Current trend of using bike-sharing by members and causal riders

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Executive Summary

The director of marketing believes the company's future success depends on maximizing the number of annual memberships. Therefore, your 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.

In this document, we would present our findings which provide us more insights about the users' behaviour of our casual riders and members based on our internal existing data. The data includes:

- Rides' check in&out time
- Date of Use
- Start & End station of ride parking
- Station address with geographical longitude and latitude details
- Type of user (causal/member)

<u>To provide insights to future marketing programme on promoting more casual riders to be our membership users…</u>

Questions:

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

Summary of Findings:

1. Demand from Casual Riders mainly come from weekend cycling for leisure as the main purpose. Therefore, they prefer to purchase single-ride or full-day passes.
2. Members mostly use the rides during the weekdays for short ride travelling, it make sense to assume the purpose of usage is for working and avoid traffic jam within busy district.

(Detailed data analysis in the following pages)

Suggested Solutions:

❑ Differentiate and offer additional type of membership to fit in different purchase pattern and capture the marginal opportunity.
❑ Offer 5-time or 10-time "weekend member pass" for weekend casual riders.
❑ Offer discount for frequent users by reaching required level of usage by joining as members.

Review the trend from the Past 12 Months (April 2020 – March 2021)

- Both Casual Riders and Members have the increasing demand for bikes during **July**, **August**, **Sept**.

- During the week, **higher demand** to:
  Casual Riders: Sun & Sat
  Members: Wed, Thu, Fri, Sat

  (*Notes*: Day_of_Week - Sunday = 1; Saturday = 7)

- Casual riders would use the bikes for the **long cycling** on average (approx. 40-50 mins), comparing with members using the bikes for **short riding** (approx. <20 mins).

Trend of usage on the Past 12 Months by Type of User (April 2020 – March 2021)

	user_type	yr	mth	num_users
1	casual	2020	4	354075
2	casual	2020	5	1302570
3	casual	2020	6	2311802
4	casual	2020	7	3761282
5	casual	2020	8	4040204
6	casual	2020	9	3220686
7	casual	2020	10	2023154
8	casual	2020	11	1230628
9	casual	2020	12	414211
10	casual	2021	1	40809
11	casual	2021	2	20058
12	casual	2021	3	85171
13	member	2020	4	916680
14	member	2020	5	1698780
15	member	2020	6	2812029
16	member	2020	7	3934028
17	member	2020	8	4632530
18	member	2020	9	4210052
19	member	2020	10	3390674
20	member	2020	11	2392894
21	member	2020	12	1394469
22	member	2021	1	177491
23	member	2021	2	77990
24	member	2021	3	146924

Trend of usage during the week by Type of User on the Past 12 Months

	user_type	Day_of_Week	num_users	avg_min_ride_length
1	casual	1	3445769	51
2	casual	7	4377589	47
3	casual	2	1955303	45
4	casual	6	2799535	43
5	casual	5	2246899	43
6	casual	3	1890290	41
7	casual	4	2089265	41
8	member	1	3375164	18
9	member	7	4062320	18
10	member	6	3877570	16
11	member	4	3805843	15
12	member	2	3306940	15
13	member	3	3525097	15
14	member	5	3831607	15

Comparing the trend on previous year performance (Q4 2019- Q3 2020)

	member_casual	weekday	number_of_rides	average_duration
	<chr>	<ord>	<int>	<dbl>
1	casual	Sun	181293	3581.
2	casual	Mon	103296	3372.
3	casual	Tue	90510	3596.
4	casual	Wed	92457	3719.
5	casual	Thu	102679	3683.
6	casual	Fri	122404	3774.
7	casual	Sat	209543	3332.
8	member	Sun	267965	920.
9	member	Mon	472196	843.
10	member	Tue	508445	826.
11	member	Wed	500329	824.
12	member	Thu	484177	824.
13	member	Fri	452790	825.
14	member	Sat	287958	969.

