Converting Casual Riders to Annual Members: Analysis and Recommendations

Business Task

Discover how annual members and casual riders use Cyclistic bikes differently and design marketing strategies aimed at converting casual riders into annual members.

Data Sources

The data used in this analysis were sourced from a bike-sharing company, covering the period from June 2023 to May 2024. The dataset comprised approximately 5,743,278 rows and 13 columns. The columns included:

- Ride_id: Unique identifier for each ride.
- Rideable_type: Type of bike used (electric, classic, docked)
- Started_at: Date and time when the ride began.
- Ended_at: Date and time when the ride ended.
- Start_station_name: Name of the station where the ride began.
- Start_station_id: ID of the station where the ride began.
- End_station_name: Name of the station where the ride ended.
- End_station_id: ID of the station where the ride ended.
- Start_lat: Starting latitude.
- Start_lng: Starting longitude.
- End_lat: Ending latitude.
- End_lng: Ending longitude.

Documentation of Cleaning & Data Manipulation

In the data cleaning process, I created a Python script using pandas and numpy to clean a total of 5,743,278 rows. A total of 1,806 rows were deleted: 441 rows had negative ride lengths (assumed to be caused by an error where the started_at timestamp was later than the ended_at timestamp), and 1,365 rows had a ride length of 0 minutes and seconds, which were also assumed to be errors.

For data manipulation, I used pandas and numpy to transform the data. I converted the started_at and ended_at columns to the datetime data type and calculated the ride_length as the difference between the two columns. I also added a day_of_week column to indicate the day of the week each ride began and a month_year column to display the month and year of each ride.

Analysis and Findings

To observe trends in the data, I utilized Python libraries such as Pandas and Matplotlib and a variety of functions. I created two dataframes: one for members and one for casual riders. I discovered while both casual and annual members are most active in spring and summer, their

weekly activity patterns and average ride times differ. Casual riders average 28 minutes per ride and are most active on weekends, whereas annual members average 12 minutes per ride and are most active during weekdays.

To explore seasonal activity, I generated a line chart shown in figure 1 that both casual and annual member counts are highest during spring and summer and drop in fall and winter. This indicates that rider activity is influenced by temperature.

