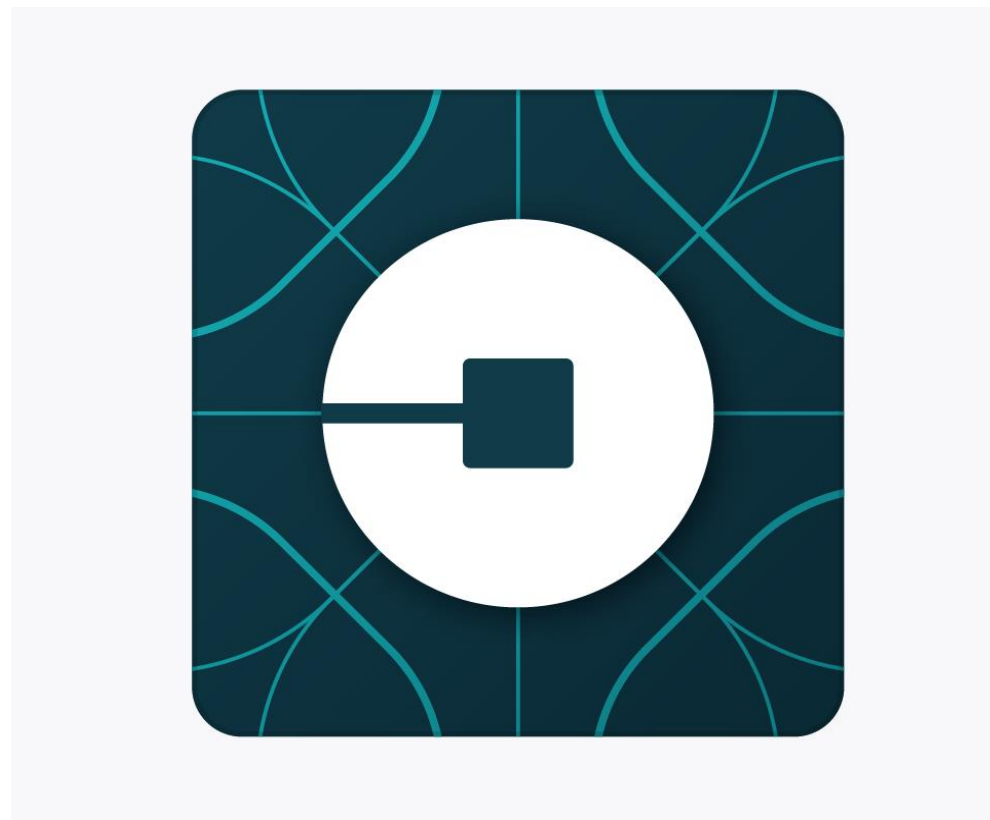# UBER SUPPLY DEMAND ASSIGNMENT

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About The Uber Supply Demand Study

Uber Technologies Inc. is a peer-to-peer ridesharing, taxi cab, food delivery, bicycle-sharing, and transportation network company headquartered in San Francisco, California, with operations in 785 metropolitan areas worldwide. Its platforms can be accessed via its websites and mobile apps.

- **Business Understanding:** You may have some experience of travelling to and from the airport. Have you ever used Uber or any other cab service for this travel? Did you at any time face the problem of cancellation by the driver or non-availability of cars? Well, if these are the problems faced by customers, these very issues also impact the business of Uber. If drivers cancel the request of riders or if cars are unavailable, Uber loses out on its revenue. Let's hear more about such problems that Uber faces during its operations.

- **Business objective:** The aim of analysis is to identify the root cause of the problem (i.e. cancellation and non-availability of cars) and recommend ways to improve the situation. As a result of your analysis, you should be able to present to the client the root cause(s) and possible hypotheses of the problem(s) and recommend ways to improve them.

- **About the dataset:** This data set is a **masked data set** which is similar to what data analysts at Uber handle. Solving this assignment will give you an idea about how problems are systematically solved using EDA and data visualisation.

Problem solving methodology

Our problem solving methodology included step by step prosecution of data , as follows:-

Understanding all the necessary conditions mentioned for the analysis

Analysing the data set provided, cleaning and preparing

Performing various tasks i.e plotting required on data set in Jupyter notebook.

Looking at the plots and finding out the reason for the supply demand gap issue that Uber is facing

Finally, representing the results in a PPT

Data Understanding

1. This includes the understanding of the data given to us. Having random look at the dataset and thinking of the possible inferences we can make.

2. Below are the attributes of the dataset provided:
   - **Request id**: A unique identifier of the request
   - **Time of request**: The date and time at which the customer made the trip request
   - **Drop-off time**: The drop-off date and time, in case the trip was completed
   - **Pick-up point**: The point from which the request was made
   - **Driver id**: The unique identification number of the driver
   - **Status of the request**: The final status of the trip, that can be either completed, cancelled by the driver or no cars available

Data Cleaning and Preparation

1. Checking the data thoroughly which includes checking both in excel or with the use of python.

2. All the columns has been checked for invalid values and no invalid value has been found

3. No encoding was found during the import

4. The DateTimestamp column has been resolved into common format

5. The DateTimestamp column has been broken down into further columns which include the

   1. Request Date

   2. Drop Date

   3. Request Hour

   4. Drop Hour

   5. Request Time

   6. Drop Time

6. Commute time has been calculated into a separate column

Data Cleaning and Preparation continued..

