Weather Impact of Uber Pickups in NYC

Project 1 -Group 9:
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UofT SCHOOL of CONTINUING STUDIES

Overview

1. Introduction - Problematic (including audience)
2. Project Objectives
3. Data sources
4. Methodology
5. Data analysis - Q1, Q2, Q3, and Q4
6. Conclusions

Objective

This project is directed towards city planners and car service companies. Our objective is to examine how weather conditions influence Uber service demand, analyze the temporal variations in Uber pickups, and explores the geographic distribution of pickups within different city boroughs.

Data Source and Structure

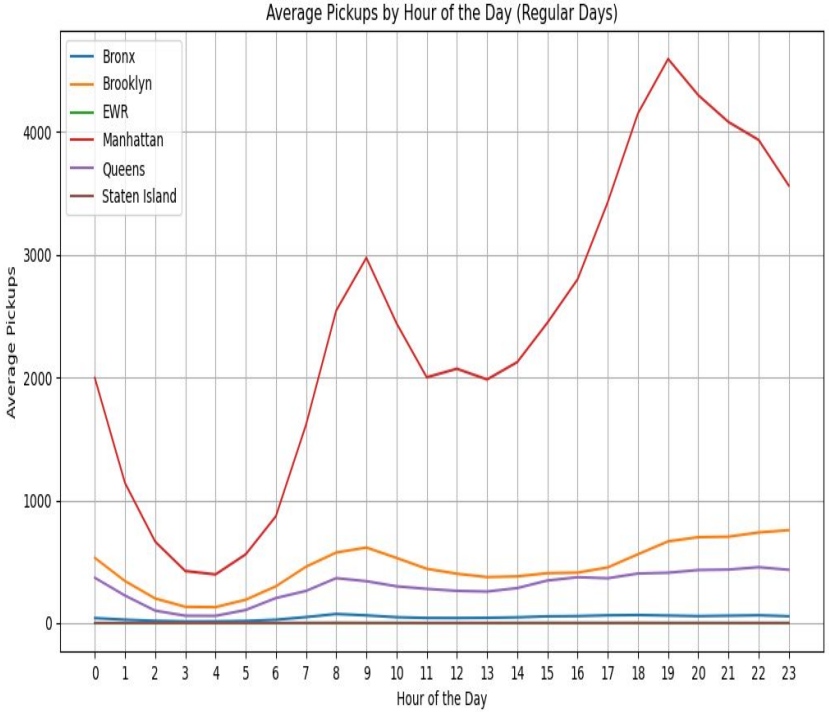
- Data set NYC Uber pickups with weather and holidays from Kaggle.
  https://www.kaggle.com/datasets/yannisp/uber-pickups-enriched/
- Six Borough in NCY - Bronx, Brooklyn, EWR, Manhattan, Queens, Staten Island.
- Number of pickups hourly and daily along the first semester of 2015.
- Weather Conditions - Wind speed, Visibility, Temperature, dew point, Sea level pressure, Precipitation 01, Precipitation 06, Precipitation 24, Snow depth.

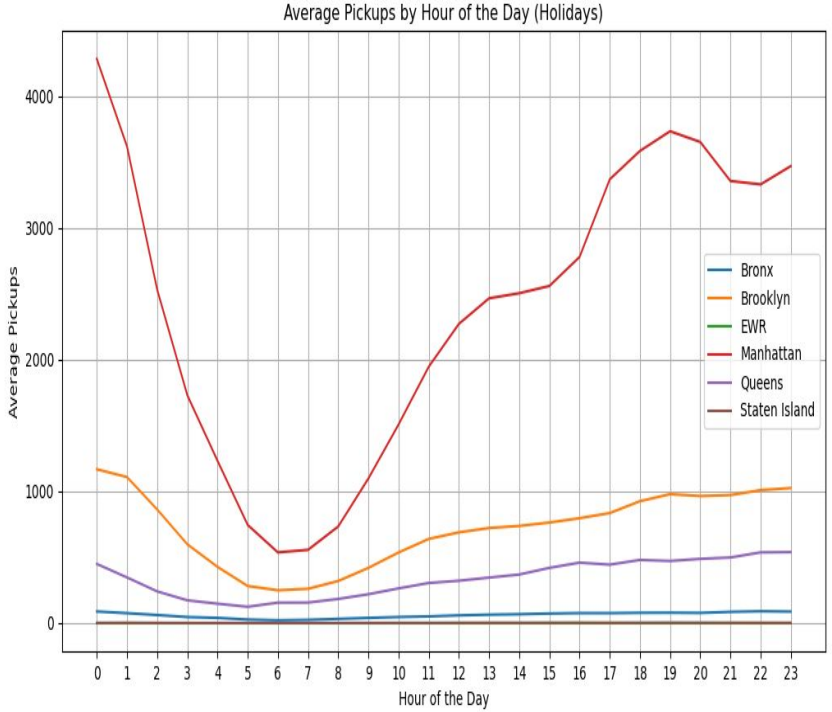
Methodology

- **Data Cleaning:** Preprocess the dataset by handling missing values, outliers, and formatting issues.
- **Exploratory Data Analysis (EDA)**: Conduct EDA to visualize data distributions, correlations, and patterns. To identify trends, generate summary statistics and visualizations.
- **Temporal Analysis:** Analyze temporal patterns by aggregating daily, weekly, and monthly data. Identify peak hours, days, and seasons for Uber demand.
- **Reporting and Visualization:** Present findings through comprehensive reports, visualizations, and interactive dashboards to facilitate easy interpretation and decision-making.

