# ONLINE CAB BOOKING


By,

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**GitHub Link-** https://github.com/Feynn-Project/online-cab-booking

## Abstract:

This project is being considered in order to reduce and eliminate loss of customers to competitors, and save the company from folding up. The current system is manual and it is time consuming. It is also cost ineffective, and average return is low and diminishing. Currently, customers can call or walk-in in order to rent or reserve a vehicle. The staff of the company will check their file to see which vehicle is available for rental. The current system is error prone and customers are dissatisfied. The goal of this project is to automate vehicle rental and reservation so that customers do not need to walk-in or call in order to reserve a vehicle. They can go online and reserve any kind of vehicle they want from the inventory of available vehicles. Even when a customer chooses to walk-in, computers are available for him to go online and perform his reservation. When he choose to reserve by phone, any of the customer service representatives can help him reserve the vehicle speedily and issue him a reservation number. The OVRS will maintain the database of all vehicles the company has. It will also keep track of all vehicle reservation and return. Reports will be generated bi-weekly. Reports for the Accounts Manager will detail the cost incurred to maintain each vehicle and revenue accrued on each vehicle.

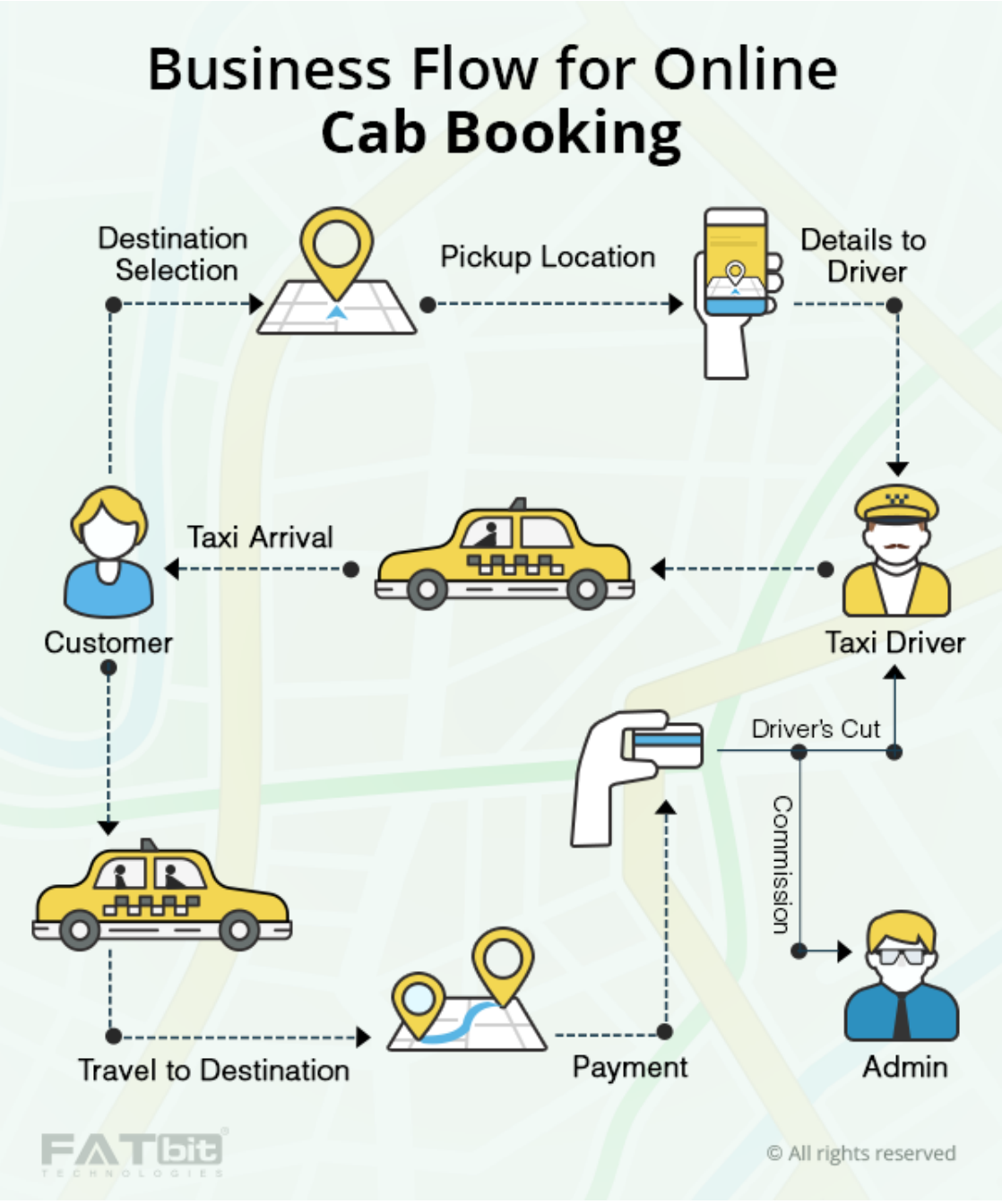
**Key Words:** **Destination Location, Pickup Location, Details to Driver, Taxi Driver, Taxi Arrival, Customer, Travel to Destination, Payment, Admin.**

