

TRAVEL AND TOURISM CATALOGUE

(WITH FLIGHT FARE PREDICTION SYSTEM)

GROUP MEMBERS

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INTRODUCTION

Flight fare prediction is an innovative application of machine learning technology that helps to predict airfare prices for different airlines and routes. This project involves the use of advanced algorithms and statistical models to analyse various factors that affect airfare prices, such as seasonality, demand, availability, and flight duration. The aim of this project is to provide accurate* flight fare predictions to travellers, allowing them to plan their trips more efficiently and save money on airfare. By leveraging the power of machine learning, flight fare prediction is revolutionizing the travel industry and making air travel more accessible and affordable for everyone.



PREVIOUS PROJECTS

GOIBIBO

EASEMYTRIP

YATRA.COM

MAKEMYTRIP

TARGET



The main aims of this flight fare prediction system using machine learning are to provide accurate* predictions of airfare prices, help travellers save money on flights, and assist them in planning their trips more efficiently. This system also aim to reduce the complexity of the pricing model used by airlines, which can be influenced by a variety of factors. By leveraging advanced algorithms and statistical models, these systems can help travellers make informed decisions about their travel plans and make air travel more accessible and affordable for everyone.

— TECHNOLOGY REQUIREMENT

- HARDWARE REQUIREMENT
- 8GB RAM
- 2GB Storage
- Intel I5 Processor

— SOFTWARE REQUIREMENT

PYTHON LIBRARIES

PYCHARM

JUPYTER

WEB BROWSER

VS CODE



ALGORITHM USED

RANDOM
FOREST

FEATURE_IMPORTANCES_

HEATMAP

EXTRA TREES
REGRESSOR

— RANDOM FOREST ALGORITHM

Random Forest is a machine learning algorithm that creates an ensemble of decision trees by randomly selecting a subset of features and samples for each tree.

It combines the predictions of all trees to make a final prediction, improving the accuracy and reducing overfitting.

It is widely used for classification and regression tasks in various domains.

HEATMAP ALGORITHM

A heatmap algorithm is a data visualization technique used to represent values in a two-dimensional format through color. Heatmaps are useful in data analysis, image processing, and machine learning.

The algorithm represents each data point as a color-coded cell, which allows for easy identification of patterns and trends.

Heatmaps are commonly used in areas such as genetics, biology, and social sciences, to identify correlations and clusters in large datasets, and to represent geographical data.



EXTRATREESREGRESSOR

ExtraTreesRegressor is a machine learning algorithm used for regression tasks. It works by creating an ensemble of decision trees using random subsets of features and samples.

The algorithm then aggregates the results of all the trees to make a final prediction. ExtraTreesRegressor is similar to Random Forest but uses a more randomized approach to build its decision trees, resulting in better performance and reduced overfitting.

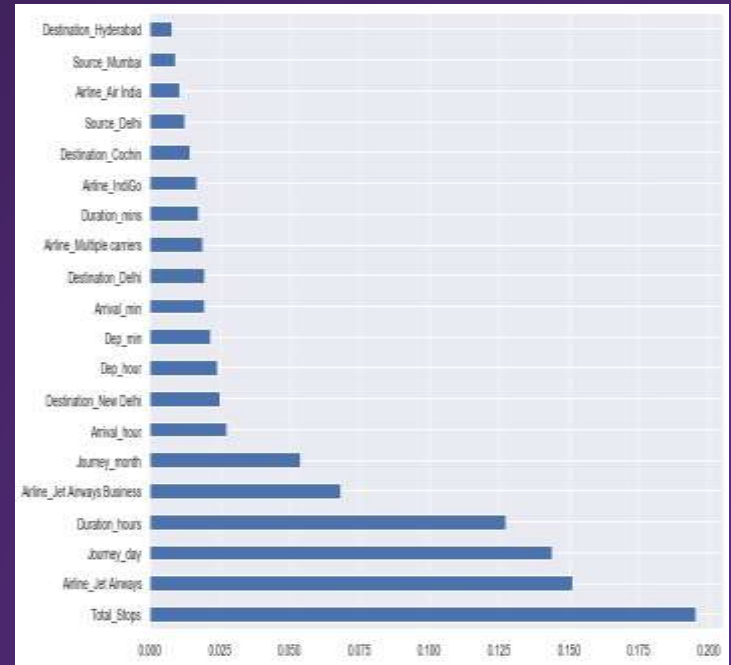
It is widely used in various domains for regression tasks.