1. Request ID has found to be unique which is the ideal case

2. A new column has been added to the dataframe i.e. RequestTimeSlotCategory based on the following timeslots:

   1. Morning => 05:00:00 to 11:59:59

   2. Afternoon => 12:00:00 to 16:59:59

   3. Evening => 17:00:00 to 21:59:59

   4. Night => 10:00:00 to 12:59:59

   5. Late Night => 01:00:00 to 04:59:59

3. The unnecessary columns are dropped

Plots

# In the plot, each plot is for every request day i.e. 11, 12, 13 and so on

Within each plot the x-axis contains the hour at which request was received and the bars are separated according to the Status

# i.e Trip completed, cancelled or 'no cars available
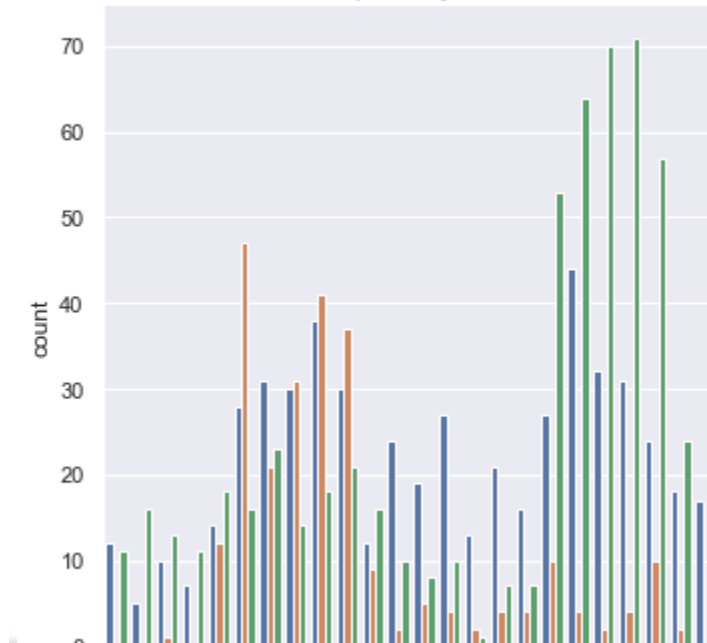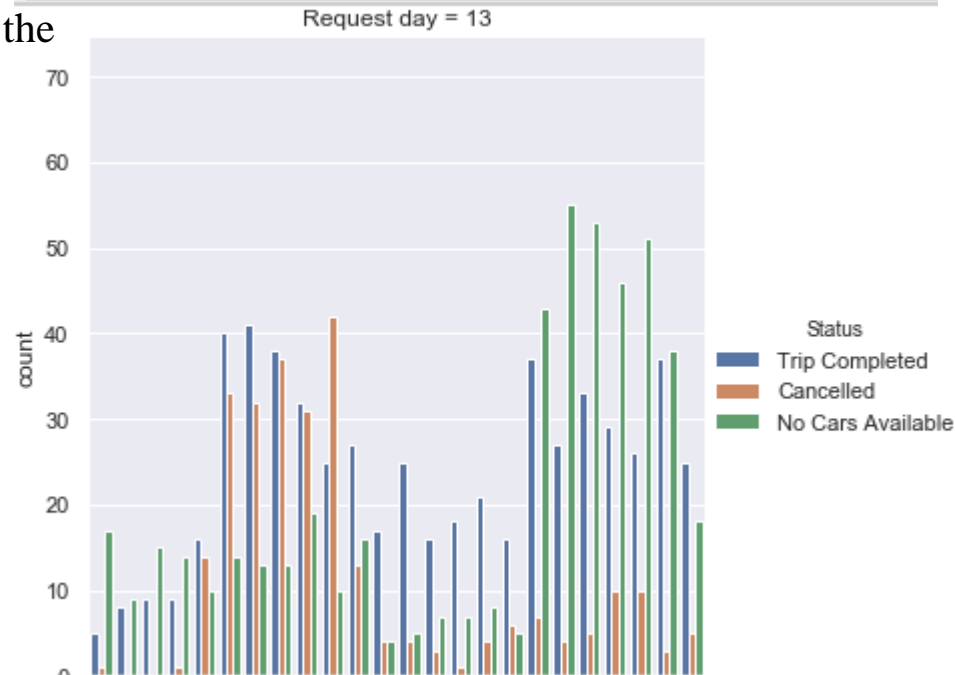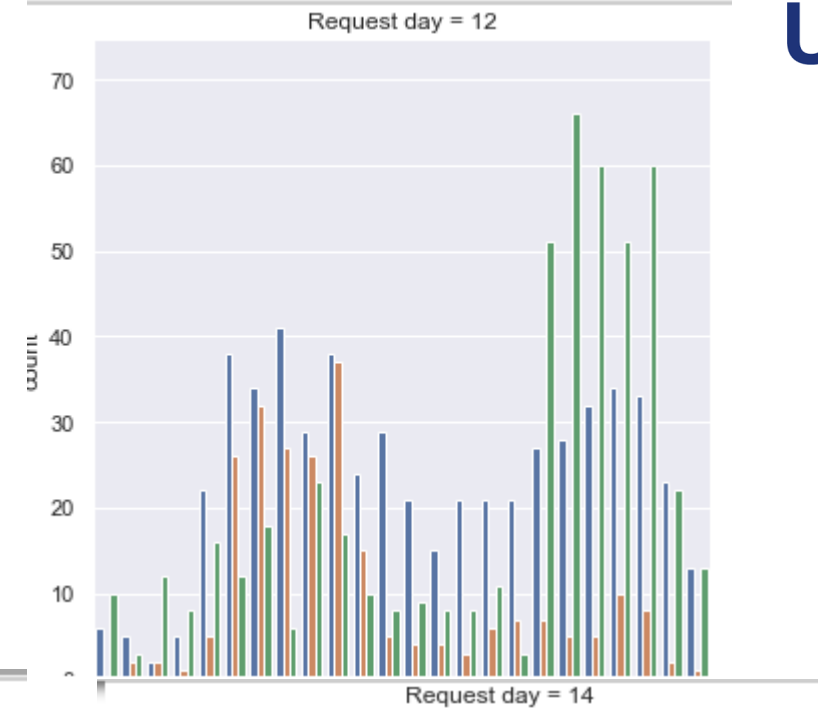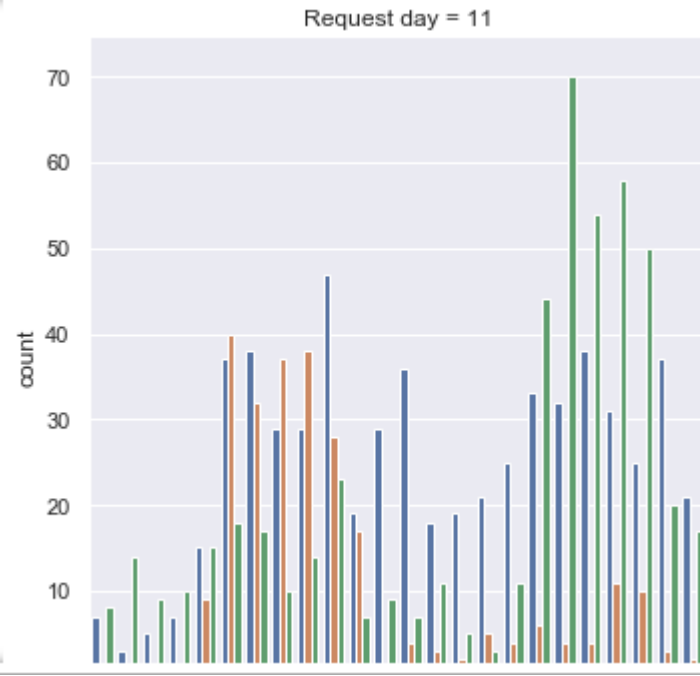
Plots contd..

