



# UBER SUPPLY- DEMAND GAP ASSIGNMENT

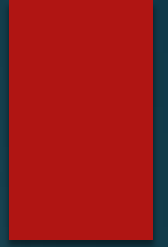
MOHIT MAMGAIN

DATA ANALYST

# Business Objective

- ▶ Customer are facing problems such as cancellation by drivers or non- availability of cars while travelling to and from the airport.
- ▶ Analysis is being done to find out the root causes of the problems, possible hypothesis of the problems and ways to improve the problems.

# Business Objective



Attributes associated with each request made by 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

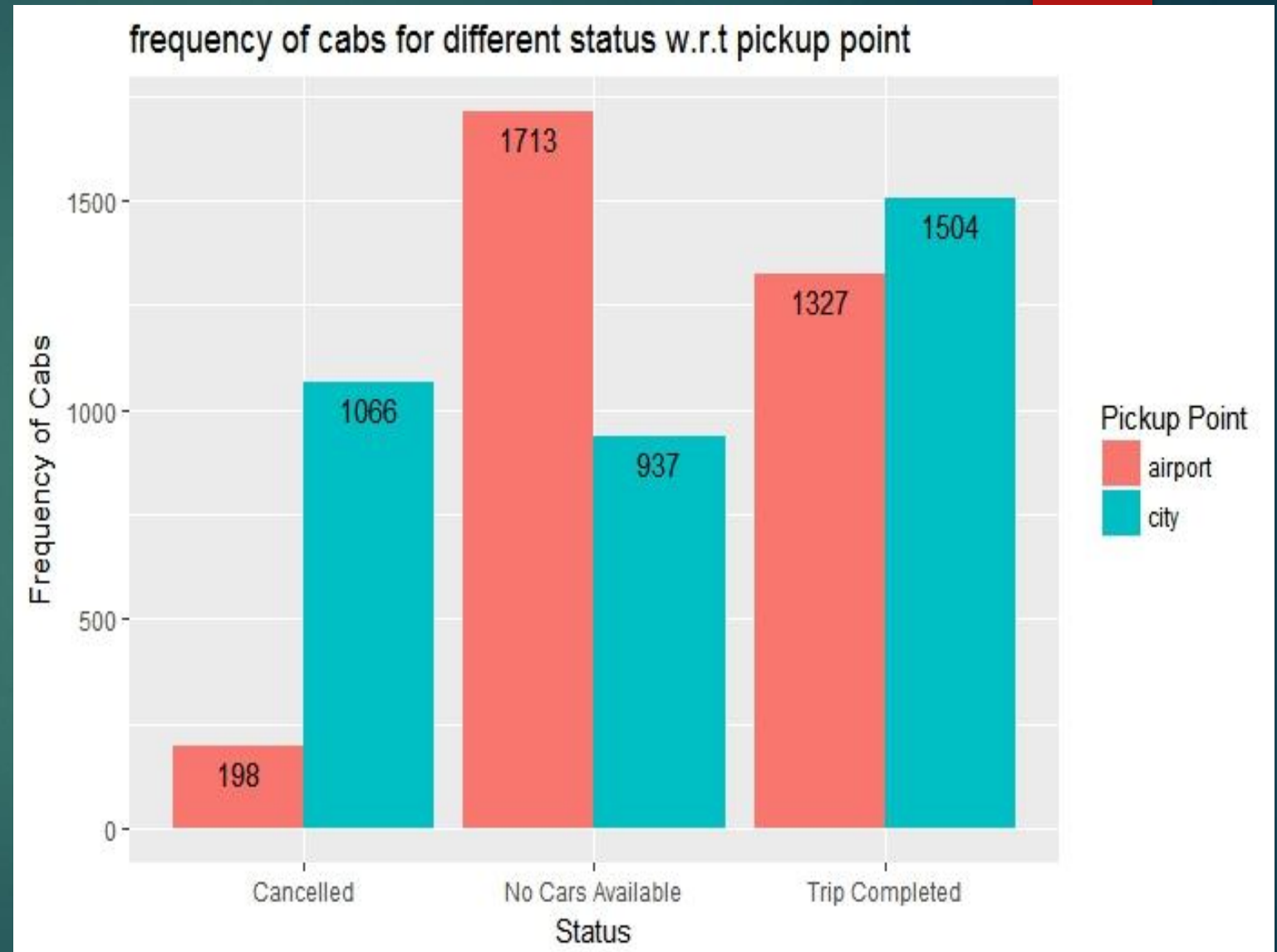
# Data Cleaning and Preparation

- Data Quality Issue:
  - ✓ Different format of date and time in pickup and drop time column are resolved and one standard format has been applied to them.
  - ✓ NA values are not replaced with '0'.
  - ✓ No empty rows are found in the column.
- New variables are also introduced for useful analysis like hours are extracted from pickup time and day period column also introduced.

