S.A. ENGINEERING COLLEGE

AN AUTONOMOUS INSTITUTION AFFLIATED TO ANNA UNIVERSITY CHENNAI
ACCREDITED BY NBA,NAAC 'A' GRADE & ISO 9001:2015 CERTIFIED INSTITUTION

NALAIYA THIRAN PROJECT BASED ON PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

PROJECT ON

FLIGHT DELAY PREDICTION USING MACHINE LEARNING

A PROJECT REPORT BY

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Index

1.Introduction:

Project Overview:

Flight delays are inevitable, and it plays an important role in every passenger's life. It plays a vital role in airline's growth also. For airlines, estimating flight delays correctly is essential since the data may be used to boost client happiness and revenue for airline agencies. There have been many Machine Learning models which are trained for predicting flight delays, where most of them have been trying to predict the delay through extracting important characteristics and most related features. These character extraction is done with different ML algorithms. One such algorithm is Decision Tree, which is used in our project. A Webpage is created for the user interaction to feed in the flight details. These data are then send to pretrained ML model in the cloud, where the model predicts the delay time of the flight and then send back the output to the user machine. Now the user will be provided with flight delay details.

Purpose:

Our project is all about developing a user-friendly webpage which allows user to interact and know about the delay time of the flight they are about to travel.

This allows the users not to lose their precious time and spend it efficiently on other stuffs.

2.LITERATURE SURVEY:

Existing Problem:

Due to its quickness and, in some circumstances like comfort, air travel has become more and more popular with tourists and travelers around the world. The result has been a spectacular increase in land traffic and air traffic. Massive levels of aircraft delays on the ground and in the air have also been brought on by an increase in air traffic. These delays are responsible for large economic and environmental losses to the globe. The passengers are sick of waiting for flight to arrive or for the departure.

Problem statement:

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Businessman	To reach the destination on time	Not able to reach	The flight is delayed	Stressed
PS-2	Tourist	To check the status	No clear information	Delay is not predicted correctly	Frustrated
PS-3	Traveller	To check list of flights with their status	No clear information	Status is unavailable	Tensed
PS-4	Passenger	Find alternate resources	Not all information is available	Limited to just one airport/ airline	Dissatisfied

1.Flight Delay Prediction based on Aviation Big Data and Machine Learning(Author: Rahul Garg et.al., 2022)

The dataset includes the scheduled and actual departure and arrival times for non-stop flights recorded by different airways. Information on delayed and canceled flights, actual travel time and non-stop distances is also available in the dataset. Airline origin and destination are also included. With this dataset, a predictive model was used to solve the flight delay cases. The flight dataset includes data for 161 airports. Flights arriving after the scheduled arrival time are considered delayed. In addition, the flight under attack is deleted from the dataset. , time of departure, time of boarding are applied. Unnecessary features are deleted from the flight data. This study aims to predict flight delays for airlines. Three methods are used to predict flight delay, that is, Random Forest, Support Vector Machine, K-nearest neighbor. The dataset is limited to only flight and weather data of the USA. The datasets from Other International Countries and the flight data for the domestic flights are not included.

2.Predicting Flight Delays with Error Calculation using Machine LearnedClassifiers (Author Prof. S B Wani et.al., 2021)

For predicting the flight delays and to train the models, the data assembled by the organization of Transportation, U.S. Statistics of all the domestic flights taken in 2015 is collected and used. This Model is capable of filling the absent values which is crucial for refining data for the model. Supervised learning technique to gather the advantages of having the schedule and real arrival time. Algorithms are light computation costs. We develop a system that predicts for a delay in flight departure based on certain parameters.The mathematical models used in this are Logistic regression, Random Forest Regression, Decision Tree Regression. In the rest of the metrics, the value of error of Random Forest Regressor is even though not minimum but still gives a low value comparatively. In maximum metrics, it is found out that Random Forest Regressor gives the best worth and thus should be the model selected.

3.Machine Learning Model - based Prediction of Flight Delay (Author: NLakshmi Kalyani et.al., 2020)

The Paper aims at predicting the arrival delay of a scheduled individual flight at the destination airport by utilizing available data. The predictive model presented in this work is to foresee airline arrival delays by employing supervised machine learning algorithms. XGBoost and linear regression algorithms were applied to develop the predictive model that aims at predicting flight delays. The performance of each algorithm was analyzed. XGBoost is a decision-tree-based machine learning algorithm that is implemented using a gradient boosting framework.Linear regression is one among the most popular machine learning algorithms for predicting values given a set of values. Linear regression is a linear method used to model the relationship between independent and dependent data. Flight data along with the weather data was given to the model.

Using this data, binary classification was carried out by the XGBoost trained model to predict whether there would be any arrival delay or not, and then the linear regression model predicted the delay time of the flight.

4.Assessing Strategic Flight Schedules at an Airport using Machine Learning based Flight Delay And Cancellation Prediction (Author: Miguel Lambelho et.al., 2020)

To migrate air traffic demand-capacity imbalances, demonstrate an approach for strategic flight schedules in the period 2013-2018. Machine learning approach to predict whether strategic, scheduled arrival/departure flights are delayed or canceled. These predictions are based on strategic flight schedules from LHR and assume a 6-month prediction horizon, i.e., we predict whether flights are delayed or canceled 6 months prior to the day of the flight execution. Light GBM is a tree-based machine learning algorithm that uses Gradient-based One-Side Sampling, which excludes data instances with small gradients, and Exclusive Feature Building, which bundles mutually exclusive variables, thus, reducing the number of features. We are considering extending the set of features for the prediction algorithms to improve the accuracy of the predictions and will evaluate the impact of considering flight delay and cancellation predictions in the flight scheduling optimization models, at the strategic phase.

5.Flight delay prediction based on deep learning and Levenberg-Marquart algorithm (Author: M F Yazdi et.al., 2020)

The Levenberg-Marquart algorithm is applied to find weight and bias proper values, and finally the output has been optimized to produce high accurate results. To investigate the three models, we apply the proposed model on the U.S flight dataset that is an imbalanced dataset.
Algorithm used in this is min max normalization and denoising autoencoder training. Inorder to evaluate the model, the number of denoising autoencoders and neurons must be determined based on the values for precision, accuracy and time consuming. At the end, to evaluate the validity of the proposed model and the results from training, we evaluate the standard deviation of all the parameters after the 30 times repetition. Comparing the three models for two of imbalanced and balanced datasets shows that accuracy of SDA-LM model with imbalanced dataset respectively is greater by 8.2 and 11.3% Than SAE-LM and SDA models. On the other hand, these values for balanced datasets are respectively 10.4 and 7.3%. At the next stage, the model has been evaluated and computed for subjects of discarding with a standard deviation for all evaluation parameters during 30 times of model run. Finally, we compared the accuracy of the proposed Model against SAE-LM, SDA and RNN models.

6.Predicting flight delays using data from US Domestic flights (2019)

The objective of the project is to "Design a Model that predicts flight delays before they are announced on the departure boards". The dataset comes from Kaggle, and it consists of a multi- year data ranging from 2009 to 2019 separated in 10 different files. The data preprocessing and cleaning was done in two separate parts, documented in two notebooks to make it easier to follow up due to their length. The first section is a standard cleaning involving minimal feature engineering, and the second is driven after the 20 most common arrival destinations were defined based on the number of flights and is the one that contains the most feature engineering done.The same way the data cleaning and preprocessing was done in two separate notebooks, the EDA was done in two as well, however the difference here is that the visualizations done on each of the EDAs were done with different libraries. The first was done using matplotlib and Seaborn, and the second with plotly. Six type of ML Algorithms were tested, they wer

- Random Forest
- AdaBoost
- Gradient Boosted Trees
- XGBoost
- Deep Neural Network (MLP)
- Bagged Trees

It is quite hard to create a ML model for flight delay prediction before you even know that the flight is delayed on the departure board. Neural Networks responded a lot better under these conditions with an average difference in accuracy, precision and recall of over 15%. Maybe an even more thorough feature analysis could raise these metrics to close to 90%.

