

The goal of this project was to predict the number of bikes rented per day by a bike sharing system called Drpia in the city of Ourra as well conduct an analysis of the data to better understand bike rental demands and the factors that influence it. I was provided with 6552 observations of bike rentals with Drpia where the variables were Count, Date, Hour, Temperature, Humidity, Wind, Visibility, Dew, Solar, Rainfall, Snowfall, Seasons, Holiday, Functioning, and ID. The Dates ranged from 2017 to 2018 and the ID was a unique identifier for each observation, unrelated to the actual bike counts or any influencing factors. All four Seasons-Summer, Winter, Autumn, and Spring were observed in the dataset. The temperature ranged from -17.8 to 39.4 degrees.

Upon conducting an in depth analysis on this data, I made several insightful observations regarding the different factors which influence the number of bikes rented. I found out that Temperature was one of the most important factors in determining the number of bikes rented on a particular date. Furthermore, I found out that as the temperature increases from -17.8 to approximately 28 degrees,, the number of bikes rented steadily increases. However, once the temperature reaches about 30 degrees, the number of bikes rented starts to decrease. These results tell us that the optimal temperature for people to be outdoors and bike is 27 to 31 degrees. Temperatures below 27 tend to be too cold and temperatures higher than 31 tend to be too warm for bikers. Aside from Temperature, two other significant variables were Hour and Season. Upon analyzing how Hour influences Counts, I discovered that the highest number of bikers will rent bikes at about hour 8 and hour 18 which translates to 8 AM and 6 PM respectively. The minimum number of bikers were at hour 4 and hour 11 which translates to 4 AM and 11 AM. This tells us that bikers tend to bike most in the early morning and evenings and bike the least in the very early morning and early afternoon.

In addition to Temperature and Hour, I also made meaningful conclusions regarding the relation between Season and number of bikes rented. I discovered that Summer had the highest number of bikes rented with a total sum of 1634082 rented in the Summer. Winter had the lowest number of bikes rented with a total sum of 389211. The second highest number of bikes were rented in Autumn with a total sum of 1406891 and the third highest were rented in Spring with a total sum of 1175208. Two other variables

I analyzed consisted of Year and Month. I discovered that the maximum number of bikes rented were in June/July and that the minimum were rented in December/January. I also discovered that there was a significantly high number of bikes rented in 2018 in 2017. However, this pattern could be due to several other factors such as the Drpia business becoming more popular in 2018 due to increased marketing or even that data wasn't collected as much until 2018.

If we take into account all of the analysis conducted, specifically the effects of Temperature, Hour, Month, and Season, we can make the overall conclusion that the highest bikes are rented when the weather is warm, yet not overly hot.