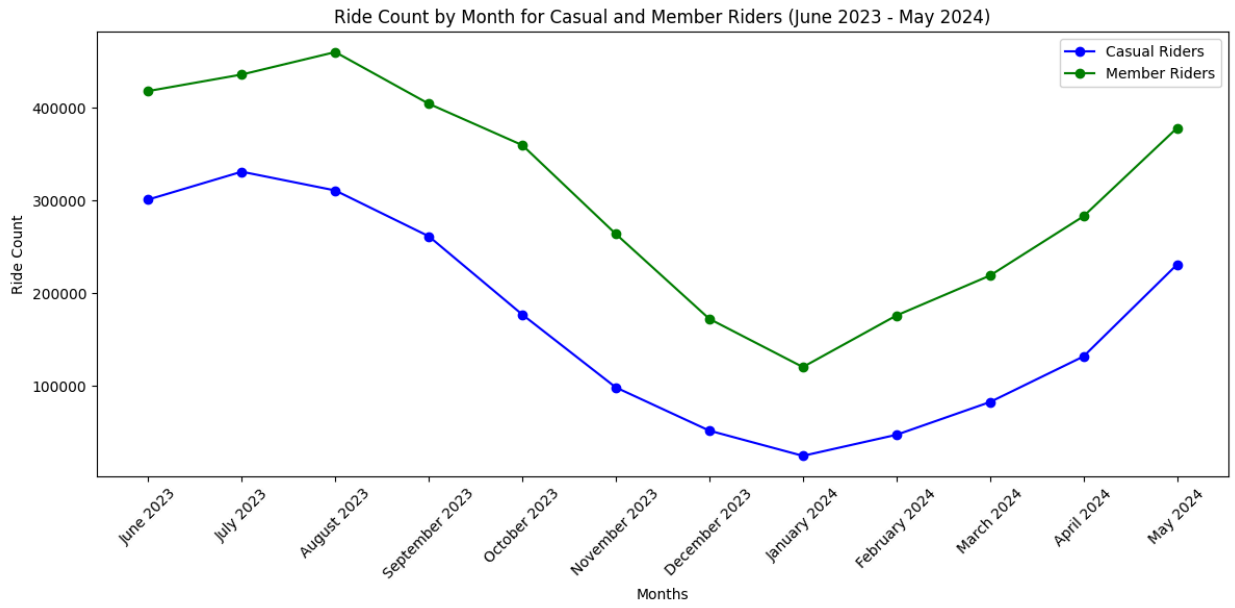

Figure 1

To highlight the differences between casual and annual members, I created two bar charts. Figure 2 shows that casual riders have an average ride time of 28 minutes, while members average 12 minutes. In Figure 3, it is revealed that casual members generally have ride lengths over 20 minutes, whereas members average below 13 minutes. These charts demonstrate that casual members typically have longer ride times than annual members.

