DataHub

Dayne Davis
Niamh Durfee
Alexandra Smith

Background and Motivation

As students, we make use of many forms of alternative transportation to explore and commute around Boston. In particular, bikes are a popular, affordable method of transportation for students and professionals alike. We want to understand who uses bikes and how to get around Boston. One of the most readily available datasets that gives an idea of the prevalence of bikes is that provide by Hubway, a bike sharing/renting program in the Boston and Cambridge.

Project Objectives

We aim to answer the following questions:

- What is the average trip distance?
- What are the most popular start and end destinations in the Boston Area?
- Where are the people using hubway from and where do they go?
- Are trips are for leisure or strictly commuting (based on speed)?

Data

Our data is found at http://hubwaydatachallenge.org/trip-history-data/

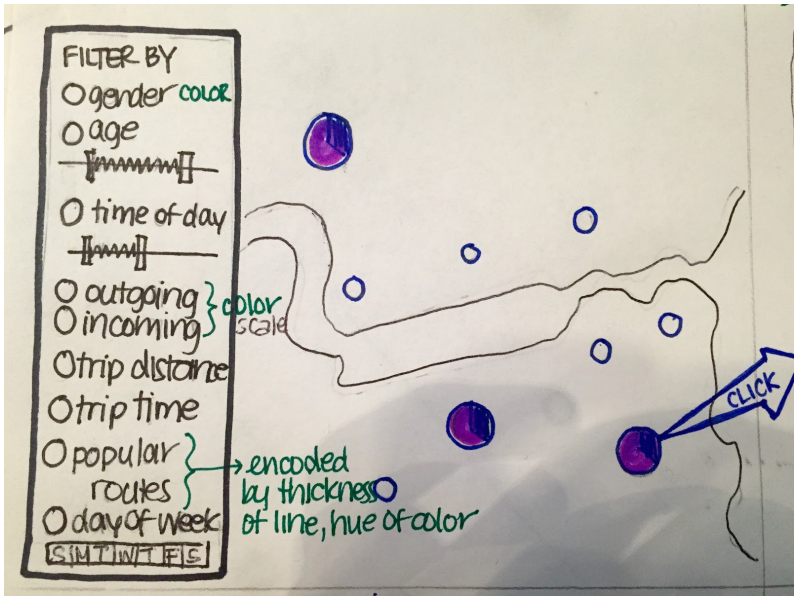
Data Processing

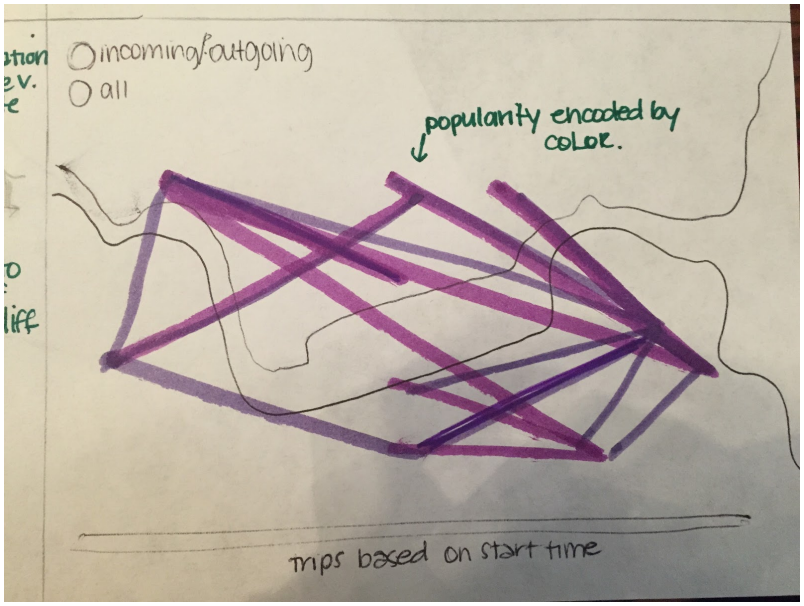
There will be little data clean up necessary based on our projected uses. We may need to format it more based on GeoJSON requirements. We plan to derive:

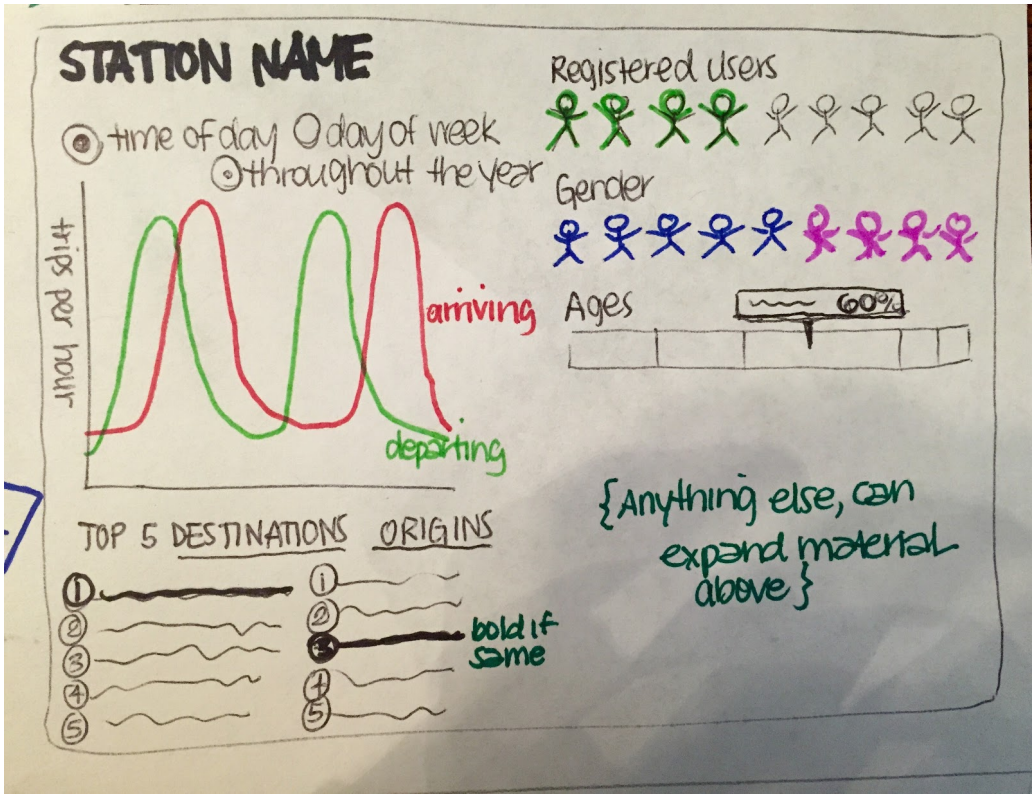
- trip length (based on start and end time, and start and end position)
- trip speed (by dividing the quantities above)
- average user age
- gender breakdown
- most popular Hubway stations

