

Google Data Analytics Capstone Project Report

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Introduction

This project is part of the Google Data Analytics Certification and serves as the capstone project. This project analyzed data from Motivate International Inc. to identify how the customers of a bike share company differ from each other.

Scenario:

Cyclistic is a company that offers bike share services to customers in Chicago. Customers who purchase single-ride or full-day passes are referred to as **casual riders**. Customers who purchase annual memberships are **Cyclistic members**.

Lily Moreno, the director of marketing at Cyclistic has set a clear goal to design marketing strategies aimed at converting casual riders into annual members. Moreno and her team have come up with three questions will guide the future marketing programs:

- How do annual members and casual riders use Cyclistic bikes differently?
- Why would casual riders buy Cyclistic annual memberships?
- How can Cyclistic use digital media to influence casual riders to become members?

This project will answer the first question: **How do annual members and casual riders use Cyclistic bikes differently?**

Methodology

- **Data Collection:** The data collection process involved obtaining 12 data sets from Motivate International Inc. link, corresponding to each month in 2023. These data sets were obtained from City of Chicago's ("City") Divvy bicycle sharing service, providing detailed information about users, stations, bike trips, and other relevant attributes. The data sets were obtained in CSV format, facilitating easy import and analysis using data analytics tools.
- **Data Pre-processing:** Before analysis, the raw data underwent several pre-processing steps in Microsoft Excel to ensure data quality and consistency. This included data cleaning and data transformation where necessary. Duplicate records were also removed to maintain data integrity.
- **Data Preparation:** The clean data sets were imported into SQLite and 12 tables were created representing each month. The tables were named according.
- **Data Analysis:** Key metrics were defined to perform effective analysis. SQL queries were used to perform analysis on the data to gain insight into the behavior between the two rider types for the bike share company. The results for each metric were exported as CSV files for further processing. The data was transposed in Excel where necessary, to ensure compatibility with Tableau for Visualization.

- **Data Visualization:** Visualizations were created in Tableau for each metric to visualize the analyzed data effectively. A dashboard was designed in Tableau link to present the key findings and insights in a comprehensive manner.

Metrics and Findings

To perform effective analysis on the data, the following metrics were defined:

- The average rides for each rider type in each month.
- The average trip duration(in minutes) for each rider type in each month.
- The peak weekday and hour for each rider type in each month.
- The preferred bike type for each rider.
- The common start and end stations for each rider type.

The average rides for each rider type in each month

The results show that Cyclistic members have a higher ride count for each month when compared to casual riders. June to August are the peak months for both Cyclistic members and casual riders. While December to February witnessed the lowest ride count for the two member types.

