Case Study Description

Google Data Analytics Capstone project

by Anna Fomina

2024

In 2016, Cyclistic launched a successful bike-share offering.

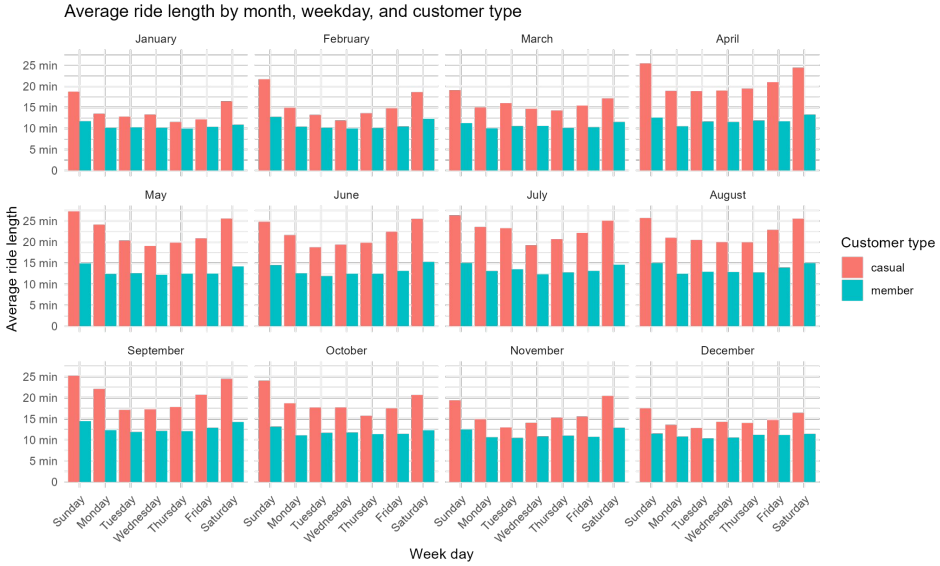
Since then, the program has grown to a fleet of **5,824 bicycles** that are geotracked and locked into a network of **692 stations** across Chicago. The bikes can be unlocked from one station and returned to any other station in the system anytime.

Until now, Cyclistic's marketing strategy relied on building general awareness and appealing to broad consumer segments. One approach that helped make these things possible was the flexibility of its pricing plans: single-ride passes, full-day passes, and annual memberships.

- Casual riders - customers who purchase **single-ride** or **full-day passes**
- Member riders - customers who purchase annual memberships

Cyclistic's finance analysts have concluded that annual members are much more profitable than casual riders. Although the pricing flexibility helps Cyclistic attract more customers, the marketing director believes that maximizing the number of annual members will be key to future growth. Therefore, **the team wants to understand:**

How do annual members and casual riders use Cyclistic bikes **differently**?



This graph visualizes the average ride length during weekdays across different months. Each subplot represents a month, showing the distribution of average ride length by day of the week. The x-axis represents the days of the week, while the y-axis represents the average ride length. Bars are colored based on the type of member (casual or member).

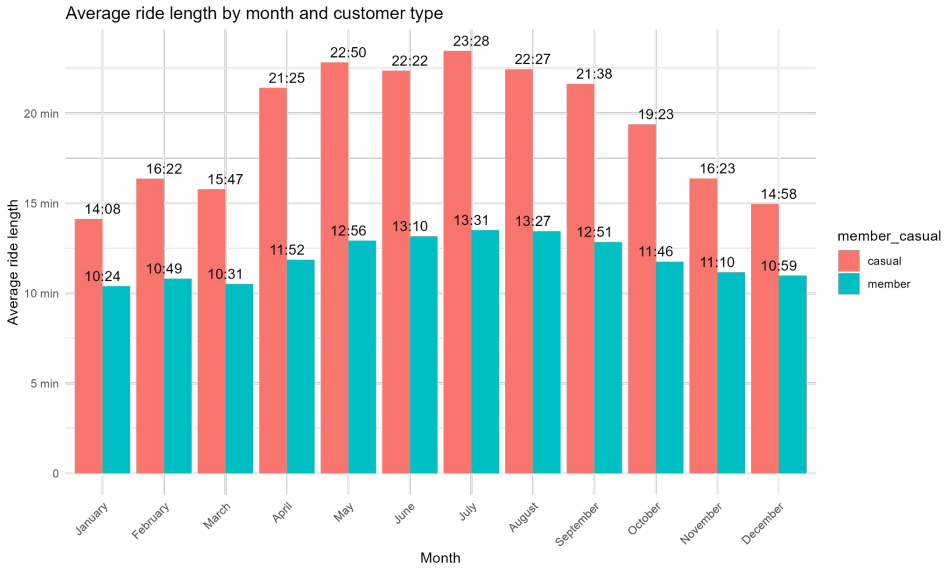
/ year 2023

Average ride length

From this chart, it's clear that on weekdays, the average ride length for Members consistently falls within the range of **10 to 12.5 minutes**.

