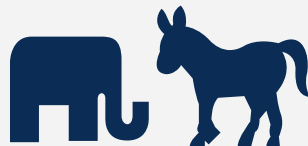


# U.S. Presidential Elections Results

## Python EDA Project



Erin Yu

Dec 29, 2023

# Background & Research Questions



## Electoral College

Which states hold more “deciding power” during the election and by what measurement?

## Political Landscape

How state party alignment has changed over time? Which states are solid blue/red states vs swing/battleground states?

```
graph TD; A[Which states hold more “deciding power” during the election and by what measurement?] --- B[Which states to focus on during 2024 Presidential Election Campaign?]; C[How state party alignment has changed over time? Which states are solid blue/red states vs swing/battleground states?] --- B;
```

***Which states to focus on during 2024 Presidential Election Campaign?***

# Dataset

- 1976 - 2020 Presidential Election Results compiled by MIT Election Data and Science Lab
- This data file contains constituency (state-level) returns for elections to the U.S. presidency from 1976 to 2020 published by MIT Election Data and Science Lab
- Merged additional state level data points such as number of Electoral votes, 2022 citizen population and 2022 GDP in USD
- Biggest challenge was to draw insight from very limited features of the dataset





# Electoral College



# How are Electoral Votes Allocated?



## Among the States

- based on the Census
- Every State is allocated a number of votes equal to the number of Senators and Representatives in its U.S. Congressional delegation

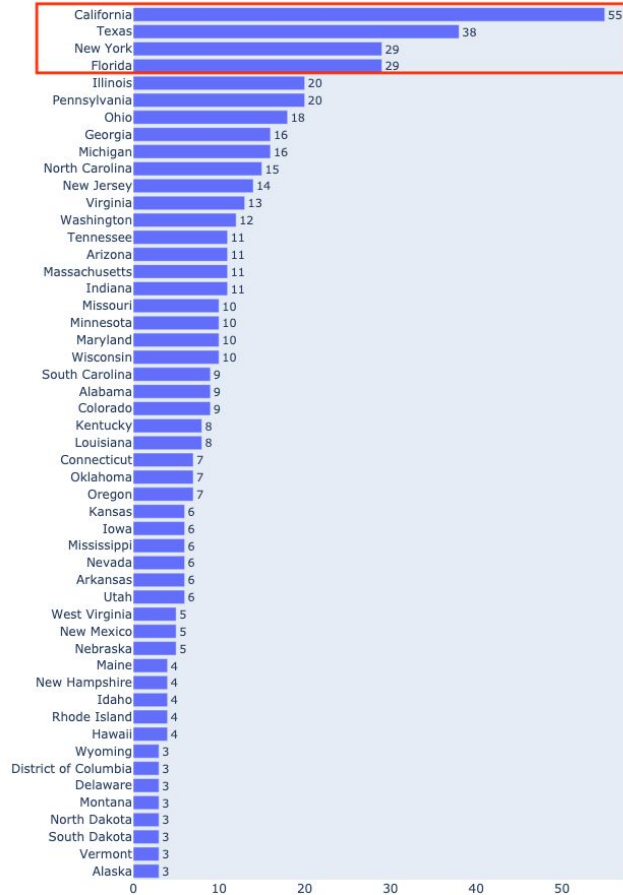


## Within each State

- All States, except for Maine and Nebraska, have a winner-take-all approach
- Maine and Nebraska use the "congressional district method"

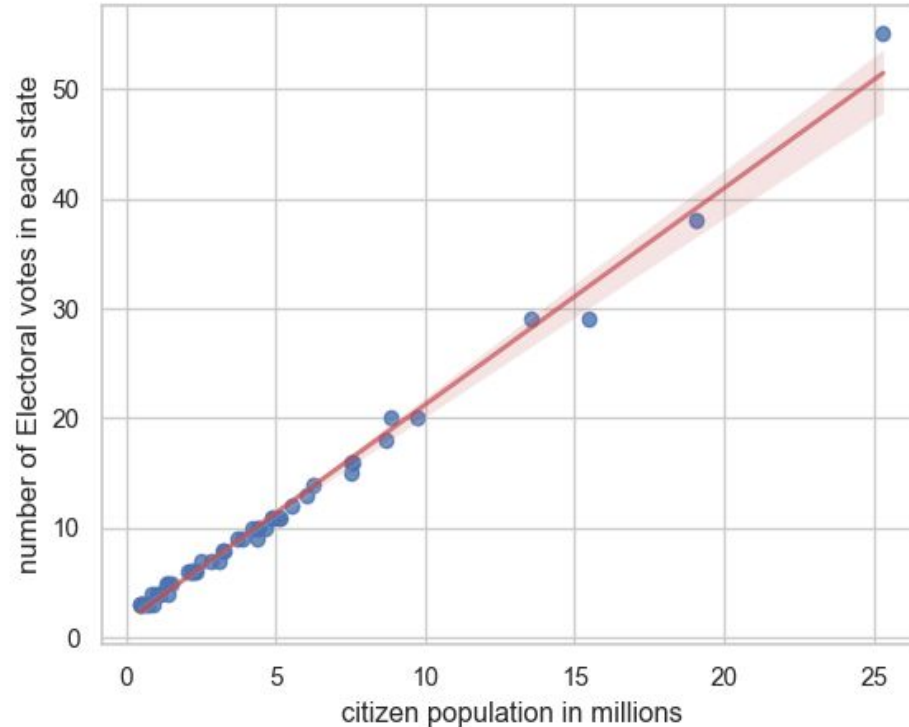


Number of Electoral votes in Each State



- There are 538 electoral votes, and a candidate needs a majority (270) to win the presidency
- California, Texas, New York and Florida hold a lot of “deciding power” measured by number of Electoral votes

# Is there a relationship between the citizen population and the number of Electoral votes?



Pearson  
correlation  
coefficient:  
0.996

P-value < 5%

+

+

+

+

Number of Electoral votes per million of citizen population

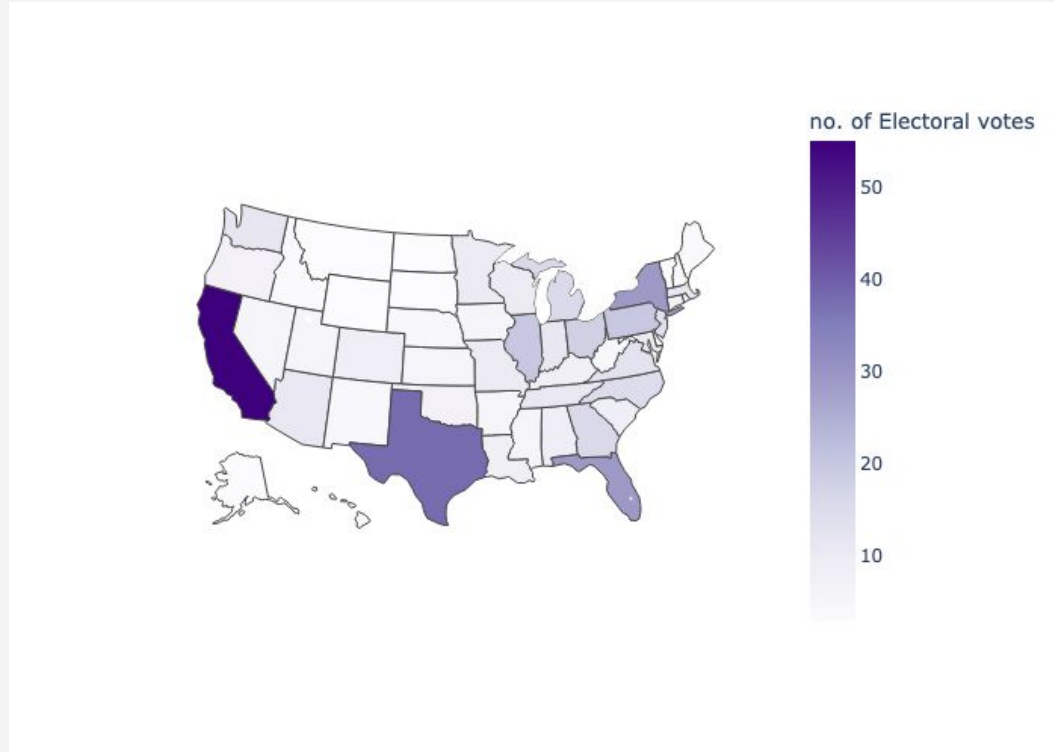


- Wyoming, Washington DC, Alaska, Vermont hold a lot of “deciding power” measured by the number of Electoral votes per million of citizen population
- 1 million of citizen in Wyoming have three times more “deciding power” compared to 1 million of citizen in California



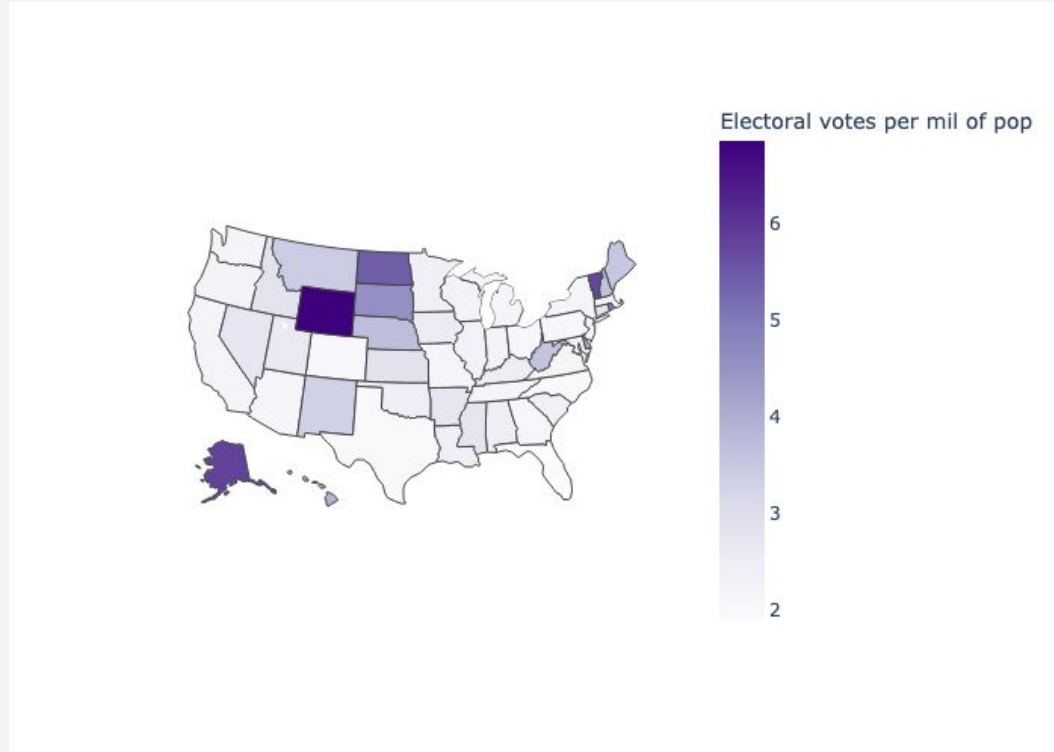
# Map of “Deciding Power” Distribution

Measured by number of Electoral votes



# Map of “Deciding Power” Distribution

Measured by number of Electoral votes per MM of citizen population





Going back to our main research question “Which states should we focus on during the election campaign? States with larger numbers of Electoral votes or states with higher Electoral votes per MM of citizen population?”



It depends!