# Analysis

## PLOT 1

- First one is a plot of count of numbers of cabs for different status w.r.t Pickup point.
- As clear from plot 1, cancelled request from city pickup point and No cars available from airport pickup point are problematic area.

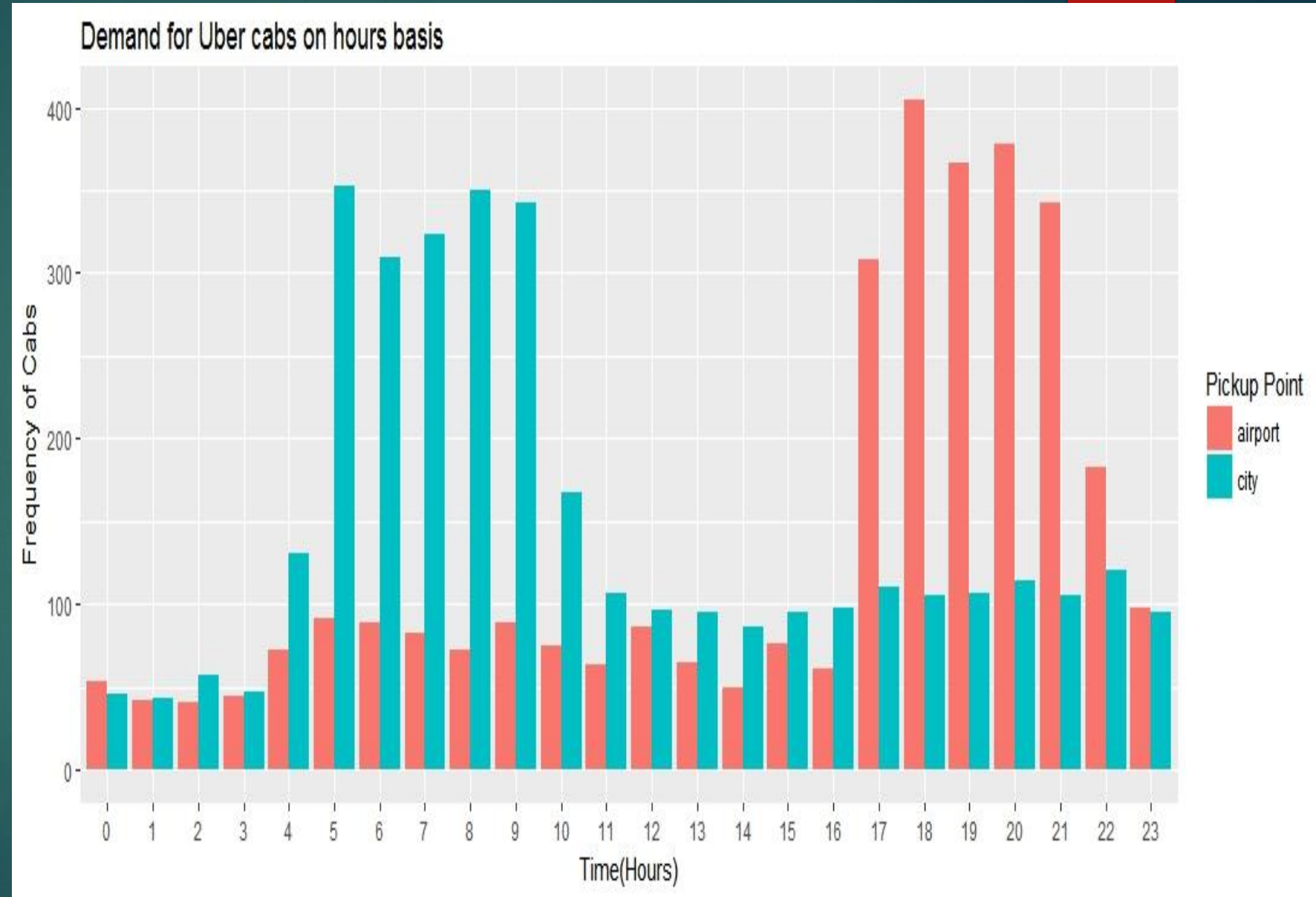


Plot 1 as mentioned in R file

# Analysis

## PLOT 2

- Plot 2 showing demand of Uber cabs on hourly basis.
- Each bar corresponds to an hour and pick-up point (city / airport) are displayed in colors.
- It is difficult to analyse the data through this graph so its better to divide the hours in different day period.
- Division of day period is on the basis of similar frequency of cabs in hours.
- So one slot is 0-4 hours as they have same frequency of cabs. Similarly for other slots also.