Goal: The goal and purpose of my project, Digital Cab or Car Reservation, is to keep track of a user's numerous activities. Our project's problem statement is to provide an online method for cab booking services like OLA and Uber

## Cab Booking overview:

Our project's goal is to automate automobile reservations. Customers no longer need to contact and waste time to reserve their favourite vehicle. They can book any type of Cab they want online, as long as it is available at the moment. One of the features of our application is that it allows customer partners to monitor the present state of the journey as well as estimate the amount of time until the passenger arrives at their destination. The car monitoring feature is greatly appreciated worldwide; in the event of an emergency, such as an accident, the tracking system will activate an alarm, simultaneously informing the attendant of the occurrence and so requesting assistance.

Prior to the introduction of Online Cab Booking Services, everything was done manually, which was both time demanding and non-standardized in case of return. In order to rent / reserve a chosen car, customers had to make a manual call. The Virtual Cab Booking System software will search their database to see which vehicles are available for hiring. Our project's goal was to automate vehicle rentals and reservation processes. Customers no longer need to contact and waste time in order to book their favourite vehicle.




They can book any type of Cab they want online, as long as it is available at the moment. One of the features of our application is that it allows customer partners to monitor the actual situation of the journey as well as estimate the amount of time until the passenger arrives at their destination. The car monitoring feature is greatly appreciated worldwide; in the event of an emergency, such as an accident, the tracking device will activate an alarm, simultaneously informing the attendants of the occurrence and so requesting assistance. This is a web-based Android application that will work over a large area. It will be an internet solution for people to

travel safely and easily from one destination to another. The consumer has the option of booking a car based on their location and preferences. This admin controls the entire application, allowing him to add, remove, and manage vehicles as well as drivers' rides. Customers will save time and effort searching for a vehicle in an unfamiliar location if they commute from one location to another.

## Fermi Estimation:

Suppose a new Start-up want to launch a Taxi booking or cab – booking business, but the market is already dominated by big players such as OLA or Uber and other local companies as well. So, to understand the market, we can assess the data on the internet and can predict which part of the market will be beneficial and stable to invest into first while launching the company.

Factor like Cab Cancellation, could be useful as people tend to cancel cabs if they have to wait or if they find a better ride. Most people book cab when it rains, so a weather data study of the city will be useful to determine which city has most rainfall throughout the year, so it can act as platform for the launch of the company.

Then people mostly book cab when they have to go to party with friends together or go to office with colleagues. So, a study based on cab booking purpose will be helpful for us to determine the hotspots in the city. Holiday and working days can also be used as variable to calculate the booking frequencies.

The above problem analysis can be used to determine where and when the cabs are need the most and how much concentration is needed to be provided to that area. It can be used to provide flexible prices and discount, plus a company can charge a premium rates based on this.

## Data Sources:

Data was collected from Kaggle and also from ResearchAndMarkets.com.

Cab- drivers: Mining the driver's information... | Kaggle

Cab-booking: online vehicle booking - Jupyter Notebook

cab-cancellation: Predicting Cab Booking Cancellations for Yourcabs | Kaggle

weather: Weather data Indian cities (1990 to 2022) | Kaggle

https://www.businesswire.com/news/home/20210525005533/en/Global-Online-Taxi-Services-Market-Report-2021-to-2030---COVID-19-Growth-and-Change---ResearchAndMarkets.com

## Data Pre-processing (steps and Libraries used):

Data preprocessing is a process of preparing the raw data and making it suitable for a machine learning model. It is the first and crucial step while creating a machine learning model.

