Cyclistic Bike-Share Case Study

"How Can a Bike-Share Company Convert Casual Riders into Members?"

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Executive Summary

- Cyclistic, a bike-share company in Chicago, wants to grow its customer base by converting more casual riders into annual members. This analysis examines how casual and member riders differ in terms of ride behavior, duration, bike type usage, and patterns across time.
- Using 12 months of real ride data, I found that casual users take longer rides, mostly on weekends and during summer months, often using electric bikes. Members ride more frequently, consistently across the year, and primarily on weekdays for shorter durations.
- Based on these findings, I will provide data-driven recommendations to help the marketing team create targeted campaigns that encourage casual riders to become loyal annual members.

Ask Phase

➔ **Business Task:**
Cyclistic, a bike-share company in Chicago, aims to convert casual riders into annual members. My role as a junior data analyst is to analyze past ride behavior to identify how casual riders differ from members, so the marketing team can develop data-driven campaigns to improve membership conversions.

➔ **Key Stakeholders:**
- ➢ **Lily Moreno** – Director of Marketing
- ➢ **Cyclistic Marketing Team**
- ➢ **Executive Team** – Interested in revenue growth through memberships

➔ **Guiding Questions:**
- ➢ How do annual members and casual riders use Cyclistic bikes differently?
- ➢ What behavioral trends can be used to influence casual riders to convert?
- ➢ What business strategies can be recommended based on these insights?

Prepare Phase

➔ **Data Source:**

I used public Cyclistic ride data (via Divvy) from January 2024 to December 2024, made available through 12 individual .csv files.

➔ **Description:**

Each file includes ride-level details such as:
- ➢ Rider type
- ➢ Timestamps
- ➢ Bike type
- ➢ Start and end stations
- ➢ Location coordinates

➔ **Tools Used:**
- ➢ Python: Pandas, Seaborn, Matplotlib
- ➢ Jupyter Notebook

Process Phase

➔ **Cleaning Steps:**
  - ➢ Removed null values
  - ➢ Removed duplicate entries and invalid records
  - ➢ Filtered out negative ride durations
  - ➢ Converted time fields to datetime format

➔ **Feature Engineering:**
  I added the following fields:
  - ➢ ride_duration (minutes)
  - ➢ day_of_week
  - ➢ month
  - ➢ start_hour
- The cleaned dataset was saved as **cleaned_ride_dataset.csv** and is available in the GitHub repository.

Analyze Phase

After preparing the data, I explored user behavior by comparing members and casual riders across several dimensions, including ride frequency, duration, bike preferences, and time patterns.

➔ **Key Observations:**
   1. **Ride Volume:**
      I grouped the dataset by user type and counted total rides. Members took over 3.7 million rides, while casual users took 2.1 million — suggesting stronger loyalty and frequent use among members.
   2. **Ride Duration:**
      By calculating the duration of each ride and then finding the average per user type, I found that casual riders take longer rides on average (~21 minutes), while members average around 12 minutes. This indicates casual riders may use bikes more for leisure, and members for commuting.
   3. **Bike Type Preferences:**
      I grouped the data by user type and bike type to compare preferences. Both groups favored electric bikes slightly more than classic bikes. Electric scooters made up a very small portion of total rides for either group.
   4. **Time of Week Patterns:**
      Grouping rides by user type and day of the week revealed that casual riders are most active on weekends (especially Saturdays), while members are more consistent on weekdays — peaking midweek (Wednesdays). This pattern reflects differing purposes between the two groups (leisure vs. commuting).
   5. **Monthly Seasonality:**
      I aggregated total ride counts by user type and month. Casual usage increased sharply during summer, especially in September, whereas member usage remained relatively steady throughout the year.