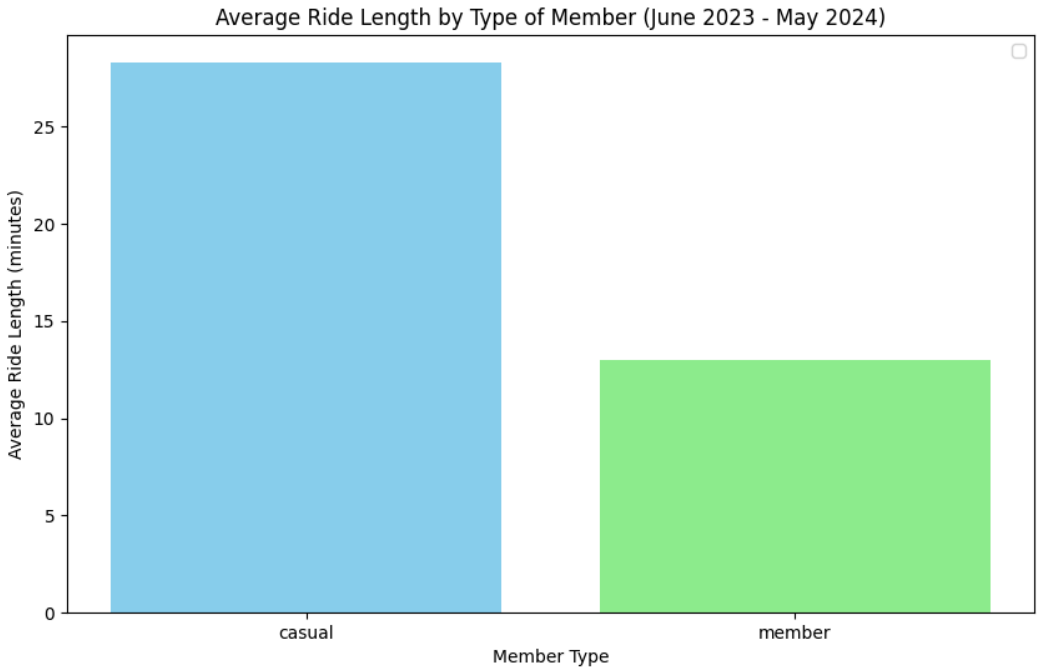

Figure 2

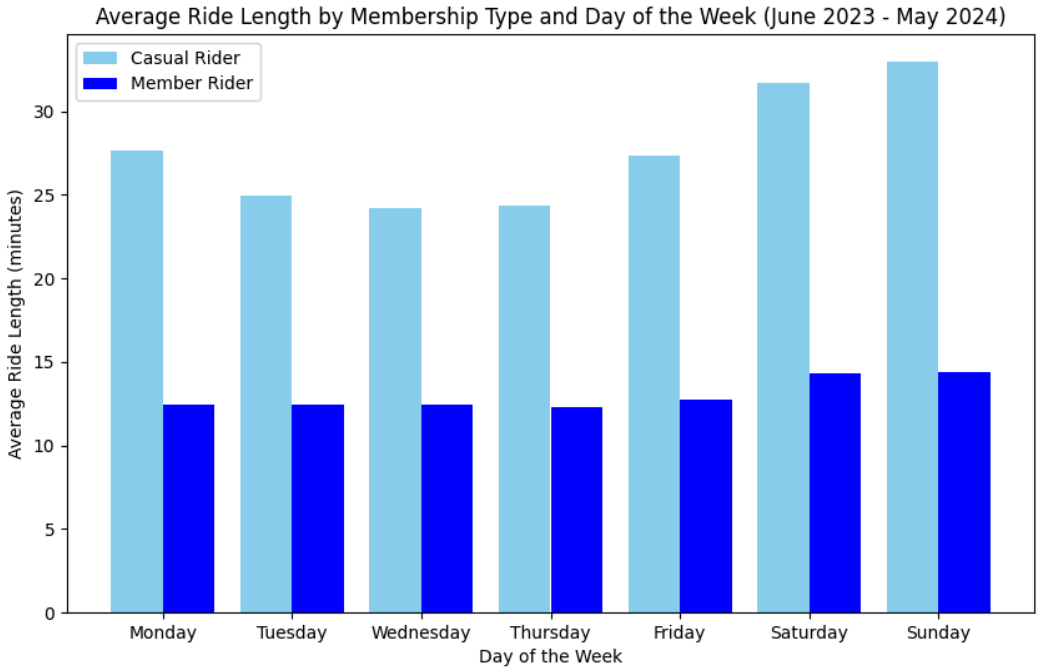

Figure 3

Further analysis showed distinct patterns in ride activity between casual and annual members. A bar chart created with Matplotlib's pyplot (figure 4) uncovered that member ride counts start high on Monday, peak on Thursday, and decrease over the weekend. Conversely, casual rider counts are low during weekdays, increase on Friday, peak on Saturday, and slightly decrease on Sunday.

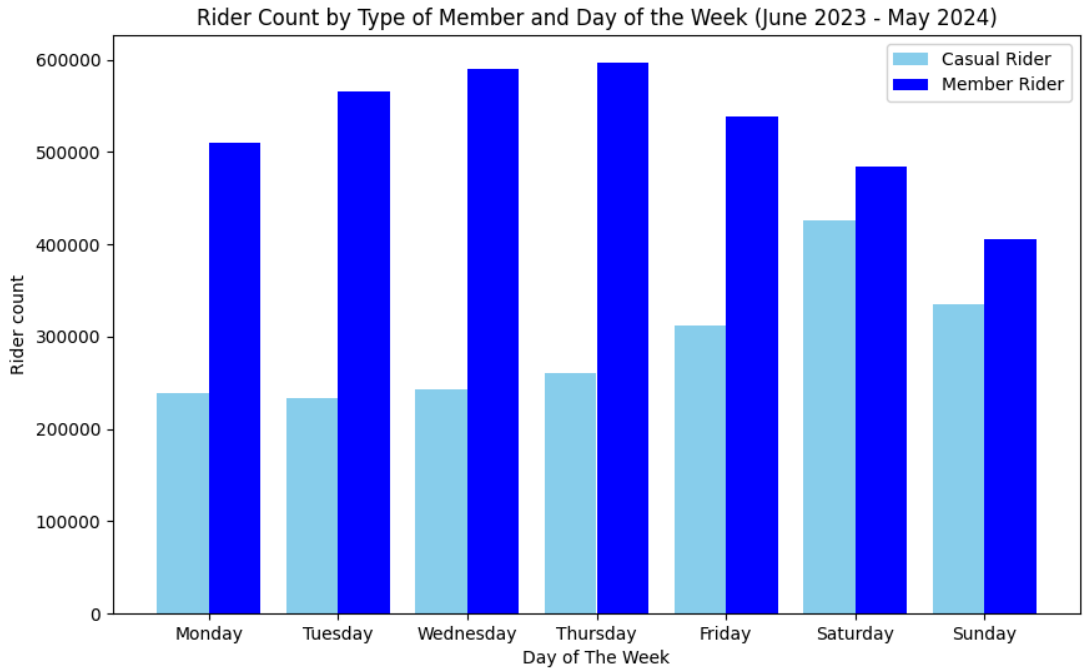

Figure 4

Recommendations

To address the question of how to convert casual riders into annual members, I have made three recommendations. Firstly, I suggest setting up membership ads during the months when casual members are most active, specifically June, July, and August. Since casual riders are particularly active during these months, this strategy will attract a lot of attention from casual members and encourage them to sign up. Secondly, since casual members are most active during the weekends, offering a discount for the first year of membership to those who sign up on Friday, Saturday, or Sunday could be effective. Lastly, on average, casual members ride for 28 minutes per trip. Highlighting the cost savings of a membership compared to day passes for longer rides could further incentivize casual riders to sign up for memberships.