A real-world data generally contains noises, missing values, and maybe in an unusable format which cannot be directly used for machine learning models. Data preprocessing is required tasks for cleaning the data and making it suitable for a machine learning model which also increases the accuracy and efficiency of a machine learning model.

For Data Preprocessing we used a few main libraries.

Import pandas as pd- Pandas is defined as an open-source library that provides high-performance data manipulation in Python. Data analysis requires lots of processing, such as **restructuring, cleaning** or **merging**, etc. There are different tools are available for fast data processing, such as **Numpy, Scipy, Cython**, and **Panda.**

Import numpy as np- NumPy stands for numeric python which is a python package for the computation and processing of the multidimensional and single dimensional array elements.

Import matplotlib.pyplot as plt- **Matplotlib** is a Python library which is defined as a multi-platform data visualization library built on Numpy array.

Import seaborn as sns- Seaborn is one of an amazing library for visualization of the graphical statistical plotting in Python. Seaborn provides many color palettes and defaults beautiful styles to make the creation of many statistical plots in Python more attractive.

cab booking: /* df= pd.read_excel("D:\online drives.xlsx")*/

cab cancellation: /* df=pd.read_csv('YourCabs_training.csv') */

cab drivers: /*df= pd.read_excel("D:\online drives.xlsx")*/

weather: /* cab = pd.read_csv('cab_weather.csv')

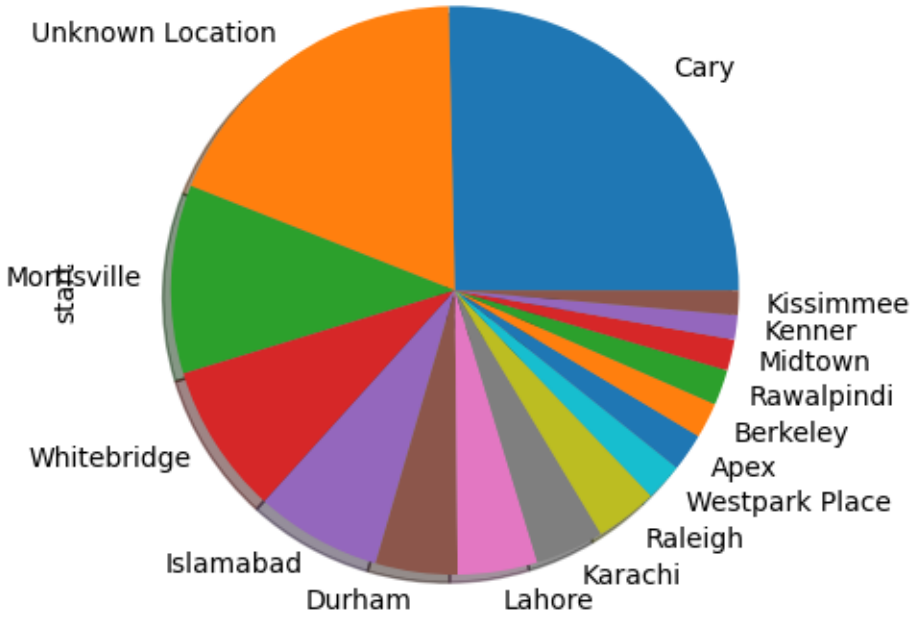
city = pd.read_csv('city_weather.csv') */

**Segment Extraction:** The online taxi services market covered in this report is segmented by service type into ride-hailing; ride sharing and by vehicle type into motorcycles; cars.

cab booking: /* import datetime */

Datetime: Python also consolidates a large number of features from other Python libraries like scikit.timeseries by using the NumPy datetime64 and timedelta64 dtypes. It provides new functionalities for manipulating the time series data.

