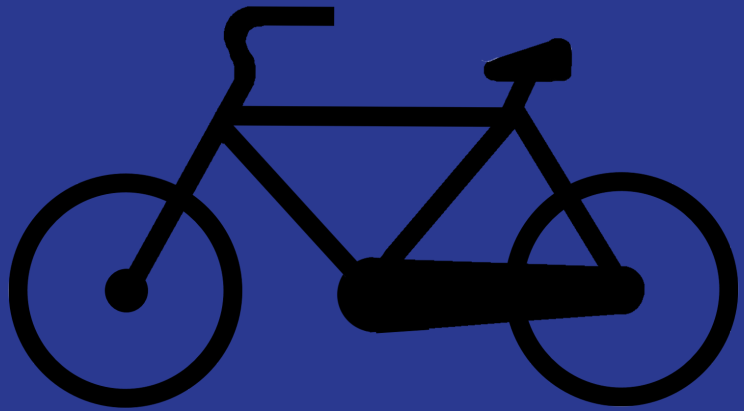
Marketing Analytics on a Bicycle Sharing Service

Case Study on Demonstrating Skills Necessary to a Data Professional



Scenario:

Cyclistic Bike Sharing

Established bicycle sharing service in the Chicago area with thousands of daily rides.

It offers flexible pricing options: single-ride passes, full-day passes, and annual memberships.

What Do We Know?

Annual membership holders are significantly more profitable than casual riders (single-ride/full-day passes). It's believed that maximizing annual memberships is key to future growth.

What's the Goal?

Utilizing historical trip data, determine how annual members and casual riders use Cyclistic bikes differently? How can casual riders be converted to annual members?

Data Sources:

Dataset location:

https://divvy-tripdata.s3.amazonaws.com/index.html.

- (Note: Cyclistic is fictional and the data has been made available by Motivate International Inc. under this license [https://www.divvybikes.com/data-license-agreement].)

Dataset description:

Files utilizing last years' (2022) metrics loaded & prepared for analyzation

Metrics:

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

Data Sources:

Disclaimer:

(.csv data was consolidated to 10,000 rows per sheet in the interest of preserving compute in order to avoid crashes/overnight import times with tools used)

Limitation:

In the interest of data-privacy, prohibited from using riders' personally identifiable information, meaning inability to connect pass purchases to credit card numbers, determining if casual riders live in the Cyclistic service area or if they have purchased multiple single passes.

Step by Step

Process

Get a sense of the data. Aggregate, clean & manipulate. Check out my (README.1st) for a detailed look at my process!

Tools used:

- **Excel**
- **RStudio**

Analyze

From the dataset, what can we answer? See my R scripting repository at (github) here!

Tools used:

- **RStudio (tidyverse)**

Visualize

What inferences can we make at a glance? See my plot scripting at my repository here! (github)

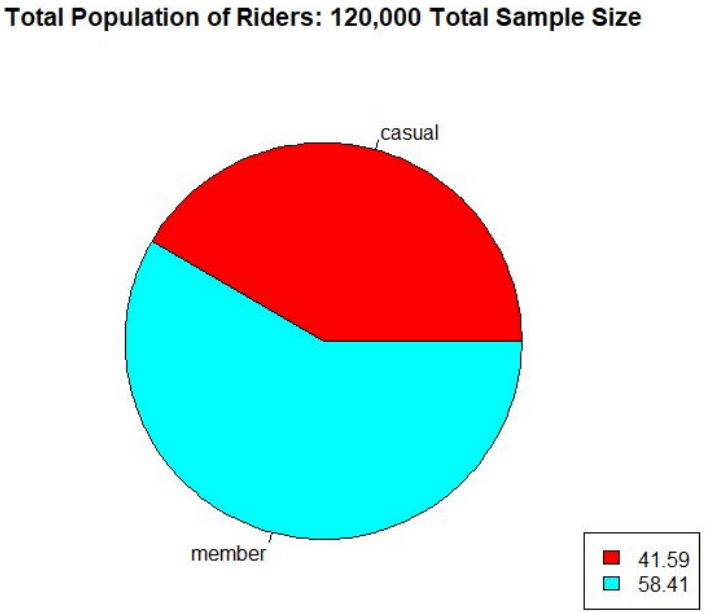
Tools used:

- **RStudio (tidyverse; ggplot2)**

What Questions Can We Ask?

