

**DEVELOPING A FLIGHT DELAY PREDICTION USING  
MODEL MACHINE LEARNING**

**TEAM ID - PNT2022TMID52214**

**A PROJECT REPORT**

**Submitted By**

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**In partial fulfillment for the award of the degree**

**Of**

**BACHELOR OF ENGINEERING**

**IN**

**COMPUTER SCIENCE AND ENGINEERING**

**PET ENGINEERING COLLEGE, VALLIOOR**

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# 1.INTRODUCTION

The goal of this Machine Learning model is to predict whether a flight you are considering booking is likely to arrive on time. If you know that the flight is likely to be late, you might choose to book another flight. Moreover, the goal of this project is to estimate the probability of any flights to be more than  $x$  minutes late, for any  $x$  being the difference between the total connection time and the time to go to the departure gate. We would like to give this information to the customer during the search and reservation process, the model will have to give long-term predictions, up to several months forward and will not take into account short-term effects, like current weather traffic in the situation. This model will be based on the unique public large dataset of flight delays. This dataset is only composed of domestic flights, with data from all major airlines.

Historically in charge of transaction processing for the travel and tourism industry, is developing new products to enhance the customer experience during the process of searching for a trip. In addition to the list of possible flight connections for a journey, a piece of information that can be provided is the risk of missing a connection. Knowing this probability can help the traveler to choose the best route, and the travel agent to adapt its suggestions or even prices.

In order to evaluate the risk of missing a connection, we need like to know the probability of the incoming flight being too late to be able to catch the second flight, taking into account the incompressible time necessary to go from the arrival gate to the departure gate of the second flight (possibly including immigration control). Models already exist to estimate the gate-to-gate transfer time. The goal of this master thesis to build a model for the prediction of flight arrival delays. The prediction of short-term delays (for the next hours or so) is already a largely explored field. Indeed, using information about weather conditions, airport congestion and current flight delays allows quite accurate prediction of future delays, as some parameters influencing them are known, even if they still have components. For example, the website Flight-Caster exploits several sources of information (airports, airlines, weather and possibly historical data) to provide probabilities of being on-time, less than the site is using the same estimations for all the flights when no short-term information is available.

## **1.1 Project Overview**

Average aircraft delay is regularly referred to as an indication of airport capacity. Flight delay is a prevailing problem in this world. It's very tough to explain the reason for a delay. A few factors responsible for the flight delays like runway construction and excessive traffic are rare, but bad weather seems to be a common cause. Some flights are delayed because of the reactionary delays, due to the late arrival of the previous flight. It hurts airports, airlines, and affects a company's marketing strategies as companies rely on customer loyalty to support their frequent flying programs. The classification and regression results obtained in these studies generate an estimate for individual flight delay in the form of a class or a point estimate, respectively

## **1.2 Purpose**

The details about the range of different methodology that is used or can be used to find out the delay in flights. The purpose is to establish a delay prediction model based on a machine learning algorithm to predict the departure delay at an airport. Predicting the likelihood of delay based on flights' features bridges an important information asymmetry between airlines and passengers. This document is to look at the approaches used to build models for predicting flight delays that occur due to bad weather conditions. Reduce further economic loss for airlines.

## **2. LITERATURE SURVEY**

**Author: Hang Zhou, Wei Cong Li, Zi qi Jiang, Franger Cain Yutong Xu**

Deep learning is used for the algorithm. Flight Departure Time Prediction Based on Deep Learning. The deep learning architecture is flexible to be adapted to new problems in the future. The same neural network-based approach can be applied to many different applications and data types. Massive parallel computations can be performed using GPUs and are scalable for large volumes of data. Moreover it delivers better performance results when the amount of data is huge. It requires a very large amount of data in order to perform better than other techniques.

**Author: Khaksar A. sheikh Lesa lime**

Machine Learning is used for the algorithm. Airline Flight Delay Prediction Machine Learning Models. No human intervention needed (automation) Easily identifies trends and patterns Continuous Improvement Handling multi-dimensional and multi-variety data. 1. Data Acquisition Time and Resources Interpretation of Results High error-susceptibility

**Author: Adrian, A. A. Simmons**

Data mining is used for the algorithm. It helps gather reliable information. Helping businesses make operational adjustments helps to make informed decisions. It helps detect risks and fraud. Data Mining tools are complex and require training. Data mining techniques are not infallible Rising privacy concern. Data mining requires a large database.

**Author: Rahul Garg, Soham Goave,**

Big data is used for the algorithm. Reveals that big data analytics has helped businesses to reduce their expenses significantly. 66.7% Reveals that big data analytics has helped businesses to reduce their expenses significantly. 66.7% of survey respondents from New Vantage claimed that they have started using big data to reduce Expenses. Furthermore, 59.4% of survey respondents from Syncsort claimed that big data tools helped them reduce costs and increase operational efficiency.

## **2.1 Existing Problem**

First, this paper summarizes the factors affecting flight operation in existing research results, and analyzes and filters the factors, so as to determine the factors affecting flight operation. Then, the GRU neural network model is established, which is verified by the real flight data. Finally, compared with several commonly used neural network models and random forest models in machine learning, the advantages of the model built in this paper are highlighted.

## 2.2 REFERENCES

1. Bo Zhang  
School of Traffic and Transportation  
Beijing Jiao tong University  
Zhang [bo@bjtu.edu.cn](mailto:bo@bjtu.edu.cn)
2. Dan dan Ma  
School of Traffic and Transportation  
Beijing Jiao tong University  
Beijing, China

## 2.3 PROBLEM DEFINITION STATEMENT

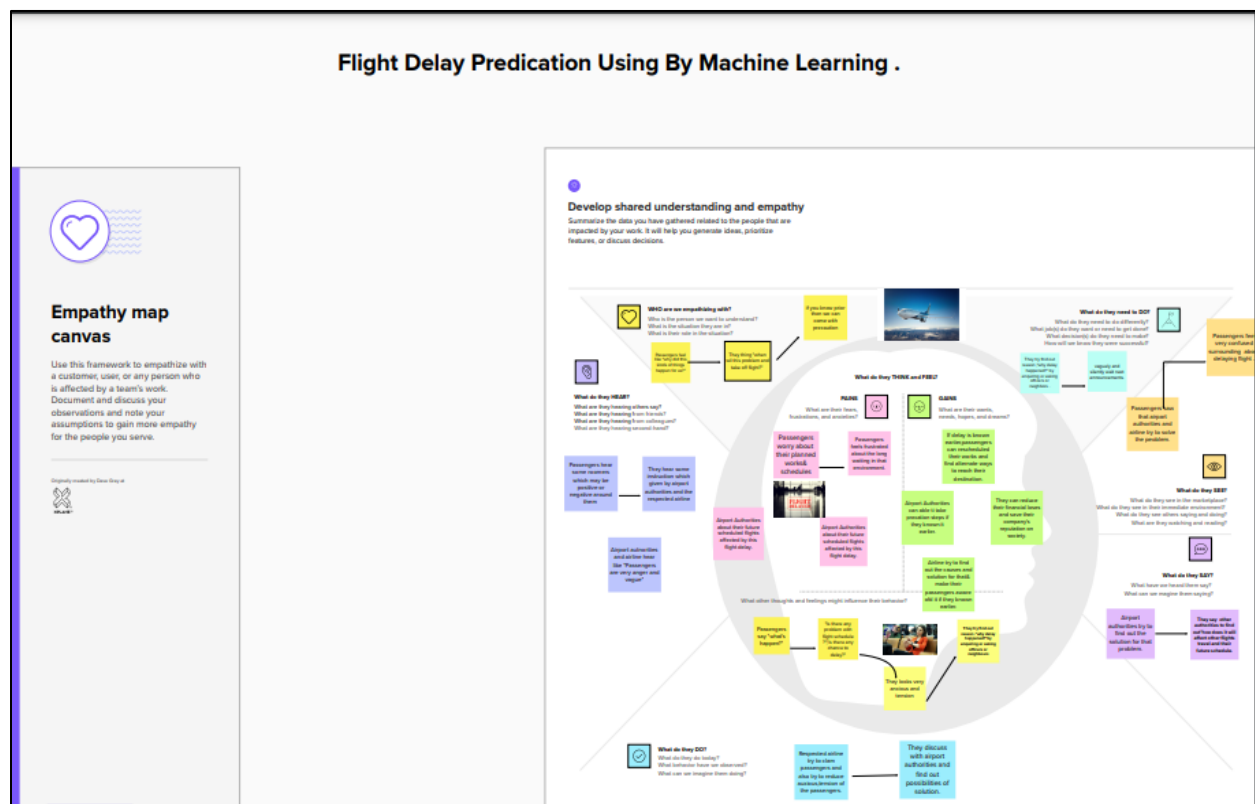
Air travel has been increasingly preferred among travelers, mainly because of its speed and in some cases comfort. This has led to phenomenal growth in air traffic and on the ground, An Increase in air traffic growth has also resulted in massive levels of aircraft delays on the ground and in the air. These delays are responsible for large economic and environmental losses. The main objective of the model is to predict flight delays accurately in order to optimize flight operations and minimize delays.

### 3. IDEATION AND PROPOSED SOLUTION

In predicting the flight delays to create a generalized system that establishes a direct contact with the passenger making him aware of the problem. Air travelers could use the model package in a smartphone application to plan layovers at a particular airport. Airlines can determine efficient routes with minimum delay possibility.

#### 3.1 Empathy map canvas

An empathy map is a collaborative visualization used to articulate what we know about a particular type of user. It externalizes knowledge about users in order to 1) create a shared understanding of user needs, and 2) aid in decision making.

