UBER RIDES AND WEATHER

Zahra Razook
Mary (Jiahui) Du
Isa Huseni
Greg Presneill

OVERVIEW

Introduction

Overview of the process

Approach

Results

Summary

Next steps

Uber

GROUP 4 PROJECT 1

For this project, we will explore the ‘Uber Pickups in New York City’ data for 2014 available from Kaggle and investigate what effect weather conditions had on ride demand (Uber usage).

OVERVIEW OF THE PROCESS

- Identifying Data Source
- Retrieving Data
- Assemble & Cleaning
- Analyze & acknowledge limitations
- Conclusion

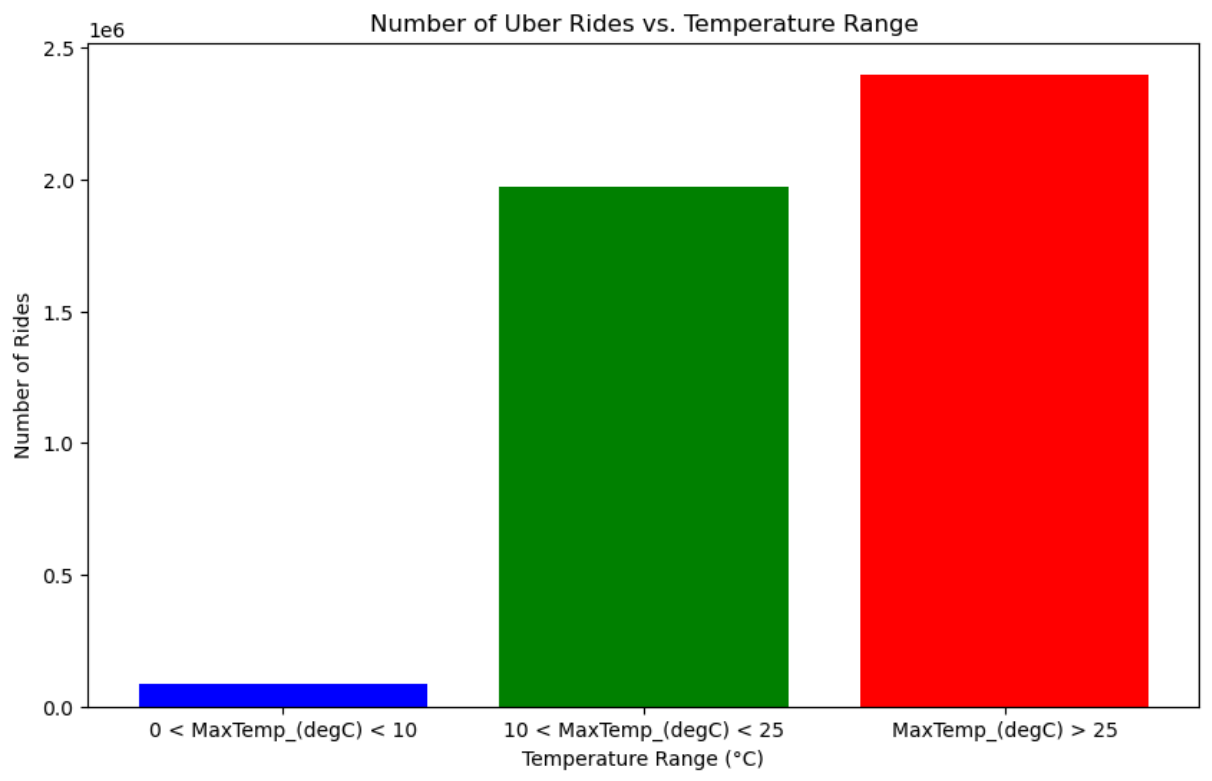
New York City data - Apr- Sep 2014
NOAA weather data – Apr- Sep 2014