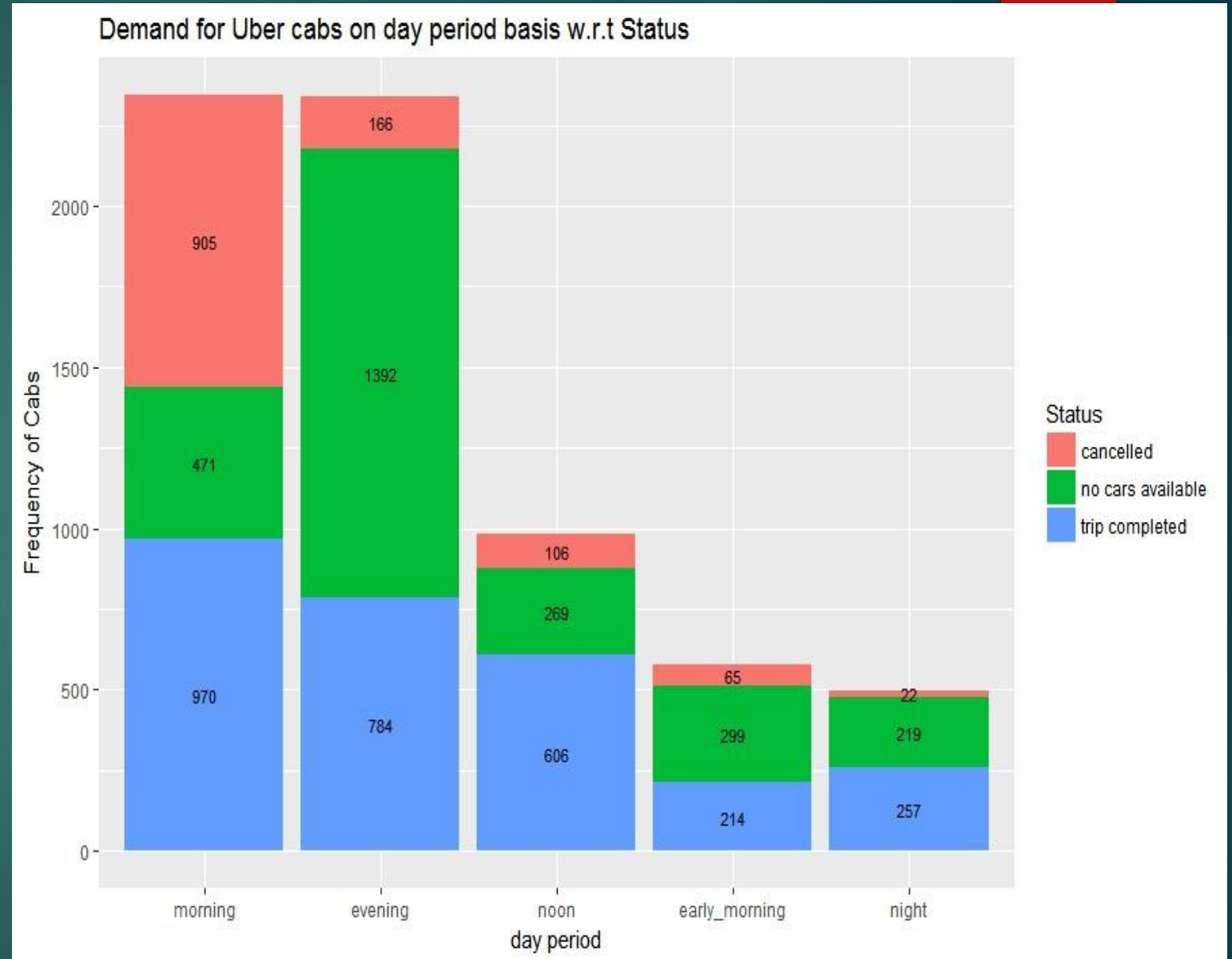
Plot 2 as mentioned in R file



# Analysis

## PLOT 3

- For better analysis hours are divided into the different day period:
  - 00-04 hrs. = early morning
  - 05-11 hrs. = morning
  - 12-16 hrs. = noon
  - 15-22 hrs. = evening
  - 23-24 hrs. = night
- Plot 3 shows demand for Uber cabs on different day periods w.r.t cabs cancelled, no car available and trips completed.
- As clear from graph demand of Uber cars are more in morning and evening for airport and city pickup point and are also the problematic day period.