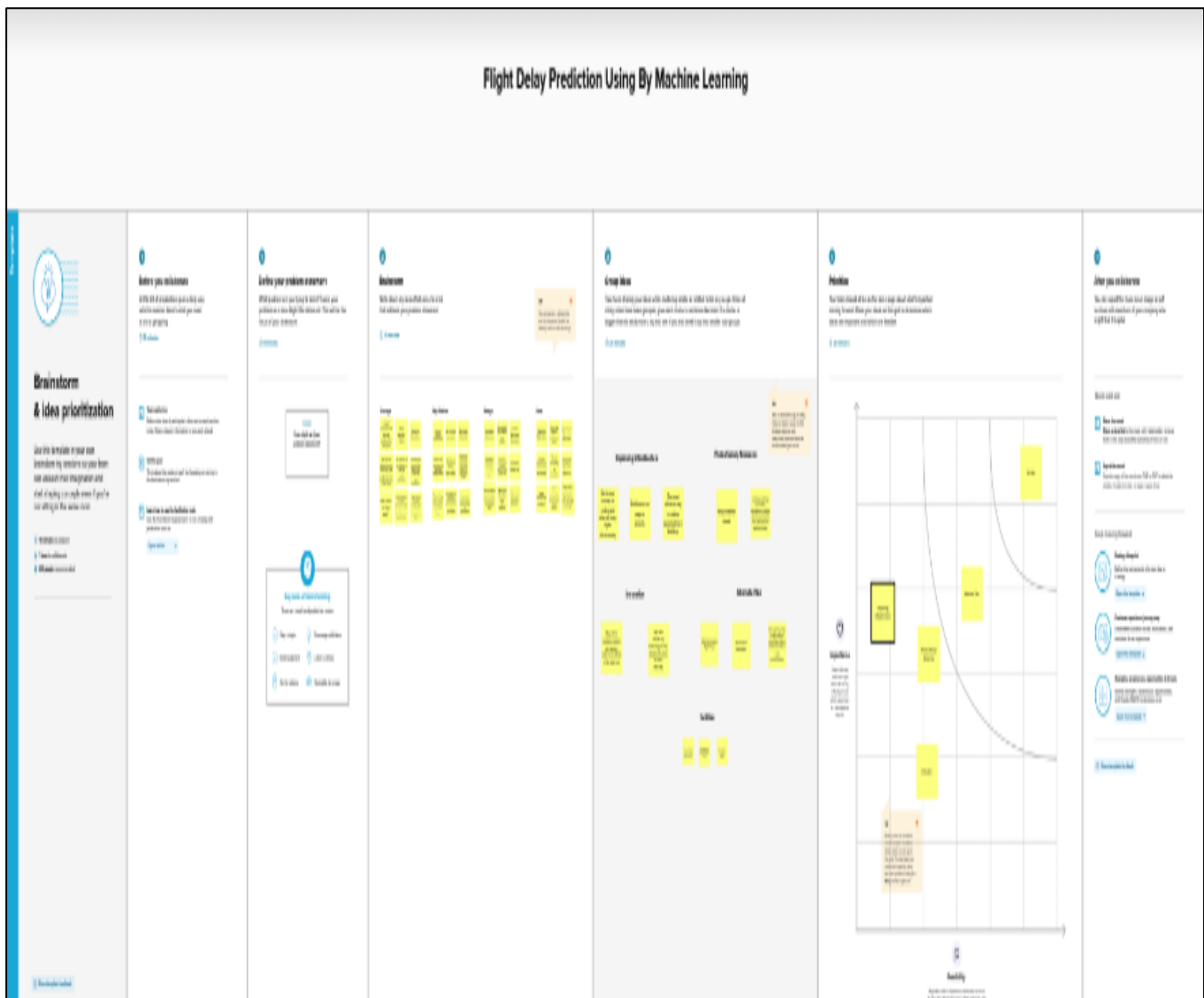


Figure



## 3.2 Ideation and Brainstorming

Ideation is often closely related to the practice of brainstorming, a specific technique that is utilized to generate new ideas. A principal difference between ideation and brainstorming is that ideation is commonly more thought of as being an individual pursuit, while brainstorming is almost always a group activity. Brainstorming is usually conducted by getting a group of people together to come up with either general new ideas or ideas for solving a specific problem or dealing with a specific situation.



**Figure**

### **3.3 Proposed solution**

#### **Parameter and Description:**

##### **1. Problem Statement (Problem to be solved)**

Flight delays are gradually increasing and bring more financial difficulties and customer dissatisfaction to airline companies. To resolve this situation, supervised machine learning models were implemented to predict flight delays.

##### **2. Idea / Solution description**

Using a machine learning model, we can predict flight arrival delays. The input to our algorithm is rows of feature vectors like departure date, departure delay, day, month, year and date distance between the two airports, scheduled arrival time and the flight. Flight departure prediction is used to predict the specific departure time of the flight. By screening the factors closely related to the flight departure, the regression prediction of the actual flight departure from the planned departure time is carried out.

##### **3. Novelty / Uniqueness**

Machine learning was built using the model which utilizes features that are readily available before the departure of an airplane and can inform passengers and airlines about flight delays in advance, helping them reduce possible monetary losses.

##### **4. Social Impact / Customer Satisfaction**

Flight delays not only irritate air passengers and disrupt their schedules but also cause a decrease in efficiency, an increase in capital costs, reallocation of flight crews and aircraft, additional crew expenses.

##### **5. Business Model (Revenue Model)**

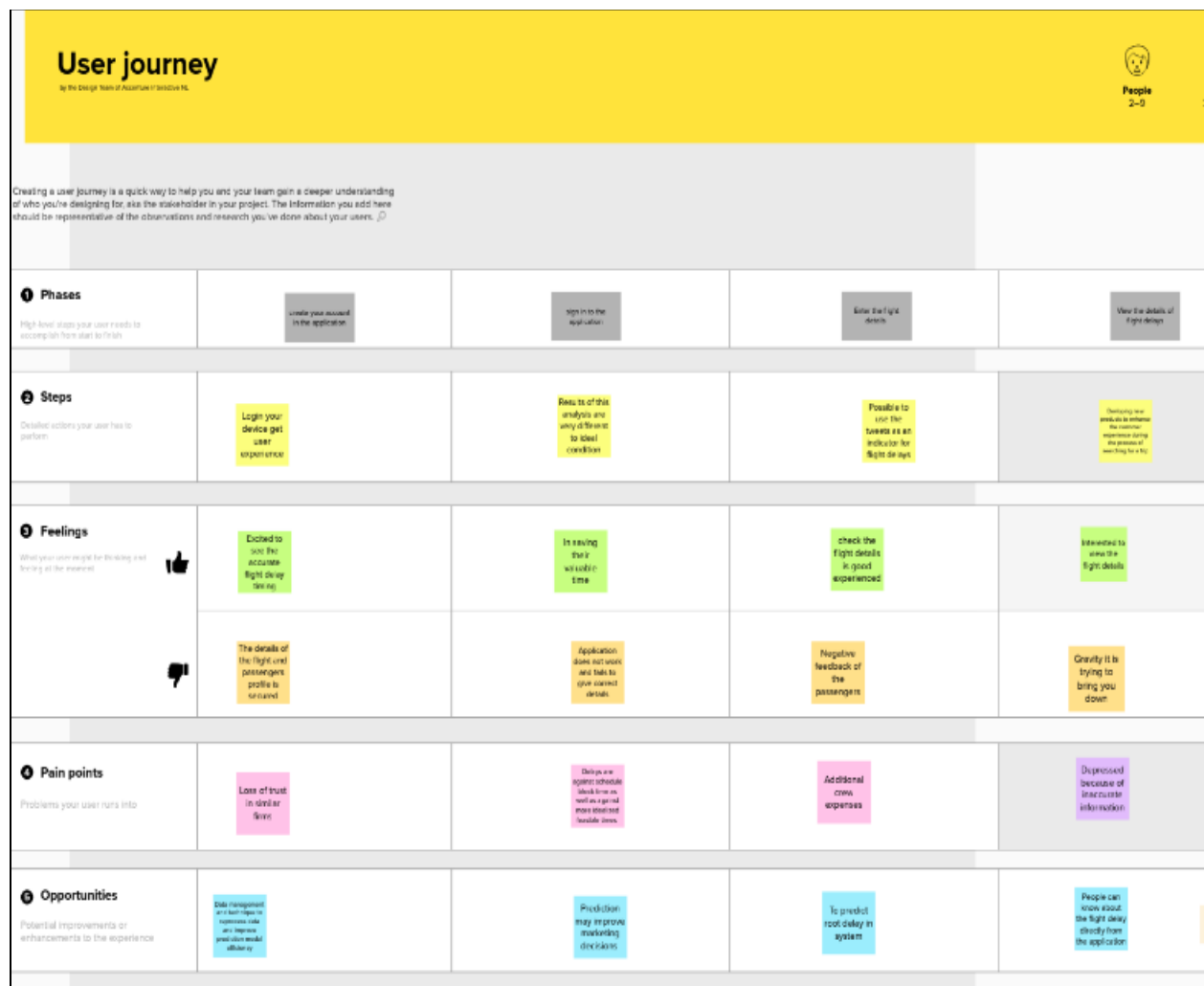
Airlines face a vital price that are related to flights being delayed because of natural occurrences and operational shortcomings that is an upscale affair for the airlines, making issues in scheduling and operations for the end users therefore inflicting unhealthy name and client discontent. As we all know, we have a tendency to not get the flight delay before departure as customers of the Airline Neither the airline company's ground staff nor the airline delay prediction supported varied conditions.

##### **6. Scalability of the Solution**

The arrival delay distribution, compared with the departure delay distribution, leans toward left. The scheduled time of an event defines a flight delay

compared to the actual time of the event. Airlines usually put extra buffer time on a flight to ensure on-time arrival. Therefore, the departure delay and arrival delay distributions difference indicate that some departure delays were recovered during the flights due to the extra amount of time embedded in the flight time between two airports.

### 3.4 Problem Solution Fit



Figure

## **4.REQUIREMENT ANALYSIS**

Requirement's analysis involves frequent communication with system users to determine specific feature expectations, resolution of conflict or ambiguity in requirements as demanded by the various users or groups of users, avoidance of feature creep and documentation of all aspects of the project development process from start to finish. Energy should be directed towards ensuring that the final system or product conforms to client needs rather than attempting to mold user expectations to fit the requirements.

### **4.1 Functional Requirement**

#### **1. User Registration**

Registration through Form

Registration through Gmail

Registration through LinkedIn

#### **2. User Confirmation**

Confirmation via Email Confirmation via OTP

#### **3.User payment**

No need.

#### **4.User requirements**

Name, address, age

#### **5.User friendliness**

This system is easy to learn and understand.

## 4.2 Non-Functional Requirements

### 1. Usability

How easy is it for a customer to use the system?

### 2. Security

Its part will be protected against malware attacks or unauthorized access. But there's a catch. The lion's share of security non-functional requirements can be translated into concrete functional counterparts. If you want to protect the admin panel from unauthorized access, you would define the login flow and different user roles as system behavior or user actions.

### 3. Reliability

Specifies how likely the system or its element would run without a failure for a given period of time under predefined conditions. Traditionally, this probability is expressed in percentages. For instance, if the system has 85 percent reliability for a month, this means that during this month, under normal usage conditions, there's an 85 percent chance that the system won't experience critical failure.

### 4. Performance

System or a particular piece of it responds to certain users' actions under a certain workload. In most cases, this metric explains how long a user must wait before the target operation happens (the page renders, a transaction is processed, etc.) given the overall number of users at the moment. But it's not always like that. Performance requirements may describe background processes invisible to users, e.g. backup. But let's focus on user-centric performance.

### 5. Availability

describes how likely the system is accessible to a user at a given point in time. While it can be expressed as an expected percentage of successful requests, you may also define it as a percentage of time the system is accessible for operation during some time period. For instance, the system may be available 98 percent of the time during a month. Availability is perhaps the most business-critical requirement, but to define it, you also must have estimations for reliability and maintainability.