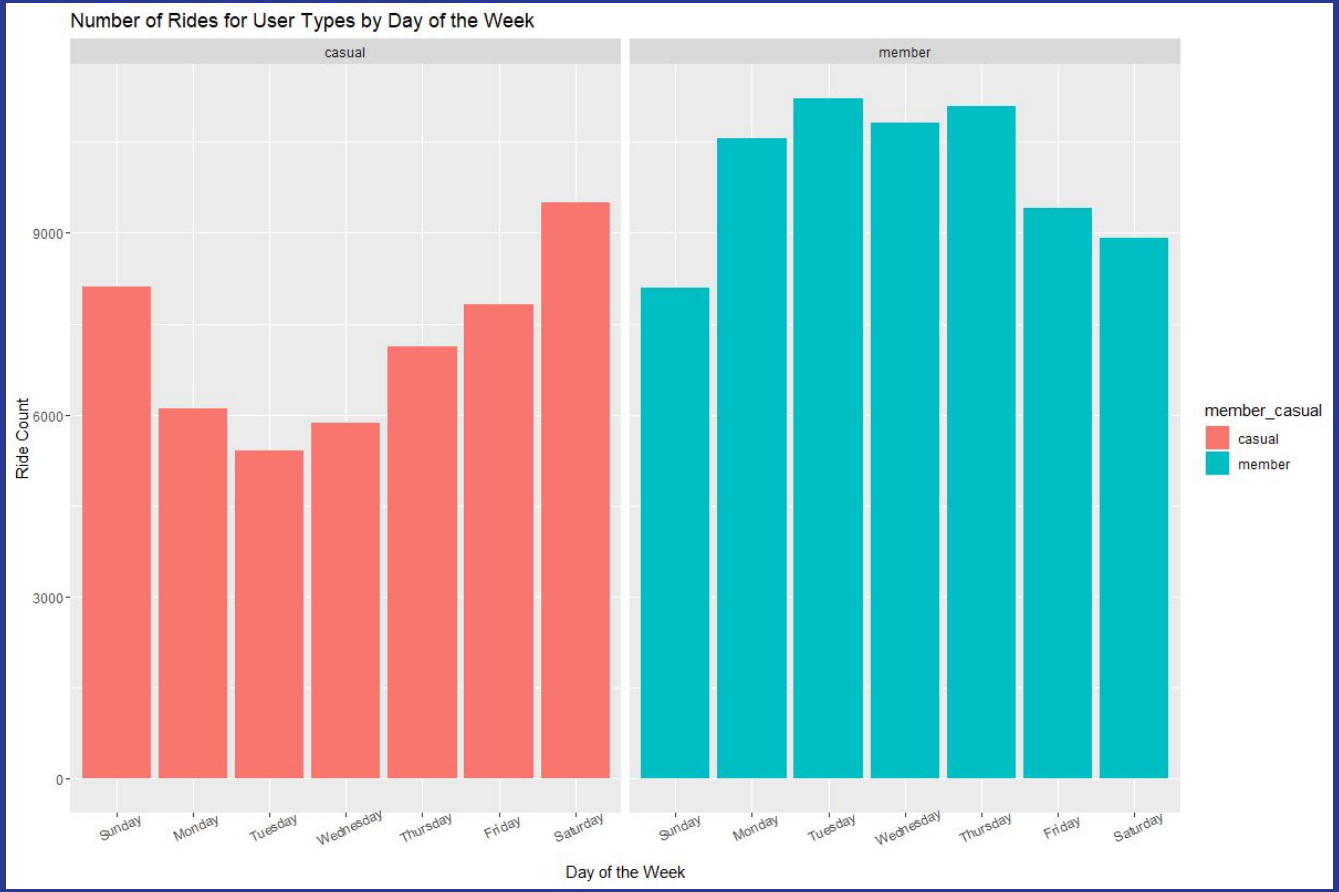
- Number of rides for users overall; casual vs. member?
  - By day of the week?
  - By month?
- What is the average ride length of each rider type?
- Average distance by user type?
- Average speed by user?
- Busiest time/total rides per hour of use by user type?
- What are the preferred bike types of each rider type?
- What are the top 5 start stations by user?
  - Top 5 end stations?