7.Flight Delay Prediction (Author: Bhuvan Bhatia, 2019)

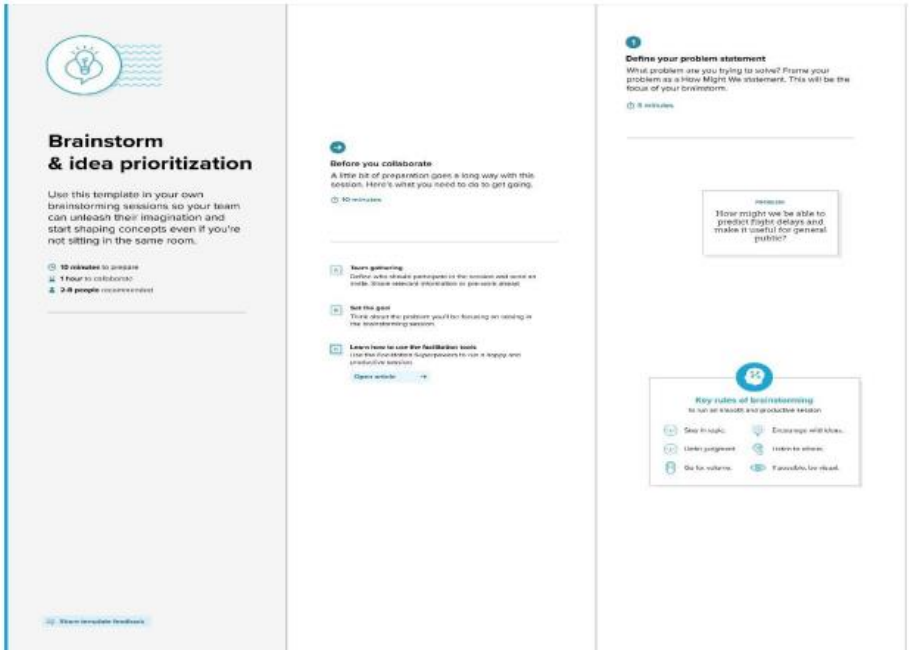
The paper titled “Flight Delay Prediction” by Bhuvan Bhatia concentrated mainly on predicting flight delays for a particular airport over a specific period of time. First, they used a regression model to examine the significance of each feature and then, a feature selection approach to examine the impact of feature combination. These two techniques determined the features to retain in the model. Instead of using the whole set, we sampled 5,000 records at a time to run through different machine learning models. The machine learning models implemented here were Random Forest classifier and Support Vector Machine (SVM) classifier. Further, we applied an approach called One-Hot-Encoder to create a variant of the model for evaluating potential prediction.

3.IDEATION & PROPOSED SOLUTION:

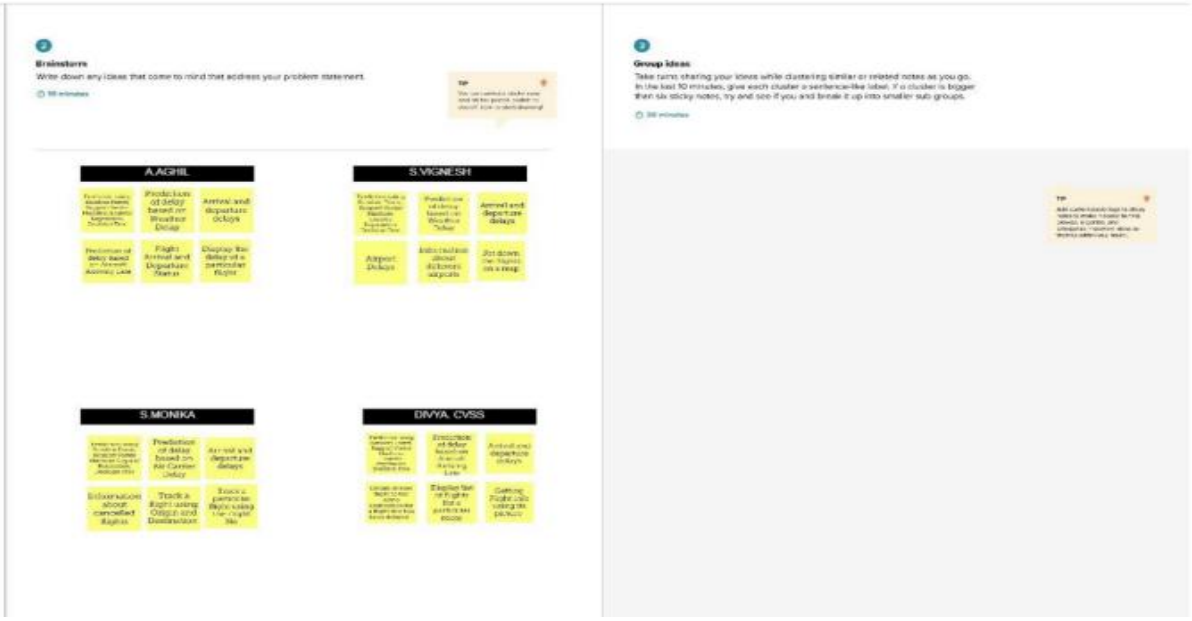
Empathy Map Canvas:

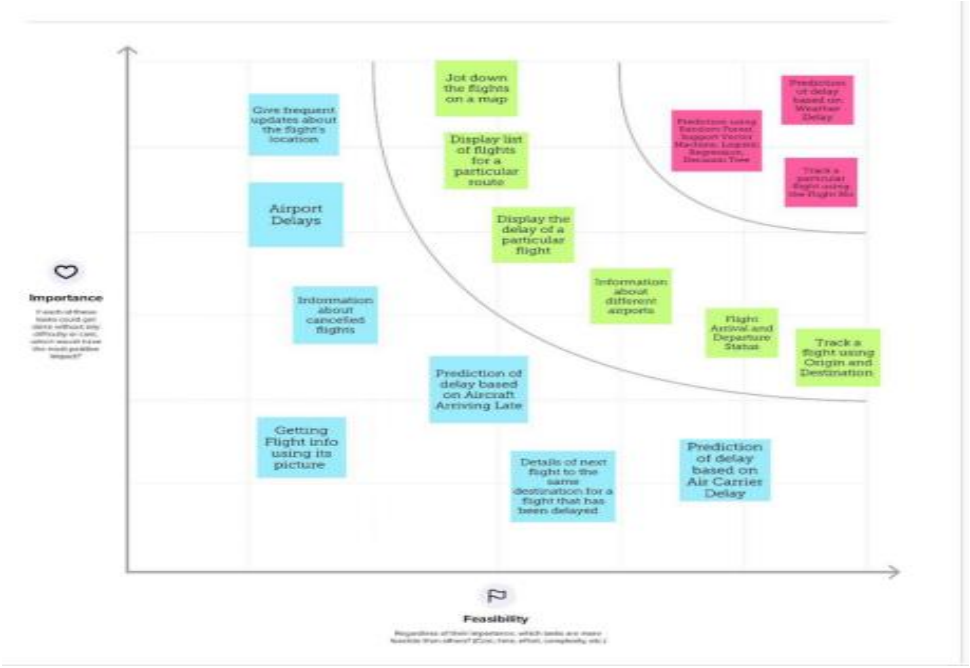
Ideation & Brainstorming:

Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



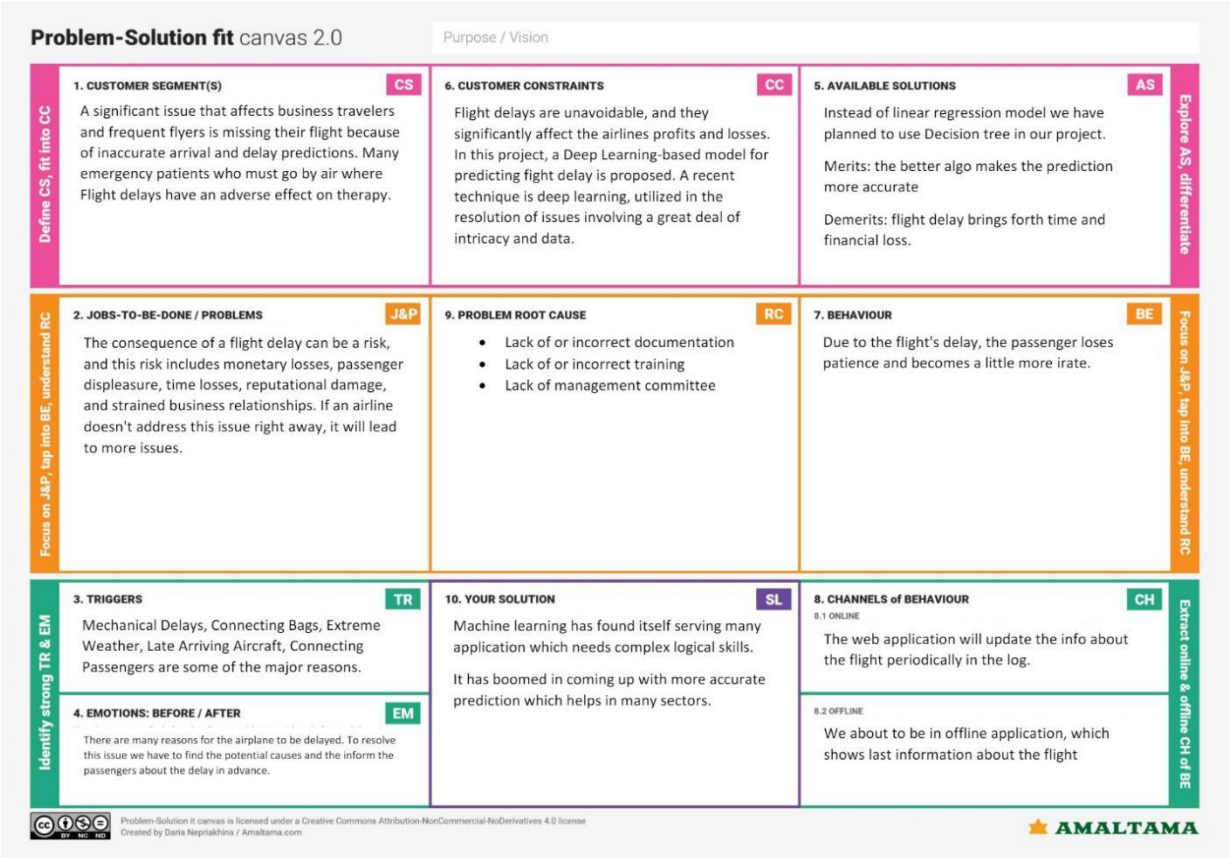


Proposed Solution:

S. no	Parameter	Description
1	Problem Statement (Problem to be solved)	Developing A Flight Delay Prediction Model Using Machine Learning.
2	Idea / Solution description	The main objective of the model is to predict flight delays accurately in order to optimize flight operations and minimize the aftereffects that caused by the delay. Using a machine learning model, we can predict flight arrival delays. The input to our algorithm is rows of feature vector like departure date, departure delay, distance between the two airports, scheduled arrival time etc. We then use decision tree classifier to predict if the flight arrival will be delayed or not. A flight is considered to be delayed when difference between scheduled and actual arrival times is greater than 10 minutes
3	Novelty /Uniqueness	Delay Detection using simple decision tree algorithm
4	Social Impact / Customer Satisfaction	By predicting the flight delay with more accuracy, the optimized results will help the passengers by alerting them, which will not lead them to miss the flight or helps them to prepare for the worst-case scenario. In the case of the medical field, if a doctor misses a flight, it can result in a life-or-death scenario. Our project helps them to stay aware of their flights.

5	Business Model (Revenue Model)	Business to Consumer model The solution is a low-cost airline model planned to be created as an application with which the consumers can interact directly to know the details of their flight. It follows a non-monetary revenue model where the consumers aren't charged for what they get but are asked to provide their flight details and ratings which can be used to improve the model and shared with the airline in return for airline's flight data.
6	Scalability of the Solution	The present solution is drafted with the aim of experimenting with airlines based out of the United States of America. If there is a possibility to acquire data of a broader region (say North America, other continents), then the solution can be developed to benefit a wider range of people.

Problem Solution fit:



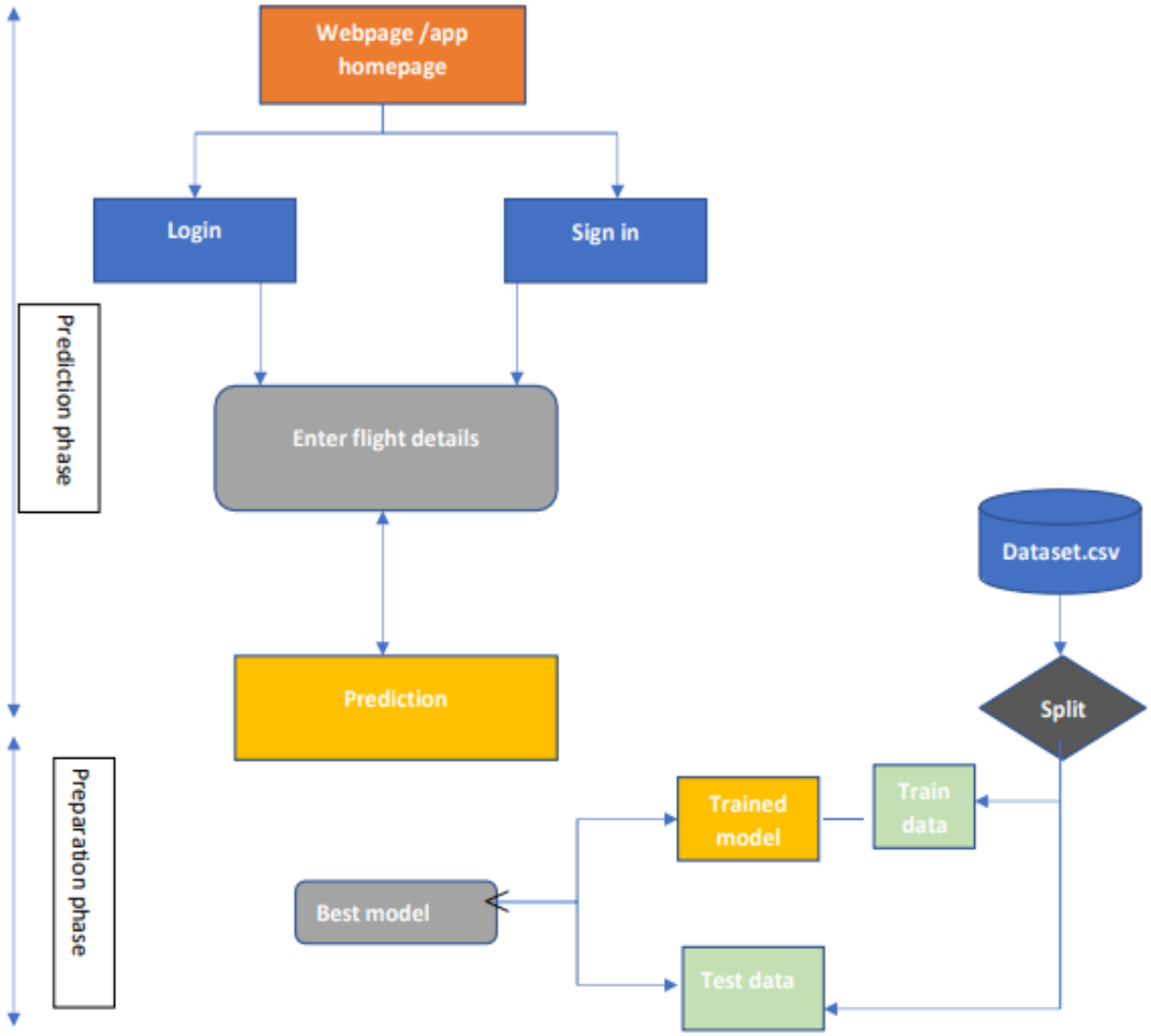
1. REQUIREMENT ANALYSIS:

Functional Requirements	Actions
Flight Search Validation	Check whether the given flight id is valid flight id present in the data
Prediction Algorithm	Train a model using a given dataset for predicting whether the flight will be delayed or not
Flight Data	Getting Flights data from the user and from the airlines
Data Verification	Verifying whether the given data is valid
Algorithm Used	Decision tree algorithm is used to train the model to predict whether the flight will be delayed or not

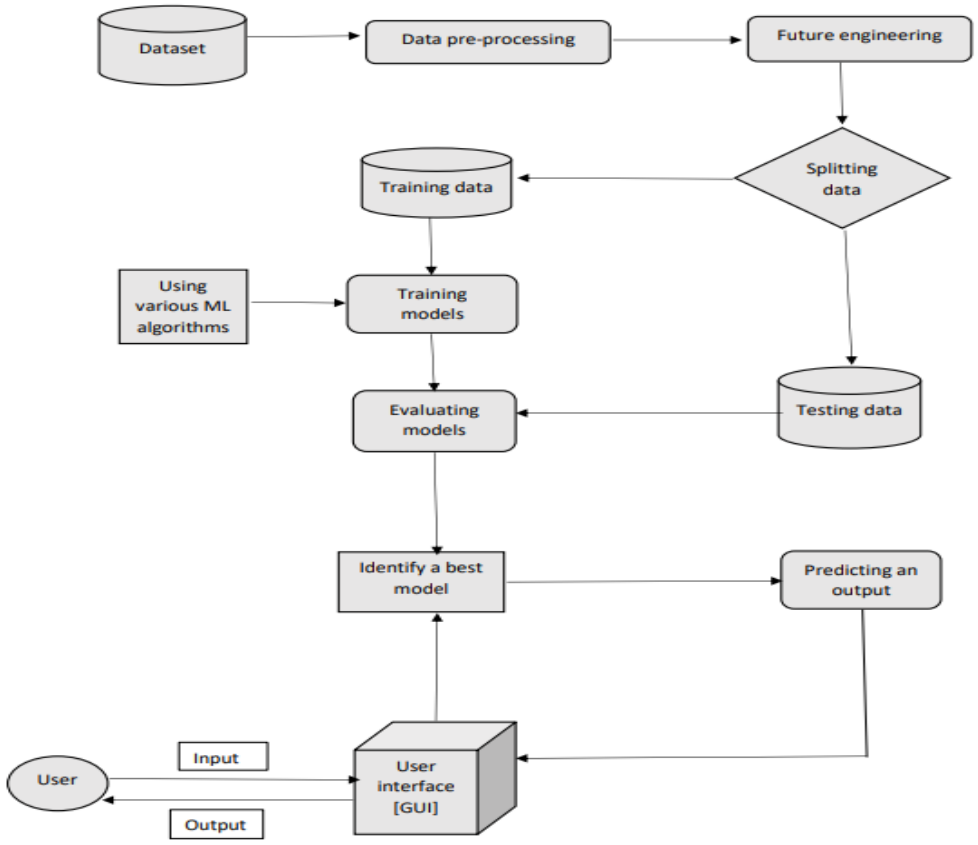
Technical Requirement:

S.No	Component	Description	Technology
1.	User Interface	Ways through which the user interacts with the application.	HTML, CSS, JavaScript
2.	Application Logic	Prediction model to predict the delay	Python
3.	Database	Stores the flight	MySQL

2. Project Design Phase:
Data Flow Diagram:



Solution Architecture:



User Stories:

User Type	Functional Requirements	User Story / Task	Priority
Customer	Provide Flight Data	As a Customer, I can give flight data to check whether the flight will be delayed or not	High
Admin	Model Creations	As an Admin, I can create a model to predict whether the flight will be delayed or not.	High

Admin	Model Updating	As an Admin, I can update the model with newer dataset to improve the performance of the model.	Medium
Customer	Website Access	As a customer, I can access the website that is used to check whether the flight will be delayed or not.	High

3. Project Planning and Scheduling:

Scheduling:

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint -1	Registration	USN-1	As a user, I mustbe able to enter theFlight details and check delay time.	2	High	Aghil. A Vignesh.S
Sprint -1	Interactive	USN-2	The webpage is buildwith CSS and HTML in a interactive way.	1	High	Divya C.V. S.S Monika.S
Sprint -2	Model Creation	USN-3	A Delay predictionmodel is created andthe application is connected to IBM Cloud network.	2	Low	Aghil. A Vignesh.S

Planning

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	7 Nov 2022	Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	Nov 2022	20	19 Nov 2022

Scheduling:

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection and Preprocessing	USN-1	As a user, I am unable to engage with anything.	2	High	Aghil A Vignesh S Divya C V S S Monika S
Sprint-1	Build HTML Pages	USN-2	As a user, I can view the web pages to enter flight details.	1	Medium	Aghil A Vignesh S Divya C V S S Monika S
Sprint-2	Build Python Pages	USN-3	As a user, I am unable to engage with anything.	2	High	Aghil A Vignesh S Divya C V S S Monika S
Sprint-2	Execute And Test Your Model	USN-4	As a user, I can predict flight delays using the best created ML models.	2	High	Aghil A Vignesh S Divya C V S S Monika S
Sprint-3	Train The ML Model	USN-6	As a user, I can predict flight delays using the best created ML models.	2	High	Aghil A Vignesh S Divya C V S S Monika S
Sprint-3	Integrate Flask with Model	USN-5	As a user, I can predict flight delays using the user interface.	2	High	Aghil A Vignesh S Divya C V S S Monika S
Sprint-4	Model Deployment on IBM Cloud using IBM Watson	USN-8	As a user, I can use the model by requesting the deployed model on Cloud.	2	High	Aghil A Vignesh S Divya C V S S Monika S

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

4. Coding and Solution:

Code:

Sprint 3:

