UBER Demand-Supply Problem Assignment

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The Problem

- PROBLEM STATEMENT
  - Unable to meet the supply requirements of the customers due to cancellation and non-availability of cars in the mornings and in the evenings only from airport to city and vice-versa

- BUSINESS OBJECTIVES
  - The aim of analysis is to identify the root cause of the cancellation and non-availability of cars and give appropriate recommendations

Data Constraints for Analysis

- From the given data we can't get inferences of the waiting time of the driver at the airports in the mornings
- Also we don't have data regarding the distance of the cab from the airport to price accordingly in-order to fill the supply demand gap in the evenings

Data Exploration And Data Cleaning

- There are six attributes associated with each request made by a customer:
- **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
- **Despite having null values in the driver id and drop timestamp, I am not dropping the values as they are not significant for the analysis and doing so would highly reduce the availablility of data for the analysis**

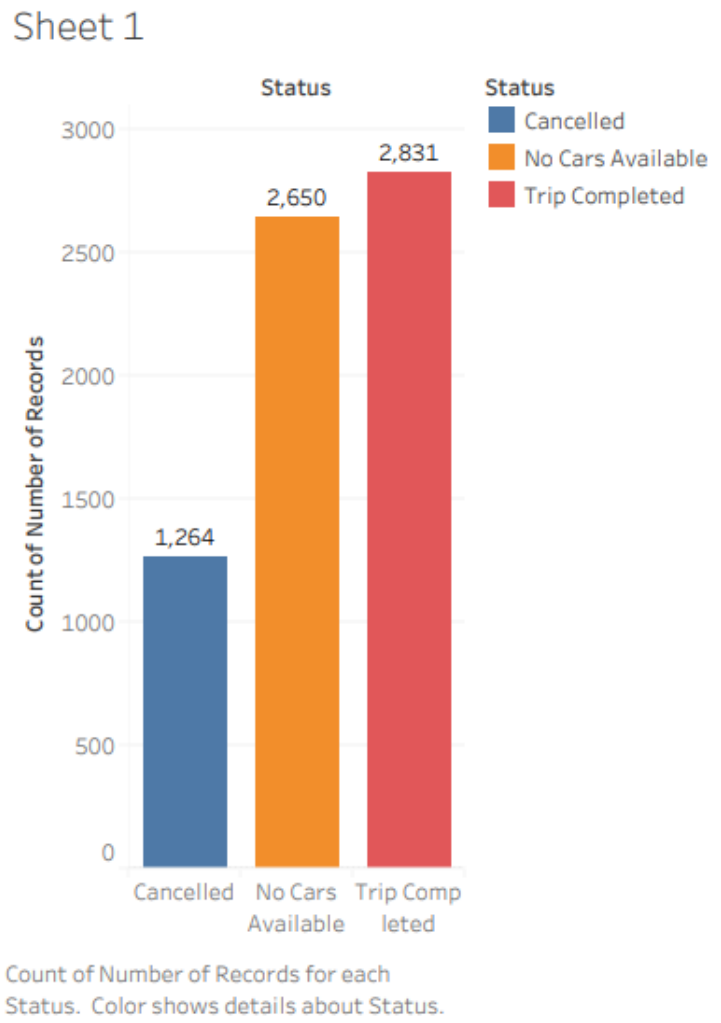
Demand Supply Gap Table

	DEMAND	SUPPLY	GAP	TOTAL
EARLY MORNING	479	174	305	**958**
MORNING	2346	970	1376	**4692**
NOON	1399	757	642	**2798**
EVENING	2288	787	642	**3717**
NIGHT	194	103	91	**388**
TOTAL	**6706**	**2791**	**3056**	**12553**