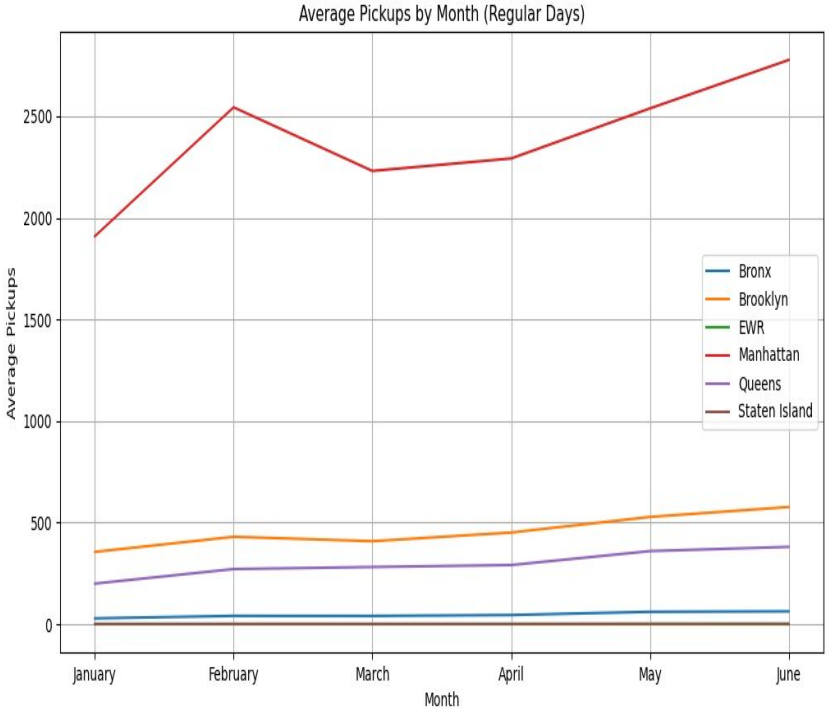
Q1. How do pickup patterns change throughout the day?

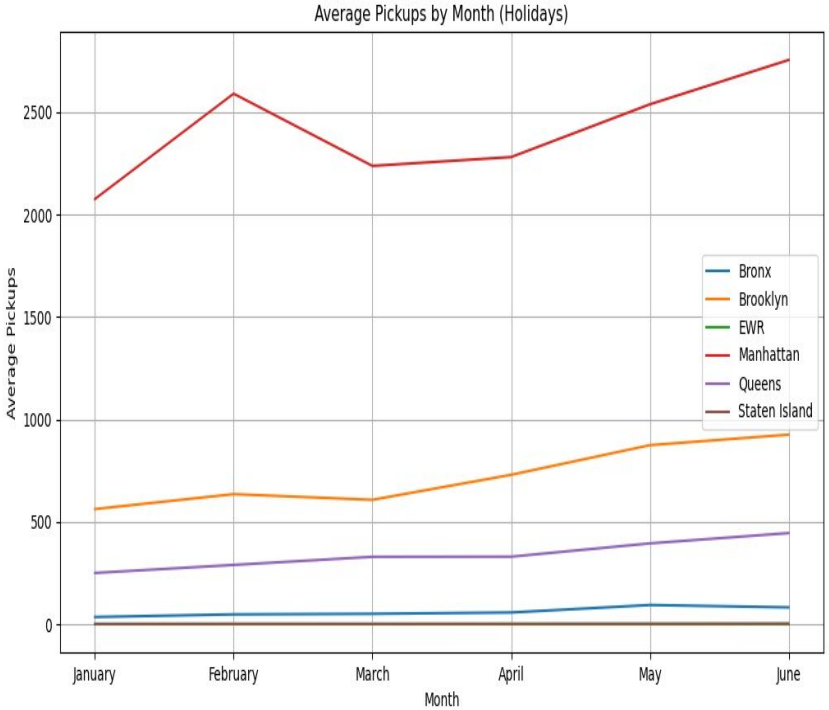
Pickup patterns change throughout the day (Jan-Jun 2015) in each borough