Pandas : pd. concat, len(), .Drop …

APPROACH

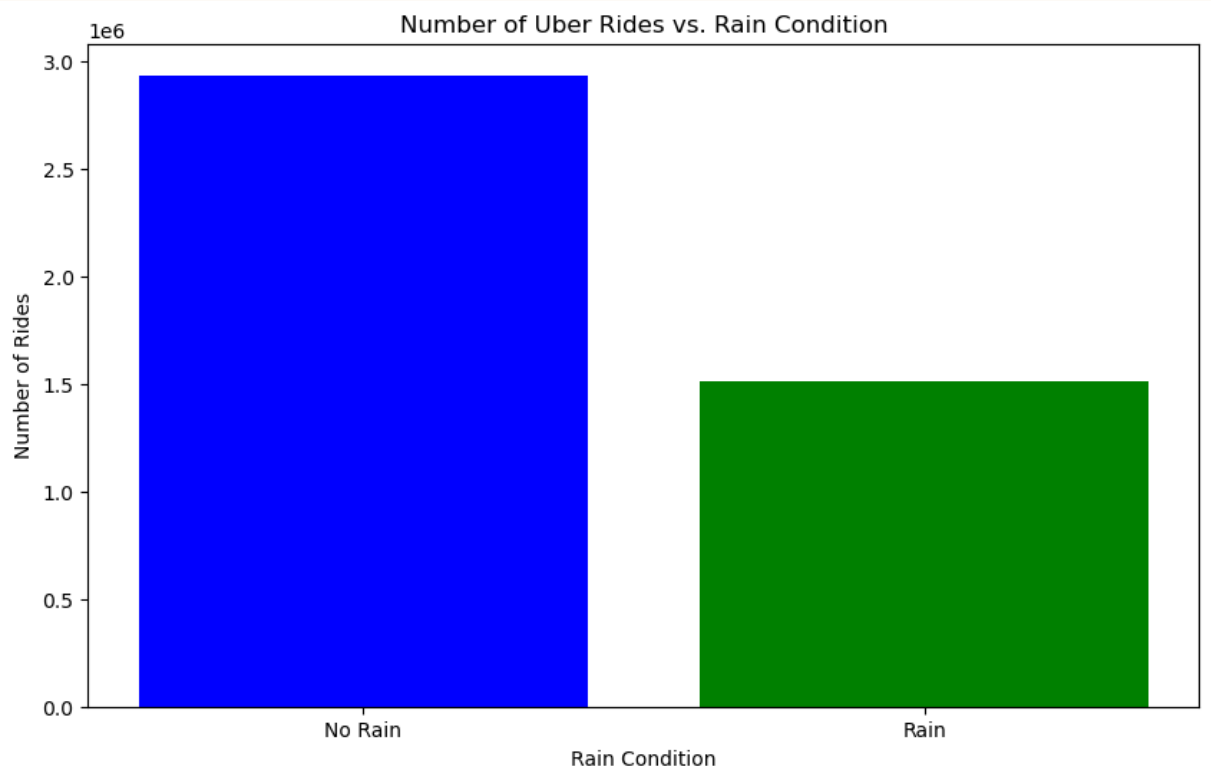
EXPLORATORY DATA ANALYSIS

- In this graph, the data is grouped into three temperature ranges.
- This data suggests that Uber was used more in warmer weather.