Rider Usage



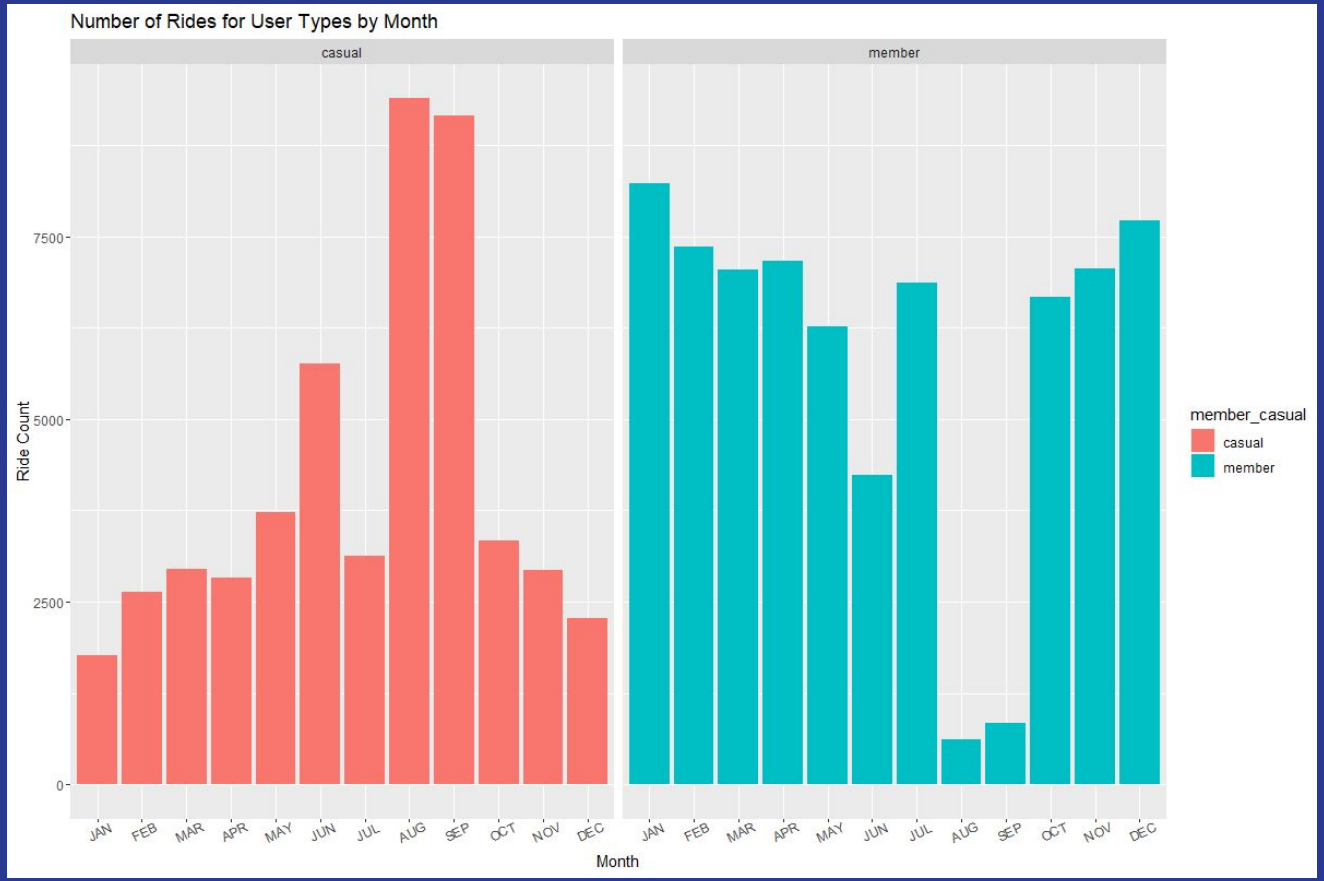
- Casual Riders make up around 42% of total users, while members account for over 58%.
- Marketing resources will be allocated to the conversion of the Casual population to Annual Memberships.