However, there are occasional spikes beyond the 12.5-minute threshold on select weekdays from May to September.

- ❏ Members' ride lengths remain relatively consistent throughout the year, regardless of the season.
- ❏ Casual riders show an increase in trip duration during warmer months.



This graph illustrates the average ride length during different months, categorized by the type of rider (casual or member). Each bar represents a specific month, and the height of the bar corresponds to the average ride length for that month.

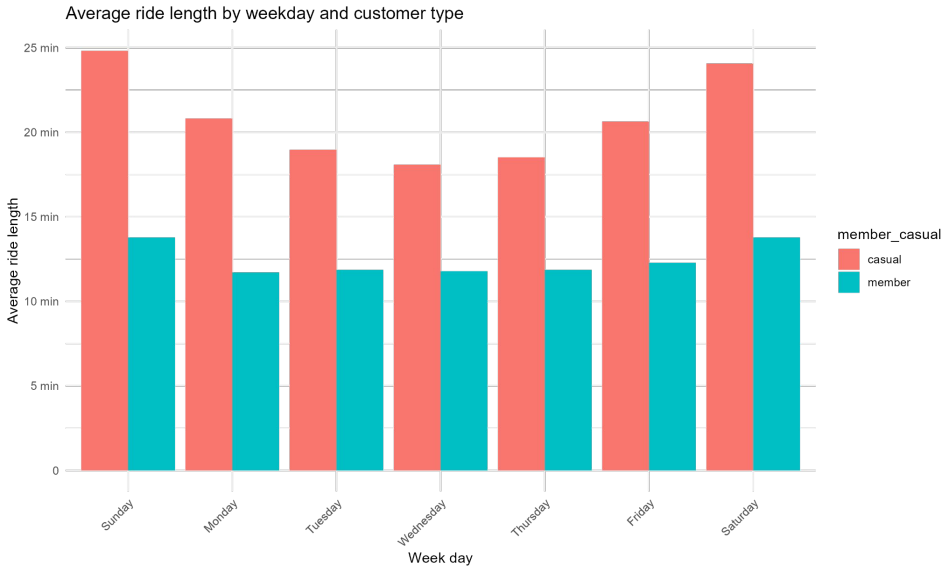
/ month

Average ride length

This chart reinforces the observation of an increase in the average ride length during warmer months.

Additionally, it highlights that the range of ride length variation

- for Member riders remains within a **5-minute span**,
- for Casual riders, it's approximately **10 minutes**.



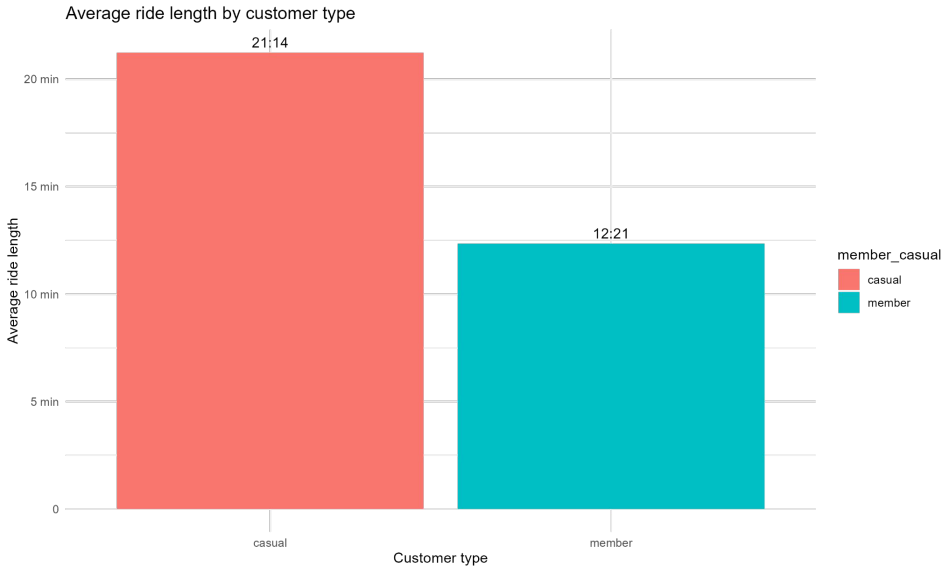
This graph presents the yearly summary of average ride length during weekdays. It provides an overview of the average ride length across all months aggregated into a single plot. Similar to the monthly graph, the x-axis represents the days of the week, the y-axis represents the average ride length, and bars are colored based on the type of member.