Plot 3 as mentioned in R file

# Analysis

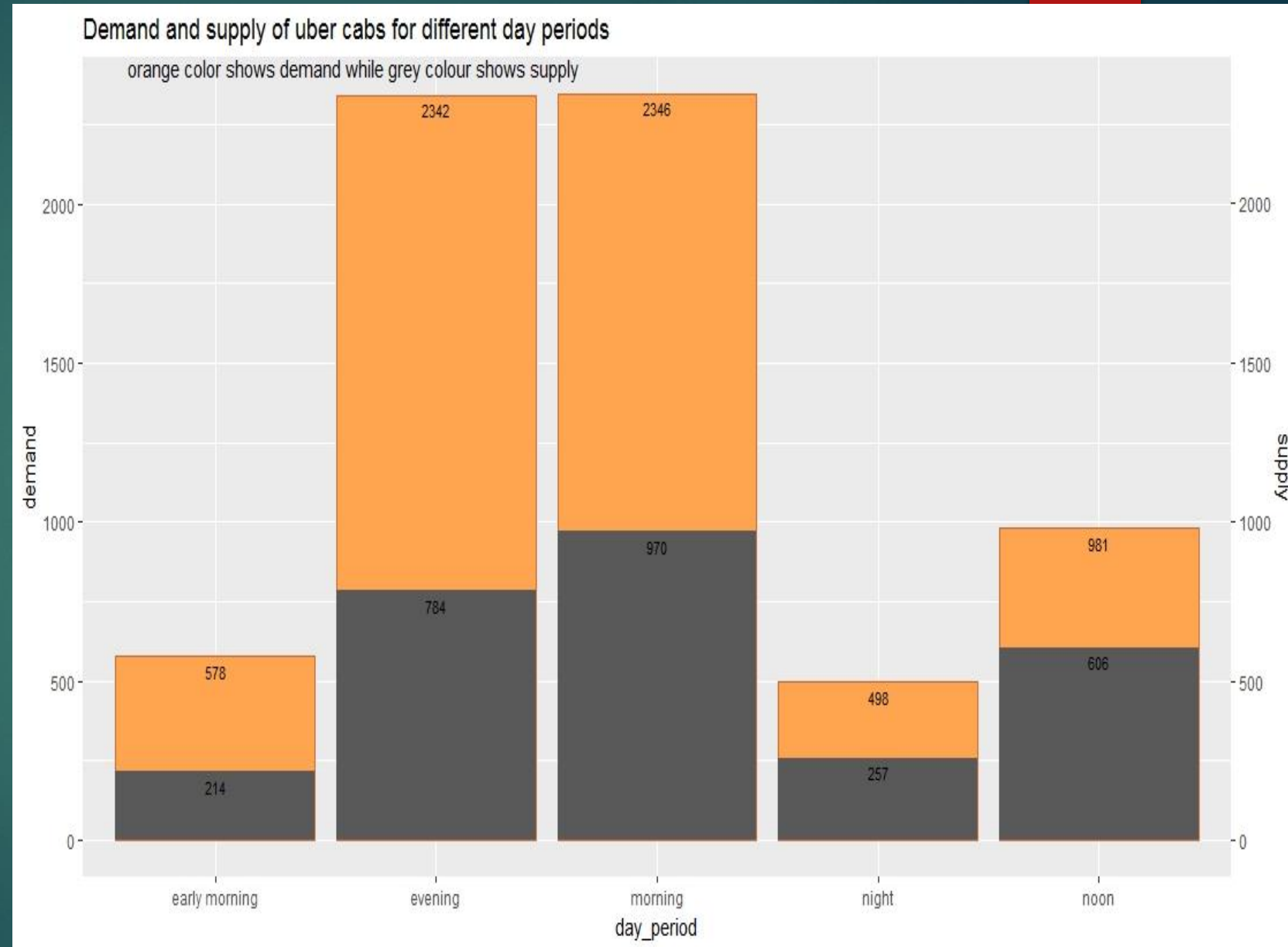
## PLOT 4

- Plot 4 shows demand and supply of cabs for different day period i.e. early morning, morning, noon, evening and night.
- Orange color shows demand of cabs and grey color shows supply of cabs.
- As clear from graph gap between supply and demand is huge for morning and evening.

**Demand of cabs in morning = 2346**  
**Supply of cabs in morning = 970**

**Demand of cabs in evening = 2342**  
**Supply of cabs in evening = 784**

- Numbers are also matched with previous plot.



