GOOGLE DATA ANALYTICS CAPSTONE: CASE STUDY-1

CYCLISTIC BIKE-SHARE ANALYSIS

Members VS Casual Riders Analysis

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INTRODUCTION OF GOOGLE DA CAPSTONE PROJECT

- The Google Data Analytics Capstone Project, Case Study-1, focuses on analyzing the data of Cyclistic, a fictional bike-share company.
- The project aims to understand ridership patterns and behavior to optimize marketing strategies and increase ridership.
- Data analysis techniques and tools are used to uncover insights that can improve Cyclistic's business decisions and performance.

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ABOUT THE COMPANY
(CYCLISTIC BIKE-SHARE)

- Cyclistic is a bike-share company launched in 2016. Operates a fleet of 5,824 bicycles across 692 stations in Chicago.
- Bikes are geotracked and can be unlocked and returned at any station.
- Offers pricing plans: *single-ride passes* & *full-day passes* ***(Casual)***, and *annual memberships* ***(Members).***
- Financial analysis shows annual members are more profitable.

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PROBLEM STATEMENT

- The declining number of annual members and lower utilization rate compared to casual riders.
- Members vs Casual customer behavior and pattern.

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OBJECTIVE

Convert Casual riders into Annual members

- Develop targeted marketing campaigns and initiatives
- Encourage more riders to become loyal annual members
- Improve overall membership retention and utilization rates

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TOOLS USED FOR THIS PROJECT

1. MS Excel: Utilized for initial data checking, processing, and analysis.

2. Python Jupyter: Employed to explore, clean, and analyze the project data.

3. Tableau Public: Used to build interactive dashboards for visualizing the data.

4. Canva: Utilized for creating visually appealing and informative project reports.

5. Github: Used to share the project and showcase it in the portfolio.

These tools were selected and employed to ensure efficient data processing, thorough analysis, effective data visualization, and professional project presentation.

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ABOUT DATASET

- The dataset used for analysis was obtained through a data license agreement with DIVVY and the City of Chicago.
- I collect 1 year data, from January 2022 to December 2022.
- The dataset contains approximately 5.6 million data points.
- The data was collected directly by Cyclistic, ensuring its integrity and reliability.
- The dataset offers a comprehensive view of rider behavior and trends, enabling meaningful analysis and insights.

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DATA'S LOOK

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	ride_id	rideable_type	started_at	ended_at	start_station_name	start_station_id	end_station_name	end_stati	start_lat	start_lng	end_lat	end_lng	member_casual
2	C2F7DD78E82EC875	electric_bike	1/13/2022 11:59	1/13/2022 12:02	Glenwood Ave & Tou	525	Clark St & Touhy Ave	RP-007	42.0128	-87.6659	42.01256	-87.6744	casual
3	A6CF8980A652D272	electric_bike	1/10/2022 8:41	1/10/2022 8:46	Glenwood Ave & Tou	525	Clark St & Touhy Ave	RP-007	42.0128	-87.666	42.01256	-87.6744	casual
4	BD0F91DFF741C66D	classic_bike	1/25/2022 4:53	1/25/2022 4:58	Sheffield Ave & Fullo	TA1306000016	Greenview Ave & Full	TA130700	41.9256	-87.6537	41.92533	-87.6658	member
5	CBB80ED419105406	classic_bike	1/4/2022 0:18	1/4/2022 0:33	Clark St & Bryn Mawr	KA1504000151	Paulina St & Montrose	TA130900	41.9836	-87.6692	41.96151	-87.6714	casual
6	DDC963BFDDA51EEA	classic_bike	1/20/2022 1:31	1/20/2022 1:37	Michigan Ave & Jack	TA1309000002	State St & Randolph St	TA130500	41.8779	-87.6241	41.88462	-87.6278	member
7	A39C6F6CC0586C0B	classic_bike	1/11/2022 18:48	1/11/2022 18:51	Wood St & Chicago A	637	Honore St & Division S	TA130500	41.8956	-87.6721	41.90312	-87.6739	member
8	BDC4AB637EDF981B	classic_bike	1/30/2022 18:32	1/30/2022 18:49	Oakley Ave & Irving	KA1504000158	Broadway & Sheridan	13323	41.9543	-87.6861	41.95283	-87.65	member
9	81751A3186E59A6B	classic_bike	1/22/2022 12:20	1/22/2022 12:32	Sheffield Ave & Fullo	TA1306000016	Damen Ave & Clybour	13271	41.9256	-87.6537	41.93193	-87.6779	member
10	154222B86A338ABD	electric_bike	1/17/2022 7:34	1/17/2022 8:00	Racine Ave & 15th St	13304	Clinton St & Washingt	WL-012	41.8613	-87.6565	41.88338	-87.6412	member

