PREDICTION OF CO2 EMISSION IN VEHICLES.

INTRODUCTION:

Official laboratory-measured monitoring data indicate a progressive decline in the average fuel consumption and CO2 emissions of the passenger car fleet. There is increasing evidence to suggest that officially reported CO2 values do not reflect the actual performance of the vehicles on the road. A reported difference of 30–40% between official values and real-world estimates was found which has been continuously increasing. This paper reviews the influence of different factors that affect fuel consumption and CO2 emissions on the road and in the laboratory. Factors such as driving behaviour, vehicle configuration and traffic conditions are reconfirmed as highly influential. Neglected factors (e.g. side winds, rain, road grade), which may have significant contributions in fuel consumption in real world driving are identified. The margins of the present certification procedure contribute between 10 and 20% in the gap between the reported values and reality. The latter was estimated to be of the order of 40%, or 47.5 gCO2/km for 2015 average fleet emissions, but could range up to 60% or down to 19% depending on prevailing traffic conditions. The introduction of a new test protocol is expected to bridge about half of the present divergence between laboratory and real world. Finally, substantial literature was found on the topic; however, the lack of common test procedures, analysis tools, and coordinated activity across different countries point out the need for additional research in order to support targeted actions for real world CO2 reduction. Quality checks of the CO2 certification procedure, and the reported values, combined with in-use consumption monitoring could be used to assess the gap on a continuous basis.

OVERVIEW:

The amount of CO2 emission from the transport sector (including cars) accounts for about 20% of total CO2 emissions. Accordingly, from the viewpoint of preventing global warming, reducing that proportion is a key issue. In regard to CO2 emissions from cars, fuel economy standards are getting tougher all over the world, so improving the fuel economy of cars is strongly desired. From now on wards, it is considered that the fuel economy of engines will be further improved by boosting engine efficiency and by hybridisation (electrification) of cars.

PURPOSE:

Significantly reducing CO2 emissions from cars will not be easy, but the available data can be used to extract the features, know the behaviour of cars, and try to reduce the emissions. Machine Learning techniques can be used in this regard.

LITERATURE SURVEY:

EXISTING PROBLEM:

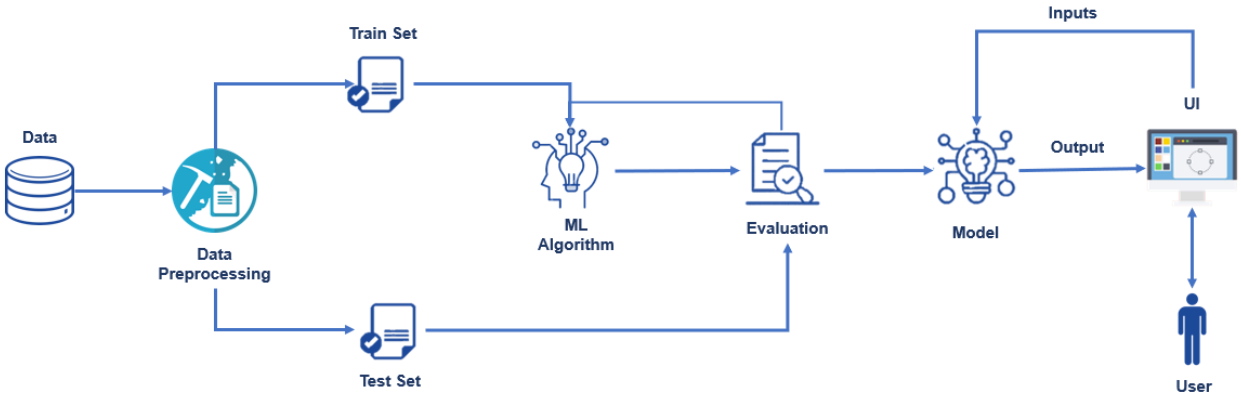
Emission from vehicles is a big damage to the living beings on the earth. Adding to this, global warming is another big threat caused by Co2 emission to the Ozone layer. Anybody who is driving a car have no idea about the amount of Co2 emission, so identifying this can bring an idea about the level of Co2.

