Assignment Requirements

Part 1: Web Scraping Tasks

Scrape the US House Election 2022 result from the designated page (https://www.politico.com/2022-election/results/). The scraped data attributes should include (but are not limited to) the items shown in the columns of DataFrame below:

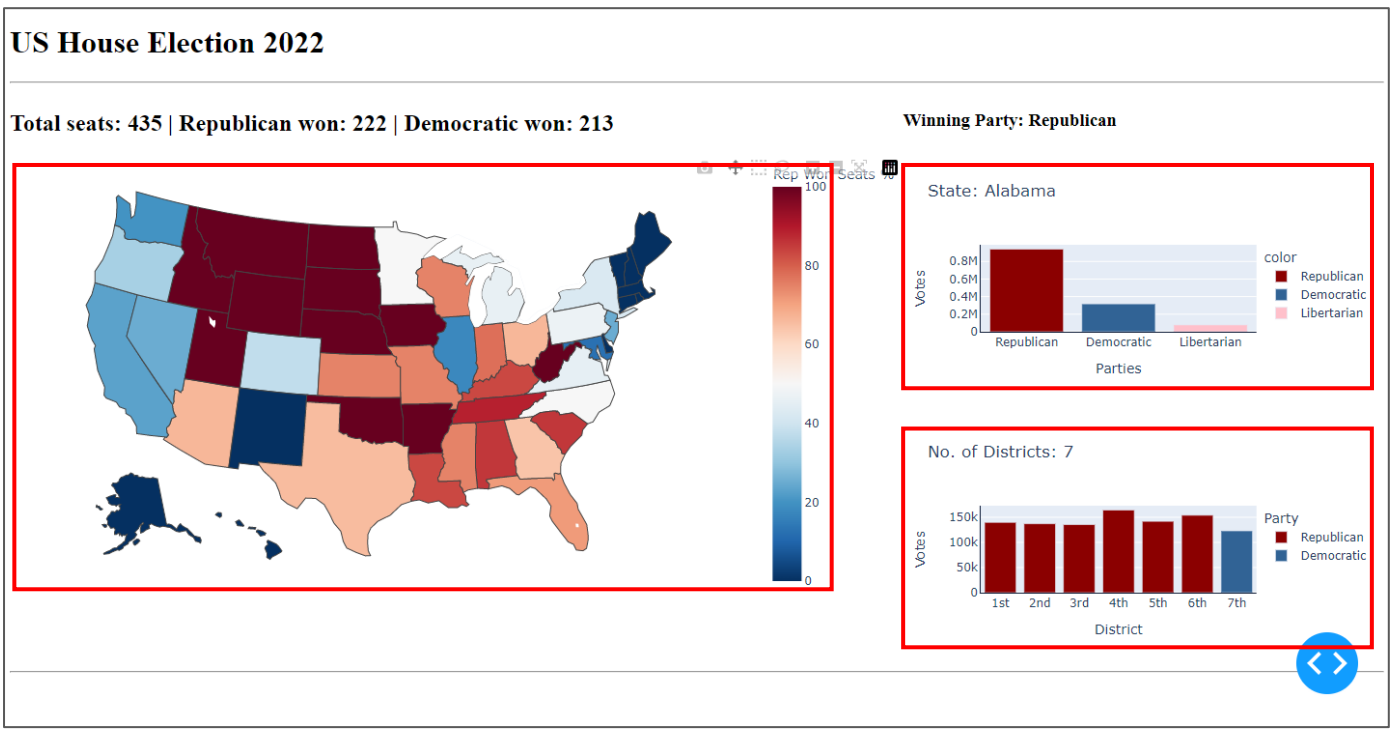
	State	State Code	District	Party	Candidate	Incumbent	Vote	Pct%
0	Alabama	AL	1st	Republican	Carl	Incumbent	139854	84.2%
1	Alabama	AL	1st	Libertarian Party	Remrey	/	26197	15.8%
2	Alabama	AL	2nd	Republican	Moore	Incumbent	137193	69.2%
3	Alabama	AL	2nd	Democratic	Harvey-Hall	/	57800	29.1%
4	Alabama	AL	2nd	Libertarian Party	Realz	/	3380	1.7%
...	...	...	...	...	...	...	...	...

Collect data for all candidates involved in the House elections, with representatives elected from all 435 US congressional districts across the 50 states. It is essential that the presented data is accurate. Store the data in a CSV file, named **'house.csv'** for processing in the next part of the assignment. Submit the programming file in the format of ***ipynb***, along with the generated CSV file for this part. All the data stored in the CSV file must be produced by your submitted program. Any human manipulation of the CSV file will result in a deduction of marks for this part.