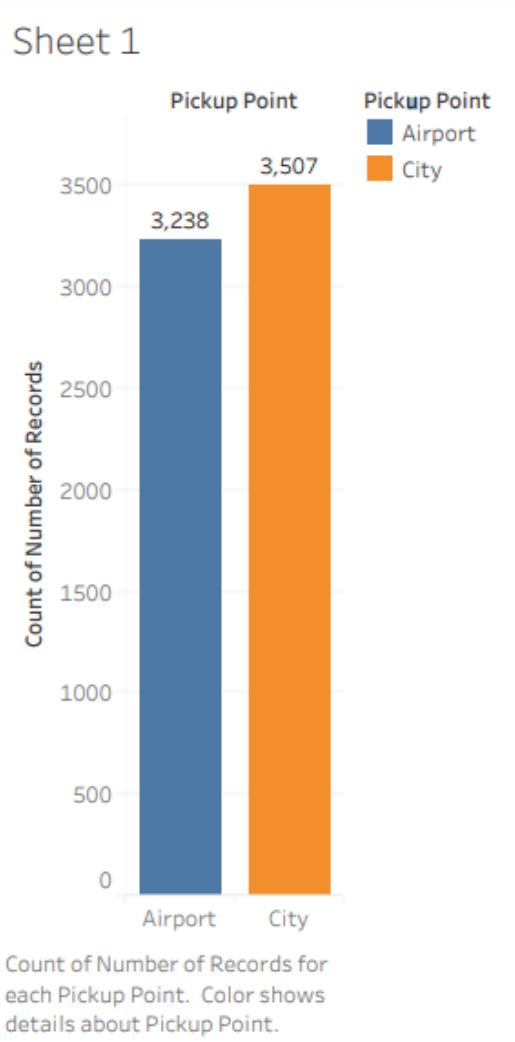
Data Manipulation

- As per the requirements of the analysis derived metrics were added namely request_time, drop_time, request_hour, drop_hour, request_day and drop_day.

