Google Data Analytics Capstone

Cyclistic Case Study

How Does a Bike-Share Navigate Speedy Success?

7/28/2023 - Eric Gordon

Introduction

Hello, and thank you for visiting my page. My name is Eric Gordon and I am currently finishing up the Google Data Analytics Professional Certificate available through Coursera. What follows here is a capstone project designed to showcase many of the skills I've learned in that program. Please take some time to read through the contents. I welcome any feedback, positive or negative.

Cyclistic Case Study

In this scenario, I'm in the role of a junior data analyst working in the marketing analyst team at Cyclistic, a fictional bike-share company in Chicago, Illinois. The director of marketing, Lily Moreno, believes the company's future success depends on maximizing the number of annual memberships. Therefore, my team wants to understand how casual riders and annual members use Cyclistic bikes differently. From these insights, our team will design a new marketing strategy to convert casual riders into annual members. But first, Cyclistic executives must approve our recommendations, so they must be backed up with compelling data insights and professional data visualizations.

Goals

The marketing team has focused on three questions which 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?

Data

The data I'm using is publicly available here. I have used data from the previous 12 months, July 2022 - June 2023. The data has been made available by Motivate International Inc. under this license.

Preparations

The Data Analysis Process includes 6 phases: Ask, Prepare, Process, Analyze, Share, and Act. I will follow that template moving forward.

Ask

With this being a capstone project, I'm not able to actually meet with the stakeholders and ask questions. However, if I could, there are a few things I would like clarification on.

1. Can I have access to more membership data? I would like to see what trends exist with membership numbers over the last few years. Are these numbers going up or down?
2. I'd also want to know if member personal data could be available to us. I think member address data could be particularly useful.
3. I would like an actual verified list of the stations. There are some inconsistencies in the station name and location data that would be easy to correct with some official data on the stations.

Prepare

I downloaded the 12 monthly datasets for July 2022 through June 2023, then imported them into BigQuery. I then used SQL to merge them all into a new table named Totals. I ended up with 13 tables in total, and browsed those to get a general feeling for what the data contains.

In terms of cleaning the data, I only found issues with the Station Names, Station ID's, longitudes, and latitudes. The case study description says that there are 692 stations, but the data has many more Station Names and Station IDs. The number of unique Station Names and Station IDs don't match either. There were also lots of null values in those fields. As far as the longitude and latitude data, when plotting those to a map some of the locations weren't near the Chicago area. I removed those entries, and the nulls, when generating map data for this report.

Process

I ran SQL queries on the data using BigQuery to summarize the data. Here are some, but not all, of the things I queried.

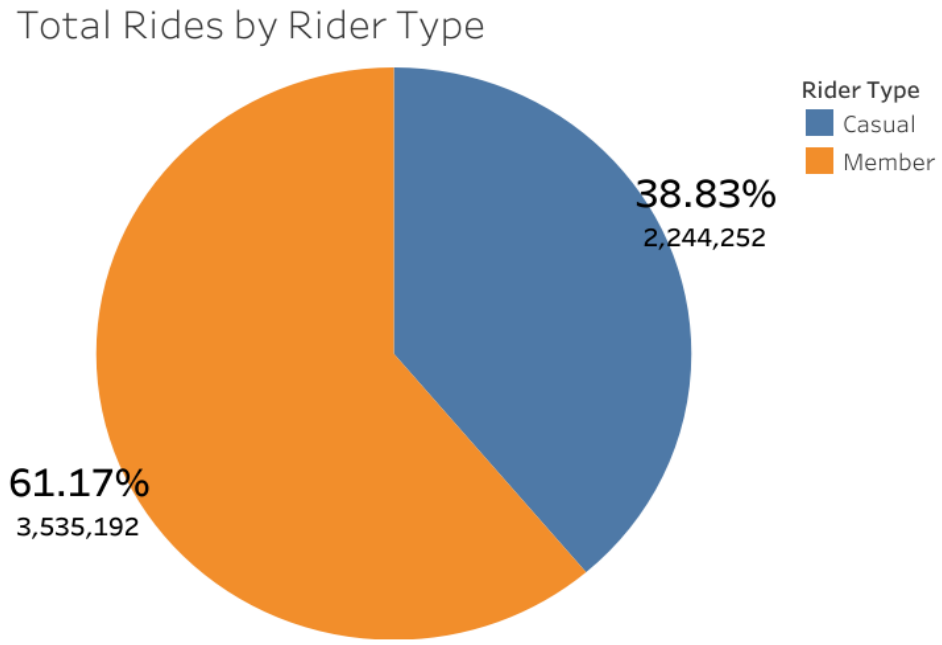
1. The total number of rides by rider type.
2. The total number of riders by bike type.
3. The average ride time by rider type.
4. The average number of rides for each day of the week by rider type.
5. The average number of rides per hour by rider type.
6. The total number of rides based on station ID.

