|  |  |  |
| --- | --- | --- |
| Checkpoint IV | Checkpoint IV: First Prototype | |
| Group: | G14 |
| Date: | 2021/11/01 |
|  |  |

# Layout

We can consider our visualization to be split in three sections:

* A top section with a slider and a dropdown menu for the user to pick the year and the attributes (respectively) that they want to visualize. After toggling an attribute in the drop-down menu, it will appear on a list next to it, which can be sorted manually either by interacting with the menu or by dragging and dropping each element.
* A bottom-left section with, from top to bottom, a choropleth map, and a dot plot to represent our data for the selected year.
* Graphical user interface, chart

  Description automatically generatedA bottom-right section with, from top to bottom, a line chart, a parallel coordinates plot and a Gantt chart, to visualize the data through the years for a chosen state.

Figure 1 Current layout of the visualization after implementing two idioms

# Visual Encoding

For this delivery we have already implemented the choropleth map and the line chart.

The choropleth map is a map of the United States of America split by states, each with their own shape, position, and hue in which the latter represents the first attribute in the list’s value for the year selected on the slider and updates every time the user changes one of those.

A picture containing map

Description automatically generatedChart, line chart

Description automatically generatedThe line chart represents the data either for the state chosen on the map or the default one, but unlike the map, it represents the attribute’s values through the years. Each value is represented by a dot connected to its neighbors by a line. The x position encodes the year and the y position the value of the attributes. Each attribute has its own unique color and can be highlighted by hovering the mouse over its line.

Figure 2 Choropleth map with a state selected (in red)

Figure 3 Line chart for the selected state showing that the colour for each attribute is the same as in the selection menu

# Implementation of Linking Mechanism

All the idioms share at least one of the top section’s selections, but the interaction between them goes beyond that, we also allow the user to change the data that is being visualized by interacting with some elements inside the idioms.

Timeline

Description automatically generatedWhenever the user hovers the mouse over a state, a tooltip shows up with the name of the state and its corresponding value for the attribute chosen. But if the user clicks on the state, it becomes selected, an icon shows up over it and the line chart (and, in the future, the other two on its section) starts displaying the values for that state.

When the user hovers the mouse over a line, a tooltip appears with the corresponding year and the attribute’s value in that point. And if the user clicks on a line, the corresponding attribute moves to the top of the list and is then shown on the map instead of the previous one.

Chart, line chart

Description automatically generatedWhen we have the dot plot and the parallel coordinates chart implemented, those will also be linked in a similar way. The dot plot will allow a state selection and the Parallel Coordinates will not only allow year selection by clicking on one of its lines but will also change its axis’ order when the user changes the order of the attributes on the list, either by interacting with the list or by clicking on a line from the line chart.