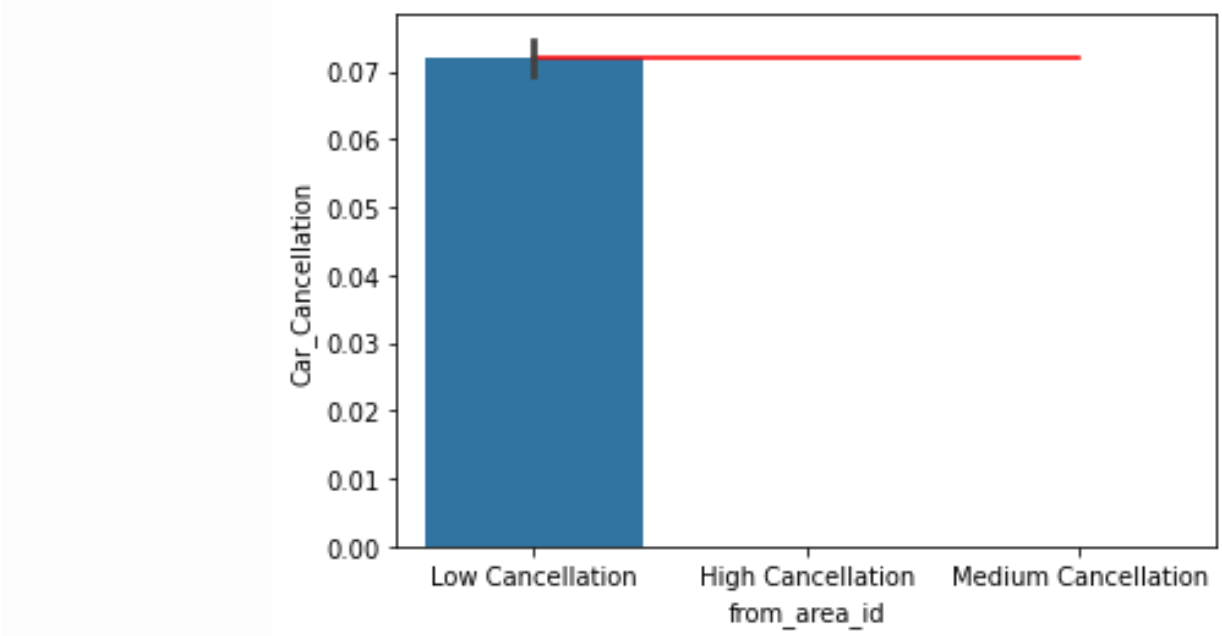
/* print(start_point[start_point > 10]) */



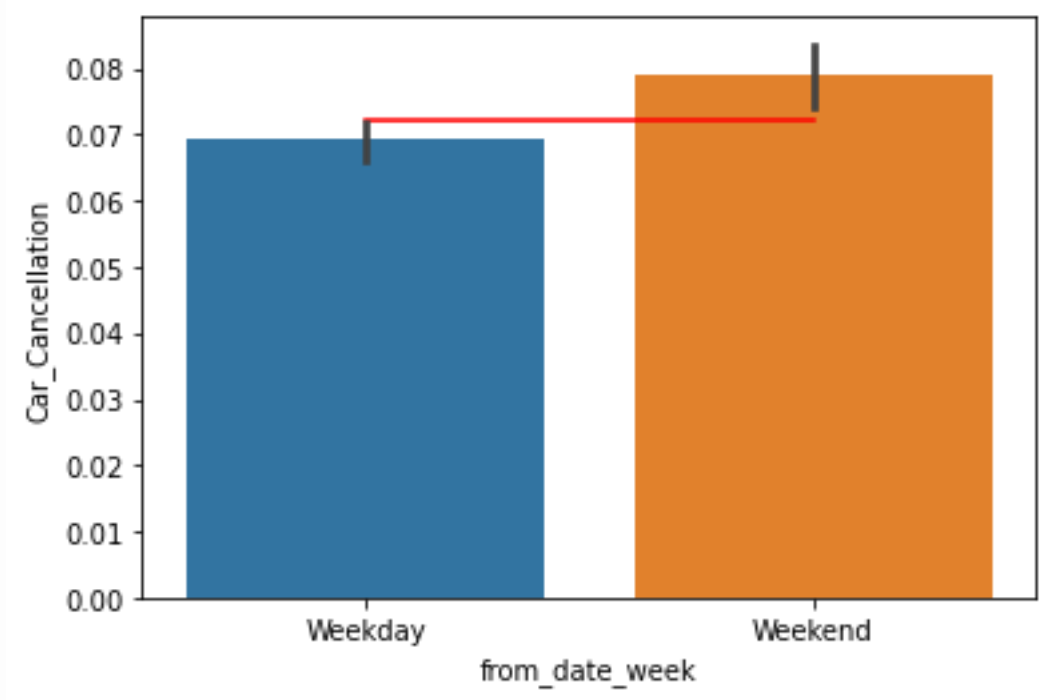

cab cancellation: /* from geopy import distance */

Geopy: geopy makes it easy for Python developers to locate the coordinates of addresses, cities, countries, and landmarks across the globe using third-party geocoders and other data sources.