Rider Usage (cont.) - Weekday Behavior



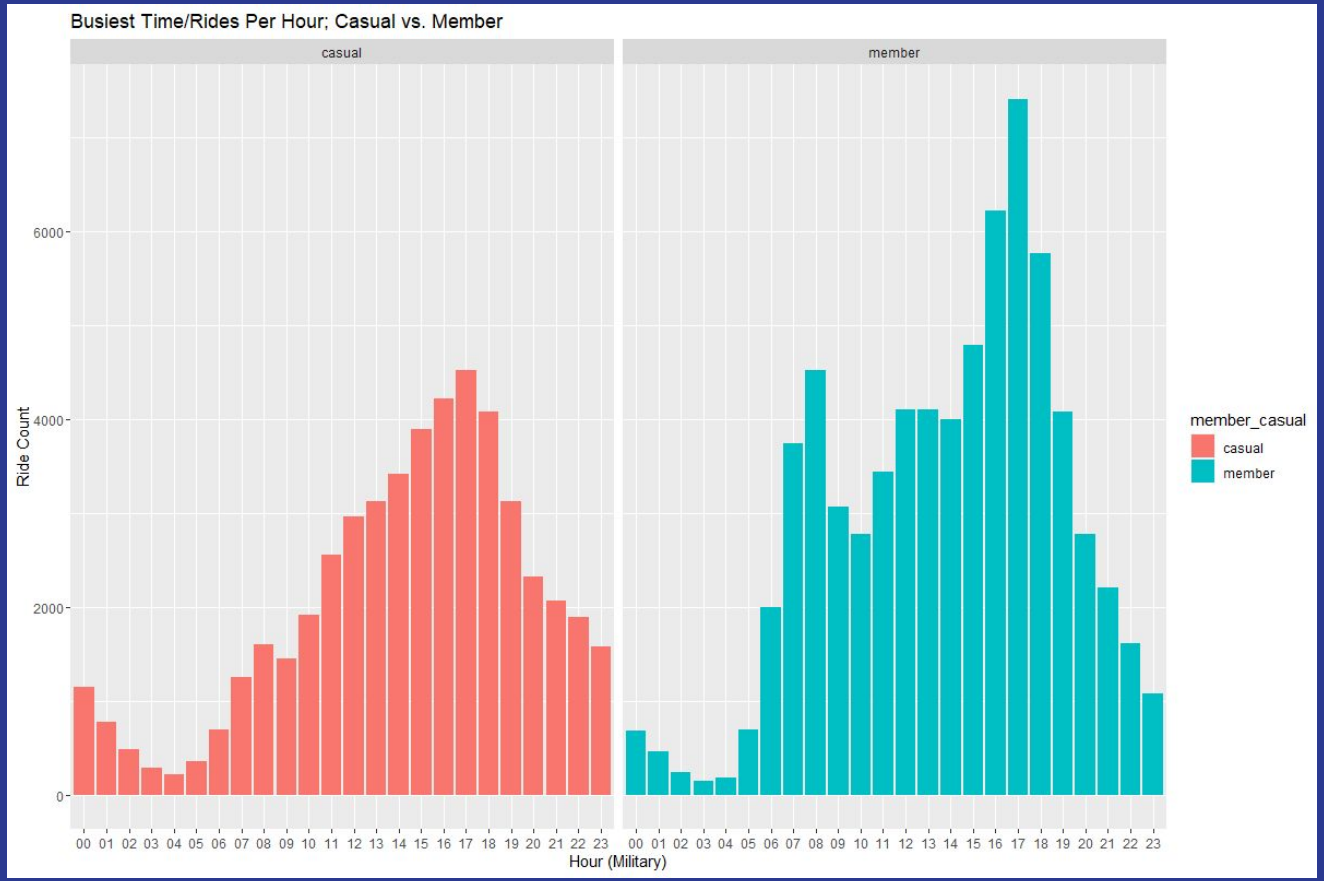
- Casual Riders tend to peak during the weekend while Members peak mid week suggesting recreation vs. commute.
- How many Casual Riders use service for commute? Could they benefit from an annual membership?

