639 Final Project

12/18/2021

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Description and Storyboard

Below is our storyboard. We designed our interaction with the idea of a data exploration tool with a globe that would have brushing and linking functionality to help explore world development data (link). In particular, we would brush the globe which was located on the left and would link to multiple visualizations on the right hand side. The visualizations compare two groups (shown by two different colors in our storyboard) and would be enhanced by queries on the data (top box). The visualisation we intended to create were visualisations for univariable (pictured with a histogram), bivariable (pictured with a scatterplot and correlation matrix) and multivariable (pictured with a radar chart) data.

Description of application

The final interactive visualisation is a data exploration tool designed to better understand the world we live in. It allows us to select one or more countries and see the specific countries economic as well as development indicators. Along with this, it helps us compare the economic and development indicators of 2 countries with the help of a histogram and scatterplot.

In particular, we chose to create a globe to better enable the selection of countries in a manner that was visually easy to understand for the user. Moreover, we placed the globe on the left and the visualisations on the right as most users naturally tend to first observe the left side before the right. Along with this, for

the 1st and 2nd countries the user selects, we chose the colour grass green and dark green so that the user can easily distinctly identify which country is Country 1 and which country is Country 2. While selecting or hovering over a country, the country is highlighted red to help the user identify the current country they are on and as red signifies importance, to help the user navigate efficiently. To make our exploration tool more accessible and easier to navigate, we added a auto rotate on and off check box so that the user can decide whether they'd the visualisation to automatically keep spinning or manually spin it themselves. Along with this, to unable the comparison of univariate data, we decided to go with the histogram visualization as it is universally understandable and helps in comparing the data of 2 distinct items efficiently. We had to stick with the design encoding of the histogram automatically sizing itself and the 2 histograms having different maximums and minimums on their axes as due to our limited knowledge of D3, we were unable to find a suitable fix for that. For the histograms, we chose a linear scale as it complimented the way our dataset was formed and as we believed it would be easier to compare 2 linearly scaled histograms than logarithmically scaled ones. Along with this, we chose the colour turquoise for the bars as it complements off the colour white and would be easy to observe for colour blind users. The Histogram has a title rather than axes on y and x axes as we had a hard time placeing the axes without placing them on top of the data, again due to our limiited knowledge of D3. The title of it has a large larger font than the the rest of the page to make it more distinct and improve readibility.

To make the selection of countries easier for our users, we have allowed 2 options, 1 option is to change the country for the 'Selected Country' dropdown menu and one is from the globe, we gave both options as we observed some users fancy the former option while others fancy the latter option. We also chose to place our data indicators in a dropdown menu as given the large abundance of indicators, it only made sense to configure them via dropdown. The visual encoding of our specific font was chosen to improve readibility. For our scatterplot, we again chose the colour turquoise for the dots due to similar reasons as for the histogram. And we also had trouble giving it axes which is why we chose to give each scatterplot a unique title. We had intended to add a Step by Step Guide to the right of our globe but due to space constraints we had to summarise it. Here is the Step by Step Guide: - Step I: Click on a Country on the globe, Country I is grass green - Step II: Click on another Country on the globe, Country II is dark green - Step III: Click on the Data dropdown menu and change it according to which indicator you would like to use

Changes Between Storyboard and Implementation

We were unable to implement box based selection, but efficiently implemented selection by clicking a country. We were unable to effectively scale the x axis in the histogram and scatterplot. Our main pitfalls was that we were unable to implement everything we wanted to implement, such as a fully functional scatter plot and radar chart. We were however able to implement the histogram. Unfortunatly, D3 proved a difficult to customize so we weren't able to pay as much attention to the details that we learned in class such as adding axis labeling and making use of small multiples by keeping a consistent scale between the plots we wanted to compare.

One thing that we were able to add was features we didn't realize we would be helpful until we started coding. For example, we added an auto-rotate feature that rotated the globe and an auto-swap feature that swaped what group you selected each time you clicked so you didn't have to use the dropdown menu to change groups.

Work Breadown

Avery spent the most amount of time writing the back end of the code which included writing the code for the globe, cleaning the data, setting up the tsv file and the histogram. Sharada wrote the code for the scatterplot and helped with the slides. Oat helped in debugging and set up the graph axes and titles. Taha wrote the final write-up. Taha and Oat wrote the presentation slides, whereas we all helped in the initial proposal document.

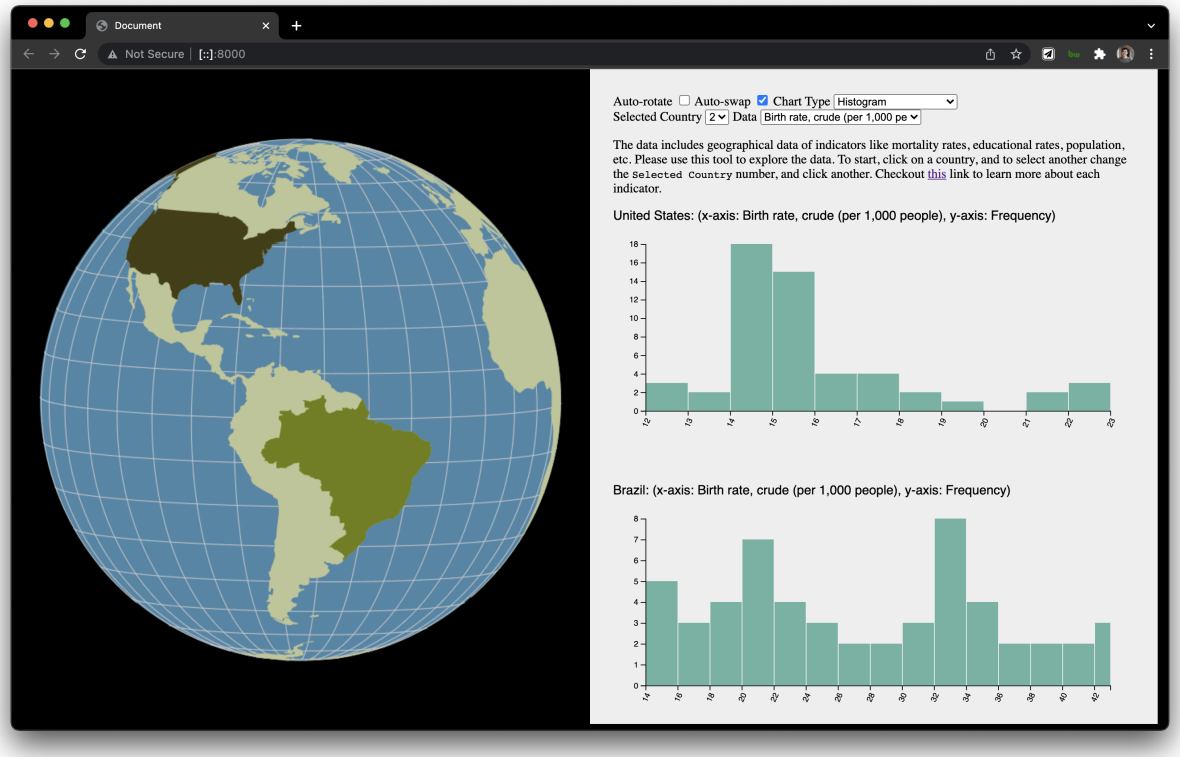

Figure 1: Screenshot of final application

Links

1. Link to interactive website
2. Source Code