Documentation: Force-Directed Network Graph and Stacked Bar Chart

GitHub: https://aaronstarrett.github.io/Final-Project-Data-Visualization/

YouTube link: https://youtu.be/_QP9VNOn_D8

1. Introduction:

This document provides an overview of the Force-Directed Network Graph and Stacked Bar Chart visualizations implemented using HTML, CSS, Bootstrap, and D3.js. These visualizations are designed to represent student behavior and attitudes towards studies, hobbies, gender distribution, and departmental affiliation.

2. Force-Directed Network Graph:

The Force-Directed Network Graph provides a visual representation of relationships between students and their respective departments. The graph allows users to understand the distribution of students across different departments, genders, financial statuses, and other attributes.

Key Features:

- **Nodes:** Each node represents either a student or a department.
- **Links:** Links between nodes represent relationships between students and departments.
- **Legend:** A legend is provided to explain the color codes used for different departments, genders, and financial statuses.

3**. Stacked Bar Chart:**

The Stacked Bar Chart visualizes data related to the gender distribution, average weight, and progress in studies across different departments.

Key Features:

- **Bars:** Each bar represents a department, and is divided into segments representing the gender distribution, average weight, and progress in studies within that department.
- **Legend:** A legend is provided to explain the color codes used for genders, average weight, and progress in studies and details are:

  Male: Represented by a blue line in the legend. Indicates the number of male students.

- **Female:** Represented by a green line in the legend. Indicates the number of female students.

- **Average Weight:** Represented by an orange line in the legend. Indicates the average weight of students.

- **Progress in Studies:** Represented by a red line in the legend. Indicates the progress in studies for each group.

4. Implementation:

The implementation utilizes HTML, CSS, Bootstrap, and D3.js.

- **HTML:** The HTML structure defines the layout of the visualizations.

- **CSS:** Custom CSS styles are used to enhance the appearance of the visualizations.

- **Bootstrap:** Bootstrap is used for responsive design and layout.

- **D3.js:** D3.js library is used to create the interactive visualizations.

5. How to Use:

- Open the HTML file in a web browser.

- Explore the Force-Directed Network Graph to understand the relationships between students and departments.

- Hover over nodes to view detailed information about students and departments.

- Explore the Stacked Bar Chart to understand gender distribution, average weight, and progress in studies across different departments.

- Hover over bars to view detailed information about each department's statistics.

6. Data Source:

The visualizations are generated using data from the "Student_Attitude_and_Behavior.csv" file.

How did I go about designing the visualization?

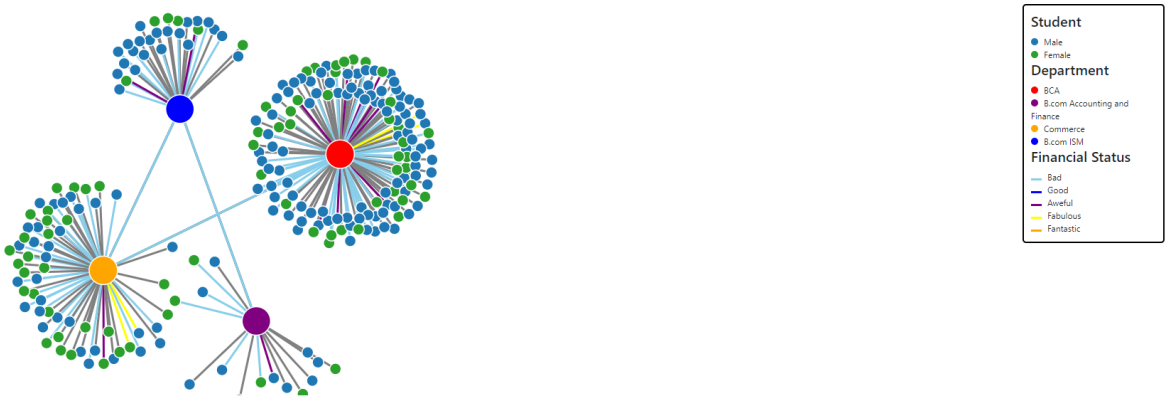
When I first started this project the goal was to find out what the relationship between the students attitudes and behaviors towards their studies, along with the demographic of who may be more successful trying to find the attitudes and behaviors that are the most and least successful depending on the program they are apart of.

While figuring out how I would represent that, I watched some YouTube videos and thought that it would be fun to attempt the Force-Directed Network Graph. I found this appealing because it is easy to visually see the groups and colors of the changing attributes amongst groups,

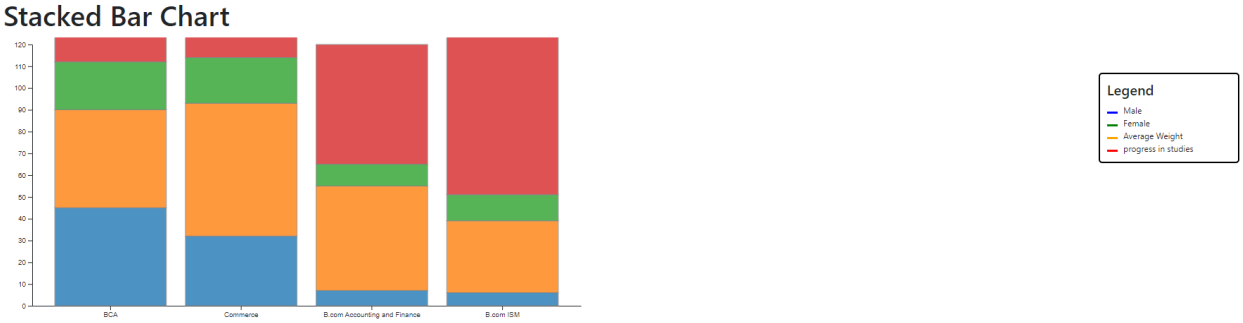
with the ability to hover over each node and uncover more detail data within that node. This was a graph I have never visualized before and thought it would be fun to attempt to do one for this project as well. Really more of curiosity to see if I could make one with D3 is what led me to this graph. I also chose the standard bar chart with different interactive data as you hover across it.

Facts or questions answered:

Force Network Graph



Stacked Bar Chart



One of the questions I had was how many student were in each type of program or department, from the BCA, Accounting and finance, Commerce, and the ISM. It appears that the majority of students reside in the Business College BCA.

I wanted to know what the demographics of student ratio amongst the departments, and we can use the ISM department as an example to show things like there are an overwhelming number of boys compared to girls, and of the students who had financial data we can see they are mostly in a Bad financial status with the best financial status coming in at a grade of “Awful”.

Likewise with the bar chart, I want to see if health has a difference in overall attitudes towards which department to enroll in, and we can see that the highest average weight in the orange, is in the Commerce school while the lowest average weight of a student is in

the ISM department. We can also see that there are more males in the BCA and Commerce where there are more females than males in the accounts and finance as well as the ISM.

Hovering over the individual parts of the graph show you the data, however I cannot screen shot that with snippet without the data going away.