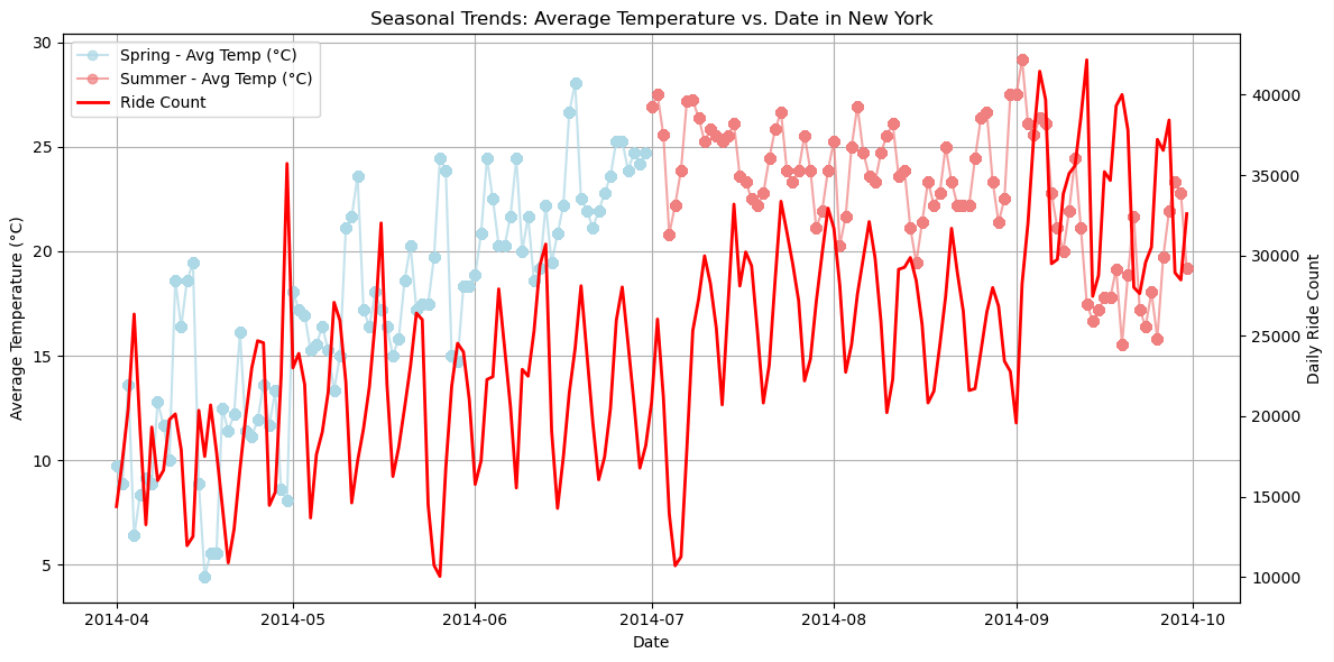
EXPLORATORY DATA ANALYSIS

- The data aims to examine the impact of rainfall on the number of Uber rides.
- In the dataset there were more dry days than wet days.
- For our “rain” values we combined rain and snow and ice (hail) values.



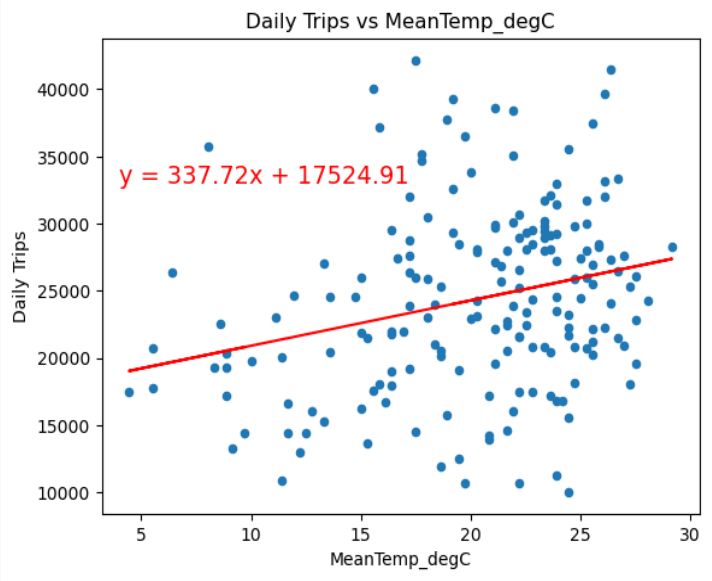
EXPLORATORY DATA ANALYSIS

- The graph illustrates the seasonal trend, depicting the variations in Uber rides relative to the average temperature over the period in the data.

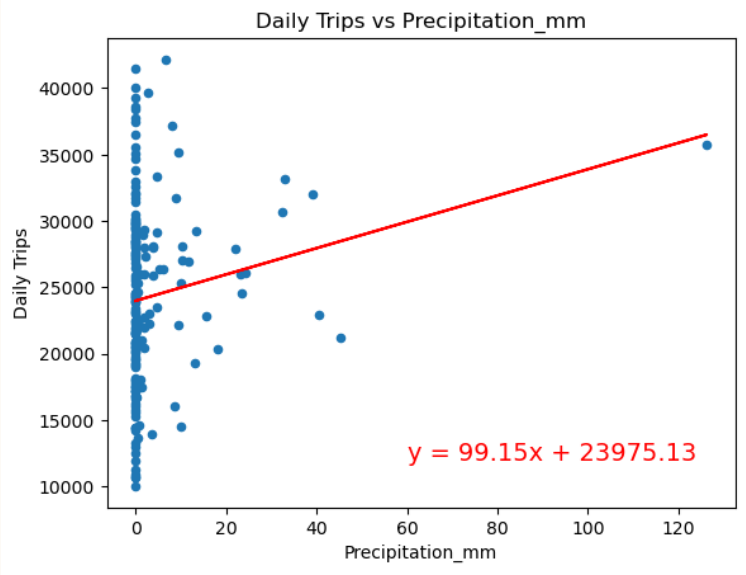


ANALYSIS & RESULTS

Correlation-Based Analysis: Correlation between Temperature and Ride counts, and Precipitation (Rain + Snow) and Ride counts



