

Uber Supply Demand Case Study

Abstract

- Objective:

To identify the root cause for cancellation and non availability of cabs

- Goals of Data Analysis:

Identify the peak hours and the frequency of requests

Identify the time slots for the highest demand and supply Gap

Identify the types of requests for which gap is most severe

- Data provided:

Request id: integer [1,2,3,4,5,...6765]

Pickup point: String [Airport, City]

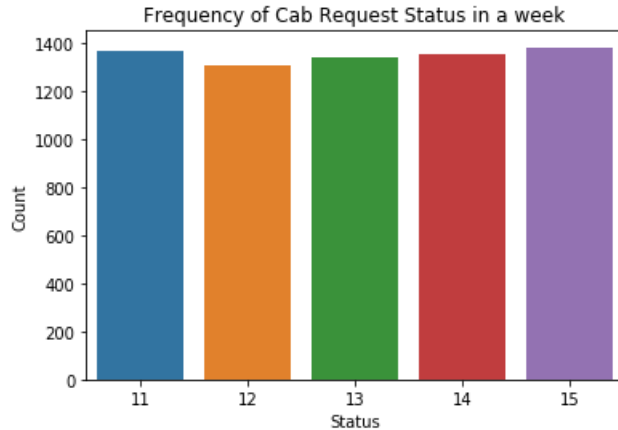
Driver id: Integer [1,2,3,...300]

Status: String [No Cars Available, Trip Completed, Cancelled]

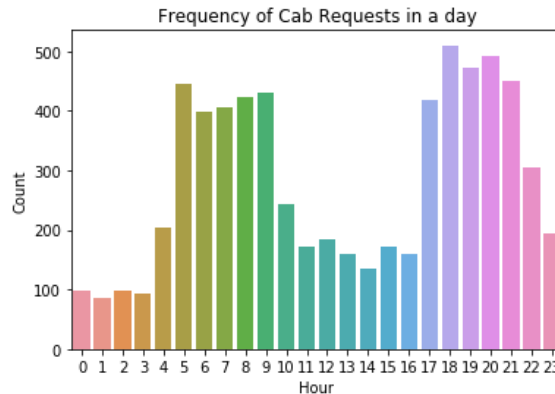
Request timestamp: [11/07/2016 11:51:00 AM...]

Drop timestamp: [11/07/2016 1:00:00 PM...]

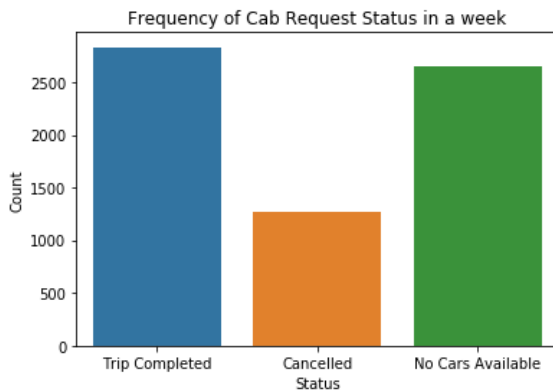
Univariate Analysis



You can see there is a consistency in number of requests everyday which is near about 1340+