App.py

```
from flask import Flask, render_template, request
import pandas as pd
import joblib
import numpy as np

app = Flask(__name__)

@app.route('/')
def home():
return render_template('Flightdelay.html')

@app.route('/result', methods = ['POST'])
def predict():
fl_num = int(request.form.get('fno'))
month = int(request.form.get('month'))
dayofmonth = int(request.form.get('daym'))
dayofweek = int(request.form.get('dayw'))
sdeptime = request.form.get('sdt')
adeptime = request.form.get('adt')
arrtime = int(request.form.get('sat'))
depdelay = int(adeptime) - int(sdeptime)
inputs = list()
inputs.append(fl_num)
inputs.append(month)
inputs.append(dayofmonth)
inputs.append(dayofweek)
if (depdelay < 15):
inputs.append(0)
else:
inputs.append(1)
inputs.append(arrtime)
origin = str(request.form.get("org"))
dest = str(request.form.get("dest"))
if(origin=="ATL"):
a=[1,0,0,0,0]
```

```
inputs.extend(a)
elif(origin=="DTW"):
a=[0,1,0,0,0]
inputs.extend(a)
elif(origin=="JFK"):
a=[0,0,1,0,0]
inputs.extend(a)
elif(origin=="MSP"):
a=[0,0,0,1,0]
inputs.extend(a)
elif(origin=="SEA"):
a=[0,0,0,0,1]
inputs.extend(a)

if(dest=="ATL"):
b=[1,0,0,0,0]
inputs.extend(b)
elif(dest=="DTW"):
b=[0,1,0,0,0]
inputs.extend(b)
elif(dest=="JFK"):
b=[0,0,1,0,0]
inputs.extend(b)
elif(dest=="MSP"):
b=[0,0,0,1,0]
inputs.extend(b)
elif(dest=="SEA"):
b=[0,0,0,0,1]
inputs.extend(b)

prediction = preprocessAndPredict(inputs)
#Pass prediction to prediction template
print(inputs)
return render_template('/result.html', prediction = prediction)

def preprocessAndPredict(inputs):
test_data = np.array(inputs).reshape((1,16))

model_file = open('D:\\IBM-Project-25904-1659976941\\Final Deliverables\\Local Deployment\\model.pkl', 'rb')

trained_model = joblib.load(model_file)
```

```
df = pd.DataFrame(data=test_data[0:, 0:], columns=['FL_NUM', 'MONTH', 'DAY_OF_MONTH', 'DAY_OF_WEEK', 'DEP_DEL15', 'CRS_ARR_TIME', 'ORIGIN_ATL', 'ORIGIN_DTW', 'ORIGIN_JFK', 'ORIGIN_MSP', 'ORIGIN_SEA', 'DEST_ATL', 'DEST_DTW', 'DEST_JFK', 'DEST_MSP', 'DEST_SEA'])

data = df.values

result = trained_model.predict(data)

print(result)
return result

if __name__ == '__main__':
app.run(debug=True)
```

FlightDelay.html

```
<!DOCTYPE html>
<html lang="en">
<head>
	<meta charset="UTF-8">
	<meta http-equiv="X-UA-Compatible">
	<meta name="viewport" content="width=device-width, initial-scale=1.0">
	<link rel="stylesheet" href="{{ url_for('static',filename='styles/styles.css') }}">
	<script src="{{url_for('static', filename='styles/delaypredict.js')}}"></script>
	<title>Flight Delay Prediction</title>
</head>
<body id="flight-form">
<h2 id="main-head" class="centered-head">FLIGHT DELAY PREDICTION</h2>
<img src="{{url_for('static', filename='styles/images/Flight.png')}}" id="bgimg">
<form name="flightForm" action="/result" method="POST" target="_blank">
	<div id="form-content">
		<div id="block1">
			<div class="detail-container">
				<label for="fno" class="label-item">Enter the Flight Number</label>
				<br>
				<input type="number" id="fno" name="fno" class="text-input">
			</div>
			<div class="detail-container">
				<label for="month" class="label-item">Month</label>
				<br>
				<input type="number" id="month" name="month" class="text-input" onblur="checkValid('month');" placeholder="Enter the Month Number">
				<div class="alert-text" id="month-valid">Enter a valid month between 1 to 12.</div>
			</div>
			<div class="detail-container">
				<label for="daym" class="label-item">Day of Month</label>
				<br>
				<input type="number" id="daym" name="daym" class="text-input" onblur="checkValid('daym');">
				<div class="alert-text" id="daym-valid">Enter a valid day of month.</div>
			</div>
			<div class="detail-container">
```

```
                        <label for="dayw" class="label-item">Day of Week</label>
                        <br>
                        <input type="number" id="dayw" name="dayw" class="text-
input" onblur="checkValid('dayw');">
                        <div class="alert-text" id="dayw-valid">Enter a valid day
between 1 to 7.</div>
                    </div>
                    <div class="detail-container">
                        <label for="org" class="label-item">Origin</label>
                        <br>
                        <select id="org" name="org" class="select-input">
                            <option value="ATL" class="option-item">ATL</option>
                            <option value="SEA" class="option-item">SEA</option>
                            <option value="DTW" class="option-item">DTW</option>
                            <option value="MSP" class="option-item">MSP</option>
                            <option value="JFK" class="option-item">JFK</option>
                        </select>
                    </div>
                    <div class="detail-container">
                        <label for="dest" class="label-item">Destination</label>
                        <br>
                        <select id="dest" name="dest" class="select-input"
onblur="checkValid('dest');">
                            <option value="ATL" class="option-item">ATL</option>
                            <option value="SEA" class="option-item">SEA</option>
                            <option value="DTW" class="option-item">DTW</option>
                            <option value="MSP" class="option-item">MSP</option>
                            <option value="JFK" class="option-item">JFK</option>
                        </select>
                        <div class="alert-text" id="dest-valid">Enter different Origin and
Destination.</div>
                    </div>
                </div>
                <div id="block2">
                    <div class="detail-container">
                        <label for="sdt" class="label-item">Scheduled Departure
Time</label>
                        <br>
                        <input type="number" id="sdt" name="sdt" class="text-input"
onblur="checkValid('sdt');" placeholder="Enter in the format HHMM">
                        <div class="alert-text" id="sdt-valid">Enter a valid time between
500 to 2359.</div>
                    </div>
```

```
                <div class="detail-container">
                    <label for="sat" class="label-item">Scheduled Arrival Time</label>
                    <br>
                    <input type="number" id="sat" name="sat" class="text-input" onblur="checkValid('sat');" placeholder="Enter in the format HHMM">
                    <div class="alert-text" id="sat-valid">Enter a valid time between 500 to 2359.</div>
                </div>
                <div class="detail-container">
                    <label for="adt" class="label-item">Actual Departure Time</label>
                    <br>
                    <input type="number" id="adt" name="adt" class="text-input" onblur="checkValid('adt');" placeholder="Enter in the format HHMM">
                    <div class="alert-text" id="adt-valid">Enter a valid time between 500 to 2359.</div>
                </div>
            </div>
        </div>
        <div id="submit-button">
            <input type="submit" value="Submit" id="submit" class="button" onclick="validateForm()">
        </div>
</form>
</body>
</html>
```