## **6.Scalability**

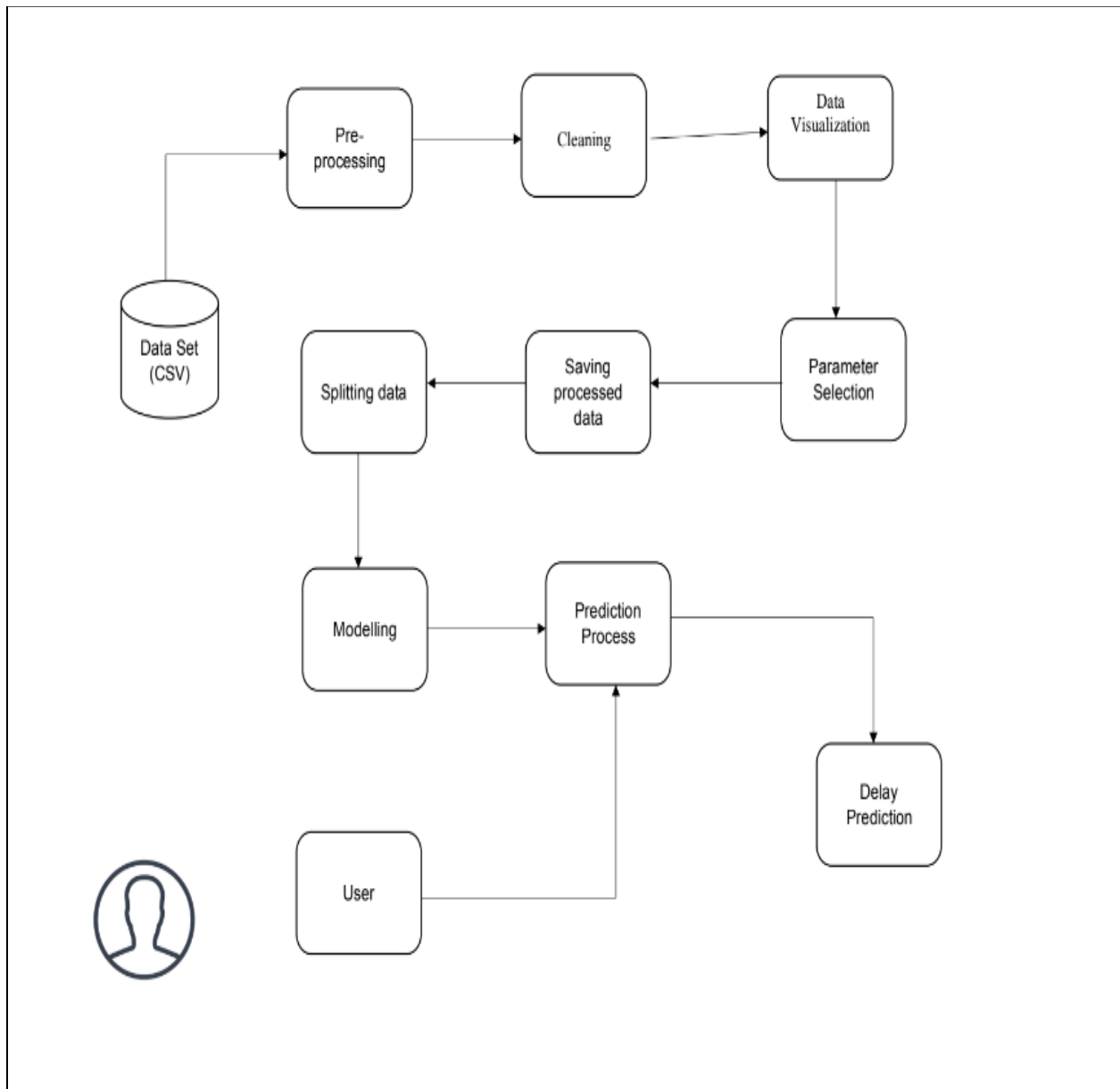
Scalability assesses the highest workloads under which the system will still meet the performance requirements. There are two ways to enable your system scale as the workloads get higher: horizontal and vertical scaling.

## **5.PROJECT DESIGN**

The project uses regression techniques of machine learning to predict the flight delay. By predicting the flight delay beforehand, the airport can reduce their cost. In this project we developed a high-level customizable API which could be used to predict flight delay on any airport around the world. Initially, the model trained itself by scraping past weather data and flight details of the given airport. Then, it containerized itself and set up a production grade flask server incorporated with nix and unicorn which is further deployed to Alibaba's cloud service and published in Alibaba's API marketplace. Moreover, the process mentioned above is automated with the use of Alibaba workflow in this GitHub repository, so that during the official release the changes could easily be reflected in the production API without any delay or overhead.

## 5.1 Data Flow Diagram

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

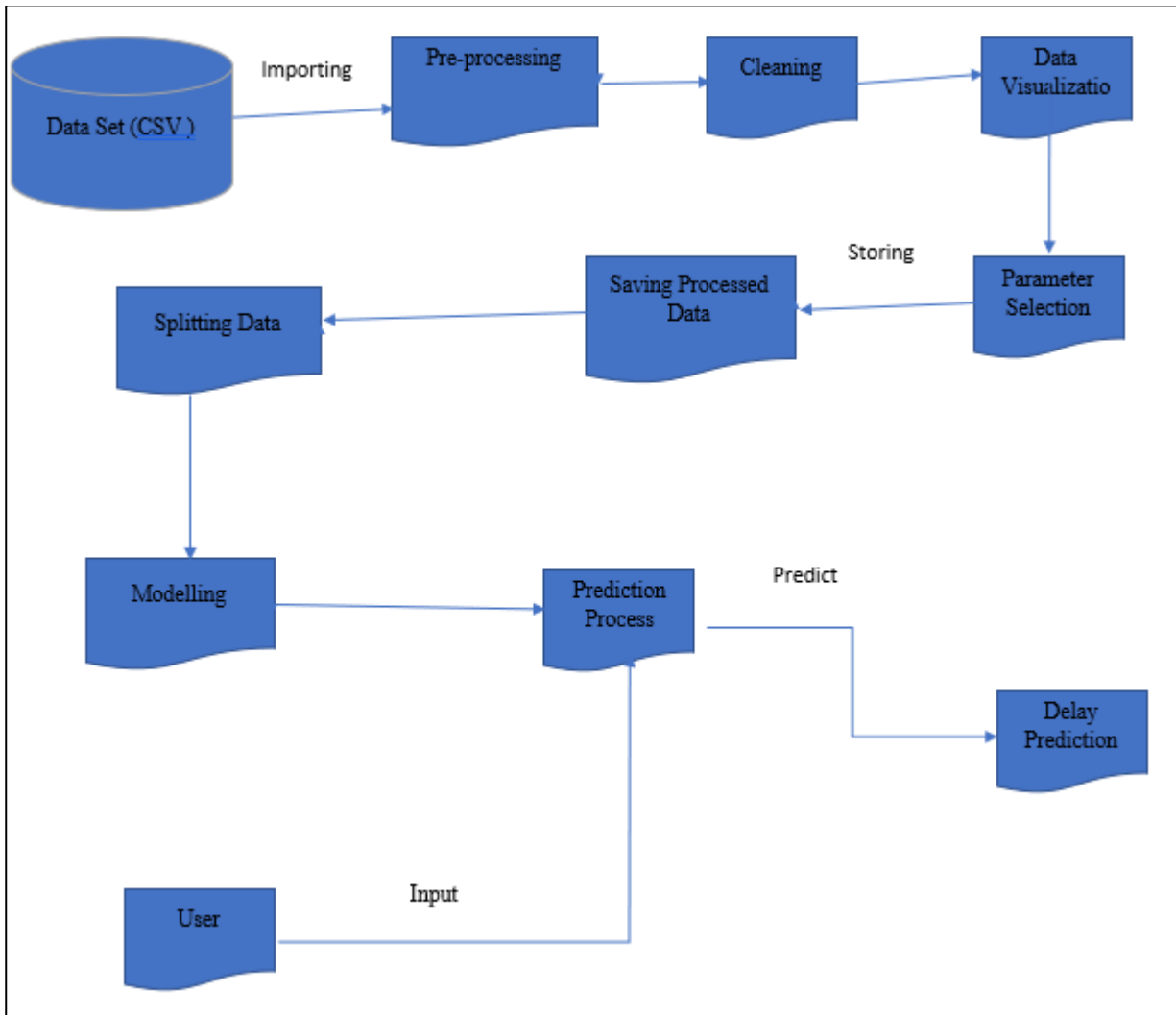


**Figure**



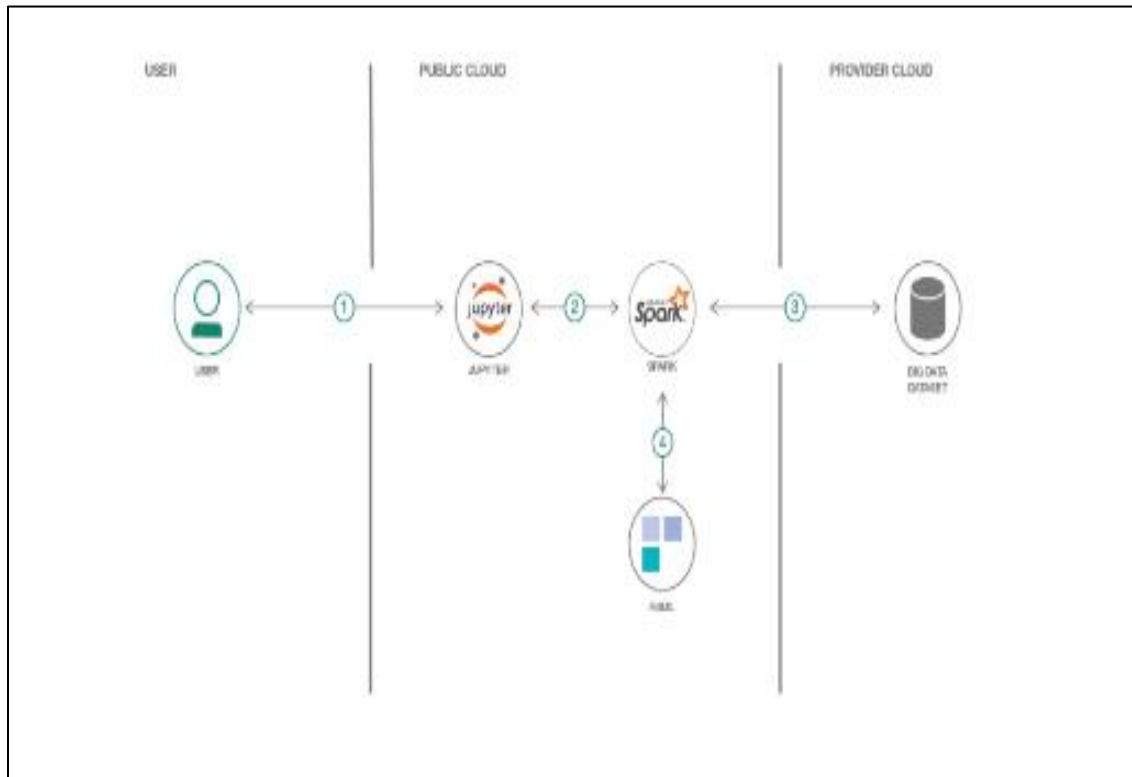
## 5.2 Solution & Technical Architecture

### Solution Architecture



Figure

## Technical Architecture



Figure

### 5.3 User Stories

**User type: Passenger**

**Registration:**

- As a passenger, I want to create login credentials so I can securely access my service online account.
- As a user, I will receive confirmation email once I have registered for creating an account
  - As a user, I can also create an account using Google.
  - As a user, I can also create an account using Facebook.

**Login:**

- As a user, I can login to the account by entering my email and password.
- As a user, I can login to the account through Facebook if I previously registered with it.
- As a user, I can reset my password if I have forgotten my password.

**My account:**

- As a user, I can view my personal account.

**User type: Customer care executive:**

- Business travelers complain about canceled flights.
- First contact the airline directly. In the event of a problem, complain to the airline operating the flight. Also informed about flight cancellation and delay in passengers.

**User type Administrator:**

- As an administrator I receive an email notification when a new user is registered.
- As an administrator I am able to add a new person to the database and backup can also be done.
- As an administrator I am able to view content that is needed.