FEATURE_IMPORTANCES_

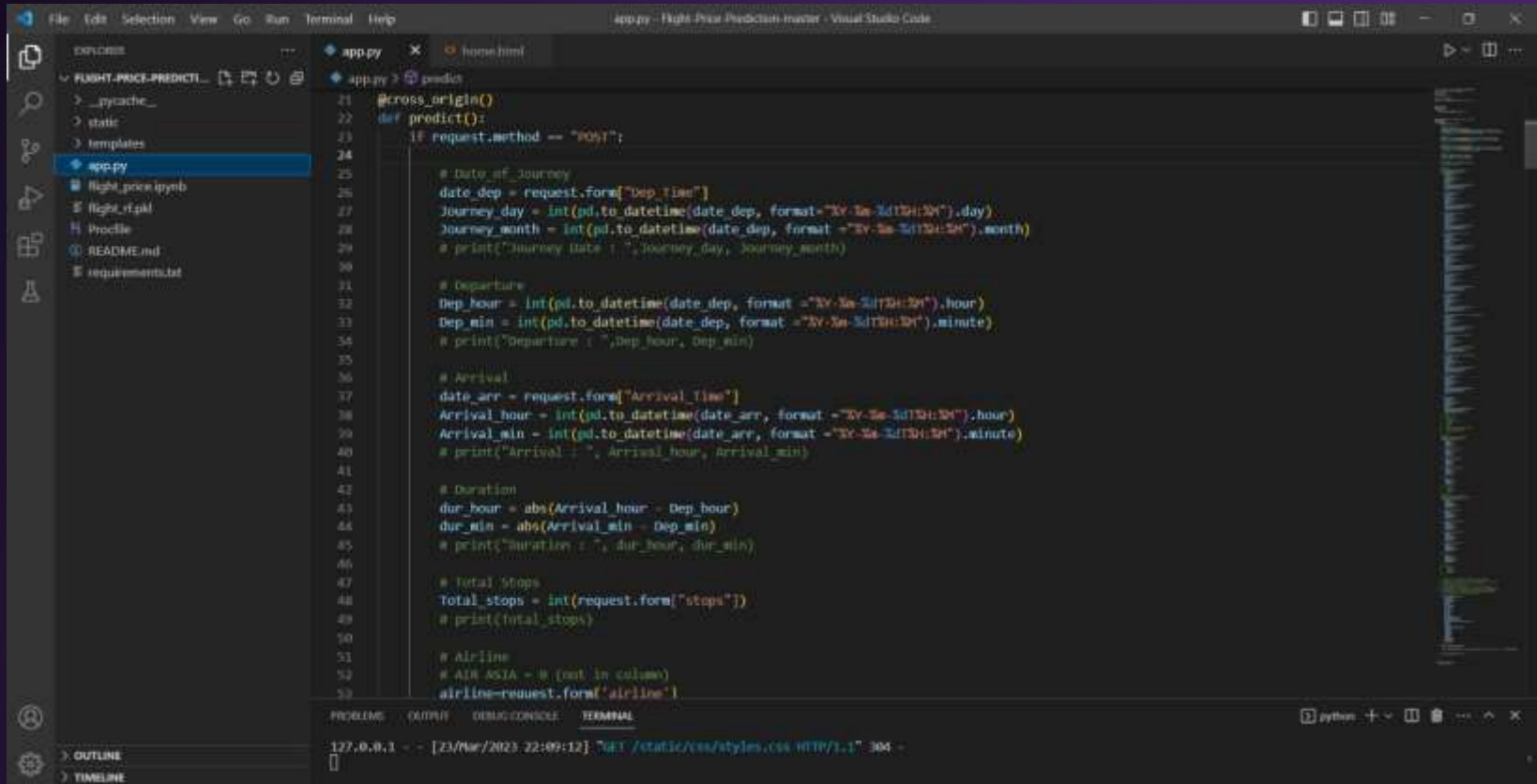
feature_importances_ is an attribute of some machine learning algorithms, such as decision trees and random forests, that measures the importance of each feature in making predictions.

It calculates the contribution of each feature to the model's accuracy and assigns a score to each feature.

This information can be used to identify the most important features and select the best subset of features for the model.