Here we draw another factor plot of hour and day with different coloured bars showing us the 'pickup point'. As we see in the plot below there is a huge demand and supply gap. If we consider the hours 11 to 15 there is a balancing of request from both the sides i.e. the airport to city as well as. City to airport but if we see in the morning hours and evening hours in which most of the rides have been cancelled or no cabs were available this is the reason that requests from airport to city and city to airport do not balance each other and are vastly different
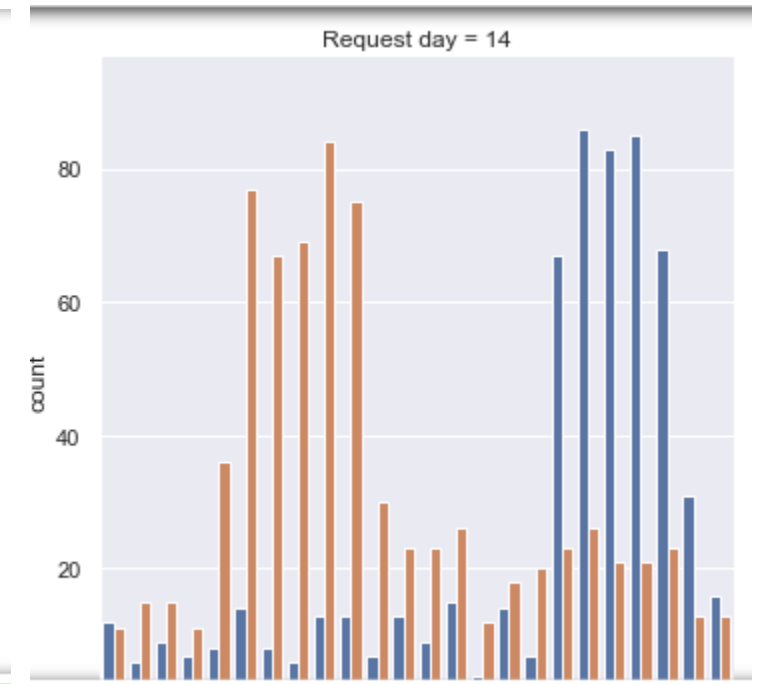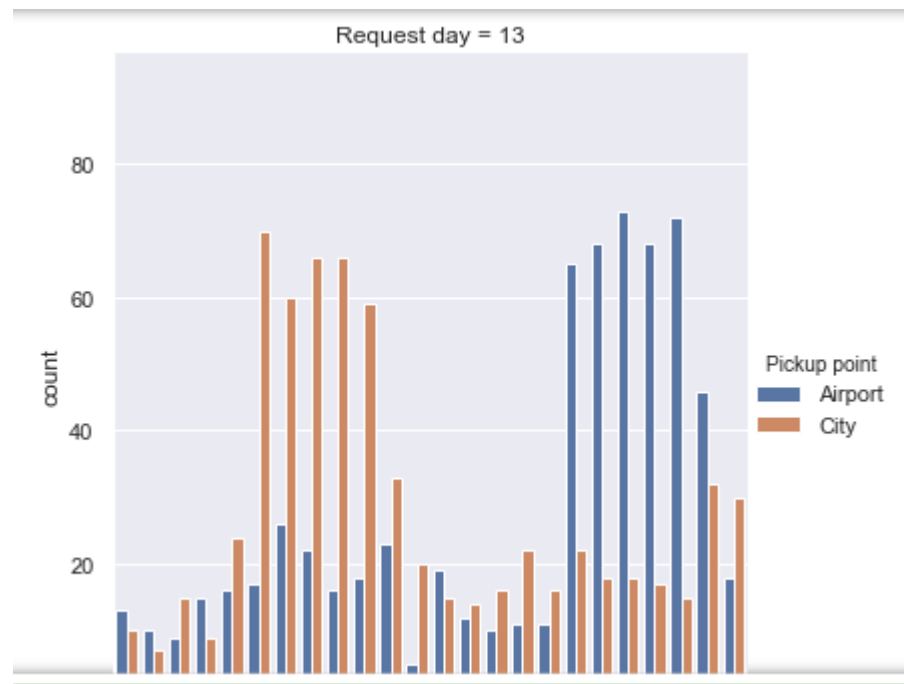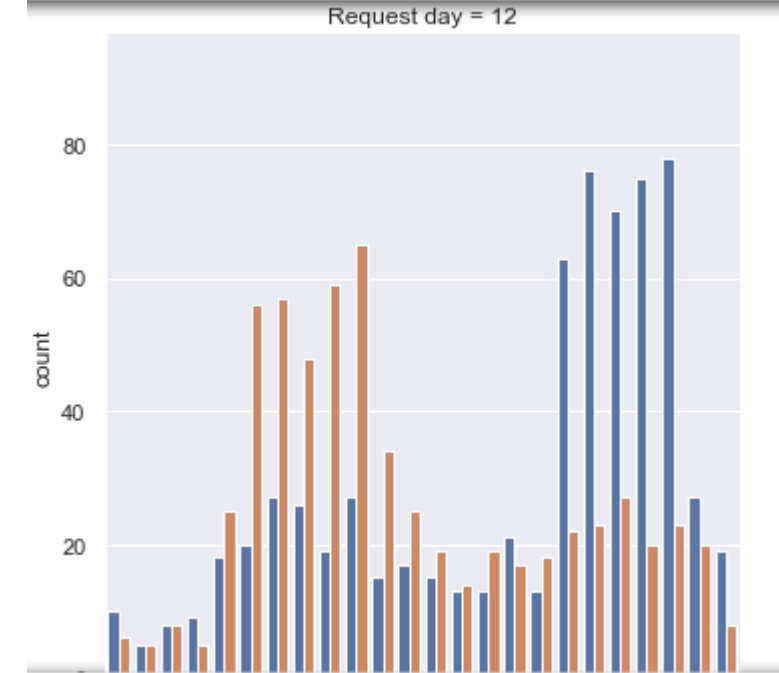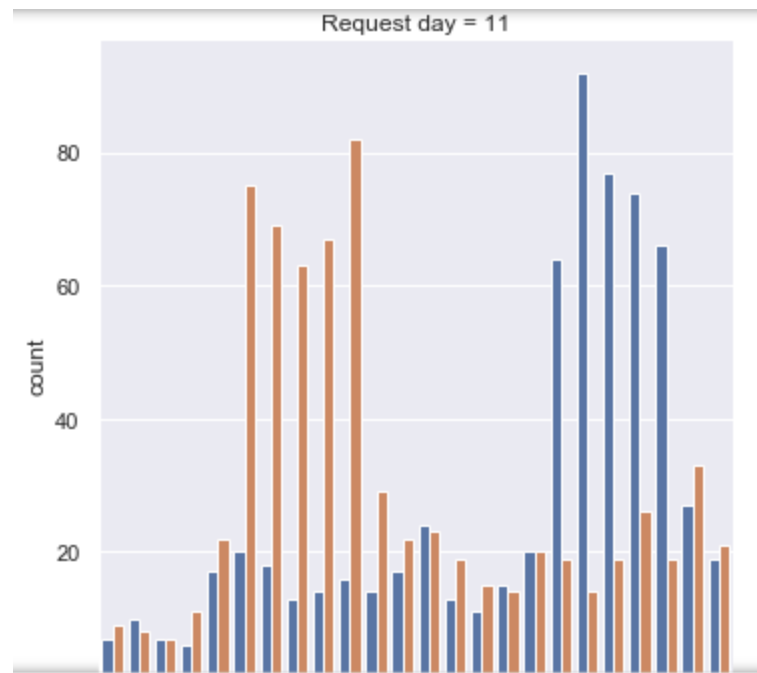
Plots contd…