## **6. PROJECT PLANNING & SCHEDULING**

### **6.1 Sprint Planning & Estimation**

#### **Registration:**

##### **Sprint-1**

As a user, I can register for the application by entering my email, password, and confirming my password

##### **Sprint-1**

As a user, I will receive confirmation email once I have registered for the application

##### **Sprint-2**

As a user, I can register for the application through Facebook

##### **Sprint-1**

As a user, I can register for the application through Gmail

#### **Login**

##### **Sprint-1:**

As a user, I can log into the application by entering email & password

#### **Dashboard:**

To view the dashboard on our project and check Customer information

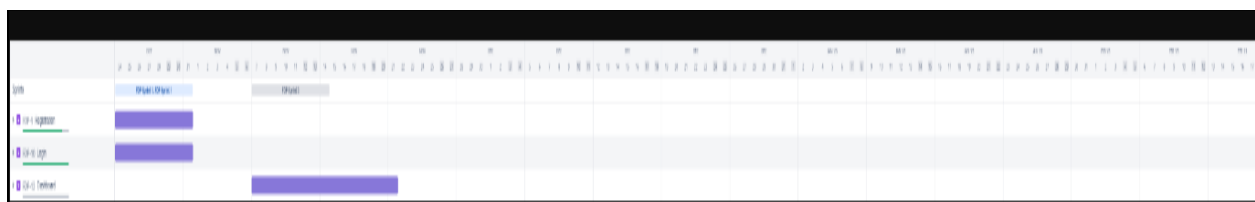
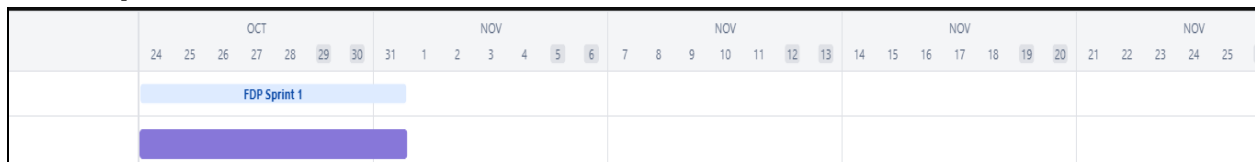
#### **Review:**

As a customer, review our site.

## 6.2 Sprint Delivery Schedule

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	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 days	31 Oct 2022	29 Oct 2022	20	05 Oct 2022
Sprint-3	25	6 days	07 Nov 2022	12 Nov 2022	19	07 Oct 2022
Sprint-4	25	6 days	14 Nov 2022	19 Nov 2022	20	14 Nov 2022

## 6.2 Reports from JIRA



## 7. CODING & SOLUTIONING

### 7.1 Feature 1

- The database used in this project are Xampp **and** MySQL
- We provide lots of facilities in our page anybody can access any time anywhere
- First you have to register on our page. Registration process is very simple. Language is not a barrier in our page. We used simple understandable language.
- After the registration process is finished, the login page will appear in which you have to enter your email id or username as you wish.
- After that you have to create very strong password in our login page
- All the details are sent to your email id.

### 7.2Feature 2

- In this login page you can update your image, change your password, change your username.
- As same as feature 1 here also registration and login page are available. In this feature 2 We provide additional facilities such as update your image, editing your username.
- In this feature you can give the home page to know more about our details

## 8. TESTING

### 8.1 Test Cases

Section	Total Cases	Not Tested	Fail	Pass
Print engine	7	0	0	7
Client application	51	0	0	51
security	2	0	0	2
Outsource shipping	3	0	0	3

### 8.2 User Acceptance Testing

#### 1. The Purpose of the Document

The purpose of this document is to look at the approaches used to build models for predicting flight delays that occur due to bad weather conditions.

#### 2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Severity 5

By Design	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	77



## 9. RESULTS

- Predicting flight delays by expanding the list of variables included in the classification and prediction models.
- Show comparable efficacy of classification rates by using only decision control
- variables as compared models reported in prior studies.
- Examine the cause of delays and evaluate delays as a multi group classification problem.

### 9.1 Performance Metrics

- The problem of traffic congestion, the traffic prediction using machine learning which contains regression models and libraries like pandas, NumPy, matplotlib. are used to predict the traffic.
- This has to be implemented so that the traffic congestion is controlled and can be accessed easily.
- Predictive maintenance in the airplane business is machine learning. With predictive analytics, sensory equipment gathers information from each aircraft's systems, and sends that information to a cloud.

## 10. ADVANTAGES & DISADVANTAGES

### Advantages:

- Predicting flight delays can improve airline operations and passenger satisfaction, which will result in a positive impact on the economy.
- Flight delay is inevitable and it plays an important role in both profits and loss of the airlines. An accurate estimation of flight delay is critical for airlines because the results can be applied to increase customer satisfaction and incomes of airline agencies.
- Flight delays hurt airlines, airports, and passengers. Their prediction is crucial during the decision-making process for all players of commercial aviation
- A **model** that can enable the airline company to better predict if a flight will be on time or will be delayed
- It significantly improves service quality.

### Disadvantages:

- Flight delays not only irritate air passengers and disrupt their schedules but also cause a decrease in efficiency, an increase in capital costs, reallocation of flight crews and aircraft, and additional crew expenses.
- Improved scheduling and operations management can assist the industry in improving on-time flight performance.
- Delay results in the dissatisfaction of trusted customers and sometimes even marketing strategies.

## 10. CONCLUSION

This paper presented the need to develop a system to predict the delay in flights along with its methodology. The paper gives details about the range of different methodology that is used or can be used to find out the delay in flights. As flight delay costs a lot to the airlines as well as passengers in financial and environmental terms, flight delay is the talk of the hour. Flight delay causes surging of prices by costing a lot on operational purpose They may increase prices to customers and operational prices to airlines. As the outcome is directly associated with the passenger and the airlines which in turn is linked to another set of airline and passengers it is very crucial to get real time delay for each player within the air transport system. Hence there is a requirement to develop a system to predict the delay in flights to scale back monetary loss and for the higher and smoother operation. Classification or regression ways are often accustomed to determine the delay which includes Feed forward network, Neural Network, Random methodologies offer virtually identical accuracy however we want an algorithmic rule that is good with real. Prediction algorithmic rule that considers or assumes independence among predictors that makes the system scalable as other independent attribute may be superimposed up to the algorithmic rule for computation of the delay the expected delay can thus facilitate the ground employees for creating correct and smooth operation plans and therefore the data if sent to the passengers will profit the airlines also because the passengers. Passenger

## 12. FEATURE SCOPE

This project is based on data analysis from 2016. Therefore, the future work of this project includes incorporating a larger dataset. There are many different ways to preprocess a larger dataset like running a Spark cluster over a server or using a cloud-based services like AWS and Azure to process the data. With the new advancement in the field of deep learning, we can use Neural Networks algorithm on flight and weather data. Neural Network works on the pattern matching methodology. It is divided into three basic parts for data modeling that includes feed forward networks, feedback networks, and self-organization networks. Feed-forward and feedback networks are generally used in the areas of prediction, pattern recognition, associative memory, and optimization calculation, whereas self-organization networks are generally used in cluster analysis. Neural Network offers distributed computer architecture with important learning abilities to represent nonlinear relationships. Also, the scope of this project is very much confined to flight and weather data of the United States, but we can include more countries like China, India, and Russia. Expanding the scope of this project, we can also add the flight data from international flights and not just restrict ourselves to the domestic flights.

## 13. APPENDIX

### Source Code:

### Home Page:

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <link rel="stylesheet" href="static/css/mystyles.css">
  <title>Flight Delay Prediction</title>
</head>

<body>
  <div class="main-container">
    <!-- Header section starts -->
    <div class="header_header">
      <div class="logo_header">
        
      </div>
      <div class="menu-container">
        <div class="dropdown">
          <button class="dropbtn"><a href="/">Home</a></button>
        </div>
        <div class="dropdown">
          <button class="dropbtn">What We Do </button>
          <div class="dropdown-content">
            <a href="/modeling">Modeling and Simulation</a>
          </div>
        </div>
        <div class="dropdown">
          <button class="dropbtn">Work With Us</button>
          <div class="dropdown-content">
```

```

        <a href="/login_validation">Prediction Value For Flight Delay</a>
        <a href="/Predict">predicted The Flight Details</a>
    </div>
</div>
<div class="dropdown">
    <button class="dropbtn">Contact Us</button>
    <div class="dropdown-content">
        <!-- <a href="/contact">Contact Us</a> -->
        <a href="/register">Sign UP</a>
        <a href="/login">Sign IN</a>
    </div>
</div>
</div>
</div>
<!-- Header section ends -->
<!-- Banner section starts -->
<div class="banner-container">
    <div class="slideshow-container1">
        <div class="mySlides1 fade1">
            
        </div>
    </div>
    <!-- <div style="text-align:center">
        <span class="dot" onclick="currentSlide(1)"></span>
        <span class="dot" onclick="currentSlide(2)"></span>
    </div> -->
</div>
<!-- Banner section ends -->
<!-- Banner desc starts -->
<div class="banner-desc">
    <div class="banner-content">
        <h1>
            Flight Delay Prediction
        </h1>
        <div class="flight-desc">
            <p>FDP industry-leading, unique solution which applies data analytics on
                historical flight operations,weather forecasts
                combined with real time operational data to produce
                accurate flight-specific delay predictions
            </p>
        </div>
    </div>
</div>

```

```

</div>
<div class="flight-desc1">
  <ul>
    <li><strong>Weather</strong>-related factors account for almost <strong>half of
all flight delays</strong></li>
    <li>Combining powerful airspace system analytics, weather forecasts, historical
weather impact analysis, we
      believe that some passenger delays can be predicted and proactively
mitigated</li>
    <li>The service will enable travel companies better insights planning for next day
operation, with insights into
      anticipated delays</li>
    <li>Result is an accurate, flight-by-flight and itinerary delay and ETA
prediction</li>
  </ul>
</div>
</div>
<div class="dataset-analysis-img">
  
</div>
</div>
<!-- Banner desc ends -->

<!-- Analysis banner starts -->
<div class="analysis-banners">
  <div class="analysis-header">
    <h1>Flight Delay Graphy</h1>
  </div>
  <div class="analysis-container1">
    <span>
      
    </span>
    <span>
      
    </span>
    <span>
      
    </span>
  </div>
  <div class="analysis-container1">

```

```

    <span>
      
    </span>
    <span>
      
    </span>
    <span>
      
    </span>
  </div>
</div>
<!-- Analysis banner ends -->
<!-- footer section starts -->
<footer>
  <div class="footer-content">
    <div class="footer-media">
      <a href="https://www.facebook.com/">  </a>
      <a href="https://www.instagram.com/">  </a>
      <a href="https://twitter.com/">  </a>
    </div>
    <div class="footer-about">
      <div class="about-member">
        <b>Posted by: Saranya Muthu</b>
      </div>
      <div class="about-member">
        <b>Contact Information: Saranyamuthu29@gmail.com</b>
      </div>
      <div class="about-member">
        <b>Contact Information: Saranyamuthu29@gmail.com</b>
      </div>
    </div>
  </div>
</div>
</footer>
<div class="copyright-area">
  <span class="footer-copyright">
    ©Delay Flight Prediction.All rights reserved. done by saranya
  </span>

```