Plot 4 as mentioned in R file

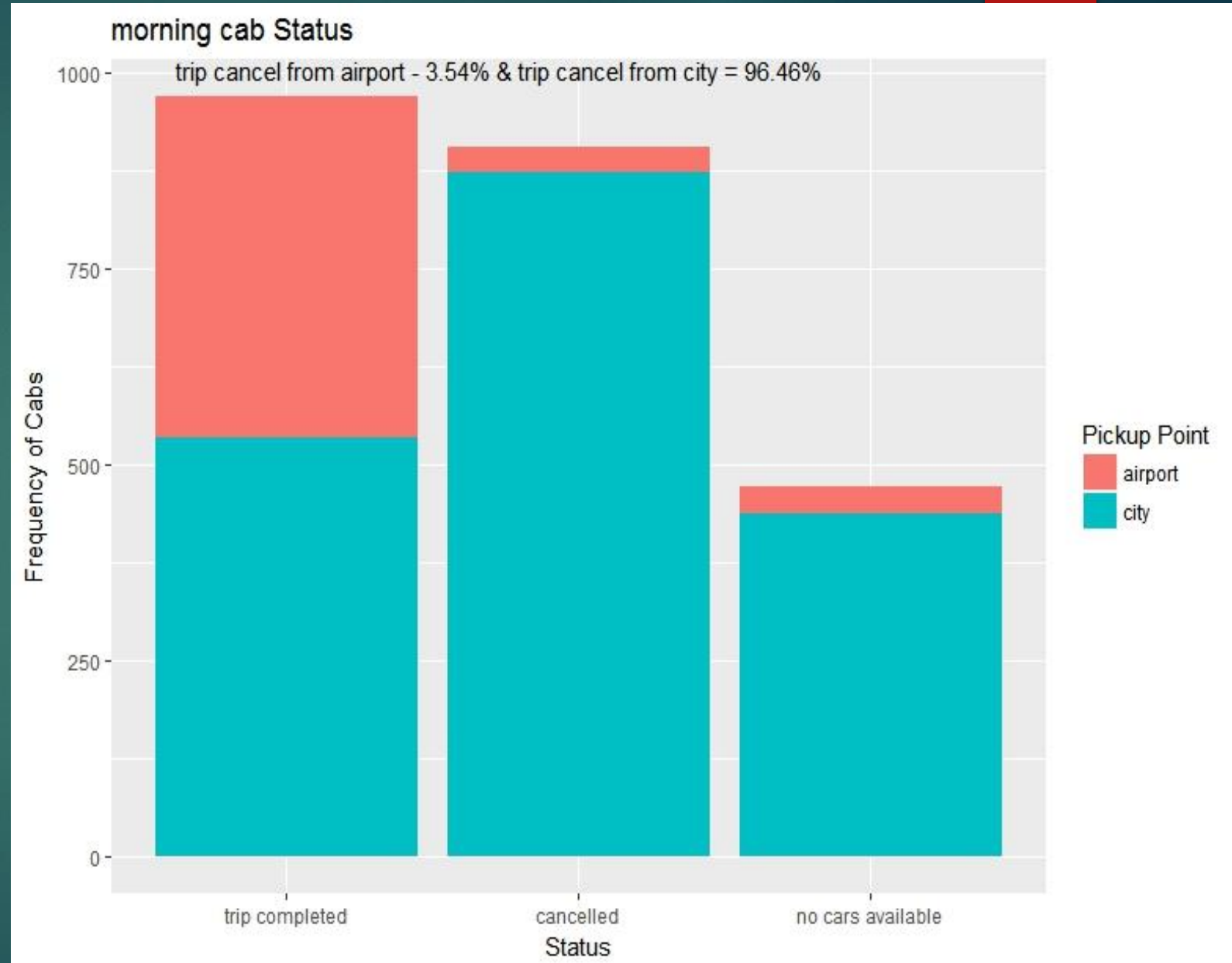


# Problem 1

- A large number of trips got cancelled during the morning day period.
- We plot a stacked bar chart to find out if the problem is more severe for pick-up requests made at the airport or the city.
- As calculated:
  - Trip cancel from airport = 3.54%
  - Trip cancel from city = 96.46%

**Gap between supply and demand:**  
**Total number of trips from city = 1845**  
**Total number of trips completed from city = 535**

