Part 1

A. What relationship, if any, do you see between voting frequency and income/education? Support your answer by referring to your visualization and what it shows.

The visualization reveals that college educated voters generally vote more frequently than less educated voters. There are more college educated sporadic or always voters than sporadic or always voters in the high school or some college categories. - we see that the dark blue (always) and medium blue (sporadic) bars for education level do not take up the same proportions of all three education levels, with the largest proportions in the college educated bar. College educated has the largest proportion of Always voters and smallest proportion of Never voters out of the three education categories. On the other hand, High school or less has the highest proportion of never voters out of the three categories.

Similarly, it appears that higher income voters generally vote more frequently than lower income voters. The lowest income bracket (<$40k) has the largest proportion of Never voters and the higher income brackets have a smaller proportion of never voters. Interestingly, the second highest income bracket ($75-$125k) has the largest proportion of Always voters - so perhaps there is a more complex, but still generally positive relationship between income and voting frequency.

B. What relationship, if any, do you see between income and education (this means independent of the voting frequency)? Support your answer by referring to your visualization and what it shows.

By highlighting each education level category, I see that the Some College category has a pretty even distribution across income levels. The ribbons that leave Some College are all about the same size and go across to all the income levels pretty equally. However, high school or less has thicker ribbons that go to lower income, and thinner ribbons that go to higher income. This indicates that lower education level is associated with lower incomes. Highlighting the college data, thicker ribbons go to the higher income categories, while thinner ribbons go to lower income categories. Seeing this supports the idea that education level has a positive relationship with income.

Part 2

A. One year looks particularly different from the others. Which year is it? What is different and how is that demonstrated on your plot? Why (yes, you will need some outside information, but it shouldn't be anything you need to look up….)? Would it be easier for a viewer to determine that this year is different if we had made separate plots for each year instead of the animation? Why or why not?

2020 looks different from the others because all the bubbles are much higher on the y-axis, % of Votes Cast Absentee, than other years. This is because of COVID - we had to vote absentee because most votes were mail-in ballots.

The animation highlights the difference in 2020 since there is a clear jump while the viewer is watching the animation of plots. The other years are generally much lower on the y-axis so when the viewer sees all the bubbles jump higher, it highlights the anomalousness of the absentee voter turnout.

B. There are two years in the data, 2016 and 2020, for which there were Presidential elections along with the Congressional elections. Are there noticeable differences in overall voter turnout in these two years versus the others? What are they? Just describe what you see on the plot – no outside information needed here.

It looks like there is more spread in the graph - the bubbles are a bit more spread out on both axes than other years - so perhaps in some localities, more people vote in presidential elections than just Congressional elections and some don't. Both 2020 and 2016 have higher voter turnout overall - the bubbles are farther right on the x-axis - which might indicate that voters are more likely to vote in presidential elections than just congressional elections.

Part 3

What geographic trends in voter turnout are revealed by the map? Explain based on what you see in your visualization

There is lower voter turnout in the Appalachian Plateau (far western Virginia) and generally higher voter turnout in central and eastern Virginia. This is revealed by the map since the western localities are generally lighter in fill color than the central and eastern regions. Eastern and central regions hover around the 50-60% voter turnout range while western Virginia hovers around the 30-50%. .

Part 4

1. Github: https://kathion3.github.io/interacting_with_data.github.io/

2. Provide a brief description of the elements you added here to exceed expectations – what specifically did you do that goes beyond what we covered in class? What challenges did you face? How do the elements you added increase effectiveness or remain neutral (i.e. they don't detract from it)?

I learned how to center all the elements because it bothered me that it was on the left and everything felt a bit uneven. I don't necessarily think it increases the effectiveness of the page generally, but it does for me personally, and could potentially be problematic on a narrow screen, but for viewing on an average laptop, I think it enhances the experience.

I figured out how to customize fonts, widths, and weights so that the font doesn't detract from viewing the page - making the spacing and weight satisfactory so it's not overly bold, etc.

Having the gray box behind the visualizations detracted from viewing the page, so I made the iframe background transparent. At first, I was confused about how to do this because I had the border set to 0 but still had the gray boxes behind the plots. It took me a while to figure out the dimensions for the iframe elements, but I did a lot of guess and check until I got rid of the scroll bars on each visualization - although it seems like it doesn't go away in the folium map, no matter how large I set the iframe dimensions to, which was frustrating.

3. Provide a 5-6 sentence discussion in the .pdf you submit (with your answers to questions) discussing the utility of interactivity for these specific visualizations; does the

interactivity add something? Does it take something away? How does the use of interactivity here align with Doumont's talk in terms of what he says about PowerPoint animations and similar effects?

Like animations in powerpoints, having interactivity allows both the creator and the viewer to highlight/draw out the specific information they're hoping to convey while not distorting the context of the data - for example, being able to choose a region of Virginia that is important in an analysis on the Bubble chart allows us to highlight the trends for that region, but also shows the context of the rest of Virginia.Similarly, the animation and interactivity highlight significant changes in patterns - as with the change in absentee voters in 2020 due to COVID.

Interactivity in the parallel categories plot can make data trends clearer by being able to focus on one ribbon at a time to follow the trends of that group of observations.

Finally, the interactivity adds the ability to include more information while not adding chart junk through tools like tooltips that allow the viewer to choose to learn more about data points - like seeing the specific percentages on the bubble chart, which we wouldn't otherwise be able to cleanly display.