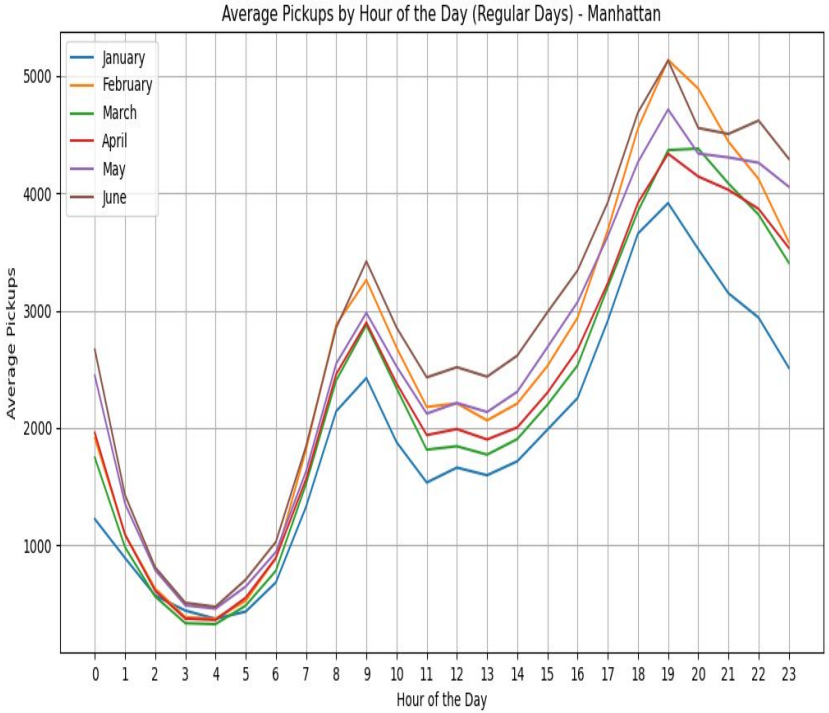


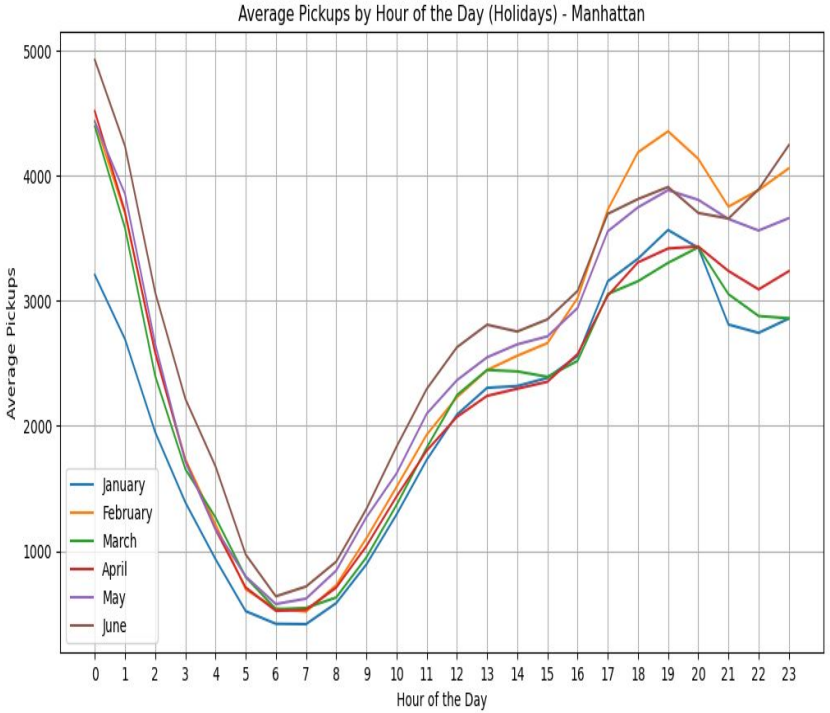
Pickup patterns change throughout the month (Jan-Jun 2015) in each borough





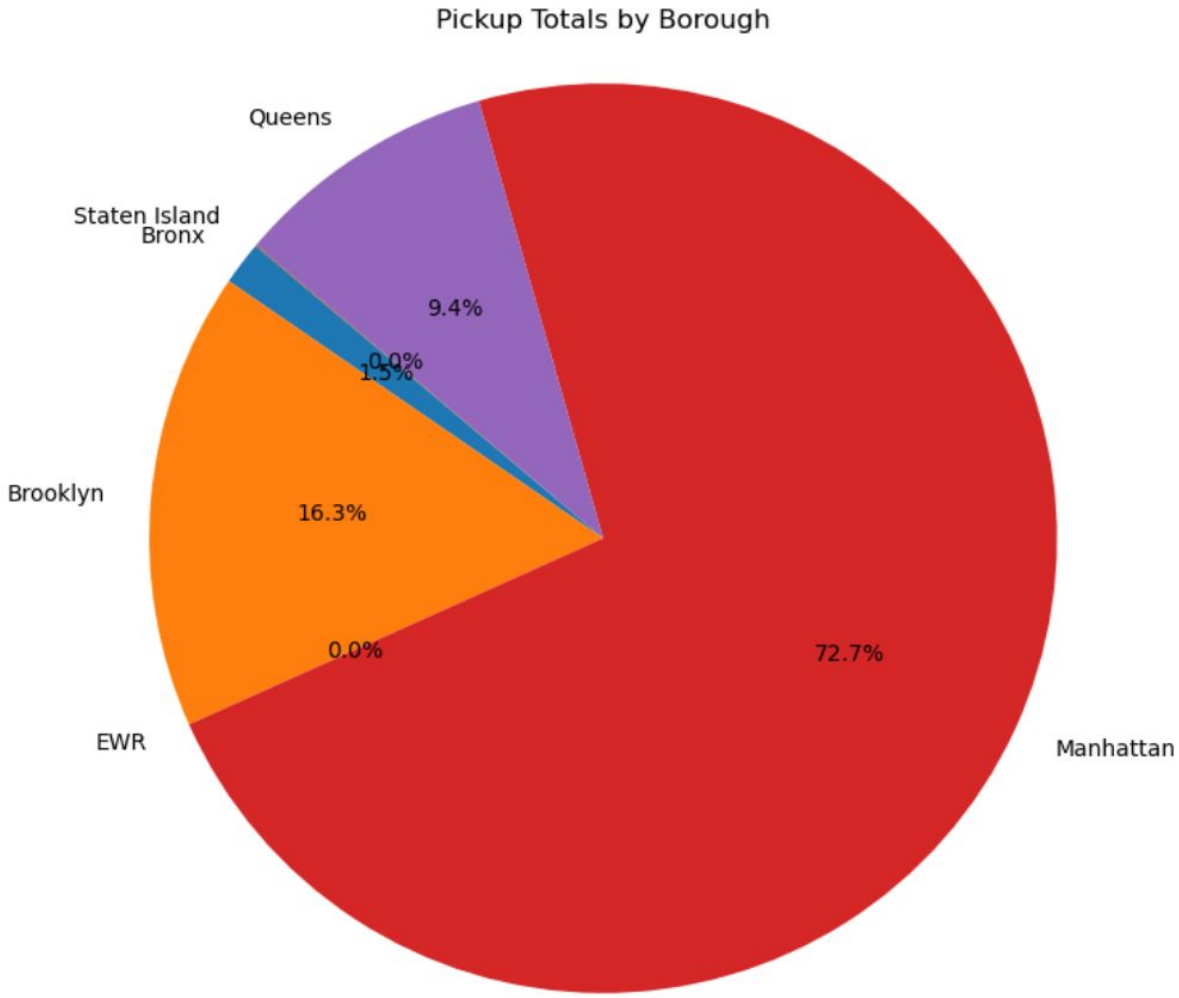
Pickup patterns change throughout the day in Manhattan (Jan-June 2015)