Part 2: Building a Web app using Dash

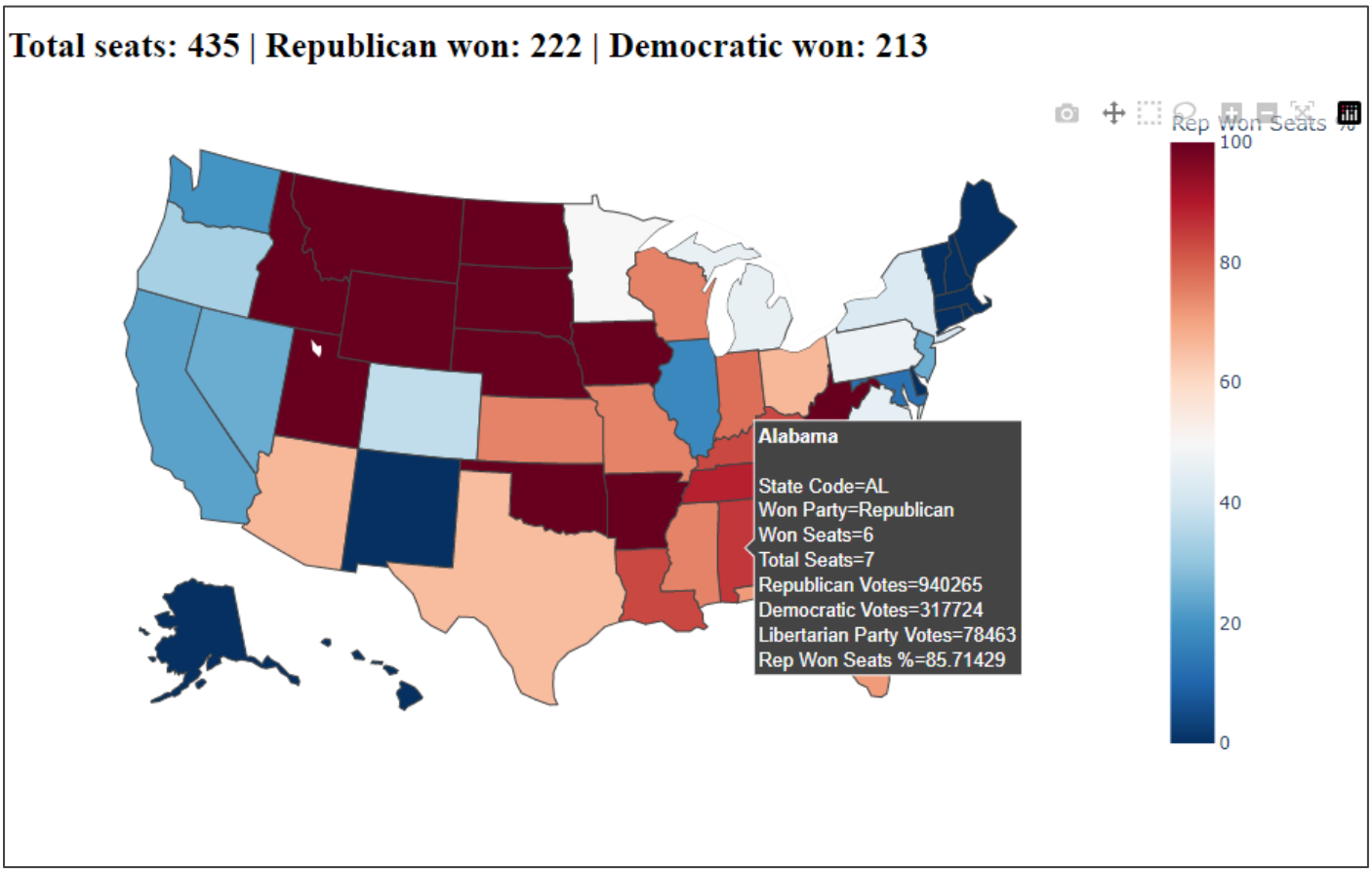
For Part 2 of the assignment, your task is to build a web app using Dash that reads the CSV file generated from the program in Part 1 and display the required graph. Data manipulation using Pandas may be required. The web app platform is shown below. It consists of three components:

1. a state-level choropleth map showing election results among 50 states,
2. a bar chart showing votes gained by parties in each state,
3. and a bar chart showing votes gained in each district.



