HOW DOES A BIKE-SHARE NAVIGATE SPEEDY SUCCESS?

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June 28, 2023

Google Data Analytics Capstone: Complete a Case Study

From Coursera

TASK

Company Goal: Design marketing strategies aimed at converting casual riders into annual members.

Questions: Three questions will guide the future marketing program:

1. How do annual members and casual riders use Cyclistic bikes differently?
2. Why would casual riders buy Cyclistic annual memberships?
3. How can Cyclistic use digital media to influence casual riders to become members?

Today's Goal: Determine trends in how annual members and casual riders use bikes.

DATA SOURCES

Overview:

- User data from 2019 (collected quarterly).
- Includes information regarding staring/ending time of trips, trip duration, type of membership, and staring/ending station information.

Files:

- Divvy_Trips_2019_Q1.csv
- Divvy_Trips_2019_Q2.csv
- Divvy_Trips_2019_Q3.csv
- Divvy_Trips_2019_Q4.csv

DATA CLEANING & MANIPULATION

- Renamed columns and changed data types as necessary to join tables
- Changed the user types:

  "Subscriber" → "member"

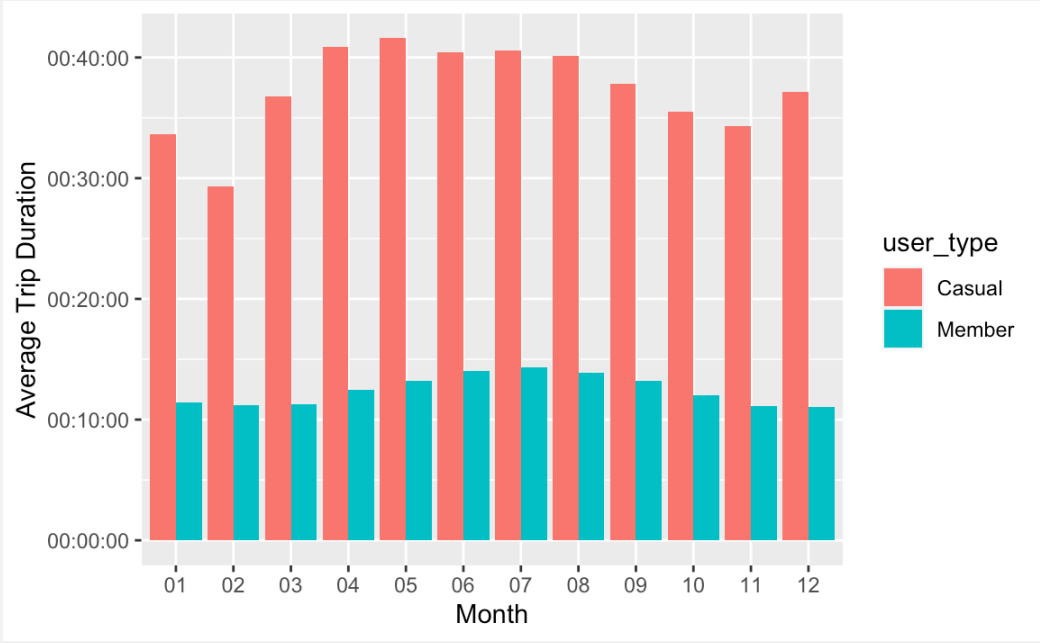
  "Customer" → "casual"
- Removed irrelevant columns (see right)
- Created new columns: month, hour, day_of_week
- Filtered out trips that lasted more than 24 hours (see appendix)

Column Name	Type	Description
trip_id	Integer	Unique id per ride
start_time	Datetime	Starting time of ride
end_time	Datetime	Ending time of ride
trip_duration	Float	Duration of ride in seconds
user_type	Categorical	User type: "member" or "casual"
month	Integer	Month of year [1,12]
hour	Categorical	Hour of day [0,23]
day_of_week	Categorical	Day of Week