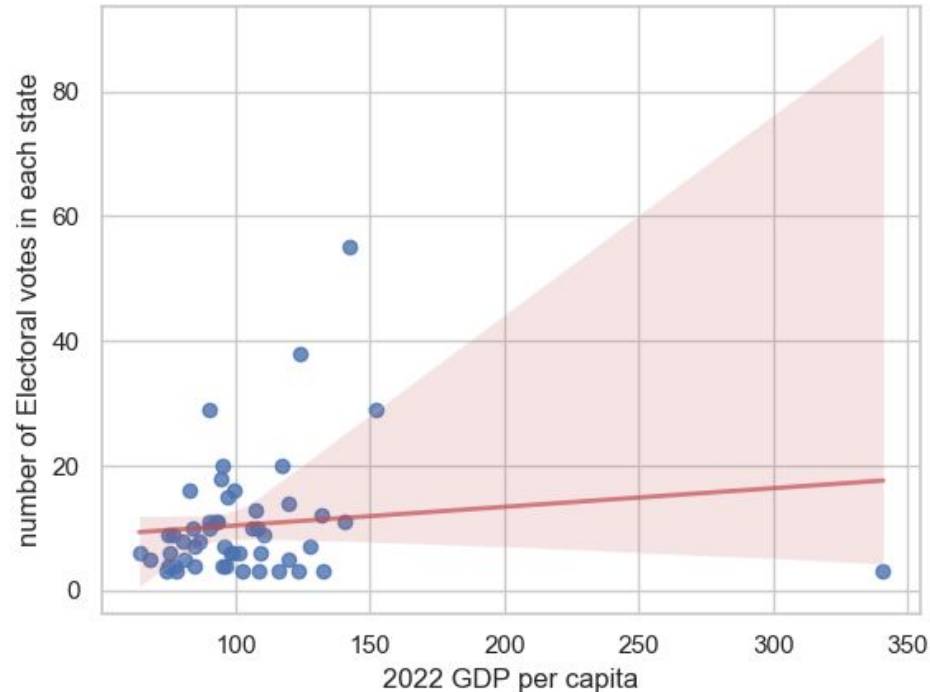




Should we consider other factors such as GDP per capita  
when distributing Electoral votes?



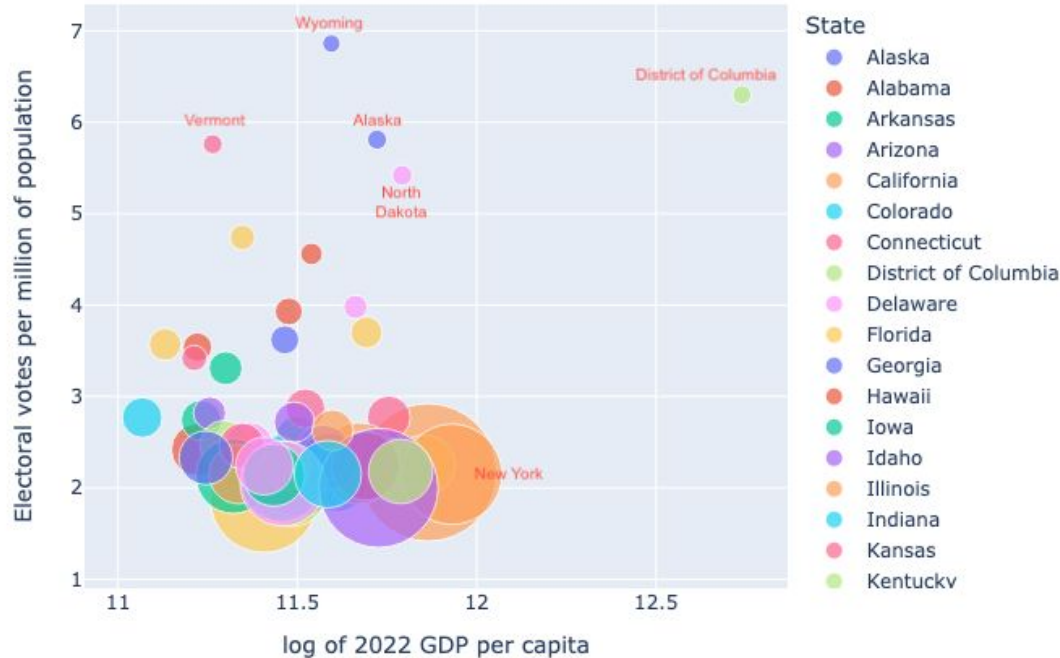
Currently there is no strong correlation between the State GDP per capita and the number of Electoral votes.



Pearson correlation coefficient: 0.123

P-value > 5%

# Should GDP per capita be considered in the distribution of Electoral votes?



- The bubble size represents the citizen population of each state..
- Under the current Electoral College, many states that generate lower GDP per capita hold greater “deciding power” during the election. Do you think the current system is reasonable?