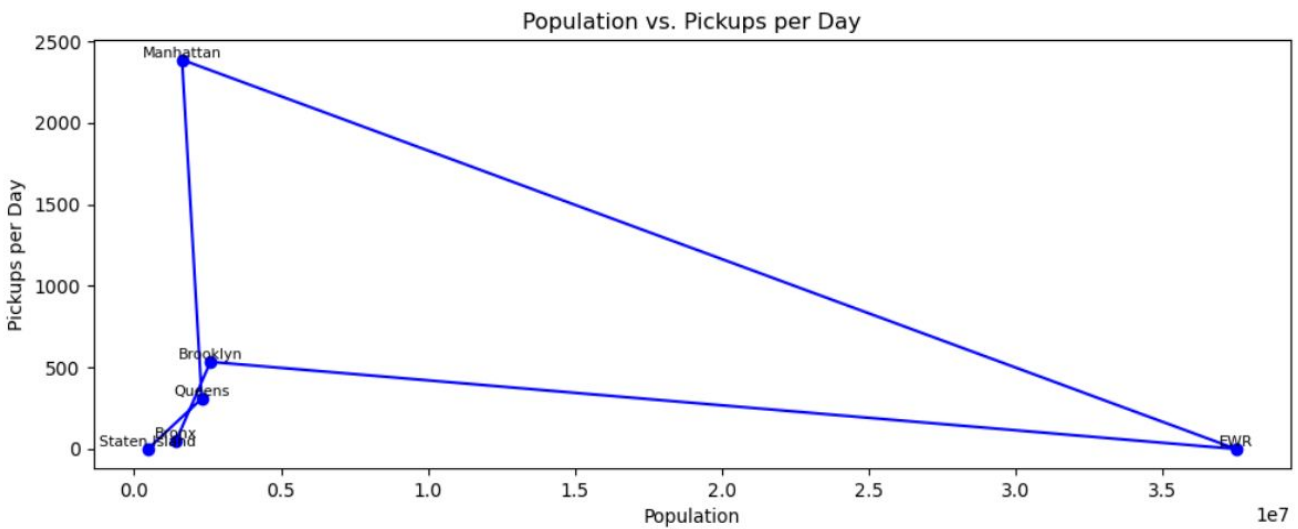


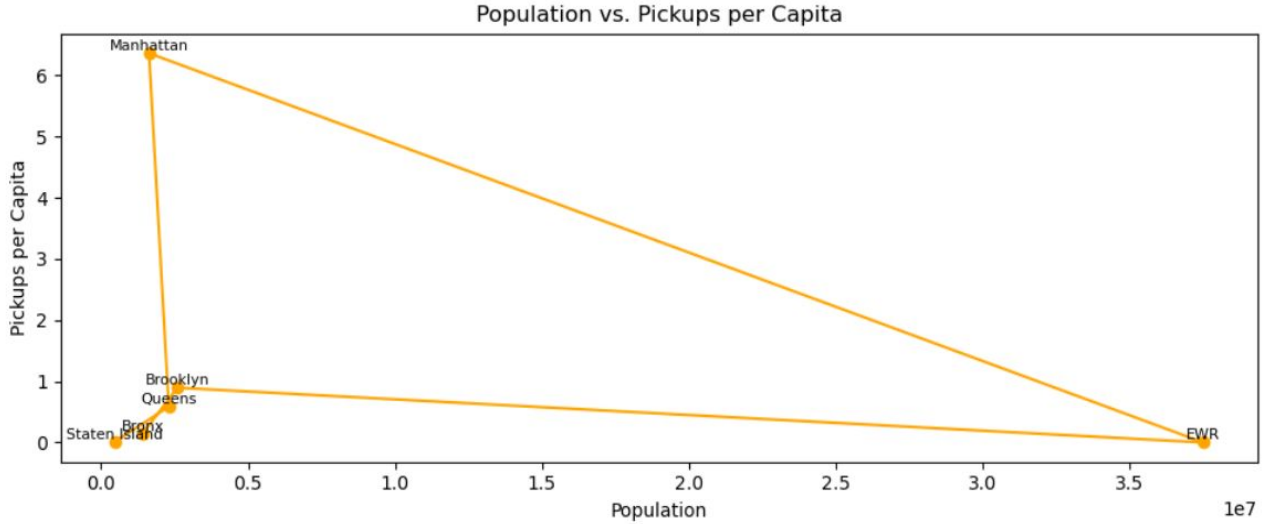
Q2. Does population has impact on pickups?

