ARCHITECTURE

FLIGHT FARE

PREDICTION

ABHISHEK MONARCH

EMMANUAL

**Contents**

**Abstract**

The recent international things had a large impact on the aviation sector because of several reasons. This impact has 2 class folks, the primary is business perspective and therefore the second is that the customers perspective. As safety is that the major reason for such impact on the aviation sector, the governments round the world amended totally different rules to their various airlines firms. These restrictions had created the supply of the flights and their attendant capability less. Taking of these factors in thought the value of the flight tickets has accrued and vary from one place to the opposite. Booking a flight price tag has split into 2, one is that the on-line and therefore the alternative is that the offline bookings. each these have their various criteria for value of the price tag, one such example is that the server load and therefore the range of booking requests. during this machine learning implementation, we are going to see numerous factors that impact worth of the flight ticket price and predict the acceptable price of the ticket

**Introduction:**

The machine learning project is designed to create an app that can take the user input about their flight travel and predict the fare price.

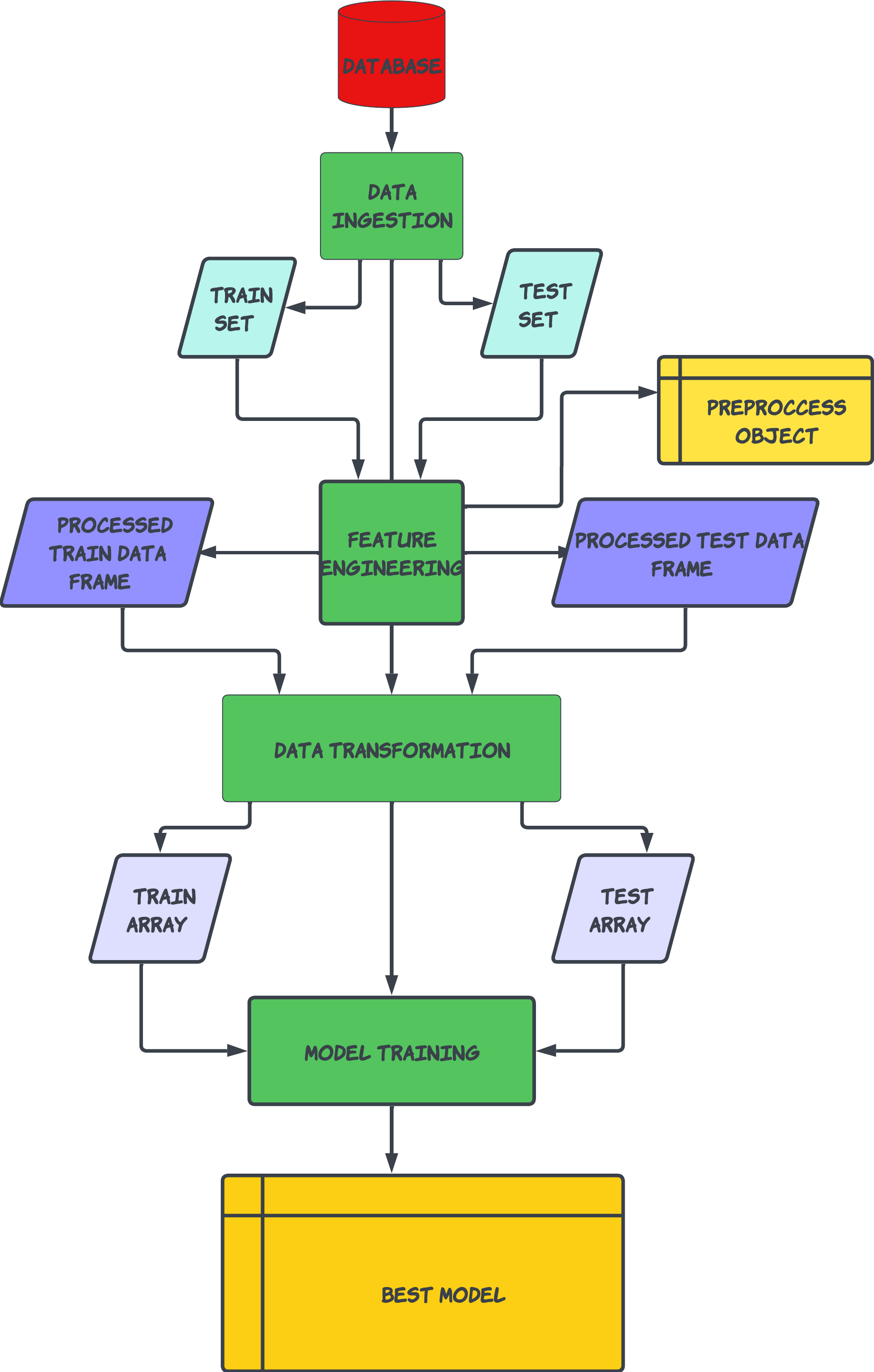
The flight travels are becoming more and more common nowadays. Therefore my app can help people to know beforehand what they could be expecting the price of their ticket at any given time.

The target audience for this app includes every common man to office going person who is looking to travel in India via flights.