The below plots shows us the overall picture of the request received i.e. both from airport to city and city to airport and shows that most of the 'No cars availabe' is in the evening slot and most of the 'Cancelled' rides are in the morning
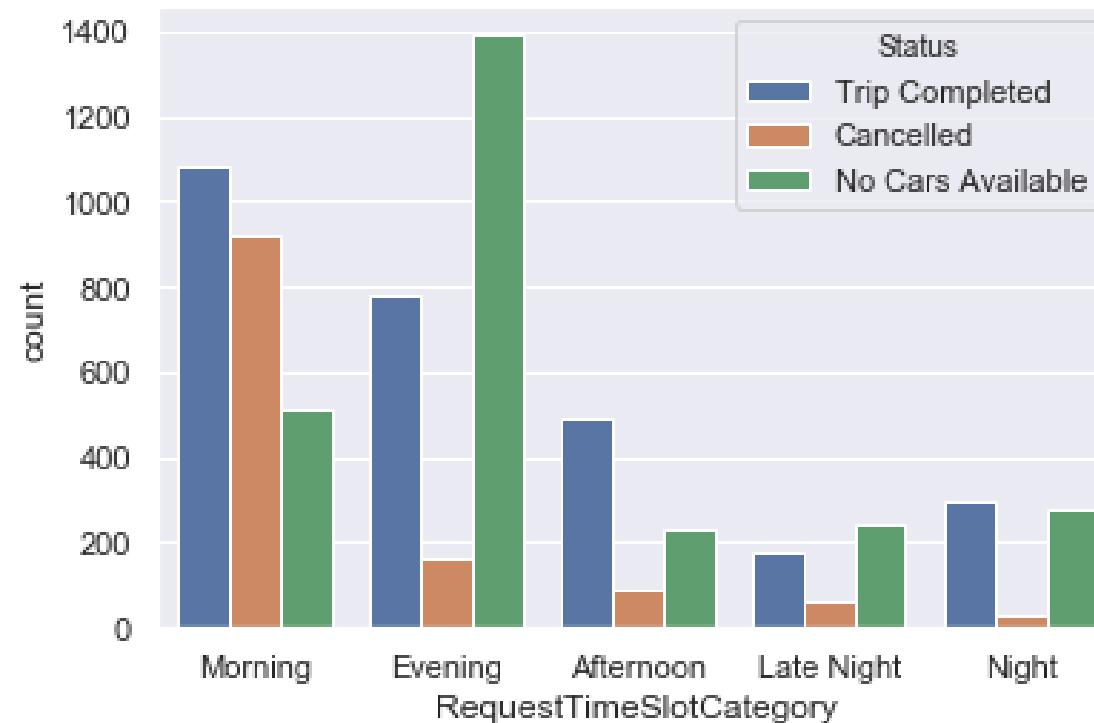
Plots contd..

