
Cyclistic Bike Data Analysis

— Aarsh Desai —
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About Me

- My name is Aarsh Desai, and I am a sophomore studying Data Science at Purdue University.
- I am a data science enthusiast, currently working as a data analyst intern at OESON Learning.
- Heavily engaged in combining my knowledge of data science and integrating it in the fields of medicine and finance.



Business Objective

To determine how casual riders use bikes differently from annual members to help convert casual riders into annual members

Data Collection

- Historical internal data collected from the company's sources for the months of January, February, March, and April 2024.
- Data consists of the following columns used for analysis:
 1. RideId (The unique ID of the ride)
 2. Ride Type (The type of bike used for the ride)
 3. Start time (Time at which the ride started)
 4. End time (Time at which the ride ended)
 5. User Type (whether the user is a casual rider or a 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
2	C1D650626C8C	electric_bike	2024-01-12 15:3	2024-01-12 15:3	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.90326738	-87.63473678	41.88917683	-87.63850577	member
3	EECD38BDB25f	electric_bike	2024-01-08 15:4	2024-01-08 15:5	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.9029365	-87.63444017	41.88917683	-87.63850577	member
4	F4A9CE78061F	electric_bike	2024-01-27 12:2	2024-01-27 12:3	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.90295133	-87.63447033	41.88917683	-87.63850577	member
5	0A0D9E15EE50	classic_bike	2024-01-29 16:2	2024-01-29 16:5	Wells St & Randolph	TA1305000030	Larrabee St & W	13193	41.884295	-87.633963	41.921822	-87.64414	member
6	33FFC9805E3E	classic_bike	2024-01-31 5:43	2024-01-31 6:09	Lincoln Ave & W	13253	Kingsbury St & W	KA1503000043	41.948797	-87.675278	41.88917683	-87.63850577	member
7	C96080812CD2	classic_bike	2024-01-07 11:2	2024-01-07 11:3	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.903222	-87.634324	41.88917683	-87.63850577	member
8	0EA7CB313D4F	classic_bike	2024-01-05 14:4	2024-01-05 14:5	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.903222	-87.634324	41.88917683	-87.63850577	member
9	EE11F3A3B39C	electric_bike	2024-01-04 18:1	2024-01-04 18:2	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.90336812	-87.63486135	41.88917683	-87.63850577	member
10	63E83DE8E327	classic_bike	2024-01-01 14:4	2024-01-01 14:5	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.903222	-87.634324	41.88917683	-87.63850577	member
11	8005682869122	electric_bike	2024-01-03 19:3	2024-01-03 19:4	Clark St & Ida B	TA1305000009	Kingsbury St & W	KA1503000043	41.8760335	-87.630866	41.88917683	-87.63850577	member
12	22B85E685AE0f	electric_bike	2024-01-03 7:39	2024-01-03 7:47	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.90302617	-87.6346065	41.88917683	-87.63850577	member
13	133CDC03CA43	classic_bike	2024-01-03 17:0	2024-01-03 17:1	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.903222	-87.634324	41.88917683	-87.63850577	member
14	32D57BF92858f	electric_bike	2024-01-10 17:0	2024-01-10 17:1	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.90314517	-87.63457883	41.88917683	-87.63850577	member
15	B110B5685C38f	electric_bike	2024-01-12 12:3	2024-01-12 12:4	Clark St & Ida B	TA1305000009	Kingsbury St & W	KA1503000043	41.87585417	-87.63093133	41.88917683	-87.63850577	member
16	B6608710B5FAf	electric_bike	2024-01-07 8:00	2024-01-07 8:06	Clark St & Ida B	TA1305000009	Kingsbury St & W	KA1503000043	41.87557133	-87.63078317	41.88917683	-87.63850577	member
17	E7A33AC59F17	electric_bike	2024-01-24 8:28	2024-01-24 8:32	Clark St & Randolph	TA1305000030	Kingsbury St & W	KA1503000043	41.884175	-87.63208667	41.88917683	-87.63850577	member
18	BAC650B3CFE6f	electric_bike	2024-01-13 11:1	2024-01-13 11:2	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.90303417	-87.63461533	41.88917683	-87.63850577	member
19	C6CC4B54F874	electric_bike	2024-01-24 18:5	2024-01-24 19:0	Sheffield Ave & I	13154	Aberdeen St & F	18062	41.9106215	-87.653143	41.884114	-87.654264	member
20	A7BDDCFEDF0	classic_bike	2024-01-27 13:1	2024-01-27 13:1	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.903222	-87.634324	41.88917683	-87.63850577	member
21	E247F34BF1F9f	electric_bike	2024-01-05 13:1	2024-01-05 13:2	Clark St & Randolph	TA1305000030	Aberdeen St & F	18062	41.885304	-87.63225333	41.884114	-87.654264	member
22	ABB990CC5347	classic_bike	2024-01-29 14:5	2024-01-29 15:0	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.903222	-87.634324	41.88917683	-87.63850577	member
23	B94F514DEB4B	classic_bike	2024-01-27 11:5	2024-01-27 11:5	Orleans St & Me	TA1305000022	Kingsbury St & W	KA1503000043	41.888243	-87.63639	41.88917683	-87.63850577	member
24	6D6DAFC26906	classic_bike	2024-01-07 11:1	2024-01-07 11:2	Orleans St & Me	TA1305000022	Kingsbury St & W	KA1503000043	41.888243	-87.63639	41.88917683	-87.63850577	member
25	A66CA4E711B38f	classic_bike	2024-01-04 10:4	2024-01-04 10:5	Wells St & Elm St	KA1504000135	Kingsbury St & W	KA1503000043	41.903222	-87.634324	41.88917683	-87.63850577	member