**High-Level Overview:**

My app include three main components:

* Data Ingestion
* Data Transformation & Feature Engineering
* Model Training



**Data Ingestion**

Data ingestion process I ingest the data from the mongo dB.

**Data Transformation and & Feature Engineering**

Data Transformation and Feature Engineering process take the data after the ingestion process and extract useful features require for model building and cleaning of data is performed. In the end we get to numpy array as our train set and test set. The array will be save along with the column transformer object into the data transformer folder and saved\_models folder.

**Model Training**

In this process we use different model and the model with the best r2\_score is used for prediction purpose. The model from here is saved in “saved\_models” folder.

**Model Selection:**

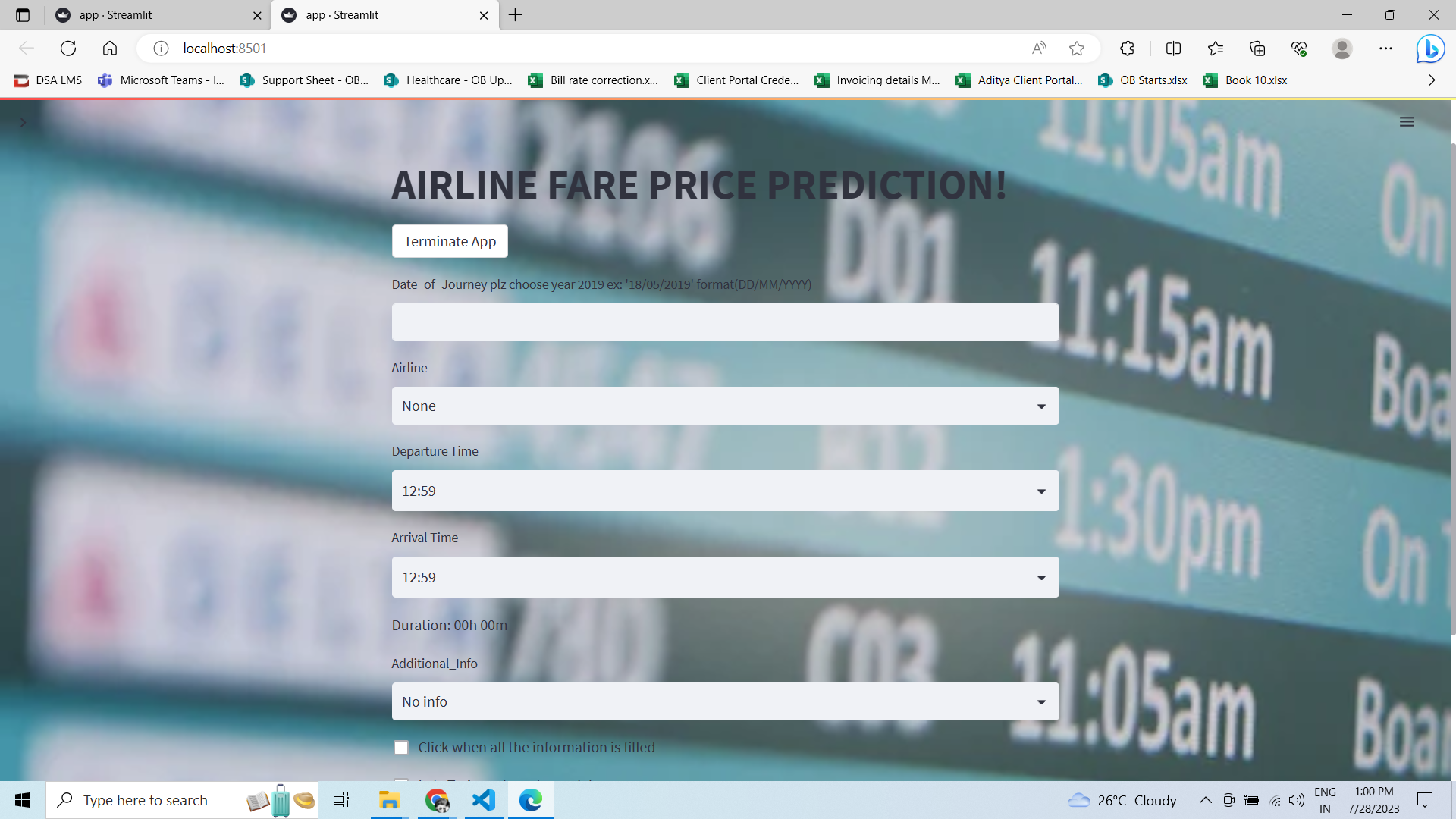
The process of selecting the machine learning model used in the app is as follows:

* In model Training we generate a report of different models performance.
* We use hyper parameter training over each model too.
* The model with the best parameter is saved in report with its r\_2 scores and best parameters.
* Later we extract the best model with best prams that has max r\_2 score and save it for our use.
* Also we make check if the accuracy is more 0.7 than only we are going to save any model. Or we will reject it.

