Daniel Geihsler
Capstone 1
Project Proposal

Problem:
Divvy is a Chicago based bike sharing company with 585 stations and 5,800 bikes across the city. Divvy is a great way to get around Chicago, but getting from point A to point B smoothly relies on an available bike at your desired starting point, and an empty slot to check out your bike at your destination. If a customer looks to start their journey, and finds out there aren't any bikes available at the closest station, this will sour their experience as they now have to travel to another station or find another mode of transport. The same is true if a customer plans to end their trip at a particular location and finds there are not any empty slots available to dock their bike. They now have to find another location within their trip time window, and backtrack to their desired destination. To help minimize these negative experiences, I propose to use Divvy's historical trip data to analyze rider usage and predict stocking requirements for Divvy's bike stations.

Client: Divvy Bikes
Divvy's customer experience heavily relies on riders being able to start and end their trips at their desired locations. As positive customer experiences are essential for retaining their current members and expanding their future client base, making sure their stations are correctly stocked is invaluable. This insight will allow Divvy to better direct their bike stocking vans each day to the the stations that need adjustment, and make sure their riders can get from point A to B smoothly. This model will also allow them to predict inventory needs in the future as their customer base changes over time.

Data:
The data will be gathered from Divvy's historical trip data posted on their website. They currently have trip information from Q3 of 2013 through Q4 of 2017. The data includes trip start day and times, trip end day and times, trip start stations, trip end stations, rider type (Member, Single Ride, and Explore Pass), and if the rider is a member, it will also include member's gender and year of birth. In addition to the trip information, there is also station data posted for the same date range. This will support the trip information by providing station locations and capacities.

Approach:
To understand the amount of inventory needed at Divvy's different bike stations, the initial focus will be on the number of rides coming to and leaving each station each day over the 2013-2017 time frame. This information can be used to predict the number of inbound and outbound rides from a particular station based on the day of the week and time of year.

Based on the predicted number of rides, and the stations capacity, we can determine how many bikes and empty slots are needed at each station.

Deliverables:

1) Report on current rider usage and station inventory requirements.
2) Code for the predictive model so Divvy can determine updated requirements as additional trip data becomes available.