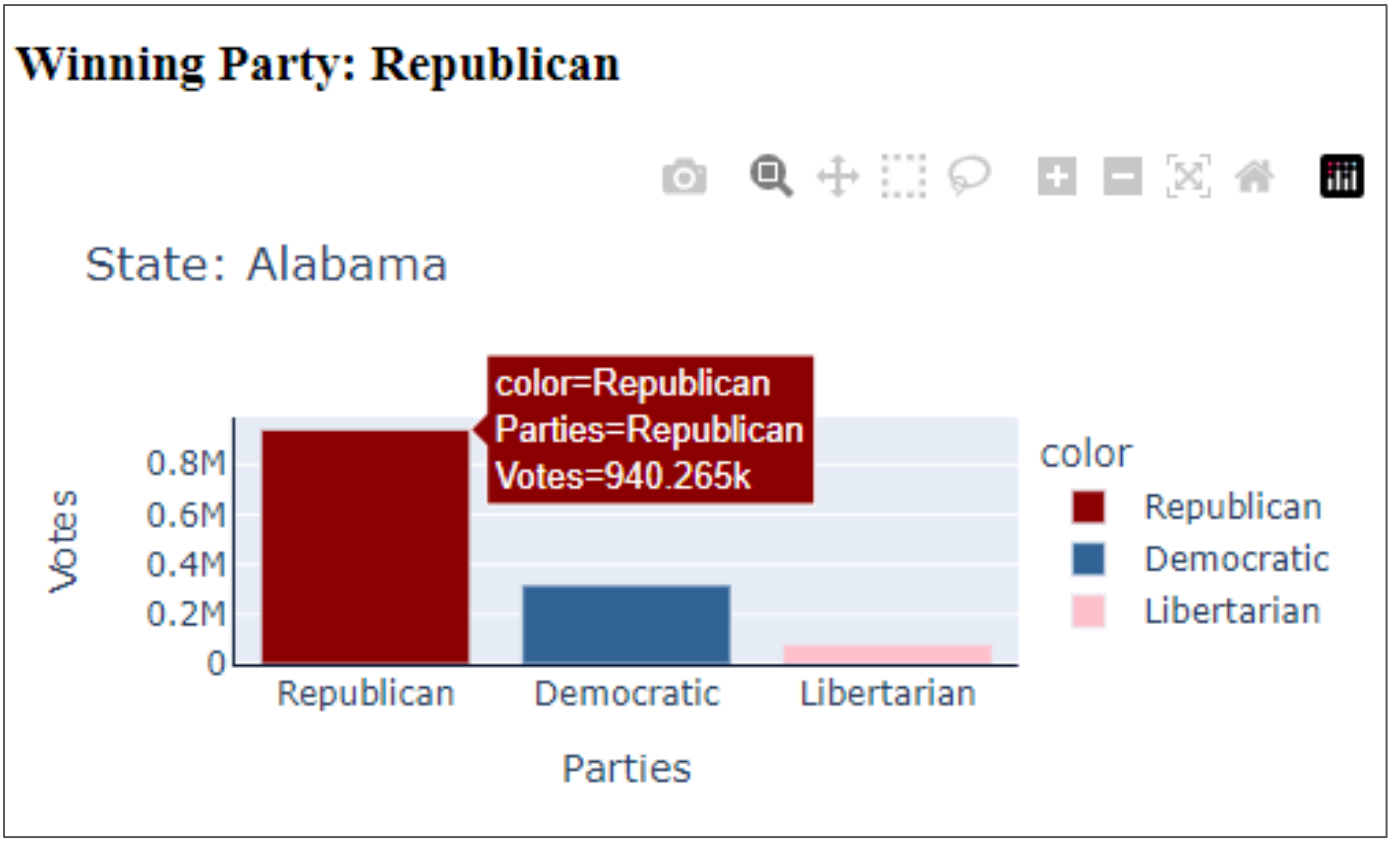
1. State-level Choropleth Map

- The choropleth map should display the election results for Republican and Democratic parties in each state.
- Use efficient color scales to show the results. Use a red theme color to represent the states dominated by Republicans, and blue for those dominated by Democrats. The deeper the color, the higher the percentage won by Republicans / Democrats. This can be evaluated by the number of seats won.
- The hover data for each state should include: **State, Won Party, Won Seats in the state, Total seats in the state, Total votes gained by Republican and Democratic parties** respectively.
- Ignoring other parties is acceptable for the basic requirement.
- The hover data will be used as input data of the next interactive features.



2. Bar Chart showing votes gained by parties

- This part is an interactive feature with the choropleth map. When a mouse hovers on a specific state on the choropleth map, this bar chart should display the data of votes gained by individual parties in the selected state.
- Use a red theme color to represent Republicans and blue for Democratic parties.
- The hover data of this bar chart should include: **Total votes gained** by individual parties in the selected state
- Identify the x and y-axis properly.
- Ignoring other parties is acceptance for basic requirement.



3. Bar Chart showing votes gained in each district

- This is another interactive feature with the choropleth map. When a mouse hovers over a specific state on the choropleth map, this bar chart should display the data of votes gained by the winner in each district of the selected state.
- Use a red theme color to represent Republicans and blue for Democratic parties.
- The hover data of this bar chart should include: **The winning party** in the district, **Votes gained**, and **the name of winning candidate**.
- Identify the x and y-axis properly.