/ weekday

Average ride length

The trends in data distribution for Casual and Member riders are similar. Both groups tend to have longer ride lengths on weekends.

- Casual riders demonstrate more variability between data points throughout the week
- Members' ride lengths remain more consistent.

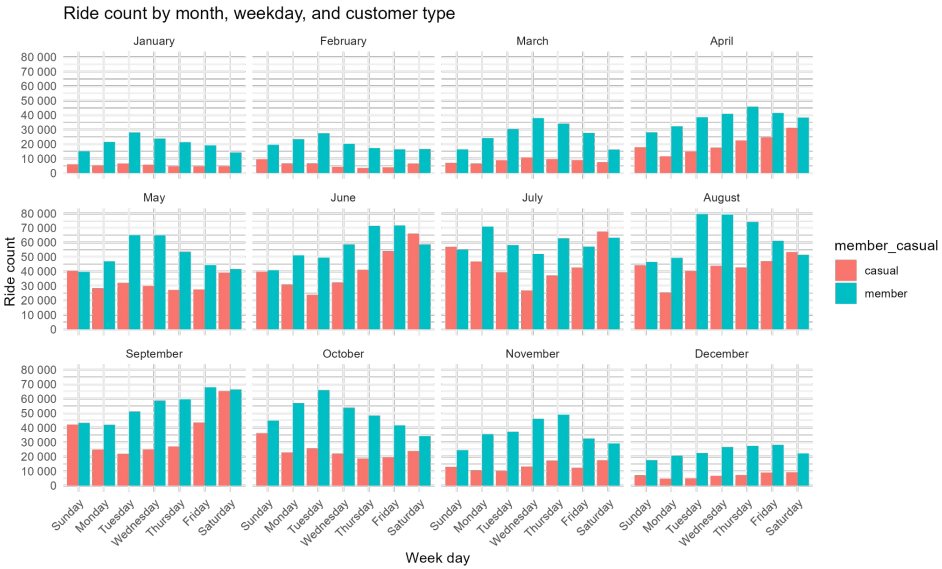


This graph visualizes the average ride length for different customer types (casual and member). Each bar represents a customer type, and the height of the bar corresponds to the average ride length. Bars are colored based on the customer type.

/ customer

Average ride length

Casual rider trips are almost **10 minutes longer** on average than Member rider trips.



This graph visualizes the ride counts by day of the week across different months, categorized by by customer type (casual or member). Each subplot represents a month, showing the distribution of ride counts by day of the week. The x-axis represents the days of the week, while the y-axis represents the total ride count. Bars are colored based on the type of member.

/ year

Ride count

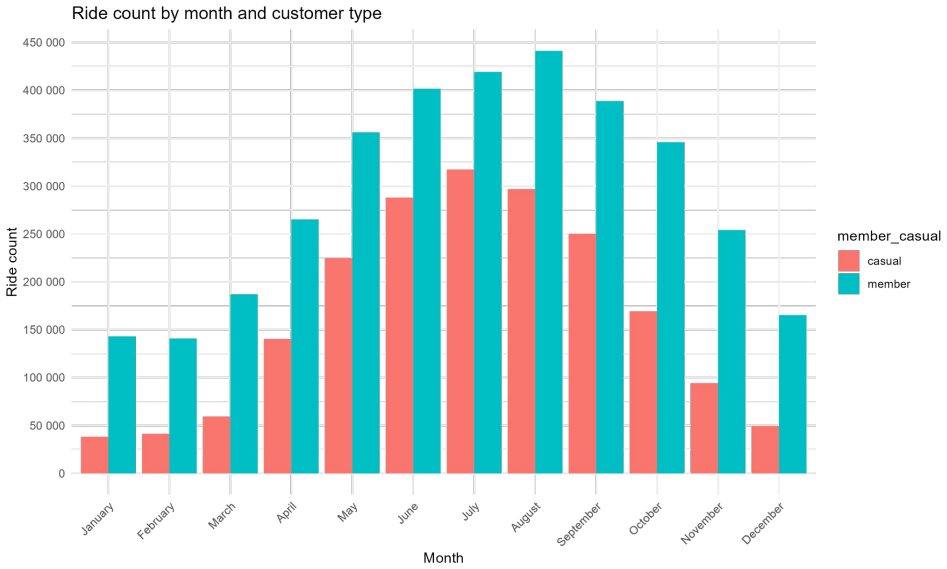
- Members **take more rides** than Casual riders.
- **Both groups** tend to take more rides from late spring through fall.

