Cyclistic Bike-share Case Study

Case Study: How Does a Bike-Share Navigate Speedy Success?

Scenario

Cyclistic is a company that organizes bike-share programs; these programs have mainly two types of members, the causal and annual members. In this case study, the director of marketing wants to turn causal members into annual members or maximize the number of annual memberships. He asked me to make some recommendations backed up by compelling data insights and professional data visualizations so that the company can improve the current situation.

Introduction

This exploratory and descriptive analysis case study is a part of the Google Data Analytics Professional Certificate. For this study, the data of customer trips of a bike-share company (in this case Cyclistic) collected over a 12-month period was used. These datasets were retrieved from here. The analysis process follows the six steps: Ask, Prepare, Process, Share, and Act.

Ask

Firstly, it is important to understand what is the problem we would like to solve. In this case, the key task is to know how annual members and causal members use Cyclistic bikes, and the stakeholders can be the marketing director and the Cyclistic executive team.

Prepare

Data Sources

A total of 12 datasets have been made available for each month starting from July 2021 to June 2022. Each dataset captures the details of every ride logged by the customers of Cyclistic.

Documentation, Cleaning, and Preparation of data for analysis

The combined size of all the 12 datasets is close to 1 GB. Data cleaning in Excel, therefore, would be time-consuming. I also did not have Google Premium Storage to upload all datasets. So, I chose R for all aspects of the analysis process, including data wrangling and visualizations.

Firstly, the required libraries were loaded to do analysis and then each and every dataset was loaded. Secondly, the column names, data structures, and data types of all datasets were checked for the sake of data consistency. Fortunately, no outliers were not found.

Process

After having been checked for data integrity, all datasets were combined into a single data frame. Following this was data transformation, in which stated_at and ended_at (start time and end time when customers use bikes) were changed into the formation Year Month Day/ Hour Minute Second. Then, data starting from start_lat to end_lng were removed as they were beyond the scope of the project. In another step, negative trip durations and test rides were removed. Finally, column names were changed for better readability and new columns were added for aggregate functions.

Analyze & Share

Now that the data were stored appropriately and had been prepared for analysis, they were analyzed and shared with visualizations.

The numbers of casual members and annual members were checked. In my case, the numbers were 2558161 and 3342077 respectively.

Total trip durations were identified by customer types.

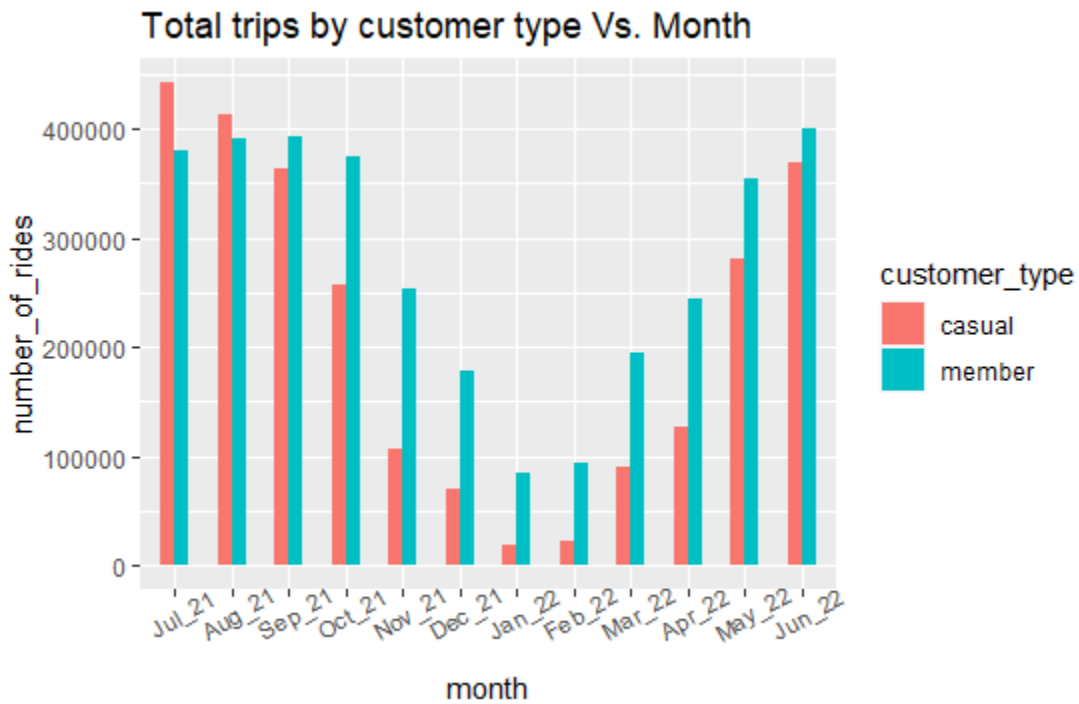| Customer Type	Trip Duration (mins)
Casual Member	76286025
Annual Member	43391109