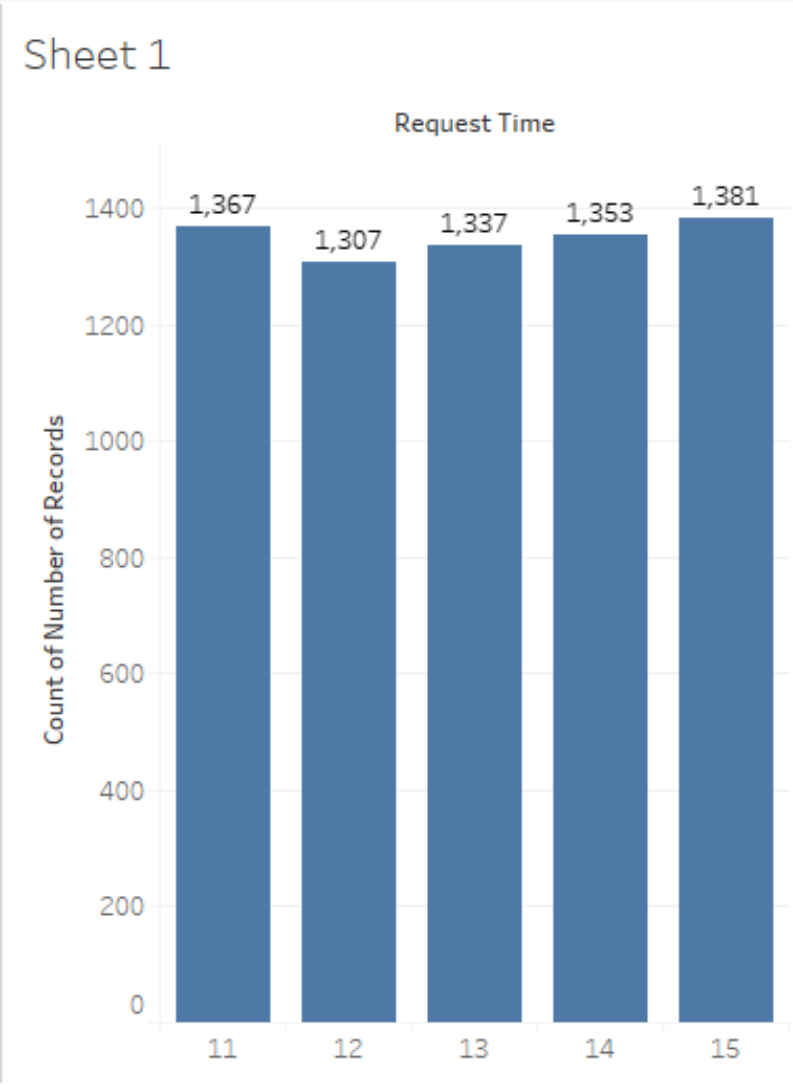
Univariate Analysis



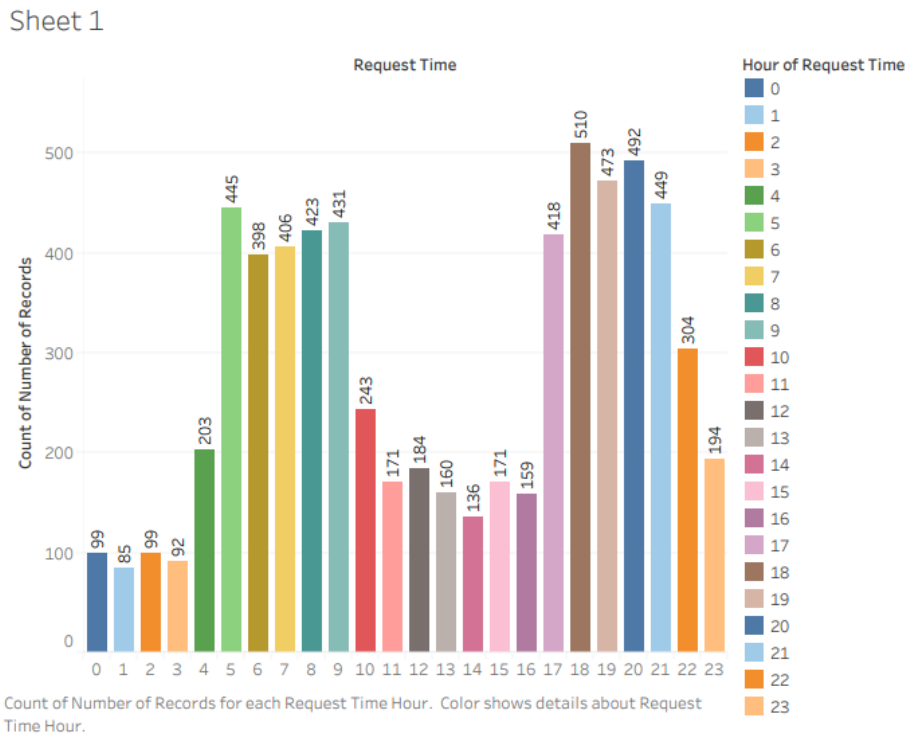
- It is clear from the plot that the combined number of no cars available and cancelled cars together are more than the trips that have been completed



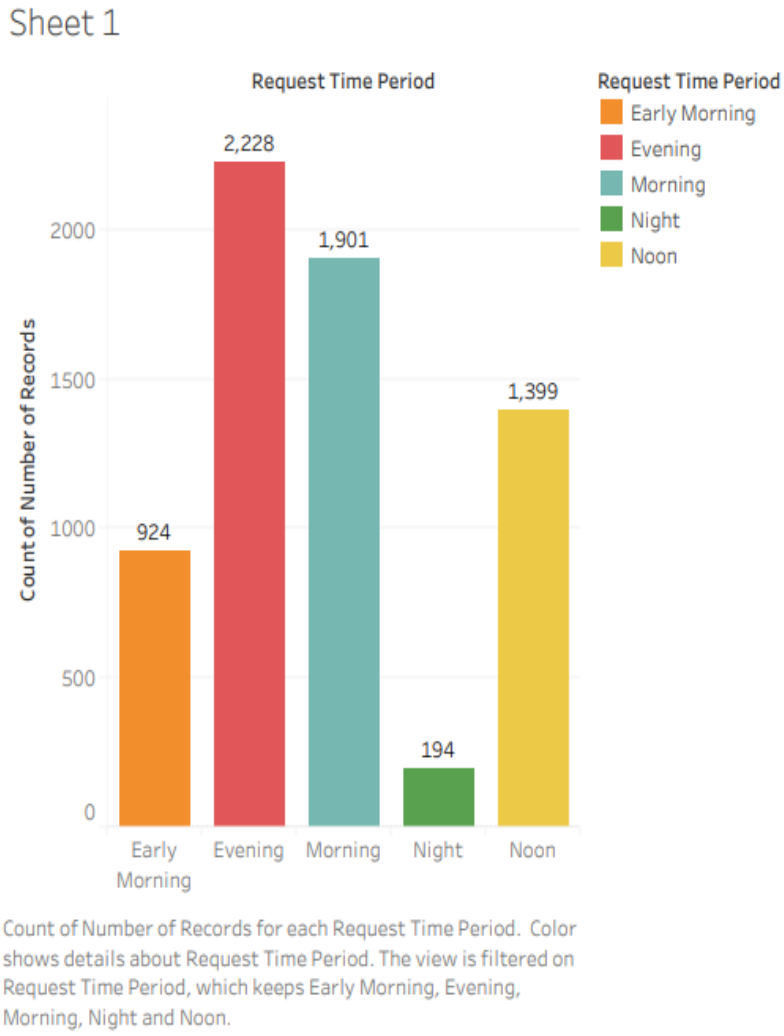
- It is visible from this plot that there is no major variations between trips originating from airport and originating from city



- When number of bookings are plotted with given dates we don’t see any major variations in number of bookings in each date



