Phase 1: Ask- Defining the business objective

The business task is to identify the behavioral differences in casual riders and annual members so that the marketing team will design a targeted strategy to convert casual riders into annual members, thereby increasing the long-term profitability of the company.

Key Stakeholders

1. Lily Moreno, Director of Marketing
2. Cyclistic Executive Team
3. Cyclistic Marketing Analytics Team

Phase 2: Prepare- Acquisition and Reliability

The data used for this analysis is Cyclistic's historical bike-share trip data provided by Motivate International Inc. This is first-party operational data collected directly through Cyclistic's bike-share system.

The dataset covers the period from January 2024 to December 2024, providing a complete annual view of bike usage and allowing seasonal patterns to be observed.

The data is structured at the individual trip level, where each record represents a single bike ride. Key fields include ride start and end timestamps and rider type (casual or member).

As first-party operational data, the dataset is considered reliable and current. However, due to data-privacy restrictions, no demographic information is available. As a result, the analysis relies on behavioral patterns—such as ride frequency, timing, and duration—rather than inferred rider characteristics.

Phase 3: Process- Data Cleaning and Optimization

The data was initially reviewed using **Microsoft Excel** to understand structure, formats, and completeness. **Python(pandas)** was then used for systematic cleaning, transformation, and preparation of trip-level records for analysis.

During the initial review, several data quality issues were identified, including missing start and end station names and station IDs. To address consistency and enable further validation, two calculated fields—**ride_duration_sec** and **ride_duration_min**—were created by subtracting the ride start and end timestamps, which were first standardized to datetime format to ensure accurate calculations. Records with missing station names were retained at this stage, as they contained valid ride duration values and were flagged for further investigation rather than being

immediately discarded. An additional field, **Week_Day**, was also created to support time-based behavioral analysis.

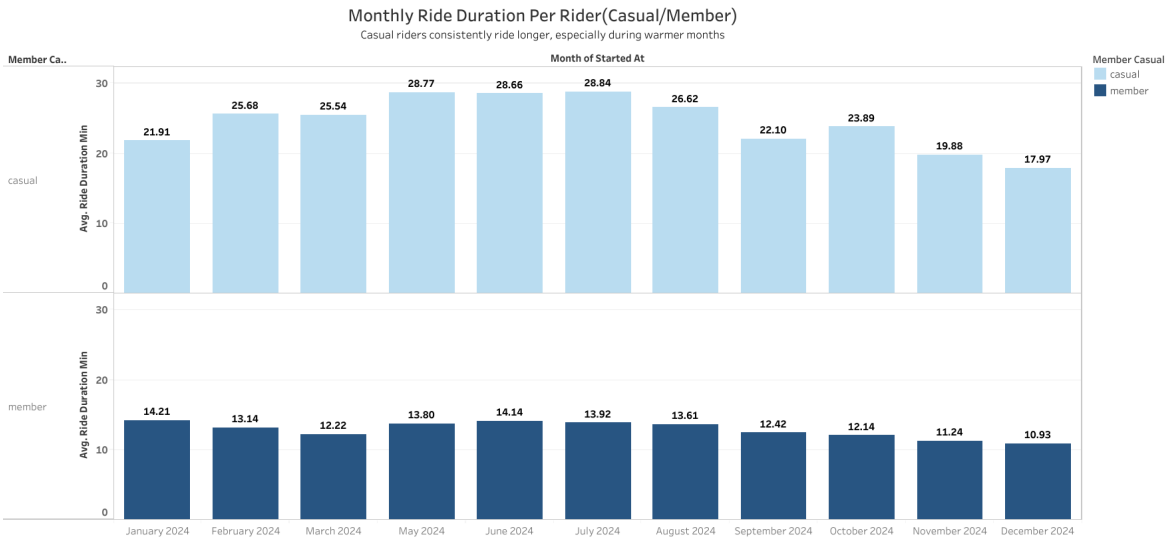
Further examination of the calculated fields revealed rides with zero duration and durations below 60 seconds. These records were flagged and removed, as they likely resulted from booking cancellations, system errors, or mechanical issues and did not represent meaningful ride activity.

