Process Book
Michelle Danoff, Maria Lovett, Mirhee Kim.
City Cycle

Preproposal work:
As our preproposal discusses, our team was initially drawn to the concept of biking data due to our interest in environmentalism and sustainable living. In New York, where Mirhee and Emily are from, bike shares completely changed the nature of city living http://www.huffingtonpost.com/jared-green/bike-share-is-growing-up_b_6188212.html , and bike shares are beginning this year in Philadelphia, where Michelle is from http://articles.philly.com/2015-02-12/news/59048312_1_bike-sharing-program-bikes-and-docking-stations-independence-blue-cross.

We wanted to create a visualization that would help these bike share companies understand their own businesses and make smart business choices. Since many of these companies manually move bikes around during the day, understanding the bike traffic patterns better would help them know the most efficient way to arrange this movement. We also think a visualization of bike share growth will appeal to the general public, who often lack knowledge of the scale of bike shares in New York City.

Sunday April 12:
Our team conceptualized in detail more what the visualization for the project would look like to have a solid vision before we start coding. We also made data requests to finalize data collection and submitted a weather data request to the National Climatic Data Center, a branch of the National Oceanic and Atmospheric Administration. We need to wait until the work week begins (tomorrow) for the organization to approve our data request. We were lucky to find all of our data (both the bike and the weather data) in CSV form so we won't have to do much data manipulation. We already have our bike data (we included that in the pre-proposal) so the only remaining question with the bike data is how long of a time period we want to visualize.

We are debating between showing several consecutive days and selecting a few particularly interesting days to display. We now have a strong idea about what aspects we want our visualization to have (a map that animates the motion of bikes around the city, a timeline where users can select where to see data from, graphs (most likely bar graphs) that compare bike usage this day to other days, and information about the day such as weather.
Tasks Accomplished: All data requests submitted, initial concept complete

Monday April 13:
Our team met with our mentor Mohammad. The meeting made us aware of some ways that our original design was vague and our team spent several hours after conceptualizing exactly what the graphs and visualizations would look like. We then began coding. We spent the bulk of the afternoon and evening learning how to use Google maps and set up the correct Google

map window with station nodes that scaled appropriately with zooming. At the end of the day, unfortunately realized that it would be impossible to do the movement animation with Google maps, so decided to approach the map animation with MapBox and Leaflet. While it is extremely frustrating that we won't' be able to use the code we spent most of the day working on, we still learned about Google maps and also realized the importance of researching the limitations of software before we start implementing. properly. We also changed our time frame and resubmitted the weather data request. By 4 pm we received the correct weather data, making our entire data collection complete, and all the data is loaded into the data folder of our github page.

Tasks Accomplished: Data collection complete. Time slider working. We know now not to use Google maps.

Tuesday April 14:
Today we dug into implementing the maps in a way that will enable animation. First, we came to the in class design studio and got useful feedback from the other team we worked with. They were very enthusiastic about the animated bike movement, and helped us conceptualize what the comparison graphs would look like. We settled on having two separate comparison graphs: one comparing the displayed day to other days (within that we will have several divisions -- other days that had the same weather, other days in the same month, etc.), and one comparing the hour displayed to the other hours of the day (so it will be easy to see if it is a peak traffic time).

After class, we dove into the implementation of the map post Google maps. We got the map up and added nodes to represent stations. We debated the best algorithm to use for bike movement: either using an adaptation of the midpoint formula or using trigonometry. We decided on using the midpoint formula, see our attached photos for the preliminary algorithm.

Tasks Accomplished: Map that will allow animation up and running, station nodes in place.

Wednesday April 15:
Today we focused on the animation. We fixed the station nodes so they scale properly when the user zooms in and out. We added bike nodes and began to think about the animation. One the side, we started working on the daily informational graph, but were slightly derailed by an extremely slow computer that kept crashing.

Thursday April 16:
We realized that our current slider would not work functionality wise with how we envisioned our animation so we are going to modify the slider. Also got the home page working which shows a citibike logo before beginning the animation.

Friday April 17:
Finished the write up of the design studio. The animation is fully functional, however we have to adjust the slider to play the animation correctly. Right now, moving it forward causes the animation to move by 1 minute, as opposed to the actual difference in minutes. It also does not play backwards yet. We also are displaying current weather data and the day, which

corresponds correctly to the slider. We have also noticed an error in the slider, when one clicks on a new time -ie not dragging it-, the event fires twice. This is problematic for us.