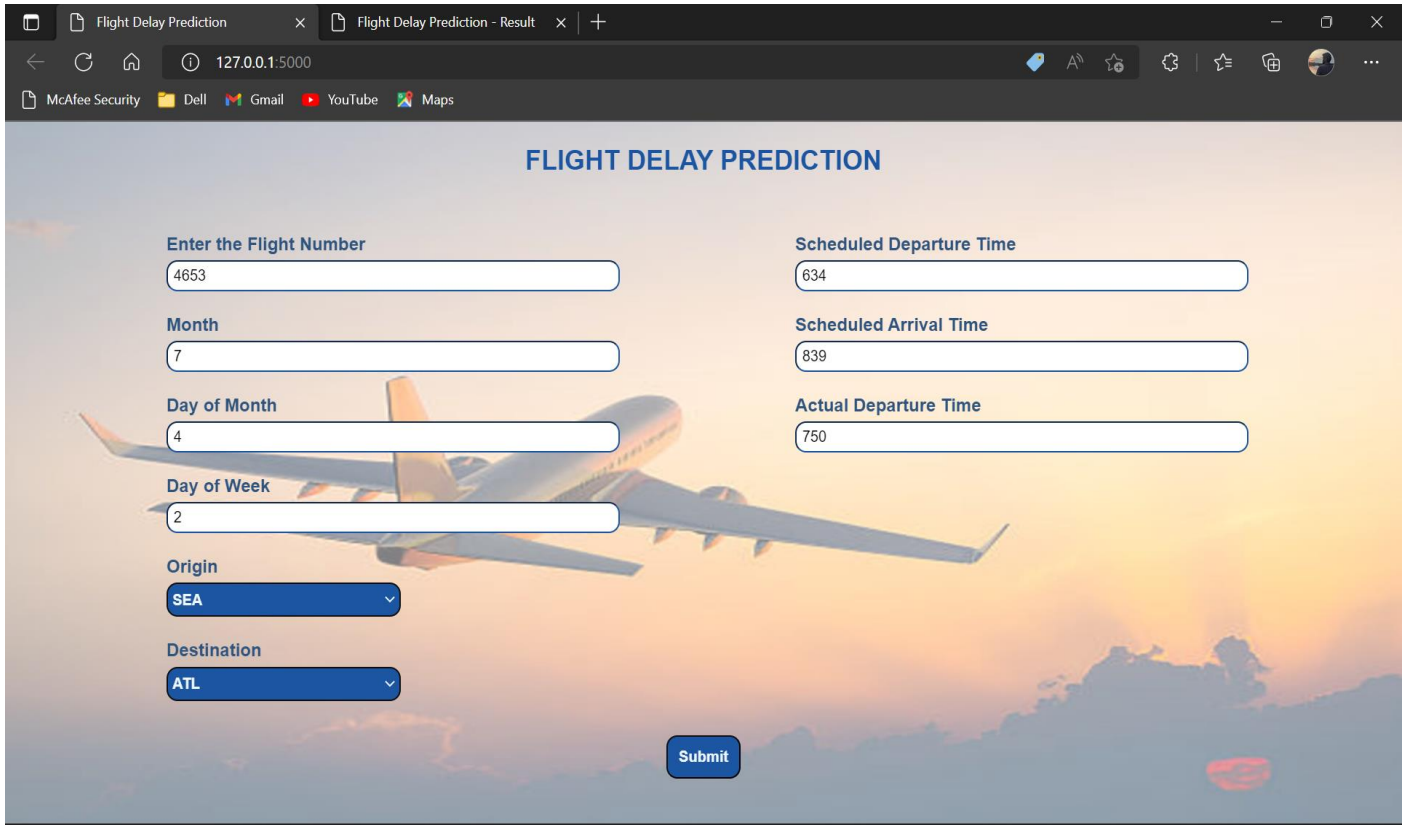
Result.html

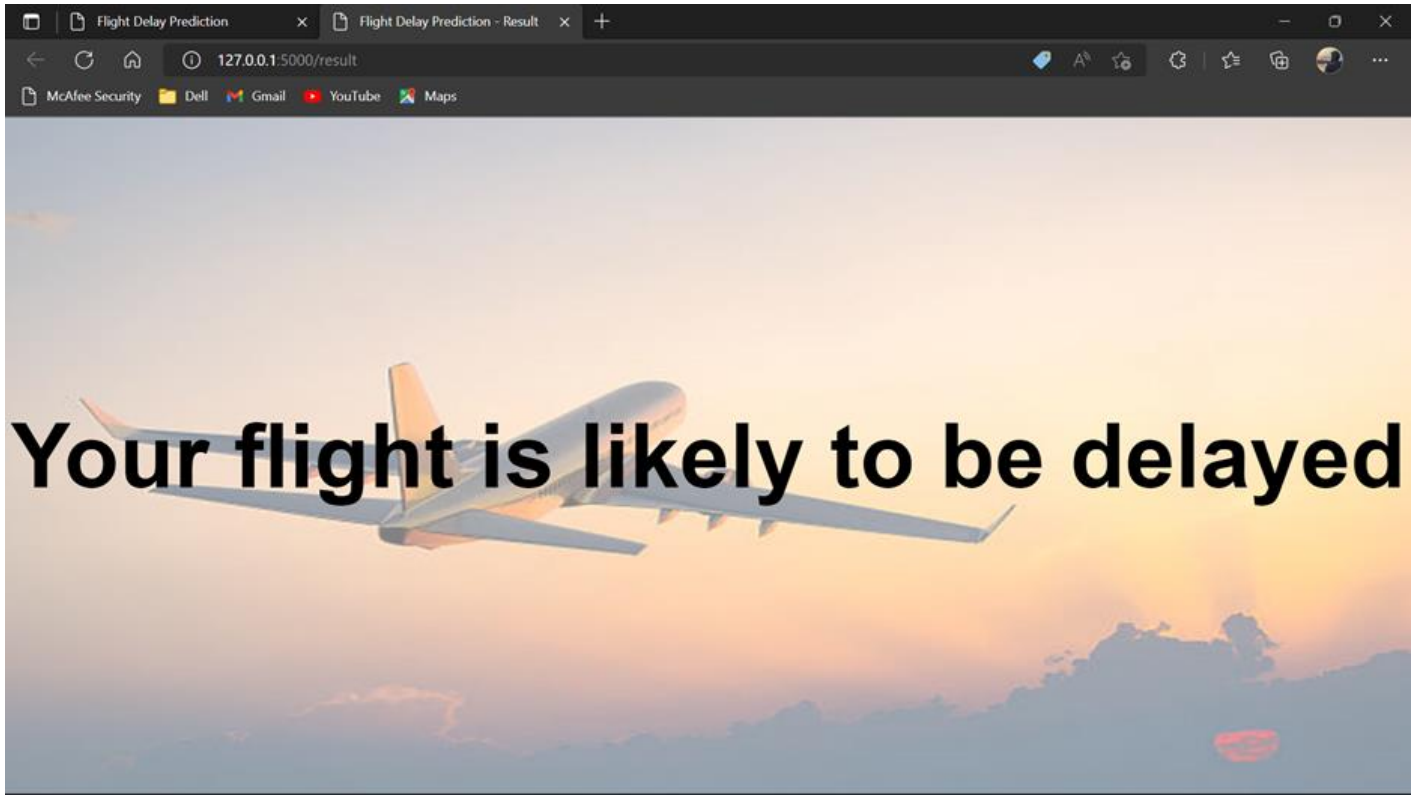
```
<!doctype html>
<html>
<head>
	<title>Flight Delay Prediction - Result</title>
	<link  rel="stylesheet"  href="{{  url_for('static',filename='styles/result_styles.css')
}}">
</head>
<body>
	<img src="{{url_for('static', filename='styles/images/Flight.png')}}" id="bgimg">
	{% if prediction[0]== 0.0 %}
	<div class="pred_result" id="result_0">Your flight will likely be on time</div>
	{% endif %}
	{% if prediction[0] == 1.0 %}
	<div class="pred_result" id="result_1">Your flight is likely to be delayed</div>
	{% endif %}
</body>
</html>
```