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DATA'S LOOK

AFTER SOME PROCESSING IN Excel

	A	B	C	D	E	F	G	H	I	J	K	L
1	ride_id	rideable_type	started_at	start_date	start_time	ended_at	end_date	end_time	day	month	member_casual	duration
2	C2F7DD78E82EC875	electric_bike	1/13/2022 11:59	1/13/2022	11:59:47	1/13/2022 12:02	1/13/2022	12:02:44	Thursday	January	casual	0:02:57
3	A6CF8980A652D272	electric_bike	1/10/2022 8:41	1/10/2022	8:41:56	1/10/2022 8:46	1/10/2022	8:46:17	Monday	January	casual	0:04:21
4	BD0F91DFF741C66D	classic_bike	1/25/2022 4:53	1/25/2022	4:53:40	1/25/2022 4:58	1/25/2022	4:58:01	Tuesday	January	member	0:04:21
5	CBB80ED419105406	classic_bike	1/4/2022 0:18	1/4/2022	0:18:04	1/4/2022 0:33	1/4/2022	0:33:00	Tuesday	January	casual	0:14:56
6	DDC963BFDDA51EEA	classic_bike	1/20/2022 1:31	1/20/2022	1:31:10	1/20/2022 1:37	1/20/2022	1:37:12	Thursday	January	member	0:06:02
7	A39C6F6CC0586C0B	classic_bike	1/11/2022 18:48	1/11/2022	18:48:09	1/11/2022 18:51	1/11/2022	18:51:31	Tuesday	January	member	0:03:22
8	BDC4AB637EDF981B	classic_bike	1/30/2022 18:32	1/30/2022	18:32:52	1/30/2022 18:49	1/30/2022	18:49:26	Sunday	January	member	0:16:34
9	81751A3186E59A6B	classic_bike	1/22/2022 12:20	1/22/2022	12:20:02	1/22/2022 12:32	1/22/2022	12:32:06	Saturday	January	member	0:12:04
10	154222B86A338ABD	electric_bike	1/17/2022 7:34	1/17/2022	7:34:41	1/17/2022 8:00	1/17/2022	8:00:08	Monday	January	member	0:25:27

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DATA'S LOOK

AND AFTER WORKING IN PYTHON NOTEBOOK

In [12]: final_data

Out[12]:

	ride_id	bike_type	date	hour	weekday	month_day	month	rider_type	ride_length	season	time_of_day
0	C2F7DD78E82EC875	electric_bike	2022-01-13	12	Thursday	13	January	casual	3	Winter	Afternoon
1	A6CF8980A652D272	electric_bike	2022-01-10	9	Monday	10	January	casual	4	Winter	Morning
2	BD0F91DFF741C66D	classic_bike	2022-01-25	5	Tuesday	25	January	member	4	Winter	Night
3	CBB80ED419105406	classic_bike	2022-01-04	0	Tuesday	4	January	casual	15	Winter	Night
4	DDC963BFDDA51EEA	classic_bike	2022-01-20	2	Thursday	20	January	member	6	Winter	Night
...	...	...	...	...	...	...	...	...	...	...	...
5596325	4FEE15DACFA74B1A	electric_bike	2022-12-02	13	Friday	2	December	member	1	Winter	Afternoon
5596326	0D89C00047A9F983	electric_bike	2022-12-07	10	Wednesday	7	December	member	1	Winter	Morning
5596327	D259991D3C31A477	classic_bike	2022-12-30	14	Friday	30	December	member	1	Winter	Afternoon
5596328	0310B8FDC76C0764	classic_bike	2022-12-10	21	Saturday	10	December	member	1	Winter	Evening
5596329	AF4D862D573A193F	electric_bike	2022-12-08	7	Thursday	8	December	member	1	Winter	Morning

5596330 rows × 11 columns

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ANALYSIS

The analysis provides insights into the bike ride data based on various factors such as member type, bike type, hour of the day, time of day, day of the week, day of the month, month, and season. Here are the key findings:

1. TOTAL RIDES:

- **The total number of rides in 2022 is 5,596,330.**

Total Rides
5,596,330

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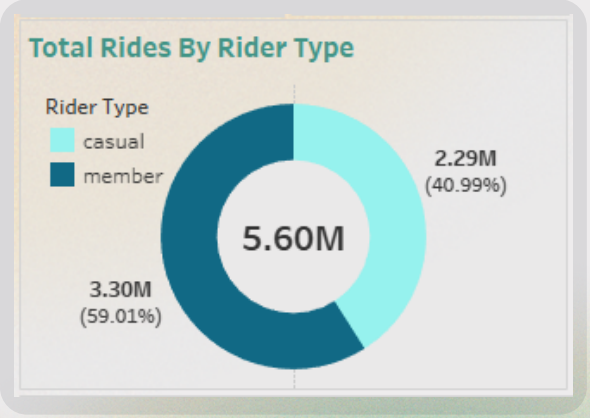
ANALYSIS

2. MEMBER TYPE:

- **There are two types of riders: Casual and Member.**
- **Casual riders have taken 2,294,098 (41%) rides, while members have taken 3,302,232(59%) rides.**



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ANALYSIS

3. BIKE TYPE:

- There are three types of bikes: classic bike, docked bike, and electric bike.
- The most popular bike type is the electric bike, with 2,841,724 rides.
- Classic bikes and docked bikes have 2,578,036 and 176,570 rides, respectively.

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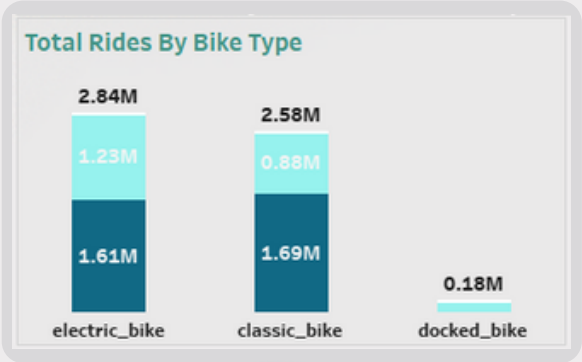
ANALYSIS

4. TOTAL RIDES BY MEMBER TYPE AND BIKE TYPE:



- **The analysis shows the distribution of rides based on both member type and bike type.**

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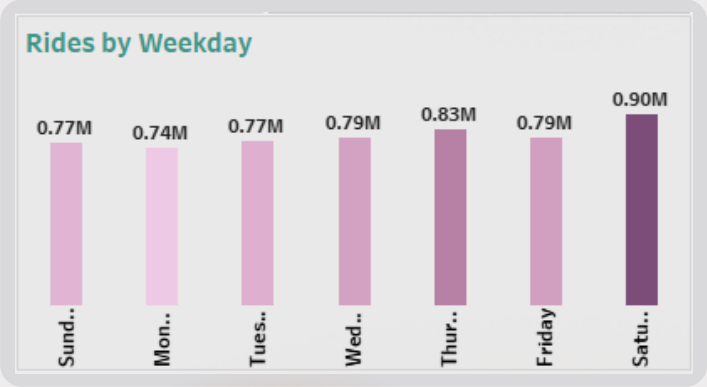
ANALYSIS

5. DAY OF THE WEEK:



- The rides are analyzed based on the day of the week.
- Saturday has the highest number of rides, followed by Friday and Sunday.

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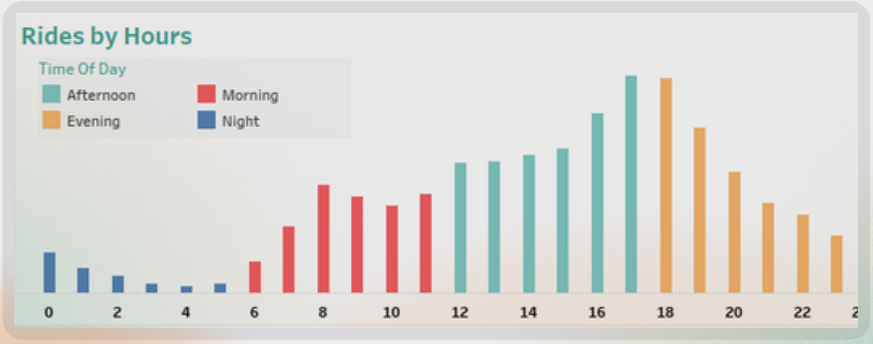
ANALYSIS