Data Cleaning and Transformation

- Added two new columns :
 1. Ride Length : Calculated the length of the ride by computing the difference between end time and start time
 2. Weekday : Determine the weekday of the ride
- Ensured data is clean through data validation, trimming white spaces wherever needed, deleting duplicate values, and eliminating completely empty rows.
- Removed rows containing inconsistent values from the ride length column wherever found



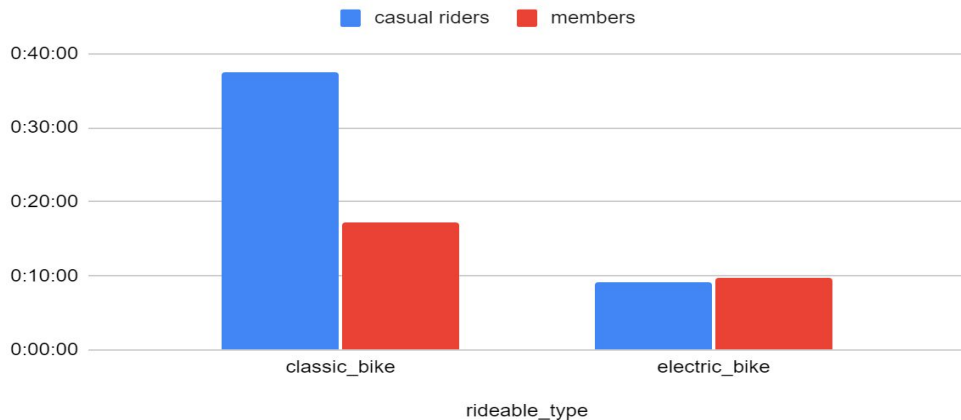
Data Analysis

The image shows a top-down view of a workspace. A spiral-bound notebook with a teal cover is the central focus, lying flat. The words "Data Analysis" are written across the middle of the notebook in a large, cursive blue font. To the top-left of the notebook, a portion of a black calculator is visible, showing buttons for "M+", "÷", "9", "x", "6", "-", "3", and "+". A pair of black-rimmed glasses with clear lenses is placed on the left side of the notebook, partially overlapping the teal cover. In the bottom-left corner, the handle of a light blue marker is visible. In the top-right corner, another light blue marker with a blue cap is partially visible. The notebook's spiral binding is on the right side.

