Let's start with some initial data analysis steps:

1. \*\*Summary Statistics\*\*: Calculate basic summary statistics for numeric columns.

2. \*\*Ride Duration Analysis\*\*: Calculate ride duration and analyze its distribution.

3. \*\*Trends Over Time\*\*: Analyze the number of rides over time (daily, weekly, monthly).

4. \*\*Member vs Casual Riders\*\*: Compare the usage patterns of members vs casual riders.

5. \*\*Popular Stations\*\*: Identify the most popular start and end stations.

We'll proceed with these analyses step by step.

### 1. Summary Statistics

We'll start by calculating summary statistics for the numeric columns.

### 2. Ride Duration Analysis

We'll calculate the duration of each ride and analyze its distribution.

### 3. Trends Over Time

We'll analyze the number of rides over time, aggregated by day, week, and month.

### 4. Member vs Casual Riders

We'll compare the usage patterns (e.g., average ride duration, number of rides) between members and casual riders.

### 5. Popular Stations

We'll identify the most popular start and end stations.

Let's start with the summary statistics and ride duration analysis.

### Summary Statistics for Numeric Columns

| Statistic | start\_lat | start\_lng | end\_lat | end\_lng |

|-----------|-----------|-----------|---------|---------|

| \*\*Count\*\* | 200,447 | 200,447 | 200,447 | 200,447 |

| \*\*Mean\*\* | 41.8983 | -87.6455 | 41.8987 | -87.6457 |

| \*\*Std\*\* | 0.0432 | 0.0247 | 0.0433 | 0.0247 |

| \*\*Min\*\* | 41.6485 | -87.8300 | 41.6485 | -87.8300 |

| \*\*25%\*\* | 41.8793 | -87.6584 | 41.8794 | -87.6586 |

| \*\*50%\*\* | 41.8940 | -87.6419 | 41.8940 | -87.6427 |

| \*\*75%\*\* | 41.9227 | -87.6298 | 41.9242 | -87.6298 |

| \*\*Max\*\* | 42.0649 | -87.5282 | 42.0649 | -87.5282 |

### Ride Duration Statistics (in minutes)

| Statistic | Value |

|-----------|-------------|

| \*\*Count\*\* | 200,447 |

| \*\*Mean\*\* | 11.70 |

| \*\*Std\*\* | 27.92 |

| \*\*Min\*\* | 0.00 |

| \*\*25%\*\* | 4.55 |

| \*\*50%\*\* | 7.68 |

| \*\*75%\*\* | 13.05 |

| \*\*Max\*\* | 1496.83 |

### Observations

- The average ride duration is approximately 11.7 minutes, with a standard deviation of 27.9 minutes.

- The median ride duration is 7.7 minutes, indicating that half of the rides are shorter than this duration.

- There are some extremely long rides, with the maximum duration being 1496.8 minutes (~25 hours), which may require further investigation.

### Next Steps

Let's analyze trends over time and compare the usage patterns of members vs casual riders. We'll start with the trends over time.

#### Trends Over Time

We'll analyze the number of rides over time, aggregated by day, week, and month.

### Trends Over Time

#### Number of Rides Per Day

Here's the number of rides for each day in March 2023:

| Date | Number of Rides |

|------------|------------------|

| 2023-03-01 | 9368 |

| 2023-03-02 | 7105 |

| 2023-03-03 | 5020 |

| ... | ... |

| 2023-03-30 | 8972 |

| 2023-03-31 | 6736 |

#### Number of Rides Per Week

Here's the number of rides aggregated by week in March 2023:

| Week Starting | Number of Rides |

|---------------|------------------|

| 2023-03-06 | 40330 |

| 2023-03-13 | 39786 |

| 2023-03-20 | 41667 |

| 2023-03-27 | 46167 |

#### Number of Rides Per Month

For March 2023, the total number of rides is 200,447.

### Member vs Casual Riders

Next, let's compare the usage patterns of members vs casual riders, including the average ride duration and the number of rides.

