# Design Process

**Initial Obstacles**

*Contacting SAS and Dr. Watson*
Soon after being divided up into our groups, we had our first meeting. When we met up, we soon realized we really had no idea what to do. We had been emailed by both SAS and Dr. Watson. Even with these emails, we had no idea where to begin. We spent the majority of that first meeting going through the emails from Dr. Watson along with SAS, and try to figure out what they wanted from us. Another challenge was not being able to get in contact with anybody from SAS except for one time at the beginning of the project.

*Obstacles Building Project*
Afterwards, the main obstacle was trying to put together the project in a professional and meaningful manner. This meant we needed to figure out using HTML, CSS, and JavaScript how to create data, and transition that data into a bar chart. We accomplished this by having a fixed number of variables, and used those variables to create a bar chart based on how high in a number format each data piece was. We also had to consider that creating the bar chart involved scaling the individual bars both for the data numbers and the area of the canvas. We accomplished this by having the highest data set scale to the height of the canvas. We also accomplished this by setting the width of the bars based on the number of data sets we had.

*Losing Fanmao*
It was not until about a month and a half into class that we found out we had lost our sixth teammate. During our first presentation we brought up the fact that our teammate was missing and we had no idea where he was. Dr. Watson asked us to speak with the TA in order to figure out what was going on. Later that day, Mike received an email from Fanmao saying he had in fact dropped out of the course.

*Division of Labor*
After our first presentation and our meeting with Dr. Watson to determine what he actually wanted us to do, we had another team meeting to reorganize and figure out what our next step would be. Here are each group member's responsibility for the project:

- **Philip's** side of the project was building the JavaScript with James in order to get the bar char's functionality working properly, along with building the x and y-axis for the chart. Another responsibility was researching Google Hangouts and helping build the presentation slides for each presentation in class.

- **James'** job was to add axes to the bar and line charts, add graph area scaling capabilities, add labels to the different charts, and do other various javascript tasks.

- **Michael's** job was to manage the team and get everyone meeting regularly. Also, he took care of testing, getting deliverables together, and turning in the final project. Also, he took care of any work re-allocation if one person had too much or too little work to do.

- **Jose's** portion of the project revolved around making sure the code was properly validated and stayed true to the purpose of the project. Seeing as how this project revolved around the making graphs more user friendly, user testing was also critical.

- **Connor's** job was to manage the GitHub and to facilitate hosting on his www4 space. Connor also did work on the javascript implementation of many of the graphs.

**Choosing Data to Chart**

During our meeting with Dr. Watson, many of our initial questions were answered. At the end of the meeting, Dr. Watson had us make a choice. Because there were two different groups working on graphs for SAS, he did not want the presentations to be too redundant. He referred us back to the emails that had been sent to us by the people of SAS. Inside of their instructions, there were two apparent use cases for this project. The first one involved the transition from data to an actual graph. When switching between data points and an actual chart, it is hard to make the connections initial. Our project revolved around making the creation of a graph from a chart more easy to follow. The second use case was about making more appeasing visuals when manipulating data inside of an already generated graph. They would make it so that when data was changed, the graph would update in a manner that would be simpler to follow for a user. In the end we decided to go with the first use case because we were more more interested in graph creation than manipulation.

**Bar, Pie, and Line Chart**

- The **Bar Graph** consisted of having data points on our website, and individual bars were animated into the next div to scale for each data point according to how high each number was. The x-axis on the bar graph showed an abbreviation of each data point description, and the y-axis scaled from 0 to the maximum data point number. In the first design of the bar graph, 6 individual bars solely appeared in the same canvas in their proper position without moving horizontally or vertically. In the final design, each bar grew vertically into their proper position as the x and y-axis labels appeared. We chose the second design because it looks more interactive, and it looks more like a transition from data points to an individual bar.

- The **Pie Chart** involved having the data on one side of the screen and a blank space on the other side. When the user animated the transition, the pie chart segments appeared and were appended in a clockwise order, with each corresponding data point right next to it. Initially, the entire chart appeared in less than half a second but we slowed down the animations to make them easier to follow.

- The **Line Chart** is comprised of a data set held on one side of the site, and a chart area directly opposite that. The chart area is scalable by putting in a scaling value that represents the width of the chart area in pixels. The value for the width of the chart area is checked to ensure it is reasonable. The animation of this chart consists of all of the points appearing along the x-axis, and then raising up to their correct heights. After they have all reached the proper height they are connected by a series of lines, forming a line graph.