Area wise car cancellations: In some areas there is no cancellations and in some areas there are a few cancellations.



In week days and in weekends the cancellations are may vary.



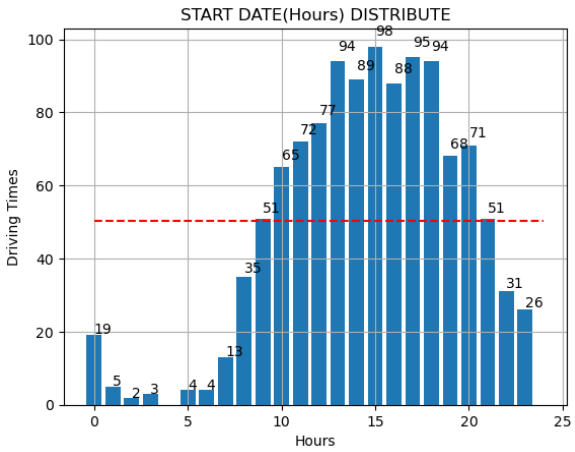

cab drivers: /*from itertools import combinations */

Apriori algorithm: In 1994, R. Agrawal and R. Srikant developed the Apriori method for identifying the most frequently occurring itemsets in a dataset using the boolean association rule. Since it makes use of previous knowledge about common itemset features, the method is referred to as Apriori. This is achieved by the use of an iterative technique or level-wise approach, in which k-frequent item sets are utilized to locate k+1 item sets. An essential feature known as the Apriori property is utilized to boost the effectiveness of level-wise production of frequent item sets. This property helps by minimizing the search area, which in turn serves to maximize the productivity of level-wise creation of frequent patterns.

```
/* sd_h_dis=df["startdate"].dt.hour.value_counts()

    sd_h_dis=sd_h_dis.sort_index()

   print("Hours Distribute:",sd_h_dis)

   sd_h_mean=sd_h_dis.mean()
```

rects=plt.bar(sd_h_dis.index,sd_h_dis.values)*/

The total hours worked by a driver has shown in the bar graph.




weather: /*from sklearn.linear_model import LinearRegression

model = LinearRegression()

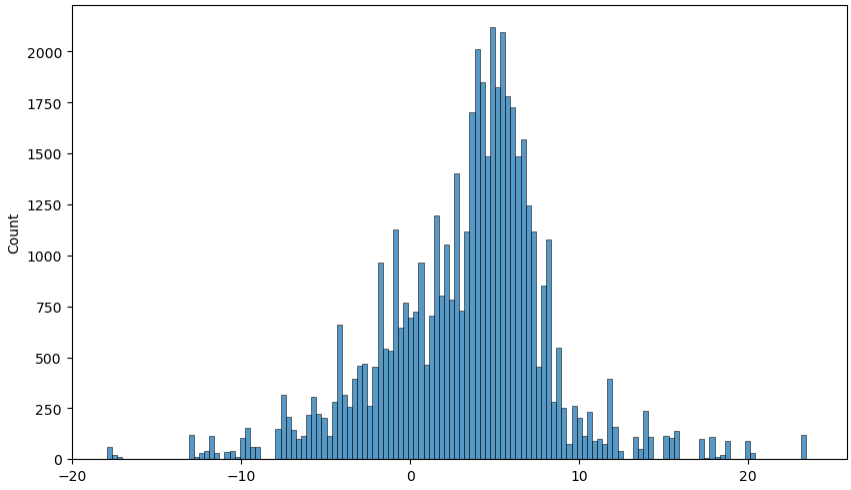
from sklearn.metrics import mean_squared_error

MSE = mean_squared_error(y_test,test_predictions)

RMSE = np.sqrt(MSE)