AVG Rides per Month for Each Rider Type

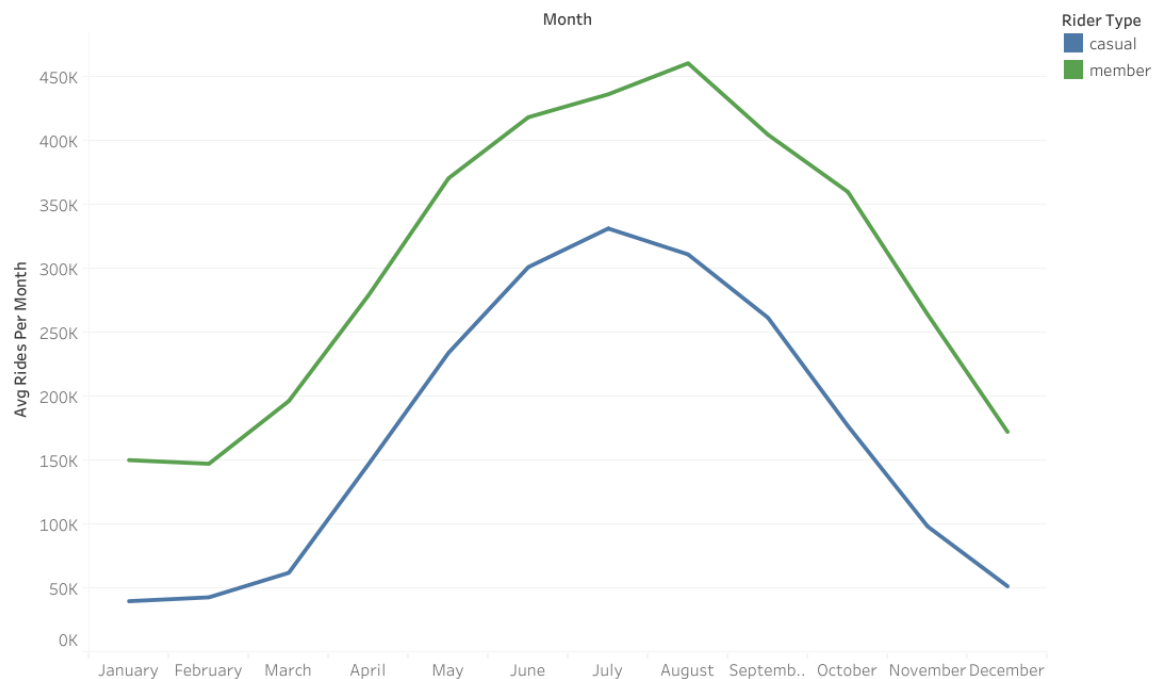


Figure 1: A graph showing the average number of riders over a 12 month period for the two rider types

The average trip duration(in minutes) for each rider type in each month

The results show that the average trip duration(in minutes) for casual riders is higher than that of Cyclistic members for each month. *More research has to be carried out to understand this result.*

AVG Trip Duration in Minutes for each Rider Type

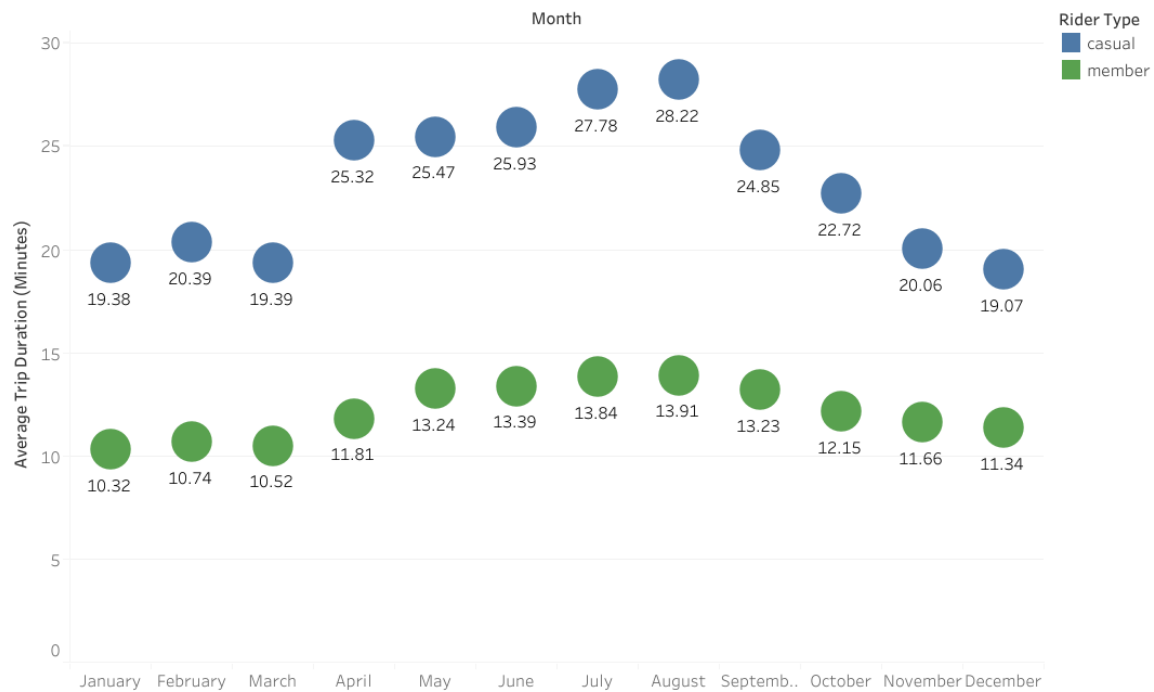


Figure 2: A graph showing the average trip duration (in minutes)for each rider type

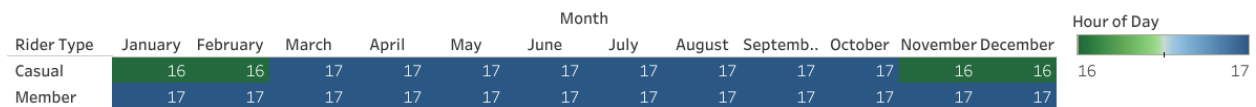
The peak weekday and hour for each rider type in each month

The results show that Tuesday and Saturday are popular weekdays for the two rider types. The peak hour of day for Cyclistic members is 17:00 for all the 12 months. This is also true for casual riders except from November to February where the peak hour is 16:00.

