Let's perform some specific analyses on the cleaned Divvy bike trip data:

### 1. Summary Statistics:

- Descriptive statistics for numerical columns.

- Ride duration statistics.

### 2. Trends Over Time:

- Number of rides over time (daily, weekly, monthly).

- Ride durations over time.

### 3. Member vs Casual:

- Comparison of ride patterns between members and casual users.

#### 1. Summary Statistics:

We'll start by generating basic summary statistics for the numerical columns and calculating ride durations.

#### 2. Trends Over Time:

We will look at the number of rides over different time periods to identify any trends.

#### 3. Member vs Casual:

We will compare the ride patterns between members and casual users to see if there are any notable differences.

Let's start with these analyses.

### 1. Summary Statistics:

\*\*Numerical Columns:\*\*

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

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

| Count | 224,073 | 224,073 | 224,073 | 224,073 |

| Mean | 41.9017 | -87.6484 | 41.9019 | -87.6485|

| Std Dev | 0.0442 | 0.0269 | 0.0442 | 0.0269 |

| Min | 41.6485 | -87.8500 | 41.6485 | -87.9600|

| 25% | 41.8803 | -87.6614 | 41.8804 | -87.6614|

| 50% | 41.8966 | -87.6444 | 41.8966 | -87.6444|

| 75% | 41.9300 | -87.6309 | 41.9300 | -87.6309|

| Max | 42.0700 | -87.5282 | 42.0700 | -87.5282|

\*\*Ride Duration:\*\*

| Statistic | Value |

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

| Count | 224,073 |

| Mean | 13.40 |

| Std Dev | 57.99 |

| Min | -14.65 |

| 25% | 4.68 |

| 50% | 7.70 |

| 75% | 13.00 |

| Max | 1499.95 |

### 2. Trends Over Time:

\*\*Number of Rides Per Day (First 5 Days):\*\*

| Date | Number of Rides |

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

| 2023-12-01 | 5,421 |

| 2023-12-02 | 9,294 |

| 2023-12-03 | 6,086 |

| 2023-12-04 | 9,766 |

| 2023-12-05 | 7,857 |

### 3. Member vs Casual:

\*\*Ride Duration Comparison:\*\*

| Member Type | Count | Mean | Std Dev | Min | 25% | 50% | 75% | Max |

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

| Casual | 51,672 | 19.94 | 97.00 | -0.03 | 5.12 | 8.45 | 14.87 | 1499.95 |

| Member | 172,401 | 11.45 | 39.17 | -14.65 | 4.57 | 7.50 | 12.53 | 1499.93 |

### Observations:

1. \*\*Summary Statistics\*\*:

- Average ride duration is about 13.4 minutes.

- There are some negative ride durations, which might be errors.

2. \*\*Trends Over Time\*\*:

- Ride volume fluctuates daily with notable peaks and troughs.

3. \*\*Member vs Casual\*\*:

- Casual riders tend to have longer ride durations on average compared to members.

- Members have more consistent ride durations with a smaller standard deviation.

Would you like to delve deeper into any specific analysis or visualize the data further?

The visualizations have been saved successfully. You can download them using the links below:

1. [Distribution of Ride Durations](sandbox:/mnt/data/ride\_duration\_distribution.png)

2. [Number of Rides Per Day](sandbox:/mnt/data/rides\_per\_day.png)

3. [Ride Duration by Member Type](sandbox:/mnt/data/member\_vs\_casual.png)

If you need any further analysis or additional visualizations, feel free to let me know!