1. Which borough has the most pickups?

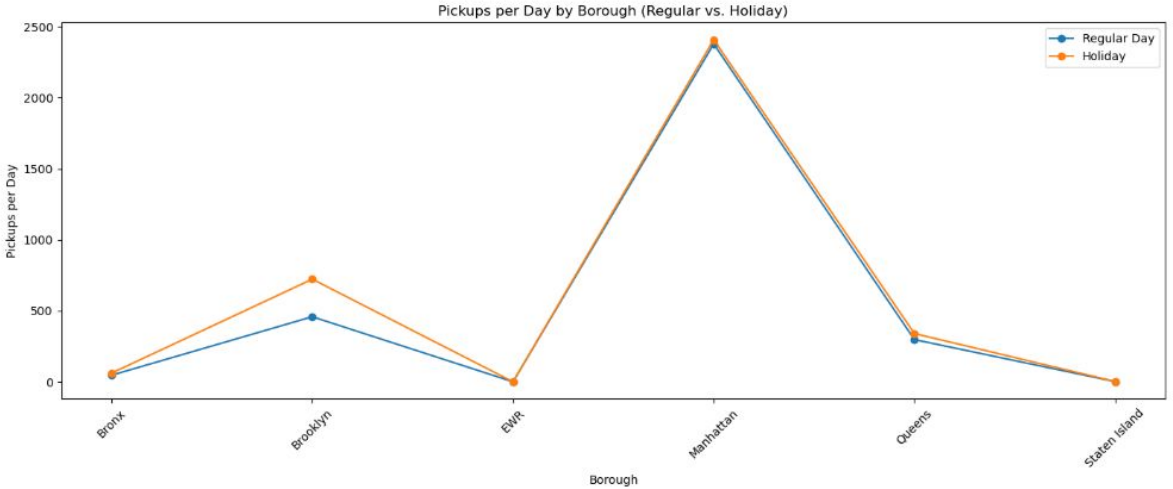


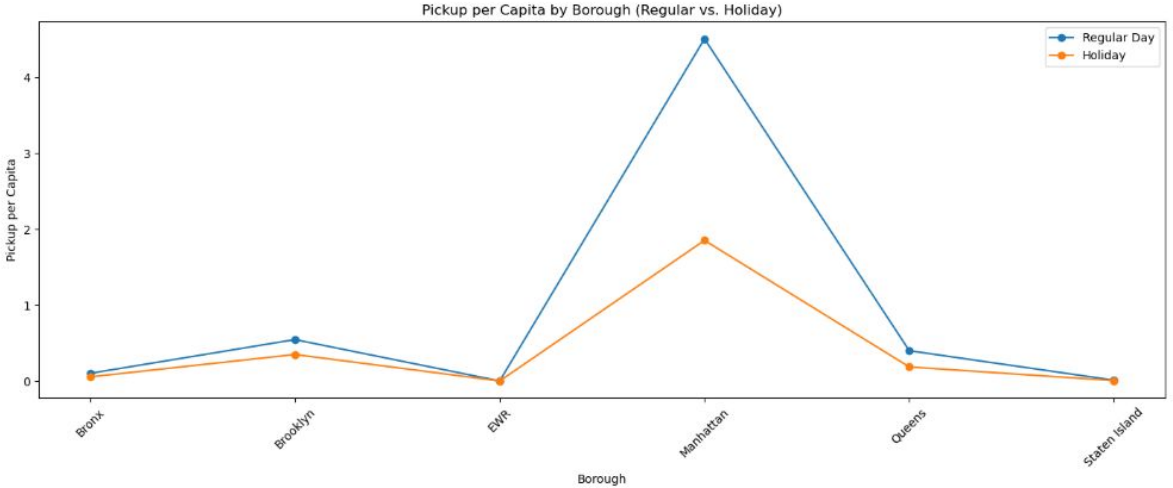
2. Population vs Pickups rate





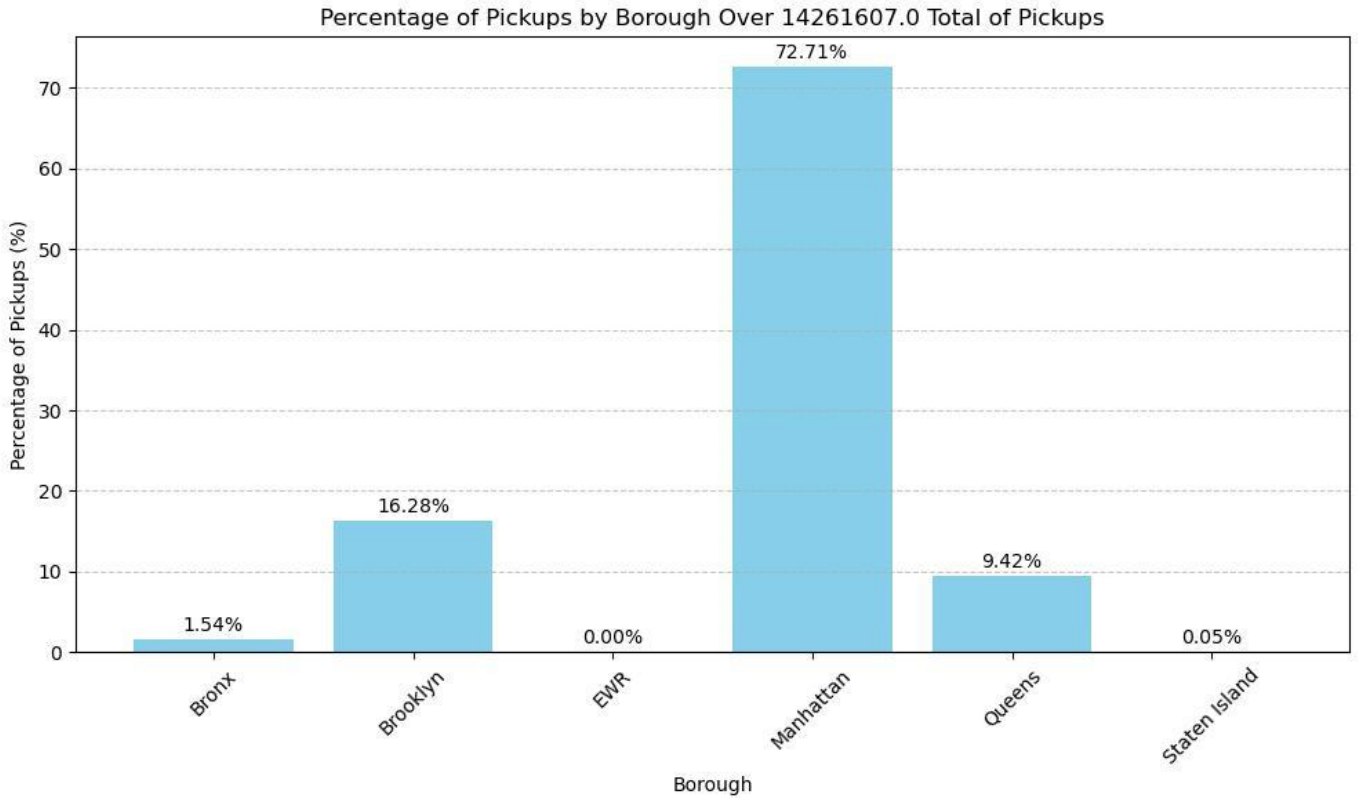
3. Pickups rate for Holiday vs Regular Day