Peak Weekday for each Rider Type



Peak Hours for Bike Riders per Month

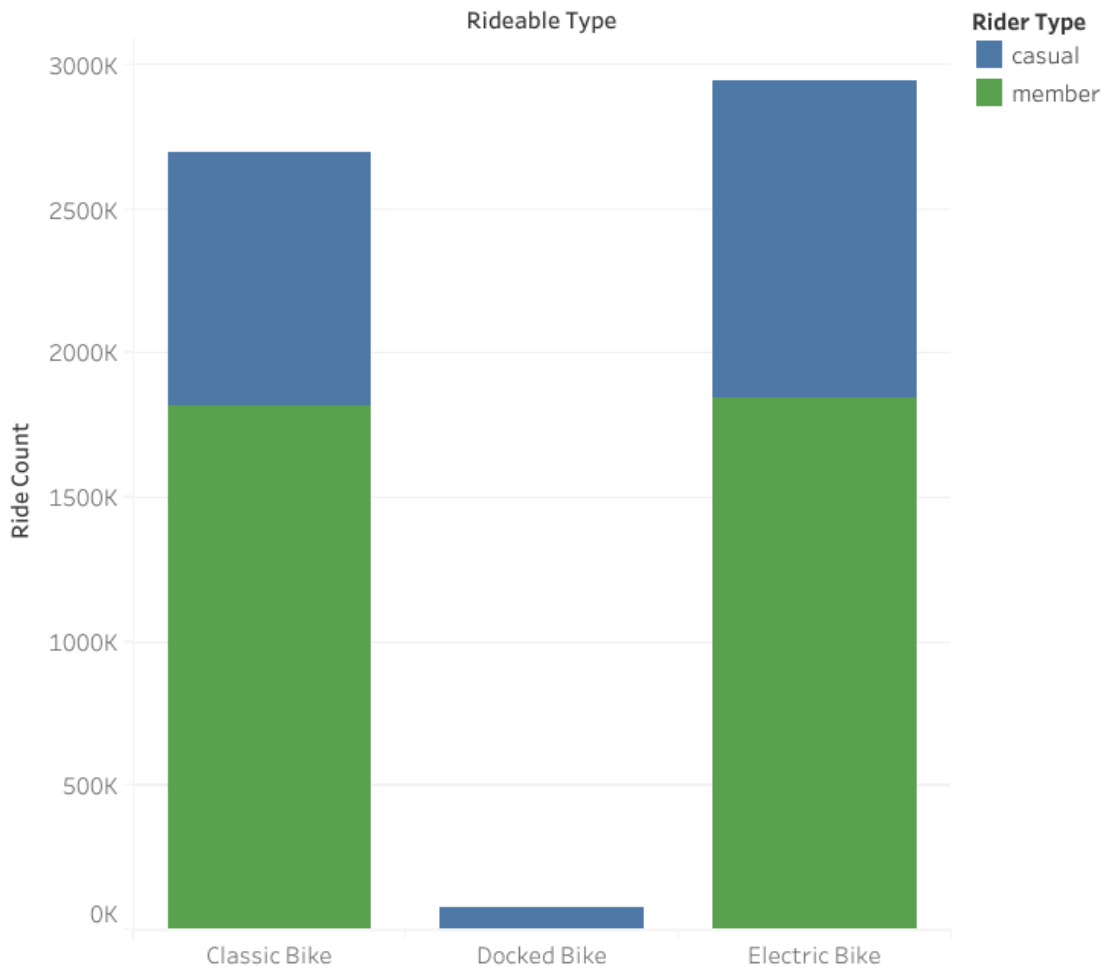


The preferred bike type for each rider

Cyclistic has three bike types available for its customers: classic bikes, docked bikes, and electric bikes. Cyclistic members use the electric and classic bikes. Electric bikes have a higher ride count, however, the difference in the ride counts for these two types is just about 20,000.

Casual riders on the other hand use all three bike types. However, the ride count for docked bikes is below a hundred thousand. Electric bikes also have the highest ride count for this group of riders.