DATA ANALYSIS: MONTH OF YEAR

NUMBER OF RIDES

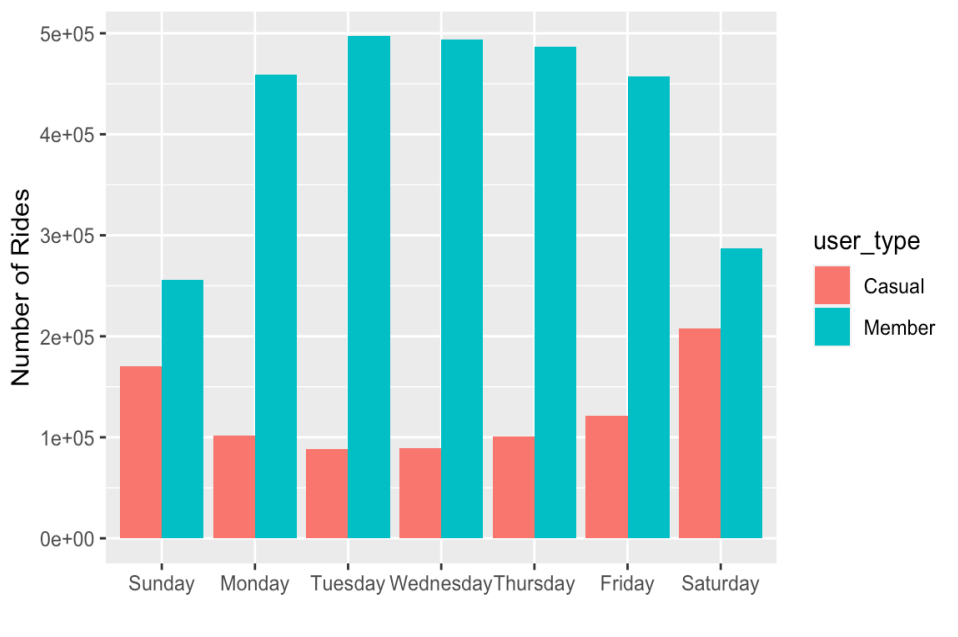
AVERAGE TRIP DURATION



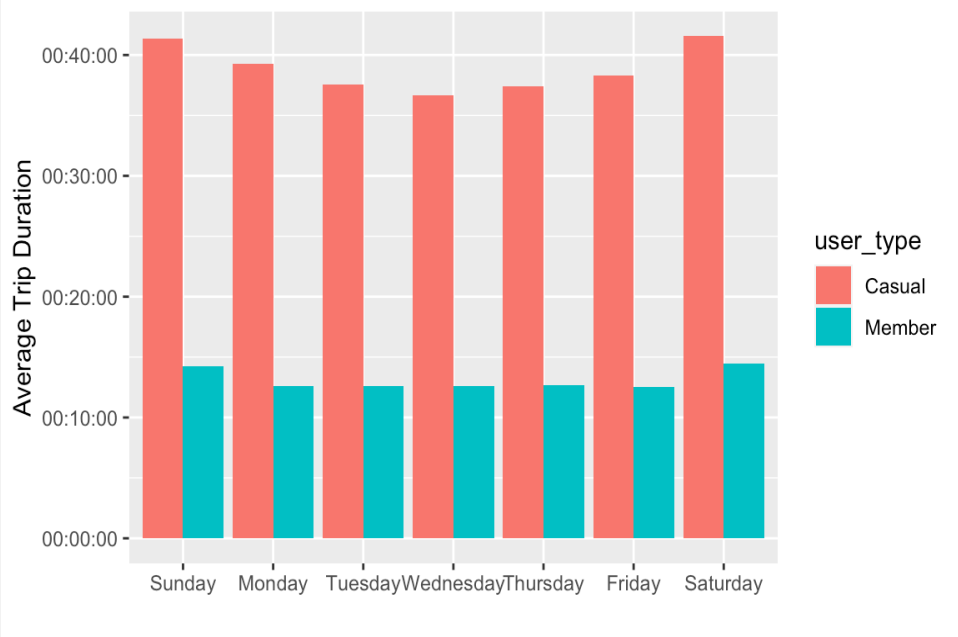
Number of trips and average trip duration **peak during the summer** for both members and casual users.