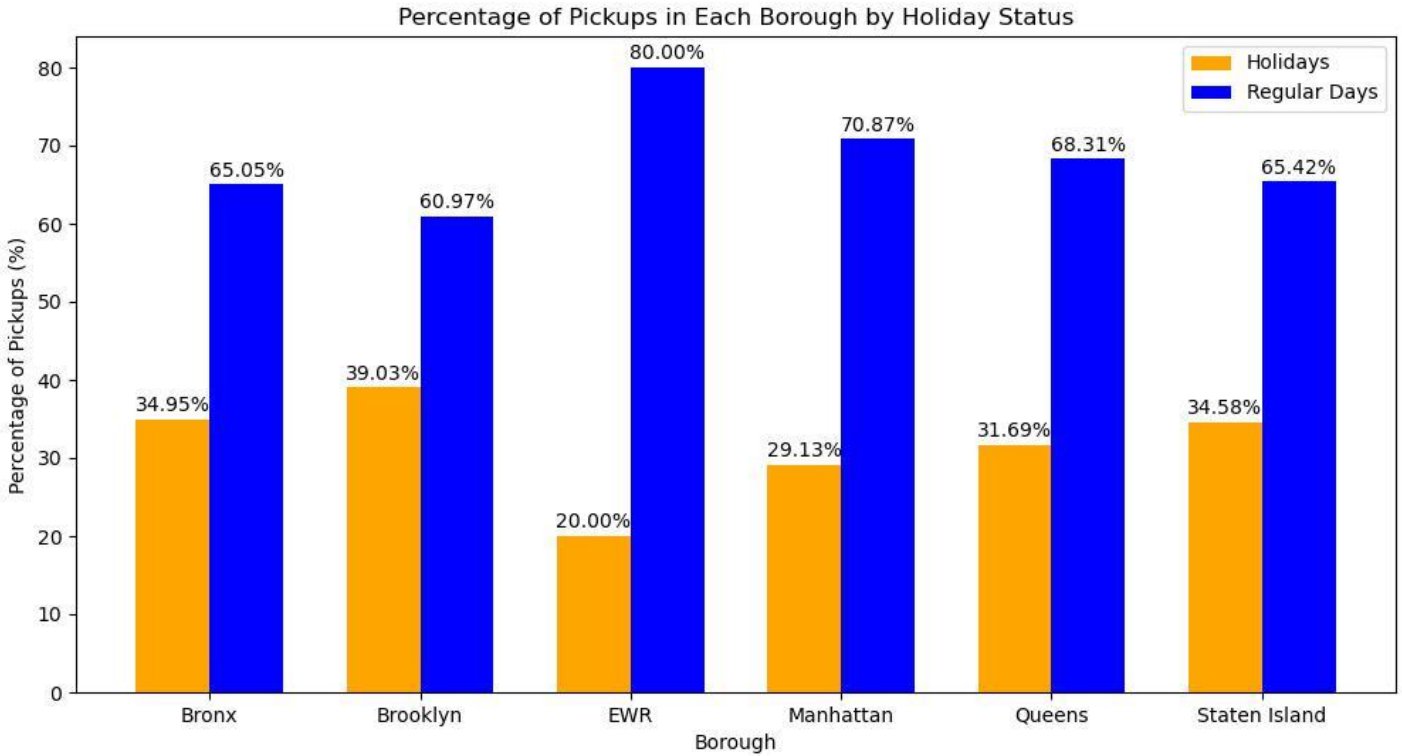


Q3. Are there any differences in pickups on holidays compared to regular days?

