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Uber Supply-Demand Gap Analysis

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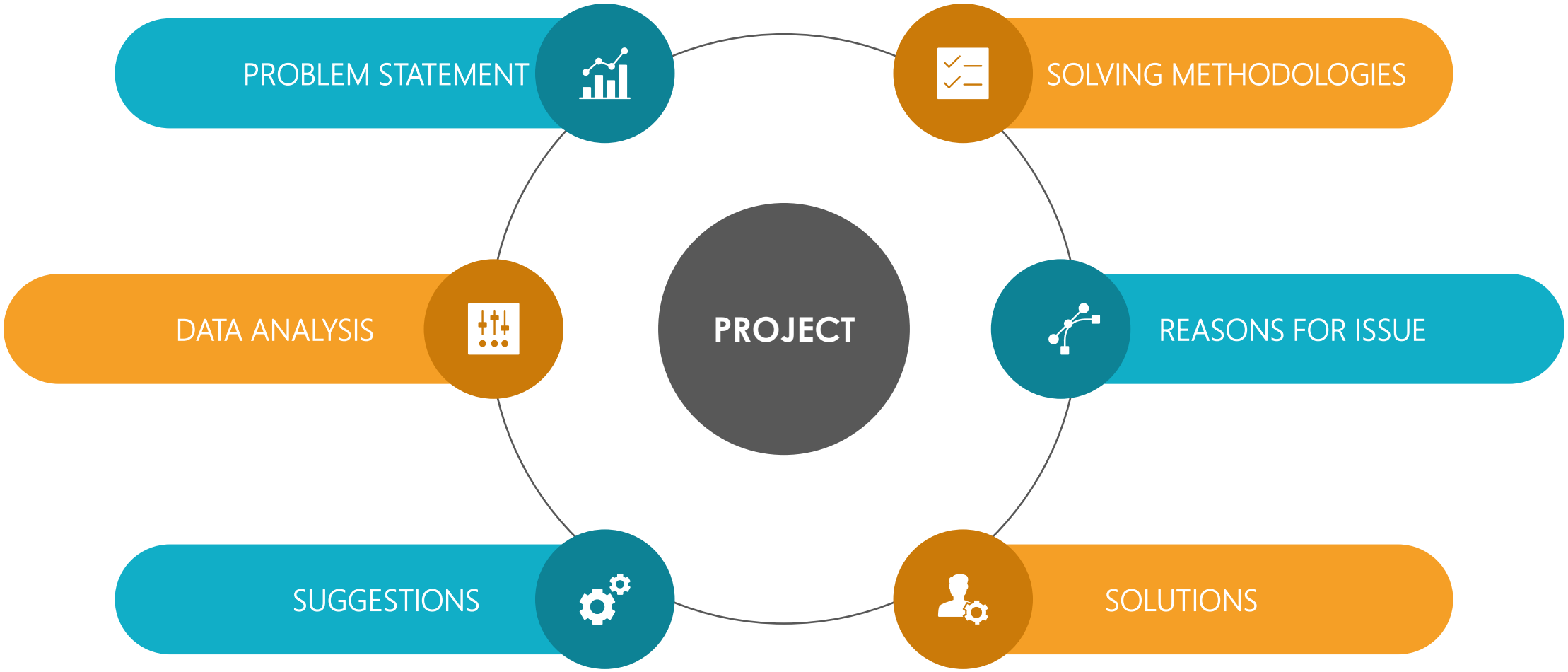
Project


PROBLEM STATEMENT
SOLVING METHODOLOGIES
DATA ANALYSIS
PROJECT
REASONS FOR ISSUE
SUGGESTIONS
SOLUTIONS

Solving Methodology

DATA COLLECTION & CLEANING

1. Importing dataset
2. Identifying data quality issues and data cleaning
3. Formatting date-time values
4. Converting data values for analysis.

EXPLORATORY DATA ANALYSIS

1. Analyzing data and variables.
2. EDA operations such as Univariate Analysis.
3. Identifying types of requests, time slots and locations that constitute for supply demand gap.

VISULAIZATION

1. Using Matplotlib & Seaborn package of Python to plot various graphs and to display important insights.
2. Visually identifying the most pressing problems for Uber.

OUTCOMES

1. Presenting the observations.
2. Recommendation of possible solutions to resolve the supply-demand gap.

Project Abstract

Aim:

The objective is to identify and analyze the problems in Supply-Demand of Uber trips from City to Airport and vice-versa across various hours of the day and find out possible solutions to address the problem.