➔ **My attention was caught by August**

- a significant leap in ride count numbers for Member riders between Monday and Tuesday
- a notable decline in ride counts on Mondays for Casual riders.

I suspect that something triggered a decline in ride counts for both groups on Mondays in August, which accentuated the difference in bar heights for Monday and Tuesday.

I plan to examine August more closely after running a few more visualizations.

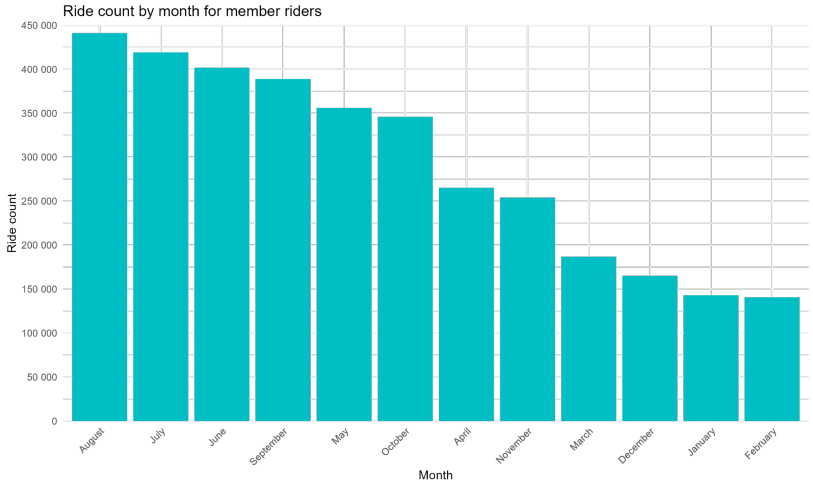


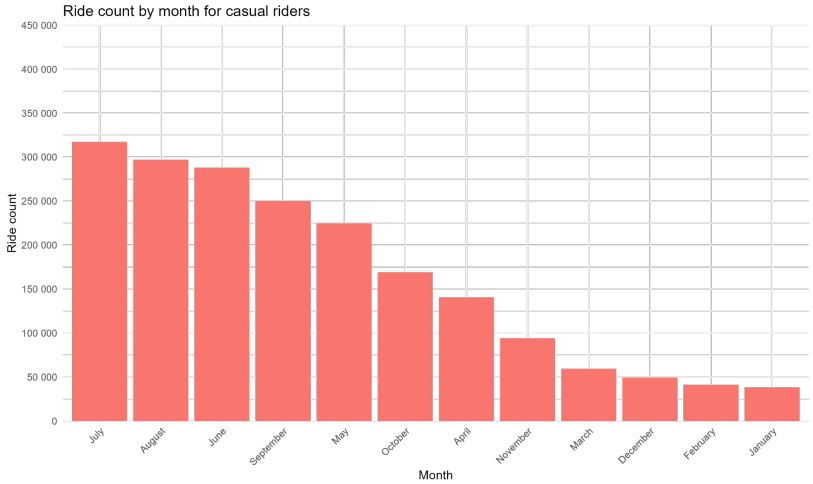
The plots depict the distribution of ride counts among two distinct groups of riders: member riders and casual riders. Each bar represents the total number of rides taken by riders within specific months. The x-axis denotes the months, while the y-axis quantifies the ride count.

/ month

Ride count

Both Casual and Member riders rent bicycles more frequently during the warmer seasons.