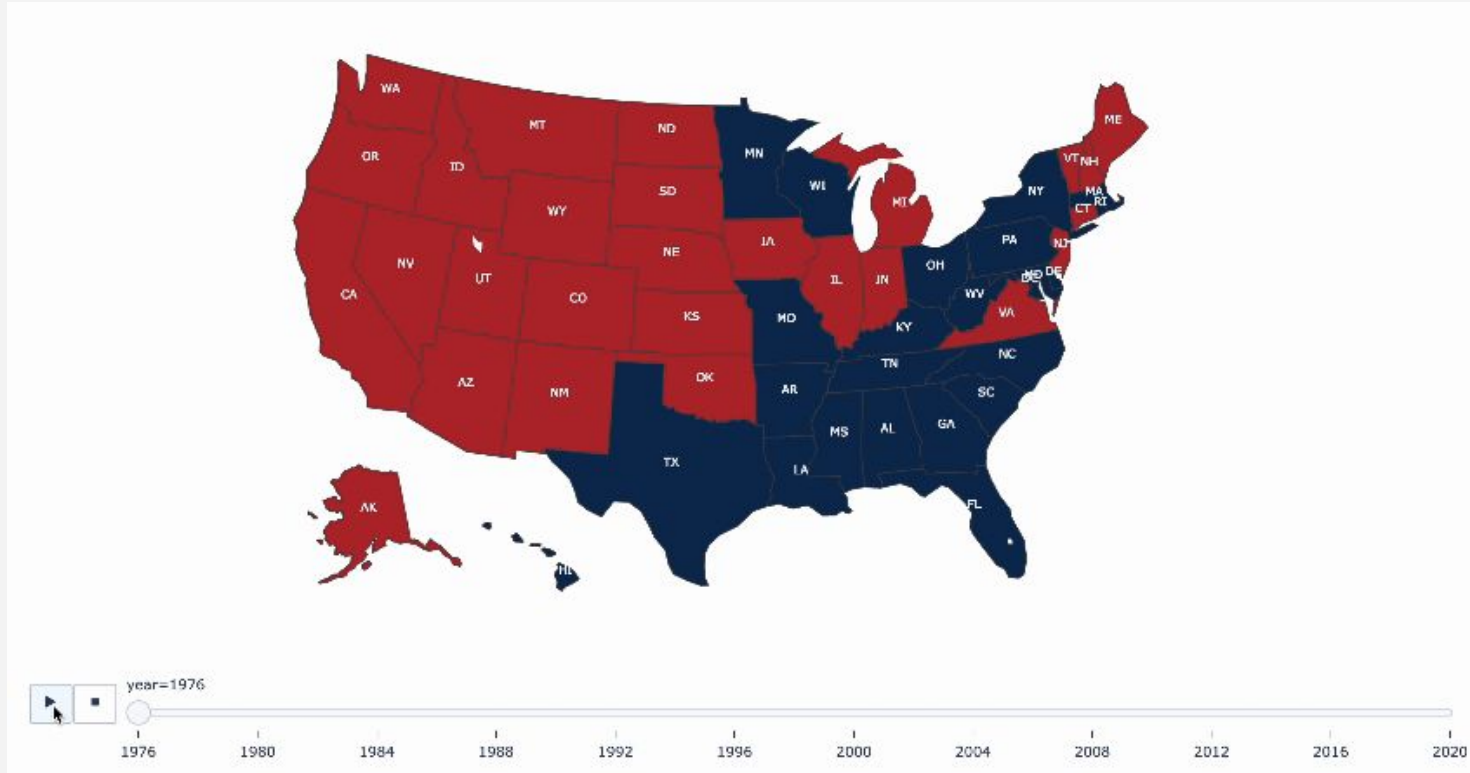


# Change in Political Landscape



# Electoral College Map from 1976 - 2020

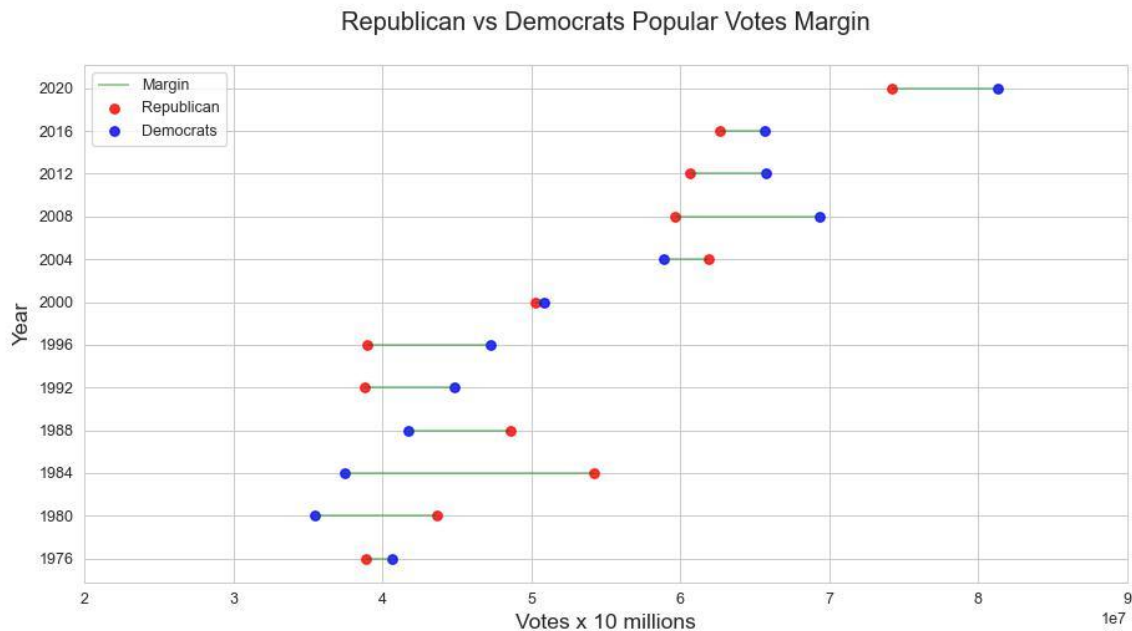
Red - Republican / Blue - Democratic



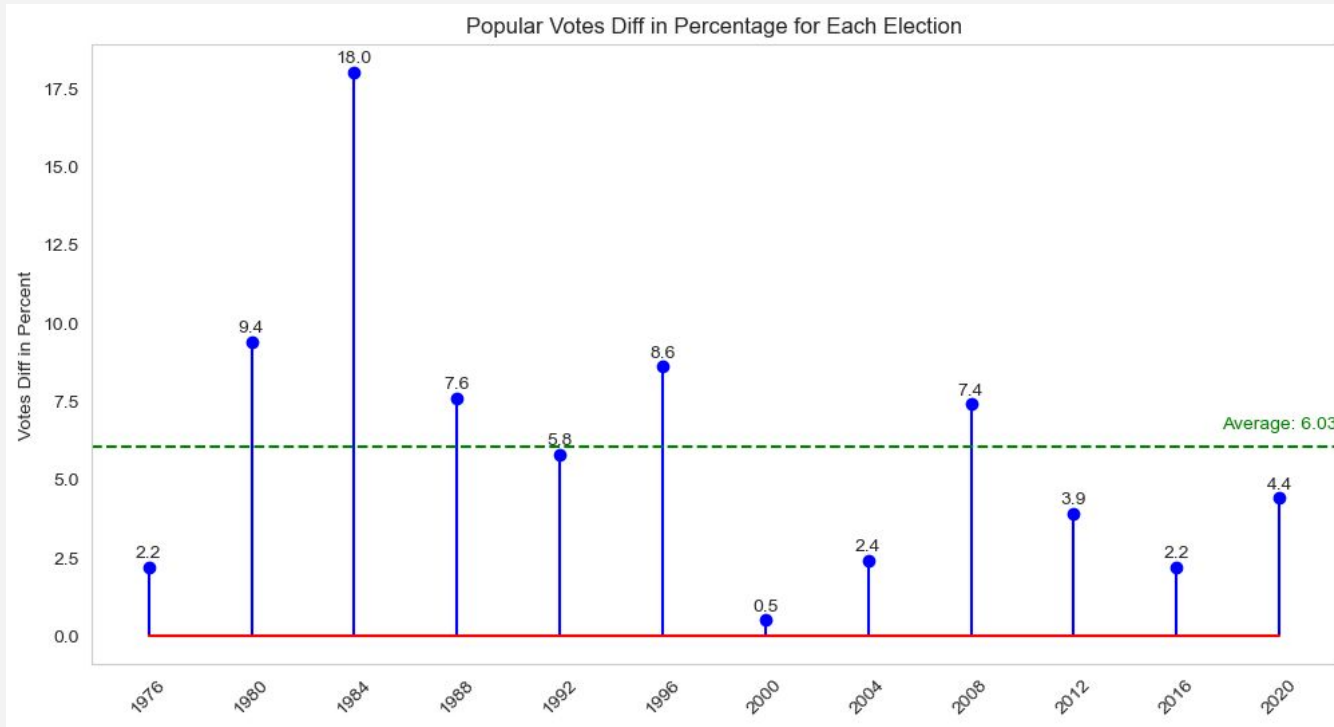


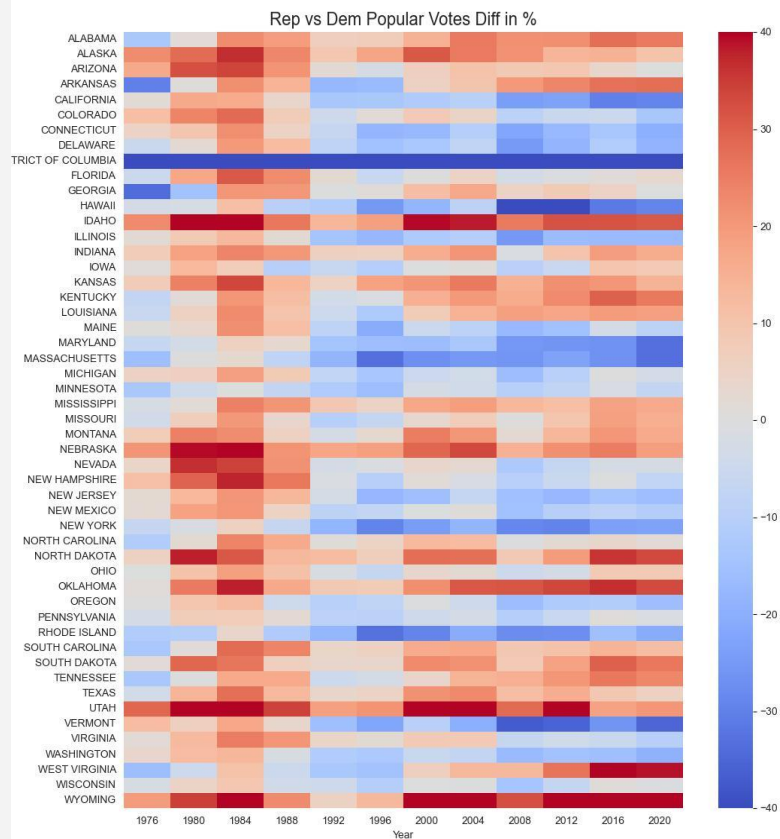


# Margin of victory by popular vote



# Margin of victory by election (in %)



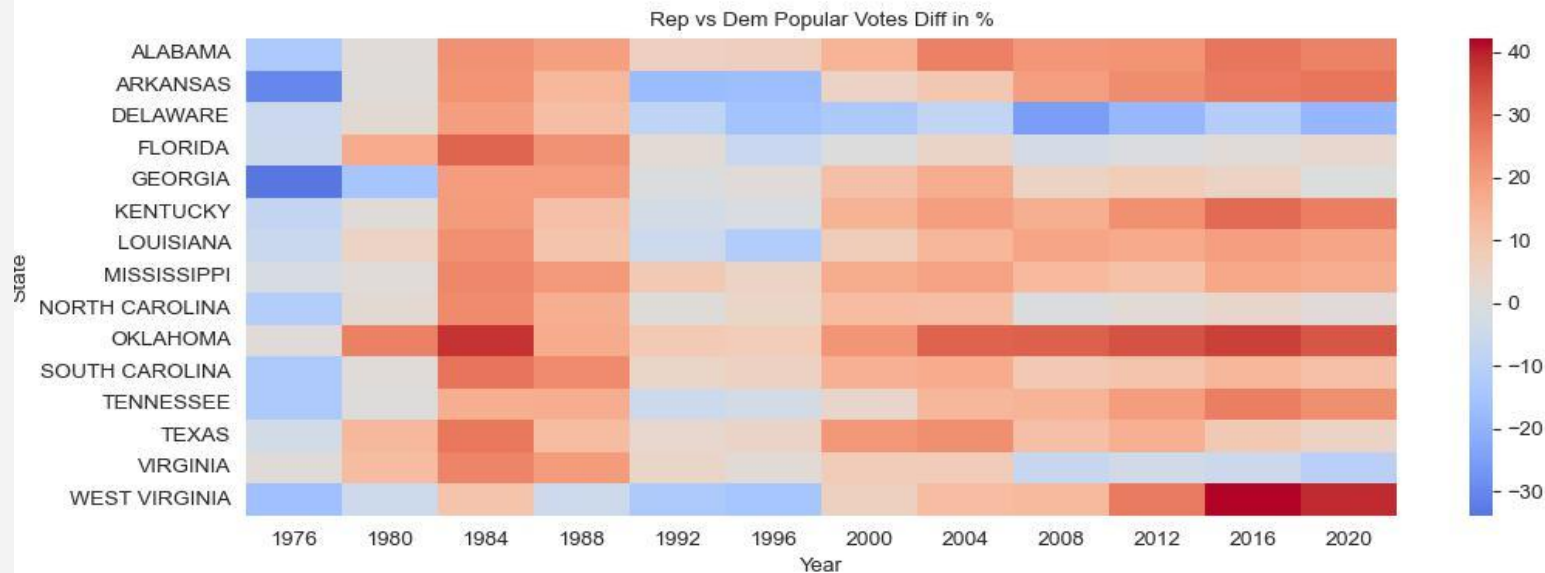


## Rep vs Dem Votes diff in %

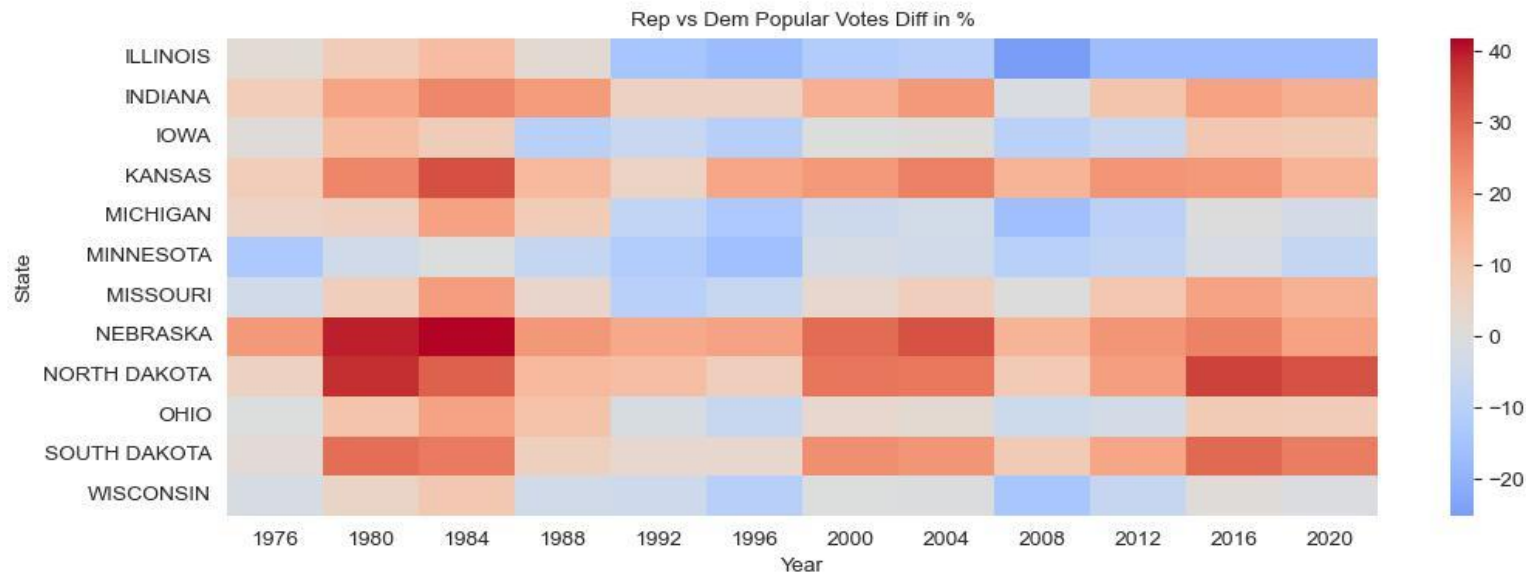
- For each election year, I took the difference between Rep votes and Dem votes, then divide the difference by the total number of votes from that year.
- Any patterns you could spot from the plot?



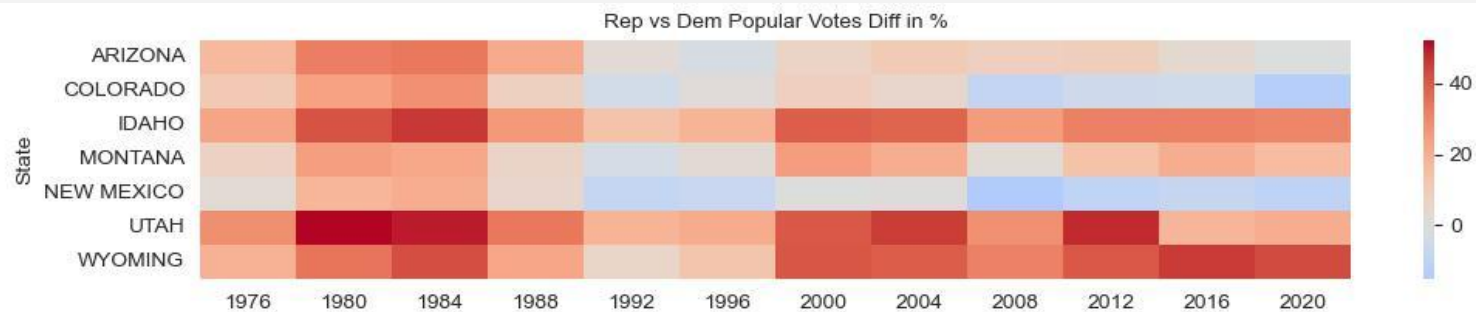
## Rep vs Dem votes diff in % - South



## Rep vs Dem votes diff in % - Midwest

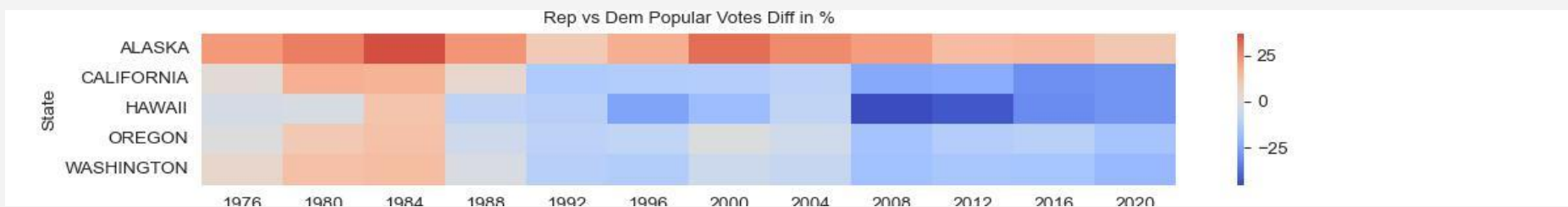
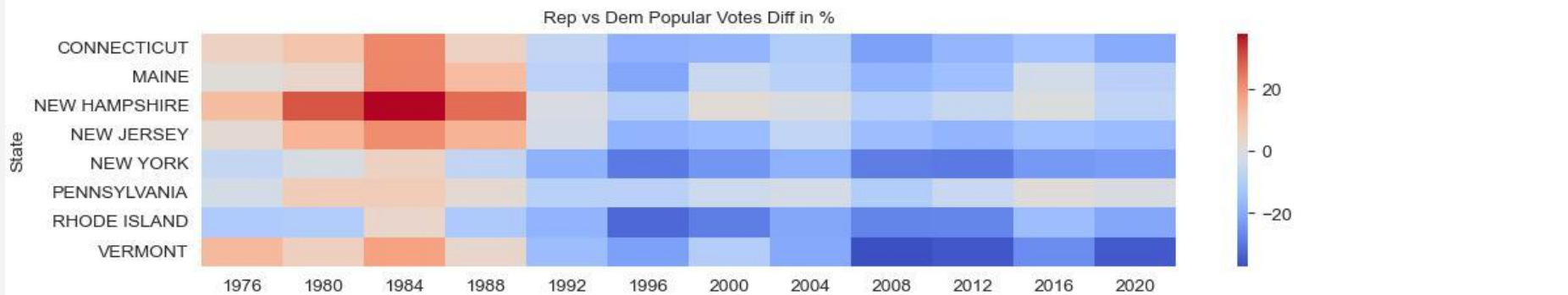