The r^2-value is: 0.068423



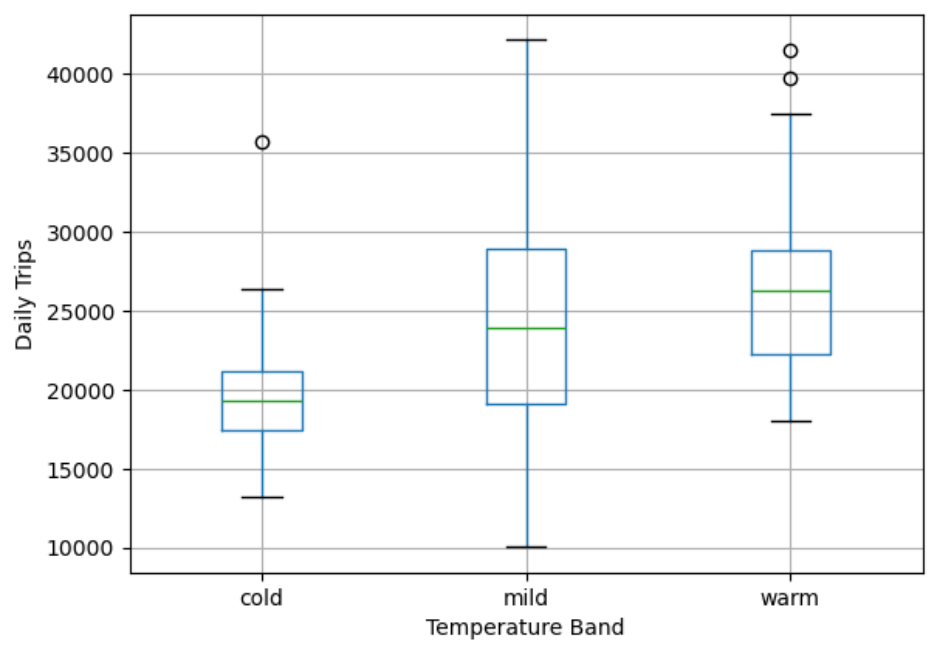
The r^2-value is: 0.029059

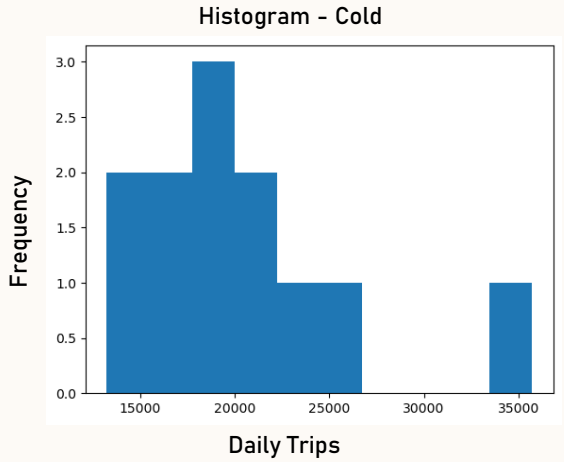
Temperature pattern: suggests a positive correlation between temperature and ride counts. R-squared value suggests a very weak linear relationship between temperature and ride counts.

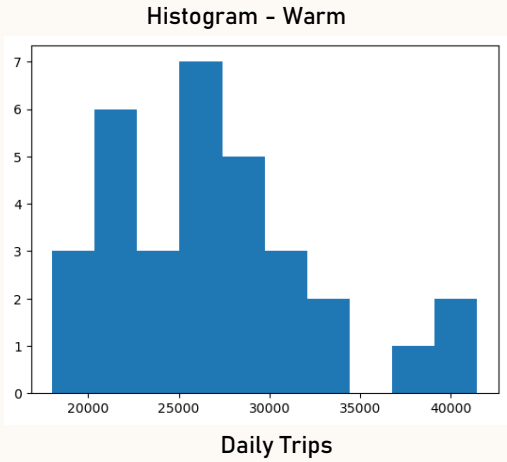
Precipitation pattern: indicates no linear correlation between rain & snow and ride counts

Frequency-Based Analysis: Comparison between Temperature & Ride counts

Null Hypothesis (H_0): There is no significant difference in Uber ride counts across different temperature bands.
Alternative Hypothesis (H_1): Uber ride counts varies significantly across in colder or warmer weather.