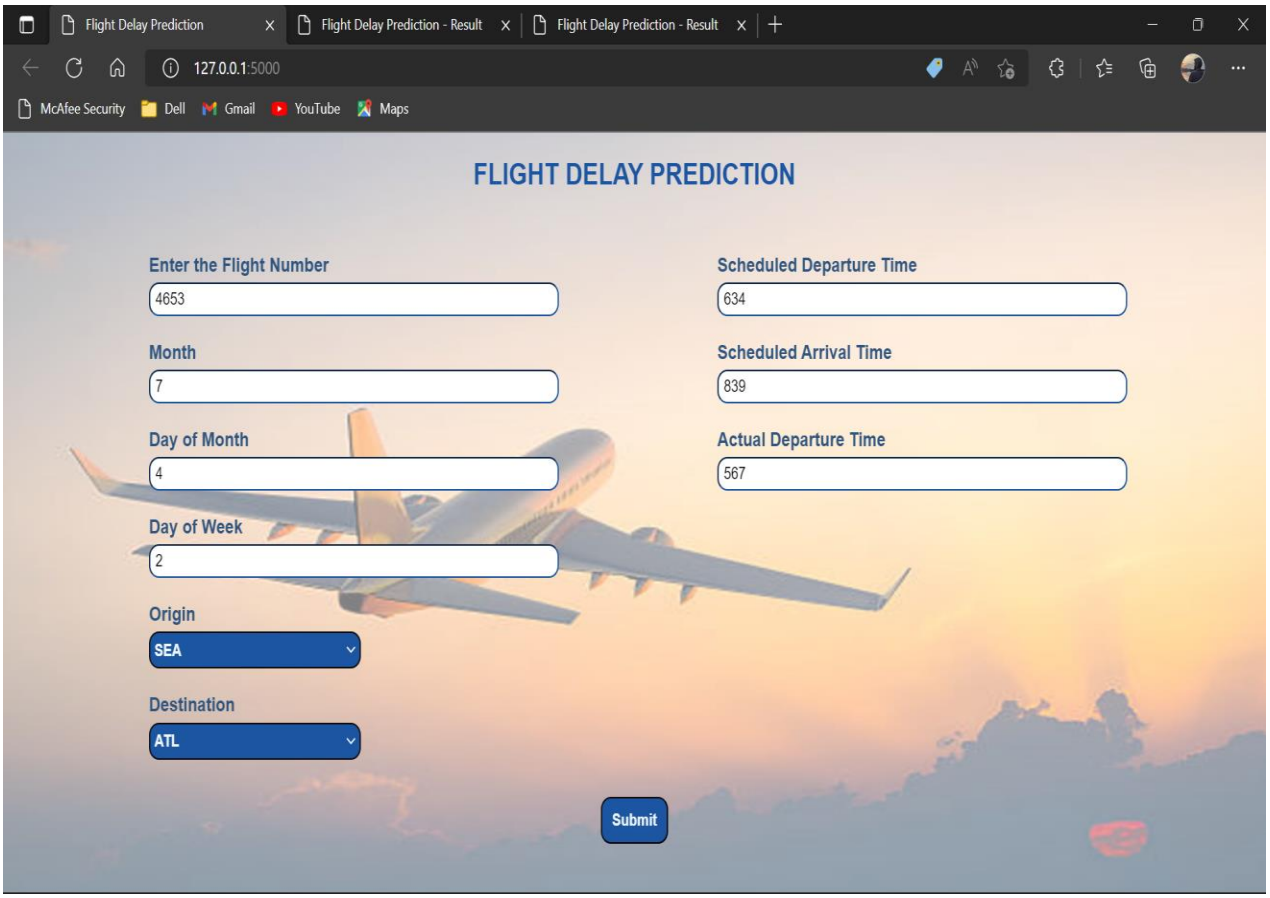
5. Results:

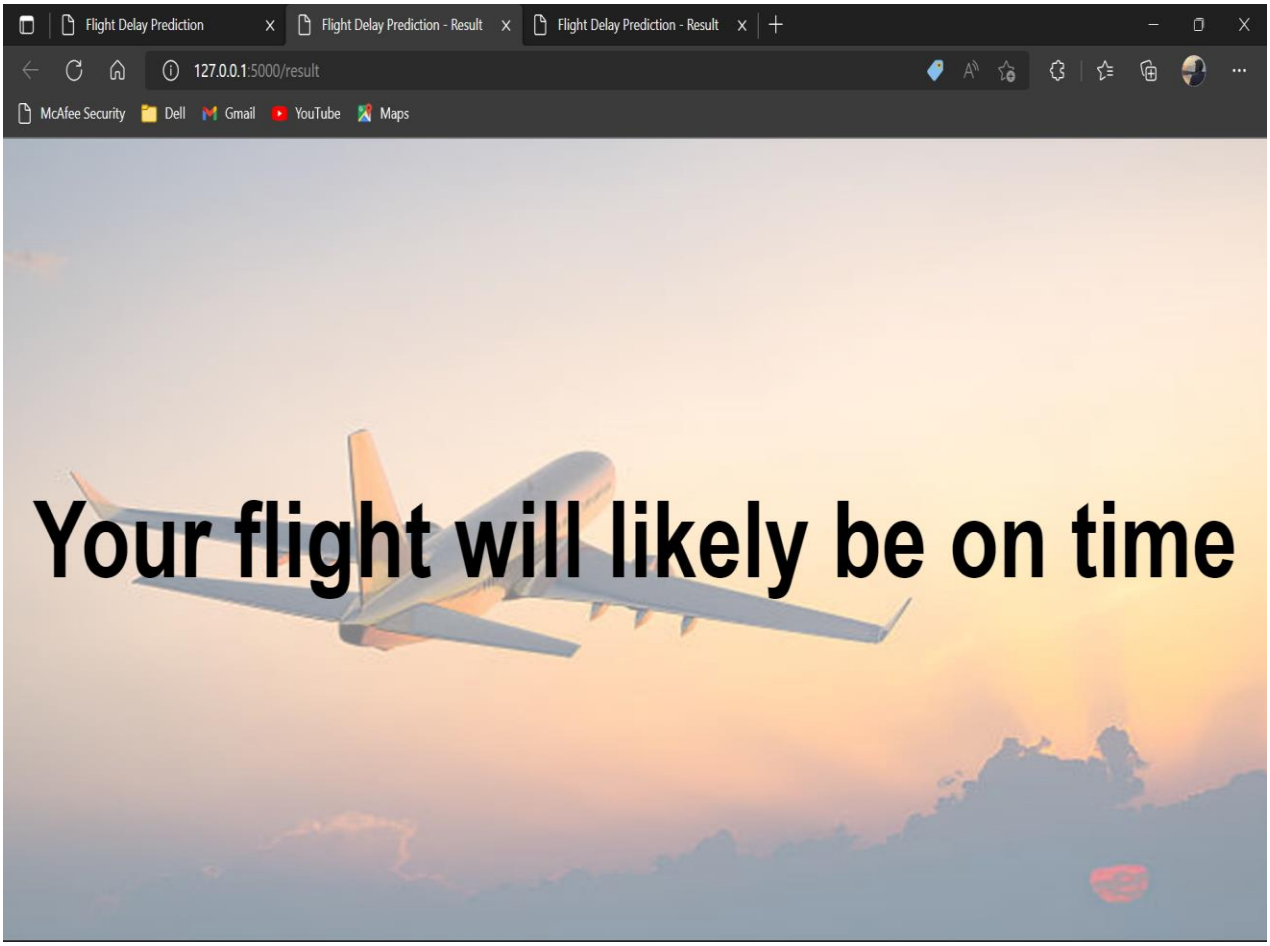
The model is created in such a way that the user finds it easy to interact with and gain the required output for the imparted input.

