not skip this! ***We expect to see examples here (it's rare that no one has ever created a visualization for any idea).***

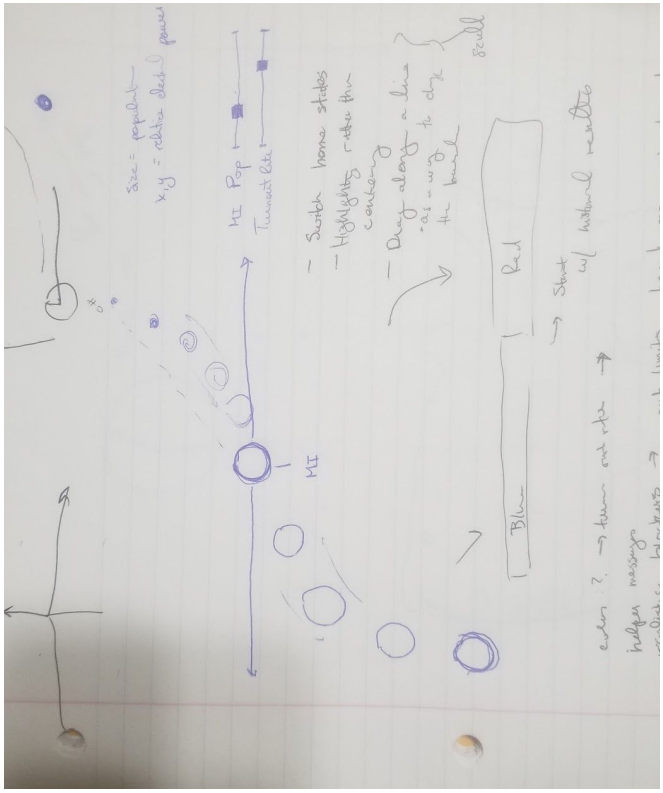



Cartogram of 2012 Electoral Votes
Barack Obama
332
270 electoral votes needed to win
Mitt Romney
206
Traditional Map View
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
MD
DC
DE
NJ
CT
RI
MA
VT
NH
ME
HI
Credit:
Song Gao (UCSB)


Georgia
449,756 people per electoral vote
Rank: 38th highest vote power
Population per Electoral Vote
↑ 140,000
9,000 ↑
Population includes only ages 18+.
Source: 2010 Census Redistricting Data


OVERREPRESENTATION
Share of electoral seats is greater than share of population
1960
2016
UNDERREPRESENTATION
Share of population is greater than share of electoral seats
Less populous states are overrepresented.
The most populous state, California is underrepresented.
ME
WI
VT
NH
WA
ID
MT
ND
MN
IL
MI
NY
MA
OR
NV
WY
SD
IA
IN
OH
PA
NJ
CT
RI
CA
UT
CO
NE
MO
KY
WV
VA
MD
DE
AZ
NM
KS
AR
TN
NC
SC
DC
OK
LA
MS
AL
GA
HI
AK
TX
FL

Peer-Robin Notes (If you get interesting feedback you want to share)



- Encode winning party into color of bubbles
- Rotating through states might be difficult on the edges (50th state and 1st state for example would make centering awkward)
    - The idea of centering a state presents issues of scale
- Consider keeping total tally of current voters