

# Uber Supply-Demand Gap Analysis

## SUBMISSION

# Abstract

**Introduction:** This analysis is to identify the root cause of the demand vs supply problem for Uber(i.e. cancellation and non-availability of cars)

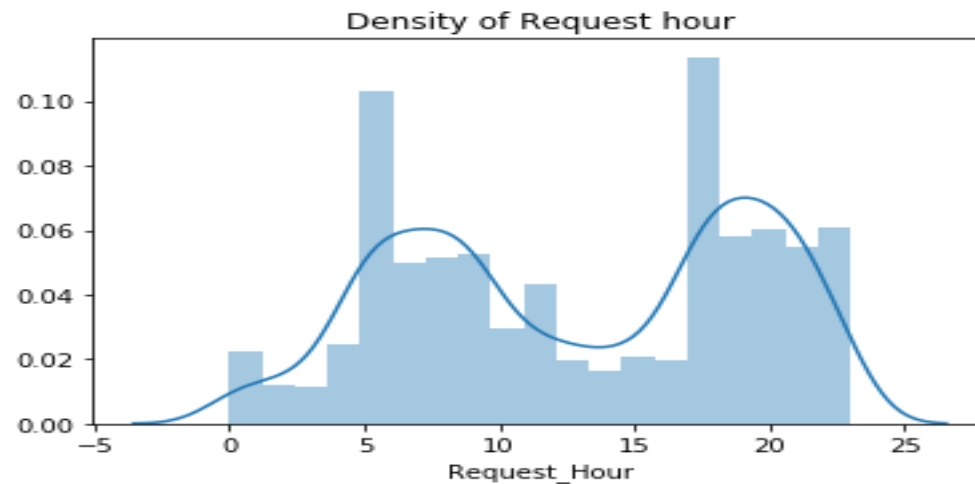
**Methods:** The analysis was done on **masked data set** which is similar to what data analysts at Uber handle. Collected data sets were analyzed by python3.6. Collected data consists of the following attributes for only the trips **to and from the airport**.

- 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

**Results:** The findings of this analysis indicate that the demand vs supply gap is high in the city during morning timeslots, whereas, it is high in the airport during afternoon & evening timeslots.

# Univariate Analysis

This analysis is done to find the timings at which more number of cab requests are done from city to airport or airport to city. To verify this below density plot has been plotted on 'Request\_Hour'.



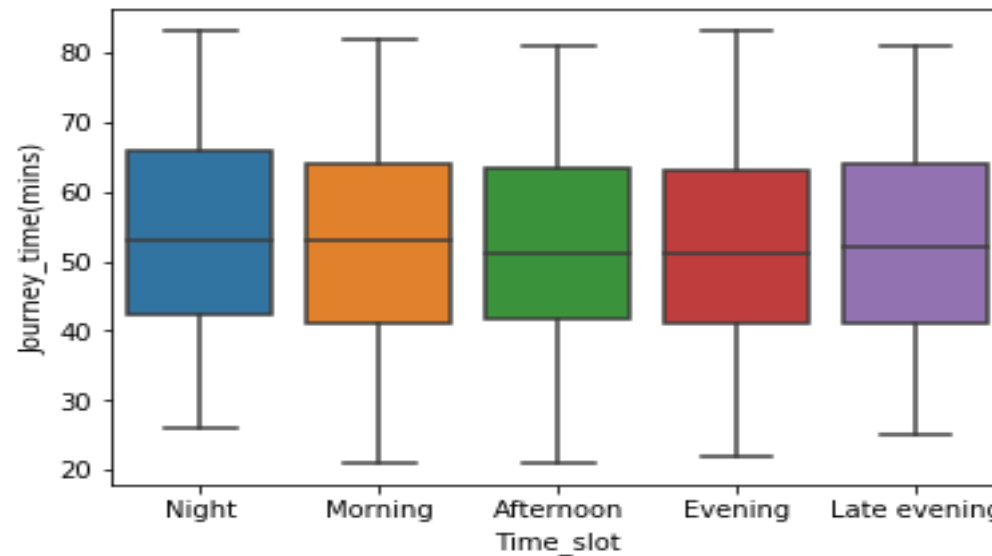
**Result:** From the above plot it is visible that high number of cab requests are done in between 5- 6 am and 6 -7pm

# Bivariate Analysis

This analysis is done to find the journey time across different time slots. To perform this analysis two new variables were created as below

1. **Journey time:** Time difference between ‘Drop timestamp’ and ‘Request timestamp’
2. **Time slot:** Different timings were grouped into one slot. For this below assumption is made.