Problem Statement:

Uber is an app-based transportation network and taxi company. In its Airport rides in a particular city, many of its users face the problem of cancellation by the driver or non-availability of cars. These very issues impact the business of Uber and it loses out on its revenue.

Approach:

The primary approach is to use EDA operations like univariate analysis to identify problems and tackle it.
Using the data set available, we make use of Python, a statistical computing program to perform various EDA (Exploratory Data Analysis) operations and hence find out the results. We make use of matplotlib and seaborn package of Python to plot graphs.

Inference:

To come up with solutions to address this Supply-Demand issue and recommend realistic, actionable solutions.

Project Abstract

Data Understanding

There are six attributes associated with each request made by a customer:

1.Request id: A unique identifier of the request

2.Time of request: The date and time at which the customer made the trip request

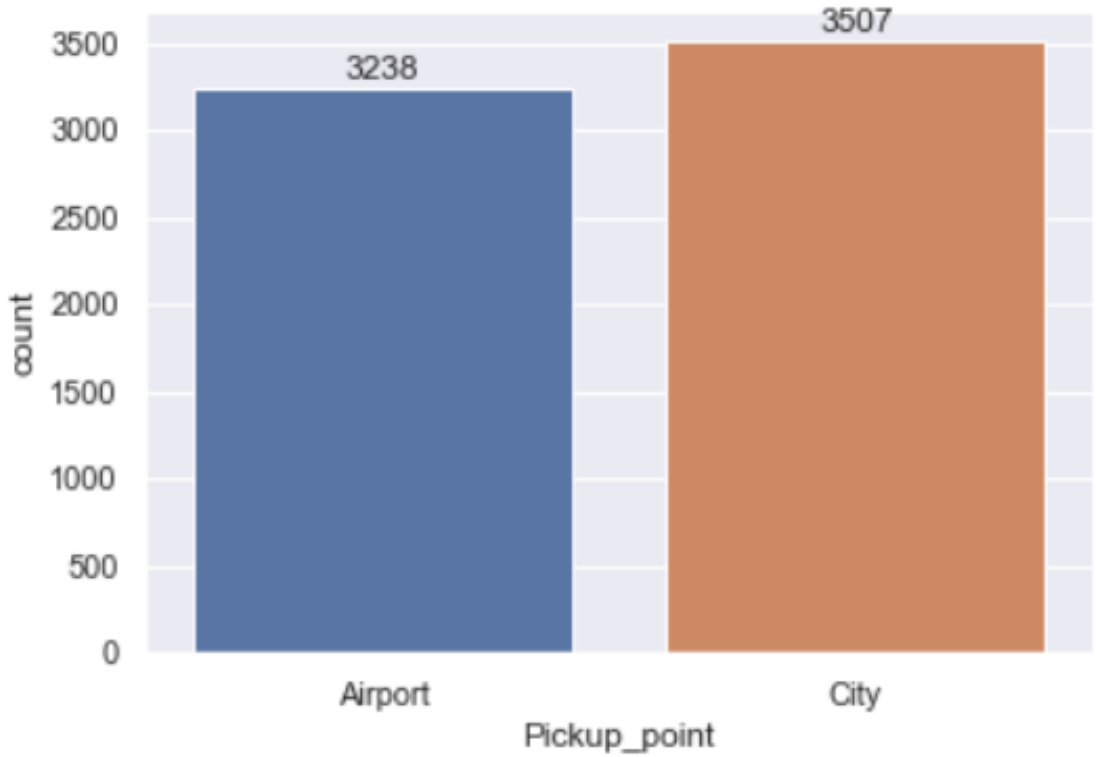
3.Drop-off time: The drop-off date and time, in case the trip was completed