I prepared visualizations for my findings in Tableau.

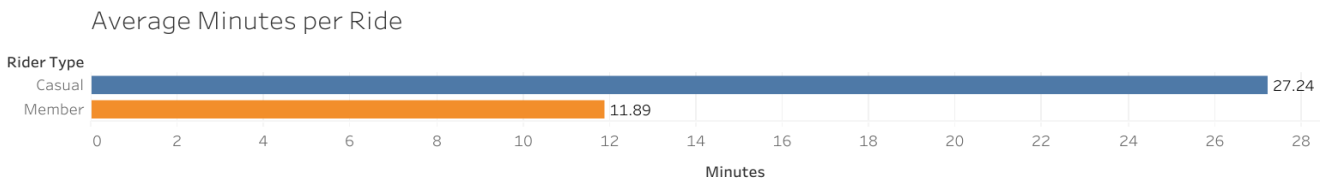
Findings

Analyze

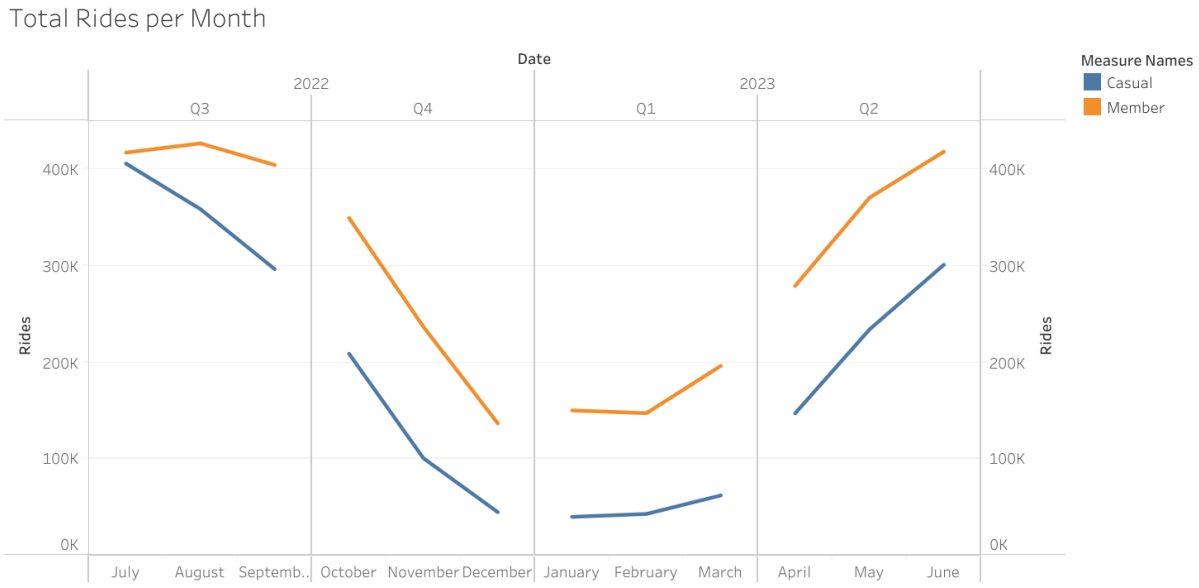
I found that members accounted for 61.17% of total rides during this time period, with casual riders accounting for 38.83% of total rides.



However, the average ride time for a member was only 11.89 minutes, while the average ride time for casual riders was 27.24 minutes.

