FLIGHT PRICE PREDICTION

Project Based Experiential Learning Program

COLLEGE NAME :

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY AND SCIENCES ,AMALAPURAM

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FLIGHT COST

InTROducTIOn

		Domestic Flights cost/100km		International Flights cost/100km		
#	Country	Low Cost Airline	Legacy Airline	Low Cost Airline	Legacy Airline	Average cost/100 km
65	Solomon Islands	$56.13	$63.76	$11.87	$12.49	**US$36.06**
66	Switzerland	$43.75	$59.66	$14.74	$29.21	**$36.84**
67	Austria	$69.70	$69.70	$3.72	$4.53	**$36.91**
68	Denmark	$26.46	$61.42	$22.61	$40.94	**$37.86**
69	Belgium	$37.75	$84.49	$13.43	$16.61	**$38.07**
70	Canada	$8.00	$8.47	$43.70	$94.66	**$38.71**
71	Japan	$29.52	$72.98	$26.46	$38.96	**$41.48**
72	The Netherlands	$28.15	$91.53	$16.88	$32.84	**$42.35**
73	Qatar	$64.36	$85.31	$18.75	$33.04	**$50.37**
74	Finland	$39.61	$130.80	$8.01	$25.48	**$50.98**
75	United Arab Emirates	$181.38	$220.36	$9.80	$11.28	**$105.71**

Source: Kiwi.com 2018 Aviation Price Index

zafigo

OBJECTIVES

The main objectives of flight prediction decision-making are as follows:

To estimate the likelihood of flight delays, cancellations, or disruptions.

To provide accurate and timely information to passengers and airlines.

To optimize flight schedules and resources based on predictions.

To enhance passenger satisfaction and overall travel experience.

Factors Influencing Flight Predictions

Flight predictions are influenced by various factors, including but not limited to:

a. Historical Data: Analysis of historical flight data helps identify patterns and trends in delays, cancellations, and on-time performance.

b. Weather Conditions: Weather is a significant factor affecting flight operations. Monitoring weather forecasts and patterns is essential for accurate predictions.

c. Air Traffic and Congestion: The level of air traffic and congestion at airports and airspace can impact flight schedules.

d. Aircraft Maintenance and Availability: The maintenance status and availability of aircraft affect their on-time departure and arrival.

e. Airline Operations: Each airline's operational efficiency and procedures influence the likelihood of delays and cancellations.

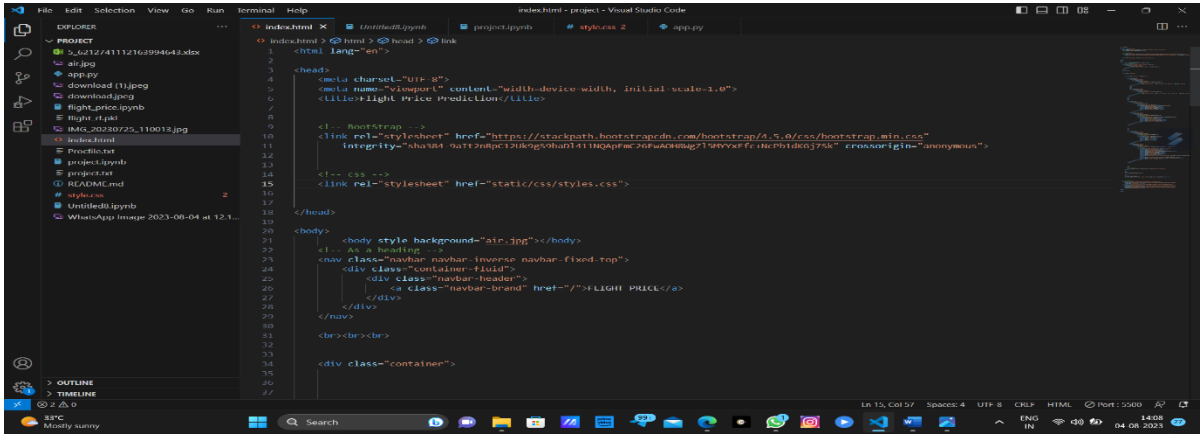
f. Airports and Airspace Management: Airport capacity, runway availability, and airspace management affect flight punctuality.

