Cyclistic bike-share services

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**Stakeholder’s problem**:

Cyclistic’s finance analysts have concluded that annual members are much more profitable than casual riders. In order to create a strategy that would incentivize casual riders to become membership drivers, we need to know what differs casual user from a membership user.

**Business task**:

**How do annual members and casual riders use Cyclistic bikes differently?**

**Data sources**:  
<https://divvy-tripdata.s3.amazonaws.com/index.html>  
2024\*\*-Divvy-tripdata.zip   
where \*\* = {01,02,03,04,05,06,07,08,9,10,11,12}  
 (on license of Google Data Analytics Professional Certificate programme,  
 The data has been made available by Motivate International Inc.)

**Data manipulation:**

Data analysis was conducted on a cleaned and standardized version of the original trip dataset. The following steps were performed to prepare the data for analysis:

* Removed duplicate records by keeping only the most recent entry per ride\_id (based on trip end time).
* Trimmed unnecessary characters such as quotation marks and whitespace from text fields.
* Converted all date and time columns from text to proper datetime formats (with seconds precision).
* Converted geographical coordinates (latitude and longitude) from text to decimal(9,6) format, ensuring consistent numeric precision.
* Standardized categorical fields (rideable\_type, member\_casual) to consistent lowercase values.
* Filtered out invalid trips, e.g. where trip start time was later than end time, or where trip duration was less than 60 seconds or greater than 24 hours.
* Restricted dataset to trips within 2024 and to coordinates falling inside the Chicago city boundary.
* Standardized station IDs by mapping each station name to its canonical (most frequent) station ID, correcting inconsistencies across records.
* Enriched the dataset with additional derived fields such as trip duration in seconds/minutes, ride date, weekday name/number, season, and roundtrip indicator.

**Data analysis:**

The analysis was performed using SQL Server on the curated dataset (cleaned\_data.trips\_cleaned).

A full set of analytical queries is documented in the accompanying data\_analysis.sql file.

These queries examined user behaviour from multiple perspectives — including ride duration, time of day, day of week, vehicle type, and seasonal trends.

In addition, a dynamic Power BI dashboard was developed to visualize these insights interactively.

While the SQL file contains a wide range of comparisons between members and casual riders, this report highlights three key behavioural differences that have the greatest business relevance:

1. **Weekday vs. Weekend Usage**
   * Members primarily ride during weekdays, indicating commuting patterns linked to daily work routines.
   * Casual riders show a strong preference for weekend trips, suggesting recreational and leisure usage.

A graph of blue bars

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1. **Riding Hours**
   * Members exhibit clear peaks during morning (8–9 AM) and evening (5–6 PM) rush hours — typical commuting times.
   * Casual riders display a more even hourly distribution, with activity spread throughout the afternoon, indicating flexible, non-commuting behavior.

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1. **Trip Duration**
   * Casual riders take longer rides on average (often around 20 minutes), while members tend to take shorter, more frequent trips (≈12 minutes), consistent with quick point-to-point commuting.

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These patterns collectively provide a clear picture of two distinct user groups: commuting members and recreational casuals. All quantitative values and visual trends are based on 2024 ride data from the Cyclistic system.   
  
The analysis highlights how different lifestyle needs shape user behavior — from weekday commuting efficiency to weekend leisure flexibility.  
  
Understanding these distinctions provides a strong analytical foundation for data-driven marketing and membership growth strategies in the following business phase.

**Business recommendations:**

Based on the observed behavioural patterns, the following strategic actions are recommended:

1. **Target weekend riders for membership conversion**
   * Design short-term or flexible weekend membership plans for casual users who ride mainly on Saturdays and Sundays.
   * Offer incentives such as “Weekend Pass Upgrade to Annual Plan” discounts to encourage transition.
2. **Leverage ride-duration differences in marketing**
   * Emphasize convenience and lower per-minute cost of annual membership for users taking longer recreational trips.
   * Introduce “Ride-more, pay-less” messaging — appealing especially to frequent casual riders.

**3. Maintain balanced vehicle availability**

* + Since casual riders use both classic and electric vehicles at similar levels, ensure a balanced fleet of both types near mixed-use areas such as tourist zones, leisure parks, and residential districts.
  + Keep a higher concentration of classic bikes in commuting-intensive areas (downtown and transit hubs), as members rely on them more for routine weekday travel.

By aligning marketing and pricing strategies with these insights, Cyclistic can effectively convert casual riders into long-term members while enhancing the overall utilization of its bike-share network. Implementing these recommendations will not only improve revenue stability but also strengthen user engagement across both customer segments.

**Conclusion**

This project provided a data-driven overview of how Cyclistic’s members and casual riders differ in their riding habits.

By combining SQL-based data analysis with an interactive Power BI dashboard, the findings were translated into clear and actionable insights.  
The dashboard, available alongside this report, allows stakeholders to explore detailed visualizations — including trip duration, time-of-day patterns, and seasonal variations.

Together, these tools support evidence-based decision-making and help guide future marketing and operational strategies aimed at increasing membership growth and optimizing bike usage across Chicago.