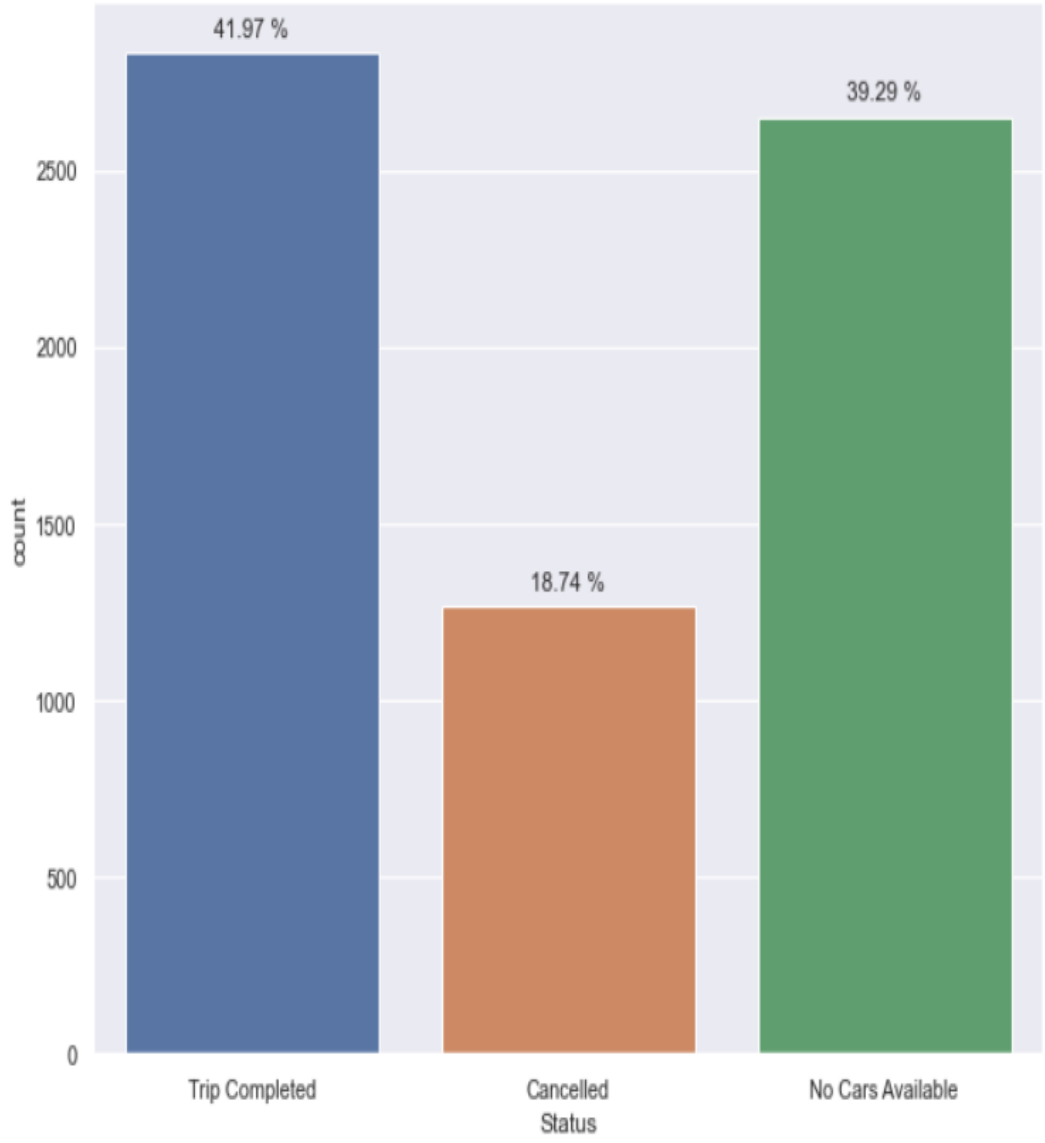
4.Pick-up point: The point from which the request was made

5.Driver id: The unique identification number of the driver

6.Status of the request: The final status of the trip, that can be either completed, cancelled by the driver or no cars available