RMSE*/

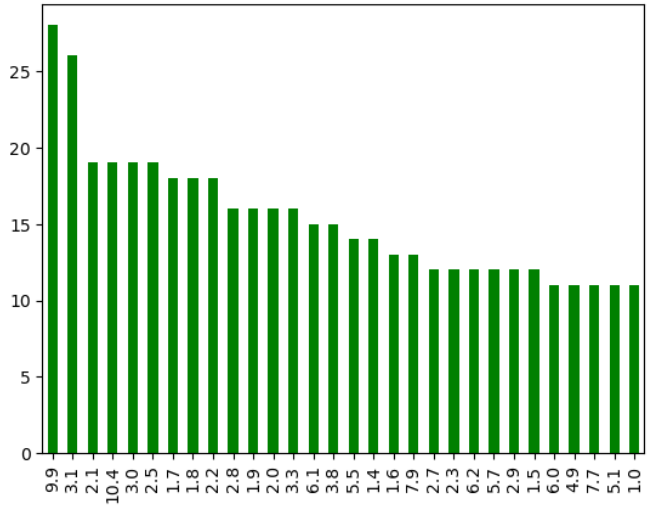
Histplot for prediction of prcp is,



## Selection of Target Statement:

cab booking: In this there is no specific target taken. Based on the rides booked the graphs were plotted. Here we taken the total number of miles cab was travelled.

/*miles_count[miles_count > 10].plot(kind = 'bar', color = 'g')*/




cab cancellation: In this we have taken the target element as car cancellation. Based on the bookings we have to predict how many cancellations has done.

/* #Selecting our target parametr is Car_cancellation

target=df[['Car_Cancellation']]

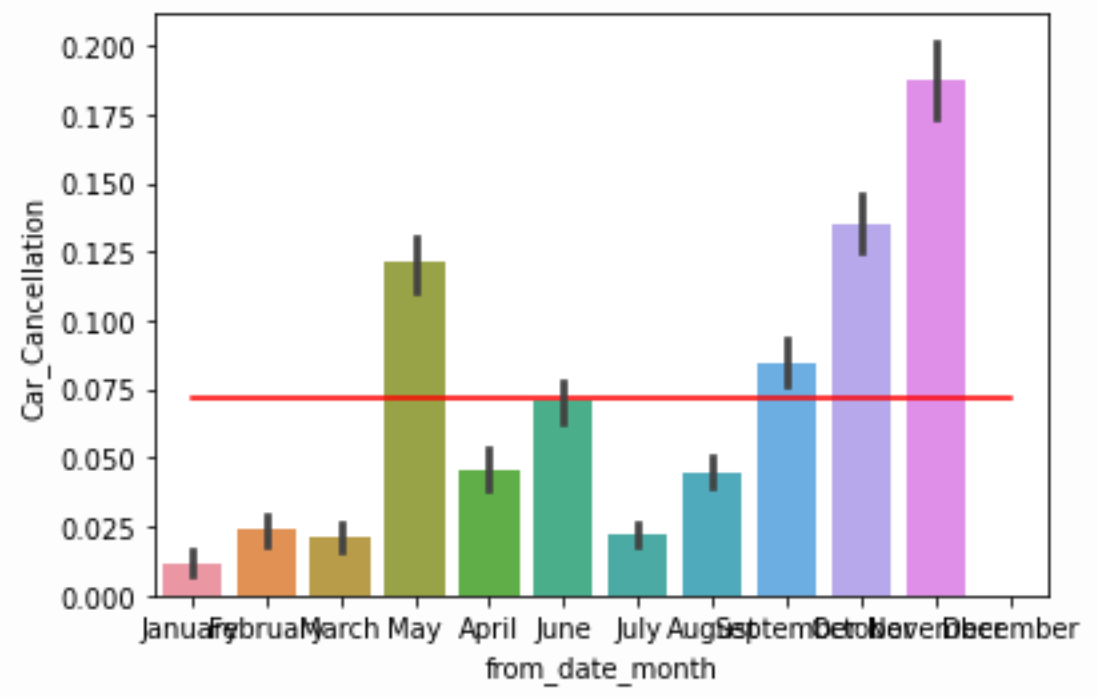
data['from_area_id'].value_counts()

output: Low Cancellation 43415

Medium Cancellation 11

High Cancellation 5
Name: from_area_id, dtype: int64*/

The cancellations may vary by every month and day to day. In January there are very few bookings and half are cancellations in that.



