Cyclistic Bike Share Report

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1. Business Task Statement

Summary:
The business task is to identify and analyze the differences in bike usage patterns between casual members and annual members. The insights from this analysis will inform marketing strategies to convert casual riders to annual members.

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2. Data Sources Used

Dataset:

The data used for this project has been made available by Motivate International Inc. under this license. The data used in the analysis covers the data made available for the year 2024.
- 12 CSV files, each representing a month of bike usage data for the year 2024.
- **Columns**:
`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`.

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3. Documentation of Data Cleaning and Manipulation

Summary:
The dataset was cleaned and prepared to ensure accurate and meaningful analysis.

Data Cleaning:
- Removed rows with missing values in critical columns (`ride_id`, `started_at`, `ended_at`, `member_casual`).
- Removed duplicate rows based on `ride_id`.
- Ensured `ended_at` is always later than `started_at`.
- Handled missing station names by filtering out rows with empty or invalid station names.

Data Manipulation:
- Added new columns:
- `ride_duration`: Calculated as the difference between `ended_at` and `started_at` (in minutes).
- `day_of_week`: Extracted from `started_at`.
- `hour_of_day`: Extracted from `started_at`.
- `month`: Extracted from `started_at` for seasonality analysis.

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4. Summary of Analysis

Summary:
The analysis revealed key differences in bike usage patterns between casual and annual members. Below are

the key findings:

Key Metrics

- **Total Rides**:
  - Casual: 2,080,193
  - Annual: 3,641,355
- **Average Ride Duration**:
  - Casual: 21.5 minutes
  - Annual: 12.4 minutes
- **Most Popular Day**:
  - Casual: Saturday
  - Annual: Wednesday
- **Most Popular Hour**:
  - Casual: 5 PM
  - Annual: 5 PM

Key Findings

1. **Ride Duration**:
   - Casual members have longer average ride durations (21.5 minutes) compared to annual members (12.4 minutes), suggesting they use bikes for **leisure or longer trips**.
   - Annual members use bikes for **shorter, utilitarian trips** (e.g., commuting).
2. **Ride Frequency**:
   - Casual members ride more frequently on **weekends** (most popular day: Saturday), indicating **leisure usage**.
   - Annual members ride more frequently on **weekdays** (most popular day: Wednesday), indicating **commuting usage**.
3. **Peak Usage Times**:
   - Casual members have peak usage during **midday and evenings** (most popular hour: 5 PM), suggesting **leisure or recreational use**.
   - Annual members have peak usage during **morning and evening rush hours** (most popular hour: 5 PM), suggesting **commuting use**.
4. **Seasonality**:
   - Casual members show higher usage during **warmer months** (spring and summer), indicating **seasonal leisure use**.
   - Annual members have **consistent usage throughout the year**, with only slight dips during colder months, indicating **year-round commuting use**.
5. **Geographical Patterns**:
   - Casual members prefer **popular leisure or tourist locations** (e.g., Streeter Dr & Grand Ave).
   - Annual members prefer **stations near business districts or transit hubs** (e.g., Clinton St & Washington Blvd).
6. **Bike Type Usage**:

- Casual members prefer **electric bikes** for convenience and speed.

- Annual members preference did not differ much between **classic bikes** and **electric bike** for traditional commuting.

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5. Recommendations

Based on the analysis, here are the top three recommendations to convert casual riders to annual members:

1. **Targeted Marketing Campaigns**:
   - Focus on casual riders who use bikes during **peak commuting hours** or at **popular stations**.
   - Highlight the **cost savings** and **convenience** of annual memberships for frequent riders.
2. **Bike Allocation and Service Improvements**:
   - Increase the availability of **electric bikes** at popular casual stations during peak leisure hours.
   - Ensure **classic bikes** are readily available at stations near business districts for annual members.
3. **Engagement Campaigns**:
   - Promote annual memberships during **warmer months** when casual riders are most active.
   - Offer **incentives** (e.g., discounts, free trials) to encourage casual riders to convert to annual members.

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6. Supporting Visualizations and Key Findings

The visualizations were created in Tableau to support the analysis:
1. **Ride Duration**: Bar chart comparing average ride duration between casual and annual members.
2. **Ride Frequency**: Bar chart showing rides by day of the week.
3. **Peak Usage Times**: Line chart showing rides by hour of the day.
4. **Seasonality**: Line chart showing monthly usage trends.
5. **Popular Stations**: Bar chart showing top start stations 6. **Bike Type Usage**: Pie chart showing membership rides by bike type.