The cleaning steps described above were applied consistently across each monthly dataset to standardize column names, formats, and data types. Once consistency was achieved, all monthly datasets were combined into a single consolidated dataset representing the full analysis period. Final summary checks were conducted to confirm that values fell within expected ranges and that the remaining records accurately reflected valid ride behavior. The resulting dataset was deemed reliable and suitable for downstream analysis and visualization.

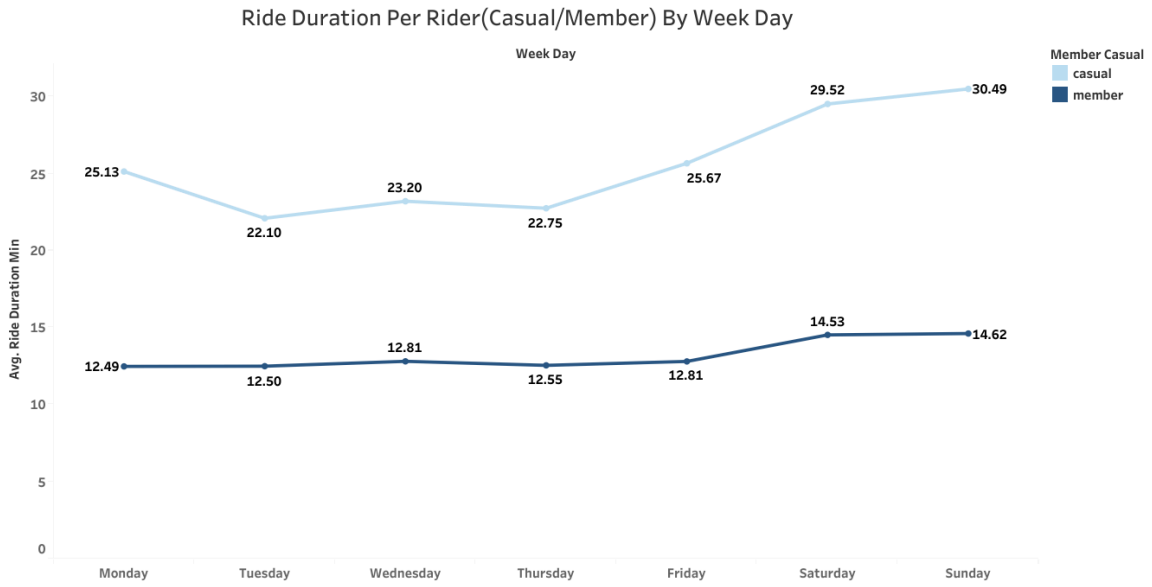
Phase 4: Analyze — Behavioral Analysis of Rider Types

Analysis was conducted to compare ride duration, temporal usage patterns, and ride frequency between casual riders and annual members. These metrics were selected to differentiate leisure-driven usage from habitual, routine behavior, which is directly relevant to membership conversion.