## Rep vs Dem votes diff in % - Mountain



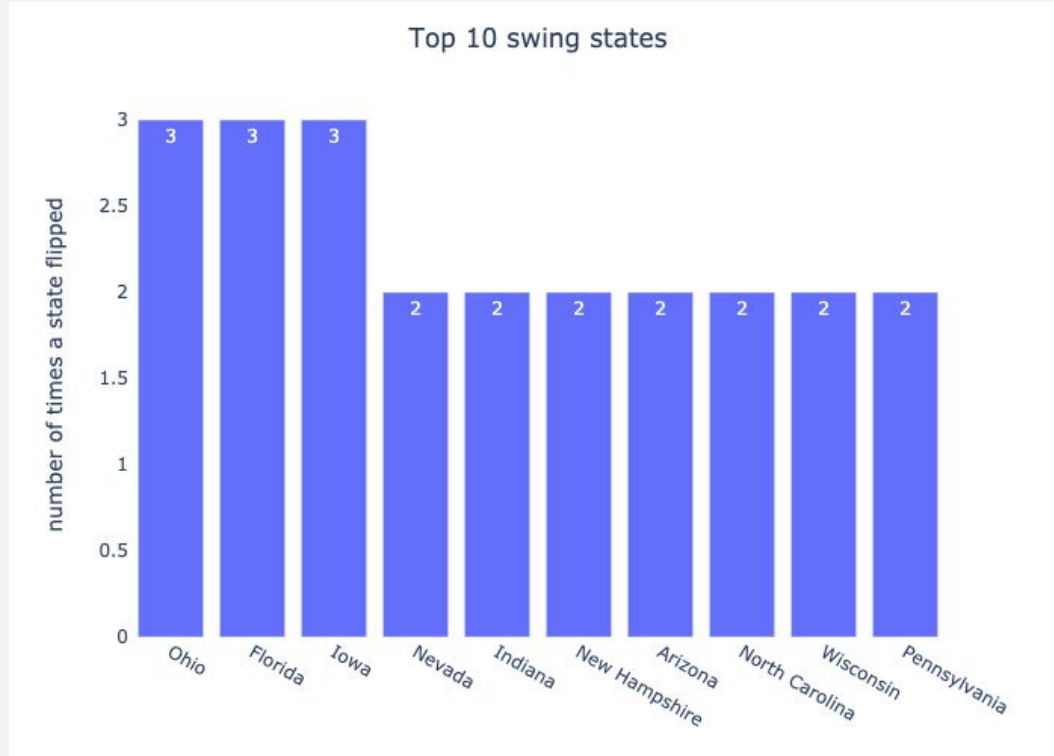


## Rep vs Dem votes diff in % - Northeast & Pacific





## How many times a state flipped from 2000 to 2020?

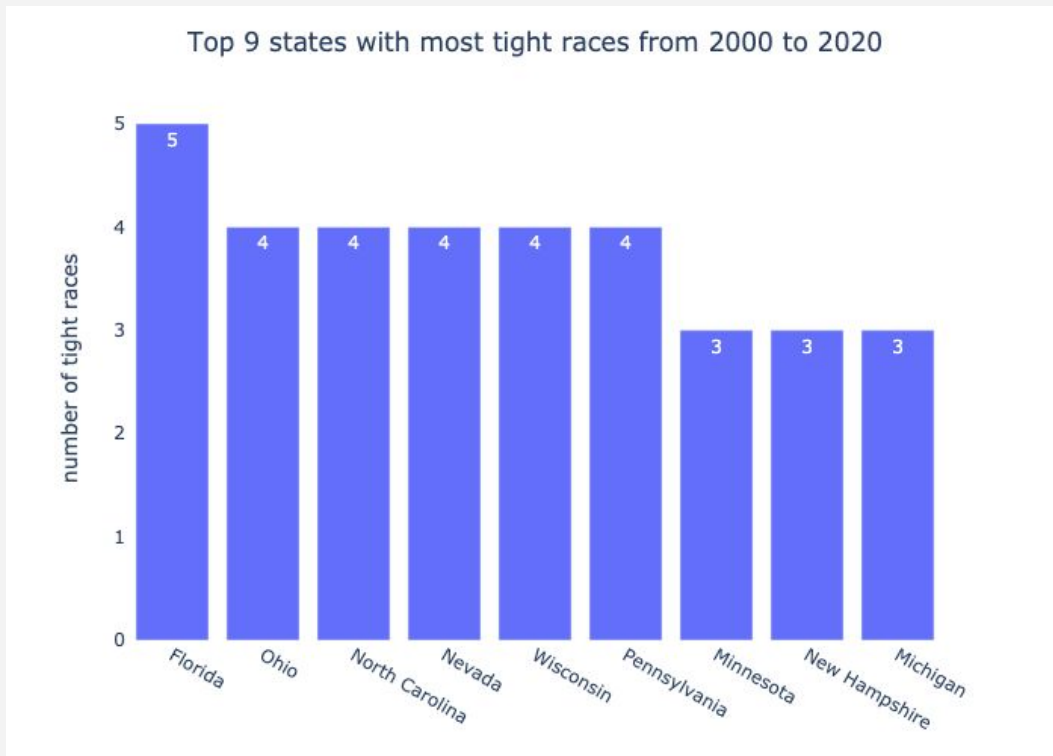




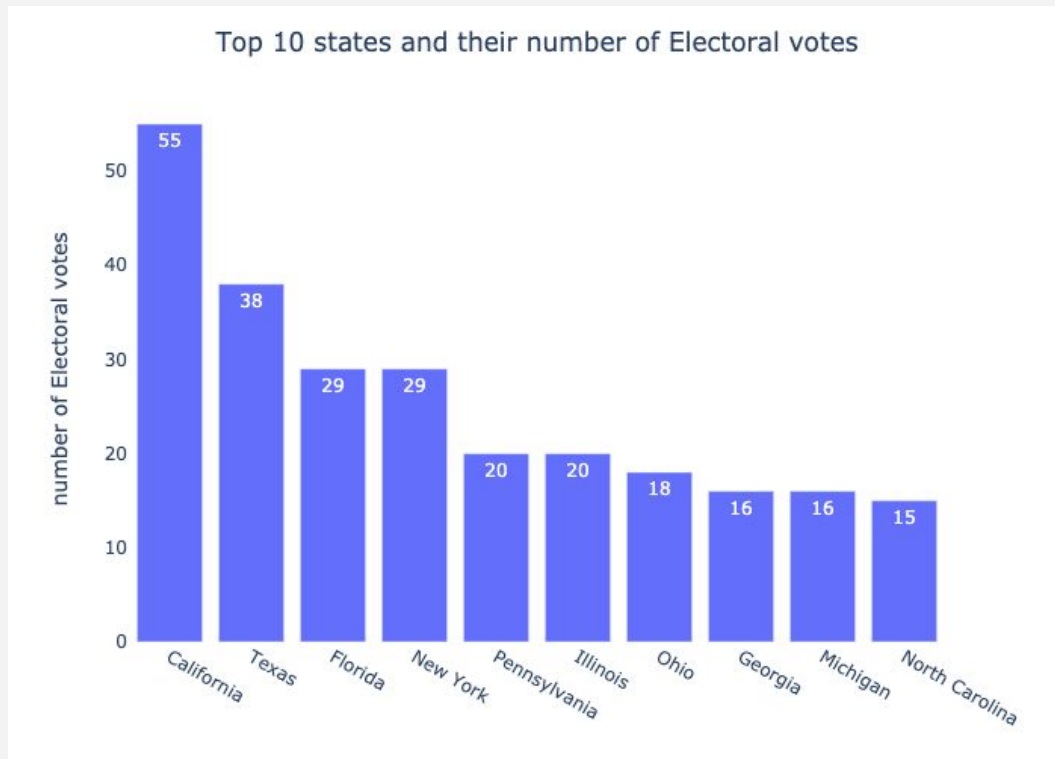


# How many tight races a state had from 2000 to 2020?

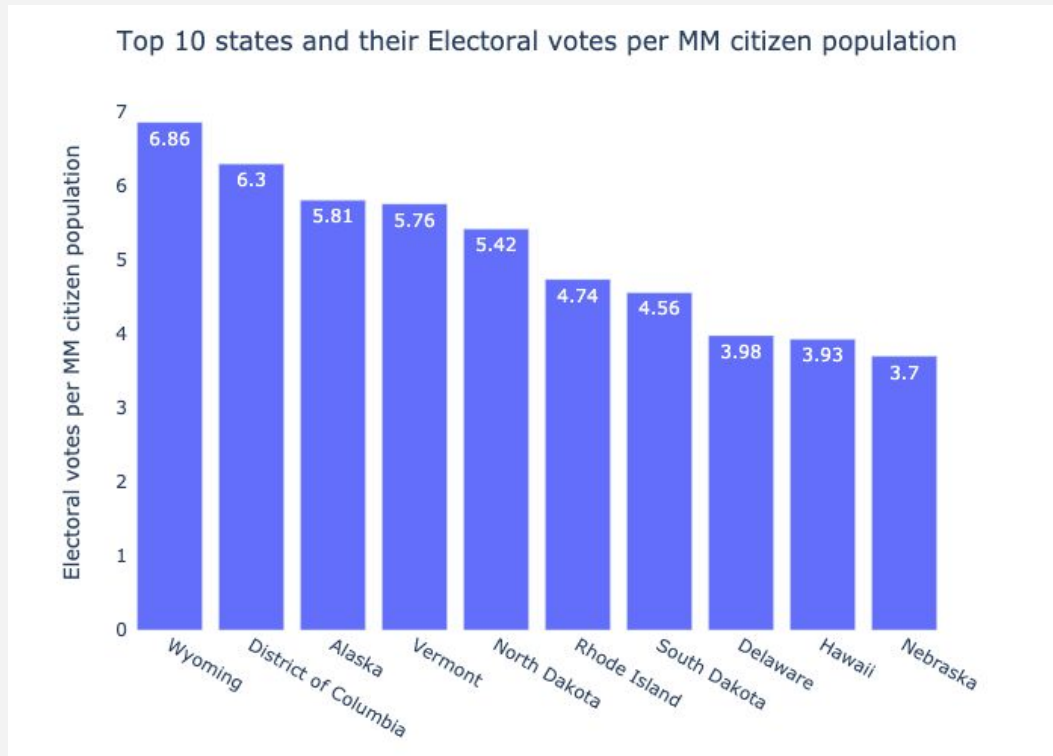
Tight race is defined by having Rep vs Dem votes diff less than 5%.