Problem



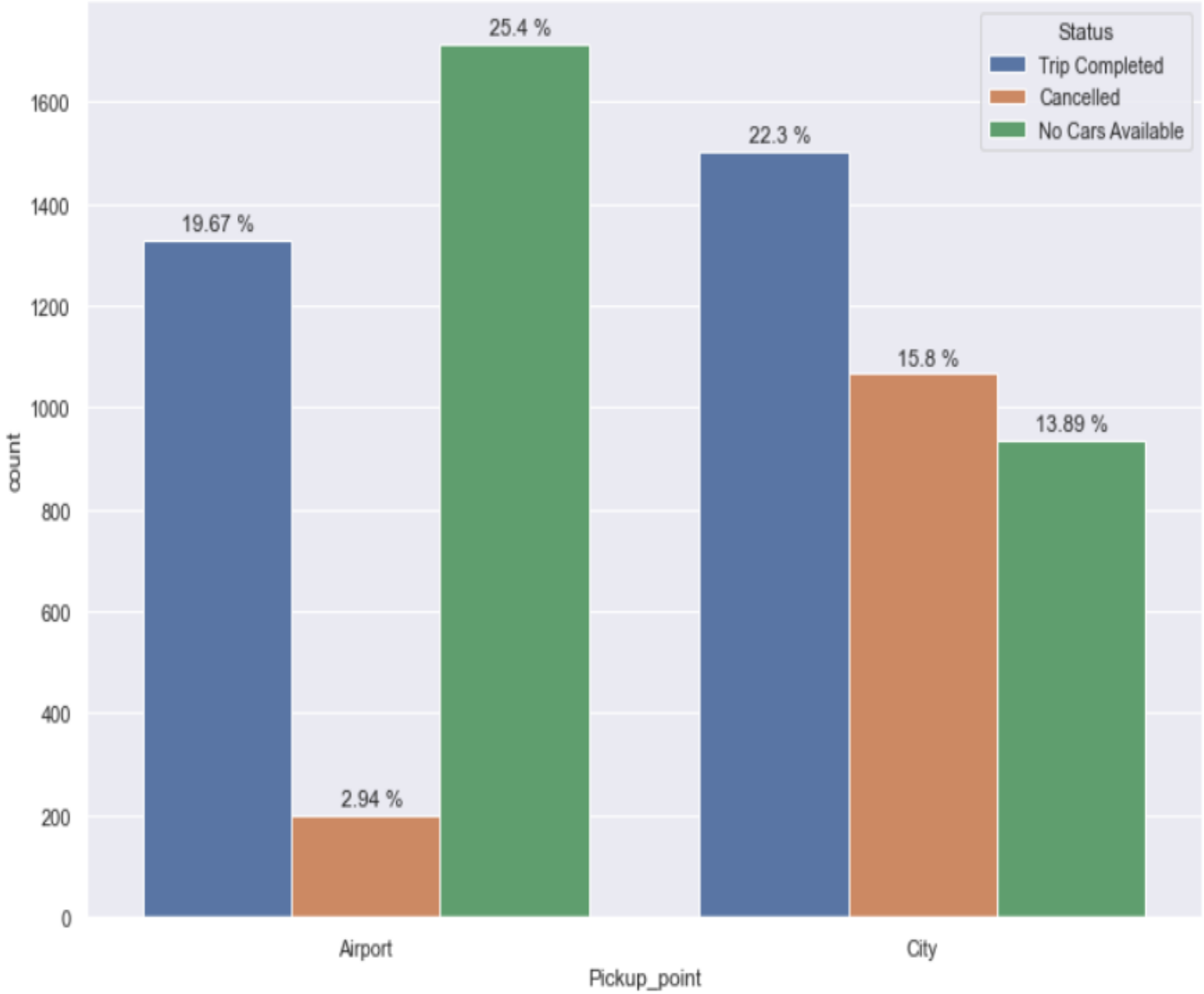


The number of requests are nearly same for Airport and City.
But, around 19% of User requests, Cabs get Cancelled.
And, around 39% of User requests, they get No Car available.