```
</div>
<!-- footer section ends -->
</div>
</body>
</html>
```

## Sign In:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="utf-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1">
<!-- The above 3 meta tags *must* come first in the head; any other head content
must
come *after* these tags -->
<title>Find Me</title>
<link href="https://fonts.googleapis.com/css?family=Lato:400,700"
rel="stylesheet">
<link type="text/css" rel="stylesheet" href="{ { url_for('static',
filename='css/bootstrap.min.css') } }" />
<link type="text/css" rel="stylesheet" href="{ { url_for('static',
filename='css/style.css') } }"
/>
<style>
#booking
{
font-family: 'Lato', sans-serif;
background: url(.....\static\background.png);
background-size: cover;
background-position: center;
color: #191a1e;
background-color: #f44336;
```

```

}
</style>
</head>
<body>
<div id="booking" class="section">
<div class="section-center">
<div class="container">
<div class="row">
<div class="col-md-4">
<div class="booking-cta">
<h1>Sign In</h1>
<p style="color:#fff">Let You Create An Account With Us.</p>
<div class="container">
<!-- {{ prediction_text }} -->
{% if prediction_text == "0" %}
<h2 style="color:#fff"> "Account Successfully Created" </h2>
{% elif prediction_text == "1" %}
<h2 style="color:#fff">" Incorrect Email Id Or Password " </h2>
{% endif %}
</div>
</div>
</div>
<div class="col-md-6 col-md-offset-1">
<div class="booking-form">
<form class="form" method="post" action="/login_validation">
<div class="row">
<div class="col-md-12">
<div class="form-group">
<span class="form-label">Email</span>
<input type="email" class="form-control" name="email"
placeholder="Enter Your Email" required="true">
<span class="select-arrow"></span>
</div>
</div>
</div>

```

```

<div class="row">
<div class="col-md-12">
<div class="form-group">
<span class="form-label">Password</span>
<input type="password" class="form-control" name="password"
placeholder="Enter Your Password" required="true">
<span class="select-arrow"></span>
</div>
</div>
</div>
<div class="form-btn">
<button class="submit-btn">Sign In</button>
</div>
<p class="mt-2"> Not a member? <a href="/register">Create Account</a> </p>
</form>
</div>
<!Booking form>
</div>
</div>
</div>
</div>
<script src="https://cdnjs.cloudflare.com/ajax/libs/gsap/3.8.0/gsap.min.js"
defer></script>
<!-- ===== SCRIPT.JS ===== -->
<script src="{ {url_for('static', filename='script.js' )} }" defer></script>
</body>
</html>
About.HTML

```

## Register Page:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="utf-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1">
<!-- The above 3 meta tags *must* come first in the head; any other head content
must
come *after* these tags -->
<title>Find Me</title>
<link href="https://fonts.googleapis.com/css?family=Lato:400,700"
rel="stylesheet">
<link type="text/css" rel="stylesheet" href="{ { url_for('static',
filename='css/bootstrap.min.css') } }" />
<link type="text/css" rel="stylesheet" href="{ { url_for('static',
filename='css/style.css') } }"
/>
<style>
#booking
{
font-family: 'Lato', sans-serif;
/* background: url(../static/background.png); */
background-size: cover;
background-position: center;
color: #191a1e;
background-color: #f44336;
}
</style>
<script src="https://code.jquery.com/jquery-3.5.1.slim.min.js" integrity="sha384-
DfXdz2htPH0lsSSs5nCTpuj/zy4C+OGpamoFVy38MVBnE+IbbVYUew+OrCXa
Rkfj"
crossorigin="anonymous"></script>
```

```

<script
src="https://cdn.jsdelivr.net/npm/bootstrap@4.5.3/dist/js/bootstrap.bundle.min.js"
integrity="sha384-
ho+j7jyWK8fNQe+A12Hb8AhRq26LrZ/JpcUGGOn+Y7RsweNrtN/tE3MoK7Ze
ZDyx"
crossorigin="anonymous"></script>
</head>
<body>
<div id="booking" class="section">
<div class="section-center">
<div class="container">
<div class="row">
<div class="col-md-4">
<div class="booking-cta">
<h1>Sign Up</h1>
<p style="color:#fff">Let You Create An Account With Us.</p>
<div class="container">
<!-- {{ prediction_text }} -->
{% if prediction_text == "0" %}
<h2 style="color:#fff"> "Account Successfully Created" </h2>
{% elif prediction_text == 1 %}
<h2 style="color:#fff">" Sorry, The Flight Is Delayed " </h2>
{% endif %}
</div>
</div>
</div>
<div class="col-md-6 col-md-offset-1">
<div class="booking-form">
<form class="form" method="post" action="/add_user">
<div class="row">
<div class="col-md-12">
<div class="form-group">
<span class="form-label">Name</span>
<input type="text" class="form-control" name="name"
placeholder="Enter Your Name" required="true">

```

```

<span class="select-arrow"></span>
</div>
</div>
</div>
<div class="row">
<div class="col-md-12">
<div class="form-group">
<span class="form-label">Email</span>
<input type="email" class="form-control" name="email"
placeholder="Enter Your Email" required="true">
<span class="select-arrow"></span>
</div>
</div>
</div>
<div class="row">
<div class="col-md-12">
<div class="form-group">
<span class="form-label">Password</span>
<input type="password" class="form-control" name="password"
placeholder="Enter Your Password" required="true">
<span class="select-arrow"></span>
</div>
</div>
</div>
<div class="form-btn">
<button class="submit-btn">Sign Up</button>
</div>
<div class="form-btn">
<p class="mt-2"> Already a member? <a href="/login">Sign In</a> </p>
</div>
</form>
</div>
<!--Booking form-->
</div>
</div>

```

```
</div>
</div>
<script src="https://unpkg.com/aos@2.3.1/dist/aos.js"></script>
<!-- ===== GSAP CDN ===== -->
<script
src="https://cdnjs.cloudflare.com/ajax/libs/gsap/3.8.0/gsap.min.js"></script>
<!-- ===== SCRIPT.JS ===== -->
<script src="{ {url_for('static', filename='script.js' )} }" defer></script>
</body>
</html>
```

## Delay Page:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="utf-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1">
<!-- The above 3 meta tags *must* come first in the head; any other head content
must
come *after* these tags -->
<title>Find Me</title>
<link href="https://fonts.googleapis.com/css?family=Lato:400,700"
rel="stylesheet">
<link type="text/css" rel="stylesheet" href="{ { url_for('static',
filename='css/bootstrap.min.css') } }" />
<link type="text/css" rel="stylesheet" href="{ { url_for('static',
filename='css/style.css') } }"
/>
<style>
#booking
{
font-family: 'Lato', sans-serif;
background: url(../static/banner4.jpg);
background-size: cover;
background-position: center;
color: #191a1e;
}
</style>
<!---->
<!-- HTML5 shim and Respond.js for IE8 support of HTML5 elements and media
queries --
>
<!-- WARNING: Respond.js doesn't work if you view the page via file:// -->
```



```

<!--[if lt IE 9]>
<script
src="https://oss.maxcdn.com/html5shiv/3.7.3/html5shiv.min.js"></script>
<script src="https://oss.maxcdn.com/respond/1.4.2/respond.min.js"></script>
<script src="https://unpkg.com/aos@2.3.1/dist/aos.js"></script>
<!-- ===== GSAP CDN ===== -->
<script
src="https://cdnjs.cloudflare.com/ajax/libs/gsap/3.8.0/gsap.min.js"></script>
<!-- ===== SCRIPT.JS ===== -->
<script src="{ { url_for('static', filename='script.js' ) } }" defer></script>
</head>
<body>
<div id="booking" class="section">
<div class="section-center">
<div class="container">
<div class="row">
<div class="col-md-4">
<div class="booking-cta">
<h1>Find Me</h1>
<p style="color:#fff">Let's Track Your Flights In Seconds.</p>
<div class="container">
<!-- { { prediction_text } } -->
{ % if prediction_text == 0 % }
<h2 style="color:#fff">" The Flight Will Be OnTime "</h2>
{ % elif prediction_text == 1 % }
<h2 style="color:#fff">" Sorry, The Flight Is Delayed "</h2>
{ % endif % }
</div>
</div>
</div>
<div class="col-md-7 col-md-offset-1">
<div class="booking-form">
<form action={ { url_for("predict") } } method="post">
<div class="row">
<div class="col-md-4">

```

```

<div class="form-group">
  <span class="form-label">Year</span>
  <input type="text" class="form-control" name="year"
placeholder="Enter year" required="true">
  <span class="select-arrow"></span>
</div>
</div>
<!Year>
<div class="col-md-4">
  <div class="form-group">
    <span class="form-label">Month</span>
    <input type="text" class="form-control" name="month"
placeholder="Enter month" required="true">
    <span class="select-arrow"></span>
  </div>
</div>
<!Month>
<div class="col-md-4">
  <div class="form-group">
    <span class="form-label">Date</span>
    <input type="text" class="form-control" name="day"
placeholder="Enter date" required="true">
    <span class="select-arrow"></span>
  </div>
</div>
<! Date>
</div>
<!-- Year,Month,Date end-->
<div class="row">
  Inc.(MQ)</option>
  <div class="col-md-6">
    <div class="form-group">
      <span class="form-label">Select an Airline</span>
      <!-- <input class="form-control" type="date" required> -->
      <select class="form-control" name="carrier">

```

```

<option value="UA">United Air Lines Inc.(UA)</option>
<option value="AA">American Airlines Inc.(AA)</option>
<option value="US">US Airways Inc.(US)</option>
<option value="F9">Frontier Airlines Inc.(F9)</option>
<option value="B6">JetBlue Airways(B6)</option>
<option value="OO">Skywest Airlines Inc.(OO)</option>
<option value="AS">Alaska Airlines Inc.(AS)</option>
<option value="WN">Southwest Airlines Co.(WN)</option>
<option value="DL">Delta Air Lines Inc.(DL)</option>
<option value="EV">Atlantic Southeast Airlines(EV)</option>
<option value="HA">Hawaiian Airlines Inc.(HA)</option>
<option value="MQ">American Eagle Airlines
<option value="VX">Virgin America(VX)</option>
<option value="9E">Endeavor Air(9E)</option>
<option value="FL">AirTran Airways(FL)</option>
<option value="YV">Mesa Airlines(YV)</option>
</select>
</div>
</div>
<!Airline>
</div>
<!--Airline end-->
<div class="row">
<!-- airport">-->
<div class="col-md-6">
<div class="form-group">
<span class="form-label">Flying from</span>
<!-- <!--<input class="form-control" type="text" placeholder="City or -->
<select class="form-control" name="origin">
<option value="EWR">Newark Liberty International
Airport(EWR)</option>
<option value="JFK">John F. Kennedy International
Airport(New York International Airport)(JFK)</option>
<option value="LGA">LaGuardia Airport(Marine Air
Terminal)(LGA)</option>