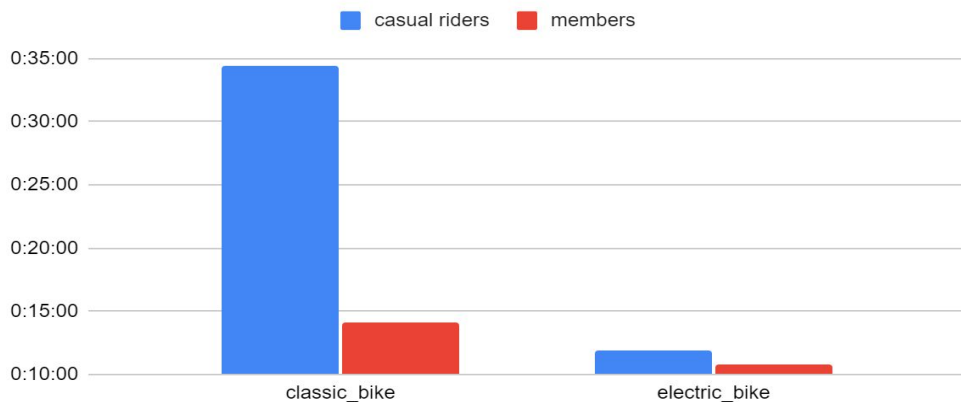
Ride Length vs Bike Type

- Casual riders drive both electric and classic bikes for longer than the annual members.
- Both casual riders and members drive classic bikers for longer on average than the electric bikes.
- In both January and February, both of the above trends almost remain the same.

Average Ride Length of Casual Riders and Members per Bike Type in January 2024

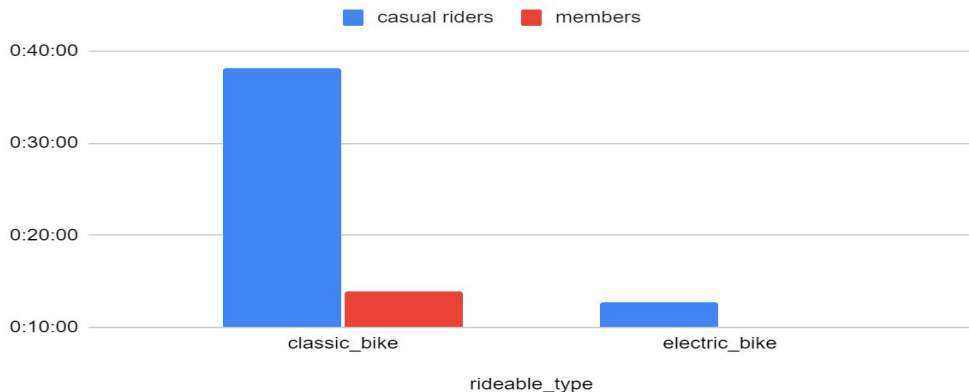


Average Ride Length of Casual Riders and Members per Bike Type in February 2024

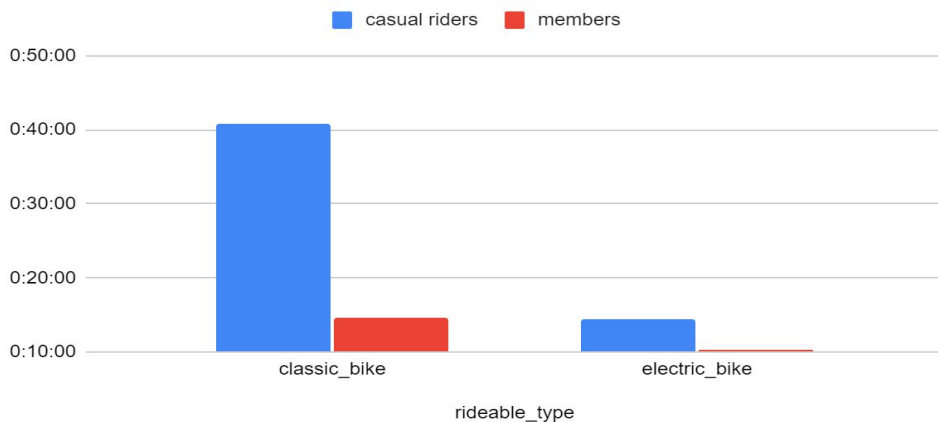


- In March and April too, casual riders drive both classes of bikes, classic and electric bikes for longer on average than annual members.
- Both casual riders and members drive classic bikes for longer on average than annual members.