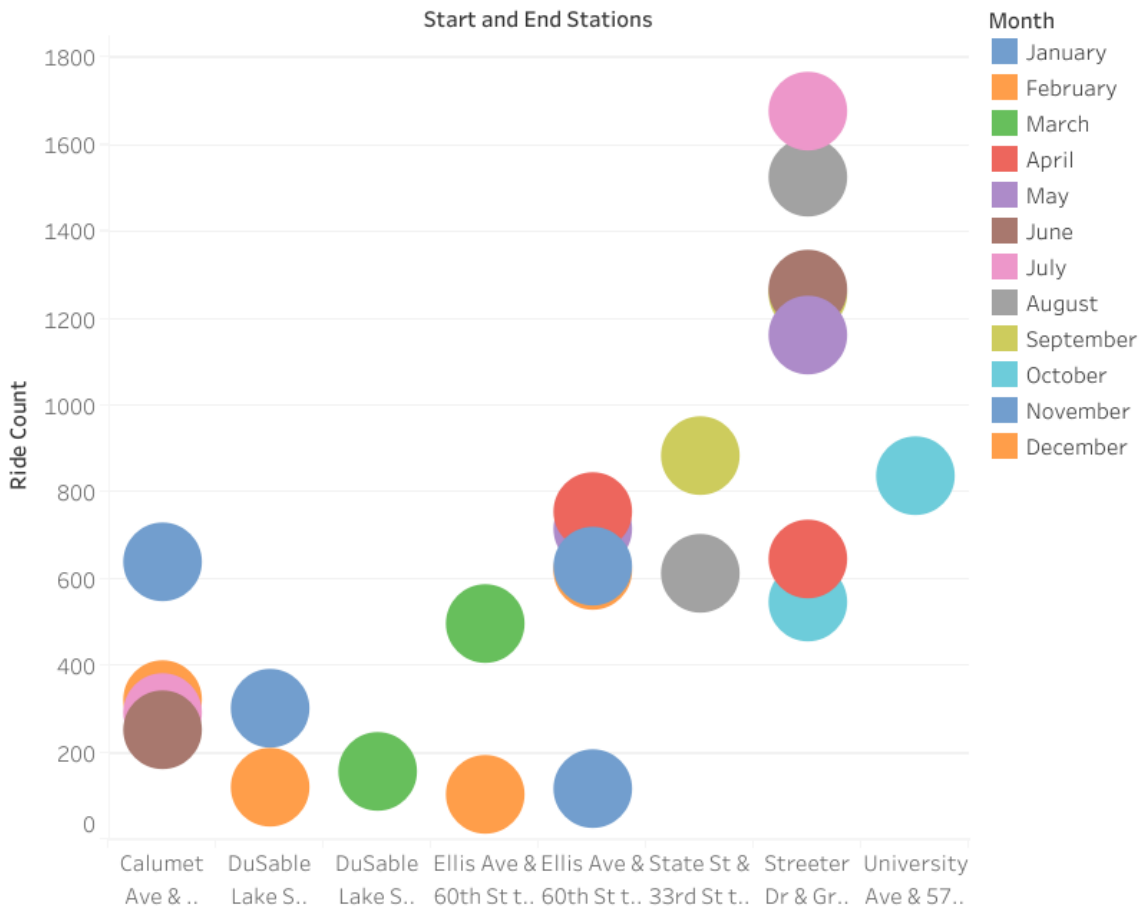
Preferred Bike for each Rider Type



The common start and end stations for each rider type

The results show that some of the popular start and end stations for each rider type include Ellis Ave & 60th St to University Ave & 57th St, Calumet Ave & 33rd St to State St & 33rd St, among others.

Common Start and End Bike Stations



Recommendations

Based on the analysis conducted, these are the following recommendations:

- Marketing efforts should be focused on weekdays with lower ride count to increase ridership on those days, especially for casual riders.
- The availability of electric bikes and classic bikes should meet the demand, as these are the most popular bike types.
- Different methods to increase the utilization of docked bikes by casual riders should be explored, as they currently have the lower ride counts compared to the other bike hours.
- Strategies should be implemented to optimize operations during peak hours such as deploying more bikes at popular stations, ensuring availability and reducing wait time for riders.

Conclusion

This analysis reveals valuable insights into ridership patterns, preferences, and behavior among Cyclistic members and casual riders. Understanding these dynamics can help optimize operations, improve rider experience, and tailor marketing strategies to attract and retain more riders.

Reference

Motivate International Inc. (n.d.). *Divvy Trip Data (2023)*. Retrieved from <https://divvy-tripdata.s3.amazonaws.com/index.html>