```

```

</select>
</div>
</div>
<!Flying from>
<!-- or airport"> -->
<div class="col-md-6">
<div class="form-group">
<span class="form-label">Flying to</span>
<!-- <!-- <input class="form-control" type="text" placeholder="City -->
<select class="form-control" name="dest">
<option value="ATL">Hartsfield-Jackson Atlanta
International Airport(ATL)</option>
<option value="ORD">Chicago O'Hare International
Airport(ORD)</option>
Airport(LAX)</option>
<option value="LAX">Los Angeles International
<option value="BOS">Gen. Edward Lawrence Logan
International Airport(BOS)</option>
<option value="MCO">Orlando International
Airport(MCO)</option>
Airport(CLT)</option>
<option value="CLT">Charlotte Douglas International
Airport(SFO)</option>
<option value="SFO">San Francisco International
<option value="FLL">Fort Lauderdale-Hollywood
International Airport(FLL)</option>
<option value="MIA">Miami International
Airport(MIA)</option>
Airport(DCA)</option>
Airport(DTW)</option>
Airport(DFW)</option>
Airport(RDU)</option>
Airport(TPA)</option>
Airport(DEN)</option>
Airport(IAH)</option>

```

Airport(MSP)</option>  
 Airport(PBI)</option>  
 Airport(BNA)</option>  
 Airport(LAS)</option>  
 Airport(SJU)</option>  
 Airport(IAD)</option>  
 Airport(PHX)</option>  
 Airport(BUF)</option>  
 Airport(CLE)</option>  
 Lambert Field(STL)</option>  
 Airport(MDW)</option>  
 Airport(SEA)</option>  
 <option value="DCA">Ronald Reagan Washington National  
 <option value="DTW">Detroit Metropolitan  
 <option value="DFW">Dallas/Fort Worth International  
 <option value="RDU">Raleigh-Durham International  
 <option value="TPA">Tampa International  
 <option value="DEN">Denver International  
 <option value="IAH">George Bush Intercontinental  
 <option value="MSP">Minneapolis-Saint Paul International  
 <option value="PBI">Palm Beach International  
 <option value="BNA">Nashville International  
 <option value="LAS">McCarran International  
 <option value="SJU">Luis MuÃ±oz MarÃ±n International  
 <option value="IAD">Washington Dulles International  
 <option value="PHX">Phoenix Sky Harbor International  
 <option value="BUF">Buffalo Niagara International  
 <option value="CLE">Cleveland Hopkins International  
 <option value="STL">St. Louis International Airport at  
 <option value="MDW">Chicago Midway International  
 <option value="SEA">Seattle-Tacoma International  
 <option value="CVG">Cincinnati/Northern Kentucky  
 International Airport(CVG)</option>  
 <option value="MSY">Louis Armstrong New Orleans  
 International Airport(MSY)</option>

<option value="RSW">Southwest Florida International  
Airport(RSW)</option>  
Airport(CMH)</option>  
<option value="CMH">Port Columbus International  
<option value="CHS">Charleston International  
Airport/Charleston AFB(CHS)</option>  
<option value="PIT">Pittsburgh International  
Airport(PIT)</option>  
<option value="SAN">San Diego International AirportÂ  
(Lindbergh Field)(SAN)</option>  
<option value="MKE">General Mitchell International  
Airport(MKE)</option>  
Airport(JAX)</option>  
Airport(BTV)</option>  
Airport(SLC)</option>  
Airport(AUS)</option>  
Airport(ROC)</option>  
Airport(RIC)</option>  
Jetport(PWM)</option>  
Airport(HOU)</option>  
Airport(IND)</option>  
Airport(MCI)</option>  
Airport(SYR)</option>  
Airport(BWI)</option>  
Airport(MEM)</option>  
Airport(PHL)</option>  
Airport(GSO)</option>  
Airport(ORF)</option>  
<option value="JAX">Jacksonville International  
<option value="BTV">Burlington International  
<option value="SLC">Salt Lake City International  
<option value="AUS">Austin-Bergstrom International  
<option value="ROC">Greater Rochester International  
<option value="RIC">Richmond International  
<option value="PWM">Portland International

<option value="HOU">William P. Hobby  
 <option value="IND">Indianapolis International  
 <option value="MCI">Kansas City International  
 <option value="SYR">Syracuse Hancock International  
 <option value="BWI">Baltimore-Washington International  
 <option value="MEM">Memphis International  
 <option value="PHL">Philadelphia International  
 <option value="GSO">Piedmont Triad International  
 <option value="ORF">Norfolk International  
 Airport(DAY)</option>  
 Airport(PDX)</option>  
 Airport(SRQ)</option>  
 <option value="DAY">James M. Cox Dayton International  
 <option value="PDX">Portland International  
 <option value="SRQ">Sarasota-Bradenton International  
 <option value="SDF">Louisville International AirportÂ  
 (Standiford Field)(SDF)</option>  
 <option value="XNA">Northwest Arkansas Regional  
 Airport(XNA)</option>  
 Airport(MHT)</option>  
 Airport(BQN)</option>  
 Airport(CAK)</option>  
 <option value="MHT">Manchester-Boston Regional  
 <option value="BQN">Rafael HernÃ¡ndez  
 <option value="CAK">Akron-Canton Regional  
 <option value="OMA">Eppley Airfield(OMA)</option>  
 <option value="SNA">John Wayne AirportÂ (Orange  
 County Airport)(SNA)</option>  
 <option value="GSP">Greenville-Spartanburg International  
 Airport(GSP)</option>  
 Airport(SAV)</option>  
 Airport(GRR)</option>  
 Airport(HNL)</option>  
 Field)(LGB)</option>  
 Airport(SAT)</option>

Airport(TYS)</option>  
 Airport(MSN)</option>  
 Airport(DSM)</option>  
 Airport(ALB)</option>  
 Airport(BDL)</option>  
 <option value="SAV">Savannah/Hilton Head International  
 <option value="GRR">Gerald R. Ford International  
 <option value="HNL">Honolulu International  
 <option value="LGB">Long Beach AirportÂ (Daugherty  
 <option value="SAT">San Antonio International  
 <option value="TYS">McGhee Tyson  
 <option value="MSN">Dane County Regional  
 <option value="DSM">Des Moines International  
 <option value="STT">Cyril E. King Airport(STT)</option>  
 <option value="ALB">Albany International  
 <option value="BDL">Bradley International  
 <option value="BUR">Bob Hope AirportÂ (Hollywood  
 Burbank Airport)(BUR)</option>  
 <option value="PVD">Theodore Francis Green State  
 Airport(PVD)</option>  
 Airport(BGR)</option>  
 <option value="BGR">Bangor International  
 <option value="PSE">Mercedita Airport(PSE)</option>  
 <option value="SJC">Norman Y. Mineta San JosÃ©  
 International Airport(SJC)</option>  
 <option value="OKC">Will Rogers World  
 Airport(OKC)</option>  
 Airport(OAK)</option>  
 Airport(TUL)</option>  
 Airport(SMF)</option>  
 <option value="AOK">Oakland International  
 <option value="TUL">Tulsa International  
 <option value="SMF">Sacramento International  
 <option value="BMH">Birmingham-Shuttlesworth  
 International Airport(BHM)</option>



<option value="ACK">Nantucket Memorial  
 Airport(ACK)</option>  
 Airport(AVL)</option>  
 Sunport(ABQ)</option>  
 Airport(MVY)</option>  
 Airport(EGE)</option>  
 Airport(ILM)</option>  
 Airport(CAE)</option>  
 Airport(TVC)</option>  
 Airport(MYR)</option>  
 Airport(CHO)</option>  
 <option value="AVL">Asheville Regional  
 <option value="ABQ">Albuquerque International  
 <option value="MVY">Martha's Vineyard  
 <option value="EGE">Eagle County Regional  
 <option value="CRW">Yeager Airport(CRW)</option>  
 <option value="ILM">Wilmington International  
 <option value="CAE">Columbia Metropolitan  
 <option value="TVC">Cherry Capital  
 <option value="MYR">Myrtle Beach International  
 <option value="CHO">Charlottesville-Albemarle  
 <option value="BZN">Bozeman Yellowstone International  
 AirportÂ (Gallatin Field Airport)(BZN)</option>  
 <option value="JAC">Jackson Hole Airport(JAC)</option>  
 <option value="PSP">Palm Springs International  
 Airport(PSP)</option>  
 Airport(EYW)</option>  
 <option value="EYW">Key West International  
 <option value="HDN">Yampa Valley AirportÂ (Yampa  
 Valley Regional)(HDN)</option>  
 <option value="MTJ">Montrose Regional  
 Airport(MTJ)</option>  
 <option value="SBN">South Bend International AirportÂ  
 (South Bend Regional)(SBN)</option>  
 <option value="ANC">Ted Stevens Anchorage International

```
Airport(ANC)</option>
<option value="LEX">Blue Grass Airport(LEX)</option>
</select>
</div>
</div>
<!Flying to>
</div>
<!--Flying to,from end-->
<div class="form-btn">
<button class="submit-btn">Predict</button>
</div>
<!Button>
</form>
<!--Form end-->
</div>
<!Booking form>
</div>
</div>
</div>
</div>
</div>
</body>
</html>
```

## Index Page:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8" />
<meta http-equiv="X-UA-Compatible" content="IE=edge" />
<meta name="viewport" content="width=device-width, initial-scale=1.0" />
<title>Find Me</title>
```

```

<style>
#nav_menu
{
font-family: 'Lato', sans-serif;
background: url(../static/background1.png);
background-size: cover;
background-position: center;
color: #191a1e;
}
</style>
<!-- ===== STYLE.CSS ===== -->
<link type="text/css" rel="stylesheet" href="{ { url_for('static',
filename='css/style1.css') } }"
/>
<!-- ===== REMIXICON CDN ===== -->
<link
href="https://cdn.jsdelivr.net/npm/remixicon@2.5.0/fonts/remixicon.css"
rel="stylesheet"
/>
<!-- ===== ANIMATE ON SCROLL CSS CDN ===== -->
<link href="https://unpkg.com/aos@2.3.1/dist/aos.css" rel="stylesheet" />
</head>
<body>
<!-- ===== HEADER ===== -->
<header class="container header">
<!-- ===== NAVBAR ===== -->
<nav class="nav">
<div class="logo">
<h2>Find Me</h2>
</div>
<div class="nav_menu" id="nav_menu">
<button class="close_btn" id="close_btn">
<i class="ri-close-fill"></i>
</button>
<ul class="nav_menu_list"></ul>

```

```

<br>
<br>
<li class="nav_menu_item">
<a href="/login" class="nav_menu_link">Sign In</a>
</li>
<li class="nav_menu_item">
<a href="/register" class="nav_menu_link">Sign Up</a>
</li>
<li class="nav_menu_item">
<a href="/service" class="nav_menu_link">Service</a>
</li>
<li class="nav_menu_item">
<a href="/home1" class="nav_menu_link">Home</a>
</li>
</ul>
</div>
<button class="toggle_btn" id="toggle_btn">
<i class="ri-menu-line"></i>
</button>
</nav>
</header>
<section class="wrapper">
<div class="container">
<div class="grid-cols-2">
<div class="grid-item-1">
<p class="info-text"; style="color:#000">Hello Travellers,<p>
<h1 class="main-heading" >
Welcome to <span>Find Me</span>
<br/>Flight Tracker
</h1>
<p class="info-text">
Let's Track Your Flights In Seconds
</p>
<div class="btn_wrapper">
<form action="/login" method="get">

```