Output:

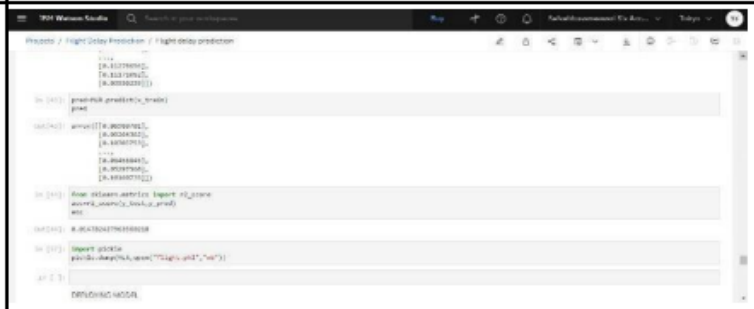
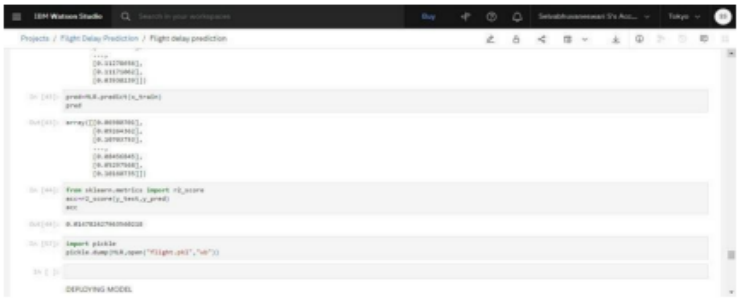



Flight Delay Prediction
Flight Delay Prediction - Result
127.0.0.1:5000/result
McAfee Security
Dell
Gmail
YouTube
Maps
Your flight is likely to be delayed


Flight Delay Prediction
Flight Delay Prediction - Result
Flight Delay Prediction - Result
127.0.0.1:5000
McAfee Security
Dell
Gmail
YouTube
Maps
FLIGHT DELAY PREDICTION
Enter the Flight Number
4653
Month
7
Day of Month
4
Day of Week
2
Origin
SEA
Destination
ATL
Scheduled Departure Time
634
Scheduled Arrival Time
839
Actual Departure Time
567
Submit


Flight Delay Prediction
Flight Delay Prediction - Result
Flight Delay Prediction - Result
127.0.0.1:5000/result
McAfee Security
Dell
Gmail
YouTube
Maps
Your flight will likely be on time

Performance Metrics:

S.No.	Parameter	Values	Screenshot
1.	Metrics	**Regression Model:** MAE - , MSE - , RMSE - , R2 score - **Classification Model:** Confusion Matrix - , Accuracy Score& Classification Report -	
2.	Tune the Model	Hyper parameter Tuning Validation Method -	

6. Advantages and disadvantages:

Advantages:

Accuracy:

This Machine Learning works at its best to predict delay time of flights with an impulsive accuracy rate of 89.4%.

Quick:

Since this model is already trained and running on a cloud platform, the model can quickly process the data and come up with an answer.

Less resource:

Since the computation is done on the cloud, less user computation power is required.

Disadvantages:

Internet:

The model is running on a cloud platform which means the user needs to connect to internet to interact with the application.

7. Conclusion:

Although the flight delay are predicted in advance based on record, some natural causes such as climate change, machine malfunction, etc. These causes will stand in our way and are quite problematic.

The developed ML model will predicts the flight delay with at most accuracy. The Decision Tree algorithm is used to boost up the performance of the model. This algorithm will enhance the prediction and give a accurate results to the users.

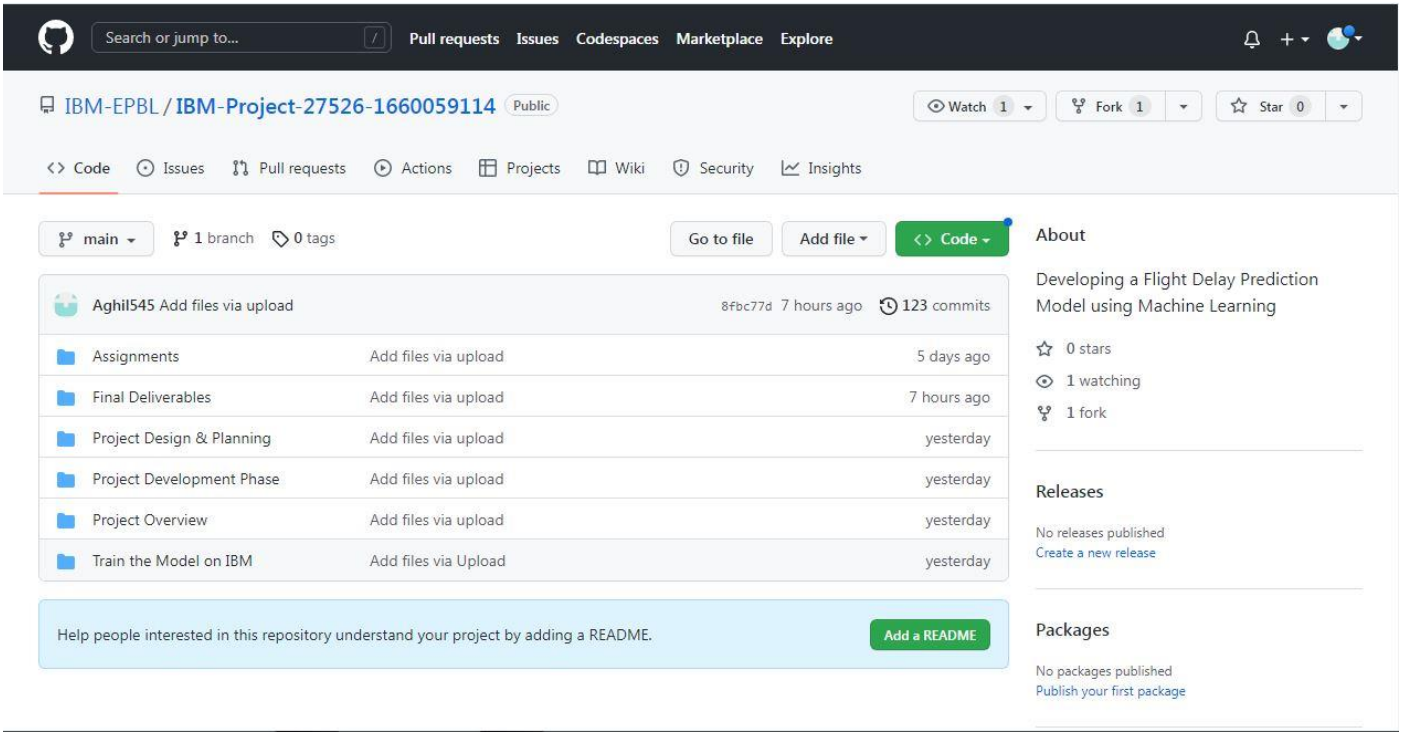
8. Future scope:

Flight delay prediction application can be integrated with some other applications like ticket booking system, travel map as an API. We can also have a dashboard for the users and track there frequent traveling path, flight and predict the delay time. We can also gain data from users to update our model periodically.

User Interface can be improved in such a way that it is more interactive. Many addition attributes can be added along with the model to enhance user experience.

9. Appendix:

GitHub Screenshot:



GitHub and Source code link:

https://github.com/IBM-EPBL/IBM-Project-275261660059114/blob/main/Final%20Deliverables/Demo%20Video.mp4

Google Drive link:

https://drive.google.com/file/d/1_wer_dvebN6R4hoNErrdt58PE4rAagjx/view?usp=drivesdk