**Feedback**

*Class Feedback*
The **class feedback** was mostly positive for our presentations. Most of the posts were either commenting on our design, and coping with losing a teammate. Another highlight of the feedbacks were some providing constructive criticism and ideas on how to improve our presentation to make it more immersive and look more transition-like.

*SAS Feedback*
The **SAS Feedback** was almost none on our project. The only time SAS provided feedback about our project was after our presentation in class when they gave us ideas about how to improve our presentation and project itself.

**Organization**

*Team Meetings*
For our Team Meetings, we met every Sunday at 3 PM, and set deadlines to have our HTML, CSS, and JavaScript done by a certain date. As the project is soon to be finished, we have been meeting more often to get our work done together. Also, as we received more feedback, certain deadlines were extended because we further understood the scope of our project. We originally met in Hunt Library for our Sunday meetings, but later on we decided to start meeting at D.H. Hill.

*Keeping Track of Documents*
The Google Apps we used were: Google Slides for each of our presentations in the class, and Google Docs for any word documents such as design process write up, task division and so forth.

*GroupMe & Email*
We communicated both by **email and GroupMe** for the project to set up our meeting dates and explain how the work would be split up. Email was convenient for contacting the teaching staff and having everyone receive the same responses through carbon copies. GroupMe was more convenient for organizing amongst ourselves because it allowed for faster responses.

*GitHub*
We used GitHub as our code repository. Most of our team at this point was familiar with how Github works and so it was easier to use as a platform, because nobody had to be shown how to use it. Having a repository that we could all co-manage was convenient, because we could all
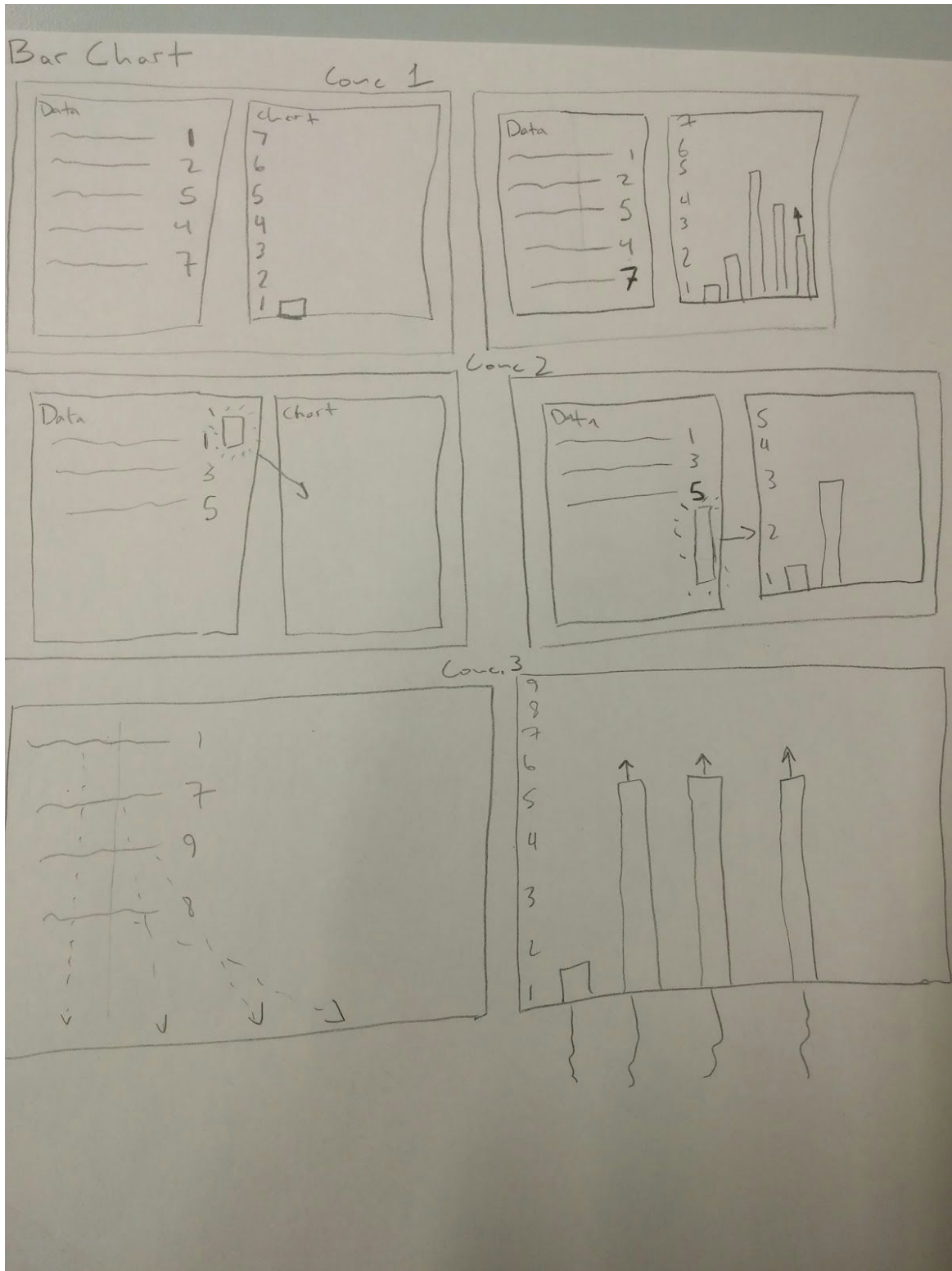
contribute whenever needed. We could inspect each other's code and even attempt peer programming. GitHub also allowed us to keep track of changes, so in case anything went terribly wrong, we could revert back to a stable version.