DATA ANALYSIS: DAY OF WEEK

NUMBER OF RIDES



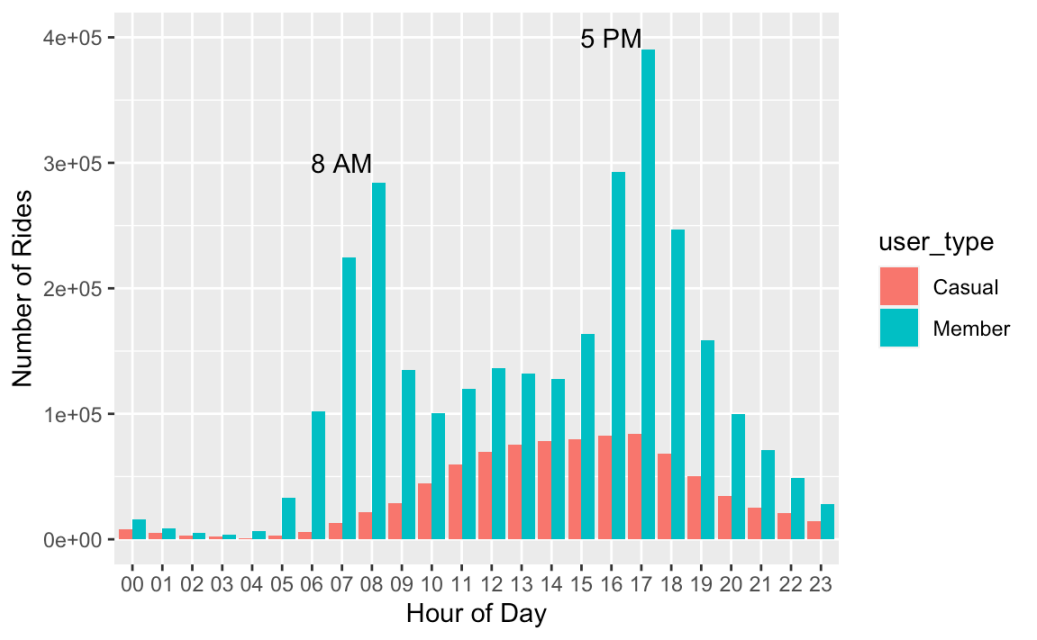
AVERAGE TRIP DURATION



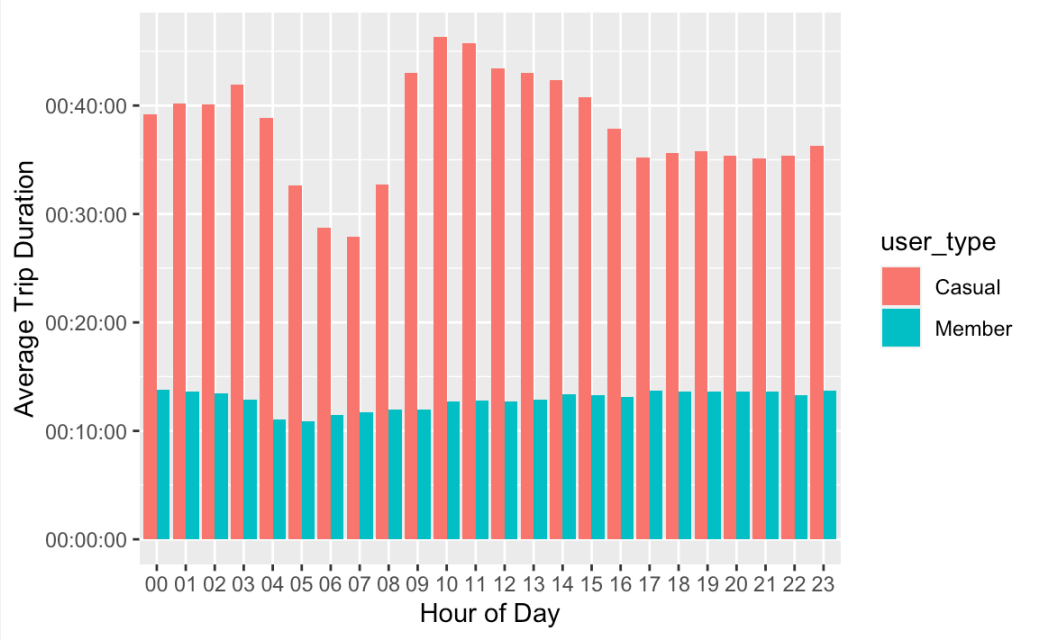
Members use the bikes more frequently during the weekdays whereas casual users use the bikes more often on the weekend. There is no significant different in trip durations throughout the week.