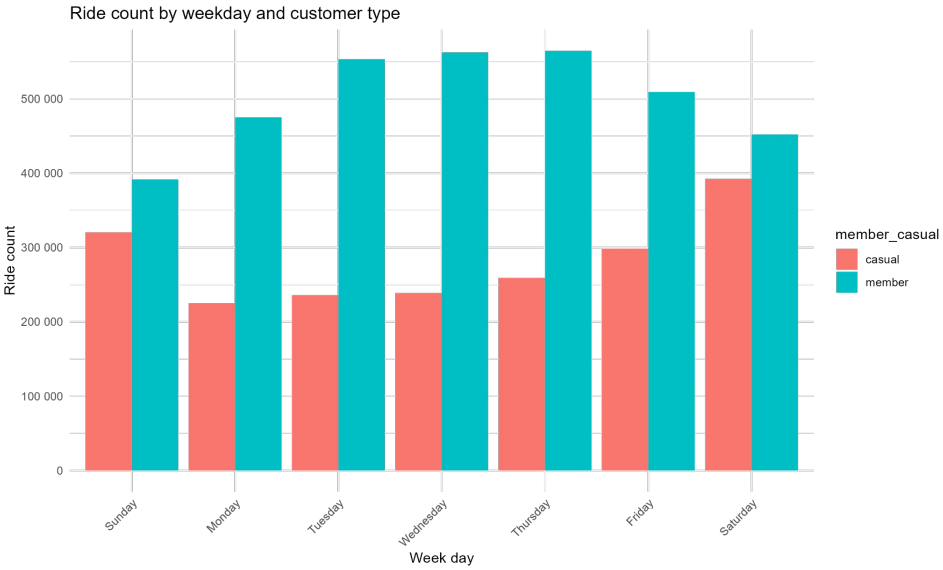
This chart illustrates the distribution of ride counts across different months, categorized by customer type (casual or member). Each bar represents the total number of rides taken during a specific month. The y-axis denotes the ride count, while the x-axis displays the months of the year.

/ month

Ride count

These charts further demonstrate the similarity in ride count distribution among different months.

When comparing these charts, only the first and last two months change their order, while the order of months in the middle remains the same.



This graph displays the distribution of ride counts by day of the week. Bars are grouped by the type of customer (casual or member).

/ weekday
Ride count

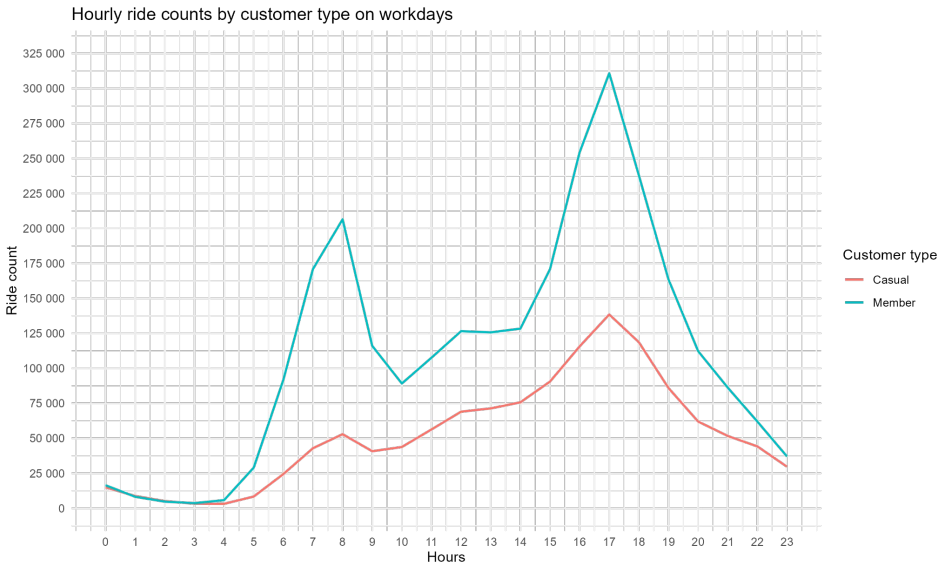
These charts illustrate the key difference between Casual and Member riders:

- Member riders **ride more on workdays**.

  Days with highest ride counts are
  1. Thursday (564 693)
  2. Wednesday (562 609)
  3. Tuesday (553 433)

- Casual riders **ride more on weekends**.

  Days with highest ride counts are
  1. Saturday (392 349)
  2. Sunday (320 498)
  3. Friday (298 460)



This graphs illustrates the hourly distribution of ride counts on workdays and weekends, categorized by customer type. The x-axis represents the hours of the day, ranging from 0 to 23, while the y-axis denotes the ride count. Each line represents the trend of ride counts throughout the day for each customer type. The colors blue and red respectively indicate 'Casual' and 'Member' customers.

These peaks align with Chicago's rush hour schedule. (*source*)

'Traffic tends to be the worst around 6 AM to 8 AM and between 4 PM and 6 PM. Traffic jams are constant on Illinois expressways, with people trying to get in and out of the city.'