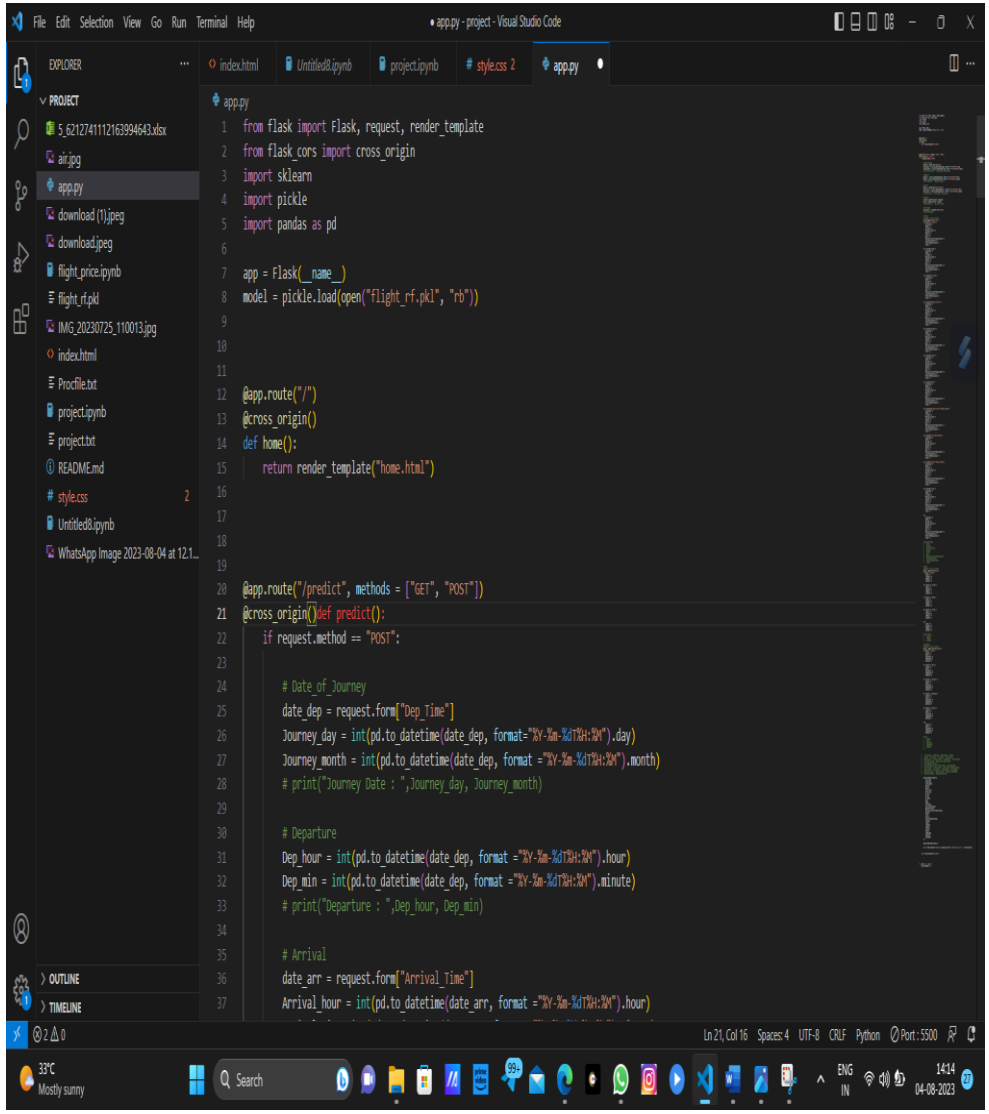
g. External Events: Events such as strikes, natural disasters, or security incidents may disrupt flight operations.

WHY WE NEED FLIGHT PRICE PREDICTION

Flight price prediction is important because airlines usually keep their price strategies as commercial secrets and information is always asymmetric. It is difficult for ordinary customers to estimate future flight price changes. However, a reasonable prediction can help customers make decisions when to buy air tickets for a lower price. Flight ticket prices fluctuate depending on different parameters such as flight schedule, destination, and duration, a variety of occasions such as vacations or the holiday season. Having a basic understanding of flight rates before booking a vacation will undoubtedly save many individuals money and time.