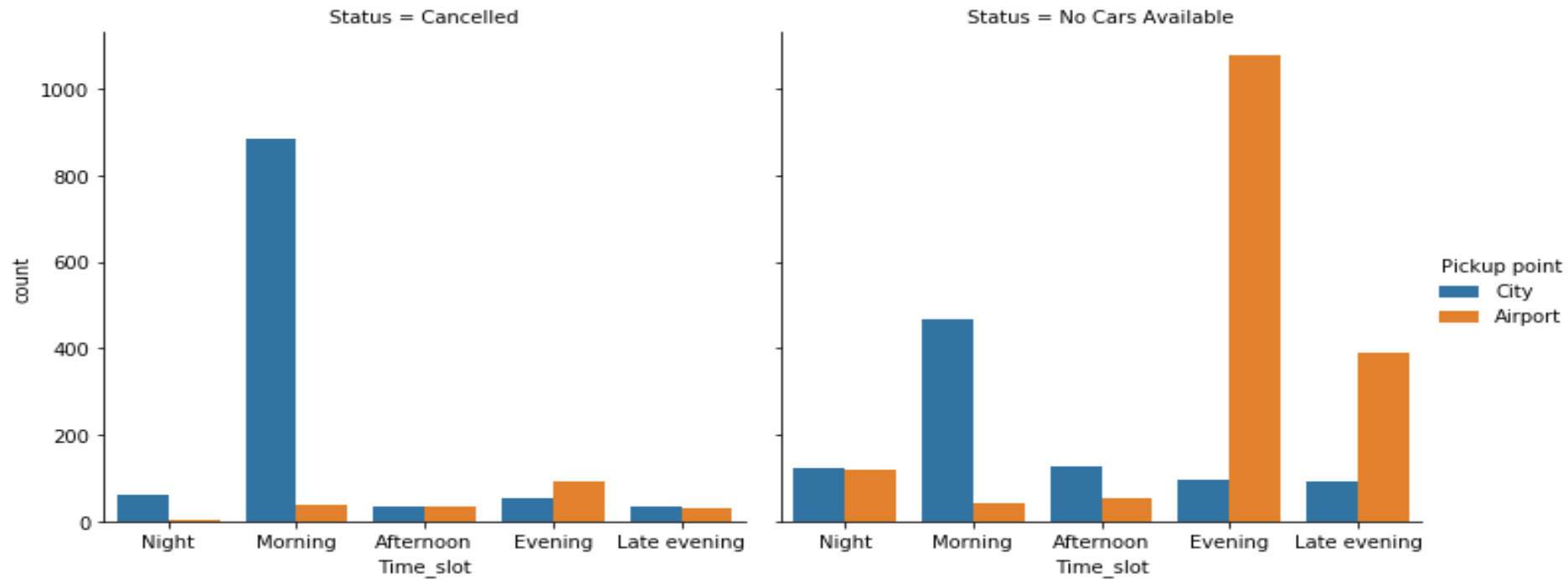
**Assumption for time slots:** 12 am – 4.59 am is considered as night, 5 – 11.59 am is considered as morning, 12pm – 3.59 pm is considered as afternoon, 4 pm – 8.59 pm as evening and 9pm – 11.59 pm as late evening



**Result:** From the above plot it is visible that journey time is high in evenings due to peak hours

# Pressing problem

To find out the pressing problem for Uber frequency of requests that get cancelled or show 'no cars available' is plotted with respect to time slots and pickup point.