6. TIME OF DAY AND HOURLY ANALYSIS:

- **The rides are categorized into four time periods: Morning, Afternoon, Evening, and Night.**



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ANALYSIS

6. TIME OF DAY AND HOURLY ANALYSIS:

- **Afternoon has the highest number of rides, followed by Evening and Morning.**
- **Night has the lowest number of rides.**
- **The rides are analyzed based on the hour of the day.**
- **The highest number of rides occur during the hours of 16:00 to 18:00 (4:00 PM to 6:00 PM).**

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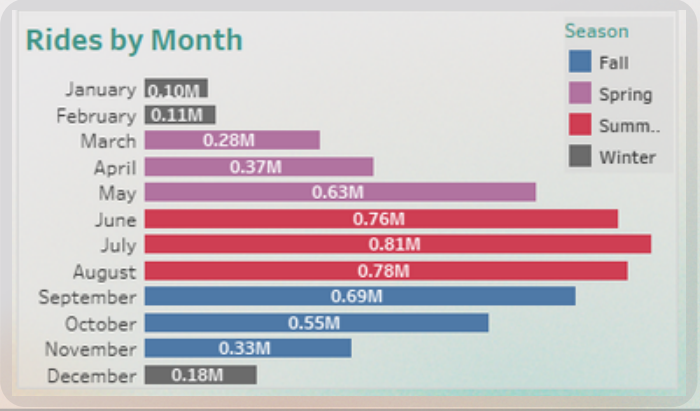
ANALYSIS

7. SEASON AND MONTH

- **The rides are analyzed based on the month.**
- **Months are categorized into four seasons: Spring, Summer, Fall, and Winter.**



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ANALYSIS

7. SEASON AND MONTH

- **Summer has the highest number of rides, followed by Fall and Spring.**
- **Winter has the lowest number of rides.**
- **July has the highest number of rides, followed by September and June.**

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KEY INSIGHTS

5,596,330	19.69	AFTERNOON	SATURDAY	SUMMER	JULY
Total No. of Rides in 2022	Average Ride Length	Peak Time of Rides	Popular Weekday	Popular Season	Popular Month

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SUMMARY OF THE ANALYSIS

- Members accounted for 59% of the total rides, as the most frequent riders.
- The average ride length for all riders was 20 minutes. However, casual riders had a longer average ride length of 29.50 minutes, while members had a shorter average ride length of 13 minutes.
- The most popular bike type among both members and casual riders was the classic bike.
- Afternoons, specifically between 12 pm and 5 pm, were the busiest bike ride times. The peak hour for rides was 5 pm, while night hours and 4 am were the least active.

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SUMMARY OF THE ANALYSIS

- Saturday was the most popular weekday for both members and casual riders.
- Members consistently used the bike-sharing service throughout the week, with a slight increase on Wednesdays, and Casual riders showed the highest number of rides on weekends, especially on Saturdays.
- The summer season (June to August) was the busiest period for both member and casual riders, with July recording the highest ride volume.
- In contrast, the winter months (December to February) had the least ride activity, with January being the least active month.

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SUGGESTIONS

1. Implement a personalized rewards program based on riders' preferences and riding habits. Offer tailored discounts and perks to encourage casual riders to become annual members.

2. Highlight the exclusive benefits of annual memberships, such as discounted rates during peak seasons like summer and weekends.

3. Feature existing members to share their positive experiences with Cyclistics Bike-Share program by offering incentives such as discounts or referral rewards, to attract new riders.

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SUGGESTIONS

4. Create an intermediate membership tier for weekend riders, offering annual benefits for rides taken on Saturdays and Sundays.

5. Enhance user experience with features such as route recommendations, bike availability notifications, and exclusive events.

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QUICK LINKS

Python Notebook

Tableau Dashboard

GitHub Repo

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RESOURCES

1. kellyjadams/google-capstone-project
I read some articles to get ideas for this project. Then I find Kelly Adams work on this project. She has done amazing (hard) work on this project. It's very helpful.

2. rodrigoleyva/google-data-analytics-cyclistic-capstone-project

THANK YOU!