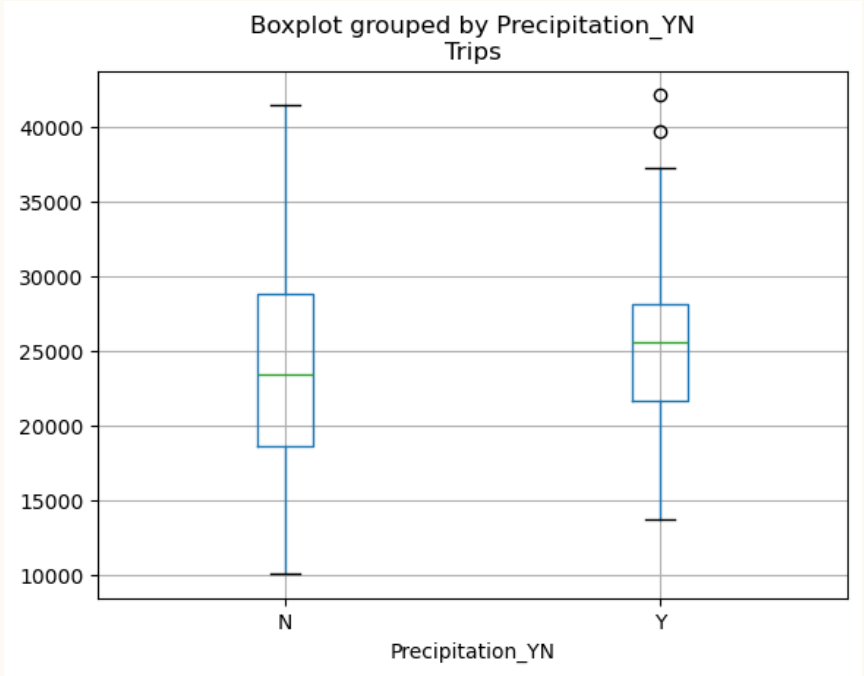


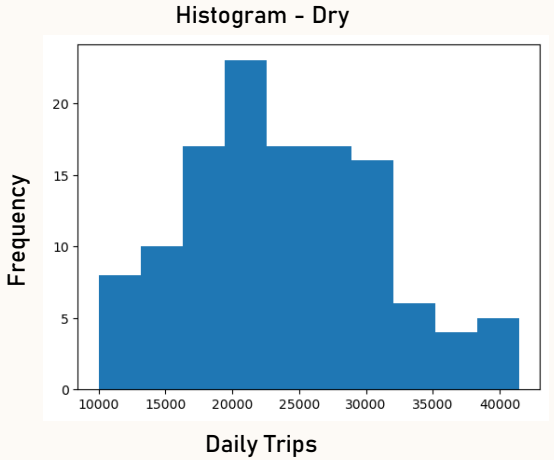


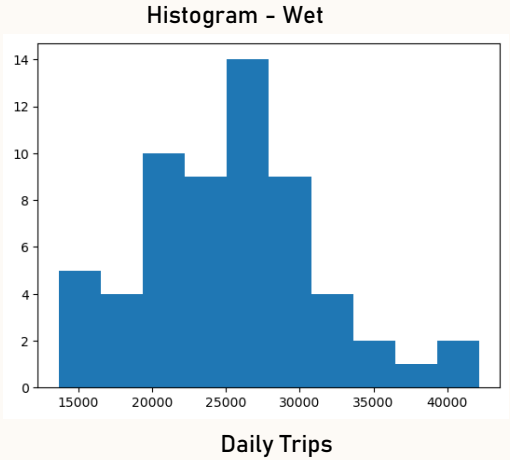
We had planned to use an ANOVA test to decide if mean trip counts during cold or warm weather were significantly different from mild weather. However, analysis indicated the data was not normally distributed.

Frequency-Based Analysis: Comparison between Precipitation & Ride counts

Null Hypothesis (H_0): There is no significant difference in Uber ride counts across dry or wet days.
Alternative Hypothesis (H_1): Uber ride counts varies significantly across in wet weather (rain and/or snow).