The below plot shows us the commute time in different time slots i.e. 'late night', 'evening', etc..
As we see the highest time to commute from airpot to city is at 'late night' and minimum is at
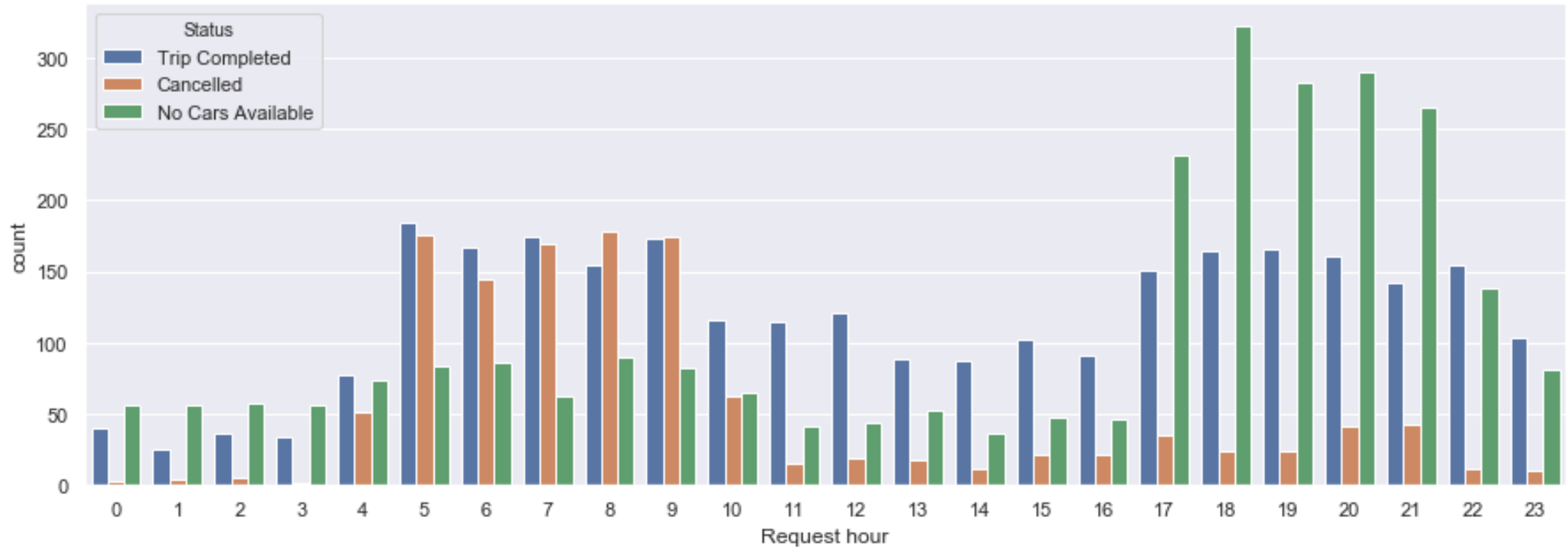morning and afternoon
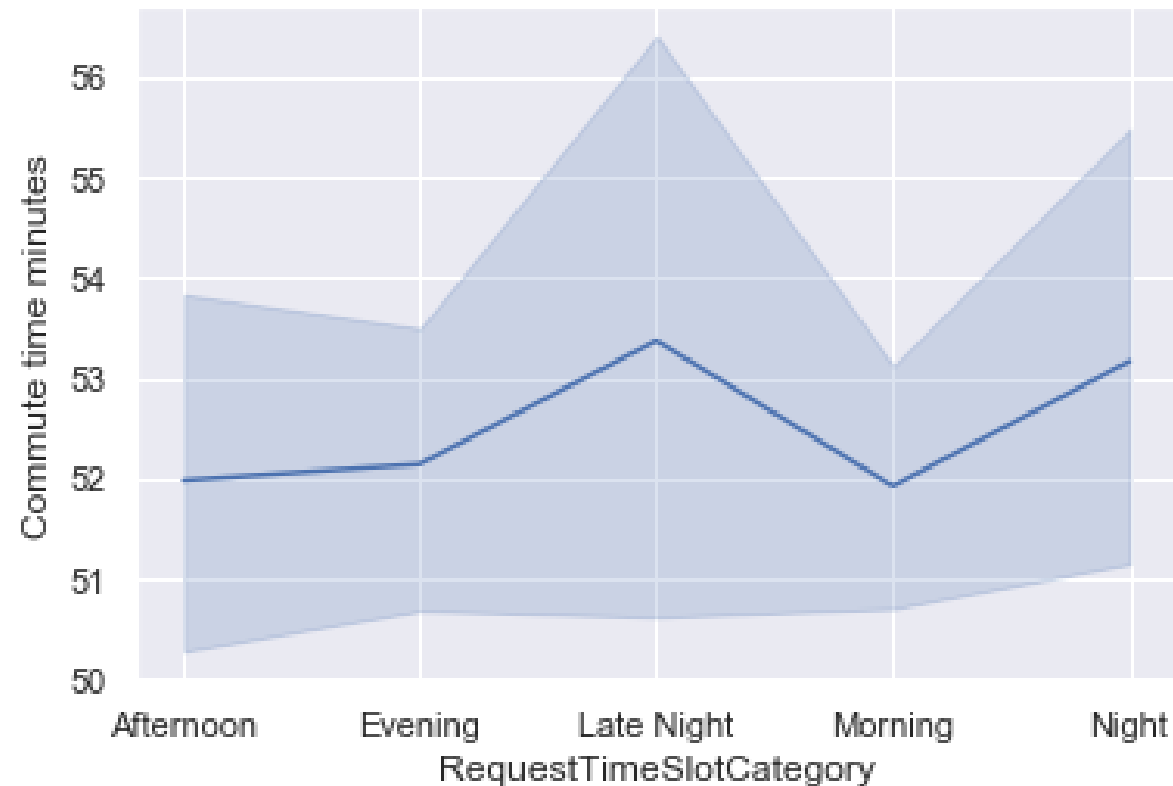
Plots