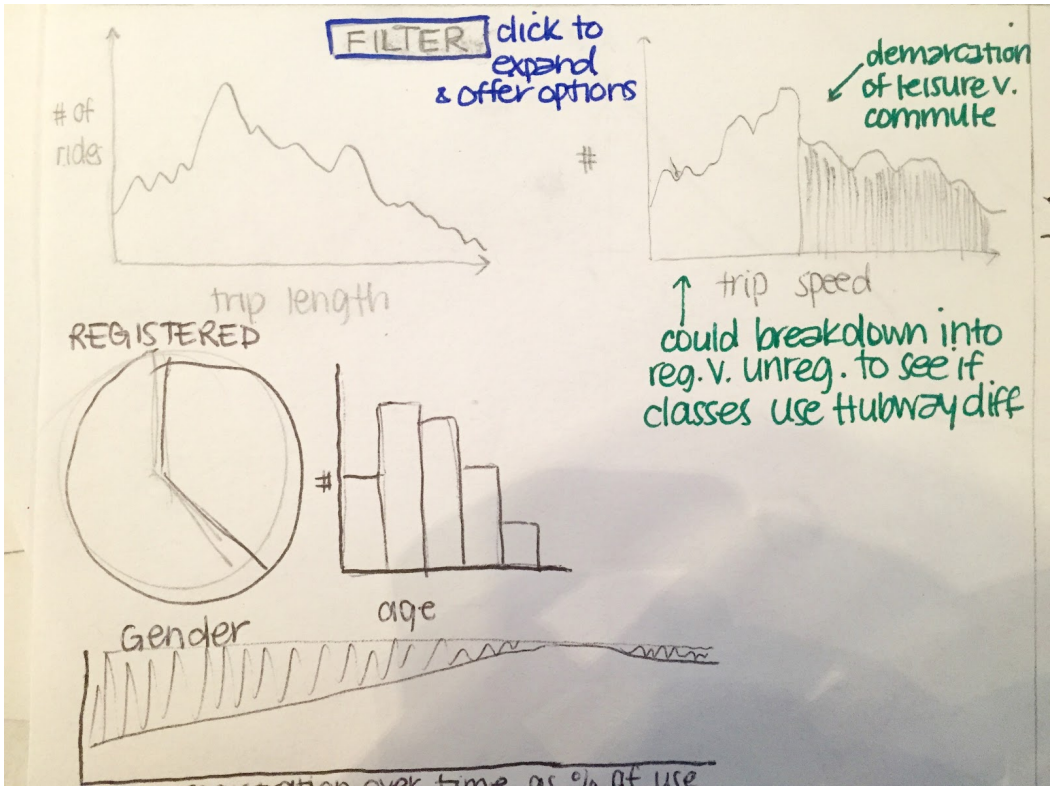
This list is by no means exhaustive, and we anticipate more derived statistics as we get deeper in the data.

Visualization How will you display your data? Provide some general ideas that you have for the visualization design. Include sketches of your design.


FILTER BY
gender
color
age
time of day
outgoing
incoming
color scale
trip distance
trip time
popular routes
day of week
S M T W T F S
encoded by thickness of line, hue of color
CLICK


incoming/outgoing
all
popularity encoded by color.
trips based on start time


STATION NAME
time of day
day of week
throughout the year
trips per hour
arriving
departing
TOP 5 DESTINATIONS
ORIGINS
bold if same
Registered users
Gender
Ages
60%
{Anything else, can expand material above}


FILTER
click to expand & offer options
# of ride
trip length
demarcation of leisure v. commute
#
trip speed
could breakdown into reg. v. unreg. to see if classes use Hubway diff
REGISTERED
#
Gender
age

Our main view will be a map of the Cambridge, Boston area. There will be two visualizations that you can switch between that are overlayed on the map. One will be nodes at the station locations that will vary in size depending on how busy they are. You will be able to add filters for the time of day, gender, age, etc. that will modify the nodes. The second will be lines connecting the stations that will show the popularity of the route based on color. You will be able to apply the same filters to this visualization. Also hovering over a route can show other details of that route such as the average trip length, gender, and age of the rider. We also plan on having two more visualizations that will show other stats of the routes, stations, and the average user of Hubway. We plan on switching to these views by either clicking on a station or route. Each of these visualizations will also have some filters and a time slider to allow the user to see how they change over time.

Must-Have Features

- trip length distribution
- trip distance distribution (base on direct route between stations)
- trip speed distribution: leisure versus commuting
- popularity of a hub (total volume, outgoing, ingoing) - plotted on a map
- distribution of genders & ages of users
- distribution of time of day/year

Optional Features

- follow the bike (one bike for an extended period of time)
- see common routes
- plot use against weather (interesting to see extreme weather events)
- plot popular routes on a map

Project Schedule

	Dayne	**Niamh**	**Lexi**
Week 1 April 5-11	Overall: Data cleaned; Page setup; Map functionality with ability to plot coordinates		
	Setting up map visualization.	Import and clean up data.	Setting up page and ui. Set up website
	Overall: Both map visualizations done		

Week 2 April 12-18	Change nodes by popularity of station	Add lines to map viz and change color by popularity.	Add filters to map visualization.
Week 3 April 19-25	Overall: View of in-depth stations complete		
	Set up visualization.	Line graph and top Destinations	Registered users by stick figures, age stats, etc
Week 4 April 26-May 2	Last view complete		
	Line graphs, Demo video	Pie graph, bar graphs, Gender graph.	Tie all visualizations together, add transitions, and clean up style.