### Member vs Casual Riders

#### Summary Statistics for Ride Duration

| Member Type | Count | Mean (min) | Std (min) | Min (min) | 25% (min) | 50% (min) | 75% (min) | Max (min) |

|-------------|----------|------------|-----------|-----------|-----------|-----------|-----------|-------------|

| \*\*Casual\*\* | 46,792 | 16.72 | 45.63 | 0.0 | 5.48 | 9.18 | 16.53 | 1496.83 |

| \*\*Member\*\* | 153,655 | 10.17 | 19.31 | 0.0 | 4.33 | 7.27 | 12.18 | 1480.65 |

#### Number of Rides by Member Type

| Member Type | Number of Rides |

|-------------|------------------|

| \*\*Member\*\* | 153,655 |

| \*\*Casual\*\* | 46,792 |

### Observations

- \*\*Casual riders\*\* have longer average ride durations (16.72 minutes) compared to \*\*members\*\* (10.17 minutes).

- \*\*Members\*\* account for a higher number of rides (153,655) compared to \*\*casual riders\*\* (46,792).

### Popular Stations

Finally, let's identify the most popular start and end stations.

### Most Popular Stations

#### Top 10 Start Stations

| Start Station Name | Number of Rides |

|--------------------------------|------------------|

| Clinton St & Washington Blvd | 1913 |

| Kingsbury St & Kinzie St | 1882 |

| Ellis Ave & 60th St | 1677 |

| Clark St & Elm St | 1655 |

| University Ave & 57th St | 1609 |

| Canal St & Adams St | 1599 |

| Clinton St & Madison St | 1510 |

| Wells St & Concord Ln | 1471 |

| Wells St & Huron St | 1388 |

| Wells St & Elm St | 1378 |

#### Top 10 End Stations

| End Station Name | Number of Rides |

|--------------------------------|------------------|

| Clinton St & Washington Blvd | 2018 |

| Kingsbury St & Kinzie St | 1806 |

| Clinton St & Madison St | 1663 |

| Clark St & Elm St | 1615 |

| University Ave & 57th St | 1606 |

| Ellis Ave & 60th St | 1597 |

| Canal St & Adams St | 1550 |

| Wells St & Concord Ln | 1541 |

| Streeter Dr & Grand Ave | 1384 |

| Wells St & Elm St | 1372 |

### Observations

- \*\*Clinton St & Washington Blvd\*\* is the most popular start and end station.

- Stations such as \*\*Kingsbury St & Kinzie St\*\*, \*\*Clark St & Elm St\*\*, and \*\*University Ave & 57th St\*\* are also popular for both starting and ending rides.

If you need any further analysis or specific insights, let me know!

Let's create the following visualizations to better understand the data:

1. \*\*Number of Rides Per Day\*\*: A line chart showing the number of rides each day in March 2023.

2. \*\*Ride Duration Distribution\*\*: A histogram showing the distribution of ride durations.

3. \*\*Number of Rides by Member Type\*\*: A bar chart comparing the number of rides by members and casual riders.

4. \*\*Most Popular Stations\*\*: Bar charts showing the top 10 start and end stations.

Let's start with these visualizations.

### Visualizations

1. \*\*Number of Rides Per Day (March 2023)\*\*

- The line chart shows fluctuations in the number of rides each day in March, with peaks and troughs throughout the month.

2. \*\*Distribution of Ride Durations\*\*

- The histogram indicates that most ride durations are relatively short, with a large number of rides lasting under 30 minutes.

3. \*\*Number of Rides by Member Type\*\*

- The bar chart highlights that members take significantly more rides than casual riders.

4. \*\*Top 10 Start Stations\*\*

- The bar chart displays the most popular start stations, with \*\*Clinton St & Washington Blvd\*\* being the most frequented.

5. \*\*Top 10 End Stations\*\*

- Similarly, the bar chart for end stations shows \*\*Clinton St & Washington Blvd\*\* as the most popular destination.

If you need more detailed visualizations or further analysis, please let me know!