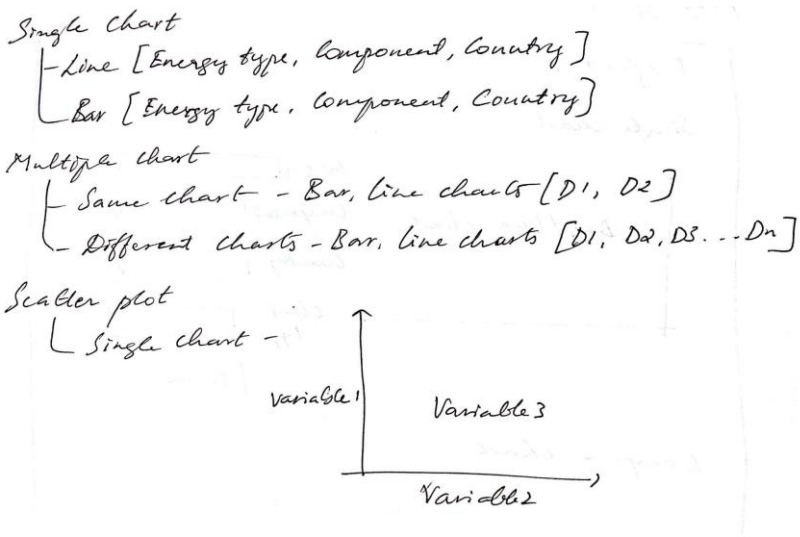
H590 Interactive Visual Analytics – Project1

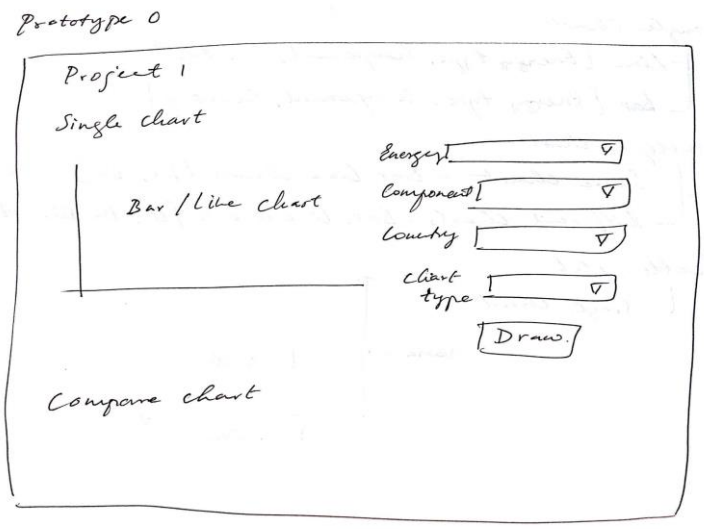
1. Design Process

Initially, I aimed at aggregating all the possible variables from the input datasets and listed variable combinations to consider for bar, line, and scatter plots.



Further, I tried to visualize simple chart for line and bar graph on a single tab and tried to integrate chart comparison with plotting on a single chart and multiple chart. But this looked to create complications with visually integrated multiple UI widgets and graph layouts. Some of the things I aimed initially were:

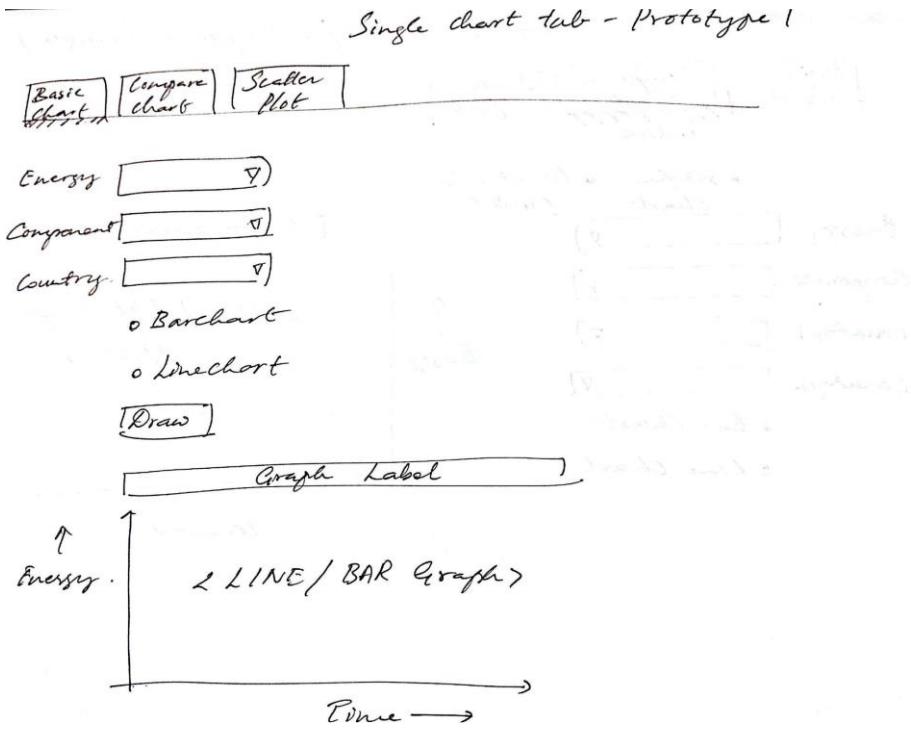
- To follow simplified design with minimal color use for UI layout.
- To design intuitive interface and approach to be modular in order to visually group into multiple layouts.



In the next design improvement, I integrated single, multiple chart comparison, and scatter plot using Bootstrap tab structure.

Tab Structure

Basic Chart – Contains implementation for visualizing simple bar chart and a line chart.
Compare Chart – Contains implementation for visualizing and comparing multiple charts and it includes single and multiple graphs.
Scatter plot – Contains implementation for visualizing a scatter plot
Documentation – Contains documentation from this page.
Video – Contains a link for visualization demonstration.



Later based on my variable list and the project requirements, I developed sketch prototypes for various tabs and used the below technologies and UI libraries for project development:

Technologies used:

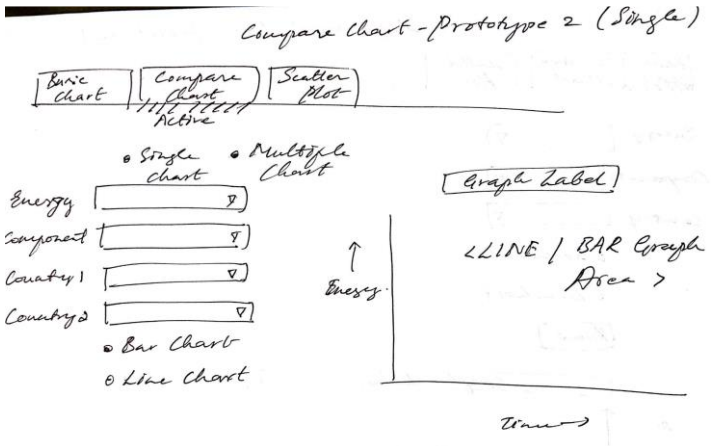
- Bootstrap CSS library (For structuring layouts and UI widgets)
- D3.min.js (For developing interactive charts)
- D3.tip.js (For implementing value label pop-ups on charts)
- Papaparse.js (For parsing the dataset CSV files)

Design Rationale

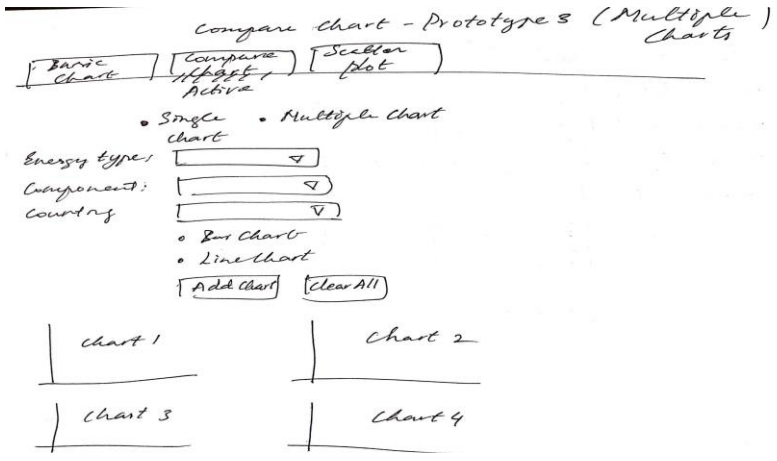
- Followed minimalistic design with respect to use of color schemes on charts.
- Used color brewer to get color scheme for plotting multiple graphs on the same chart.