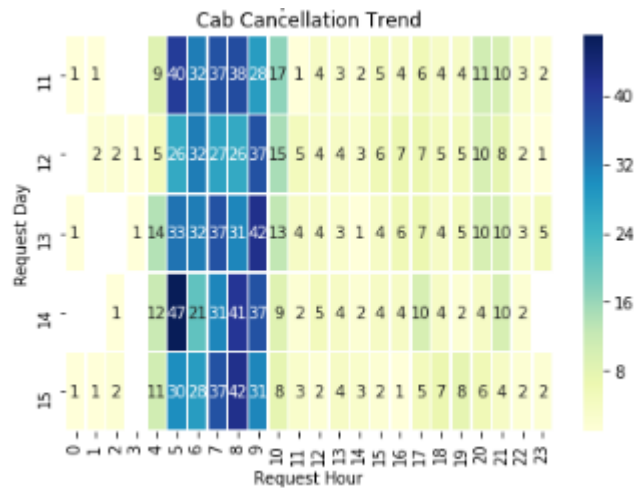
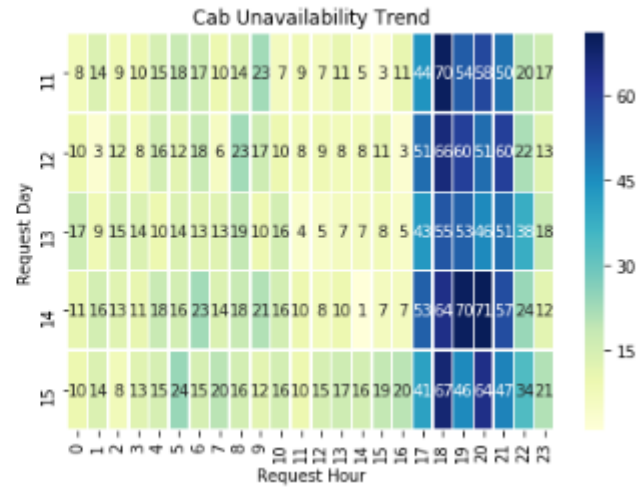
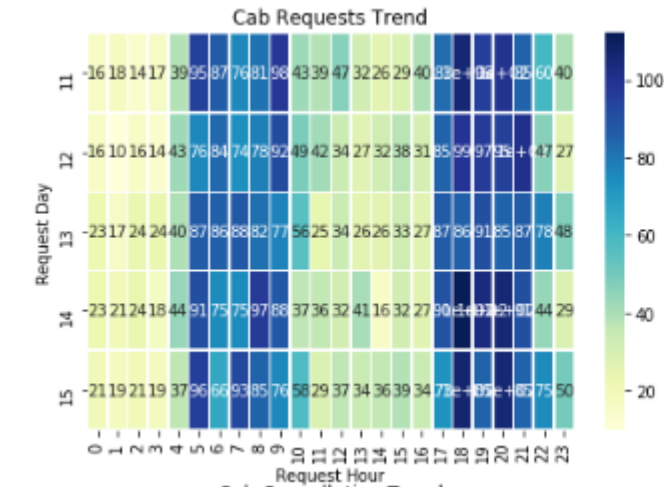
Peak Hours: 5 - 10 AM
5 -10 PM



The number of Trips completed is almost same as Cabs unavailable which is near about 40% a piece.

The cancelled requests are also significant ~20% of the total requests.

Bivariate Analysis



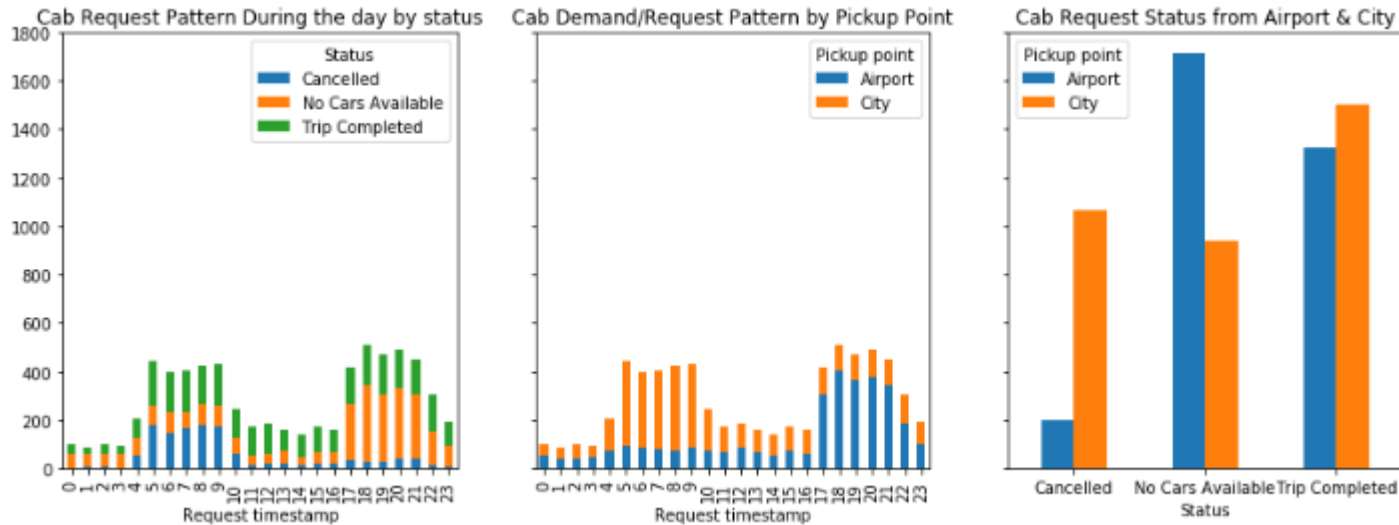
Morning Peak Hours:

- 5 - 10AM :
High city to Airport requests & also High Cancellations

Evening Peak Hours:

- 5 - 9PM :
High Airport to city requests & High unavailability

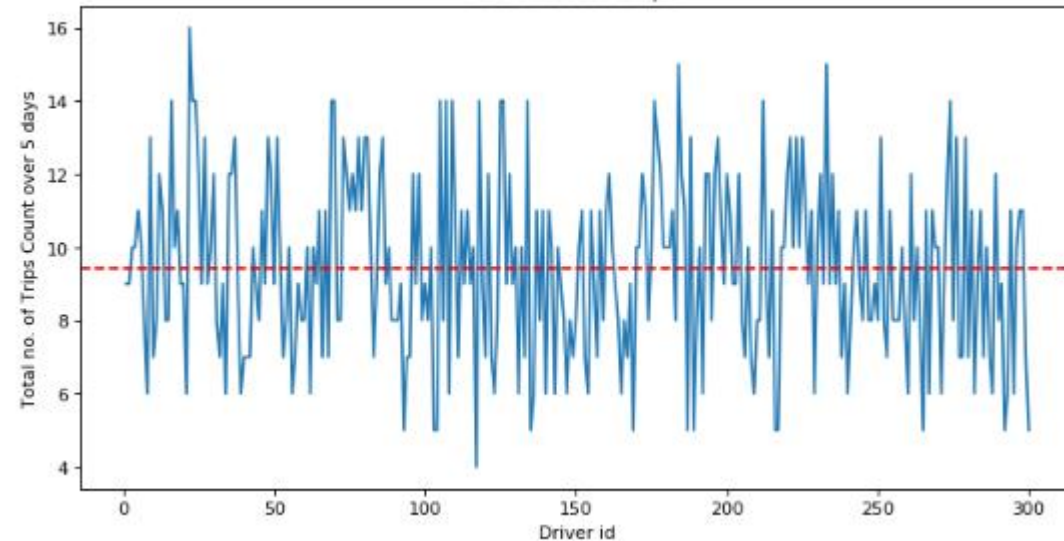
Supply Demand Gap



- Maximum Supply Demand gap is observed for 5AM to 10AM and 5PM to 10PM
- From the above it is observed that the demand to Airport is high in the morning peak hours. Also can observe the cancellations are also high in the same time frame.
- The demand to city is high in the evening hours and Cabs unavailability is also observed relatively high in the same time frame.