Share phase

In this phase, I focused on delivering clear, business-relevant insights through well-designed visualizations. The goal was to communicate complex patterns in user behavior in a way that is easy for the Cyclistic marketing team and stakeholders to understand.
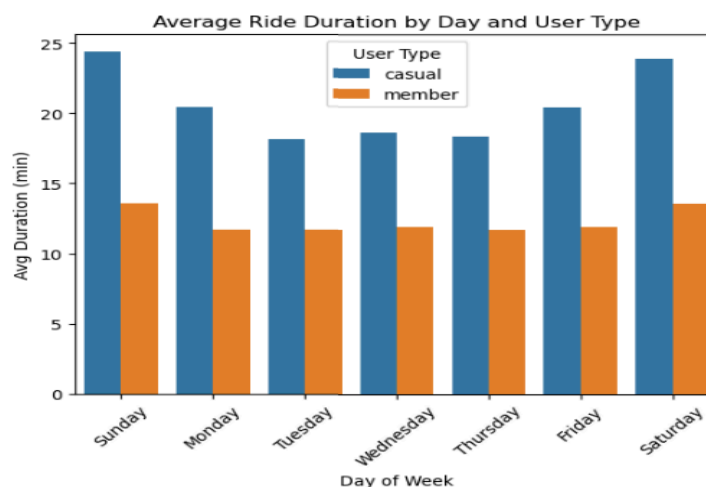
The following visualizations are included in this report:
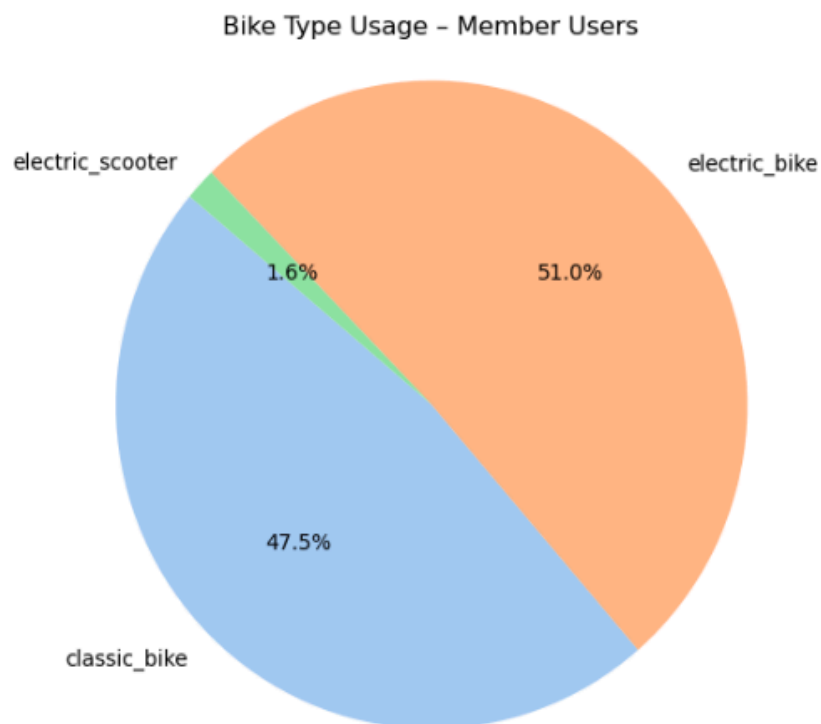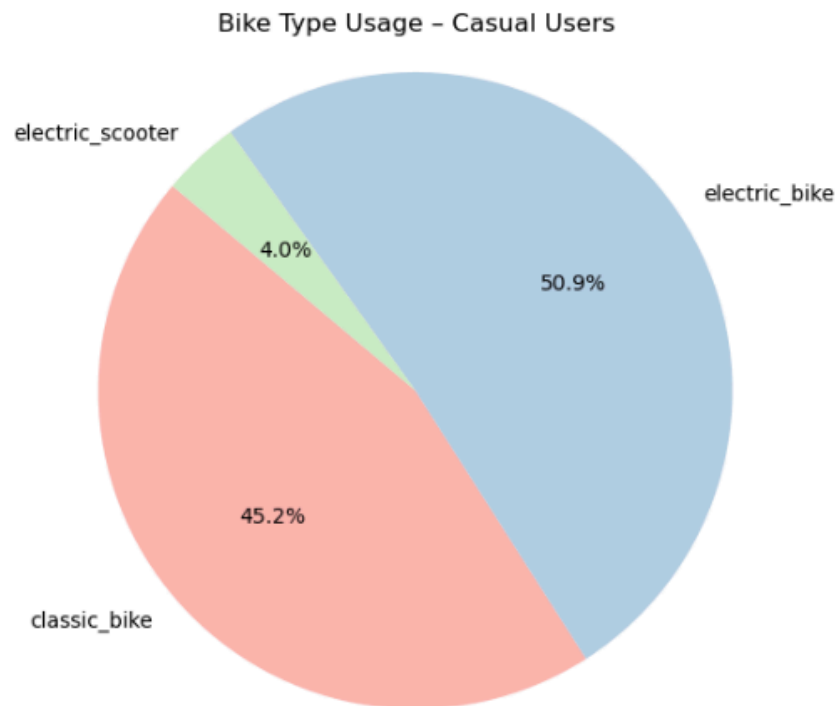
★ **Ride Counts by User Type:**
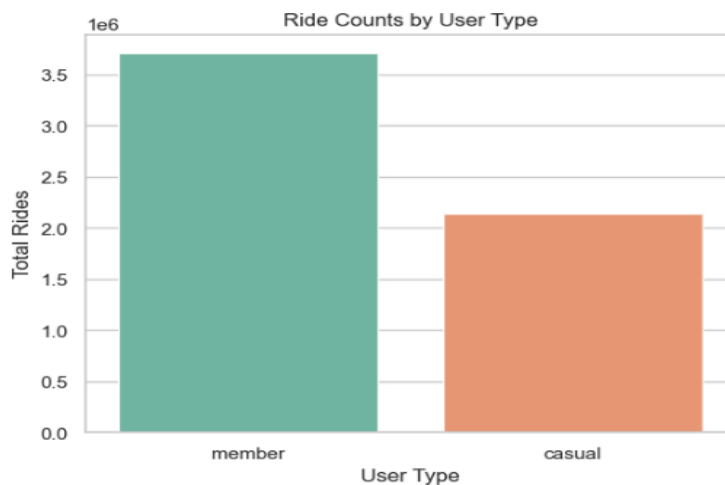
- Members take significantly more rides than casual users, indicating stronger platform engagement.