Average Ride Length of Casual Riders and Members per Bike Type in March 2024



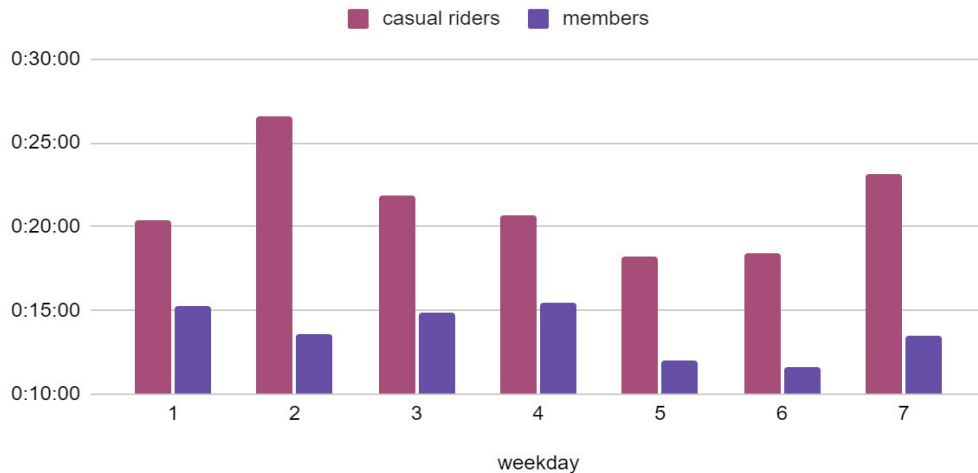
Average Ride Length of Casual Riders and Members per Bike Type in April 2024



Ride Length vs Weekday

- Casual riders drove longer on average than annual members on each weekday in January and February, with 1 representing Sunday and so on.
- Casual riders drove the most on Monday in January and Sunday in February respectively on an average.
- On an average, members drove the most on wednesday in January and Sunday in February.

Average Ride Length of Casual Riders and Members per Weekday in January 2024

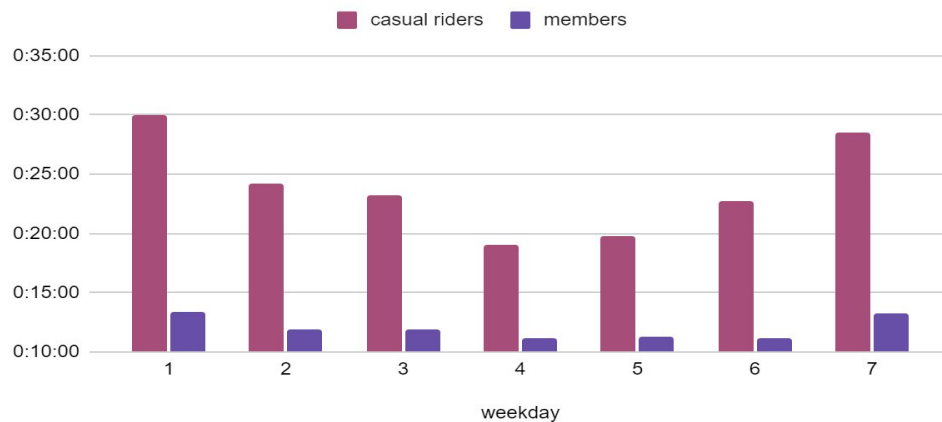


Average Ride Length of Casual Riders and Members per Weekday in February 2024

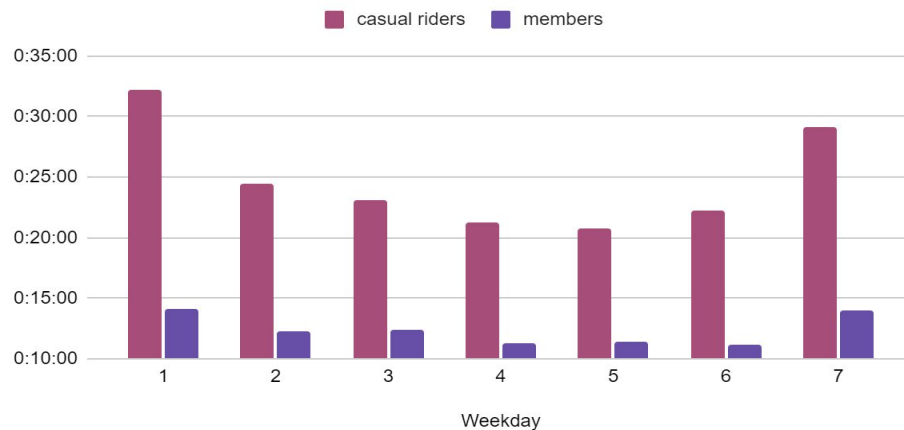


- In March and April, casual riders drove longer on average every weekday than members.
- Casual riders drove the most on average on Sunday in both the months.
- Members drove the most on average on Sunday in both the months.
- Both categories of users drove the least on average during the middle of the week and the most during the weekends.