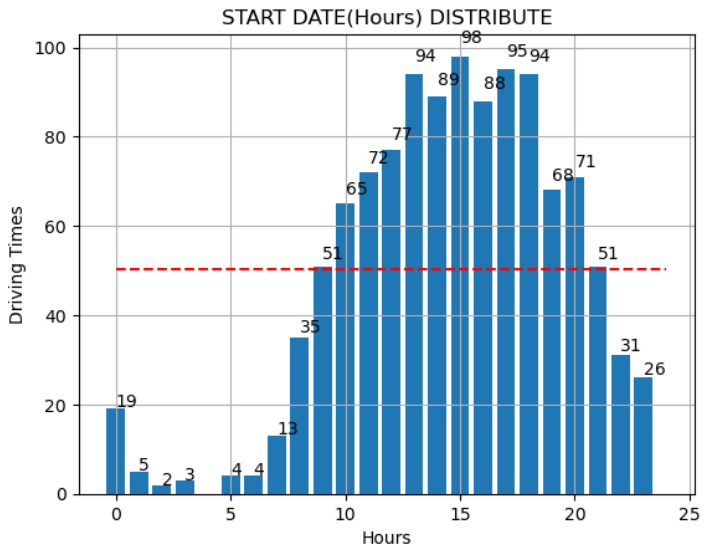

cab drivers: /*sd_h_dis=df["startdate"].dt.hour.value_counts()

sd_h_dis=sd_h_dis.sort_index()

print("Hours Distribute:",sd_h_dis)

sd_h_mean=sd_h_dis.mean()

rects=plt.bar(sd_h_dis.index,sd_h_dis.values)*/



weather: /*In this dataset we took precipitation as the target element.

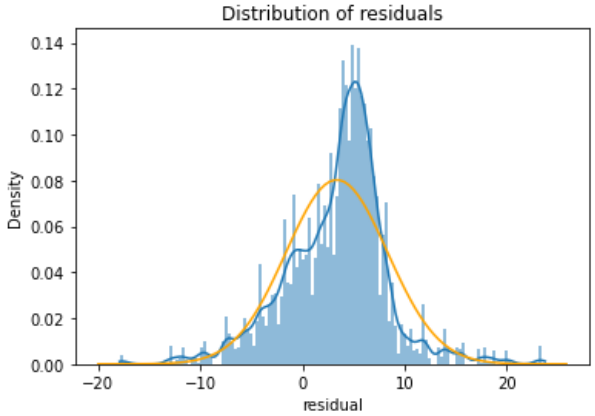
y = main['prcp']

and then we used linear regression to predict the target element.

from sklearn.linear_model import LinearRegression

model = LinearRegression()*/

Histplot for test predictions is




## Business Market (Potential Profit):

Internet users are ever-growing, so are the cab bookers. According to Statista estimate, there will be 5 billion active internet users globally in the current year, and the figure is projected to grow by another 300 million by 2023. The more people get into the web, the more they are availing of the services of an **online cab booking system**. Statista also projects global app cab users will be 20% of the population by 2022, which will also see a rise of another 1.1% by 2026.