```

<button class="btn view_more_btn">
Find
</button>
</form>
<form action="https://github.com/IBM-EPBL/IBM-Project-18828-1659690581"
method="get">
<button class="btn documentation_btn">Help ?</button>
</form>
</div>
</div>
<div class="grid-item-2">
<div class="team_img_wrapper">
<!--  -->
</div>
</div>
</div>
</div>
</section>
<!-- ===== ANIMATE ON SCROLL JS CDN -->
<script src="https://unpkg.com/aos@2.3.1/dist/aos.js"></script>
<!-- ===== GSAP CDN ===== -->
<script
src="https://cdnjs.cloudflare.com/ajax/libs/gsap/3.8.0/gsap.min.js"></script>
<!-- ===== SCRIPT.JS ===== -->
<script src="{ {url_for('static', filename='script.js' )} }" defer></script>
</body>
</html>

```

## Service page:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8" />
<meta http-equiv="X-UA-Compatible" content="IE=edge" />
<meta name="viewport" content="width=device-width, initial-scale=1.0" />
<title>About</title>
<style>
#nav_menu
{
font-family: 'Lato', sans-serif;
background: url(../static/background1.png);
background-size: cover;
background-position: center;
color: #191a1e;
/* background-color: #f44336; */
}
</style>
<!-- ===== STYLE.CSS ===== -->
<link type="text/css" rel="stylesheet" href="{ { url_for('static',
filename='css/style1.css') } }"
/>
<!-- ===== REMIXICON CDN ===== -->
<link
href="https://cdn.jsdelivr.net/npm/remixicon@2.5.0/fonts/remixicon.css"
rel="stylesheet"
/>
<!-- ===== ANIMATE ON SCROLL CSS CDN ===== -->
<link href="https://unpkg.com/aos@2.3.1/dist/aos.css" rel="stylesheet" />
</head>
```

```

<body>
<!-- ===== HEADER ===== -->
<header class="container header">
<!-- ===== NAVBAR ===== -->
<nav class="nav">
<div class="logo">
<h2>Service</h2>
</div>
<div class="nav_menu" id="nav_menu">
<button class="close_btn" id="close_btn">
<i class="ri-close-fill"></i>
</button>
<ul class="nav_menu_list">
<li class="nav_menu_item">
<a href="/" class="nav_menu_link">Home</a>
</li>
<li class="nav_menu_item">
<a href="/register" class="nav_menu_link">Sign Up</a>
</li>
<li class="nav_menu_item">
<a href="/login" class="nav_menu_link">Sign In</a>
</li>
<li class="nav_menu_item">
<a href="/about" class="nav_menu_link">About</a>
</li>
</ul>
</div>
<button class="toggle_btn" id="toggle_btn">
<i class="ri-menu-line"></i>
</button>
</nav>
</header>
<section class="wrapper">
<div class="container">
<div class="grid-cols-2">

```

```

<div class="grid-item-1">
  <p class="info-text"; style="color:#000">We are providing the<p>
  <h1 class="main-heading" >
  <span> Flight Delay </span>Prediction</br> Service
  </h1>
  <p class="info-text">
  Using Machine Learning
  </p>
  <div class="btn_wrapper">
  <form action="https://github.com/IBM-EPBL/IBM-Project-46775-1660758589"
  method="get">
  <button class="btn view_more_btn" action="/login">
  GitHub Repo
  </button>
  </form>
  <form action="/" method="get">
  <button type="submit" class="btn documentation_btn">Back</button>
  </form>
  </div>
  </div>
  <div class="grid-item-2">
  <div class="team_img_wrapper">
  <!--  -->
  </div>
  </div>
  </div>
  </div>
  </div>
  </section>
  <!-- ===== ANIMATE ON SCROLL JS CDN -->
  <script src="https://unpkg.com/aos@2.3.1/dist/aos.js"></script>
  <!-- ===== GSAP CDN ===== -->
  <script
  src="https://cdnjs.cloudflare.com/ajax/libs/gsap/3.8.0/gsap.min.js"></script>
  <!-- ===== SCRIPT.JS ===== -->
  <script src="{ { url_for('static', filename='script.js' ) }}" defer></script>

```



```
</body>  
</htm
```

## App.py:

```
from flask import Flask, render_template, request
import requests
import requests
# NOTE: you must manually set API_KEY below using information retrieved
from your IBM
# Cloud account.
import requests
# NOTE: you must manually set API_KEY below using information retrieved
from your IBM
# Cloud account.
API_KEY = "2DFmuohBDmMuaxLg06oY9hJbEdzik5-CRKjdn6yGB762"
token_response = requests.post('https://iam.cloud.ibm.com/identity/token',
data={"apikey":
API_KEY, "grant_type": 'urn:ibm:params:oauth:grant-type:apikey'})
mltoken = token_response.json()["access_token"]
header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}
import mysql.connector
app = Flask(__name__)
conn=mysql.connector.connect(host="localhost", user="root", password="",
database="login")
cursor=conn.cursor()
@app.route('/')
def index():
    return render_template('index.html')
@app.route('/login')
def login(): # put application's code here
    return render_template('login.html')
@app.route('/register')
def register():
    return render_template('register.html')
@app.route('/modeling')
def modeling():
```

```

return render_template('modeling.html')
@app.route('/home')
def home():
    return render_template('home.html')
@app.route('/service')
def service():
    return render_template('service.html')
@app.route('/home1')
def about():
    return render_template('home1.html')
@app.route('/login_validation', methods=['POST'])
def login_validation():
    email=request.form.get('email')
    password=request.form.get('password')
    cursor.execute("""SELECT * FROM `users` WHERE `email` LIKE'{}' AND
`password`
LIKE '{}'""".format(email,password))
    users = cursor.fetchall()
    if len(users)>0:
        return render_template('home.html')
    else:
        return render_template('login.html', prediction_text = "1" )
@app.route('/add_user', methods=['POST'])
def add_user():
    name= request.form.get('name')
    email = request.form.get('email')
    password = request.form.get('password')
    cursor.execute("""INSERT INTO `users`(`id`, `name`, `email`, `password`)
VALUES
(NULL,'{}','{}','{}')""".format(name,email,password))
    conn.commit()
    return render_template('login.html', prediction_text = "0")
@app.route('/predict',methods=['POST'])
def predict():

```

```
year = request.form['year']
month = request.form['month']
day = request.form['day']
carrier = request.form['carrier']
origin = request.form['origin']
dest = request.form['dest']
```

```
if (carrier=="UA"):
    carrier=11
if (carrier=="AA"):
    carrier=1
if (carrier=="B6"):
    carrier=3
if (carrier=="DL"):
    carrier=4
if (carrier=="EV"):
    carrier=8
if (carrier=="MQ"):
    carrier=9
if (carrier=="US"):
    carrier=12
if (carrier=="WN"):
    carrier=14
if (carrier=="VX"):
    carrier=13
if (carrier=="FL"):
    carrier=7
if (carrier=="AS"):
    carrier=2
if (carrier=="9E"):
    carrier=0
if (carrier=="F9"):
    carrier=9
if (carrier=="HA"):
    carrier=4
```

```
if (carrier=="OO"):
    carrier=5
if (carrier=="YV"):
    carrier=15

if (origin=="EWR"):
    origin=0
if (origin=="LGA"):
    origin=2
if (origin=="JFK"):
    origin=1

if (dest=="ATL"):
    dest=4
if (dest=="IAH"):
    dest=43
if (dest=="MIA"):
    dest=57
if (dest=="BQN"):
    dest=12
if (dest=="ORD"):
    dest=68
if (dest=="FLL"):
    dest=35
if (dest=="IAD"):
    dest=42
if (dest=="MCO"):
    dest=53
if (dest=="PBI"):
    dest=70
if (dest=="TPA"):
    dest=99
if (dest=="LAX"):
    dest=49
if (dest=="SFO"):
```

```
    dest=89
if (dest=="DFW"):
    dest=30
if (dest=="BOS"):
    dest=11
if (dest=="LAS"):
    dest=48
if (dest=="MSP"):
    dest=60
if (dest=="DTW"):
    dest=32
if (dest=="RSW"):
    dest=82
if (dest=="SJU"):
    dest=91
if (dest=="PHX"):
    dest=73
if (dest=="BWI"):
    dest=16
if (dest=="CLT"):
    dest=23
if (dest=="BOS"):
    dest=11
if (dest=="BUF"):
    dest=14
if (dest=="DEN"):
    dest=29
if (dest=="SNA"):
    dest=94
if (dest=="LAS"):
    dest=48
if (dest=="MSY"):
    dest=61
if (dest=="SLC"):
    dest=92
```

```
if (dest=="SEA"):
    dest=88
if (dest=="ROC"):
    dest=99
if (dest=="ATL"):
    dest=4
if (dest=="DCA"):
    dest=33
if (dest=="RDU"):
    dest=4
if (dest=="BNA"):
    dest=4
if (dest=="CLE"):
    dest=88
if (dest=="STL"):
    dest=82
if (dest=="MDW"):
    dest=99
if (dest=="CVG"):
    dest=68
if (dest=="CMH"):
    dest=68
if (dest=="CHS"):
    dest=99
if (dest=="PIT"):
    dest=1
if (dest=="SAN"):
    dest=82
if (dest=="MKE"):
    dest=11
if (dest=="JAX"):
    dest=88
if (dest=="BTV"):
    dest=4
if (dest=="AUS"):
```

```
    dest=23
if (dest=="RIC"):
    dest=64
if (dest=="PWM"):
    dest=83
if (dest=="HOU"):
    dest=89
if (dest=="IND"):
    dest=47
if (dest=="MCI"):
    dest=80
if (dest=="SYR"):
    dest=78
if (dest=="BWI"):
    dest=4
if (dest=="MEM"):
    dest=23
if (dest=="PHL"):
    dest=14
if (dest=="GSO"):
    dest=96
if (dest=="ORF"):
    dest=23
if (dest=="DAY"):
    dest=57
if (dest=="PDX"):
    dest=83
if (dest=="SRQ"):
    dest=91
if (dest=="SDF"):
    dest=29
if (dest=="XNA"):
    dest=88
if (dest=="MHT"):
    dest=43
```



```
if (dest=="BDL"):
    dest=23
if (dest=="OMA"):
    dest=4
if (dest=="GSP"):
    dest=57
if (dest=="SAV"):
    dest=28
if (dest=="GRR"):
    dest=16
if (dest=="HNL"):
    dest=24
if (dest=="SAT"):
    dest=30
if (dest=="TYS"):
    dest=99
if (dest=="MSN"):
    dest=55
if (dest=="DSM"):
    dest=23
if (dest=="STT"):
    dest=23
if (dest=="ALB"):
    dest=99
if (dest=="BUR"):
    dest=41
if (dest=="PVD"):
    dest=32
if (dest=="PSE"):
    dest=96
if (dest=="OKC"):
    dest=61
if (dest=="TUL"):
    dest=60
if (dest=="SMF"):
```

```

    dest=88
    if (dest=="ACK"):
        dest=11
    if (dest=="AVL"):
        dest=10
    if (dest=="ABQ"):
        dest=30
    if (dest=="MVY"):
        dest=68
    if (dest=="EGE"):
        dest=32
    if (dest=="CRW"):
        dest=4
    if (dest=="ILM"):
        dest=79
    if (dest=="CAE"):
        dest=69

```

```

t=[[int(year),int(month),int(day),int(carrier),int(origin),int(dest)]]

