INTRODUCTION

1.1 OVERVIEW

The Flight ticket prices increase or decrease every now and then depending on various factors like timing of the flights, destination, duration of flights. People who work frequently travel through flight will have better knowledge on best discount and right time to buy the ticket. Optimal timing for airline ticket purchasing from the consumer's perspective is challenging principally because buyers have insufficient information for reasoning about future price movements. Currently, everyone loves to travel by flights. Going along with the study, the charge of travelling through a plane change now and then which also includes the day and night time. Additionally, it changes with special times of the year or celebration seasons. There are a few unique elements upon which the cost of air transport depends. For the business purpose many airline companies change prices according to the seasons or time duration. They will increase the price when people travel more. Estimating the highest prices of the airlines data for the route is collected with features such as Duration, Source, Destination, Arrival and Departure. Features are taken from chosen dataset and in the price wherein the airline price ticket costs vary overtime. we have implemented flight price prediction for users by using KNN, decision tree and random forest algorithms. Random Forest shows the best accuracy of 80% for predicting the flight price. also, we have done correlation tests and metrics for the statistical analysis.

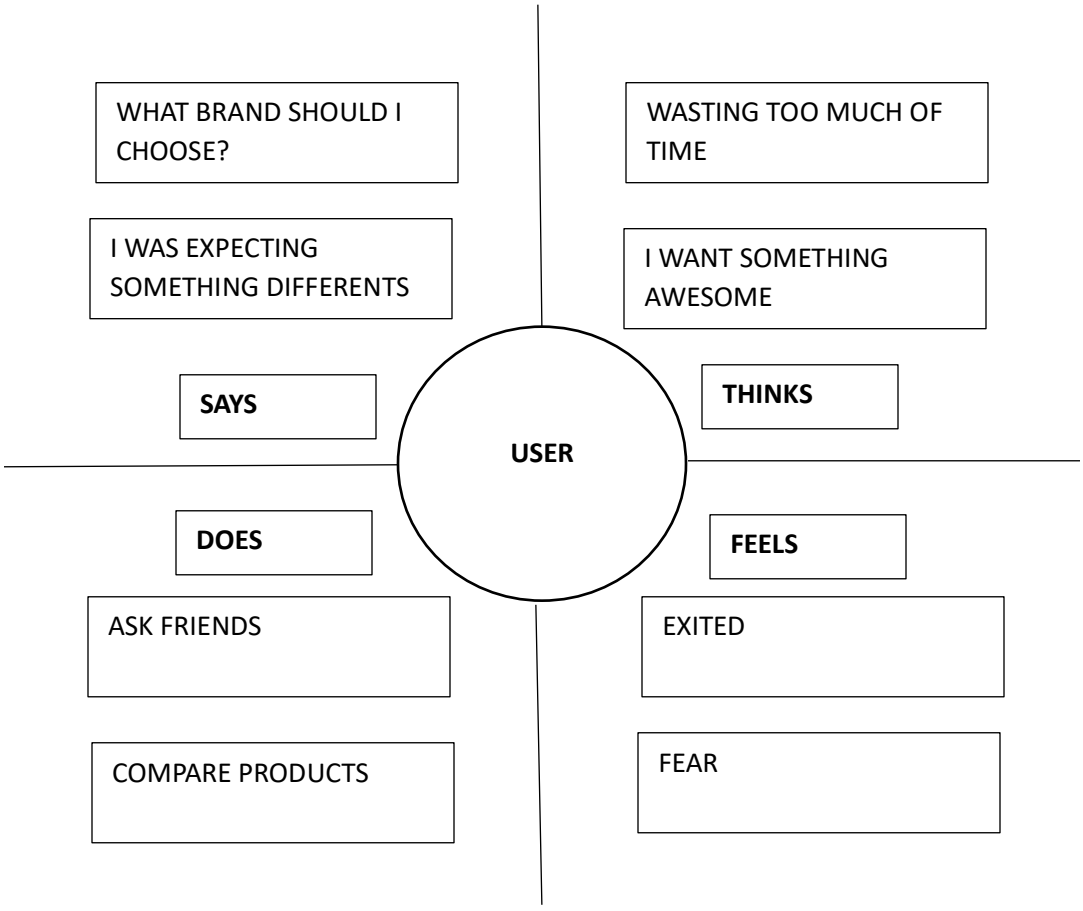
1.2 PURPOSE

- The aim of this project is to detect the prices of different flights as compare to today to another day due to which help to people to book the flight ticket according to their need.
- Forecasting is an important factor to any businesses because it gives the ability to make informed business decisions and establish data-driven strategies.
- The overall goal of the project is to create the web UI which will predict the price to the customer on the basis of the given input.
- To build the model with maximum accuracy using the appropriate Machine learning algorithms.
- To save the final built model.
- Design web pages using HTML and CSS.
- Expose the web pages using Flask framework.