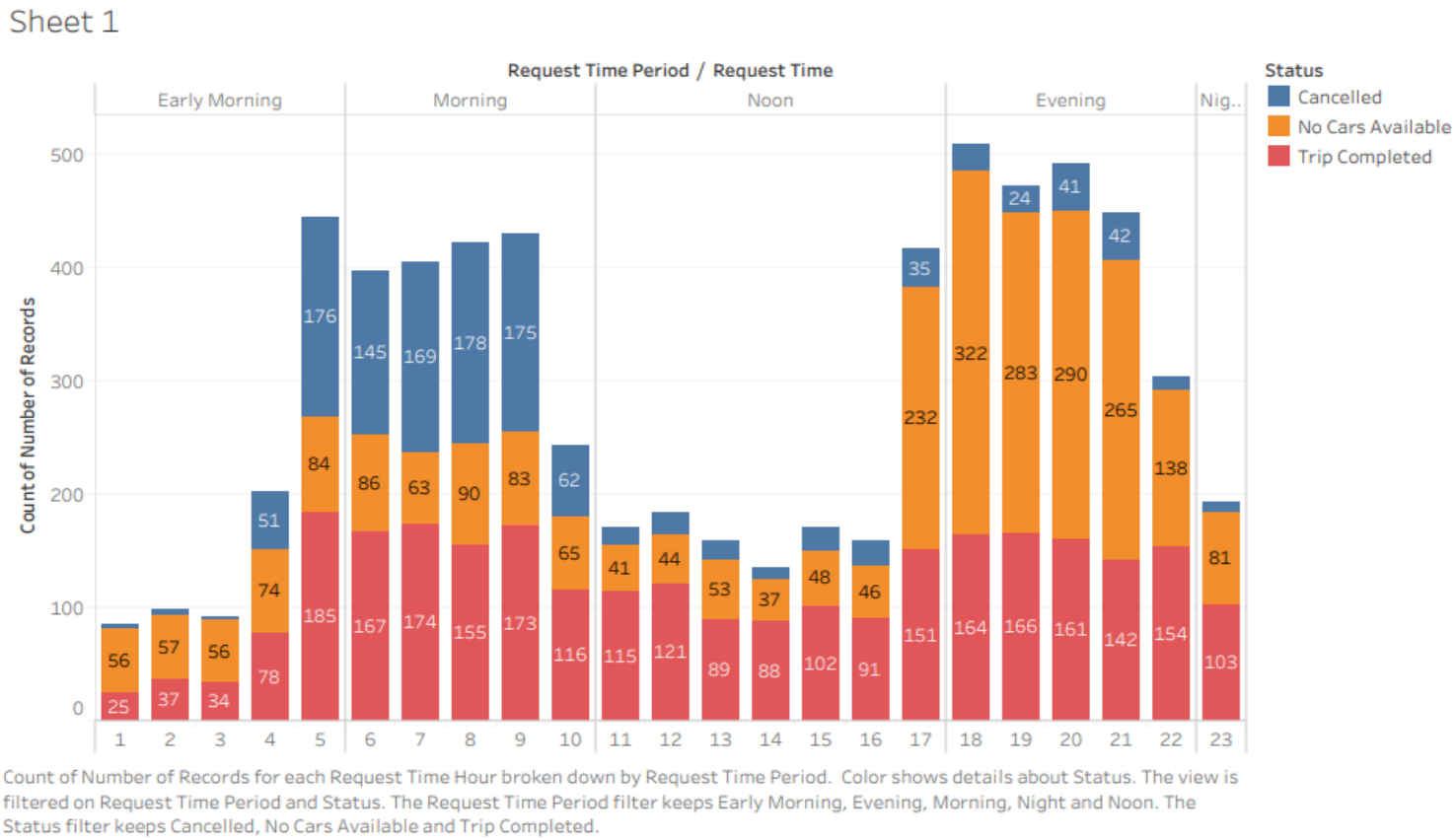
- It is noticeable from the plot that the number of bookings are more in the timings ranging from 05:00 to 9:59 and 17:00 to 22:59



- It can be observed that the bookings in the night time is low and are high in the evening and mornings comparitively

Segmented Analysis

The below plot shows there is demand supply gap in the availability of cabs in various hours of all days. It is clear that demand is high and cancellations are more in the mornings and availability is less in the evenings



Count of Number of Records for each Request Time Hour broken down by Request Time Period. Color shows details about Status. The view is filtered on Request Time Period and Status. The Request Time Period filter keeps Early Morning, Evening, Morning, Night and Noon. The Status filter keeps Cancelled, No Cars Available and Trip Completed.

Recommendations

- In-order to minimize the supply-demand gap of UBER cabs, the following are the recommendations
- Increase the number of cabs by encouraging the drivers to use UBER by offering them good initial incentives
- Starting new plan in which airport duty is compulsory to a driver. (This plan may be implemented with/without informing to the driver)
- Example, if there are 900 drivers in a city. 900(drivers)/30(days) = 30 drivers per day. So, 30 different drivers should have airport duty for one day in a month compulsorily. These 30 drivers should be given trips with end location near by the airport.
- Not giving an option to cancel at peak hours to the drivers.
- Giving incentives to the drivers at peak times and charging the customer accordingly to avoid loss to UBER.
- Increasing charges significantly may discourage booking, to counter this we can use pre-booking for airport pooling so that UBER, driver and customer are equally benefitted