## Which states have the most Electoral votes?



## Which states have the most Electoral votes per MM of citizen population?



## Four features 27 states in scope

States flipped 2 or 3  
times in the past six  
elections

States had the most  
tight races in the past  
six elections

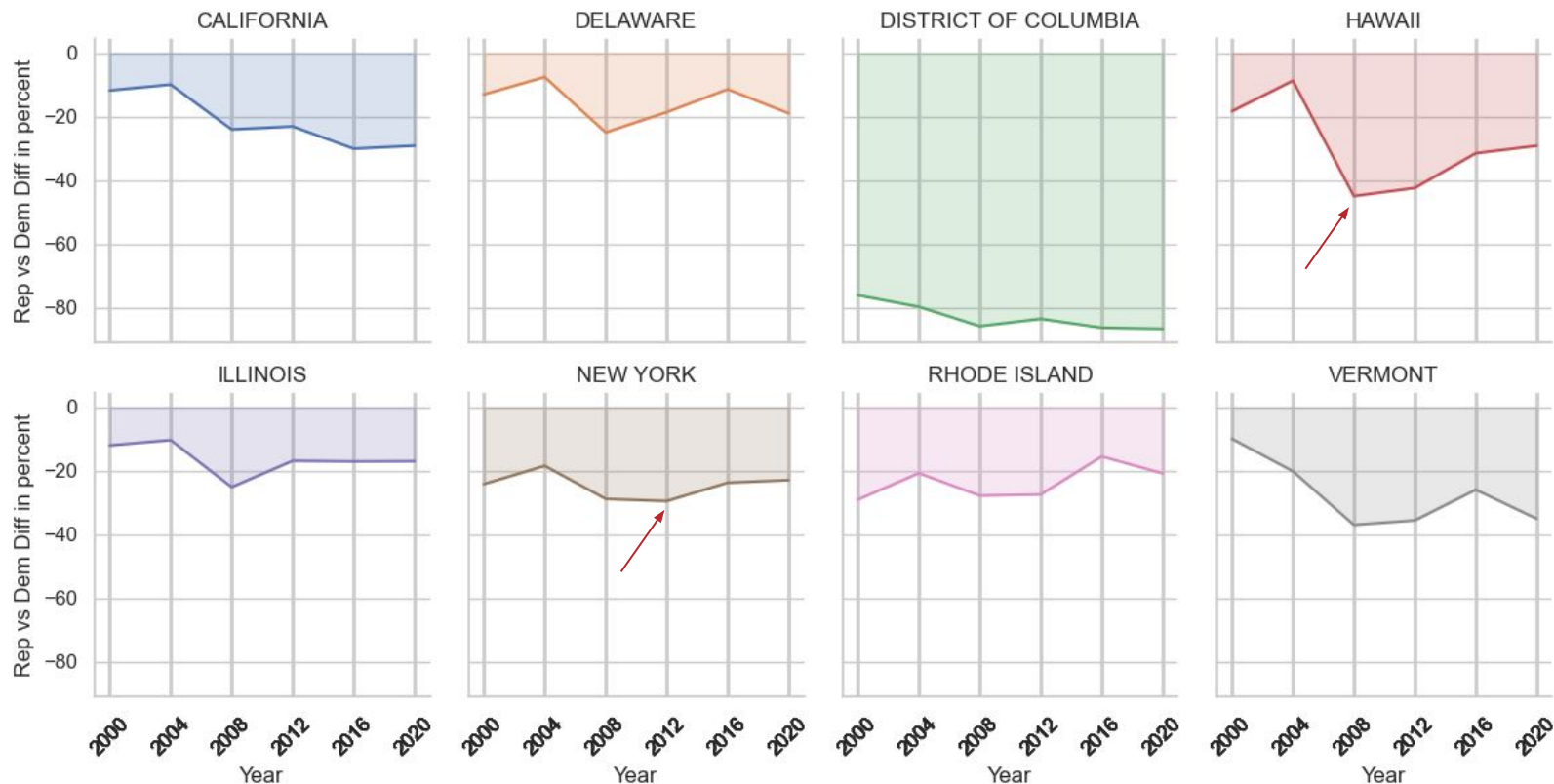
States have the most  
Electoral votes

States have the most  
Electoral votes per  
MM citizen  
population



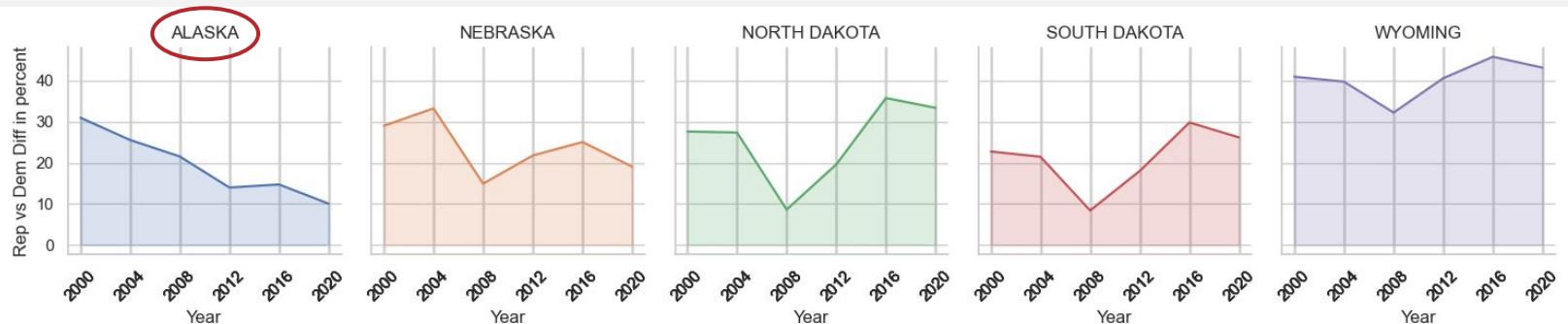


## Solid blue states



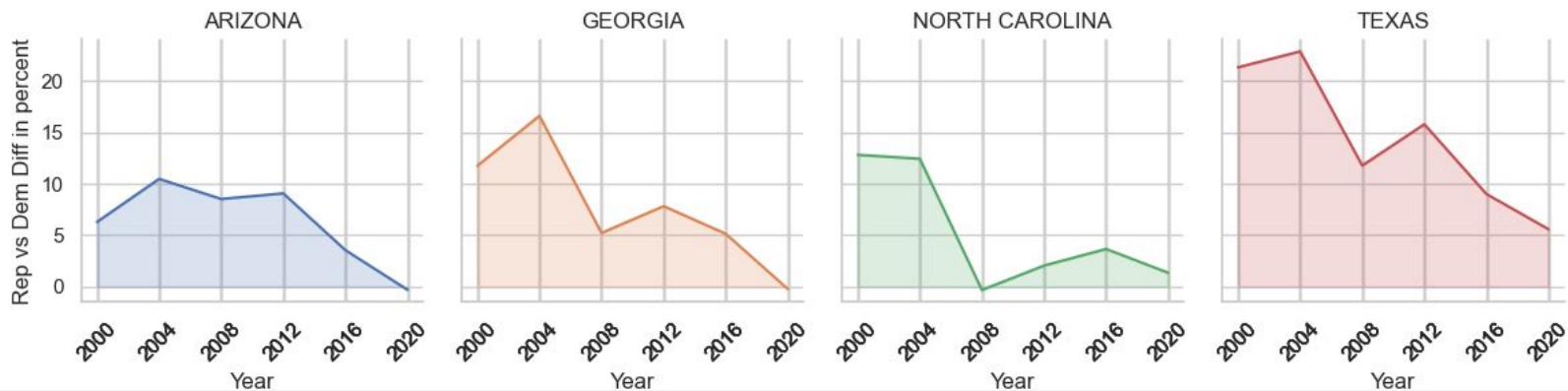


## Solid red states



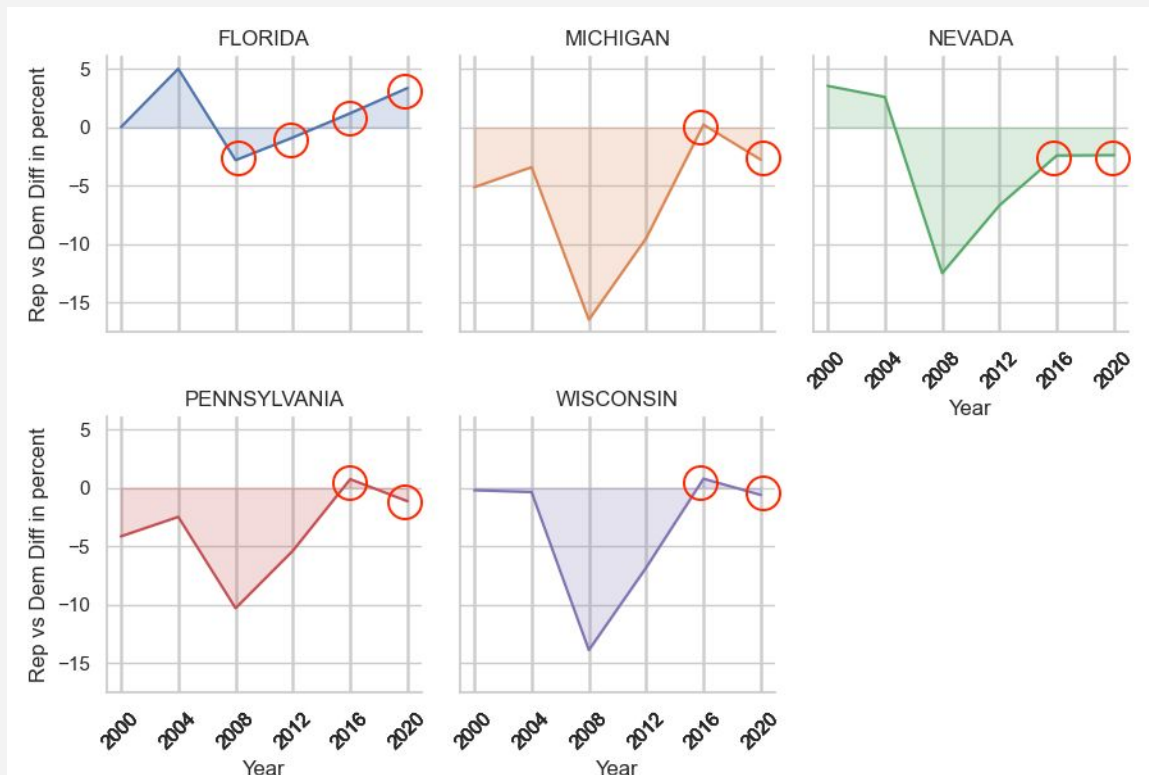


## Not so solid red states

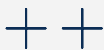




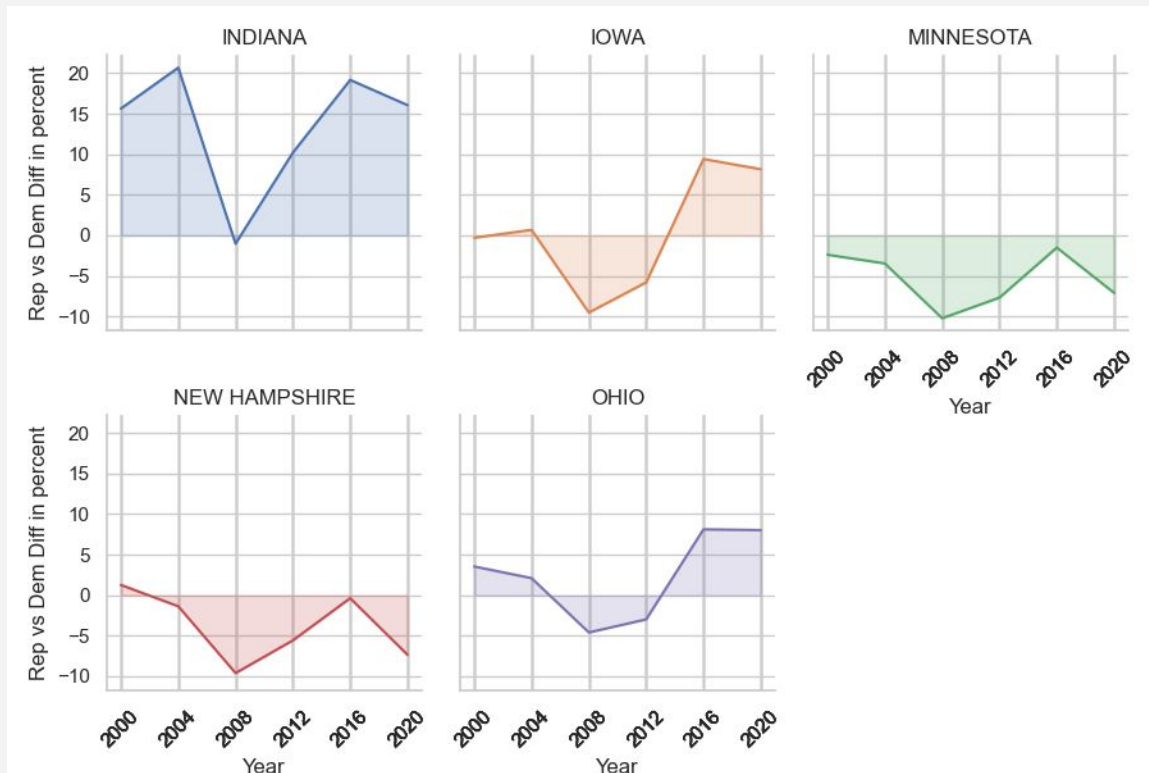
## Battleground states







## How safe are these states?



## Conclusion and Future Work

- Based on my analysis, I would recommend focusing on Arizona, Florida, Georgia, Michigan, Nevada, North Carolina, Pennsylvania, Texas and Wisconsin during the 2024 Presidential Election.
- If given more time, I would look into what was driving the trend we have observed in the state of Hawaii, New York, Alaska and Texas.
- If given more time, I would look into how voter demographics is related to election result. This will provide the groundwork to create a election predict model later on.