Observation

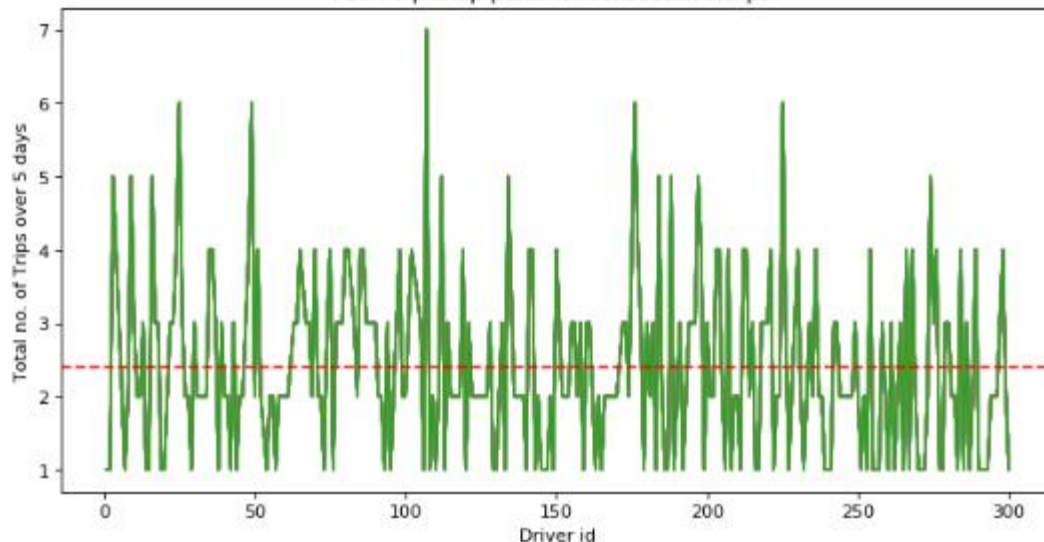
All successful trips



Key observations in this plot is total number of trips per driver, where the pickup point is same for consecutive trips.

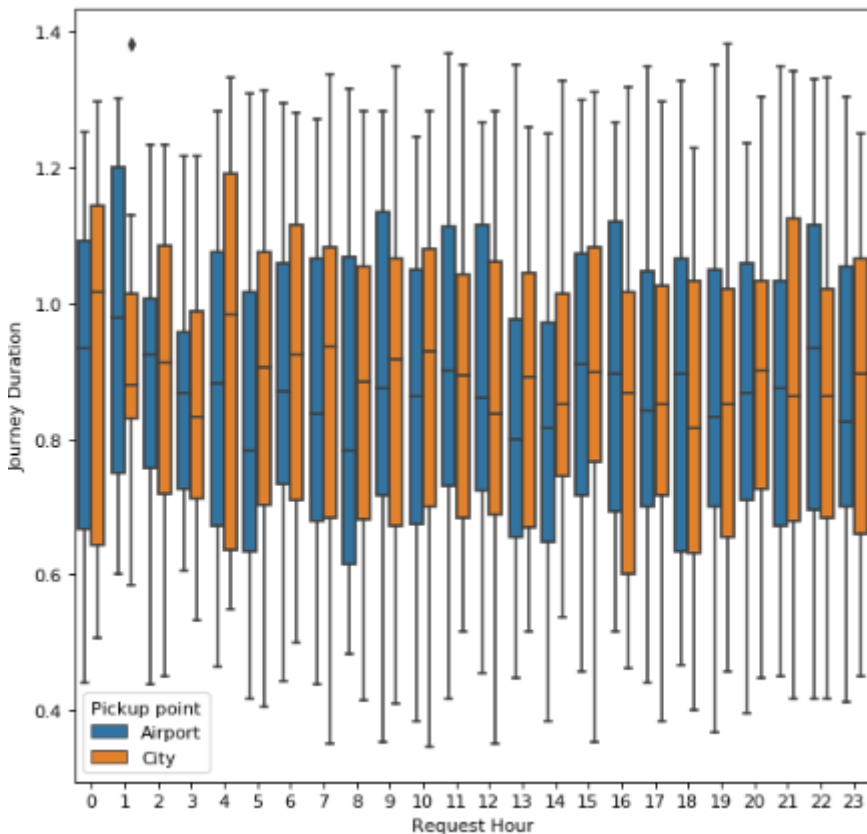
On an average every Driver has to make at least 3 trips out of 9 trips in a week where he has to return from a drop point empty.