**Deployment Architecture**

For deployment of the app I Have used Render hosting platform. Since, render is easy to use and free. Anyone looking to check my app can go to this links. https://internship-flight-fare-prediction.onrender.com/

**User Interface (UI):**



Our Model takes various input from the user related to their journey.

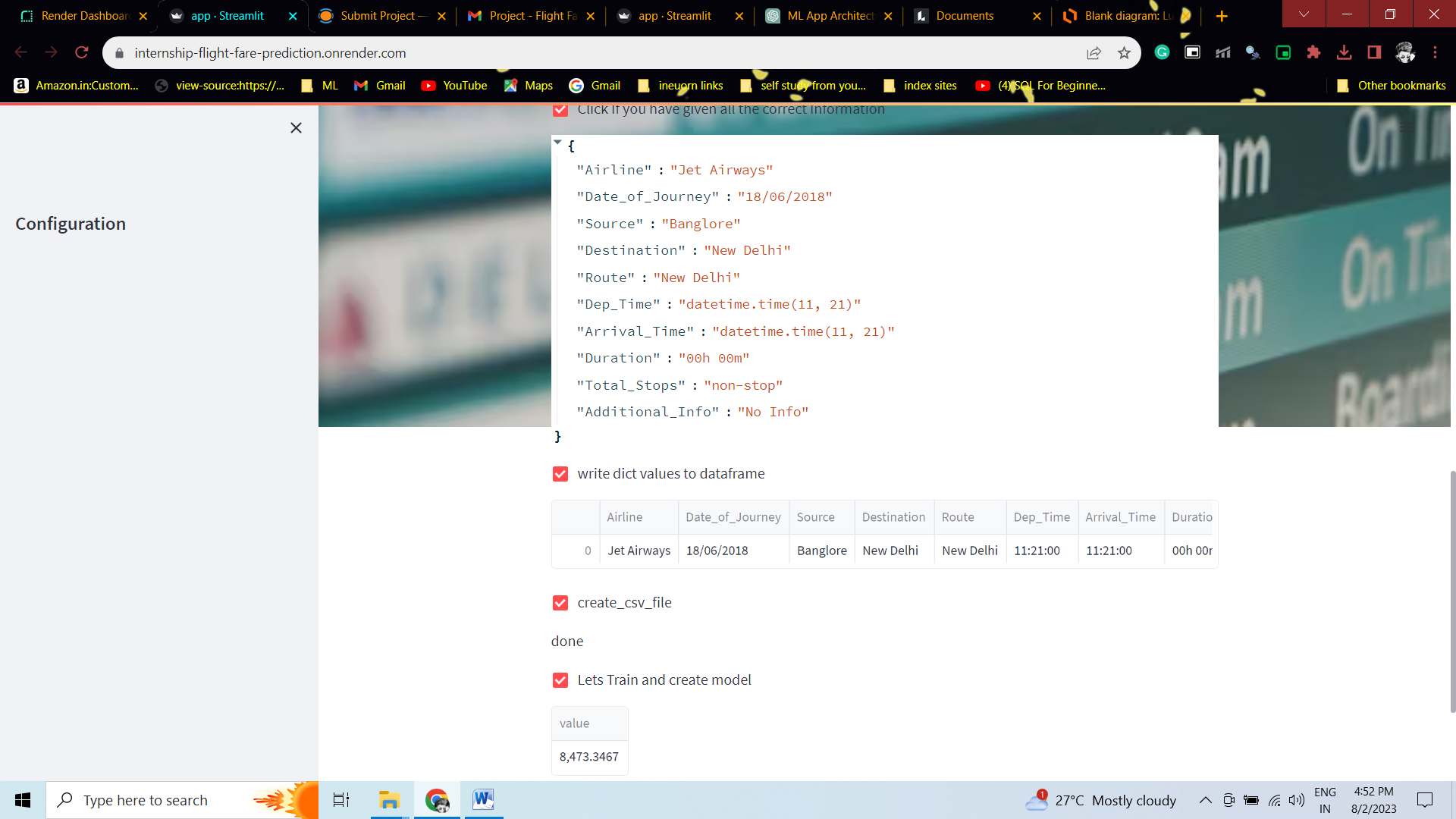
* Date Of Journey
* Airline
* Source or Boarding based on the airline they have chosen.
* Destination based on the airline and Source they have chosen.
* Route in accordance to their previous selection
* Departure time
* Arrival time
* Additional info such as (luggage, changing of airports etc. )

**Backend architecture of the app**

After taking the input I Convert this input to a dictionary and then to data frame. Then we perform all the transformation and feature selection on this data frame.

And pass it to our model for prediction and we get our predicted price.

For preprocessing we have created a preprocess object that we use to create train and test set. Since to avoid any leakage we never ‘fit transform’ method to convert data frame to array.



**External Services**

Stream lit is the only external service that I have used to create a user interface while building this app.

Stream lit provides easy to use widget that can help to create beautiful UI for the user. Making webpage is easy since I have zero knowledge regarding web development.

**Monitoring and Logging**

For logging we have created the logging module that will log each and every step regarding from data ingestion to model training.

**Deployment Process**

For the deployment of the app I am using Render as it is free and it can connect to git hub easily and allow hosting up to 15 min.

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