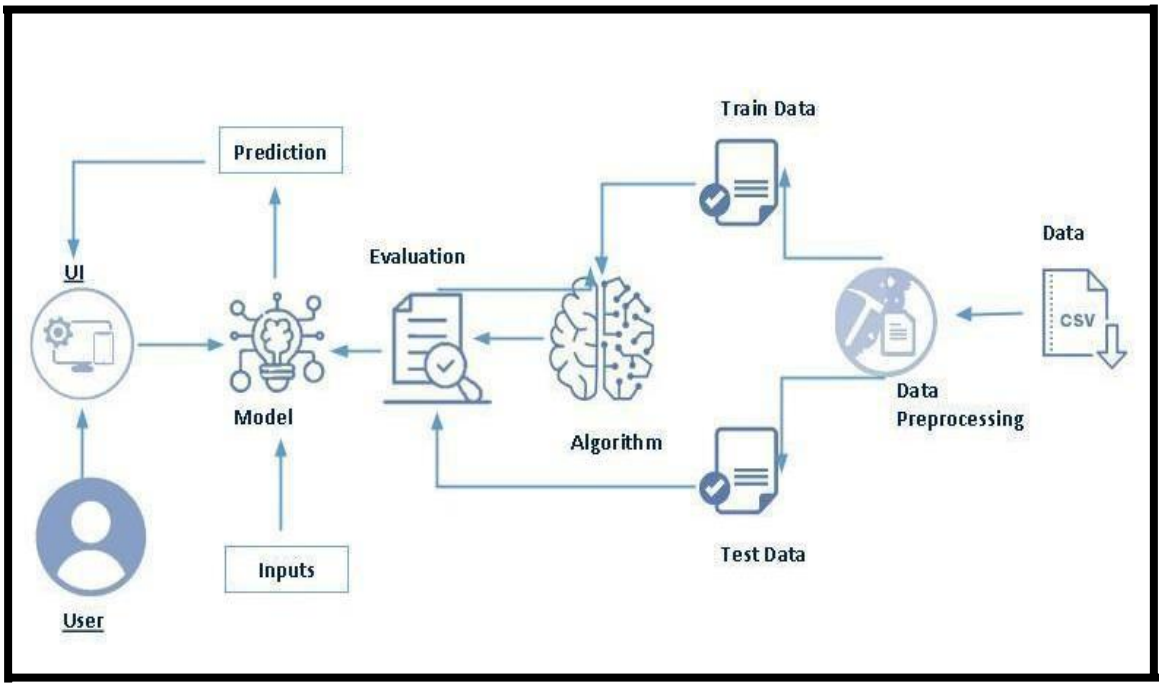
PROBLEM DEFINITION AND DESIGN THINKING

2.1 EMPATHY MAP

An empathy map is a square divided into four quadrants with the user or client in the middle. Each of the four quadrants comprises a category that helps us delve into the mind of the user. The four empathy map quadrants look at what the user says, thinks, feels, and does.