# Thanks!



## Do you have any questions?



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# Resources



- <https://www.nytimes.com/2016/08/23/upshot/50-years-of-electoral-college-maps-how-the-us-turned-red-and-blue.html>
- <https://www.pbs.org/video/why-do-we-have-political-parties-vwh76q/>
- <https://crosscut.com/2019/08/how-washington-state-turned-blue-three-decades-data-explain-our-partisan-shift>
- <https://www.archives.gov/electoral-college/allocation>
- <https://www.cato.org/blog/proposition-187-turned-california-blue>
- [https://news.yahoo.com/california-land-nixon-reagan-turned-140045154.html?guccounter=1&guce\\_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce\\_referrer\\_sig=AQAAAG6sRXhIkJ3RCN8hd2PcBN4LSBtMa-ru\\_GcZrth59bWn6XilOdeO6OUdj2DEtSi0K\\_1qAOq91GuFt94dUggquSNPZFgEGHPLeJ-i-dRrh30pBf2zBtPVoPsUblxEr3EC6bv97DiA4J7hCzC7uFTf3H1a829sC-RbZ2SS0ozo3LzQ](https://news.yahoo.com/california-land-nixon-reagan-turned-140045154.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAG6sRXhIkJ3RCN8hd2PcBN4LSBtMa-ru_GcZrth59bWn6XilOdeO6OUdj2DEtSi0K_1qAOq91GuFt94dUggquSNPZFgEGHPLeJ-i-dRrh30pBf2zBtPVoPsUblxEr3EC6bv97DiA4J7hCzC7uFTf3H1a829sC-RbZ2SS0ozo3LzQ)
- <https://www.nytimes.com/2020/11/06/us/california-blue-state-democrat.html>
- <https://www.pewresearch.org/politics/2023/07/12/republican-gains-in-2022-midterms-driven-mostly-by-turnout-advantage/>

# Appendix





# History

Among the many thorny questions debated by the delegates to the 1787 Constitutional Convention, one of the hardest to resolve was how to elect the president. The Founding Fathers debated for months, with some arguing that Congress should pick the president and others insistent on a democratic popular vote.

Their compromise is known as the Electoral College.



# How does it work?

American voters can vote in-person or vote by mail before or on the Tuesday following the first Monday in November, but the ballots that they cast do not directly elect the president.

Instead, the will of the voters is reflected in the actions of state electors. These electors are selected by political parties at the state level and in many cases are bound by law to vote in a way that is consistent with the results of the popular vote.



# Background & Research Questions



## Electoral College

Which states hold more “deciding power” during the election?

## Change in Political Landscape

How state party alignment has changed over time? Which states are solid blue/red states vs swing/battleground states?

## Voter Demographics

Are there any patterns between voter demographics and the party people voted for?



***Which states to focus on during 2024 Presidential Election Campaign?***





# Voter Demographics



# Dataset

- 2016-2022 Validated Voter Demographics Table published by Pew Research Center on July 12, 2023
- I picked 5 categories (Gender, Age, Race, Religion Status and Community Type) and created visualizations to show patterns between these factors and the party voters voted for during an election.



# Voter Demographics

Gender



Age

Race



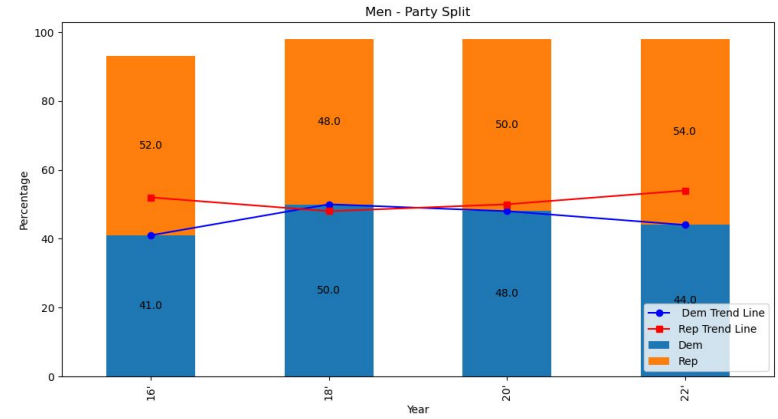
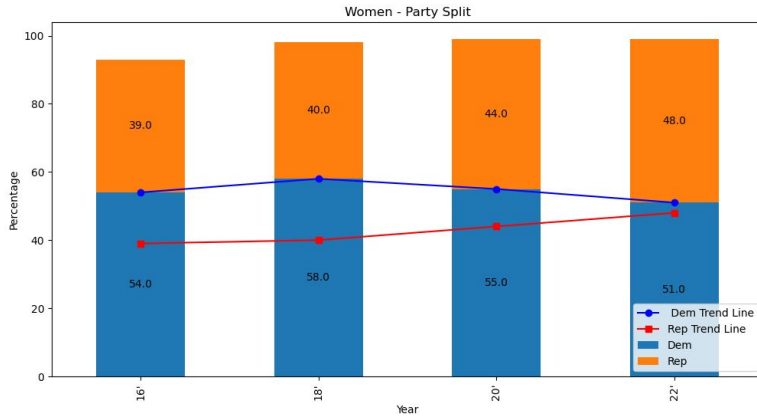
Religion Status



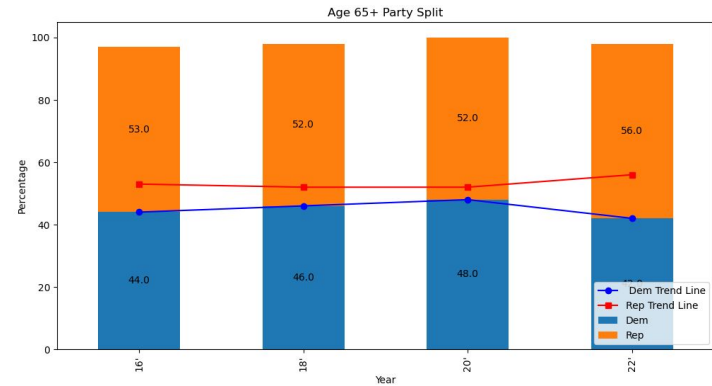
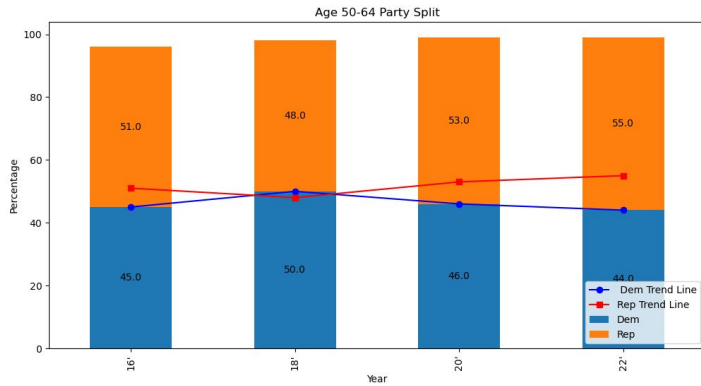
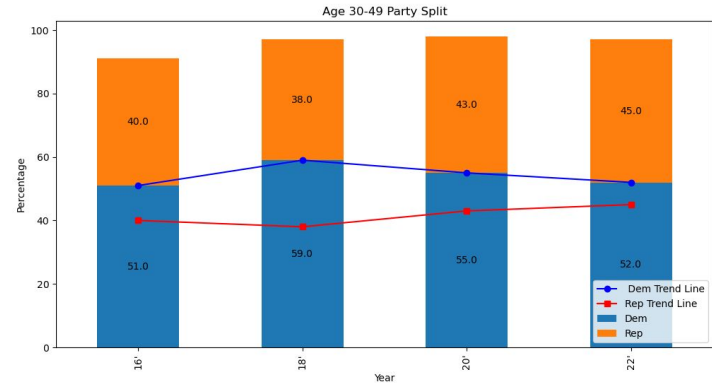
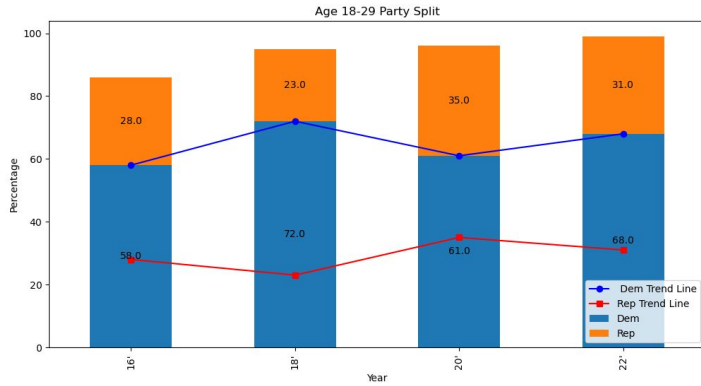
Community Type



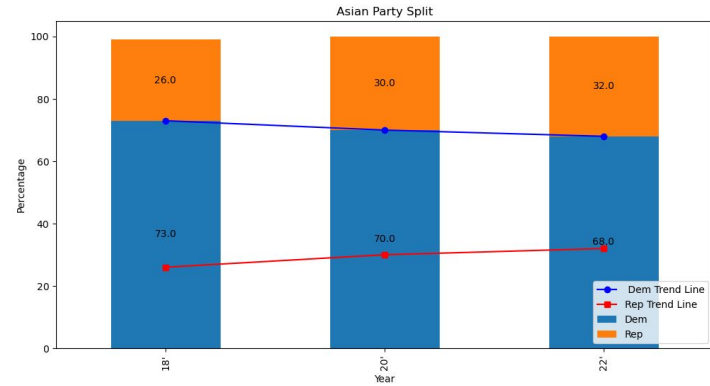
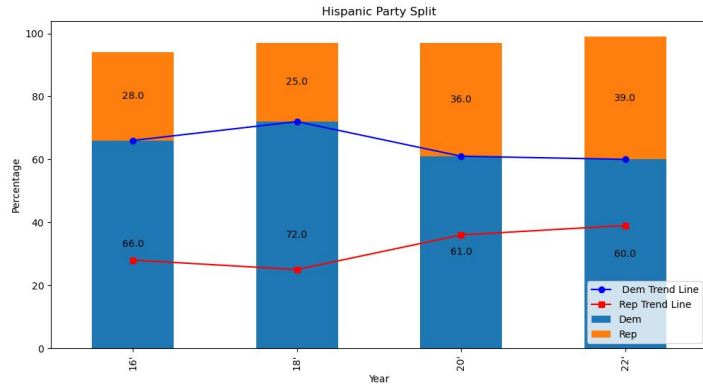
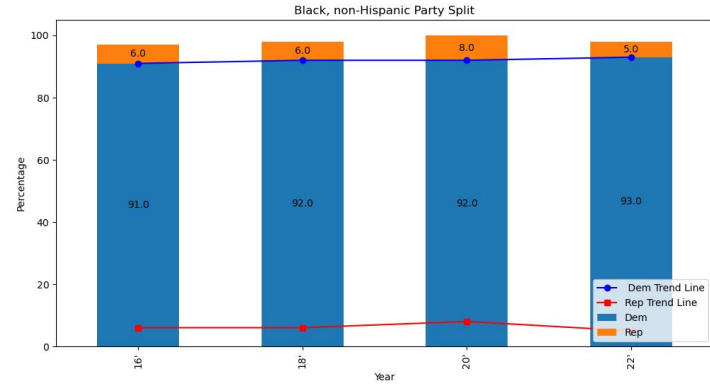
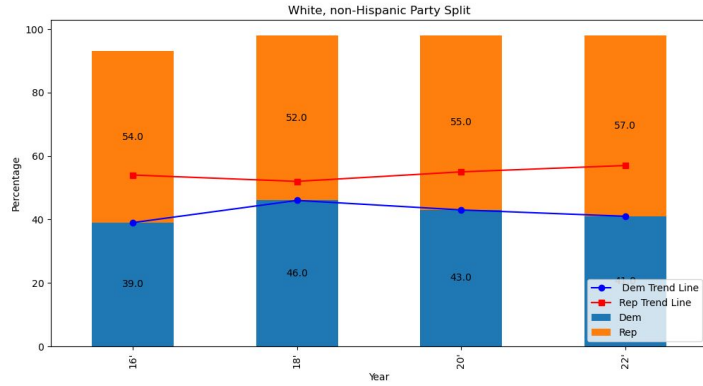
# Gender



