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Python Bridge Course
Project 2 Proposal

Introduction

The goal of this project is to compare bikeshare data from two cities, San Francisco and New York City, to understand how user behavior differs between the two locations. We'll also be merging this information with weather data to better understand how weather factors influence ridership in each of the cities.

As a first step, we created two dataframes, one for each city. Each dataframe includes trip and weather information. We leveraged NYC bikeshare trip data and merged it with weather data collected from the government using date as a key. Since the weather data was collected through various weather stations, we decided to use the Central Park station data in our analysis. However, we used trip and weather data provided by the bikeshare organization in San Francisco, instead of merging in government weather data since the weather was readily available. To do this, we had to merge the trip data, which included station ID's, to the station data, which included station zip codes. We used Google to map these zip codes to actual city names (San Francisco, Mountain View, etc.) and then mapped those city names to the weather data.

After creating the dataframes for each city, we analyzed and mapped fields across the dataframes, standardizing the header names and contents for overlapping fields. This was particularly difficult for the weather data, since we had to understand weather metrics to accurately map the data and ensure we were doing an apples-to-apples comparison. The reason for standardizing the header names and contents is to enable us to leverage the same code when we analyze the data simply by changing the csv files loaded.

Here is a summary of the the dataframe contents:

Field Name	NYC Source	SF Source
tripduration	NYC Trip Data	SF Trip Data
starttime	NYC Trip Data	SF Trip Data
stoptime	NYC Trip Data	SF Trip Data
start station id	NYC Trip Data	SF Trip Data
start station name	NYC Trip Data	SF Trip Data
end station id	NYC Trip Data	SF Trip Data
end station name	NYC Trip Data	SF Trip Data
bikeid	NYC Trip Data	SF Trip Data
usertype	NYC Trip Data	SF Trip Data
city	Added by Team	Station Data
weather key	date	date + zip

Precipitation	From Gov Weather File, PRCP	From weather file, Precipitation In
max temp	From Gov Weather File, TMAX	From weather file, Max TemperatureF
min temp	From Gov Weather File, TMIN	From weather File, Min TemperatureF
avg wind	From Gov Weather File, AWND	From weather File, Mean Wind Speed MPH

Final Report Outline

For the final report, we plan on having eight major sections, with each about one page:

1. Introduction
2. Overall Ridership
3. Rider Types
4. Trip Times
5. Time of Day Analysis
6. Impact of Weather
7. Station Utilization
8. Conclusion