Average Ride Length of Casual Riders and Members per Weekday in March 2024



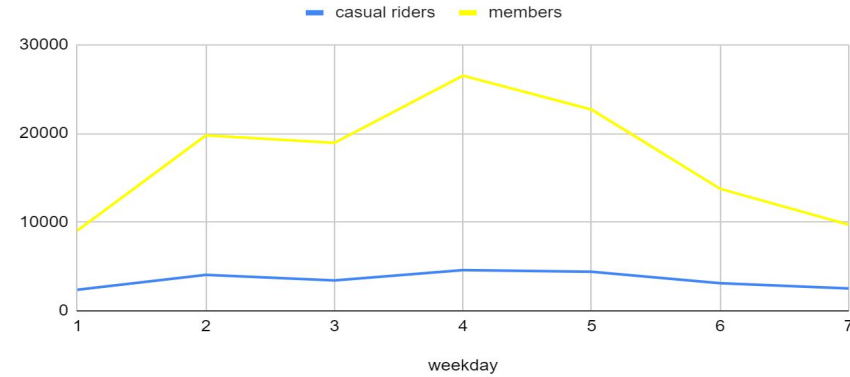
Average Ride Length of Casual Riders and Members per Weekday in April 2024



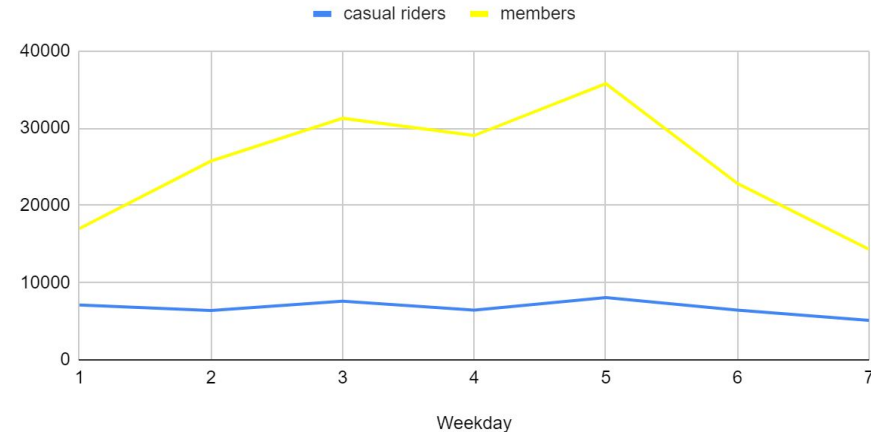
Number of Rides vs Weekday

- On all weekdays in both January and February, members made more rides than casual riders.
- Both casual riders and members made the most rides on Wednesday and Thursday in January and February respectively.
- The number of rides peaked towards the middle of the week and reduced during the weekends.