# Age



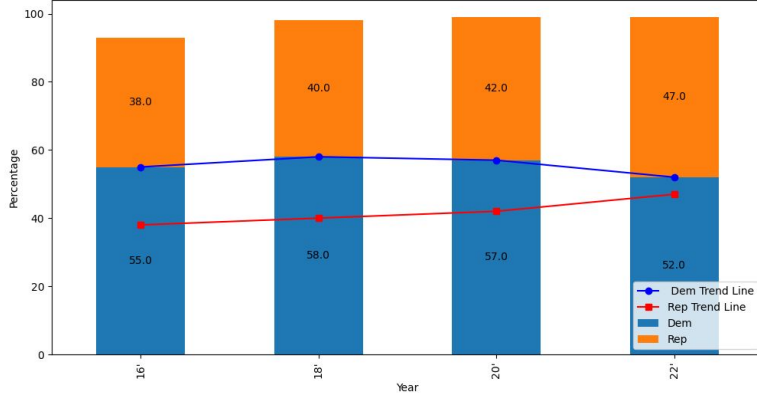
# Race



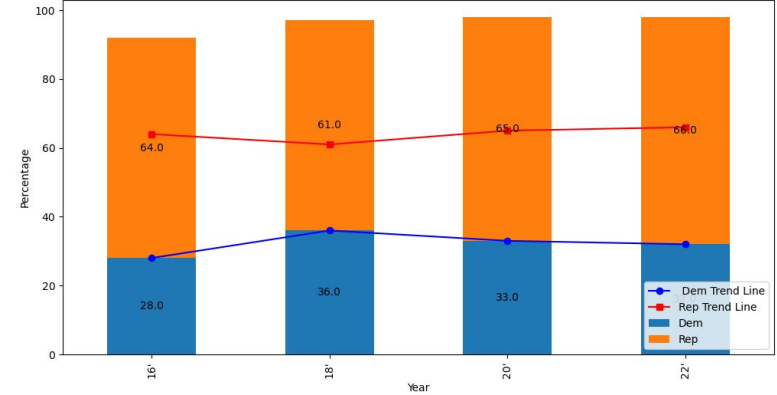
# Race & Education



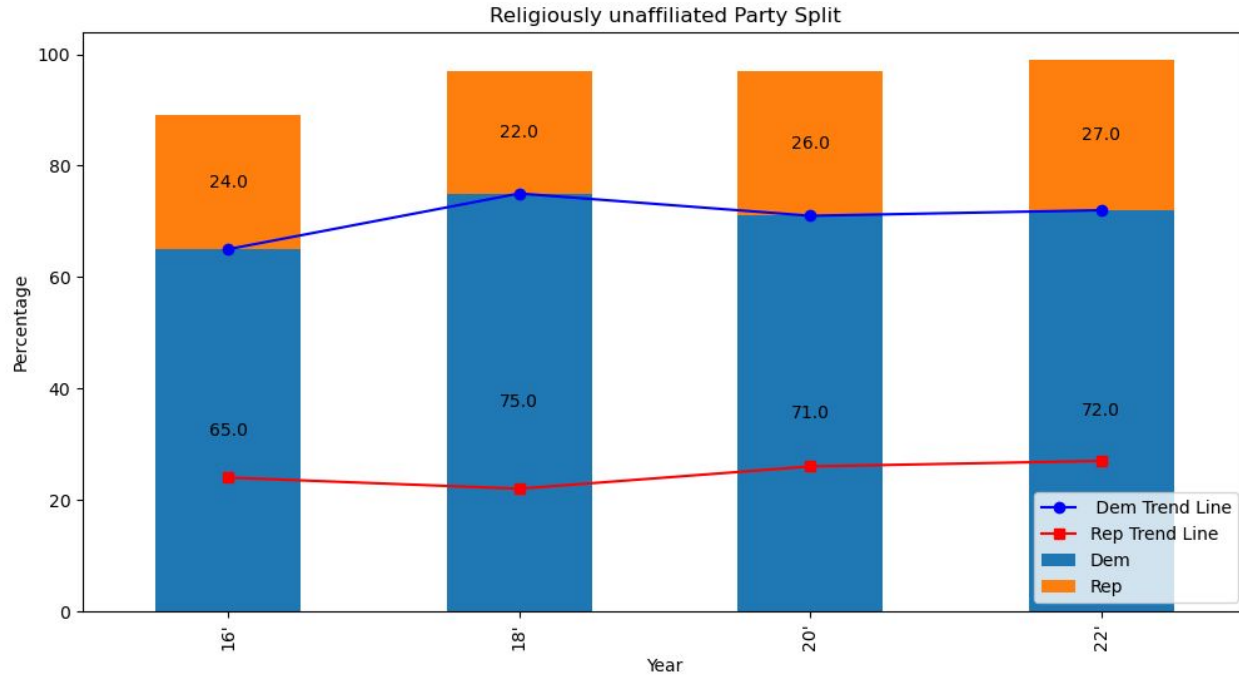
White, non-Hispanic college grad+ Party Split



White, non-Hispanic some college or less Party Split

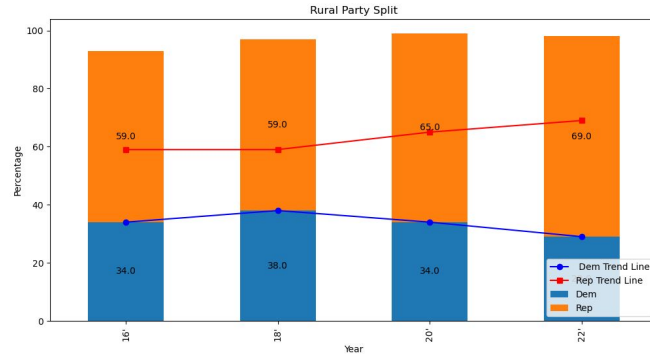
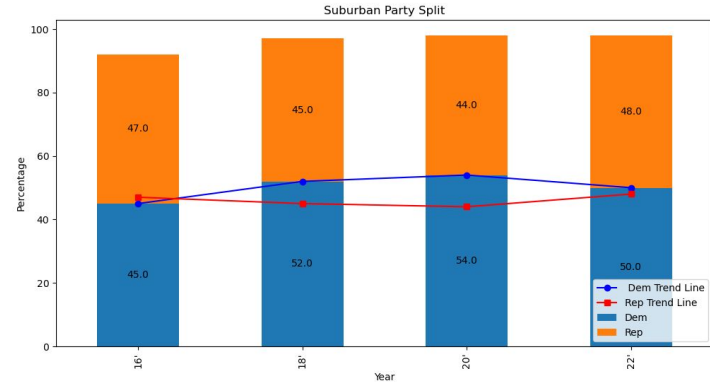
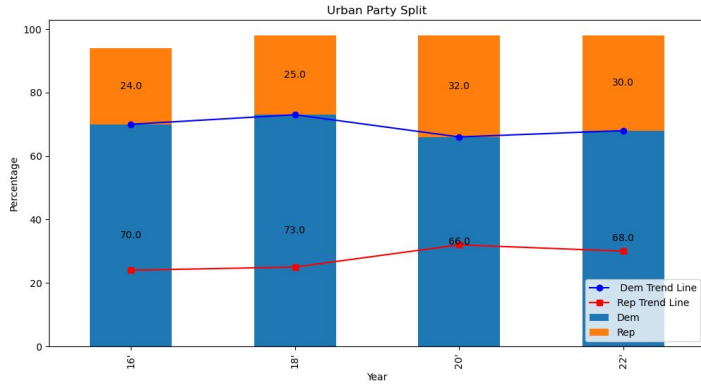


# Religion Status

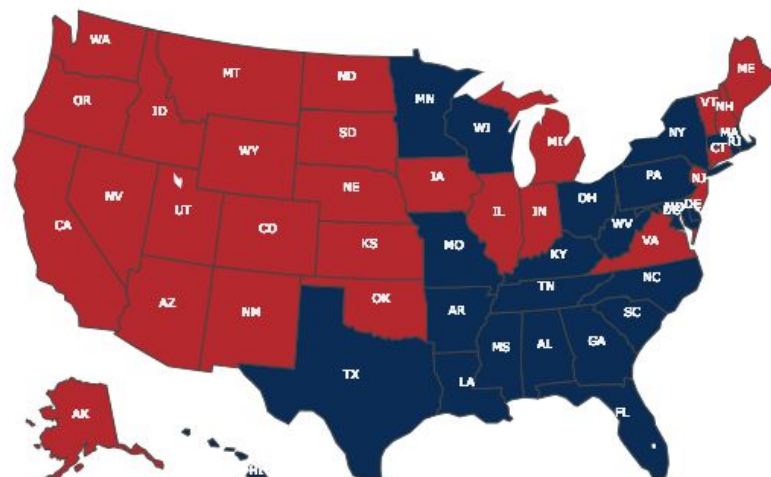




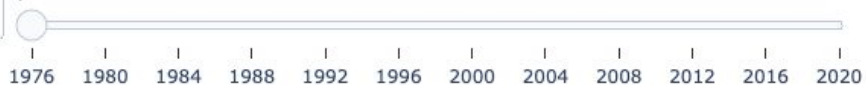
# Community Type



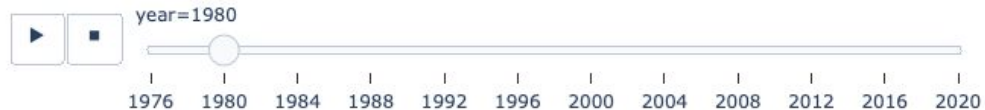
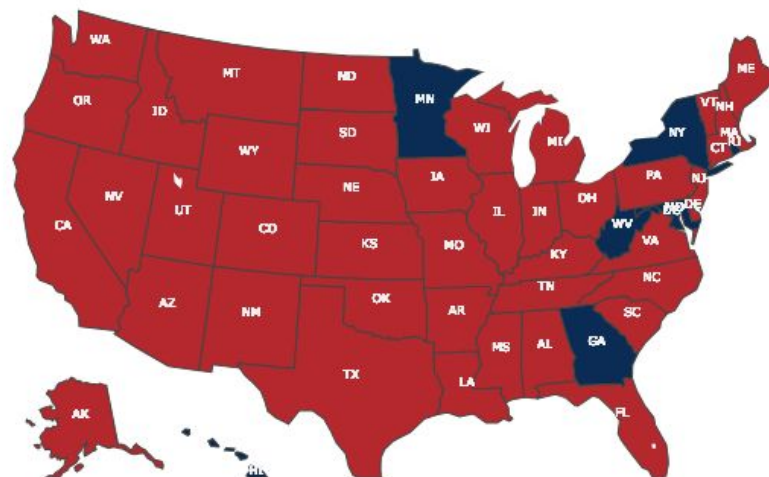
# The 1976 Election