HOW DID WE BUILD FLIGHT PRICE PREDICTION




File Edit Selection View Go Run Terminal Help
app.py - project - Visual Studio Code
EXPLORER
PROJECT
5_62127411121639964 3.xlsx
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app.py
download (1).jpeg
download.jpeg
flight_price.ipynb
flight_rf.pkl
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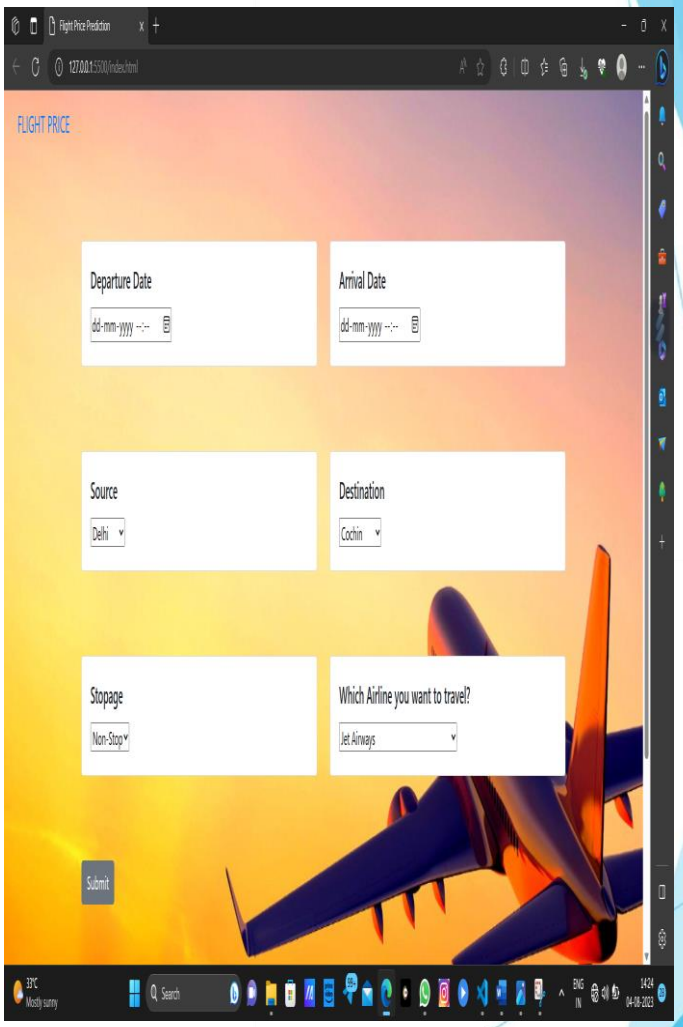
index.html
Procfile.txt
project.ipynb
project.txt
README.md
style.css
Untitled8.ipynb
WhatsApp Image 2023-08-04 at 12.1...
OUTLINE
TIMELINE
index.html
Untitled8.ipynb
project.ipynb
style.css 2
app.py
app.py
from flask import Flask, request, render_template
from flask_cors import cross_origin
import sklearn
import pickle
import pandas as pd
app = Flask(__name__)
model = pickle.load(open("flight_rf.pkl", "rb"))
@app.route("/")
@cross_origin()
def home():
return render_template("home.html")
@app.route("/predict", methods = ["GET", "POST"])
@cross_origin()def predict():
if request.method == "POST":
# Date_of_Journey
date_dep = request.form["Dep_Time"]
Journey_day = int(pd.to_datetime(date_dep, format="%Y-%m-%dT%H:%M").day)
Journey_month = int(pd.to_datetime(date_dep, format ="%Y-%m-%dT%H:%M").month)
# print("Journey Date : ",Journey_day, Journey_month)
# Departure
Dep_hour = int(pd.to_datetime(date_dep, format ="%Y-%m-%dT%H:%M").hour)
Dep_min = int(pd.to_datetime(date_dep, format ="%Y-%m-%dT%H:%M").minute)
# print("Departure : ",Dep_hour, Dep_min)
# Arrival
date_arr = request.form["Arrival_Time"]
Arrival_hour = int(pd.to_datetime(date_arr, format ="%Y-%m-%dT%H:%M").hour)
Ln 21, Col 16 Spaces: 4 UTF-8 CRLF Python Port : 5500
33°C
Mostly sunny
Search
ENG
IN
14:14
04-08-2023