**Therefore, most trip getting cancelled from city during morning is main problem.**



Plot 5 as mentioned in R file

# Analysis

## PLOT 6

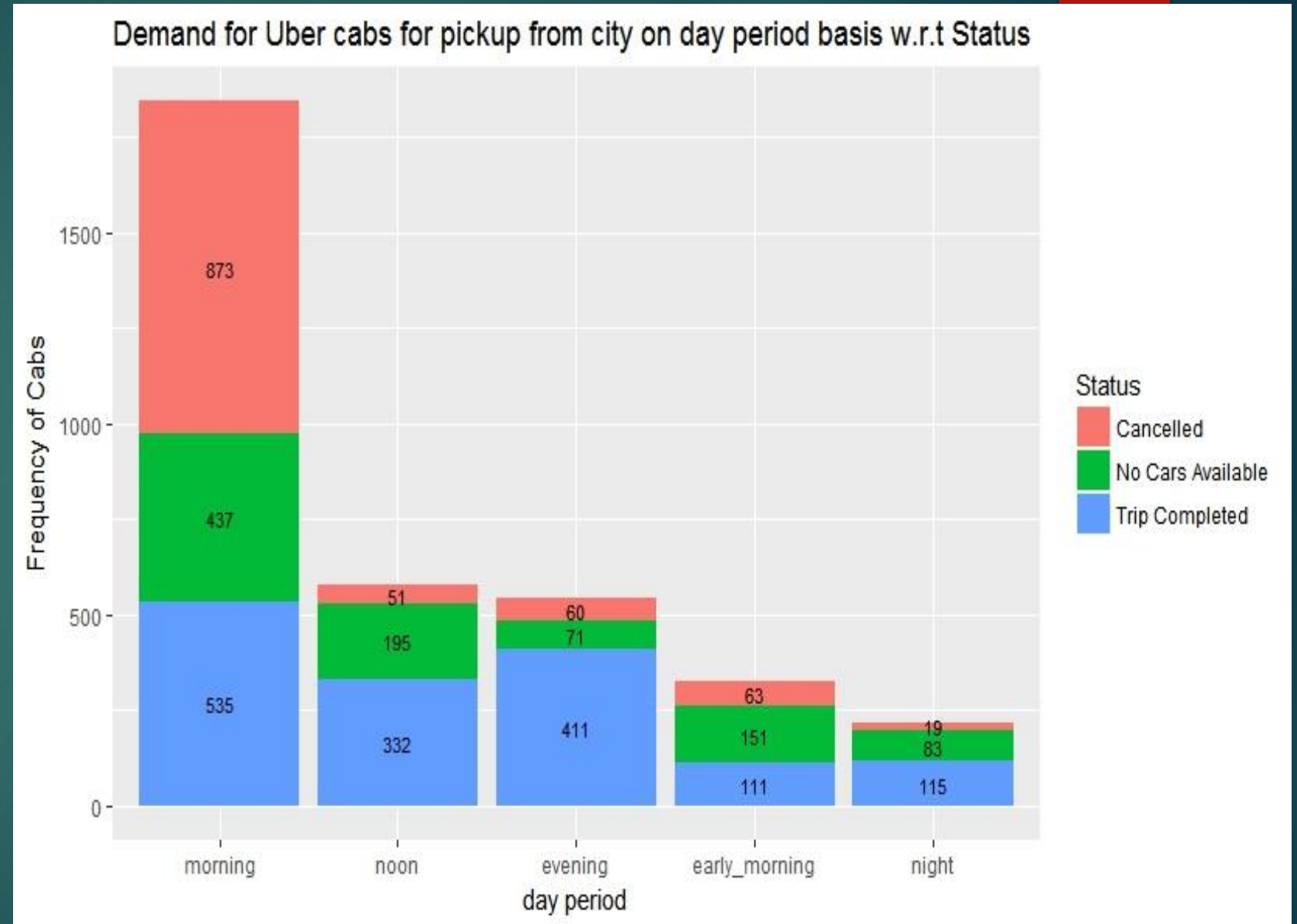
- For more precision we plot demand for Uber cabs for pickup from city only on day period basis w.r.t cab status.
- As clear from the graph for pickup point from city, cab cancellation is also main concern in the morning period of day period.

**Gap between supply and demand:**

**Total number of trips from city = 1845**

**Total number of trips completed from city = 535**

**Results are matching with previous one.**



Plot 6 as mentioned in R file

# Possible hypothesis for Problem 1

## Reason

- ▶ There are large number of flights leaves the airport and few flights reaches airport in morning. Therefore, when driver reaches airport during that period has to wait quite a time to get a cab request back to city and coming back to city without request will be waste of gas .
- ▶ Drivers decides not to go to airport so that he could utilize that waiting time for other trips in the city. Due to this a large number of requests got cancelled in morning results in supply-demand gap.