- I have encoded graph labels in the same color – grey to help differentiate from rest of the graph details.
- Since plotting multiple graphs with too many regions on the same chart would drastically cause space issue, I have restricted to two regions for demonstration purpose.
- I have given freedom of choosing as many countries as possible when plotting on different charts for comparison purpose.
- I have introduced pop-up value dialog on the graph to interactively check values plotted. I have used color scheme different from the one I have implemented for graph to distinguish the value displayed in value dialog pop-up.
- In order to introduce certain level of abstraction, I have designed the entire layout to show as a overview and let user interact to perceive internal details on demand (example: tool-tip)

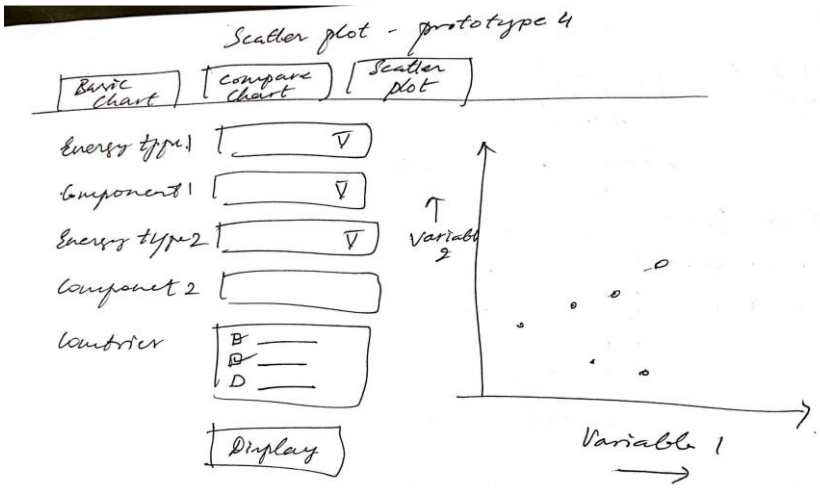
Sketch Prototypes



Prototype 1: Chart comparison prototype – Single Chart



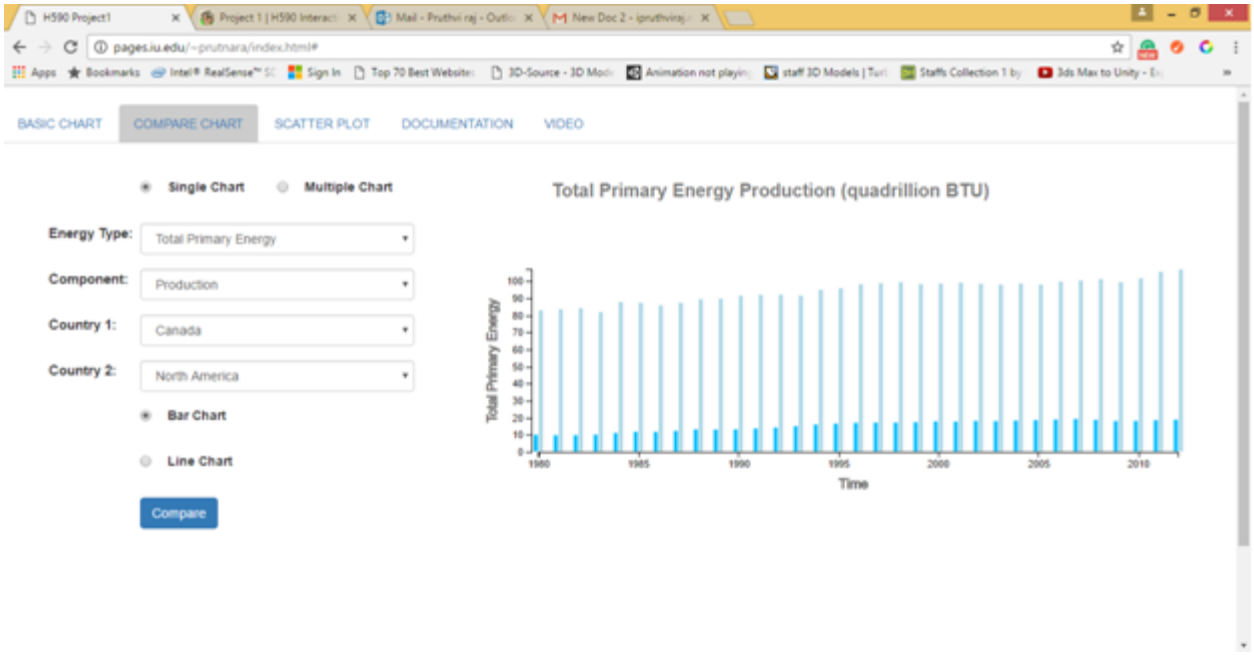
Prototype 2: Chart comparison prototype – Multiple Chart



