Cyclistic
Bike-Share Analysis Case Study

Understanding the Behavioral Differences Between Annual Members & Casual Riders

- by Sachin Kanchan | LinkedIn
- Last Updated – 9th Oct, 2024

Objective

Analyze the differences in how annual members and casual riders use Cyclistic bikes.

The goal is to uncover insights that will guide the development of a targeted marketing strategy to convert casual riders into annual members, thus driving higher profitability for Cyclistic.

Stakeholders

- Marketing Team
- Executive Team

Data Collection & Prep

Data Sources Used

The data used for the analysis was obtained from the publicly available Divvy bike-share system, which provides historical trip data for Cyclistic bikes. The data spans the last 6 months and is stored as monthly CSV files, accessible through Divvy Trip Data.

Index of bucket "divvy-tripdata"

Name	Date Modified	Size	Type
202403-divvy-tripdata.zip	Apr 2nd 2024, 12:19:19 am	10.96 MB	ZIP file
202404-divvy-tripdata.zip	May 7th 2024, 01:59:41 am	15.41 MB	ZIP file
202405-divvy-tripdata.zip	Jun 26th 2024, 08:53:09 pm	22.82 MB	ZIP file
202406-divvy-tripdata.zip	Jul 8th 2024, 10:47:18 pm	28.82 MB	ZIP file
202407-divvy-tripdata.zip	Aug 8th 2024, 08:10:41 pm	29.23 MB	ZIP file
202408-divvy-tripdata.zip	Sep 5th 2024, 05:50:36 am	30.06 MB	ZIP file

This data includes key variables such as:

- Ride ID: Unique identifier for each bike trip.
- Rideable Type: Type of bike used (e.g., classic, electric).
- Start/End Timestamps: Details of when and where each ride started and ended.
- Station Information: Names and IDs of the stations where trips began and ended.
- Geolocation Data: Latitude and longitude coordinates for start and end locations.
- User Type: Classification of riders as either 'casual' or 'member'.

ride_id	rideable_type	started_at	ended_at	start_station_name	start_station_id	end_station_name	end_station_id	start_lat	start_lng	end_lat	end_lng	member_casual
6F2A48192B2F2921	classic_bike	00:43.0	11:51.0	California Ave & Altgeld St	15646	Damen Ave & Pierce Ave	TA1305000041	41.92669	-87.697668	41.90939601	-87.67769193	member
B929FF5BF24D4F83	classic_bike	00:54.0	03:33.0	University Library (NU)	605	Sheridan Rd & Noyes St (NU)	604	42.052939	-87.673447	42.058239	-87.677432	member
05ADF1DA01BBB6BF	electric_bike	01:15.0	06:14.0	Eckhart Park	13289	Ogden Ave & Chicago Ave	TA1305000020	41.89644992	-87.66100669	41.89636246	-87.65406127	member
C555B5538B0C461B	classic_bike	01:31.0	05:44.0	Clark St & Newport St	632	Sheffield Ave & Wellington Ave	TA1307000052	41.94454	-87.654678	41.93625348	-87.6526621	casual
45F5D93322B356A7	classic_bike	01:46.0	27:00.0	900 W Harrison St	13028	Clinton St & Polk St	15542	41.874754	-87.649807	41.87146652	-87.64094913	member

The data is sourced from Motivate International Inc., ensuring it adheres to licensing agreements and privacy protocols by excluding any personally identifiable information. This dataset provides sufficient detail for an in-depth analysis of rider behaviour trends, helping answer the key business question about usage patterns between casual riders and annual members.

Data Processing

Data Import and Initial Review

- Imported 6 months of data (Mar-2024 to Aug-2024) into SQL tool

- Performed initial data structure and content review

Data Cleaning and Feature Engineering

- Dropped records - 211 duplicate rows, 159 rows where start time was after end time

- Created Table with additional date time columns to help with analysis

Performance Optimization

- Created non-clustered indexes on key columns

Final Checks

- Ensured no duplicates

- Verified data types and null values

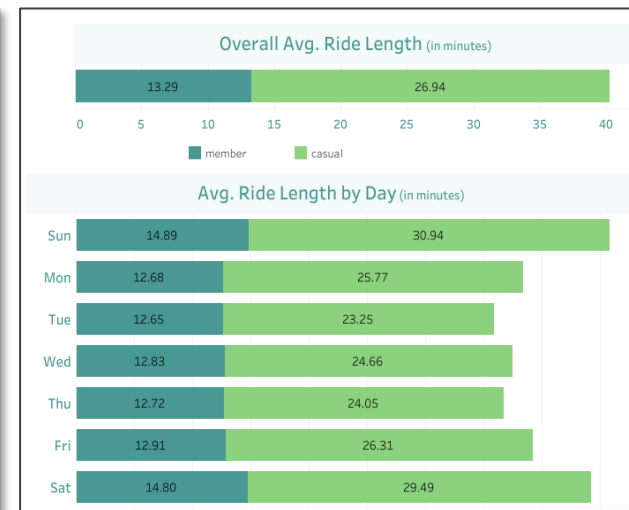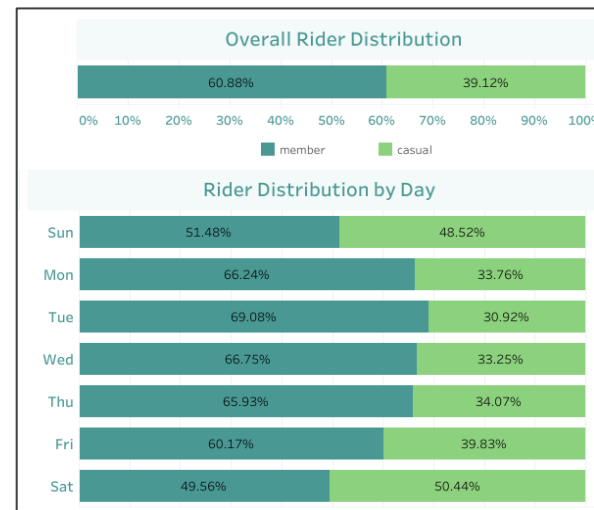- Reviewed extreme values and sorted data for visual inspection

Analysis

Observations

- **Membership split**: Members (60.88%) have shorter trips, while casual riders (39.12%) take longer rides.