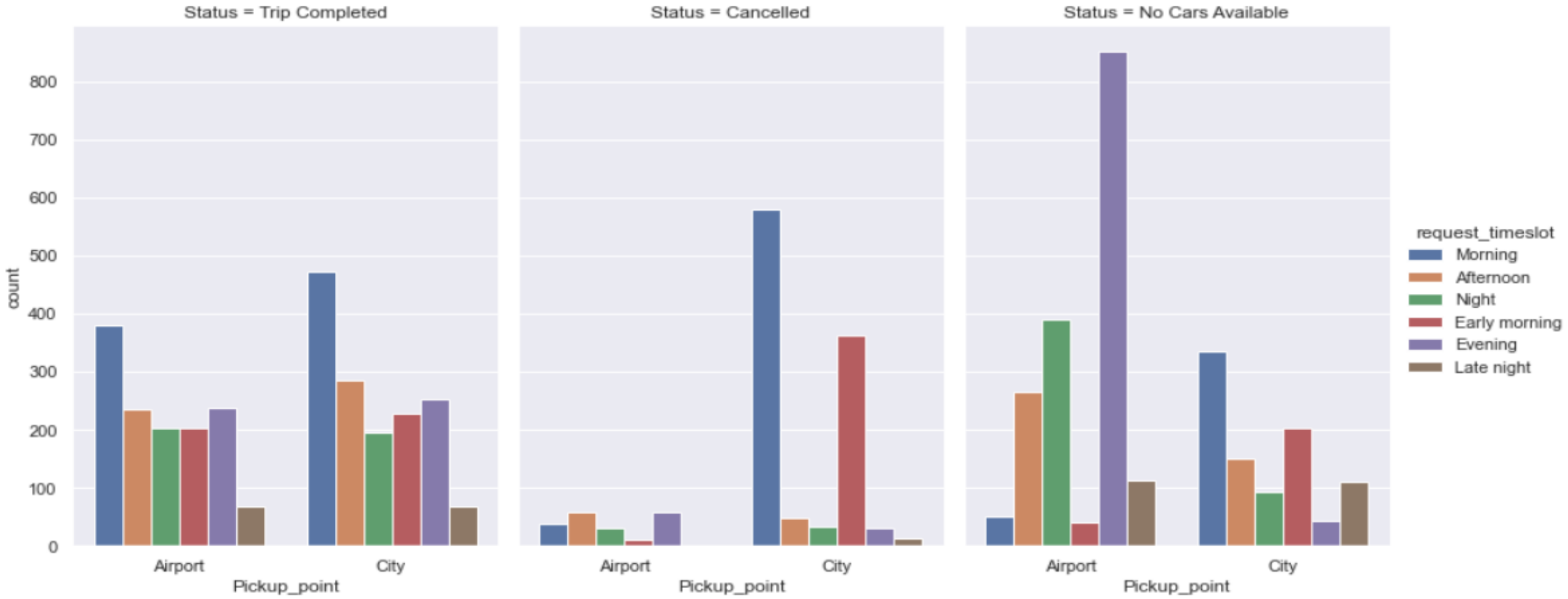
Analysis based on Pickup Point

At Airport:
For 25% requests: No Cab available

At City:
For 16% requests: Cab Cancelled

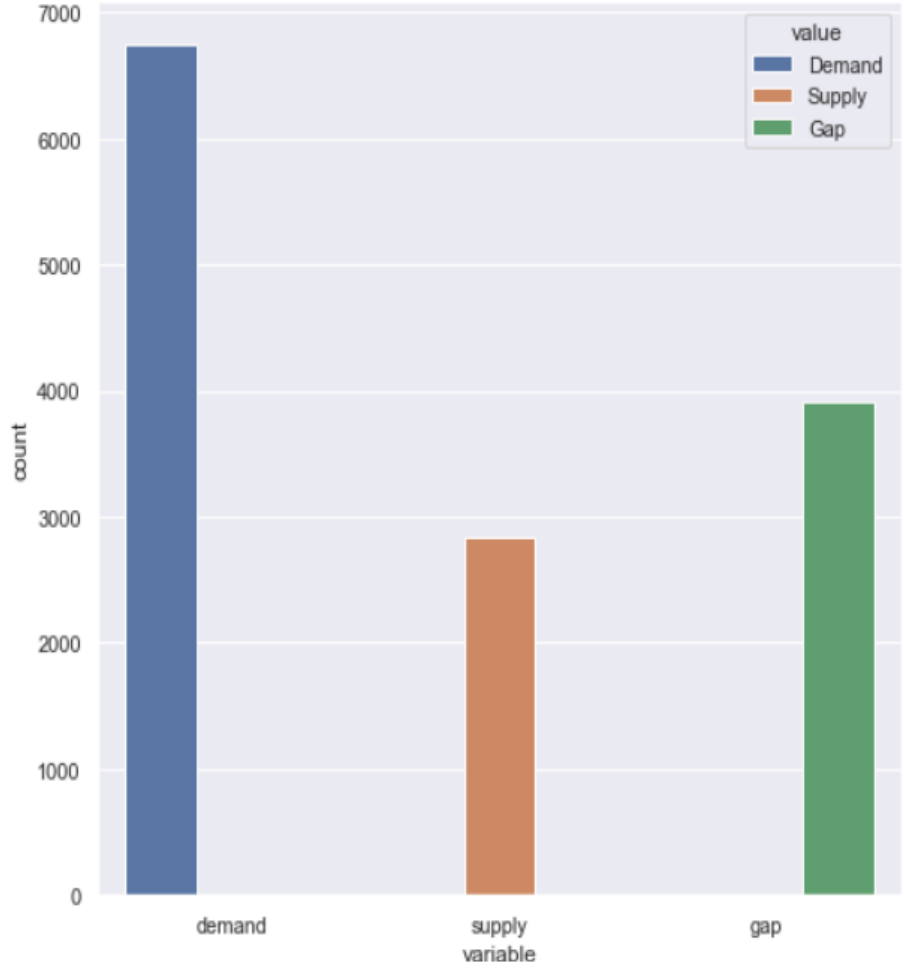