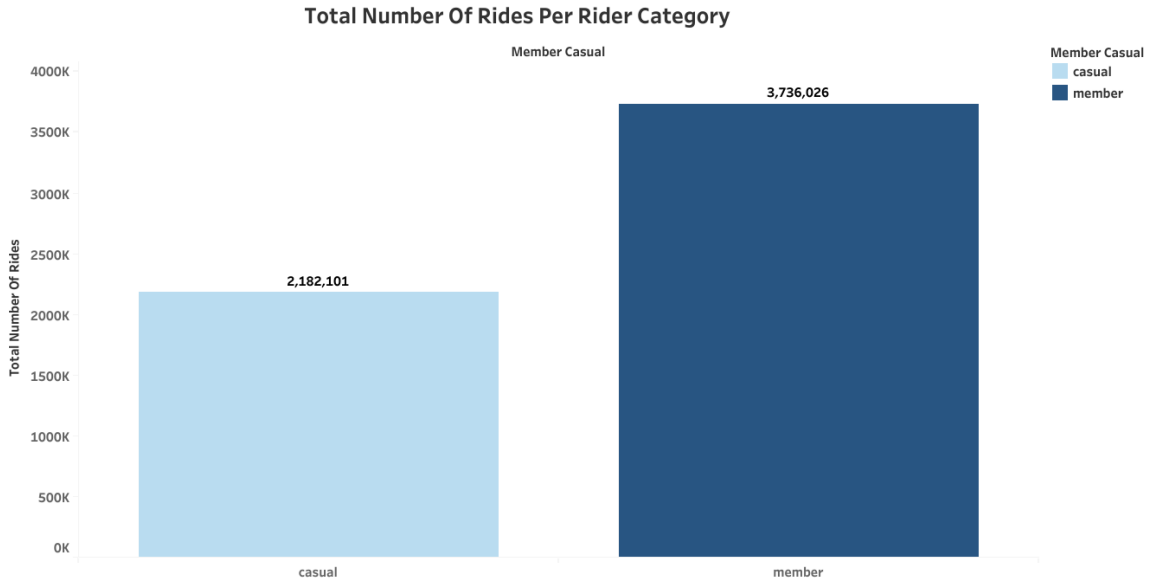
Casual riders consistently record longer average ride durations across all months, with durations increasing during warmer seasons. This pattern indicates that casual usage is strongly influenced by seasonality and recreational intent. In contrast, annual members show relatively stable ride durations throughout the year, suggesting consistent reliance on the bike-share service regardless of season.



Weekday analysis further highlights this distinction. Casual riders exhibit their longest ride durations on weekends, particularly Saturdays and Sundays, while member ride durations remain largely consistent across all days. This reinforces the interpretation that casual riders use bikes primarily during discretionary free time, whereas members integrate bike usage into regular routines.



Despite shorter average ride durations, annual members account for a significantly higher total number of rides over the year. This demonstrates stronger engagement and dependency on the service, emphasizing that membership value is driven by frequency and habitual use, not ride length.



Collectively, these findings reveal that casual riders are primarily episodic and leisure-oriented, while annual members demonstrate high-frequency, routine usage. Importantly, casual riders who begin to show repeated usage patterns may represent the most promising segment for membership conversion.

Phase 5: Share — Communicating Insights to Stakeholders

The findings from this analysis were communicated through comparative visualizations designed for non-technical stakeholders. Monthly and weekday charts were used to highlight seasonal and temporal differences in ride duration, while total ride count comparisons clearly conveyed differences in engagement levels between rider types.

Consistent color usage, concise titles, and direct data labeling were applied to ensure clarity and accessibility. Together, the visualizations support a straightforward narrative that enables executives and marketing teams to quickly understand rider behavior and identify opportunities for targeted intervention.

Phase 6: Act — Strategic Recommendations

Based on the behavioral differences identified between casual riders and annual members, the following actions are recommended to support Cyclistic's goal of increasing annual memberships.

Target High-Frequency Casual Riders

Casual riders who demonstrate repeated usage—especially across multiple weekends or months—should be prioritized for conversion campaigns.

Action:
Deploy targeted in-app or email prompts offering limited-time membership trials to frequent casual riders.

Position Membership Around Convenience and Routine

The analysis shows that members benefit from frequent, short rides rather than long individual trips. Marketing efforts should emphasize ease of access, everyday utility, and seamless usage, rather than focusing solely on cost savings.

Action:
Refine marketing messaging to highlight how memberships support routine, spontaneous travel.

Time Campaigns to Peak Casual Usage

Casual rider engagement peaks during weekends and warmer months, indicating optimal periods for outreach.

Action:
Launch seasonal and weekend-focused campaigns when casual rider activity is highest to maximize conversion likelihood.

Business Impact

By shifting marketing efforts toward behavioral signals of habit and frequency, Cyclistic can reduce untargeted outreach and improve membership conversion efficiency. This data-driven approach supports long-term revenue growth by increasing the number of annual members and strengthening customer loyalty.