/ workday

Ride count

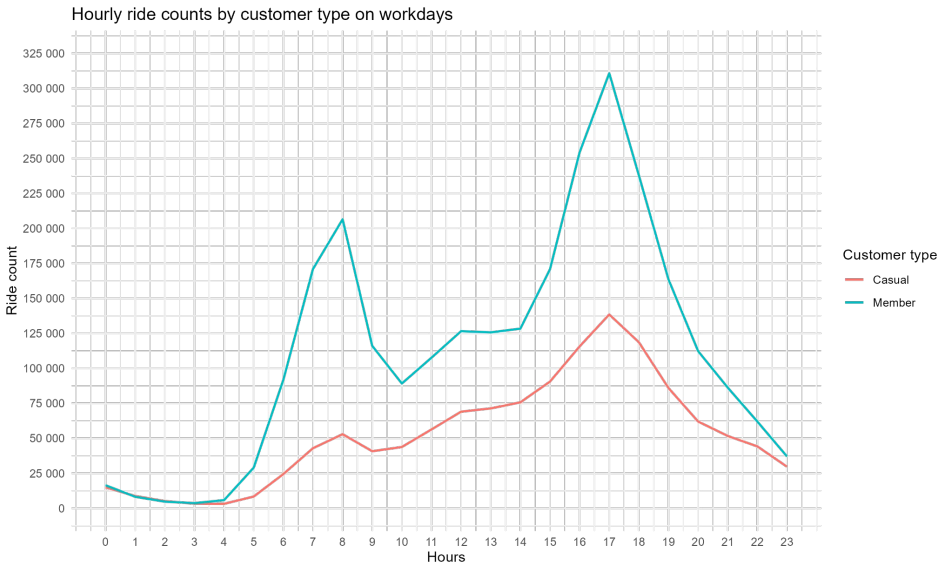
There are two notable peaks in ride count during workdays for **both groups**:

8:00

- Member riders: 206 460 rides
- Casual riders: 52 924 rides

17:00

- Member riders: 310 870 rides
- Casual riders: 138 470 rides



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/ workday

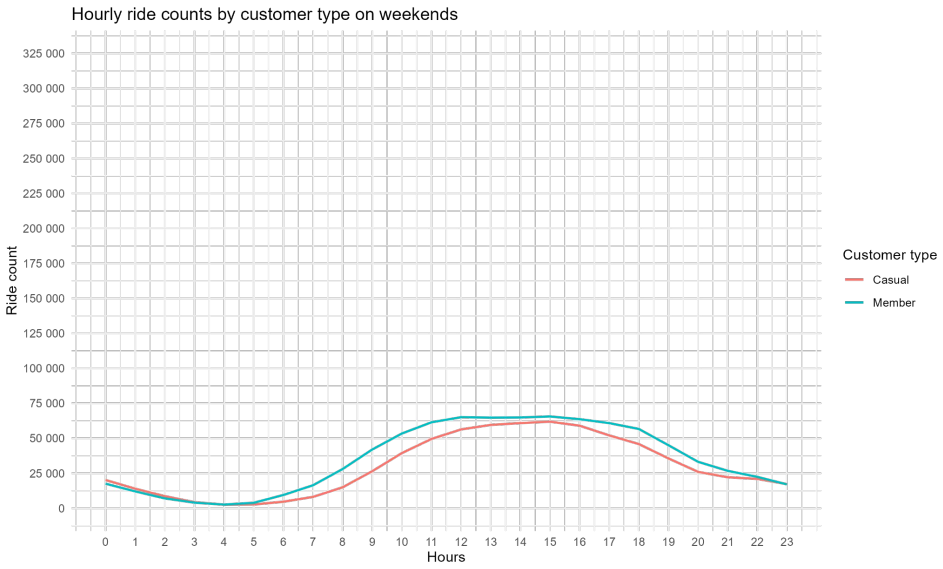
Ride count

16:00

- Member riders will surpass their 8:00 ride count peak by 47 883 rides.
- Casual riders will have a total of 115 628 rides, which is 62 704 rides more than at 8:00. - 118% increase

12:00

- For Casual riders, the 8:00 threshold will also be surpassed with a total of 69 000 rides.
- Members also experience a slight increase in ride numbers but not as significant as the early morning and evening peaks.



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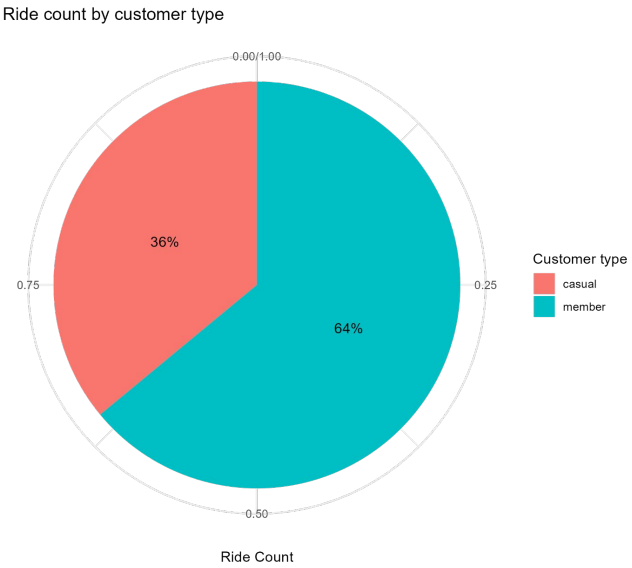
/ weekend