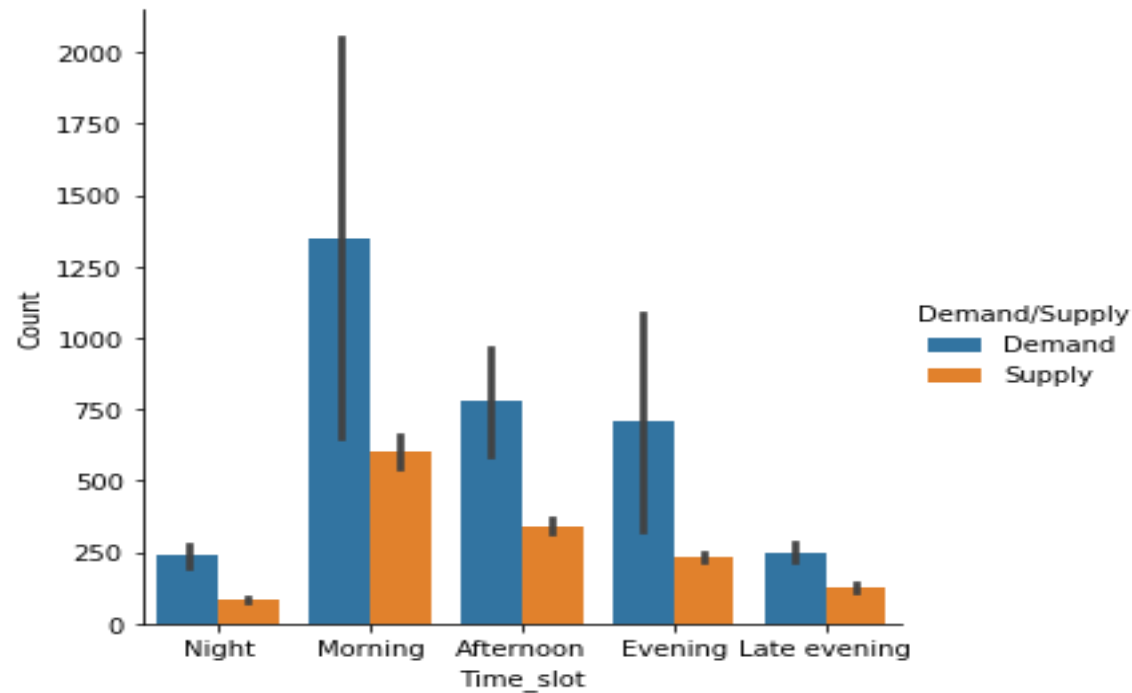


**Result:** From the above plot it is visible that 'cancellations' are too high in city during mornings and 'No cars available' is high in airports during evenings and late evenings

# Demand vs Supply

This analysis is done to find the gap between supply and demand.

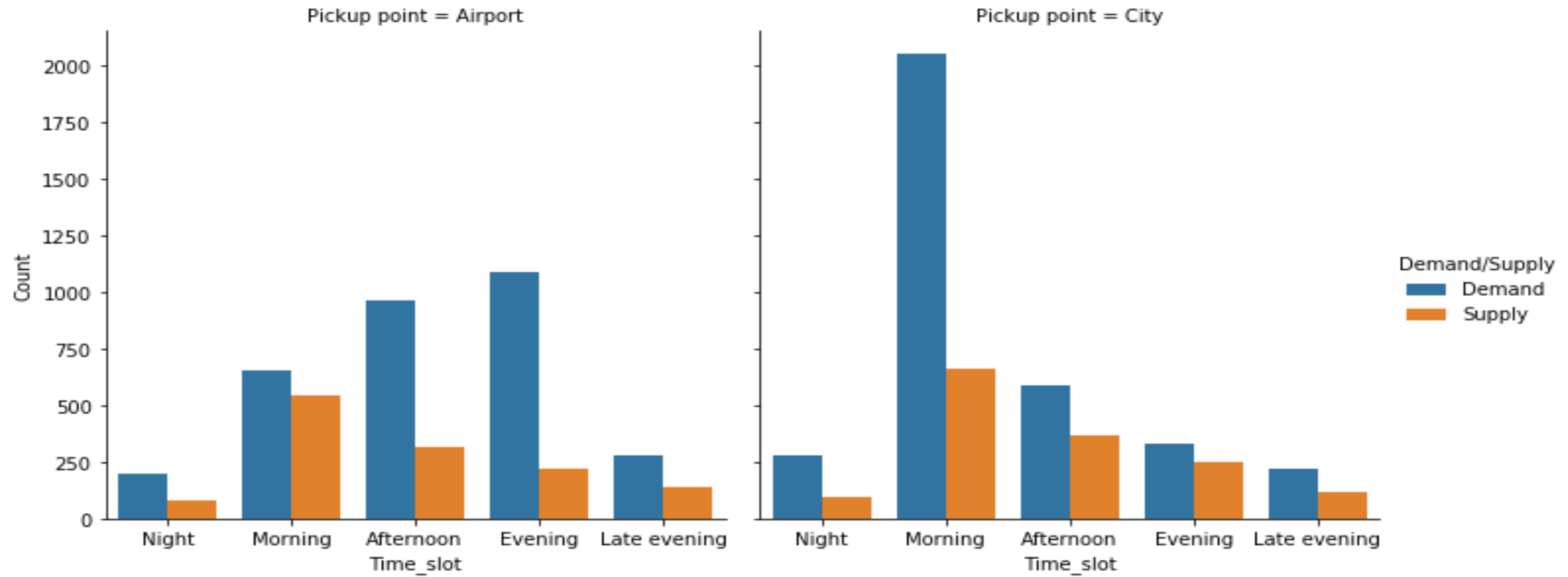
To perform this two new data frames were created with Demand and Supply columns by grouping the Time\_slot and Pickup point. Later they were joined together as a single dataframe.