The below plot shows us the commute time in different time slots i.e. 'late night', 'evening', etc.. As we see the highest time to commute from city to airport is at 'late night' and minimum is in the evening
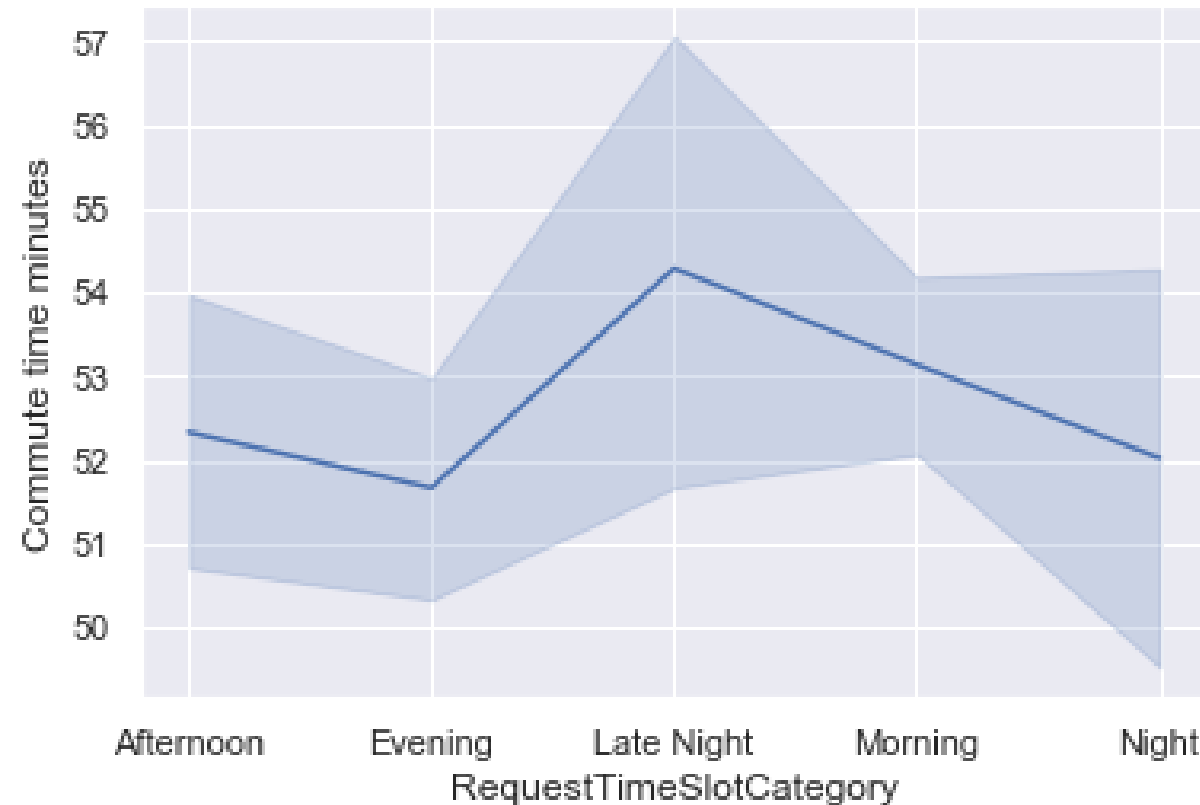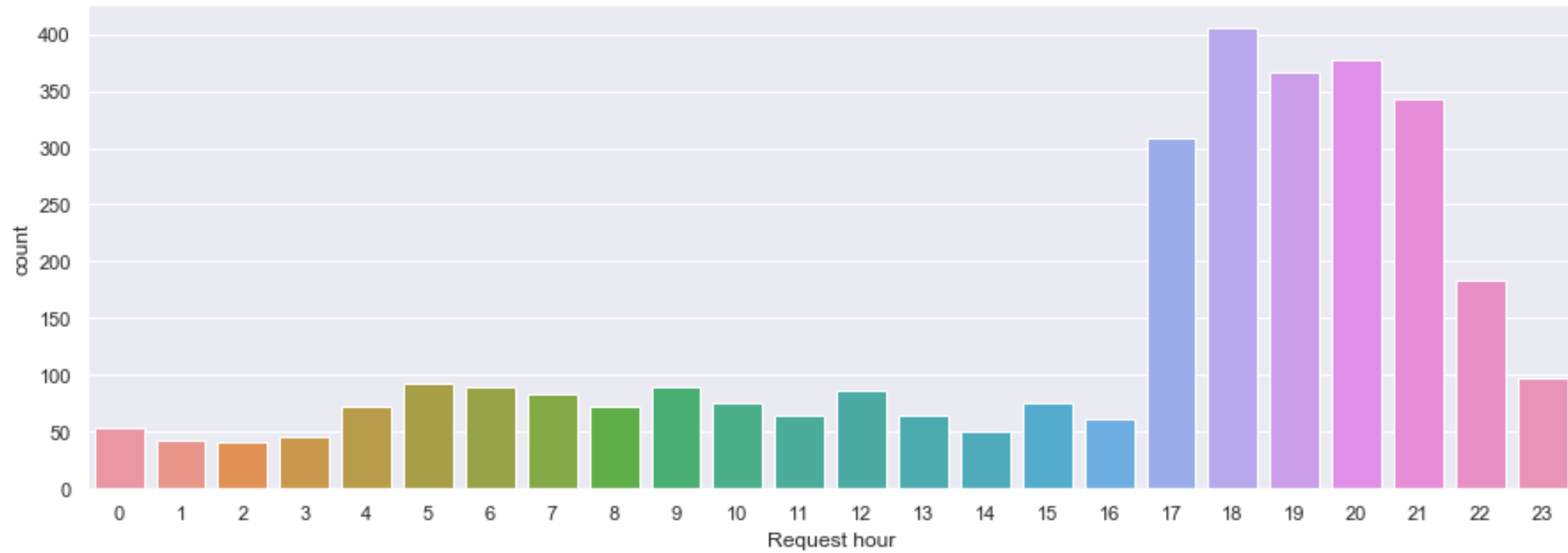
Plots