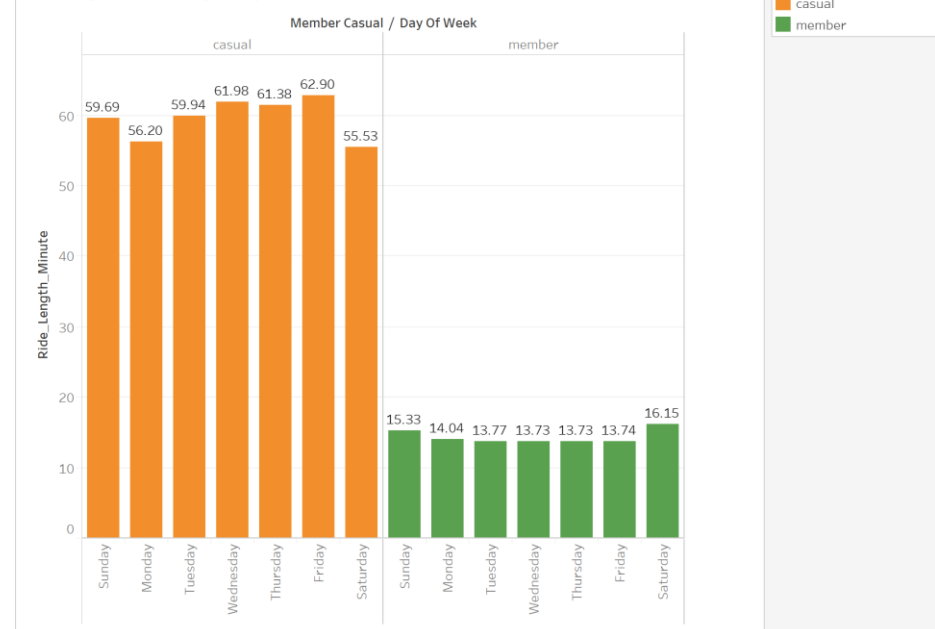- During the week, similar pattern for the trend of **high demand**:
  Casual Riders: Sun & Sat
  Members: Mon, Tue, Wed, Thu, Fri, Sat

- In this period, similar trend captured, Casual riders normally use the bikes for the **long cycling** on average (approx. >50 mins), comparing with members using the bikes for **short riding** (approx. <20 mins).

Average Ride Length By Member and Casual Users

Member Casual / Day Of Week

Type of User — casual / member

casual: 59.69, 56.20, 59.94, 61.98, 61.38, 62.90, 55.53

member: 15.33, 14.04, 13.77, 13.73, 13.73, 13.74, 16.15

Further Exploration

- The existing data includes the geographical data (the station location with latitude and longitude). It is possible to explore the distribution of casual riders and members which is useful for planning the marketing campaign by considering the area factor, e.g. putting customized ad on targeted region/district.

Data Limitation

- The yearly data has quite a lot of missing data and error which is found during the data cleaning process. There are more than thousand data records with error, for example, same datetime and unaligned time format on start & end time records, extremely large figures on ride length. It is worth to do further investigation the reason causing these issues.

Appendix

Statistical Insights by this dataset

1. Statistical Summary of Length of Usage

❏ Statistical Summary of users by year & month in the past 12 months on ride_length by users (between April 2020 - March 2021)

Whole dataset

	max_num	min_num	avg_num	std_num
1	8672734	98048	3715765	3113978.04

❏ As there are a certain number of outliers in this dataset, it can be also identified with the larger standard deviation figure on ride_length. Below shows the Statistical Summary for the interquartile range (2nd+3rd quartiles) only.

Interquartile Range only

	max_num	min_num	avg_num	std_num
1	4382676	47802	1857883	1577629.7

2. Yearly Trend of Ride Usage in the past 12 months by type of users (April 2020 - March 2021)

	user_type	yr	mth	num_users
1	casual	2020	4	354075
2	casual	2020	5	1302570
3	casual	2020	6	2311802
4	casual	2020	7	3761282
5	casual	2020	8	4040204
6	casual	2020	9	3220686
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10	casual	2021	1	40809
11	casual	2021	2	20058
12	casual	2021	3	85171
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19	member	2020	10	3390674
20	member	2020	11	2392894
21	member	2020	12	1394469
22	member	2021	1	177491
23	member	2021	2	77990
24	member	2021	3	146924