# Problem 2

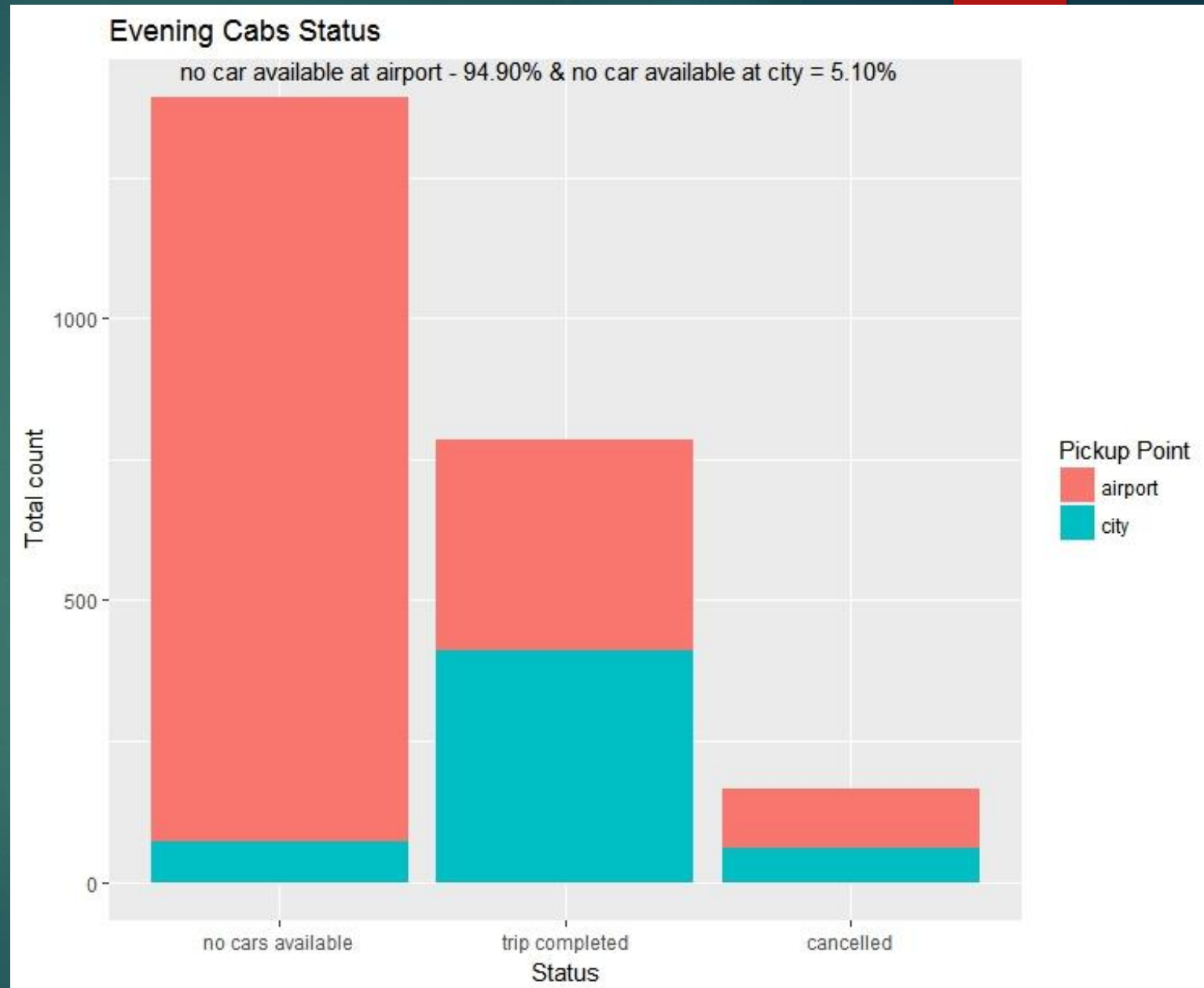
- No cars available status for most number of requests during the evening day period.
- We plot the stacked bar chart to find out if the issue is for pick-up request made at the airport or the city.
- As calculated:
  - car not available at airport = 94.90%
  - car not available at city = 5.10%

**Gap between supply and demand:**

**Total number of trips request = 1800**

**Total number of trips request completed = 373**

**Therefore, no cars available status for large number of request at pickup point airport in evening is also the main problem.**