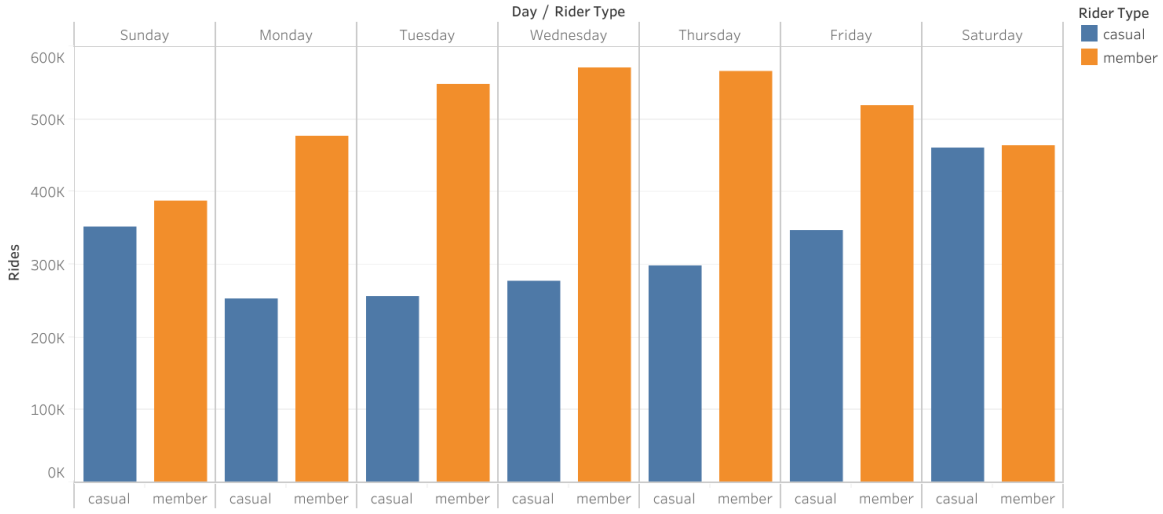


In terms of rider activity, the busiest times were during the summer months, with the least activity being during the winter months.



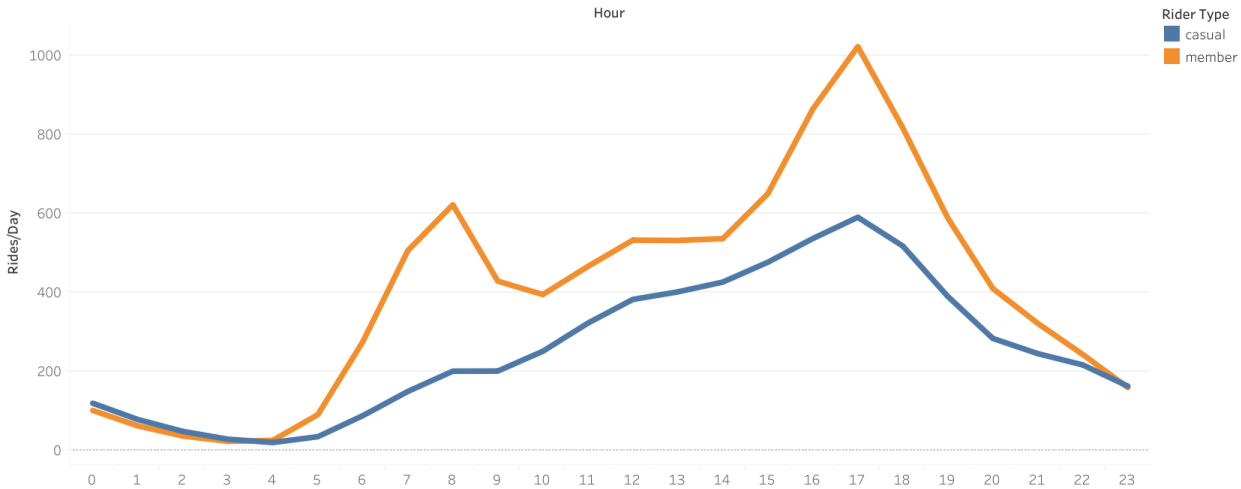
In terms of rides per day, you do see different trends based on the rider type. The members' busiest days are in the middle of week, peaking on Wednesday and Thursday. The casual riders busiest days are over the weekend, peaking on Saturday and Sunday.