Statistical summaries of trip duration for all trips and trip duration by customer type were generated.

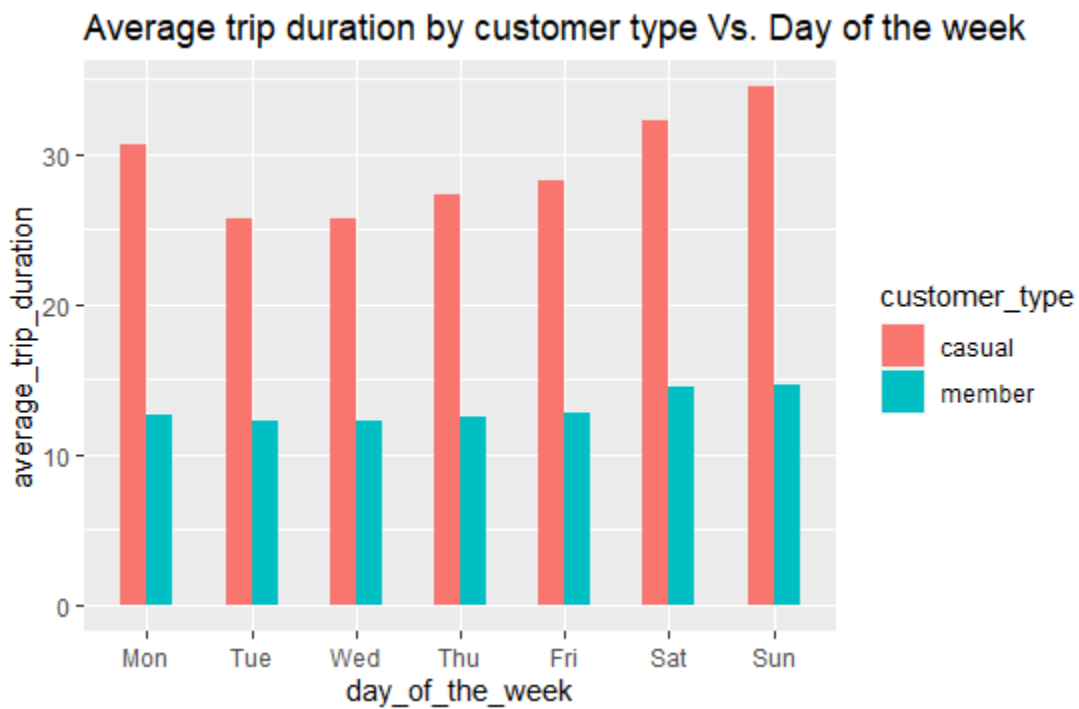The total number of trips by customer type and day of the week were identified.