*Hosting our Project*
We used **www4** because  it is easier to use a web host by N.C. State that was already provided for us versus one of us figuring out how to host a domain and website on the Internet.
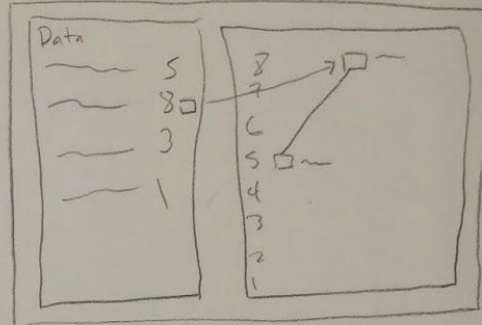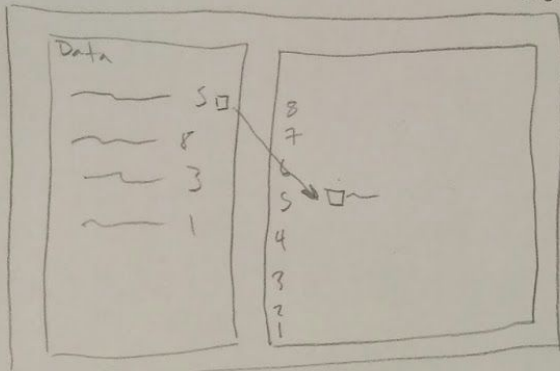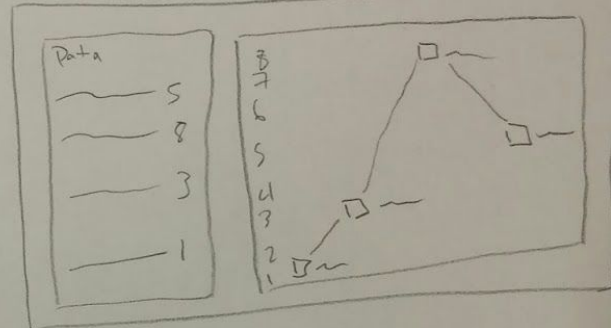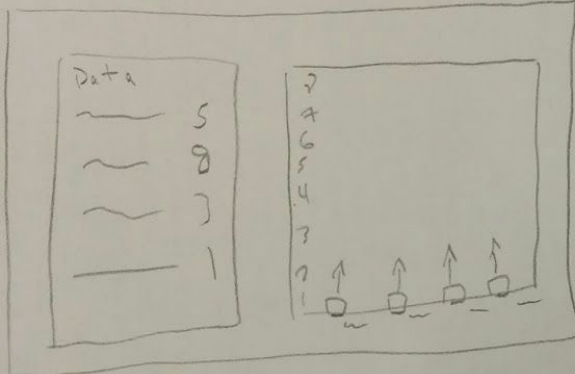
# Conceptual Drawings

**Bar Chart**

# Line Chart

**Pie Chart**