- *A rationale for your design decisions. How did you choose your particular visual encodings and interaction techniques? What alternatives did you consider and how did you arrive at your ultimate choices?*

In this visualization, we used levels of saturation of blue to encode financial effort towards public schools for different U.S. states. We decided to use saturation, rather than different hues/sizes to effectively communicate the intensity differences without overwhelming users with additional colors or shapes. Additionally, we chose blue so that our visualization would be red-green color-blind friendly. We used a lower saturation for lower effort indices and a higher saturation for high effort indices to ensure that the relative saturations align with users' expectations about comparative financial efforts by state.

To support analysis across time, we included a slider that lets users view financial efforts by state per year (from 2006-2021). This allows users to explore changes over time without overcrowding the map with data from multiple years at the same time. We determined that a slider would be the most intuitive interaction for examining multi-year trends across states, and we added a watermark of the currently displayed year, so users don't have to rely solely on small text near the slider for reference. It also enables users to examine specific time periods and observe trends for particular states by tracking changes in saturation over time.

Additionally, users can click on a state, or a select few states, to isolate their data, graying out other states and highlighting the selection with a bold border. This allows viewers to easily do state-specific analysis, which is especially helpful when comparing trends for states that may not be geographically close. The grayscale background and bold outline provide a clear visual distinction of the selected state(s), allowing users to follow those specific trends over time without distraction from other states' data.

- *References to external resources. Be sure to list the data sources you used. If your work adapts or builds on existing visualization examples, please cite those as well.*

We used the following source for the financial effort for education data: https://www.schoolfinancedata.org/download-data/

- *An overview of your development process. Describe how the work was split among the team members. Include a commentary on the development process, including answers to the following questions: Roughly how much time did you spend developing your application (in people-hours)? What aspects took the most time?*

Here is a brief overview of our development process:

Everyone: We first had a short meeting to discuss everyone's ideas for A3 and picked the one we thought would be the best to develop. Following this, we all met to discuss everyone's schedules and how we would divide up the work.

Raymond: Raymond constructed the original skeleton of the visualization including a map and hovering logic. He also helped fine-tune features and bug fix near the end of our development. He also deployed our project to GitLab pages.

Leo: Leo developed the state ID system (which synced state abbreviations to their topojson ID number) and integrated the dataset into the map. He also added the state selection feature which allows users to individually select groups of states to show only their data.

Negar: Negar worked on the time slider which allows viewers to step through each year, comparing the displayed effort levels of each time scale. Additionally, she did some data cleaning by extracting only relevant fields out from the dataset and compiling them into an array of objects. She also helped fix some bugs at the end of our development.

Aparna: Aparna researched and came up with the idea for our project, and found the appropriate dataset. She also handled the bulk of our write up.

We spent around 12-16 cumulative hours developing our application. I found that implementing the map took the most time as it was very difficult to ID each state element and get it to correspond to our dataset. Debugging was also a long process as we had several errors relating to unexpected re-renders and formatting issues. On the

other hand, deployment wasn’t too difficult and only took about half an hour to configure.