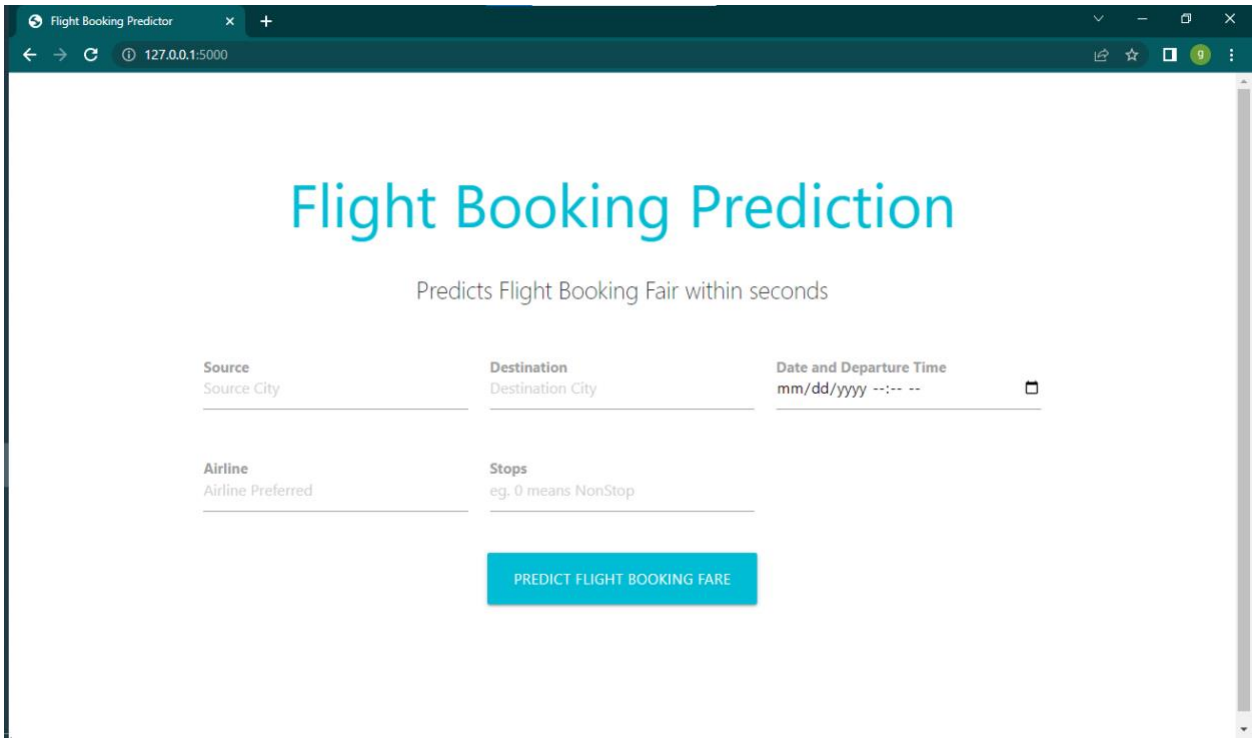
2.2 IDEATION MAP



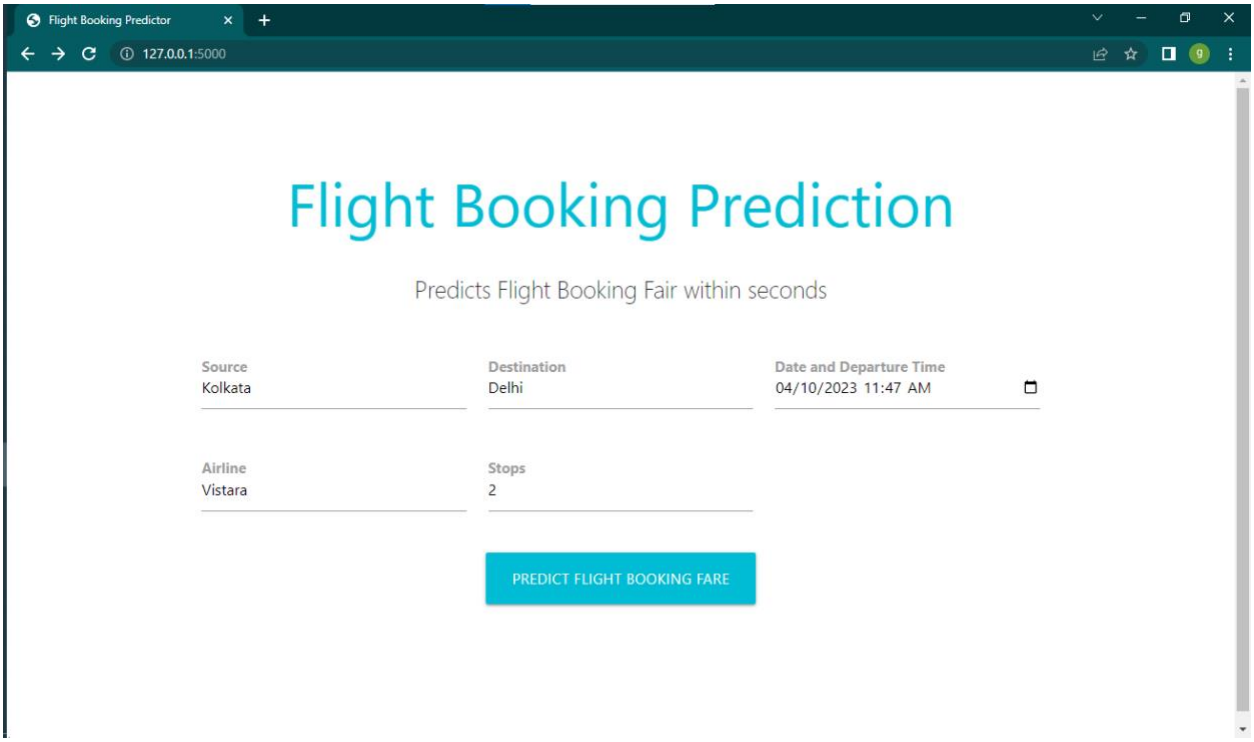
RESULT

3.1 OUTPUT OF THE PROJECT

Now, Go the web browser and write the localhost url (http://127.0.0.1:5000) to get the below result.