DATA ANALYSIS: TIME OF DAY

NUMBER OF RIDES

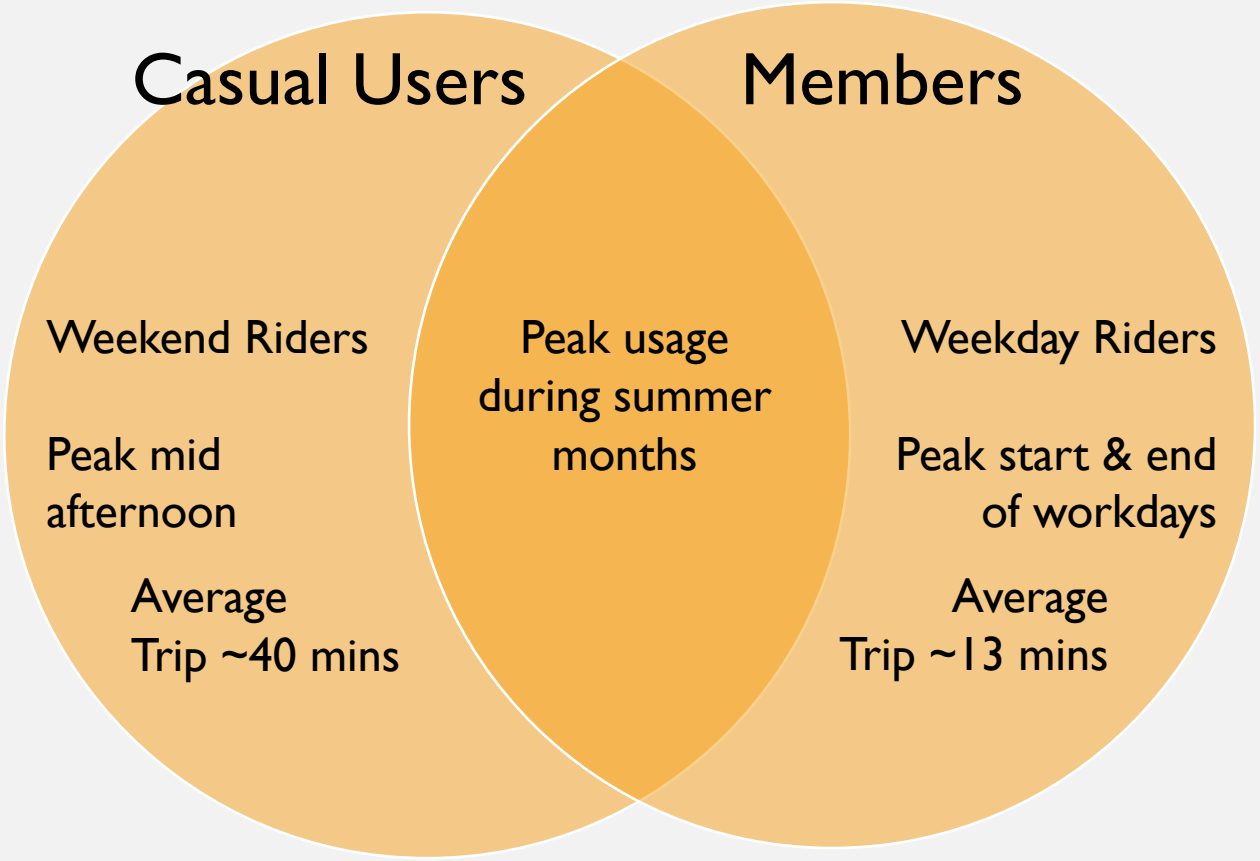


AVERAGE TRIP DURATION



Members' bike use peaks at 8 AM and 5 PM (beginning and end of the workday) whereas casual users' bike use is fairly normally distributed with a peak around 4 PM. There is no significant different in trip durations throughout the day.

TAKE-AWAYS & NEXT STEPS



Recommendations to convert casual users to members:

1. Offer incentive for riding on weekends for members.
2. Offer incentive for trips longer than 30 minutes for members.
3. Offer incentive for midday trips for members.

* Incentives could include (reduced rates, free ride at a certain point, etc.)

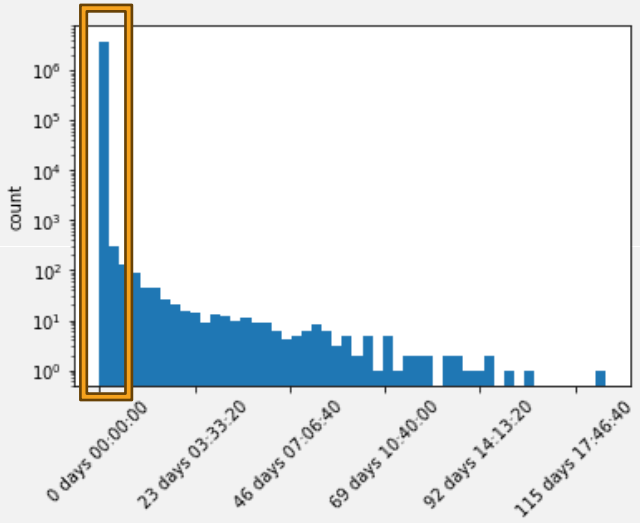
MORE QUESTIONS

Questions:

- How many casual users are one-time vs repeat customers?
- Are some of the trips that lasted more than 24 hours legitimate?
- Where there any changes to memberships in 2019 that may have impacted the number of casual users vs members?
- Do users ride together in groups? How often?
- Are some stations more popular for the different user types?

APPENDIX

FILTERING BY TRIP DURATION



Total.Trips	Trips.less.24.hrs	Percentage
2937367	2936866	0.9998294
880637	879290	0.9984704

Kept 99.95% of all data

Summaries of Trip Duration

Raw Data

user_type	Casual	Member
count	880637	2937367
mean	00:57:00.885729	00:14:19.383275
max	2952:20:00	2515:43:53

After Filtering

user_type	Casual	Member
count	879290	2936866
mean	00:39:25.535000	00:12:55.632406
max	24:00:00	23:59:45