Plot 7 as mentioned in R file

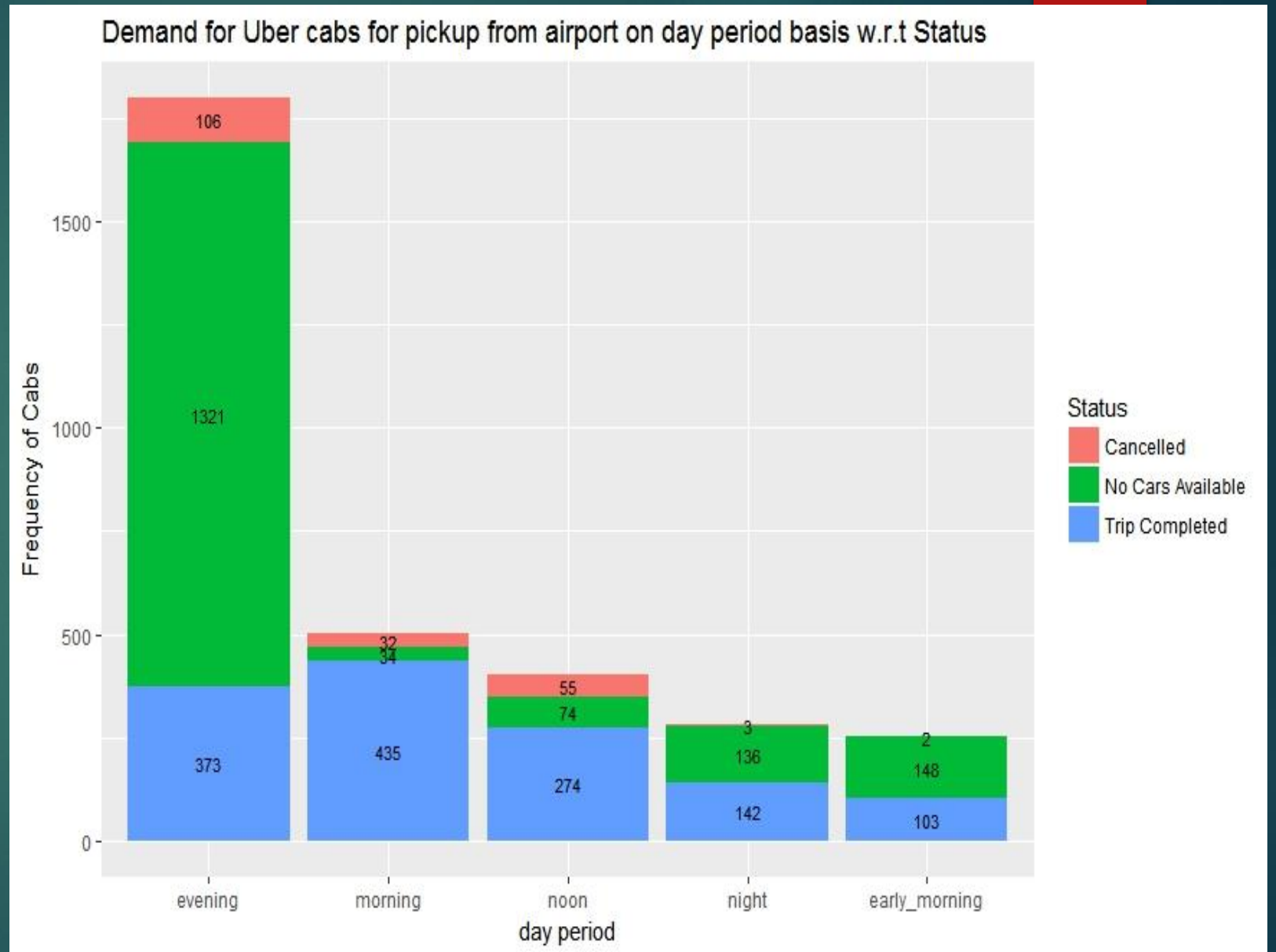
# Analysis

## PLOT 8

- For more precision, plot 8 shows demand for Uber cabs for pickup from airport only on day period basis w.r.t cab status.
- As clear from the graph for pickup point from airport, no car available is the main concern in the evening period of day period.

**Gap between supply and demand:**  
**Total number of trips request = 1800**  
**Total number of trips request completed = 373**

**Same as previous result.**



Plot 8 as mentioned in R file

# Possible hypothesis for Problem 2

## Reason

- ▶ At the airport there are more number of incoming flights and less number of outgoing flights during evening period.
- ▶ As there is more flights in evening means more passengers and cabs coming to the airport are also very less during this period. Therefore, passengers got no cars available while request leading to supply demand gap at the airport in evening.



# Solution to Supply-Demand Gap

- ▶ First solution will be Charging more money from the customers for trip to airport.
- ▶ Reducing the amount charged from cab drivers for taking Uber services for trip to the airport.

# CONCLUSION

- ▶ Data quality issues are correctly identified and cleaned for analysis.
- ▶ New variables are introduced for useful analysis.
- ▶ Problems are identified i.e. cabs are getting cancelled during morning from city and no cars available during evening at airport.
- ▶ Possible reason behind problem is waiting time of drivers is more in morning at airport as less flights are coming. And in evening less flight are leaving airport so no car available status is shown while request for cabs.
- ▶ Possible solution will be charging more money from the customers for trip to airport or reducing the amount charged from cab drivers for taking Uber services for trip to the airport.