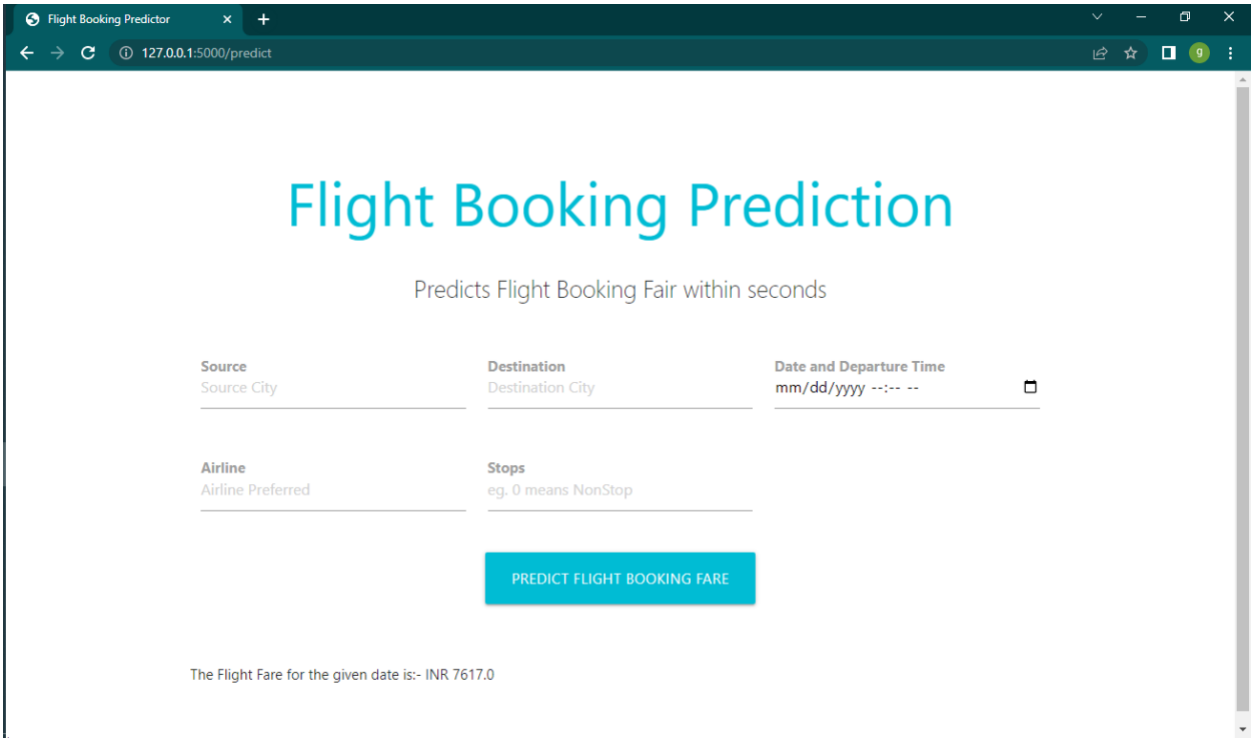


Now, when you click on Predict button you will get redirected to the prediction page.



Input 1- Now, the user will give inputs to get the predicted result after clicking onto the submit button.

Now when you click on submit button from right top corner you will get redirected to submit.html



ADVANTAGES AND DISADVANTAGES

4.1 ADVANTAGES

- Nowadays there are lots of apps for flight ticket booking, if passenger want to travel from one space to another space so they don't know actually what is the prices of that same space flight.
- To save their money and time we will decide to develop such system due to which user can book the flight ticket according to their need.
- A Flight price prediction application which predicts fares of flight for a particular date based on various parameters like Source, Destination, Stops & Airline**.**
- This help people who tends to pay more for the flight fare ticket and for those who are naïve to this booking tickets process.
- This will also help us to get more exposure to the machine learning techniques that will help us to excel and improve in the existing skills.
- To get effective price for the customers.
- Make UI user friendly.
- Use of various ML methods to know more about dataset and get accurate results.
- An online booking system will reduce no-shows.
- Flight Reservation System plays an important role in airline companies to maximize sales of tickets, increased the number of valuable customers and also improving the brand image of the company.