Implementation of code



```
app.py - Flight Price Prediction-master - Visual Studio Code
File Edit Selection View Go Run Terminal Help
app.py x home.html
app.py > predict
21 @cross_origin()
22 def predict():
23     if request.method == "POST":
24
25         # Date of Journey
26         date_dep = request.form["Dep_Time"]
27         Journey_day = int(pd.to_datetime(date_dep, format="%Y-%m-%d%H:%M").day)
28         Journey_month = int(pd.to_datetime(date_dep, format="%Y-%m-%d%H:%M").month)
29         # print("Journey Date : ", Journey_day, Journey_month)
30
31         # Departure
32         Dep_hour = int(pd.to_datetime(date_dep, format="%Y-%m-%d%H:%M").hour)
33         Dep_min = int(pd.to_datetime(date_dep, format="%Y-%m-%d%H:%M").minute)
34         # print("Departure : ", Dep_hour, Dep_min)
35
36         # Arrival
37         date_arr = request.form["Arrival_Time"]
38         Arrival_hour = int(pd.to_datetime(date_arr, format="%Y-%m-%d%H:%M").hour)
39         Arrival_min = int(pd.to_datetime(date_arr, format="%Y-%m-%d%H:%M").minute)
40         # print("Arrival : ", Arrival_hour, Arrival_min)
41
42         # Duration
43         dur_hour = abs(Arrival_hour - Dep_hour)
44         dur_min = abs(Arrival_min - Dep_min)
45         # print("Duration : ", dur_hour, dur_min)
46
47         # Total Stops
48         Total_stops = int(request.form["stops"])
49         # print(Total_stops)
50
51         # Airline
52         # AIN ASIA = 0 (not in column)
53         airline=request.form['airline']
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

127.0.0.1 - - [23/Mar/2023 22:09:12] "GET /static/css/styles.css HTTP/1.1" 304 -

Visual Studio Code interface showing a Jupyter Notebook titled "flight_price.ipynb" with the following content:

```
train_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10683 entries, 0 to 10682
Data columns (total 11 columns):
#   Column              Non-Null Count  Dtype
---  ---
0   Airline              10683 non-null object
1   Date_of_Journey      10683 non-null object
2   Source               10683 non-null object
3   Destination          10683 non-null object
4   Route                10682 non-null object
5   Dep_Time             10683 non-null object
6   Arrival_Time         10683 non-null object
7   Duration             10683 non-null object
8   Total_Stops          10682 non-null object
9   Additional_Info      10683 non-null object
10  Price                10683 non-null int64
dtypes: int64(1), object(10)
```

The notebook output displays a table of flight data with the following columns: Airline, Date of Journey, Source, Destination, Route, Dep Time, Arrival Time, Duration, Total Stops, Additional Info, and Price.

	Airline	Date of Journey	Source	Destination	Route	Dep Time	Arrival Time	Duration	Total Stops	Additional Info	Price
0	IndiGo	24/03/2019	Bangalore	New Delhi	BLR → DEL	22:20	01:10 22 Mar	2h 50m	non-stop	No info	3897
1	Air India	1/05/2019	Kolkata	Bangalore	CCU → DDR → BBI → BLR	05:50	13:15	7h 25m	2 stops	No info	7662
2	Jet Airways	9/06/2019	Delhi	Cochin	DEL → LKO → BOM → COK	09:25	04:25 10 Jun	19h	2 stops	No info	13882
3	IndiGo	12/05/2019	Kolkata	Bangalore	CCU → NAG → BLR	18:05	23:30	5h 25m	1 stop	No info	6218
4	IndiGo	01/03/2019	Bangalore	New Delhi	BLR → NAG → DEL	16:50	21:35	4h 45m	1 stop	No info	13302

The bottom status bar shows the Python version: 127.0.0.1 - [23/Mar/2023 22:09:12] "GET /static/css/styles.css HTTP/1.1" 304 -

UI DESIGN

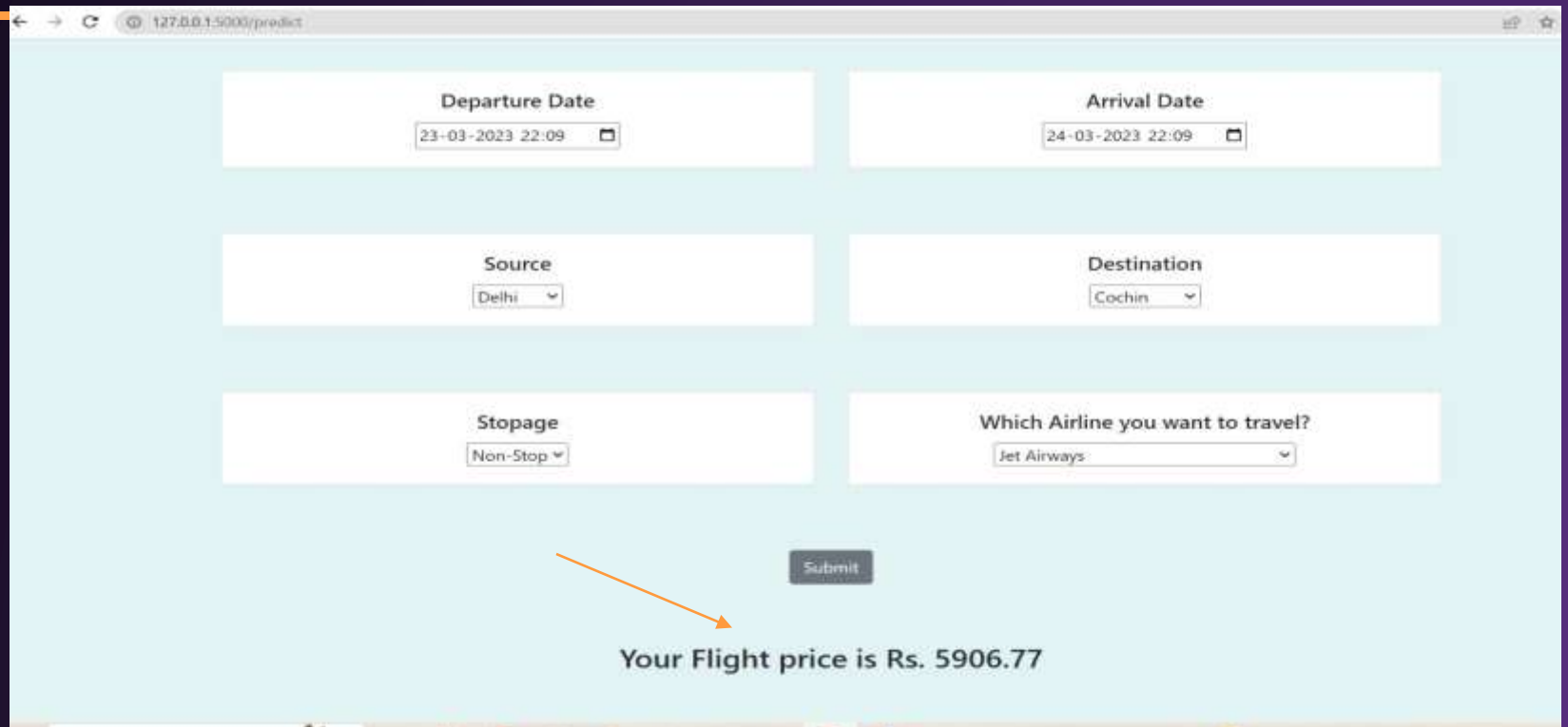
← → ↻ 127.0.0.1:5000

FLIGHT PRICE

<p>Departure Date</p> <p>dd-mm-yyyy --:--</p>	<p>Arrival Date</p> <p>dd-mm-yyyy --:--</p>
<p>Source</p> <p>Delhi</p>	<p>Destination</p> <p>Cochin</p>
<p>Stopage</p> <p>Non-Stop</p>	<p>Which Airline you want to travel?</p> <p>Jet Airways</p>

Submit

RESULT



A screenshot of a web browser displaying a flight prediction interface. The browser's address bar shows the URL `127.0.0.1:5000/predict`. The interface consists of six input fields arranged in a 3x2 grid, each with a title and a value. The first row contains 'Departure Date' (23-03-2023 22:09) and 'Arrival Date' (24-03-2023 22:09). The second row contains 'Source' (Delhi) and 'Destination' (Cochin). The third row contains 'Stopage' (Non-Stop) and 'Which Airline you want to travel?' (Jet Airways). Below these fields is a 'Submit' button. An orange arrow points from the 'Submit' button to the text 'Your Flight price is Rs. 5906.77'.

Field	Value
Departure Date	23-03-2023 22:09
Arrival Date	24-03-2023 22:09
Source	Delhi
Destination	Cochin
Stopage	Non-Stop
Which Airline you want to travel?	Jet Airways

Submit

Your Flight price is Rs. 5906.77

— SCOPE

The scope of this project is limited to predicting flight prices for a specific set of features and does not include other aspects of travel planning such as accommodations or transportation. Additionally, the model will be trained on a specific dataset and may not generalize to other datasets or contexts. Therefore, further research may be needed to validate the effectiveness of the model in different settings and to improve its accuracy and usability.



THANKS!