Geospatial Analysis: Percentage of Pickups by Borough

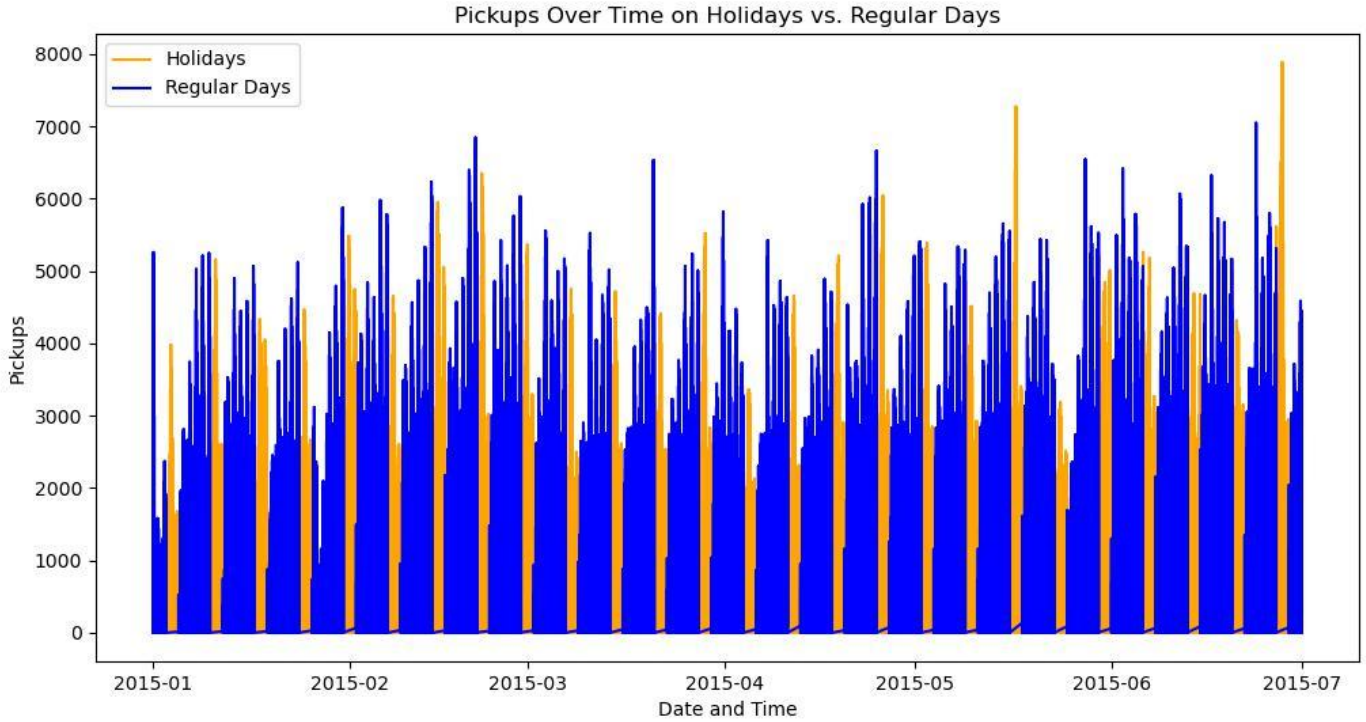


Holidays Vs Regular Days
Percentage of Pickups by Borough



Temporal Analysis
Monthly Pickups - Holidays vs Regular

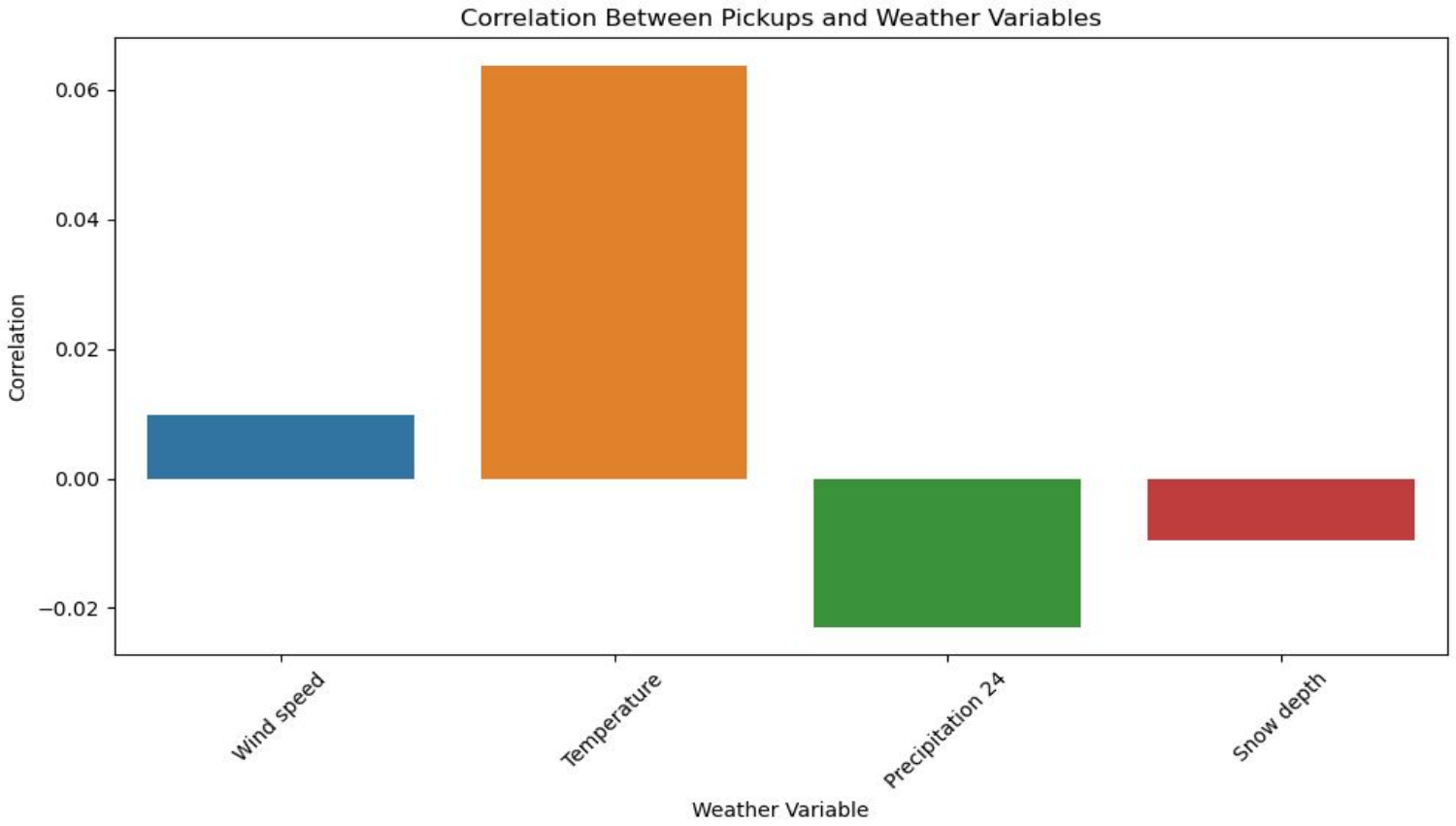
Temporal Analysis
Daily Pickups – Holidays vs Regular



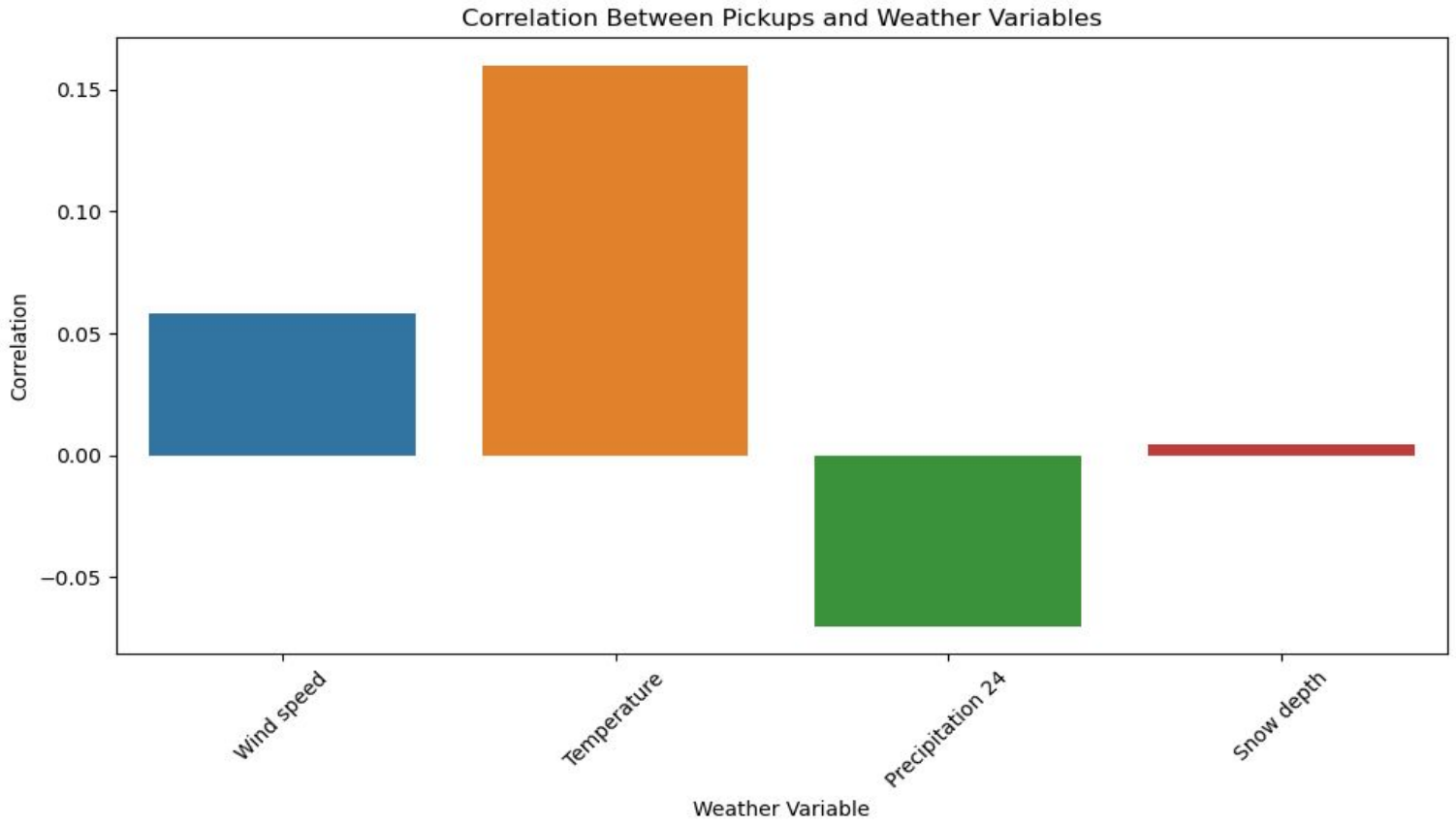
Q4. What is the impact the weather has on Uber pickups?