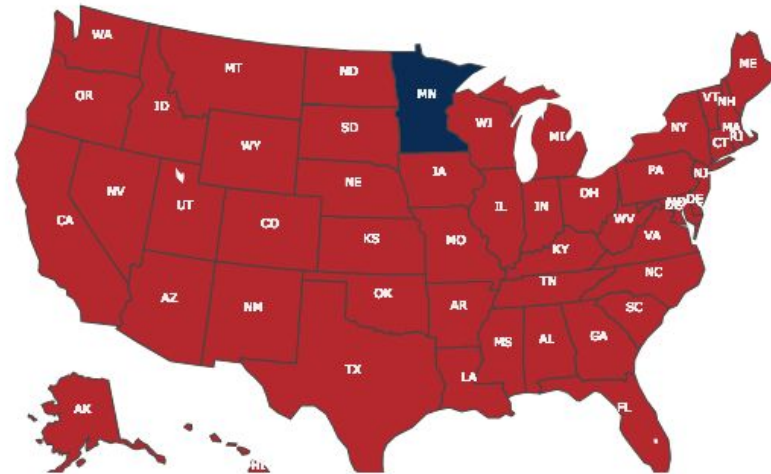
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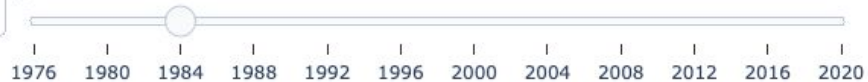
# The 1980 Election



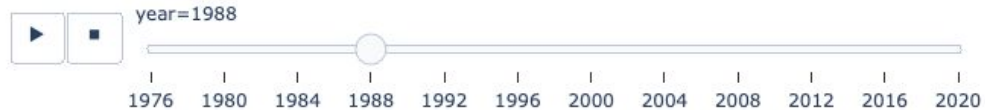
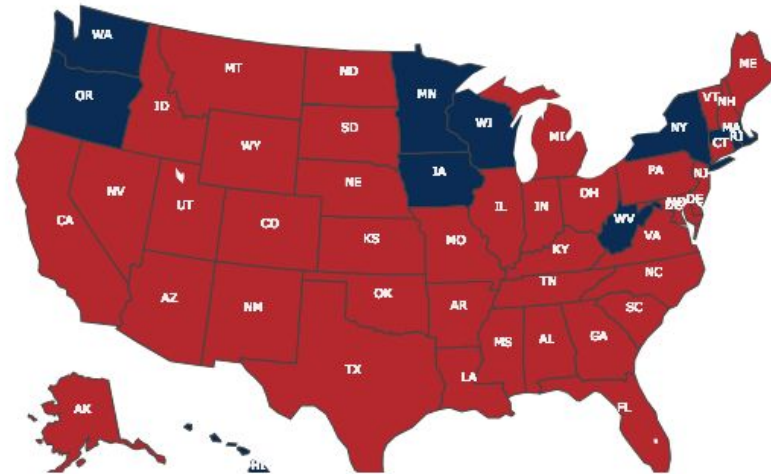
# The 1984 Election



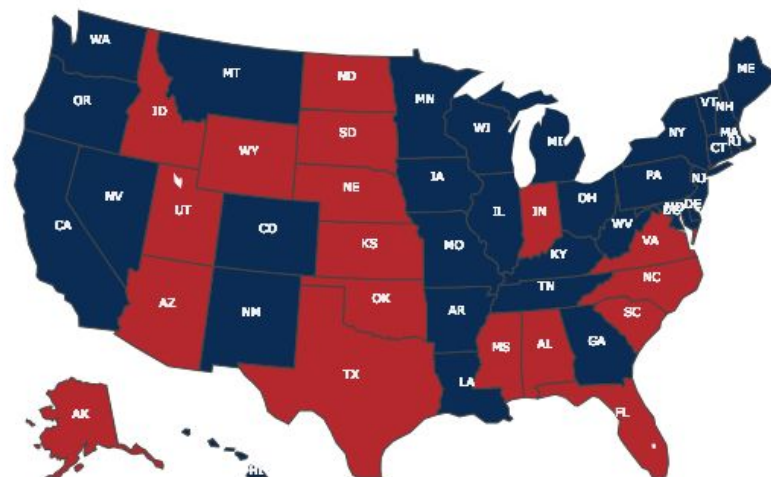
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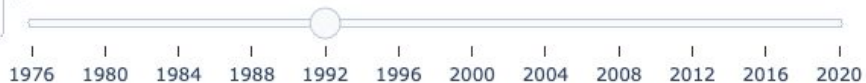
# The 1988 Election



# The 1992 Election

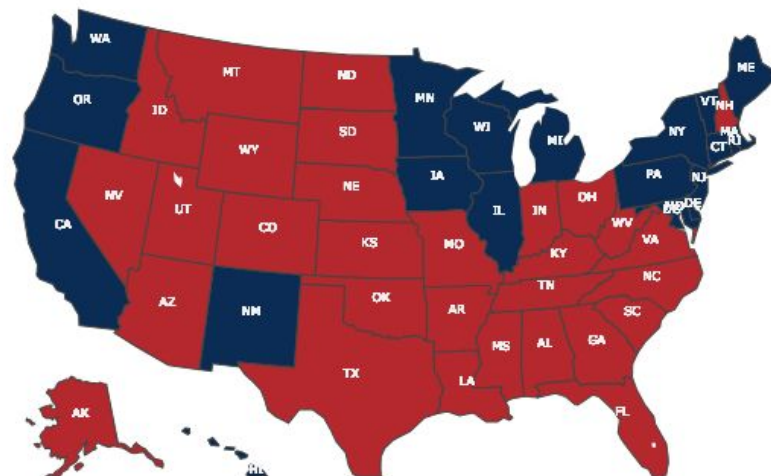


year=1992



$$\begin{array}{c} + \\ + \\ + \end{array}$$


# The 2000 Election

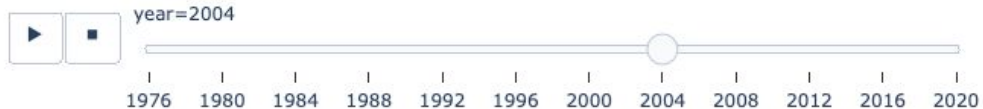
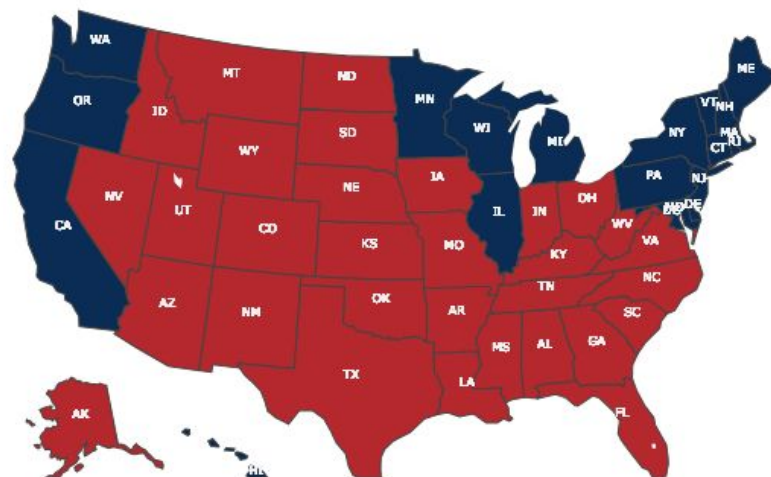


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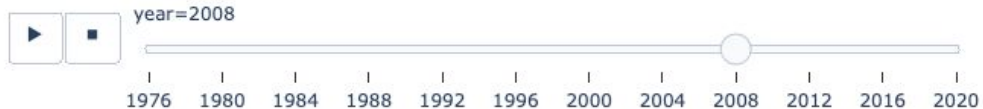
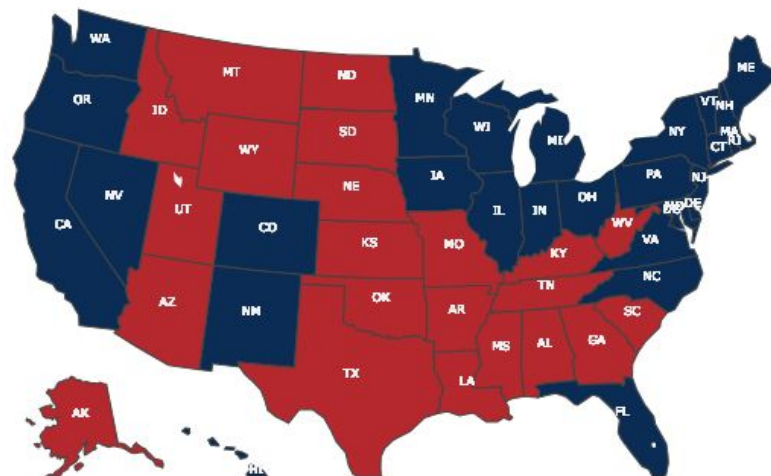




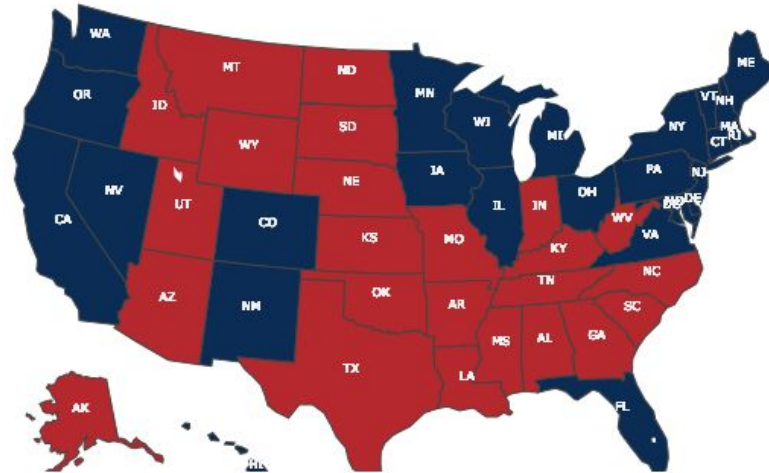
# The 2004 Election



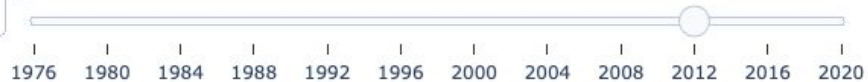
# The 2008 Election



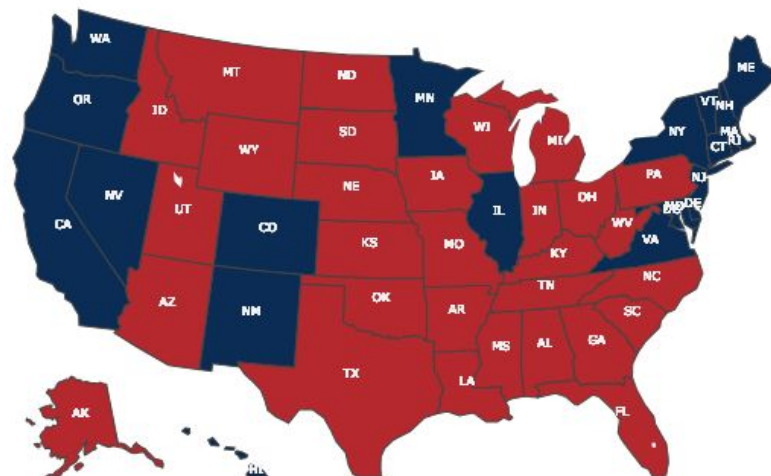
# The 2012 Election



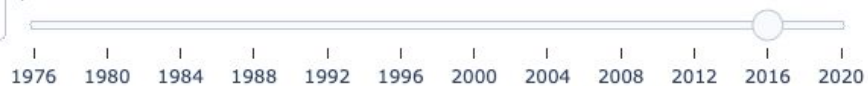
year=2012



# The 2016 Election



year=2016



# The 2020 Election