Number of Rides for Casual Riders and Members per Weekday in January 2024

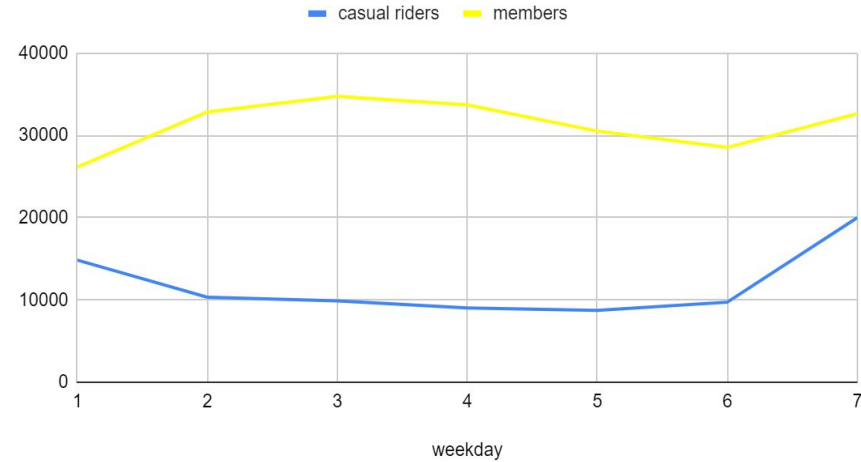


Number of Rides for Casual Riders and Members per Weekday in February 2024

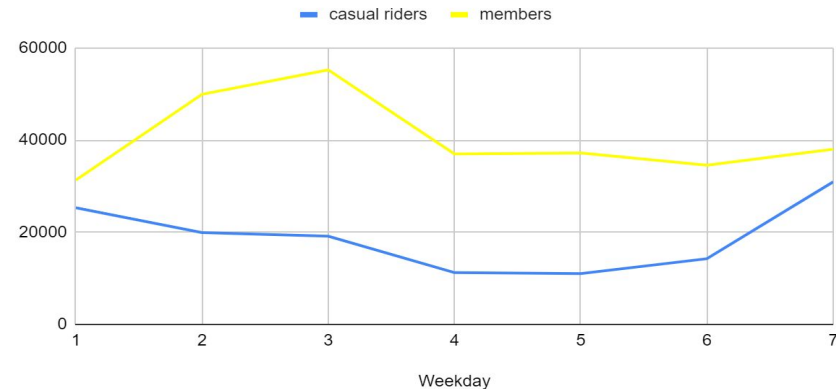


- On all weekdays in both March and April, members made more rides than casual riders.
- Members made the most rides on Wednesday in both March and April.
- Casual riders made the most rides on Saturday in both March and April.

Number of Rides for Casual Riders and Members per Weekday in March 2024



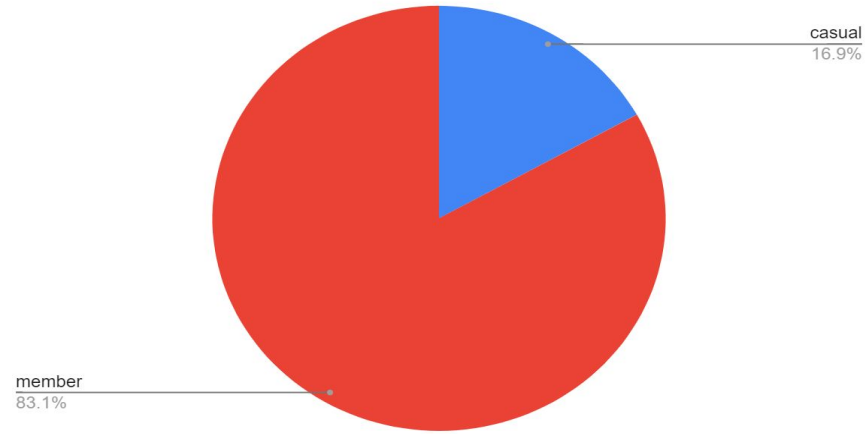
Number of Rides for Casual Riders and Members per Weekday in April 2024



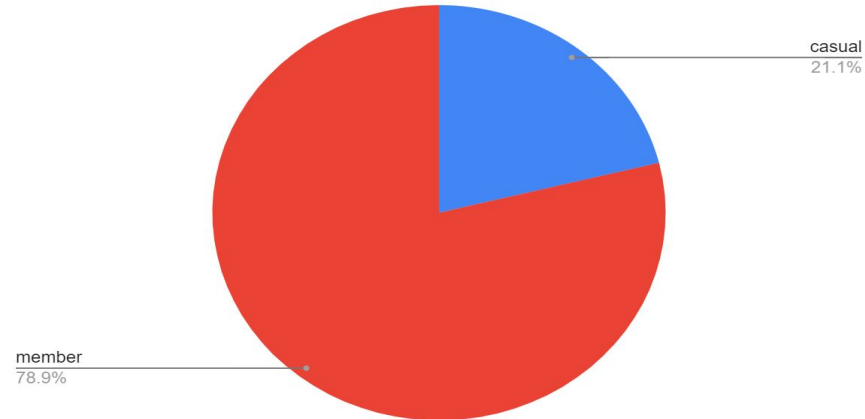
Number of Rides vs User Type

- In both January and February, rides made by annual members constituted more than 75% of the total rides made that month.
- Rides made by casual riders constituted a relatively small proportion of the total rides.
- The relative proportion of rides made by casual riders increased in February as compared to January.