Same pickup point for consecutive trips

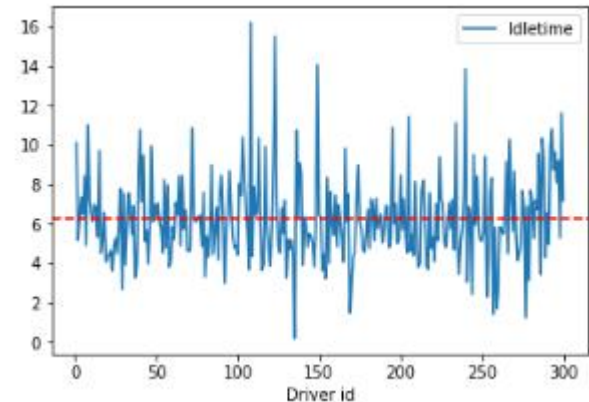


This is consistent for both Airport pickup as well as city pickups.

Cab Cancellation Analysis

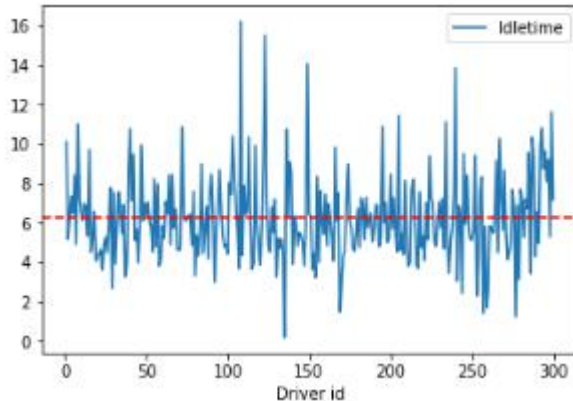


Between 5AM to 10AM, the Journey duration is high from City
Between 5PM to 10PM, the Journey duration is high from Airport



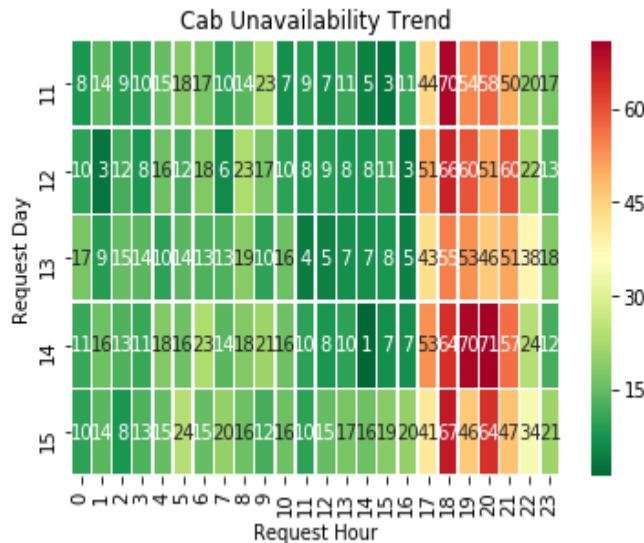
- Due to high Journey time, the drivers might not be interested to travel for the same price which resulted in the high cancellations.
- Also, the idle time is very high from the Airport which means the number of requests from the Airport in the Morning is very less.

Cab Unavailability Analysis



Clearly shows that, the driver idle time at the Airport in the Morning is very high where the requests from the Airport are very low

Whereas, the idle time has been reduced in the evening where the requests from the Airport are very high



This says that the number of cabs from Airport are very less during the evening peak hour

Conclusion

- Morning Cancellation to airport are high mainly due to two reasons
 - Idle time before getting another request back to city is high
 - Journey time as well is high due with morning office/school commuters
- Possible solution would be to implement surge charges which would compensate for the idle time at the airport (or) Have a separate tariff for airport destination.
- Evening Unavailability's at airport is high due to huge demand – supply gap as number of requests are more which is not equally compensated with number of cabs.
- Possible solution would be to have additional cabs placed at airport in sync with the trend of requests seen earlier.