Rides per Day

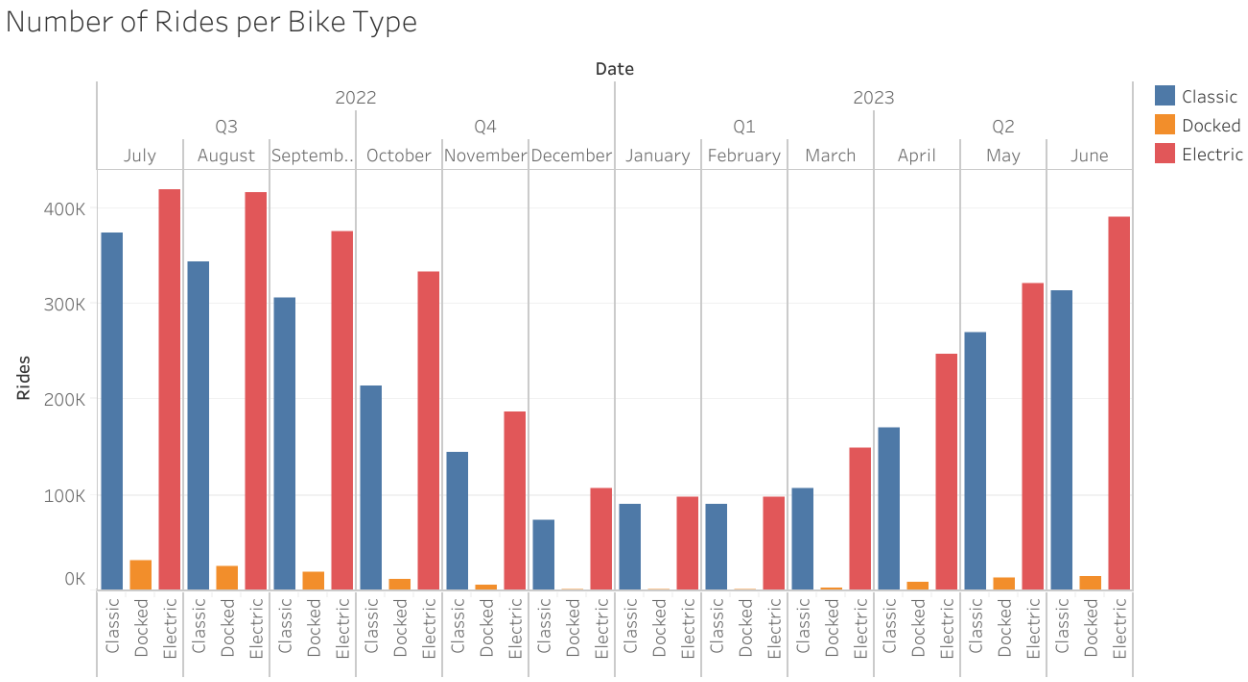


When looking at average rides per hour, the peak time for member and casual riders is the 5PM hour. Member riders also see a spike around 8AM hour. This suggests that a significant portion of the members are using the service for their daily commute.