Percentage of Rides per User Type in January 2024

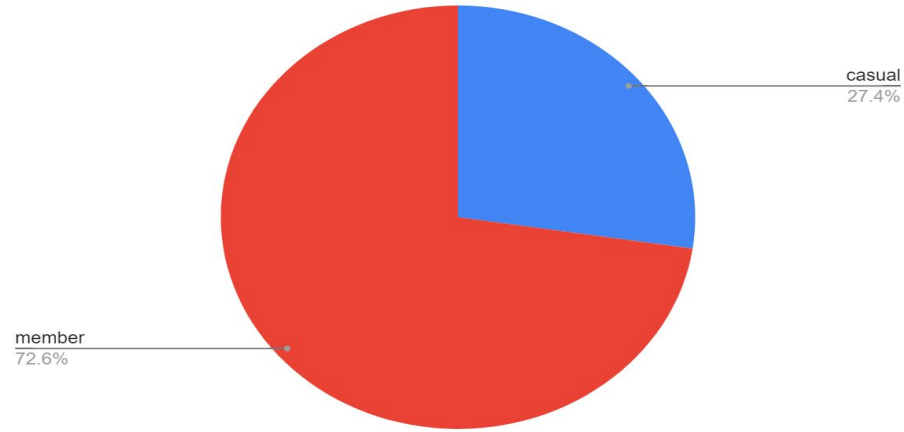


Percentage of Rides per User Type in February 2024

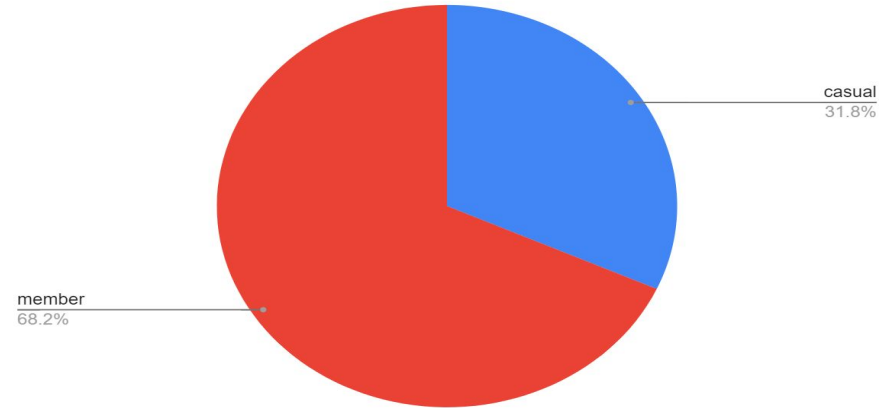


- Members made significantly more number of rides than casual riders in March and April too.
- The relative proportion of rides made by casual riders increased over March as compared to February and then again in April.

Percentage of Rides per User Type in March 2024



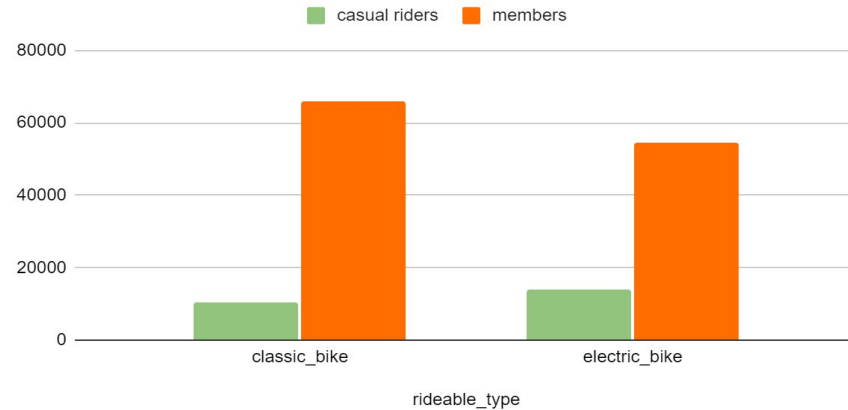
Percentage of Rides per User Type in April 2024