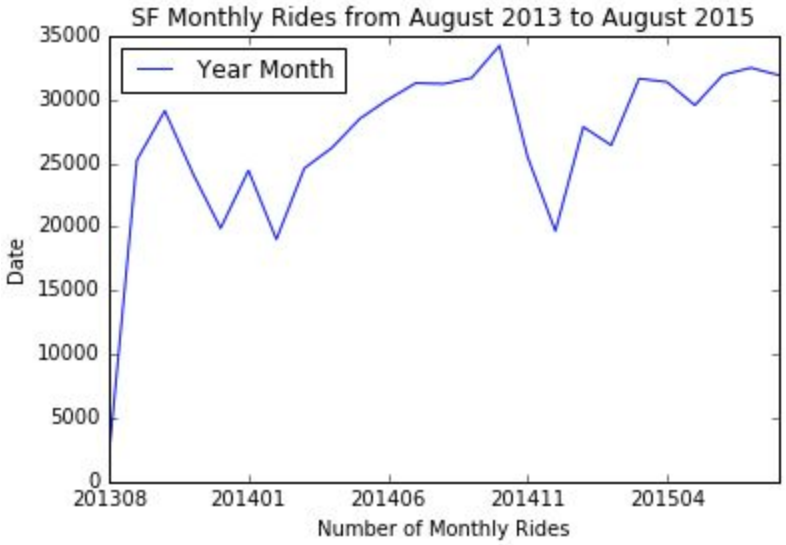
Questions & Column Names

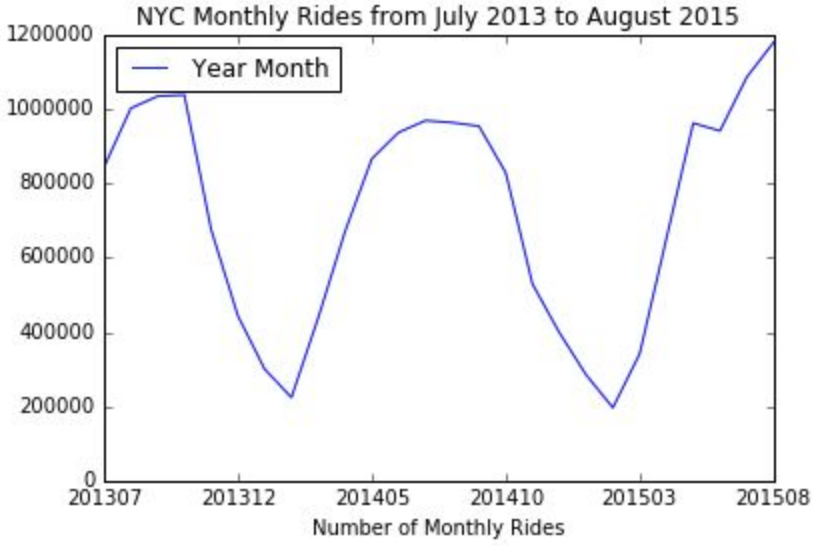
The table below describes the questions we would like to answer along with the column names we plan on using for the analysis:

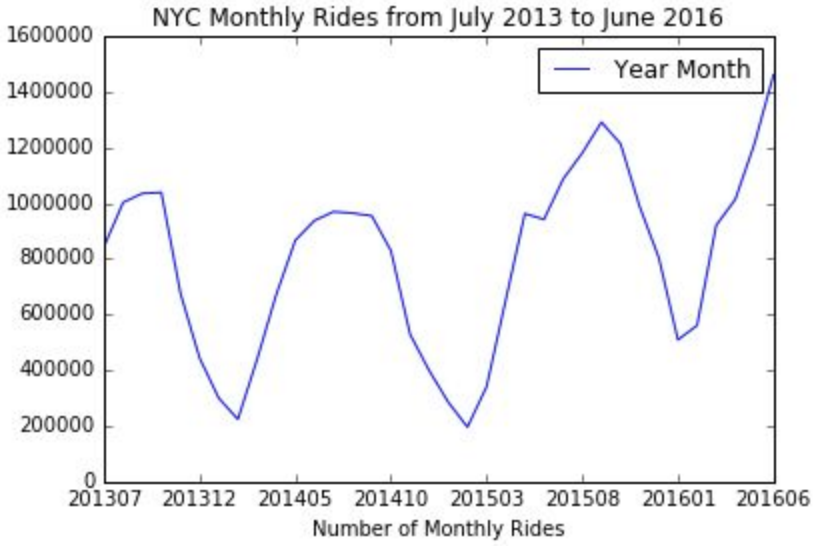
Section	Questions	Column Names	Frequency
Introduction	N/A	N/A	N/A
Overall Ridership	What is the overall trend in ridership by city?	Trips	Per month
	Within each city, what is the average number of trips per station per month?	Trips per start station, trips per end station, or trips for each start-end station combination	Per month
Rider Types	What is the distribution of rider types?	User / subscription type	Per month
Trip Times	What is the average trip time by start/stop station?	Trip duration	Per month
	What is the median trip time?	Trip duration	Per month
	What is the range of trip times?	Trip duration	Per month
	What is the standard deviation of trip times?	Trip duration	Per month
Time of Day Analysis	Are there more riders on the weekdays vs. weekends?	Start date / end date	Per week

	Does the composition of riders change on the weekends (i.e., more leisure riders)?	Start date, end date, and user / subscription type	Per week
	What are the most popular and least popular time blocks (by hour)?	Start date / end date	Per day
Impact of Weather	How do seasons affect ridership?	Start date, end date	Per season
	How does temperature affect ridership?	TMAX, TMIN	Per day
	How does precipitation affect ridership?	Precipitation	Per day
	How do extreme weather events affect ridership?	WT01-WT06, WT08-WT11, events	Per day
	How does wind affect ridership?	Average daily wind speed	Per day
Conclusion	N/A	N/A	N/A

Initial Plots and Graphs




NYC Monthly Rides from July 2013 to August 2015
Year Month
1200000
1000000
800000
600000
400000
200000
0
201307
201312
201405
201410
201503
201508
Number of Monthly Rides


NYC Monthly Rides from July 2013 to June 2016
Year Month
1600000
1400000
1200000
1000000
800000
600000
400000
200000
0
201307
201312
201405
201410
201503
201508
201601
201606
Number of Monthly Rides