★ **Average Ride Duration by Day and User Type:**

- Casual users ride longer and mostly on weekends, while members are consistent across weekdays with shorter trips.

★ Bike Type Usage (Pie Charts by User Type)

Bike Type Usage – Casual Users

electric_scooter

electric_bike

4.0%

50.9%

45.2%

classic_bike

Bike Type Usage – Member Users

electric_scooter

electric_bike

1.6%

51.0%

47.5%

classic_bike

- Electric bikes are slightly more popular than classic bikes for both user types; scooters are rarely used.
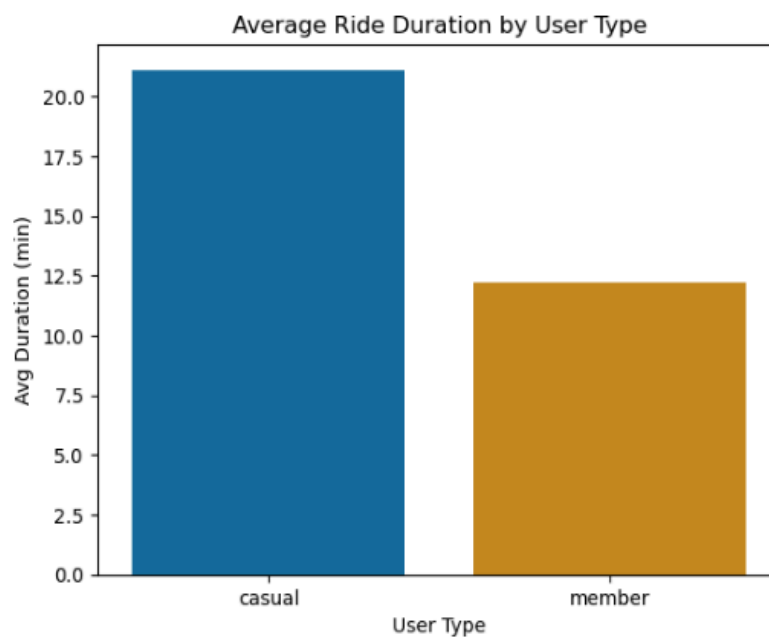
★ **Monthly Ride Trends:**