3. Number of change in users by year & month in the past 12 months (between April 2020 - March 2021)

	yr	mth	num_users	gap	num_of_change
1	2020	4	1270755	NULL	NULL
2	2020	5	3001350	1270755	1730595
3	2020	6	5123831	3001350	2122481
4	2020	7	7695310	5123831	2571479
5	2020	8	8672734	7695310	977424
6	2020	9	7430738	8672734	-1241996
7	2020	10	5413828	7430738	-2016910
8	2020	11	3623522	5413828	-1790306
9	2020	12	1808680	3623522	-1814842
10	2021	1	218300	NULL	NULL
11	2021	2	98048	218300	-120252
12	2021	3	232095	98048	134047

4. Day of Week for Mostly Frequent Usage in the past 12 months (April 2020 - March 2021)

Results   Messages

	user_type	Day_of_Week	num_users
1	casual	7	4377589
2	member	7	4062320
3	member	6	3877570
4	member	5	3831607
5	member	4	3805843
6	member	3	3525097
7	casual	1	3445769
8	member	1	3375164
9	member	2	3306940
10	casual	6	2799535
11	casual	5	2246899
12	casual	4	2089265
13	casual	2	1955303
14	casual	3	1890290

(*Notes*: Day_of_Week - Sunday = 1; Saturday = 7)

5. Average Riding Time per user (in minutes) by Type of Users in the past 12 months (April 2020 - March 2021)

▦ Results 🗐 Messages

	user_type	Day_of_Week	num_users	avg_min_ride_length
1	casual	1	3445769	51
2	casual	7	4377589	47
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11	member	4	3805843	15
12	member	2	3306940	15
13	member	3	3525097	15
14	member	5	3831607	15

(*Notes*: Day_of_Week - Sunday = 1; Saturday = 7)

6. Membership type for Monthly Top 3 Users by months during the past 12 months (April 2020 - March 2021)

	Yr	Mth	ride_id	member_casual	ride_length
1	2020	4	42F4CB6F0ECBBFA4	member	0:27:19
2	2020	4	1A3422539E5265FB	member	0:27:19
3	2020	4	DC5E5149CD331092	member	0:27:19
4	2020	5	230EC12AA295601B	member	0:27:19
5	2020	5	161E8EBFE7F791BA	member	0:27:19
6	2020	5	0AA5C8A345B7A6FB	member	0:27:19
7	2020	6	0B62F6B7D84DC6F1	casual	0:27:19
8	2020	6	6168C439C326DB9C	member	0:27:19
9	2020	6	7208DB973B3E8EED	casual	0:27:19
10	2020	7	7DADD0286EC0C013	casual	0:27:19
11	2020	7	7D803C0C32225985	casual	0:27:19
12	2020	7	BF70DE240798442D	casual	0:27:19
13	2020	8	C3890D9E6814248A	member	0:27:19
14	2020	8	BA84DBB9F4E7E55E	member	0:27:19
15	2020	8	46418F1A91D53F3F	member	0:27:19
16	2020	9	3055547A1CF43B22	casual	0:27:19
17	2020	9	5D655FF3DF46C032	casual	0:27:19
18	2020	9	60C3D8967C3227E5	casual	0:27:19
19	2020	10	0FE12C362DD6392D	casual	0:27:19
20	2020	10	AF9E210300574518	casual	0:27:19
21	2020	10	36FCED218754B6FC	member	0:27:19
22	2020	11	E69A1CCF0C429DE7	casual	0:27:19
23	2020	11	CD7F0B6169C42E9C	casual	0:27:19
24	2020	11	F45940E62416F7C3	casual	0:27:19
25	2020	12	0F8ED9551CA73814	casual	0:27:19
26	2020	12	2B5EC3700692CD52	member	0:27:19
27	2020	12	60BC6C480792D188	casual	0:27:19
28	2021	1	E297F7C1E3DA8E92	member	0:27:19
29	2021	1	E297F7C1E3DA8E92	member	0:27:19
30	2021	1	AFD3303D74046CFA	casual	0:27:19
31	2021	2	23BDAC1EBD9999DC	member	0:27:00
32	2021	2	D00E88C65859ED4C	member	0:27:00
33	2021	2	E1CF020D1DDBCE...	casual	0:27:00
34	2021	3	B66072B7BC92D2D1	member	0:27:18
35	2021	3	29BD6F57C1925A20	casual	0:27:18
36	2021	3	3F6A4322CA523967	member	0:27:18

❑ As there are a certain number of outliers in this dataset, this output is only considering the interquartile range (2nd+3rd quartiles) of the whole dataset.