Final Report
Chris Park

Project Introduction:

After the city of Ourra implemented a bike sharing system called Drpia for better environmental and social welfare, the secretary of the department of transportation is looking to understand drivers of rental bike demands so as to properly balance the available supply at any given time. As a data science consultant for the department of transportation, the task was to predict and model rental bike counts for the bike sharing system. In order to successfully finish this task, historical data of weather and seasonal information was provided. This consists of Count (rented bike counts), Date (YYYY-MM-DD), Hour (24 hours of the day), Temperature (Celsius), Humidity (%), Wind (m/s), Visibility (10m), Dew (Celsius), Solar (MJ/m2), Rainfall (mm), Snowfall (cm), Seasons (Winter, Spring, Summer, Autumn), Holiday (Yes/No), and Functioning (Yes/No).

Key Findings:

Out of all the data provided, information on Temperature, Hour, Functioning, and Rainfall were the most important indicators on the rental bike counts. Specifically, the higher the temperature, the later into the evening, and the less rainfall will result in more bike rental counts. Not only that, but bike rental counts are increased during functional hours.

As a result, if the city of Ourra wants Drpia to have the right number of bike supply at any given time, more bikes should be rolled out during the previously mentioned scenarios. Inversely, a limited number of bikes should be rolled out in the opposite of the previously mentioned scenarios. This will ultimately allow more people to utilize Drpia in times of high demand which will lead to more revenue for the city of Ourra. Since people tend to not rent bikes in “worse” weather conditions, limiting the number of bikes in times of low demand will preserve the bikes from environmental rundown. This will save Drpia many expenses on bike repairs and replacements long term.

However, if Drpia wants to increase bike rental count in circumstances where the temperatures are colder and there is more rainfall, Drpia should consider lowering bike rental rates during these conditions to encourage more rentals. This discount can be applied to non-functional hours as well to incite more bike rentals. Not only that, but it may be beneficial to implement an incentives program in which users are rewarded with points in relation to how many times they rent bikes.

Another application is increasing availability in densely populated areas in the city. Since there was an increased number of bike rentals during certain hours such as functioning hours (which are usually busier than non-functional hours), people who are working will be willing to rent bikes as a means of transportation to avoid traffic which will be beneficial for the environment as well. Additionally, there will generally be more people in these areas which means there is a higher chance of rentals.

In order to understand other underlying causes as to why certain conditions have higher bike rental counts than other conditions should be explored through case studies, surveys, and interviews of users.