Monthly Ride Counts by User Type
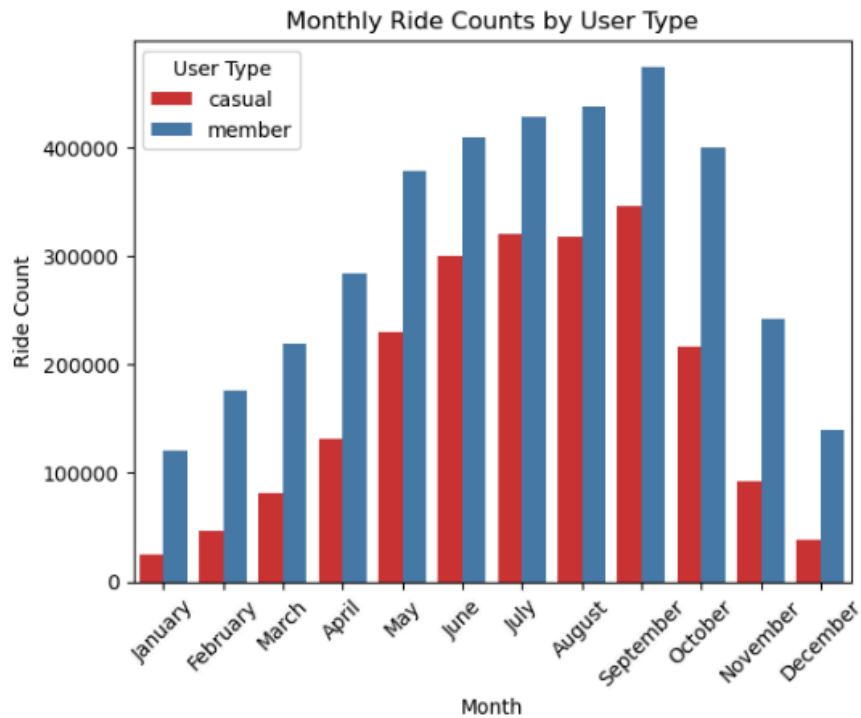
- Casual riders peak in summer months; members ride steadily year-round.

★ **Average Ride Duration by User Type:**

Average Ride Duration by User Type

- Casual riders average ~21 minutes; members ~12 minutes per ride.