Rider Usage (cont.) - Behavior Month to Month



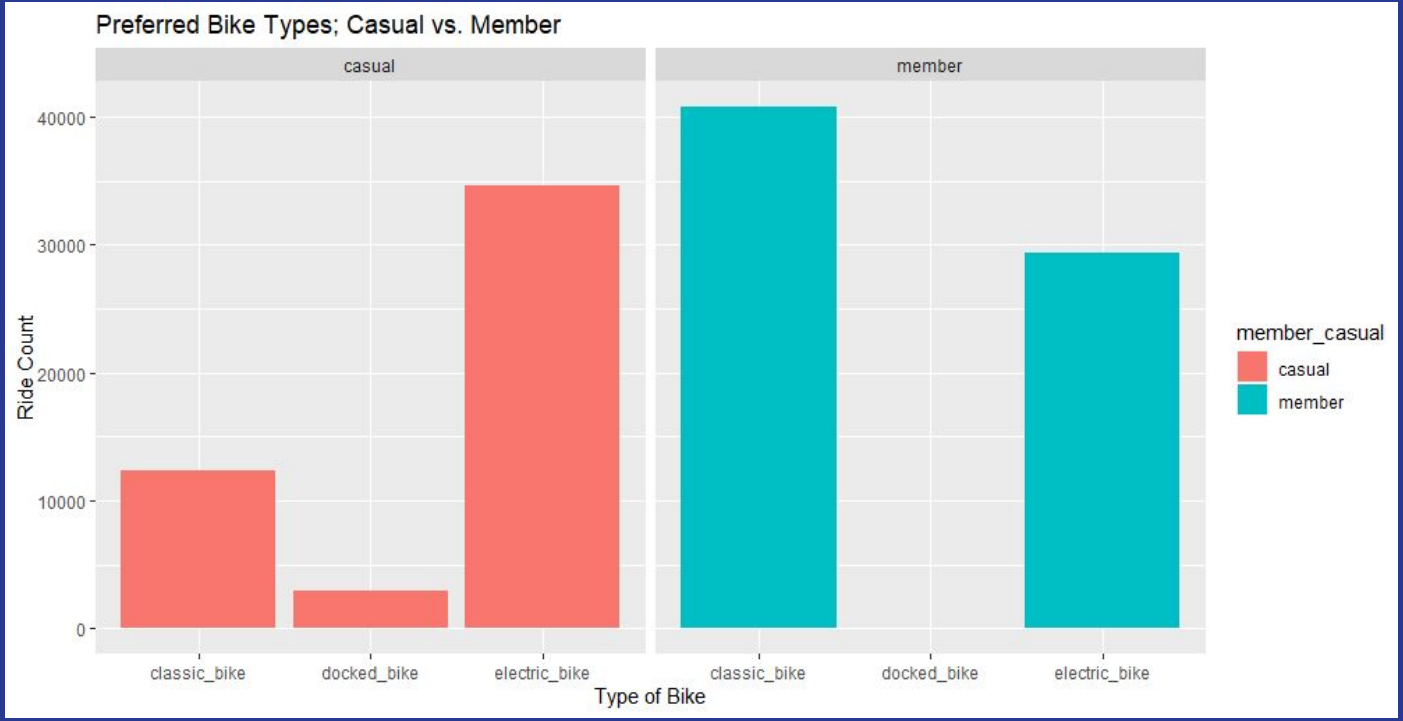
- Casual Riders skyrocket during the late summer while the inverse is true for members. This could indicate tourism, while Casuals visit the city and Members take vacation.
- A weeklong + summer promotion could be a fitting offer for folks in town for a short time.