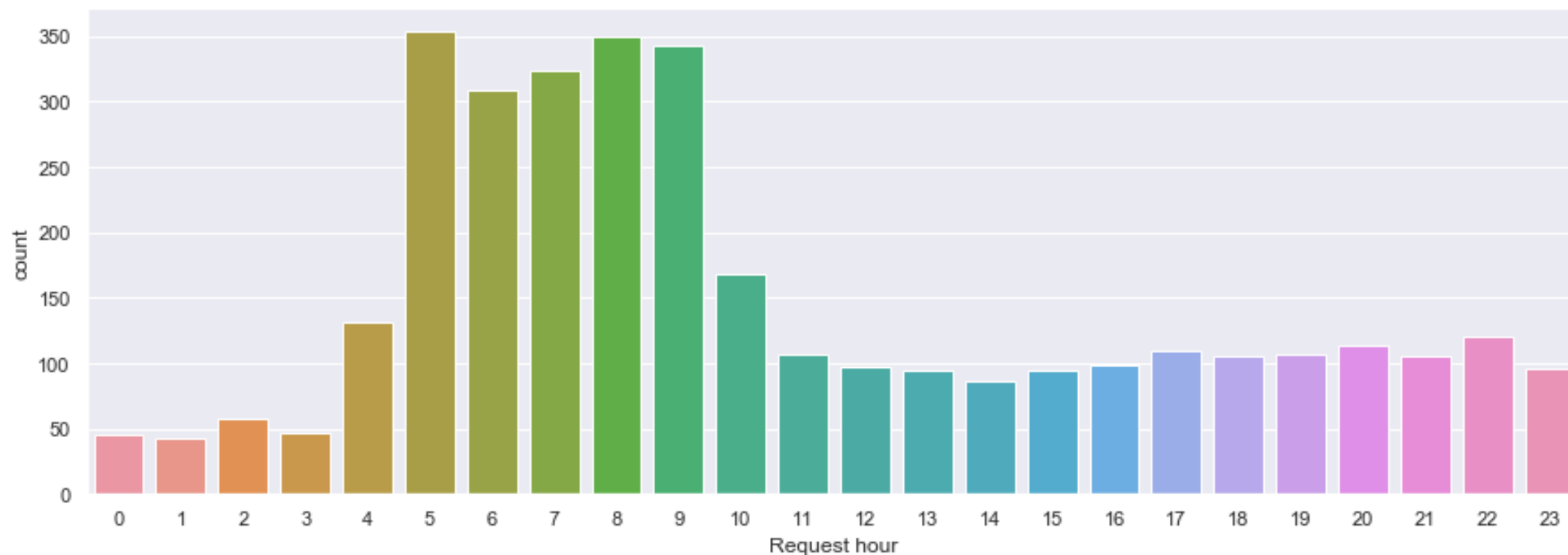The below plot shows the number of requests received every hour and their corresponding status