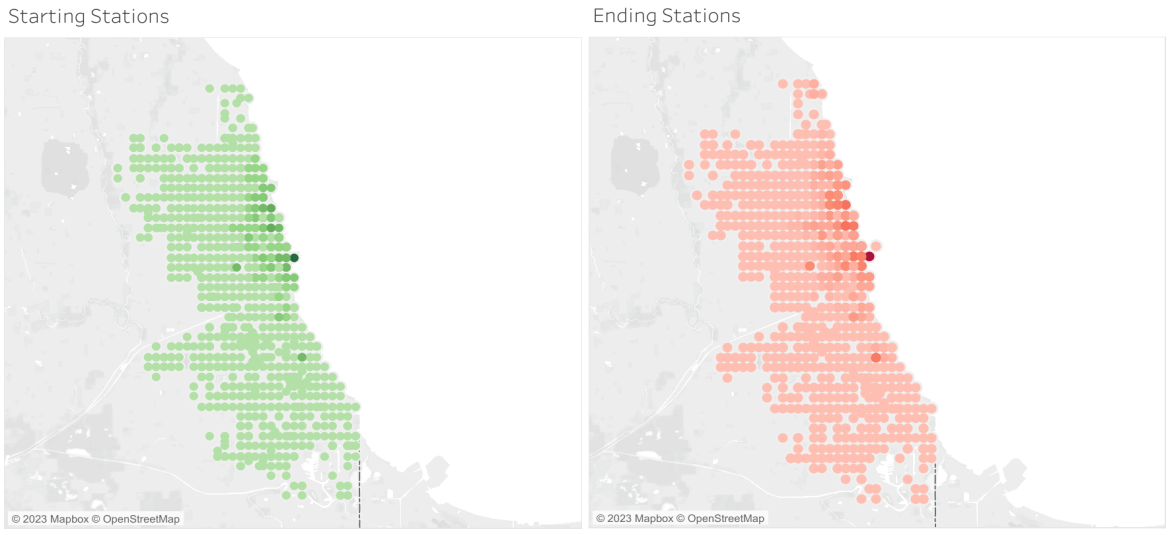
Average Rides per Hour



The most popular bike type was the Electric bike, followed closely by the Classic bike. The docked bike type only represents a small percentage of total rides.



I did not find any significant difference in where members and casual riders actually ride. The most activity is in the heart of the city, near the coast. The busiest stations are Streeter Dr and Grand Ave, DuSable Lake Shore Dr & Monroe St, and Kingsbury St & Kinzie St.



Conclusions

Share

At this point our team would share our findings with the stakeholders. This would include presenting our findings, and making the visualizations and data available to them. I'd like to return to our three guiding questions to start summarizing what I've found.

1. **How do annual members and casual riders use Cyclistic bikes differently?** I've found that the two user types do show some significant differences in how they use the service. Members take shorter trips, with more activity during the work week. They are likely local residents using the service for their daily commute, along with other short trips as needed, but the occasional joy ride can be included as well. Casual riders take longer trips, with activity peaking over weekends. They are likely people simply wanting to get out and enjoy a day traveling through the city. This group will include locals and tourists.
2. **Why would casual riders buy Cyclistic annual memberships?** I think the key to convincing casual riders to sign up for annual memberships is to show them all of the different ways they can use the service. I'd recommend a marketing campaign that features actual members, and highlights all of the ways they use the service. This could help them realize that there's more to the service than going around for sight-seeing. I'd also recommend membership options beyond just an annual membership. Considering that usage rates drop significantly during the colder months, a seasonal membership, or month to month membership, could be very appealing to the casual riders.
3. **How can Cyclistic use digital media to influence casual riders to become members?** One great thing about digital media is that it allows you to target specific groups. Depending on what personal information we have for casual riders, we could use email or social media ads. This marketing campaign needs to be targeted to people who live and work in Chicago. It needs to show how Cyclistic can make their lives easier by highlighting all of the ways actual members use the service. The marketing campaign could also highlight the cost benefits of a membership, as well as the health benefits of riding a bike daily.

Act

At this point it's up to our main stakeholders to decide how they want to proceed. Here are my three recommendations based on this analysis.

1. Create a marketing campaign that showcases actual members. This campaign should allow the members to explain how they use Cyclistic in their daily lives. The goal is to highlight that this service can be used for a wide range of activities. The data does show that members and casual riders use the service in different ways. I believe it would be wise to show potential members all of the ways actual members use the service.
2. Expand the membership options beyond just an annual membership. The data does show that rider activity peaks in the warmer months. Casual riders would likely be more open to a seasonal, or month to month membership.
3. Make sure that this campaign is targeted to casual riders who live and work in Chicago. This program can feature ads via email, social media, local television, local radio, billboards, and local newspapers. In addition to showing all of the practical ways members use the service, the campaign needs to highlight the cost benefits of being a member. This could include the cost benefits of membership versus paying for individual rides, but also the cost benefits of membership compared to other forms of public and private transportation available in the city.