a. Do certain weather conditions lead to an increase or decrease in pickups?
b. Are there any correlations between weather variables and pickups?

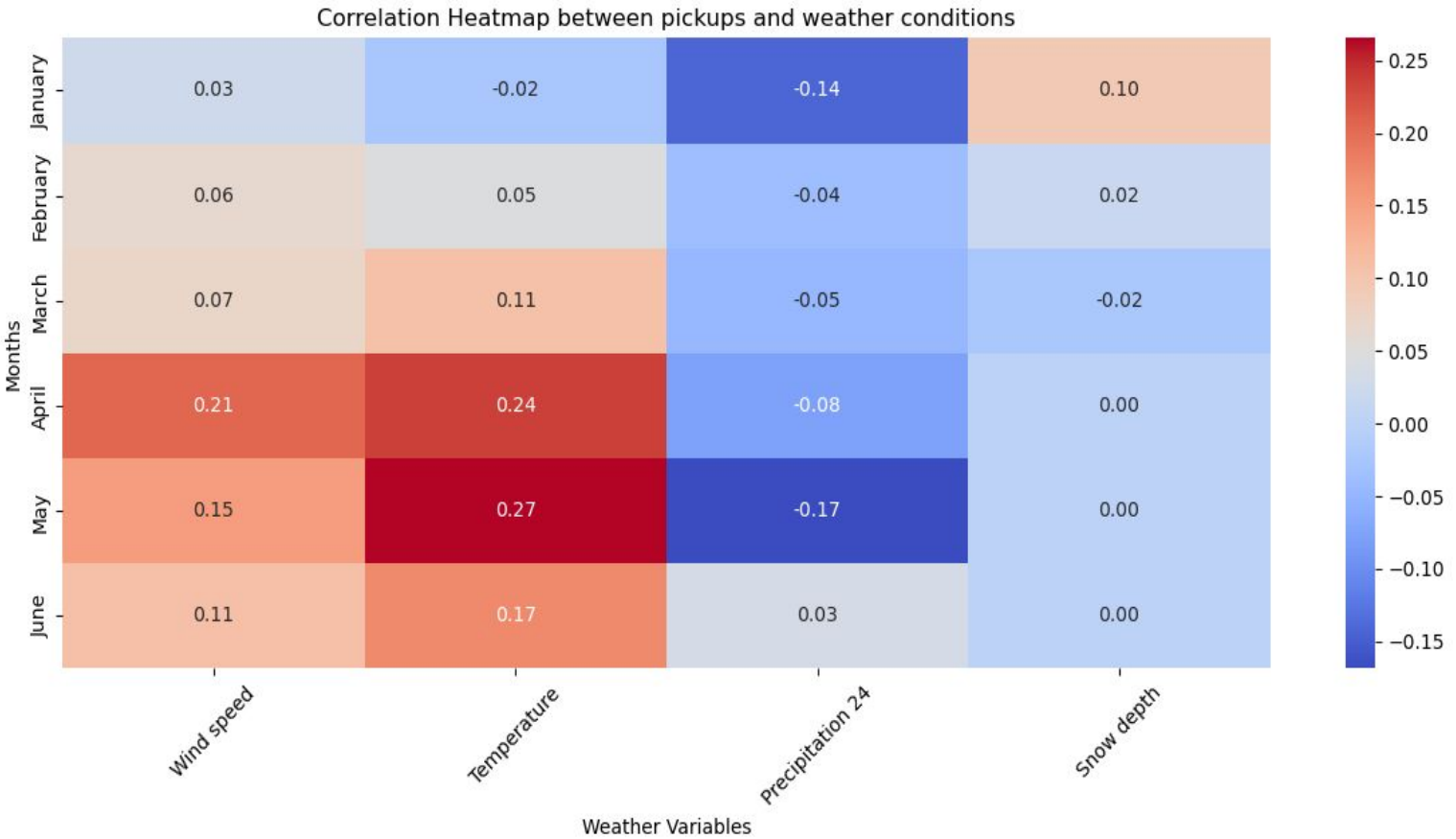
Correlations between weather variables and pickups in NYC (Jan-June 2015)



Correlations between weather variables and pickups in Manhattan (Jan-June 2015)



Correlations between weather variables and pickups in Manhattan (Jan-June 2015)



Conclusion

1. Pickups is highly impacted by weather, positive relationship between pickups and temperature, negative relationship between pickups and snow fall.
2. There is no correlation between population and pickup rates.
3. The peak time for pickups is daytime and pickups rapidly drop during night.
4. The correlation analysis on pickup rates indicates a notable difference between holiday and regular day pickups.
5. Our analysis reveals that Manhattan, Brooklyn, and Queens consistently emerge as the highest demand areas for Uber services.

Thank you!

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