Visual Presentation of Total Trips by Customer Type Vs. Day of the Week

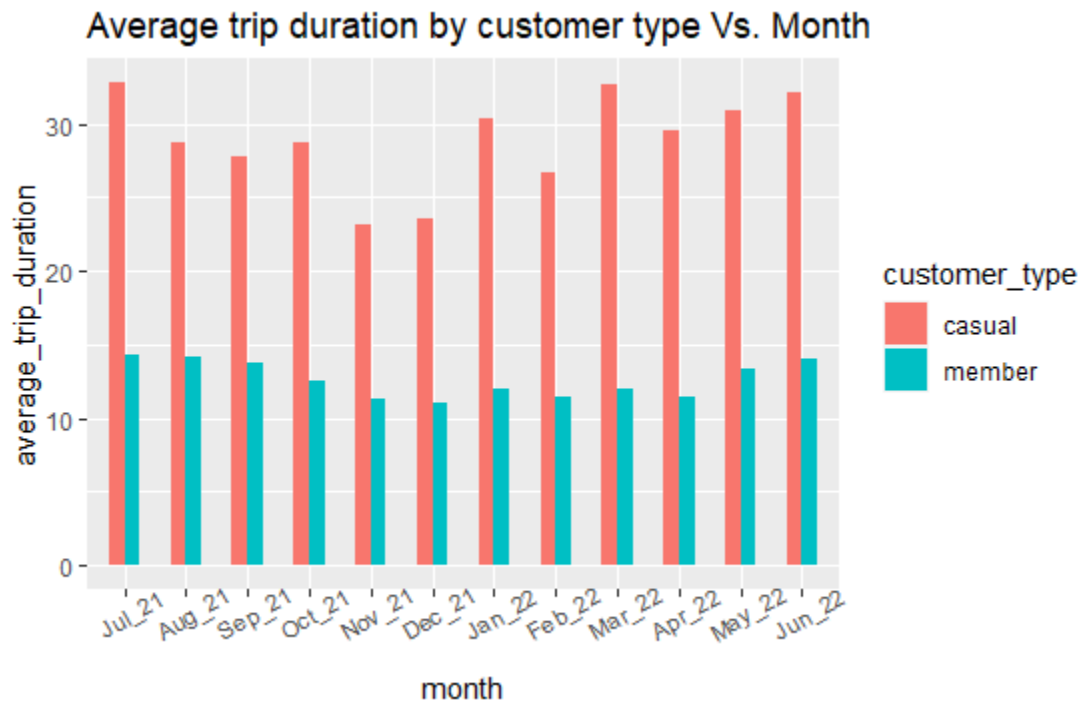**Total trips by Customer Type and Day of the Week**
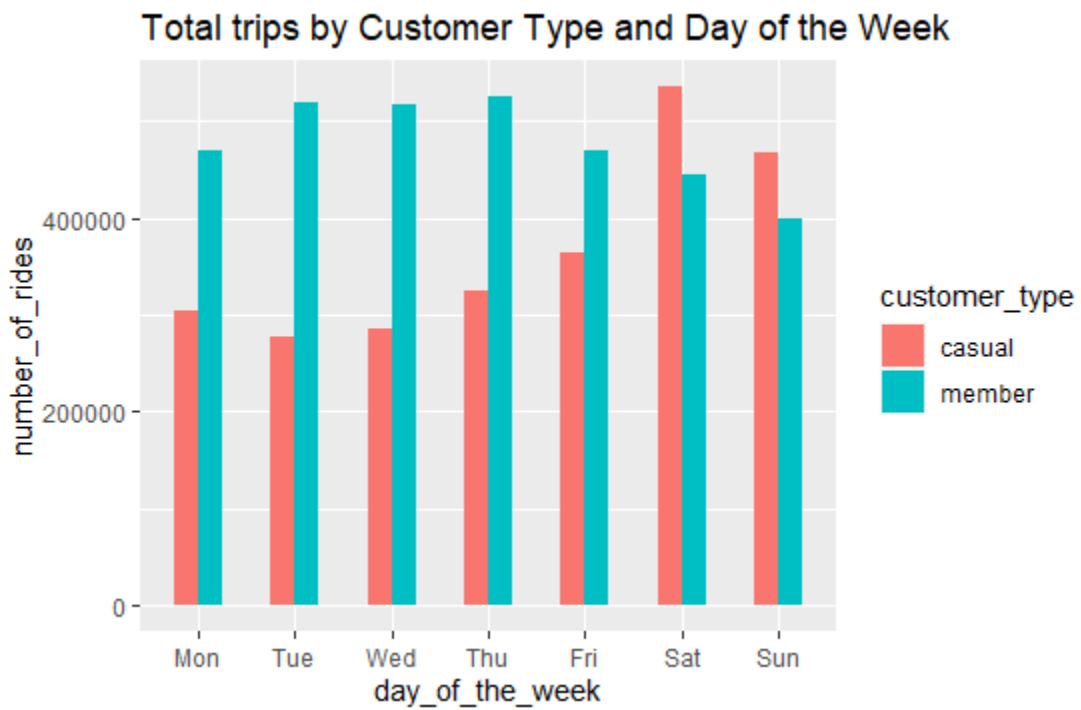
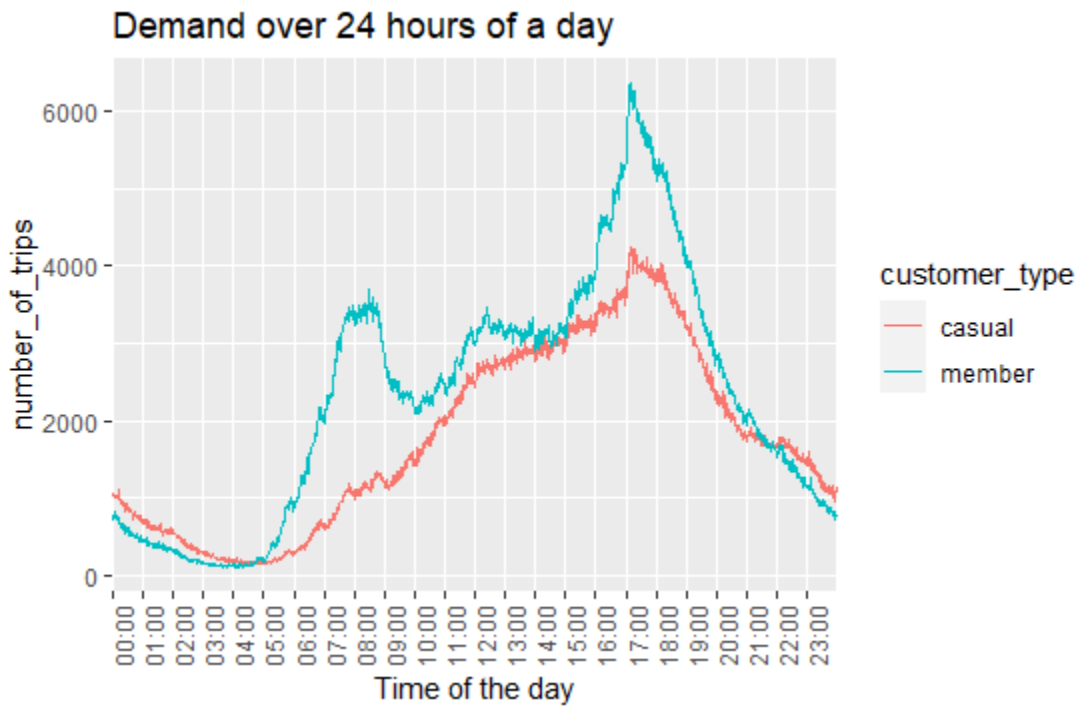Visual Presentation of Total Trips by Customer Type Vs. Month