Rider Usage (cont.) - Hour Over Hour Behavior



- For both Casual Riders and Members, there is a spike of activity around regular commuting hours (0600 to 1000 and 1400 to 1900), further suggesting regular users who have not yet been converted to annual members.

Rider Usage (cont.) - Cycle Type Preferences.



- Casual Riders overwhelmly prefer electric type. A fitness incentive could be offered to assist in Casual -> Member conversion (I.E. sign up and use classic type over 50% for 10% off yearly membership) to convert regular riders who aren't members. Would also alleviate electric type demand.

Further Analysis:

Average Ride Length:

- ***Casuals:***
  - ***20min***
- ***Members:***
  - ***12min***

Further suggesting recreation vs. commute. Casuals with regular short rides could be targeted.

Average Distance:

- **Casuals:**
  - **1.5 miles**
- **Members:**
  - **1.3 miles**

No significant difference.

Average Speed:

- **Casuals:**
  - **6.9 MPH**
- **Members:**
  - **7.4 MPH**

Again, no significant differences.

Further Analysis: Station Popularity

Starting Stations:

- Casual

1	*NA*	22532
2	LaSalle St & Illinois St	499
3	Streeter Dr & Grand Ave	444
4	DuSable Lake Shore Dr & Monroe St	393
5	Wells St & Concord Ln	367
6	Dearborn St & Erie St	341

- Member

1	*NA*	4800
2	Desplaines St & Kinzie St	858
3	LaSalle St & Illinois St	795
4	Wolcott Ave & Polk St	786
5	Loomis St & Lexington St	761
6	Halsted St & Clybourn Ave	691

Ending Stations:

- Casual

1	*NA*	22746
2	Clark St & Elm St	514
3	Wells St & Concord Ln	418
4	Shedd Aquarium	331
5	Streeter Dr & Grand Ave	282
6	Clark St & Drummond Pl	279

- Member

1	*NA*	3381
2	Clark St & Elm St	1127
3	Kingsbury St & Kinzie St	846
4	Loomis St & Lexington St	824
5	St. Clair St & Erie St	799
6	Wells St & Concord Ln	766

- 5 stations occur at least twice between the top start and end stations for casual & membership riders.
- Further analysis may indicate that these stations might service many casual riders that are conversion candidates.

Key Takeaways:

- With nearly 60% of our customer base being Annual Members, there is a large opportunity for converting Casuals into Members.
- There is a large population of casual riders during the work week, as well as a measurable spike during normal commute times. How many of these riders are regular customers without a membership?
- There is a massive spike in casual use during late summer months. Tourism may be the cause of this, and offering weekly passes may be lucrative from a month-over-month standpoint.
- Members are measurably choosing traditional over electric bikes, suggesting health consciousness; getting a workout in during their commute.
- Casuals typically ride for longer periods of time. Identifying casuals with regular trips at a lesser interval may be key targets.
- Popular stations may be a great place for physical advertisements

Action Items:

- Primary objective is to acquire individual casual rider data. Determining how often casuals use the service would be key in drilling down optimal targets for annual membership.

- With a spike in tourism months, offering weekly passes should be considered.

- Physical advertisements for Annual Memberships at our most popular stations could assist in enrollment.

Questions / Feedback

Thank You.

-Ryan Miller