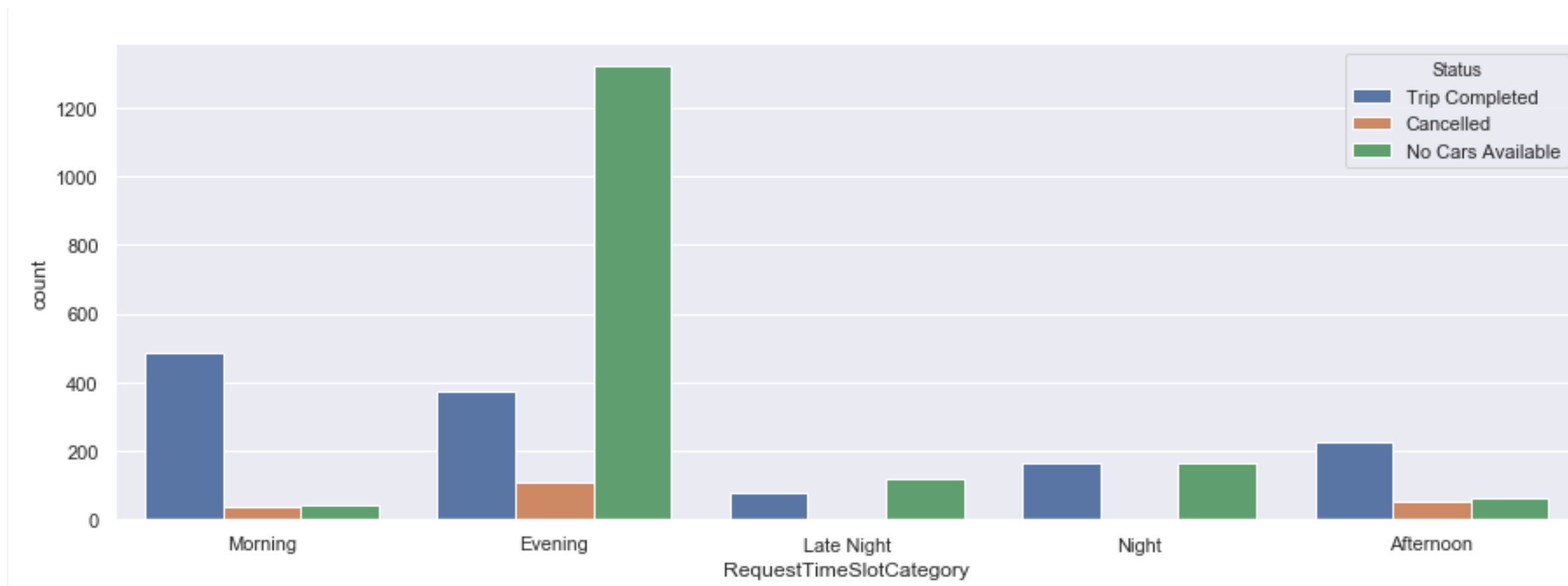Hourly request rate to go from airport to city

Plots

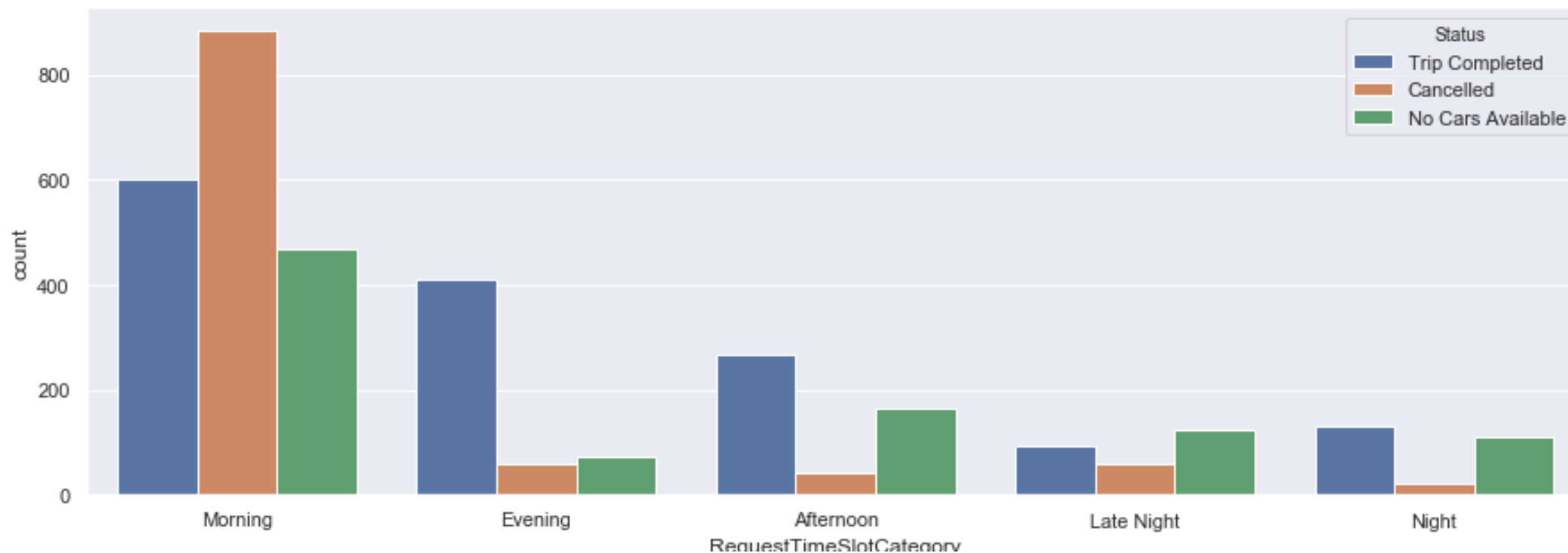Hourly request rate to go from city to airport

Plots

Airport to City Requests being received based on Time slot category
from city to airport

Plots

City to airport Requests being received based on Time slot category and their status

Conclusion

Reason for non-availability of cars during night:
*   Drivers must be busy in the city serving other request
*   More rush of people due to more flights coming in at evening time
*   More rush of people leaving from offices to home

Reason for cancelled trips in morning:
*   Drivers don't get passengers from airport to city easily in morning
*   Lesser number of flights
*   They can make more money by working within city in the morning completing more rides within same time

Suggestions

- Provide more profits to the drivers when demand is low in the morning from the airport
- Encourage car pooling so that easily get more passengers
- Provide incentives to the drivers for carrying out this number of rides to and from airport