Processing and Cleaning

Data was imported from GCS into BigQuery for manipulation and analysis using SQL. Visualizations were developed in Google Data Studio. Data types were standardized and consolidated into a single view using a comprehensive SQL query.

Additional Columns Added:

1. Start point location
2. End point location
3. Ride start day name
4. Ride duration in seconds

Data Cleaning Steps:

1. Identified and filled missing start and end station names.
2. Checked other columns for inconsistencies.
3. Removed negative and zero ride duration values.

Post-cleaning, the consolidated table contained 3,476,354 rows, ready for analysis.

Analysis and Visualization

The final dataset, comprising approximately 3.4 million ride records, was analyzed. Visualizations were created in Google Data Studio to identify differential trends between casual riders and annual members.

Total Ride Share

Insights:

- 58.6% of total rides were taken by annual members.
- 41.4% of total rides were taken by casual riders.
- Annual members form the majority of Cyclistic's business, indicating that increasing this number should be a long-term focus.

Weekly Distribution of Number of Rides

Insights:

- Casual riders' usage peaks on weekends, whereas annual members' usage remains relatively stable throughout the week.
- Casual riders' weekday usage is about 50% lower than on weekends, suggesting leisure rather than commuting purposes.

Weekly Distribution of Average Ride Duration

Insights:

- Casual riders' average ride duration is approximately three times that of annual members.
- Both user types see an increase in ride duration on weekends, further indicating casual riders' preference for leisure activities.

Ride Duration vs. Ride Distance

Insights:

- Despite similar average ride distances, casual riders' average ride duration is three times longer than that of annual members.

Hourly Distribution of Number of Rides

Insights:

- Casual riders' proportion increases during non-commuting hours (forenoon and post-8 PM).
- Annual members dominate during peak commuting hours, accounting for up to 82% of total riders during these times.

Monthly Distribution of Number of Rides - Seasonality

Insights:

- Casual riders' proportion drops significantly during winter months (Dec-Feb) to about 20% of total riders.
- Their proportion peaks during the summer months (June-September) to up to 40% of total riders.

Conclusion and Recommendations

Observations:

- Casual riders primarily use Cyclistic bike rentals for leisure and tourism, while annual members use them for commuting.

Recommendations:

1. **Targeted Marketing:** Develop on-ground marketing strategies at leisure spots like parks, theaters, restaurants, and cafes.
2. **Discount Campaigns:** Implement discount campaigns for casual riders on weekdays to encourage commuting usage.
3. **Push Notifications:** Utilize push notifications to attract casual riders during off-peak hours.
4. **Seasonal Campaigns:** Launch campaigns during winter, possibly linked to holidays or Christmas, to boost ridership during these months.