- **Weekly dominance:** Members dominate weekdays (66-69%), casual riders surge on weekends (~50%).

- **High-traffic locations:** Stations like "Streeter Dr & Grand Ave" are ideal for targeted marketing.

- **Ride variability:** Casual riders show more variability, including extreme outliers (up to 26-hour rides).

Hypothesis

- Casual riders prefer weekend leisure rides, while annual members use bikes for weekday commuting.
- Casual riders engage in more recreational or tourist activities, while members use bikes for practical purposes.

Overall Rider Distribution

member	casual
60.88%	39.12%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Rider Distribution by Day

Day	member	casual
Sun	51.48%	48.52%
Mon	66.24%	33.76%
Tue	69.08%	30.92%
Wed	66.75%	33.25%
Thu	65.93%	34.07%
Fri	60.17%	39.83%
Sat	49.56%	50.44%

Overall Avg. Ride Length (in minutes)

member	casual
13.29	26.94

0 5 10 15 20 25 30 35 40

Avg. Ride Length by Day (in minutes)

Day	member	casual
Sun	14.89	30.94
Mon	12.68	25.77
Tue	12.65	23.25
Wed	12.83	24.66
Thu	12.72	24.05
Fri	12.91	26.31
Sat	14.80	29.49

Top 10 Longest Rides

Ride Id	Rideable Type	Member Casual	Start Station Name	End Station Name	Ride Length	Day Name
2E7A26B0B6513B10	classic_bike	casual	Green St & Madison St	Null	25:59:56	Saturday
446B8A4213AAD837	classic_bike	casual	Franklin St & Chicago Ave	Null	25:59:55	Saturday

Ride Start & End Locations

© 2024 Mapbox © OpenStreetMap
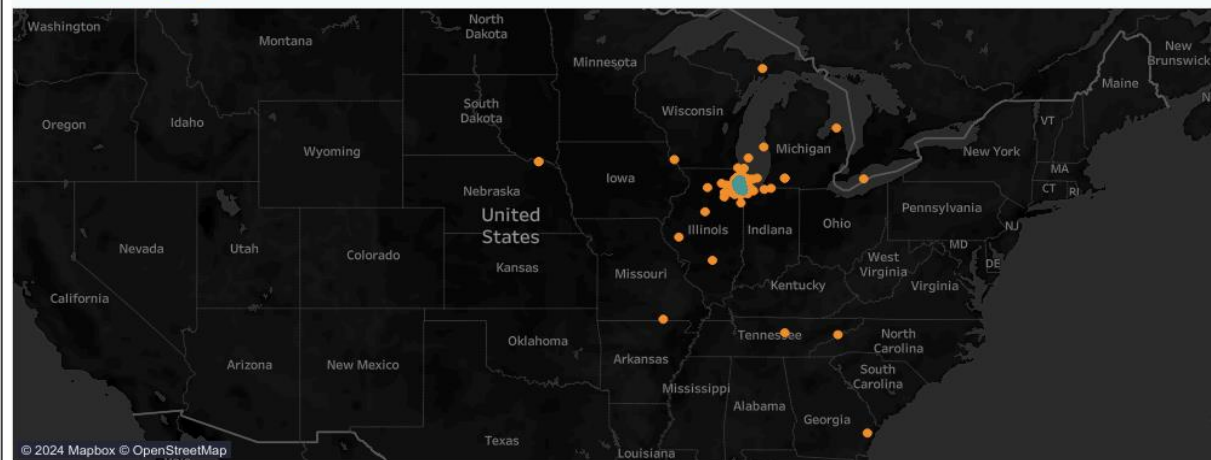
Recommendations

Action & Next Steps

Based on our analysis, here are three key recommendations:

1. Targeted Weekend Conversion Campaign: Launch a marketing campaign aimed at converting casual riders to members, focusing on weekends when casual ridership peaks. Highlight the cost-savings of membership for frequent weekend riders.

2. Introduce Tiered Membership Options: Develop membership tiers that cater to different usage patterns. For example, a "Weekend" membership for those who primarily ride on weekends, or a "Vacation" membership for users who prefer extended rides.

3. Location-Based Marketing: Implement targeted marketing strategies at high-traffic stations, particularly "Streeter Dr & Grand Ave". This could include on-site promotional events, digital advertising geotargeted to these areas, or special offers for first-time members who sign up at these locations.

APPENDIX

1. **Cyclistic (Divvy) Trip Data** - Original dataset available [here](#) .
   - Monthly trip data from March 2024 to August 2024 used in this analysis.

2. **Licensing Information –**
   - Project Code License - This project is licensed under the MIT License.
   - Cyclistic Data License Agreement - The dataset is provided by Divvy and is governed by the [Divvy Data License Agreement](#).

3. **Tools Used –**
   - SQL Server
   - Tableau
   - PowerPoint

For questions about this project, please contact via the repository's issue tracker.

Thank You