SI649 project 2 Interactive Redesign Project Report
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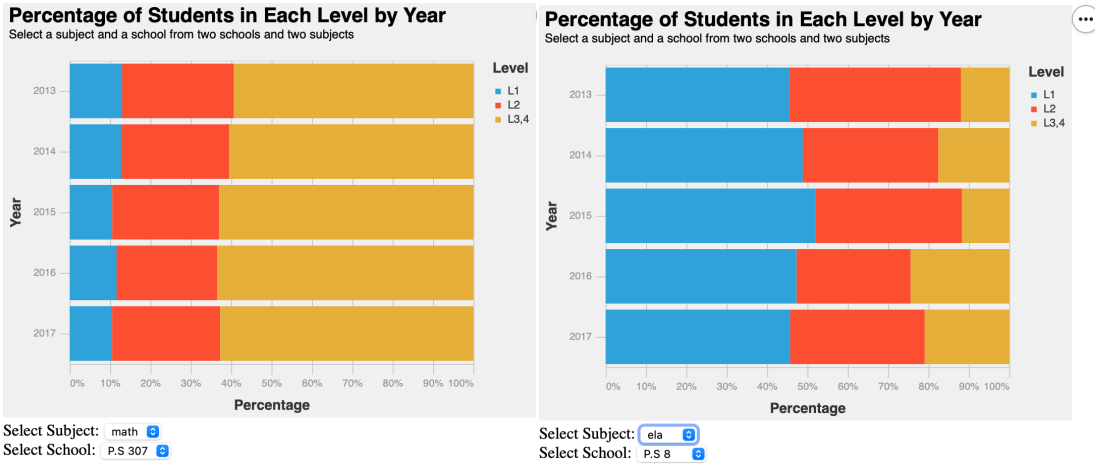
Figure1:



Starting Point:
The original design was a static stacked bar chart based on historical test score data for two New York schools—P.S. 307 Daniel Hale Williams and P.S. 8 Robert Fulton. The first version of the chart is the last picture in my project 1. The initial design had fixed representations of the performance levels in Math and ELA, without allowing the viewer to switch between subjects or schools.

Objectives:
The primary task was to support direct comparisons of student performance across subjects and between schools. I aimed to help the viewer quickly assess how each school performed over time, focusing on the differences in the distribution of proficiency levels (Level 1, Level 2, and Level 3&4). Additionally, the redesign was intended to allow users to explore performance trends interactively, choosing either math or ELA and selecting the specific school of interest.

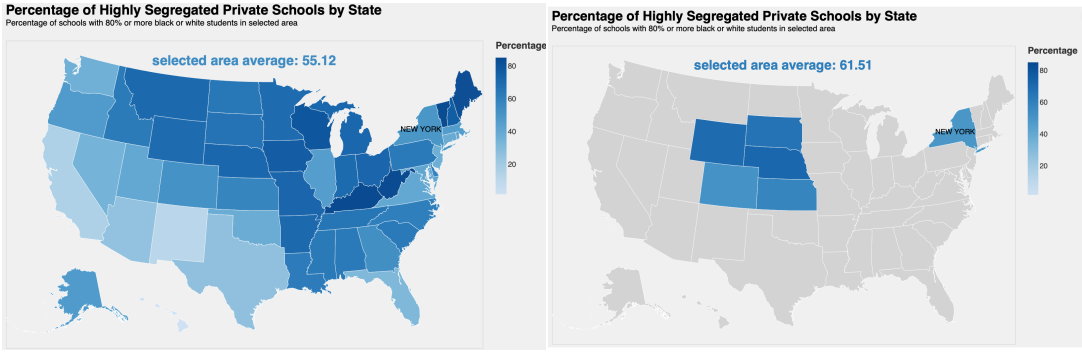
Interactivity Explored:

- Dropdown Menus: Two dropdown menus were introduced: one for subject selection (math vs. ELA) and another for school selection (P.S. 307 vs. P.S. 8).
- Data Filtering: The chart dynamically filters the data based on the selections. The transformation from wide to long data format was key to supporting a stacked bar chart that normalizes percentages, making comparisons across levels more intuitive.
- Tooltips: Hover functionality was added to provide detailed information without cluttering the visual space.

Final Design Evaluation:
The final design effectively meets the stated goals. The interactivity allows users to switch between subjects and schools, revealing subtle trends and comparisons that were not

apparent in the static version. The normalized stacked bars simplify the visual comparison of performance distributions, and the tooltips add an extra layer of detail. Overall, the interactive design encourages exploration and supports the intended comparative analysis.

Figure2:



Starting Point:

The original map was a static visualization of private school segregation across U.S. states. The design displayed the percentage of highly segregated schools per state, using a color scale to represent severity. The initial version was built by aggregating data from the NCES Private School Dataset (2015-16), and a static text label was used to highlight New York. However, it did not allow users to interact with the map or drill down into the data for additional insights.

Objectives:

The redesign aimed to enhance the map with interactive selection capabilities. The primary tasks were to: Allow users to select one or more states to compare segregation levels. Visually differentiate selected states from unselected ones (by highlighting them in color while displaying others in gray). Compute and display the average segregation percentage for the selected states in real time. Enable users to easily clear the selection by clicking outside the selected regions.

Interactivity Explored:

- Multi-select Interaction: After exploring options like brush-based selection (which had limitations on geoshape elements), I implemented a multi-select interaction using click-based selection. This allows users to click on states to toggle their selection, with the ability to select multiple states at once.
- Conditional Encoding: The map uses conditional color encoding so that selected states are colored based on their segregation percentage (using a blue color scheme), whereas unselected states are shown in light gray.
- Real-time Computation: A text layer computes the mean segregation percentage of the selected states. This average value is dynamically updated as the user changes their selection. Additionally, the text is enhanced by prepending a descriptive label ("selected area average:") and encoding its color based on the computed average (using a diverging color scale) to emphasize relative differences.

Final Design Evaluation:

The final interactive map meets the design goals well. Users can now easily select multiple states, and the map immediately reflects the selection with an updated color scheme. The average segregation percentage, displayed at the top of the map, provides a quick summary of the selected data. This additional level of interactivity not only improves user engagement but also enriches the analysis by allowing viewers to focus on specific regions. The design's clarity and responsiveness suggest that it effectively communicates the extent and distribution of school segregation across the country.