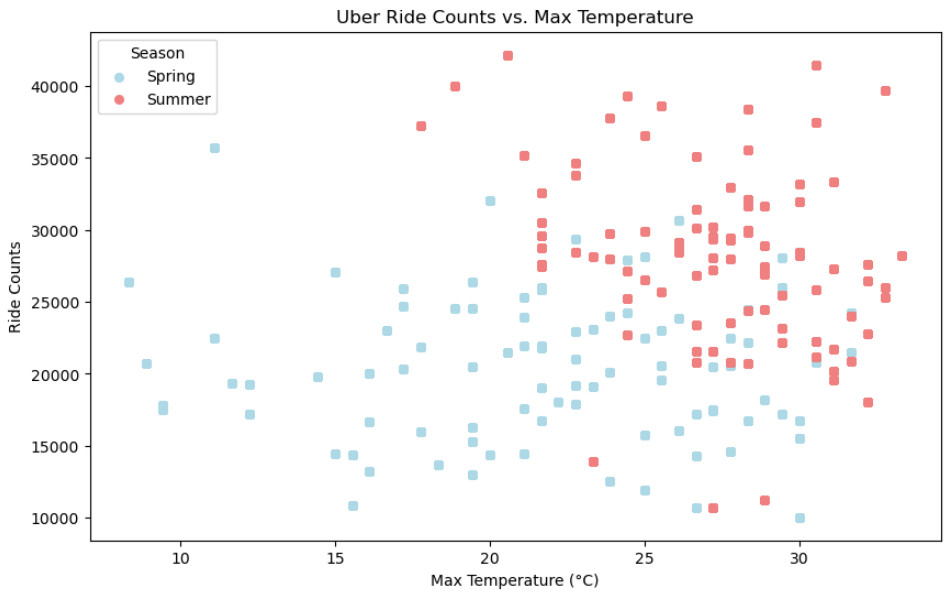


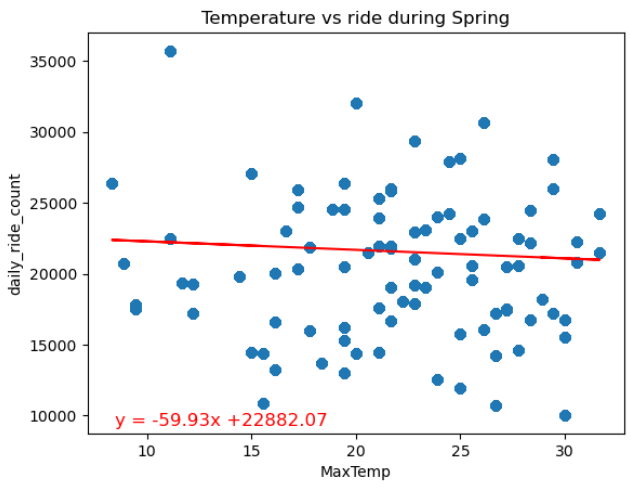




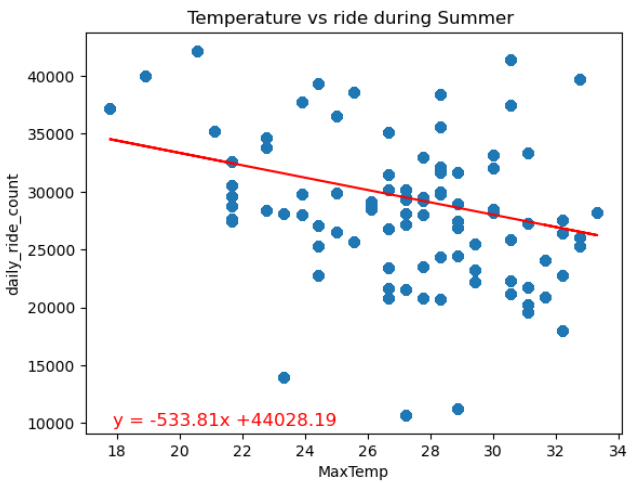
We had planned to use a t-test to decide if mean trip counts during rain or snow weather were significantly different from dry weather. However, analysis indicated the data was not normally distributed.