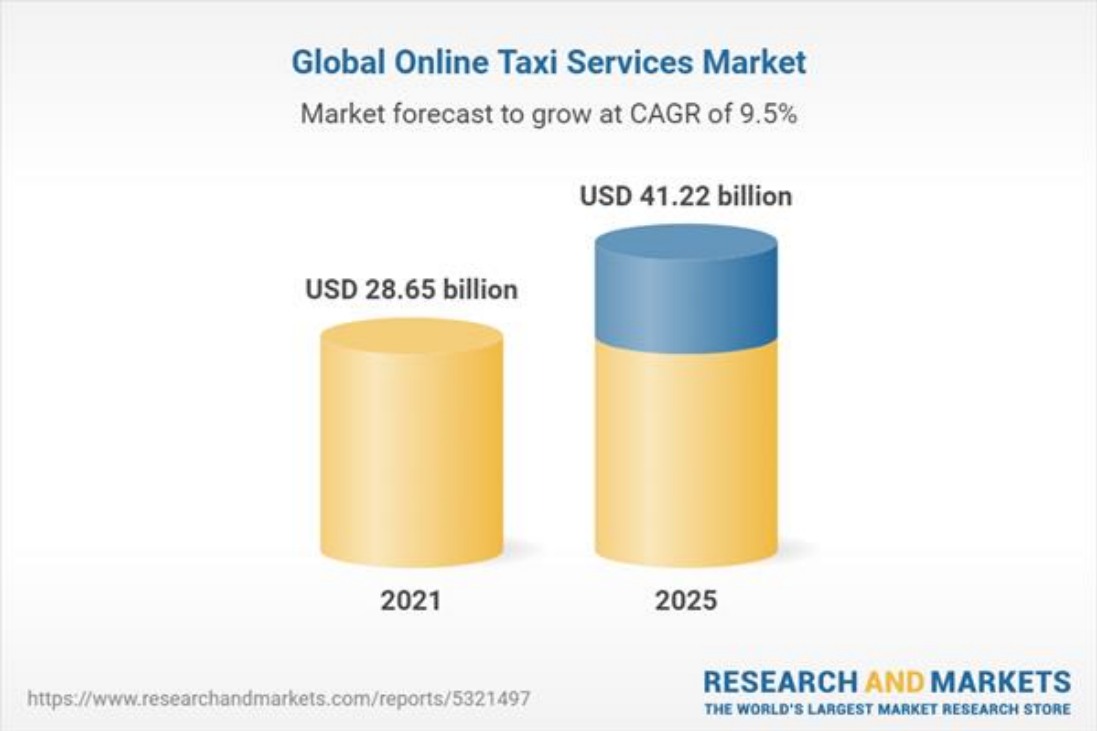
The online taxi services market consists of sales of taxi services and related goods by entities (organizations, sole traders, and partnerships) that provide passenger transportation by automobile or van through online reservations or on a booking basis. This industry comprises establishments primarily engaged in providing passenger transportation by taxi that are booked by using a mobile application. These companies use online platforms and mobile applications to offer their services to customers. Examples include Uber, Lyft, and Didi. Taxis booked online through an app are mentioned in the report as ride-hailing services. This does not include taxis stopped on roadsides. Only goods and services traded between entities or sold to end consumers are included.

Rising internet penetration drives the demand for the online taxi services market. The availability of high-speed internet connectivity and convenience associated with using online

services is shifting consumer preferences towards online taxi services. According to the Internet World Stats, the number of internet users increased from 4,208 million to 4,833 million in June 2020. Furthermore, internet users in India are expected to grow from 636.73 million in 2019 to 974.86 million by the end of 2025. A growing number of internet users with smartphones now have taxi services at their fingertips that give the drivers' details and location and benefit the user and thereby fuel the demand for the online taxi services market.

The launch of self-driving taxi services is gaining popularity in the online taxi services market. Major players operating in the industry are continuously focused on introducing innovations and technologies to better serve the needs of consumers. For instance, in August 2020, AutoX, an autonomous driving startup announced the public launch of robo-taxi services in China. In December 2018, Waymo LLC, a US-based autonomous driving technology development company, launched self-driving taxi services for paying customers in Arizona, USA. Moreover, in October 2019, Ola, a ride-hailing firm introduced Ola Drive, self-driving car-sharing services in multiple locations in India including Bangalore, New Delhi, Mumbai, and Hyderabad.

In September 2019, Mahindra & Mahindra, an Indian multinational vehicle manufacturing corporation announced the acquisition of 55% stakes in Meru Cabs, a taxi cab service provider for $27.3 million (Rs 201.5 crore). With the acquisition of Meru Cabs, Mahindra & Mahindra plans to expand its business with participation in the growing shared mobility space. Meru Cabs is an India-based ridesharing company operating in the ride-hailing segment and corporate transportation solutions.



## Conclusion:

It is quite difficult to travel physically from one location to another in today's world, and it is even more difficult to get from one location to another if someone is travelling from afar and is unfamiliar with the city. As a result, the establishment of an online auto booking service will assist individuals in booking a cab for their preferred location and vehicle. When you sign up for a car booking service, you will have the option to pay online and, in certain cases, you will receive a free one-time service. This is an online Android software that allows any car driver to become a member of the service and participate in it. When it comes to the future scope of our taxi booking application, it already has a lot of functions, but we can add more in the future, such as voice help, so that users may book their rides in minutes. With this chat bot function, which gives consumers with a 24x7 helpdesk option for any concerns and an SOS tool for women in the event of an emergency.

## References: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