Ride count

Trends during the weekend are also similar for Casual and Member riders, with ride counts peaking at **15:00** for **both groups**:

- Member riders: 65 592 rides
- Casual riders: 61 883 rides



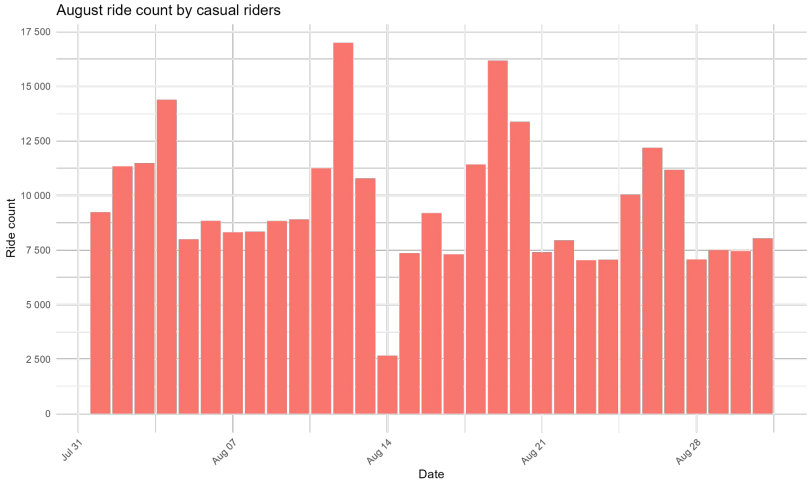
This pie chart visualizes the distribution of ride counts by customer type. Each segment of the pie represents a different customer type (member or casual), with the size of the segment indicating the proportion of rides attributed to each customer type. The chart provides a comparison of ride counts between member and casual customers.

/ customer

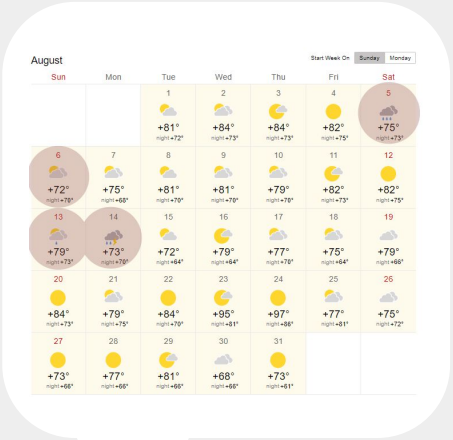
Ride count

Members enjoy nearly twice as many rides as Casual riders

- **Total ride count** for Members: 3 508 685 rides
- **Total ride count** for Casual riders: 1 970 110 rides



This chart illustrates the distribution of ride counts across different months, categorized by customer type (casual or member). Each bar represents the total number of rides taken during a specific month. The y-axis denotes the ride count, while the x-axis displays the months of the year.



/ August
Ride count

There were storms on Saturday the 5th and **Monday the 14th**. *(source)*

The bad weather led to a decrease in ride counts for both rider groups as riders opted for alternative transportation options.

For Member riders the two days with the lowest ride counts in August were

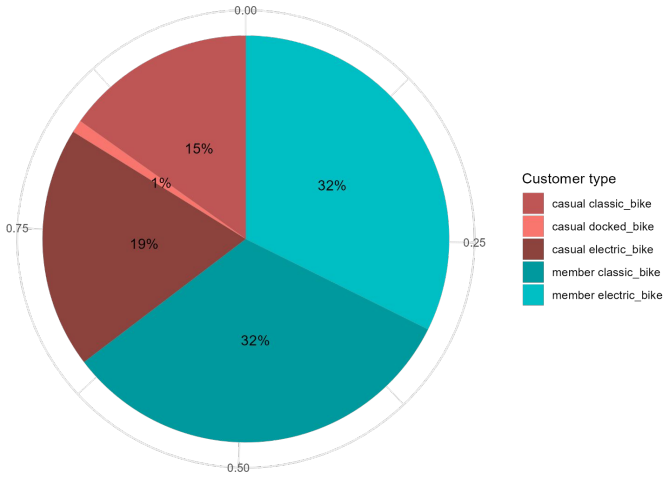
- Saturday the 5th (8 535 ride counts)
- Monday the 14th (6 830 ride counts)

For Casual riders the ride counts were also impacted by storms

- Saturday the 5th (7 989 ride counts)
- Monday the 14th (2 656 ride counts)

The bar for Saturday the 5th is nearly half as small as the usual peaks observed on Saturdays for the Casual rider group.