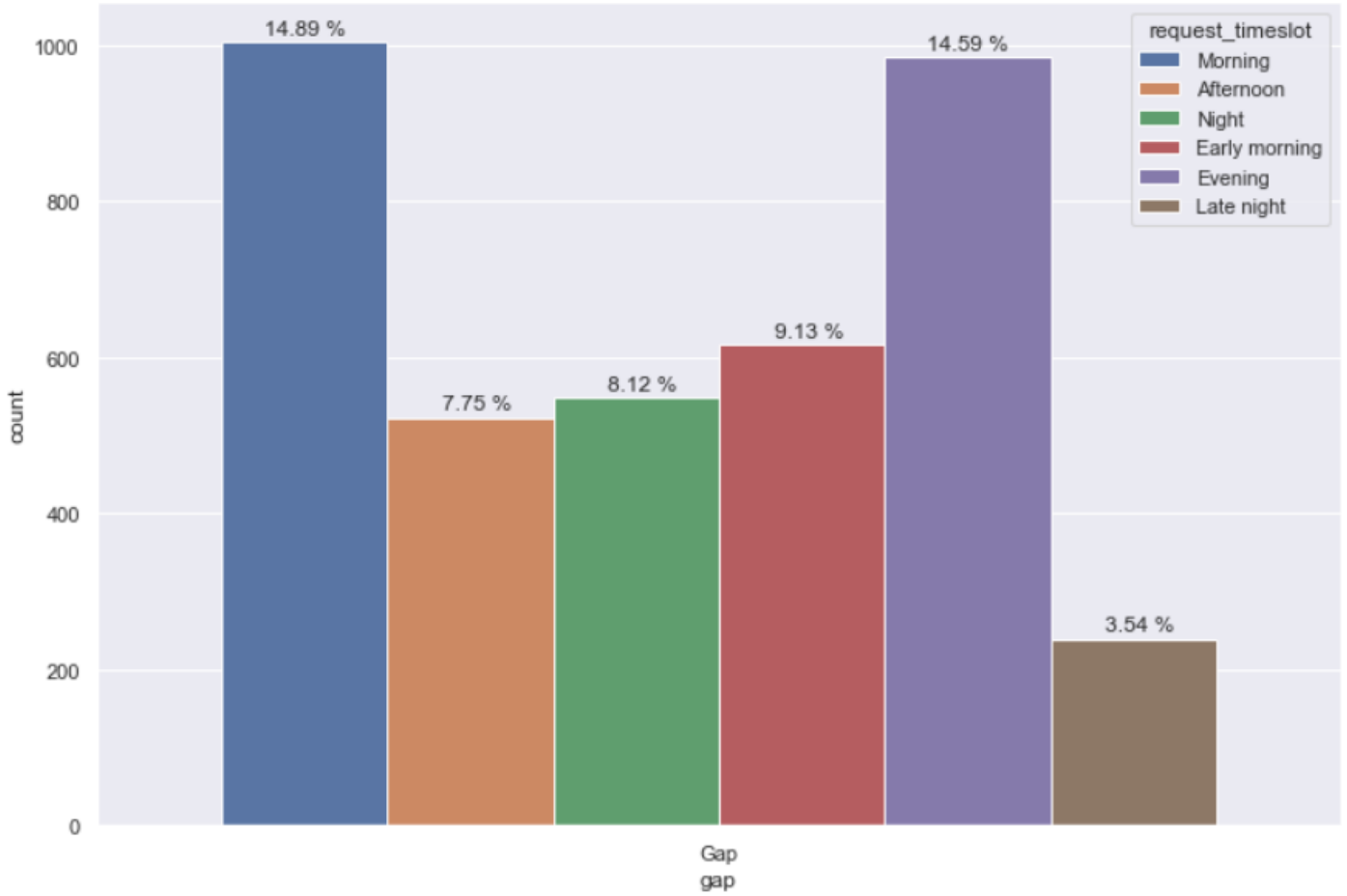
Analysis based on Time



1. Morning hours : There is high demand for cabs from city to airport.
2. Evening hours : There is high demand for cabs from airport to city.