- Reduce human error.

4.2 DISADVANTAGES

- Reliable internet access is required to check reservations and add bookings that are made over the phone.
- Choosing an online booking software that doesn’t meet your needs can be a real detriment to your business.
- Especially during the middle of the season, it’s critical to find a booking system provider that won’t put you temporarily out of commission.

APPLICATIONS

5.1 APPLICATION

- Flight booking applications help the airline industry automate the booking process.
- Users worldwide can book flights on the go using the simple apps, which include features such as quick flight search, download tickets, check and modify booking details, one-tap check-in, and many more.
- This system can be used by all the common people.

CONCLUSION

6.1 CONCLUSION

Machine Learning algorithms are applied on the dataset to predict the dynamic fare of flights. This gives the predicted values of flight fare to get a flight ticket at minimum cost. Data is collected from the websites which sell the flight tickets so only limited information can be accessed. The values of R-squared obtained from the algorithm give the accuracy of the model. Finally, we have created the entire process of predicting an airline ticket and given a proof of our predictions based on the previous trends with our prediction. We learn that ML models can be used to predict prices based on earlier data more correctly. The presented paper reflects the dynamic change in the cost of flight tickets from which we get the information about the increase or decrease in the price as per the days, weekends, and the time of the

day. With the ML algorithm applied on various datasets, better results can be obtained for prediction.

FUTURE SCOPE

7.1 FUTURE SCOPE

In the future, if more data could be accessed such as the current availability of seats, the predicted results will be more accurate. In the future, this work could be extended to predict the airfare prices for the entire flight map of the airline. We need to test these machine learning algorithms on the huge airline datasets, but the preliminary studies remark on the capabilities of ML Models to help the end users to give an idea when to buy the tickets in what period so they will be in profit. Features took from external factors such as social media data and search engine query are not taken. Therefore, we will introduce and discuss the concept of using social media data for ticket/demand prediction (i.e., twitter sentiment analysis).

APPENDIX

8.1 SOURCE CODE

```
import numpy as np

import pandas as pd

import pickle

from flask import Flask,request,jsonify,render_template


app = Flask(__name__)

model = pickle.load(open('model.pkl','rb'))


@app.route('/')

def home():
```

```
    return render_template('index.html')


@app.route('/predict',methods=['GET','POST'])
def predict():
    ##For rendering result on HTML interface
    if request.method=='POST':
        features = [x for x in request.form.values()]
        source_dict = {'Bangalore': 0, 'Chennai': 1, 'Delhi': 2, 'Kolkata': 3, 'Mumbai': 4}
        destination_dict = {'Bangalore':0,'Cochin':1,'Delhi':2,'Kolkata':
3,'Hyderabad':4,'New Delhi':5}
        airline_dict = {'IndiGo': 3, 'Air India': 1, 'Jet Airways': 4, 'SpiceJet': 8, 'Multiple
carriers': 6, 'GoAir': 2, 'Vistara': 10, 'Air Asia': 0, 'Vistara Premium economy': 11, 'Jet
Airways Business': 5, 'Multiple carriers Premium economy': 7, 'Trujet': 9}
        source_value = features[0]
        dest_value = features[1]
        date_value = features[2]
        airline_value = features[3]


        stops_value = int(features[4])   #<----------


        a= pd.Series(source_value)
```

```
source = a.map(source_dict).values[0]   #<----------

b= pd.Series(dest_value)

destination = b.map(destination_dict).values[0] #<---------

c= pd.Series(airline_value)

airline = c.map(airline_dict).values[0]   #<----------


day  =  int(pd.to_datetime(date_value,  format="%Y-%m-%dT%H:%M").day) #<----------------

month  =  int(pd.to_datetime(date_value,  format="%Y-%m-%dT%H:%M").month)  #<---------


hour  =  int(pd.to_datetime(date_value,  format  ="%Y-%m-%dT%H:%M").hour)

minute  =  int(pd.to_datetime(date_value,  format  ="%Y-%m-%dT%H:%M").minute)


if  source==destination:

   return  render_template('index.html',pred='Source  and  Destination  City cannot be same. Please try again! ')


else:
```

```
        pred_features =
[np.array([day,month,stops_value,hour,minute,airline,source,destination])]
        prediction = model.predict(pred_features)

        if stops_value==0:
            output = round(prediction[0],0)

        else:
            output = round(prediction[0],0)-2000

        return render_template('index.html',pred='The Flight Fare for the given date
is:-  INR {}'.format(output))
    else:
        return render_template('index.html')
if __name__=='__main__':
    app.run(debug=True)
```