Flight Price Prediction
127.0.0.1:5500/index.html
FLIGHT PRICE
Departure Date
dd-mm-yyyy --:--
Arrival Date
dd-mm-yyyy --:--
Source
Delhi
Destination
Cochin
Stopage
Non-Stop
Which Airline you want to travel?
Jet Airways
Submit
33°C
Mostly sunny
Search
ENG
IN
14:24
04-08-2023

To make well-informed flight predictions, we rely on data from various sources, including:

Flight data from airlines and aviation authorities.

Weather information from meteorological agencies.

Air traffic and airspace data from aviation authorities.

Historical flight performance data.

Prediction Methodology

Our flight prediction decision-making process follows a structured methodology:

a. Data Collection: We gather and update relevant data from the sources mentioned above.

b. Data Analysis: Through statistical analysis and machine learning algorithms, we identify patterns and trends in historical data.

c. Model Development: We develop predictive models based on historical and real-time data, incorporating factors such as weather forecasts, air traffic, and more.

```
async function fetchWeatherData(city) {
  try {
    const response = await fetch(
      `${baseUrl}?q=${city}&appid=${apiKey}&units=${units}`
    );
    if (!response.ok) {
      throw new Error("Weather data not available.");
    }
    const data = await response.json();
    updateWeatherInfo(data);
  } catch (error) {
    console.log(error);
  }
}
```

```
function updateWeatherInfo(data) {
  cityElement.textContent = data.name;
  datetimeElement.textContent = getCurrentTime();
  forecastElement.textContent = data.weather[0].description;
  iconElement.innerHTML = `<img src="http://openweathermap.org/img/wn/${data.weather[0].icon}.png" alt="Weath
  temperatureElement.innerHTML = `${Math.round(data.main.temp)}&#176;${
    units === "metric" ? "C" : "F"
  }`;
  minMaxElement.innerHTML = `<p>Min: ${Math.round(data.main.temp_min)}&#176;${
    units === "metric" ? "C" : "F"
  }</p><p>Max: ${Math.round(data.main.temp_max)}&#176;${
    units === "metric" ? "C" : "F"
  }</p>`;
  realFeelElement.innerHTML = `<p>${Math.round(data.main.feels_like)}&#176;${
    units === "metric" ? "C" : "F"
  }</p>`;
  humidityElement.textContent = `${data.main.humidity}%`;
  windElement.textContent = `${data.wind.speed} ${
    units === "imperial" ? "mph" : "m/s"
  }`;
  pressureElement.textContent = `${data.main.pressure} hPa`;
}
```

d. Model Evaluation: We continually assess the accuracy and performance of our predictive models using validation data.

e. Prediction Generation: Based on the models, we generate flight predictions for specific routes and timeframes.

COMMUNICATION AND DISSEMINATION

To ensure the effective utilization of flight predictions, we communicate the information through:

Airlines: Providing airlines with timely updates and predictions to optimize their operations.

Passengers: Sharing predictions through various channels, including websites, mobile apps, and notifications.

Airport Authorities: Collaborating with airport authorities to improve overall efficiency.

Continuous Improvement

Flight prediction decision-making is an iterative process. We are committed to continuous improvement through:

Regularly updating and refining our predictive models.

Incorporating feedback from airlines, passengers, and other stakeholders.

Staying up-to-date with the latest data sources and technologies.

APPLICATIONS

- To help travellers find the best rates for their flights by comparing different factors that affect the prices
- To help airlines forecast the rates of competitors and adjust their pricing strategies accordingly
- To help travel platforms attract more visitors and increase their revenue
- 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.

CONCLUSION

Flight prediction decision-making is a critical aspect of the aviation industry, benefiting airlines, passengers, and all stakeholders. By employing a structured approach and leveraging data-driven methodologies, we strive to enhance the

accuracy and reliability of flight predictions, ultimately leading to improved travel experiences for all.

LINKS

Github Link:

https://github.com/Chandiniadabala/optimizing-flight-booking-decisions-through-machine-learning-price-prediction