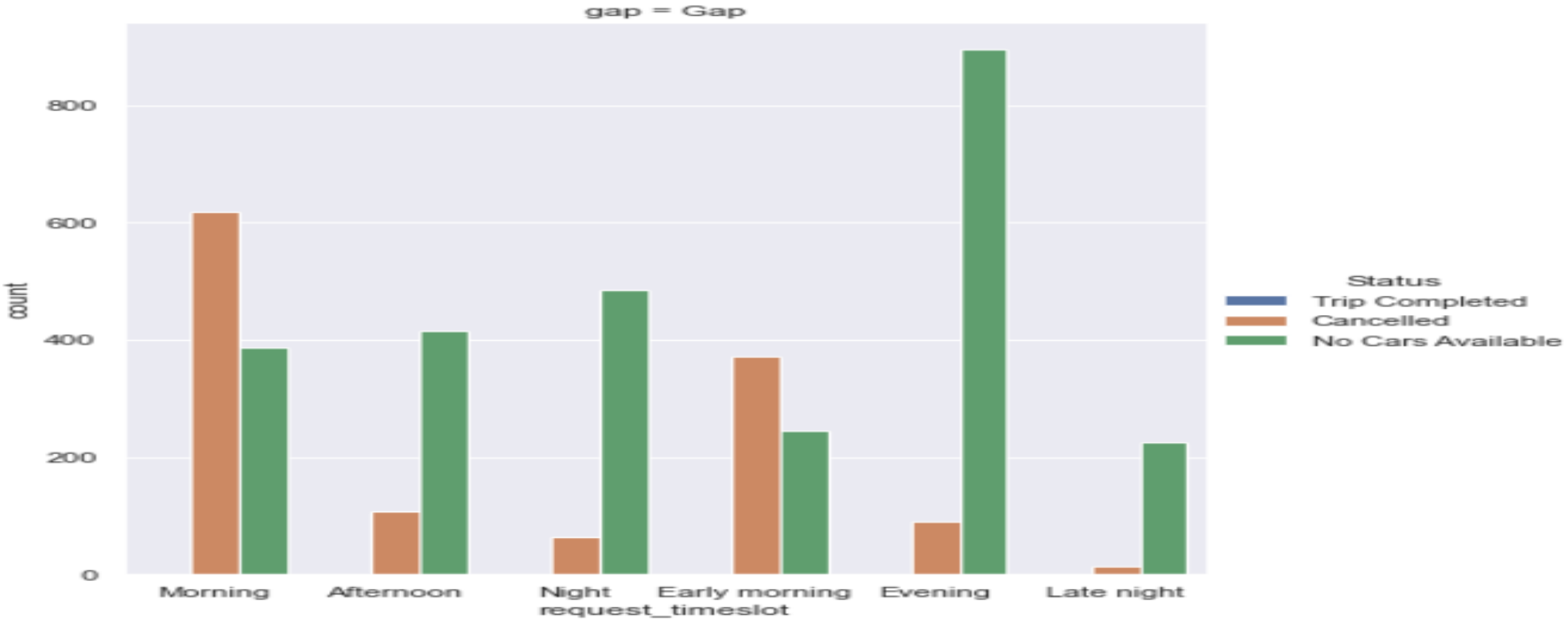
Analysis of Supply-Demand Gap





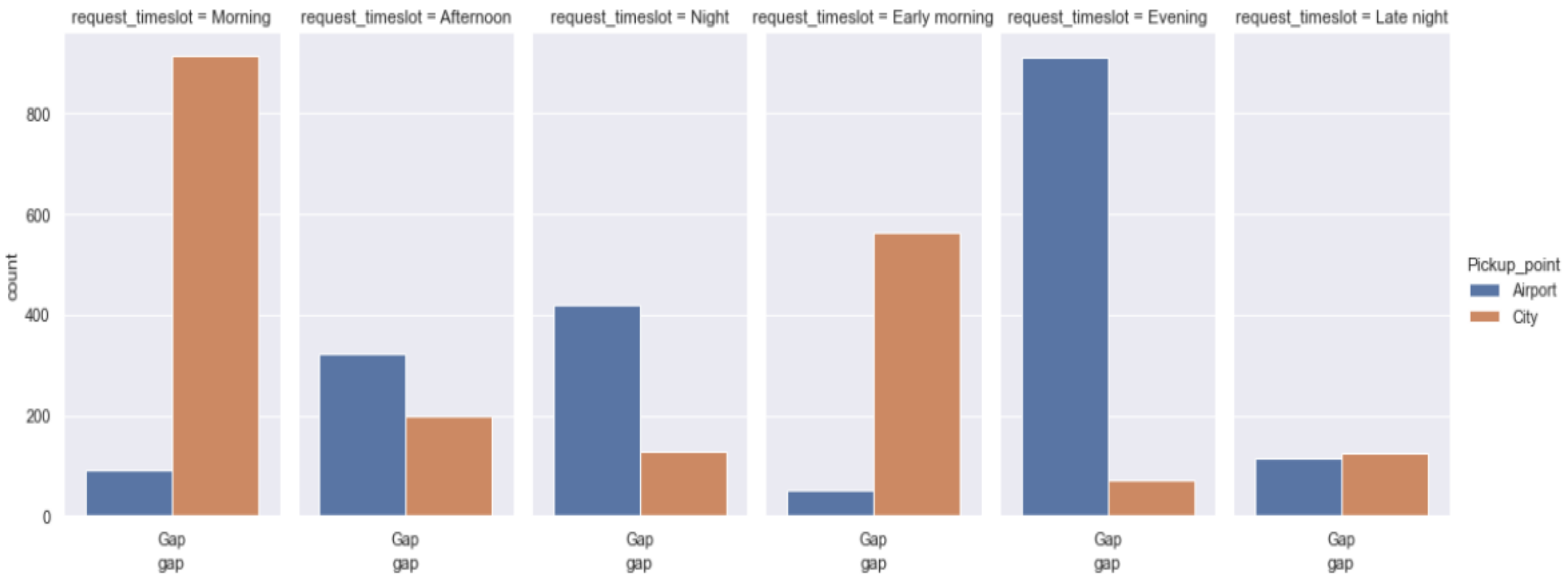
There is gap of 58% in the supply of cabs.
And 15% gap happens in morning and evening timeslot each.

Supply-Demand Gap based on Time



Highest 'cancelled' gap comes from morning slot.
Highest 'No car available' gap comes from evening slot.

Supply-Demand Gap based on Location



15% of gap that exist in morning is due to cancellation of cab at City.
15% of gap that exist in morning is due to no car availability at Airport.

Possible Reasons for the Gap issue

Peak Morning Slot Problem

1.We observed that in the Peak Morning Slot where the demand for City to Airport trips are high, there are maximum number of trip cancellations leading to great Gap in the Demand & Supply.
2.This is because the trip to Airport from the City usually takes a longer time. Once the driver is in the Airport, he will have a longer idle time depending on the flight patterns. In the mornings, a lot of flights usually leave the city and less flights arrive. Also, it doesn't make any economical sense to come back empty from the Airport to the City.
3.All these factors lead to high cancellation rate for trips from City to Airport.

Peak Evening Slot Problem

1.We observed that in the Peak Evening Slot where the demand for Airport to City trips are high, there are maximum number of "No Cars Available" leading to great Gap in the Demand & Supply.
2.This is because by the night, a lot of flights including the international ones start arriving at the airport. This creates a high demand for the cars. Also, the Uber driver partners start retiring for the day as the dawn proceeds leading to a high non availability of the cars.
3.These factors lead to high "No Cars Available" issue for trips from Airport to City.

Solutions & Recommendations

1. Provide incentives for airport trips during peak time.
2. Assigning few extra cabs specially to the airport trips.
3. Fixing a base price for drivers idle time in the airport or to come back to the city without any passenger.
4. Impose penalty for cancellation of requests by the drivers. Set a threshold for the maximum cancellation per day.
5. Promote continuous trip to airport with incentives.
6. Promote advance booking to airports and at the same time keeping drivers updated with the flight schedule, this will help them plan their work and they can accept the request as per their work plan.

Thank You