Visual Presentation of Average Trip Duration by Customer type Vs. Day of the Week
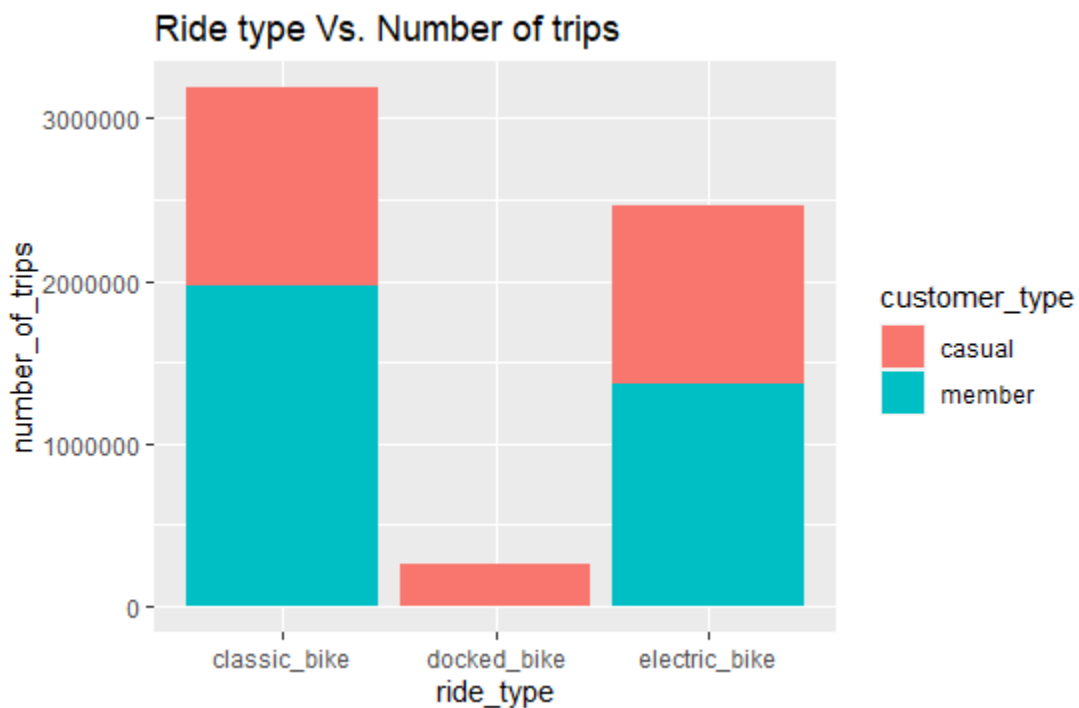
Visual Presentation of Average Trip Duration by Customer type Vs. Month