★ **Most Popular Day Table:**

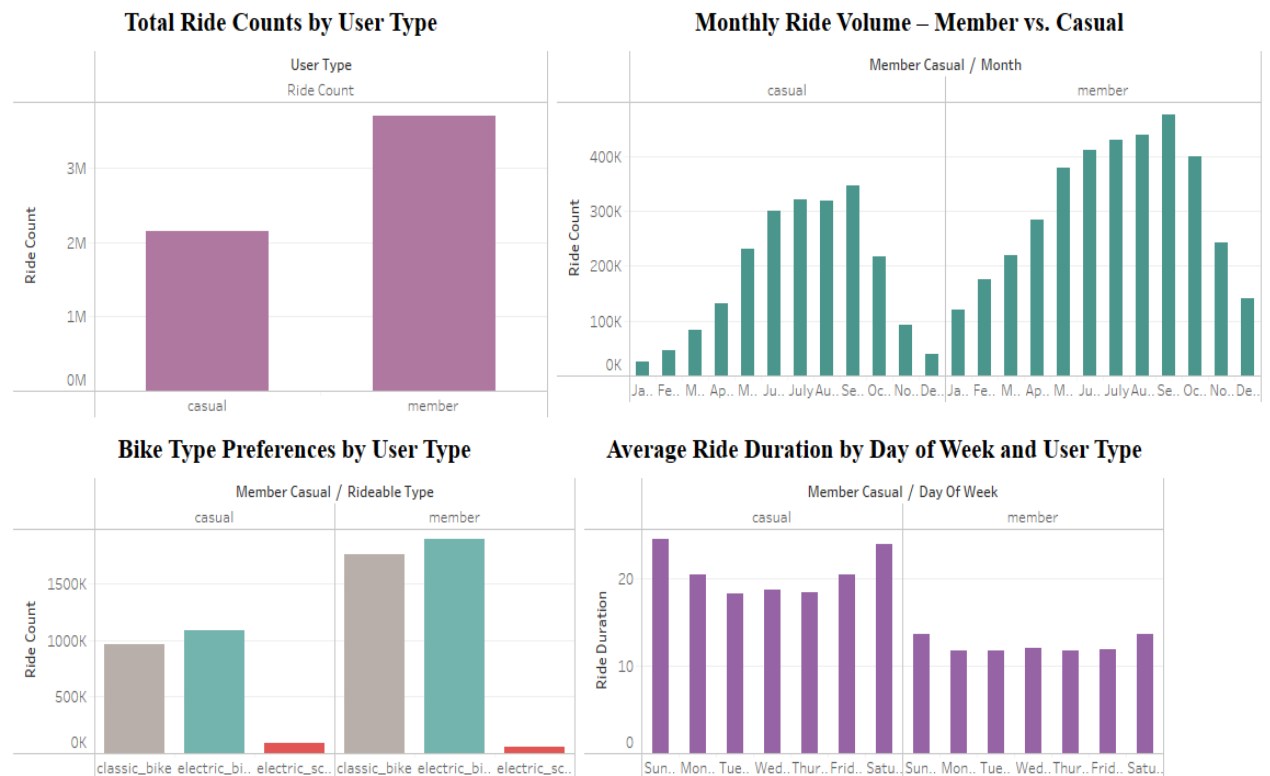|	User Type	Most Popular Day
0	Casual	Saturday
1	Member	Wednesday

- Casuals ride most on Saturdays; members on Wednesdays — showing different usage motivations.

Tableau Dashboard

For an interactive overview of the same insights in a dashboard format, refer to the **Tableau dashboard** below:

Cyclistic Bike-Share User Behavior Analysis

Total Ride Counts by User Type

Monthly Ride Volume – Member vs. Casual

Bike Type Preferences by User Type

Average Ride Duration by Day of Week and User Type

Click the image to open the full interactive dashboard on Tableau Public.

Act Phase - Final Recommendations

Business Objective: Convert casual riders into annual members

Based on the findings, I recommend:

➔ **Launch a "Weekend to Weekday" Campaign**
  - **Why:** Casual riders are mostly active on weekends, especially Saturdays.
  - **Action:** Offer time-limited weekday passes or small rewards for riding during weekdays to shift behavior toward consistent usage — similar to members.
➔ **Promote the Value of Membership for Longer, Frequent Rides**
  - **Why**: Casual users ride longer and use electric bikes more, which can become expensive over time.
  - **Action**: Use app/email messaging to show casual riders how much they could save by switching to an annual plan, especially if they ride more than X(specific) times/month.
➔ **Introduce Summer Discount Plans for Casual Users**
  - **Why:** Casual usage spikes in summer months.
  - **Action:** Offer summer-exclusive "trial memberships" or discounts during peak months (June–Sept) to convert casual riders while usage is already high.

Appendix

Project Resources

- **Dataset Source:**
  Divvy Trip Data Archive
  (12 months of bike-share ride data used for analysis)

- **Interactive Dashboard:**
  View Tableau Dashboard – Cyclistic Case Study
  (Includes ride trends, user behavior, bike preferences, and ride duration insights)

- **Jupyter Notebook (Python Analysis)**:
  Cyclistic_analysis.ipynb
  (Complete data cleaning, EDA, and visualization code)

Tools Used

- **Python** – Pandas, NumPy, Seaborn, Matplotlib
- **Jupyter Notebook**
- **Tableau Public** – Interactive visual dashboard
- **GitHub** – Project hosting and version control
- **Google Docs / MS Word** – Report writing and formatting