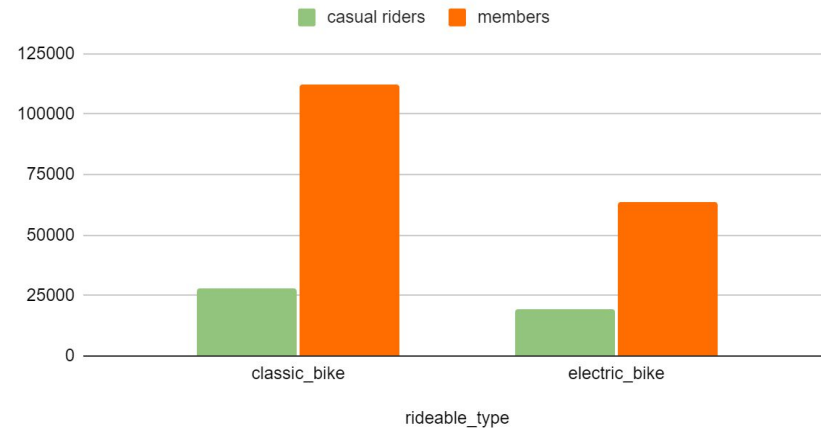
Number of Rides vs Bike Type

- In both months, members made a significantly higher number of rides than casual riders.
- In both January and February, members made more classic bike rides than electric bike rides.
- In January, casual riders preferred the electric bikes over classic bikes, whereas in February, casual riders preferred classic bikes over electric bikes.

Number of Rides for Casual Riders and Members per Bike Type in January 2024

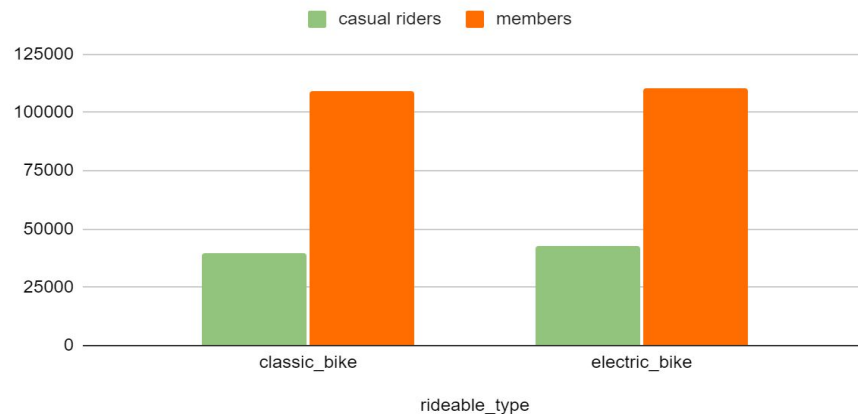


Number of Rides for Casual Riders and Members per Bike Type in February 2024

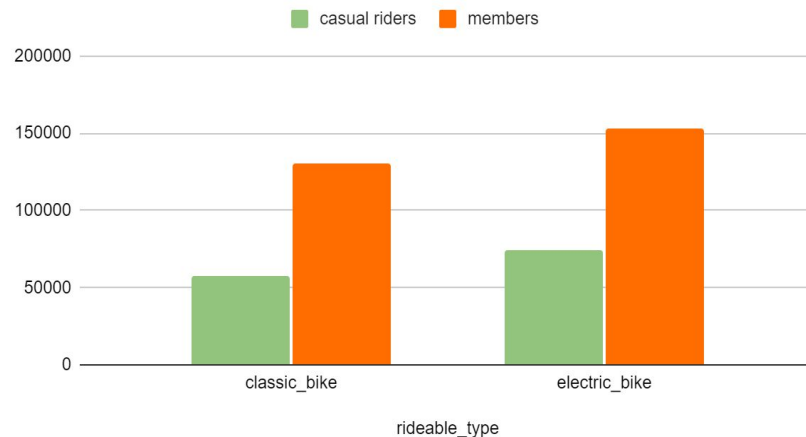


- In March and April, members made significantly higher number of rides than casual riders.
- Members preferred the electric bikes over classic bikes in both the months.
- Likewise, casual riders preferred the electric bikes over classic bikes in both the months.

Number of Rides for Casual Riders and Members per Bike Type in March 2024



Number of Rides for Casual Riders and Members per Bike Type in April 2024



CONCLUSIONS



Conclusions

1. Casual riders preferred driving both categories of bikes for longer on average than members in all the months.
2. On each weekday, casual riders drove for longer on an average than members in all months.
3. On all weekdays in all the months, members made more rides than casual riders.
4. In spite of averaging more minutes per ride in all months, casual riders only constituted less than 30% of the monthly rides in all the months.
5. Casual riders generally preferred driving electric bikes over classic bikes, except in February, whereas members preferred classic bikes for the first two months and electric bikes for the next 2 months.

Thank
You