```

```

payload_scoring = {"input_data": [{"fields": ["f0", "f1", "f2", "f3", "f4", "f5"]},
"values":t ]}]

```

```

#paload_scoring = {"input_data": [{"fields": [array_of_input_fields],
"values":
[0, 0]

```

```

response_scoring = requests.post('https://us-
south.ml.cloud.ibm.com/ml/v4/deployments/b6206819-9cf0-4be3-ad76-
6949a3a90717/predictions?version=2022-11-18', json=payload_scoring,
headers={'Authorization': 'Bearer ' + mltoken})

```

```

print("Scoring response")

```

```

payload_scoring = {"input_data": [{"fields": ["f0", "f1", "f2", "f3", "f4", "f5"]},
"values":t ]}]

```

```
pred= response_scoring.json()
output=pred['predictions'][0]['values'][0][0]
print(output)
return render_template('home.html', prediction_text = output)

if __name__ == '__main__':
    app.run(debug=True)
# For mac, make 'app.run(debug=True)'
```

## Styles:

mystyle:

```
* {  
  margin: 0;  
  padding: 0;  
  font-family: verdana;  
  font-size: 14px;  
}
```

```
.main-container {  
  padding: 0px;  
  margin: 10px;  
}
```

/\* Header section css starts \*/

```
.header_header .menu-container {  
  display: flex;  
  align-items: center;  
}
```

```
.main-container .header_header {  
  display: flex;  
  justify-content: space-between;  
  border-bottom: 2px solid #ddd;  
  padding: 0px 30px;  
  box-shadow: 1px -8px 15px 7px #dddd;  
  margin-bottom: 10px;  
}
```

```
.menu-container .dropbtn {  
  background-color: white;
```

```

    color: #387cc4;
    border: none;
    font-size: 20px;
}

.menu-container .dropdown {
    position: relative;
    display: inline-block;
    padding: 15px 27px;
}

.menu-container .dropdown-content {
    display: none;
    position: absolute;
    background-color: #f1f1f1;
    min-width: 160px;
    box-shadow: 0px 8px 16px 0px rgba(0, 0, 0, 0.2);
    z-index: 1;
}

.menu-container .dropdown-content a {
    color: black;
    text-decoration: none;
    display: block;
    padding: 10px;
}

.menu-container .dropbtn a {
    font-size: 20px;
    color: #387cc4;
    text-decoration: none;
}

.menu-container .dropbtn a:hover {
    color: #fff;

```

```

}

.menu-container .dropdown-content a:hover {
    background-color: #ddd;
}

.menu-container .dropdown:hover .dropdown-content {
    display: block;
}

.menu-container .dropdown:hover .dropbtn {
    background-color: #387cc4;
    color: white;
    padding: 10px 22px;
}

.text {
    padding: 15px 264px;
    font-size: 42px;
    font-weight: 400;
}

/* Header section css ends */

/* video section css stars */

.video-container {
    margin-left: 260px;
}

/* video section css ends */

```

```
/* Banner container starts */
```

```
.slideshow-container {  
    max-width: 100%;  
    max-height: 100%;  
    position: relative;  
    margin: auto;  
}
```

```
.mySlides {  
    display: none  
}
```

```
.slideshow-container img {  
    vertical-align: middle;  
    top: -10px;  
    height: 50%;  
    width: 100%;  
}
```

```
.dot {  
    position: relative;  
    cursor: pointer;  
    top: -130px;  
    height: 15px;  
    width: 15px;  
    margin: 0 2px;  
    background-color: #bbb;  
    border-radius: 50%;  
    display: inline-block;  
    transition: background-color 0.6s ease;  
}
```

```

.active,
.dot:hover {
    background-color: #717171;
}

/* Fading animation */

.fade {
    -webkit-animation-name: fade;
    -webkit-animation-duration: .5s;
    animation-name: fade;
    animation-duration: .5s;
}

/* Banner container ends */

/* Banner description starts */

.banner-content {
    padding: 32px 164px;
    border: 1px solid #104073;
    margin-top: 10px;
    box-shadow: 4px 4px 4px 4px #ddd;
}

/* .banner-desc {
    margin-top: 10px;
    box-shadow: 4px 4px 4px 4px #ddd;
} */

.banner-content h1,

```



```
.analysis-header h1 {
    text-align: center;
    font-size: 43px;
    color: #104073;
    margin-bottom: 30px;
    font-weight: bold;
}

.flight-desc p {
    font-size: 20px;
    text-align: center;
    line-height: 30px;
}

.flight-desc1 ul {
    font-size: 20px;
    line-height: 30px;
}

.flight-desc1 {
    padding: 10px 144px;
}

.dataset-analysis-img img {
    width: 1280px;
    border: 1px solid #ddd;
    margin-top: 20px;
}

.dataset-analysis-img {
    text-align: center;
}

/* Banner description ends */
```

```
/* Analysis banner */

.analysis-banners {
    margin: 20px;
    text-align: center;
}

.analysis-container1 img {
    padding: 10px;
    border: 1px solid #ccc;
    margin: 15px;
    box-shadow: 4px 4px 4px 4px #ddd;
}

/* footer starts */

footer {
    text-align: center;
    border-top: 1px solid #113c50;
    padding: 25px;
    background: #a2dcee;
}

footer .footer-media {
    margin-bottom: 18px;
}

.copyright-area {
    background: #a09797;
    padding: 10px;
    text-align: center;
    color: #fff;
```

```
}

/* footer ends */

/* registration page css starts */

.login-box {
    text-align: center;
    padding: 45px;
}

.login-box .textbox {
    padding: 15px;
}

.login-box .textbox input {
    padding: 16px;
    width: 50%;
}

.login-box h1 {
    font-size: 40px;
    color: #0a175c;
}

.login-box .btn {
    background: #0a175c;
    color: #fff;
    padding: 15px 79px;
    border-radius: 24px;
}
```

```
/* container session start */

.container input[type=text],
select,
textarea {
    width: 100%;
    padding: 12px;
    border: 1px solid #ccc;
    border-radius: 4px;
    box-sizing: border-box;
    margin-top: 6px;
    margin-bottom: 16px;
    resize: vertical;
}

.container input[type=submit] {
    background-color: #387cc4;
    color: white;
    padding: 12px 20px;
    border: none;
    border-radius: 4px;
    cursor: pointer;
}

.container input[type=submit]:hover {
    background-color: #387cc4;
}

.container {
    border-radius: 5px;
    background-color: #f2f2f2;
    padding: 16px;
    width: 50%;
}
```

```
h2 {  
  color: #387cc4;  
  font-size: large;  
  padding-bottom: 40px;  
}
```

style:

```
.section {  
  position: relative;  
  height: 100vh;  
}  
.section .section-center {  
  position: absolute;  
  top: 50%;  
  left: 0;  
  right: 0;  
  -webkit-transform: translateY(-50%);  
  transform: translateY(-50%);  
}  
.booking-form {  
  position: relative;  
  background: #fff;  
  max-width: 642px;  
  width: 100%;  
  margin: auto;  
  padding: 45px 25px 25px;  
  border-radius: 4px;  
  -webkit-box-shadow: 0px 0px 10px -5px rgba(0, 0, 0, 0.4);  
  box-shadow: 0px 0px 10px -5px rgba(0, 0, 0, 0.4);  
}  
.booking-form .form-group {
```

```

position: relative;
margin-bottom: 20px;
}
.booking-form .form-control {
background-color: #fff;
height: 65px;
padding: 0px 15px;
padding-top: 24px;
color: #191a1e;
border: 2px solid #f44336ab;
font-size: 16px;
font-weight: 700;
-webkit-box-shadow: none;
box-shadow: none;
border-radius: 4px;
-webkit-transition: 0.2s all;
transition: 0.2s all;
}
.booking-form .form-control::-webkit-input-placeholder {
color: #fff;
}
.booking-form .form-control:-ms-input-placeholder {
color: #fff;
}
.booking-form .form-control::placeholder {
color: #00000099;
}
.booking-form .form-control:focus {
background: #fff;
}
.booking-form input[type="date"].form-control:invalid {
color: #dfe5e9;
}
.booking-form select.form-control {
-webkit-appearance: none;

```

```
-moz-appearance: none;
appearance: none;
}
.booking-form select.form-control+.select-arrow {
position: absolute;
right: 6px;
bottom: 6px;
width: 32px;
line-height: 32px;
height: 32px;
text-align: center;
pointer-events: none;
color: #dfe5e9;
font-size: 14px;
}
.booking-form select.form-control+.select-arrow:after {
content: '\279C';
display: block;
-webkit-transform: rotate(90deg);
transform: rotate(90deg);
}
.booking-form .form-label {
position: absolute;
top: 6px;
left: 20px;
font-weight: 700;
text-transform: uppercase;
line-height: 24px;
height: 24px;
font-size: 12px;
color: #f44336;
}
.booking-form .form-checkbox input {
position: absolute !important;
margin-left: -9999px !important;
```

```
visibility: hidden !important;
}
.booking-form .form-checkbox label {
position: relative;
padding-top: 4px;
padding-left: 30px;
font-weight: 700;
color: #191a1e;
}
.booking-form .form-checkbox label+label {
margin-left: 15px;
}
.booking-form .form-checkbox input+span {
position: absolute;
left: 2px;
top: 4px;
width: 20px;
height: 20px;
background: #fff;
border: 2px solid #dfe5e9;
border-radius: 50%;
}
.booking-form .form-checkbox input+span:after {
content: "";
position: absolute;
top: 50%;
left: 50%;
width: 0px;
height: 0px;
border-radius: 50%;
background-color: #4fa3e3;
-webkit-transform: translate(-50%, -50%);
transform: translate(-50%, -50%);
-webkit-transition: 0.2s all;
transition: 0.2s all;
```



```

}
.booking-form .form-checkbox input:not(:checked)+span:after {
opacity: 0;
}
.booking-form .form-checkbox input:checked+span:after {
opacity: 1;
width: 10px;
height: 10px;
}
.booking-form .submit-btn {
color: #fff;
background-color: #f44336;
font-weight: 400;
height: 65px;
font-size: 18px;
border: none;
width: 100%;
border-radius: 4px;
text-transform: uppercase
}
.booking-form .submit-btn1 {
color: #fff;
background-color: #f44336;
font-weight: 200;
height: 35px;
font-size: 9px;
border: none;
width: 50%;
border-radius: 2px;
text-transform: uppercase
}
.booking-cta {
margin-top: 10px;
}
.booking-cta h1 {

```

```
font-size: 52px;  
text-transform: uppercase;  
color: #fff;  
font-weight: 400;  
}  
.booking-cta p {  
font-size: 22px;  
color: #fff;  
}
```

**Git repo Link:**

<https://github.com/IBM-EPBL/IBM-Project-46775-1660758589>

**Dataset Link:**

<https://drive.google.com/drive/u/3/folders/1bxxrsgYHzlZtxE8DRkyjGVdYM3vKmEXz>

**Jupyter Data Preprocessing:**

<https://drive.google.com/drive/u/3/folders/1ygi8k0rRhWLjEXKSr7dNloyGktBMH9B7>

**Demo Video Link:**

[https://drive.google.com/drive/u/3/folders/1FnOkeY\\_kcS64or-vjvdruepSOtjEaP9M](https://drive.google.com/drive/u/3/folders/1FnOkeY_kcS64or-vjvdruepSOtjEaP9M)