**Result:** From the above plot it is visible that highest gap exists in Morning, Afternoon & Evening time slots

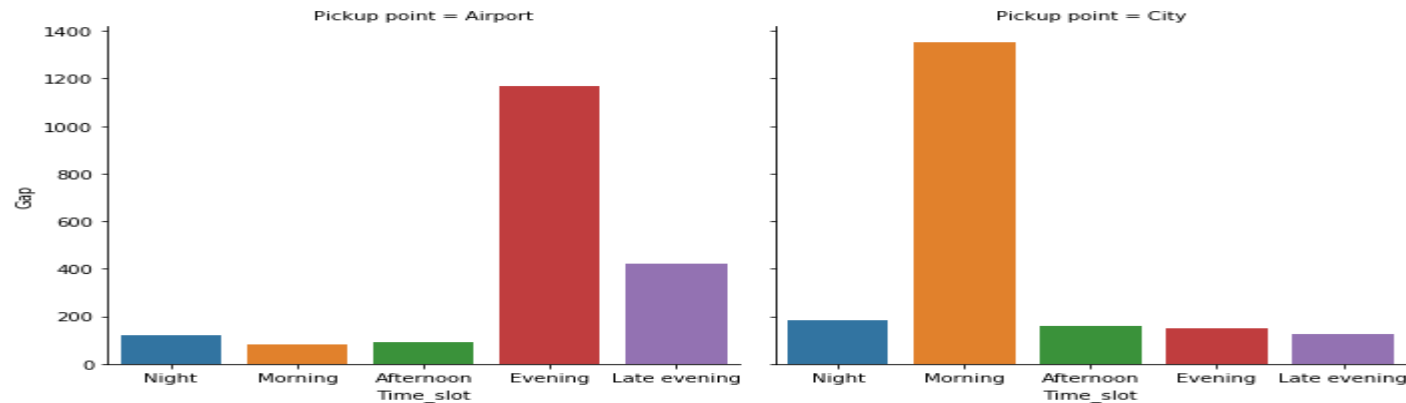
# Demand vs Supply

Demand vs supply for each time slot according to pickup point



**Result:** From the above plot it is visible that gap is high in city during morning whereas, it is high in airport during Aftenoon & Evening

## Reason for Demand-Supply gap



Reason for Demand-Supply gap from city to airport:

1. There is a huge gap between demand and supply in city during morning time slot. This may be because there are very less number of incoming flights to the city which may result in high waiting time for driver in the airport to get the next trip. This might be one of the reason for more cancellations by drivers.
2. Journey time is around 1 hour in any time slot for single trip but if driver rides within city there are chances to complete more than 1 trip which in turn helps driver to reach daily targets.

Reason for Demand-Supply gap from airport to city:

1. There is a huge gap between demand and supply in airport during evening and afternoon time slot. This may be because of less number of cabs that come in to airport in these time slots.



## Recommendations

1. Cancellation limits should be set for drivers where if drivers cancels more than the limit on that particular day they should pay the cancellation charges
2. Introduce incentives to drivers for airport pickups in non peak hours.
3. Minimum amount should be payed to drivers in case driver returns to city without any passenger.
4. Encourage pre bookings by reduction in bill amount when compared to adhoc requests. This helps both passenger and driver where customer satisfaction will be high if there is some monetary benefit also driver will be happy to have an assured trip.