Average trip duration by customer type Vs. Month

Visualization of Bike Demand over 24 hr period (a day)

Demand over 24 hours of a day

Visualization of Ride type Vs. Number of trips by Customer Types

Ride type Vs. Number of trips

Act

Key Takeaways

- Casual riders made 43% of total trips contributing to 64% of total trip duration between July 2021 - June 2022. Member riders make up 57% of total trips contributing to 36% of total trip duration between July 2021 - June 2022

- Casual customers use bike-share services more during weekends, while members use them consistently over the entire week.

- Casual riders ride longer than member riders in the last 12 months.

- Casual riders prefer docked bikes the most while classic bikes are popular among members.

Recommendations

- Provide attractive promotions for casual riders on weekdays so that casual members use the bikeshare services ore uniformly across the entire week.
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- Offer discounted membership fee for renewals after the first year. It might nudge casual riders to take up membership.
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- Offer discounted pricing during non-busy hours so that casual riders might choose to use bikes more often and level out demand over the day.

Additonal data that could expand scope of analysis

- Occupation of member riders - this data could be used to target non-members who come under similar occupation

- Age and gender profile - Again, this data could be used to study the category of riders who can be targeted for attracting new members.

- Pricing details for members and casual riders - Based on this data, we might be to optimize cost structure for casual riders or provide discounts without affecting the profit margin.