Correlation-Based Analysis: Correlation between Temperature and Ride counts across different Seasons





The r^2-value is: 0.0047



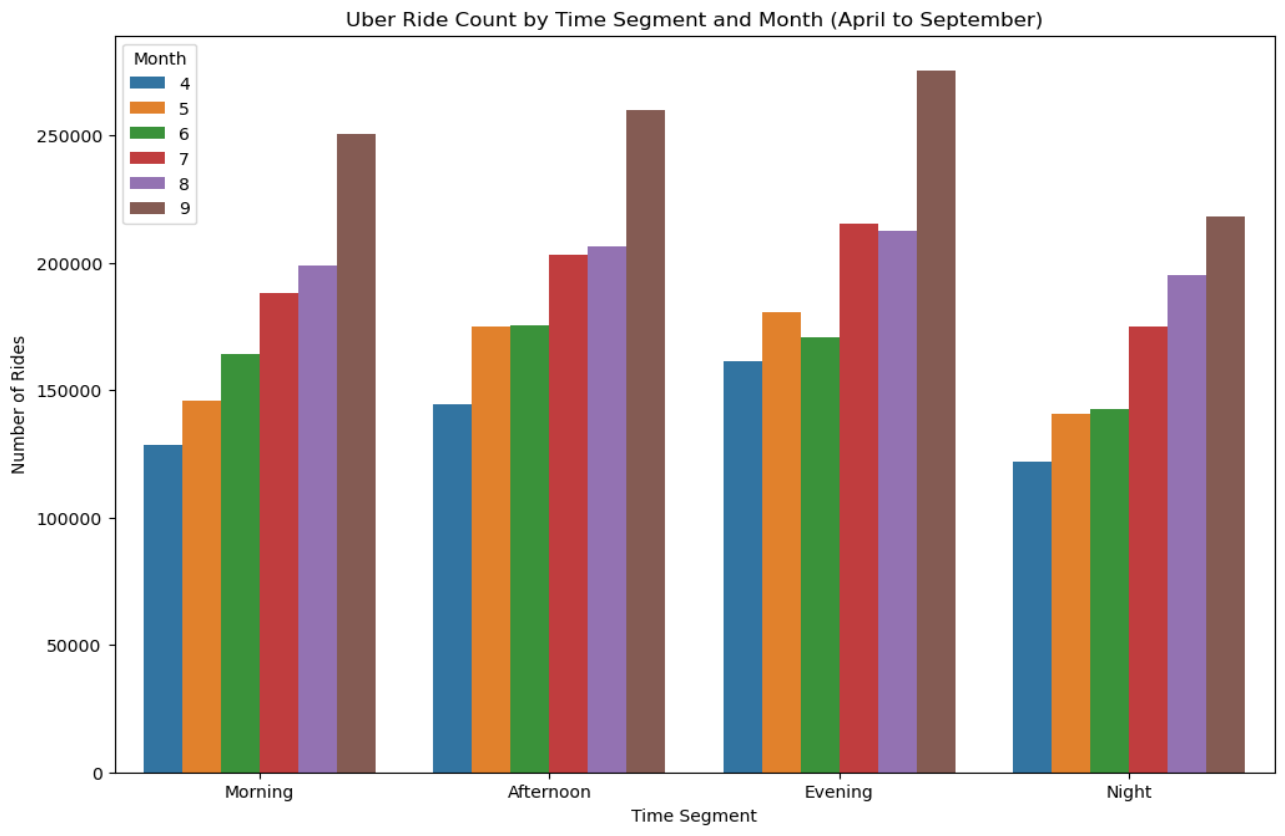
The r^2-value is: 0.103

Spring pattern: Negative correlation between temperature and ride counts during Spring. R-square value suggests a very weak linear relationship between temperature and ride counts during spring season.

Summer pattern: The steeper negative slope of the line compared to spring appears significant except the R-squared value is low, so the correlation is still weak.

Analyse the Influence of Time of Day on Uber Ride Counts Across Varied Weather Conditions

Null Hypothesis (H_0): There is no significant difference in Uber ride count across different times of the day, regardless of weather conditions.
Alternative Hypothesis (H_1): Uber ride count varies significantly across different times of the day, influenced by varying weather conditions.



We wanted to look at how the time-of-day impacts Uber ride count. However, due to the lack of available hourly temperature data, we were unable to analyse whether the time of day affects Uber ride count in various weather conditions.

SUMMARY

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We expected that more Uber trips would be taken in wet and cold weather.

- The data indicated more of a trend to increased rides in warmer weather.
- The trend could also be explained other factors (for example, more Uber drivers on the road during Summer, or more sporting events).

Limitations of the analysis

- More detailed analysis would require more Uber trips data

NEXT STEPS

NEXT STEPS

Next steps

- Get 12 months or more of Uber trip data
- More recent Uber trips data
- Weather data for more locations in New York (or other cities)