Distribution of rideable types among member & casual riders



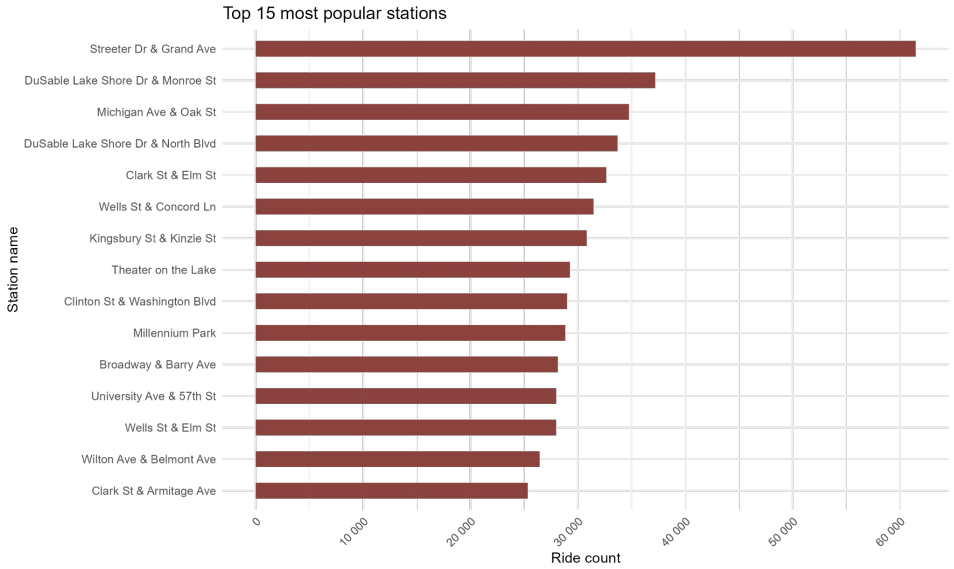
Readable type distribution

This pie chart visualizes the distribution of rideable types utilized by customers of Cyclistic bike-sharing service, categorized by customer type (casual and member). Each segment of the pie chart represents a combination of customer type and rideable type, indicating the proportion of rides associated with that combination.

/ customer

Rideable type

- Members equally prefer classic and electric bikes.
- Casual riders tend to ride electric bikes slightly more frequently compared to classic bikes.
- Only Casual riders used docked bikes in 2023.



This bar graph illustrates the top 15 stations ranked by the number of rides initiated from each station. Each bar represents a station, with the height indicating the total ride count. Stations are ordered from top to bottom based on their ride count, with the station boasting the highest number of rides positioned at the top. The x-axis displays the ride count, while the y-axis denotes the station names.

/ top 15 stations

Ride count

1. Streeter Dr & Grand Ave - **61 472**
2. DuSable Lake Shore Dr & Monroe St - **37 210**

❑ **35 000 - 30 000**

3. Michigan Ave & Oak St
4. DuSable Lake Shore Dr & North Blvd
5. Clark St & Elm St
6. Wells St & Concord Ln
7. Kingsbury St & Kinzie St

❑ **30 000 - 25 000**

8. Theater on the Lake
9. Clinton St & Washington Blvd
10. Millennium Park
11. Broadway & Barry Ave
12. University Ave & 57th St
13. Wells St & Elm St
14. Wilton Ave & Belmont Ave
15. Clark St & Armitage Ave

How do annual members and casual riders use Cyclistic bikes **differently**?

The difference in ride frequency between annual members and casual riders can be attributed to the distinct payment structures they operate under:

Annual Members, **benefiting from an unlimited pass**, are able to take advantage of the bikes without incurring additional costs per ride. This unrestricted access encourages them to utilize the bikes more frequently, incorporating them into various aspects of their daily routines.

use Cyclistic bikes more frequently for commuting or short trips

Casual riders, who are **charged for each trip**, approach bike usage with a more selective mindset. They may reserve their rides for specific occasions or longer journeys where they can maximize the value of each paid trip.

use Cyclistic bikes for longer, leisurely rides, especially during weekends and warmer months.

**The data for Casual riders did not include information about whether they purchased a single pass or a full-day pass. Collecting this data will provide further insights into differences between Cyclistic riders.*