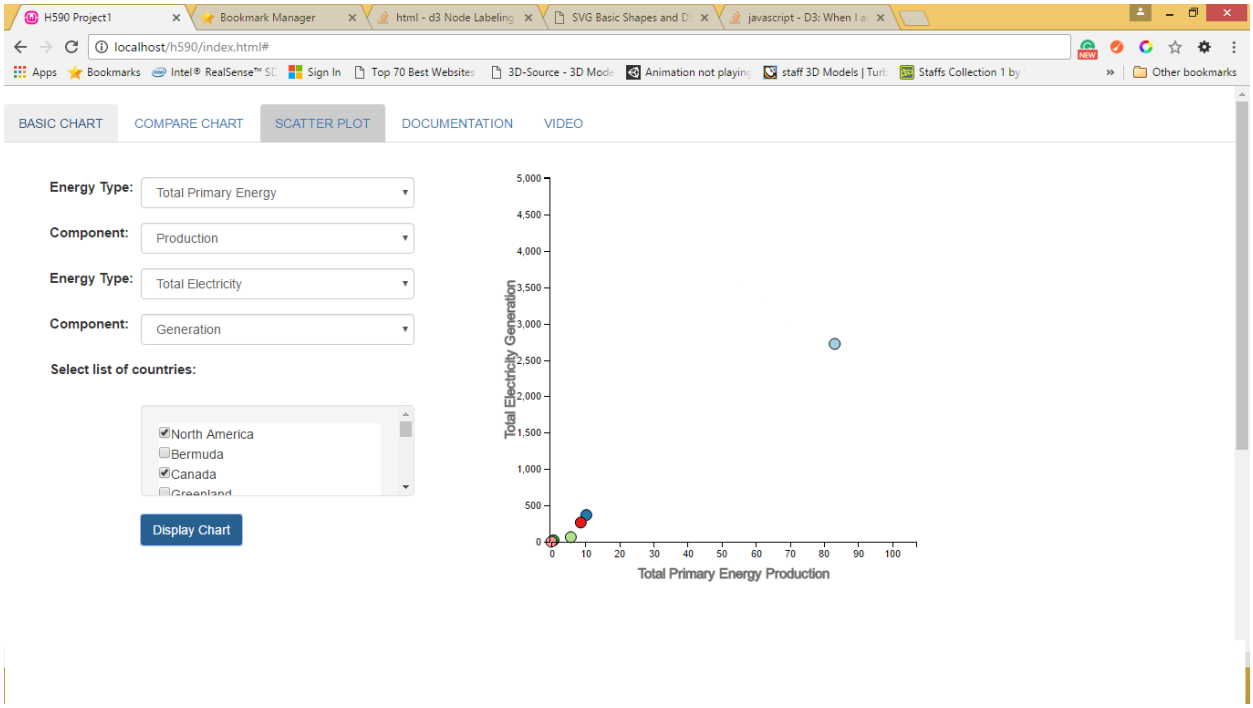
Prototype 3: Scatter plot

What are the questions answered and learning from the interactive visualization

- By having to visually compare energy type for various regions, I was able to understand the trends in energy production and consumption around the world and how it changed over time.



- By introducing scatter plots, I was able to visually explore and understand correlations between different variables for regions around the world.



YouTube Demonstration Video Link: https://youtu.be/UlRp409DjjE