PROPOSED SOLUTION:

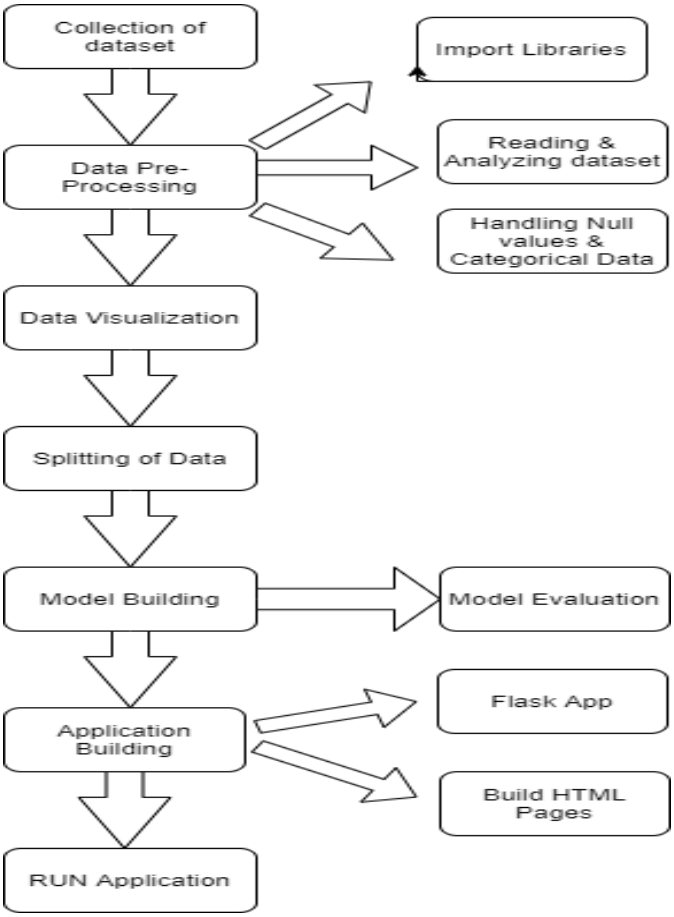
From the Dataset, we used variables such as model, make, vehicle class, engine size, cylinders, transmission, fuel type, fuel consumption, Co2 emission list. The Linear Regression model is proposed to identify the relation between the input and output variables. The Co2 emission as dependent variable and remaining as the independent variables, the model is executed. A web application is created to take input from the user to identify the emission of Co2 from vehicles as output.

THEORITICAL ANALYSIS:

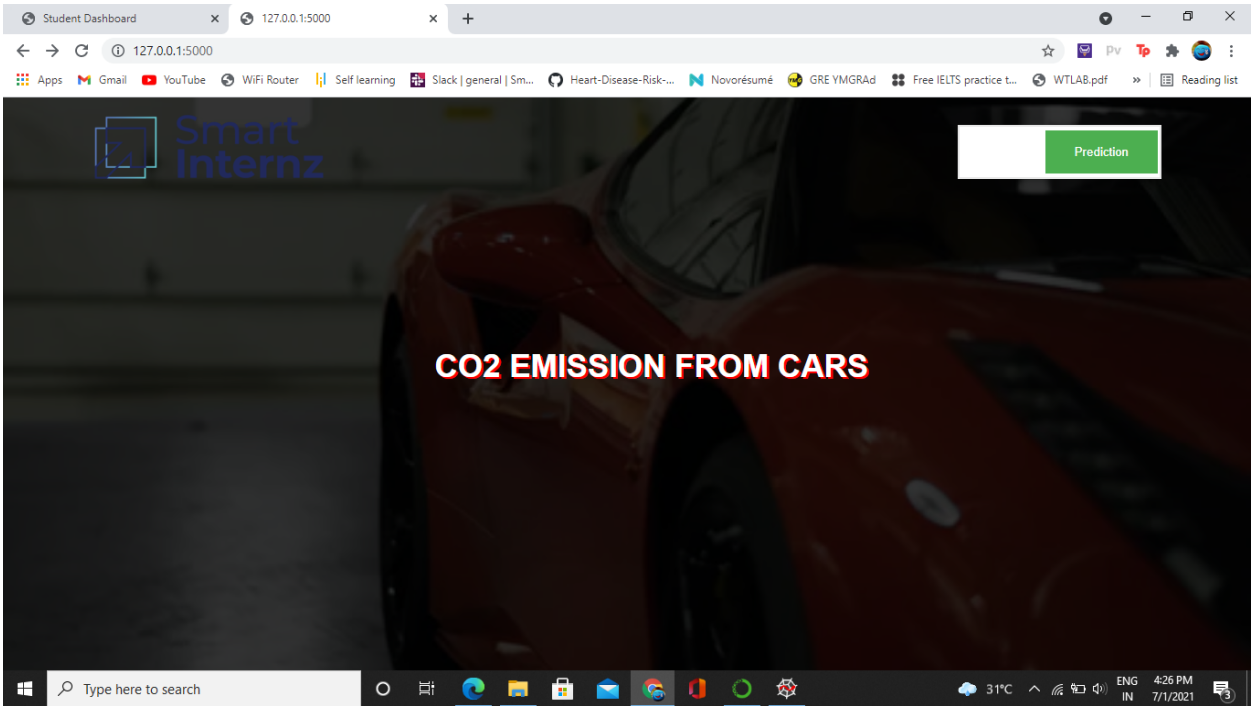
BLOCK DIAGRAM:

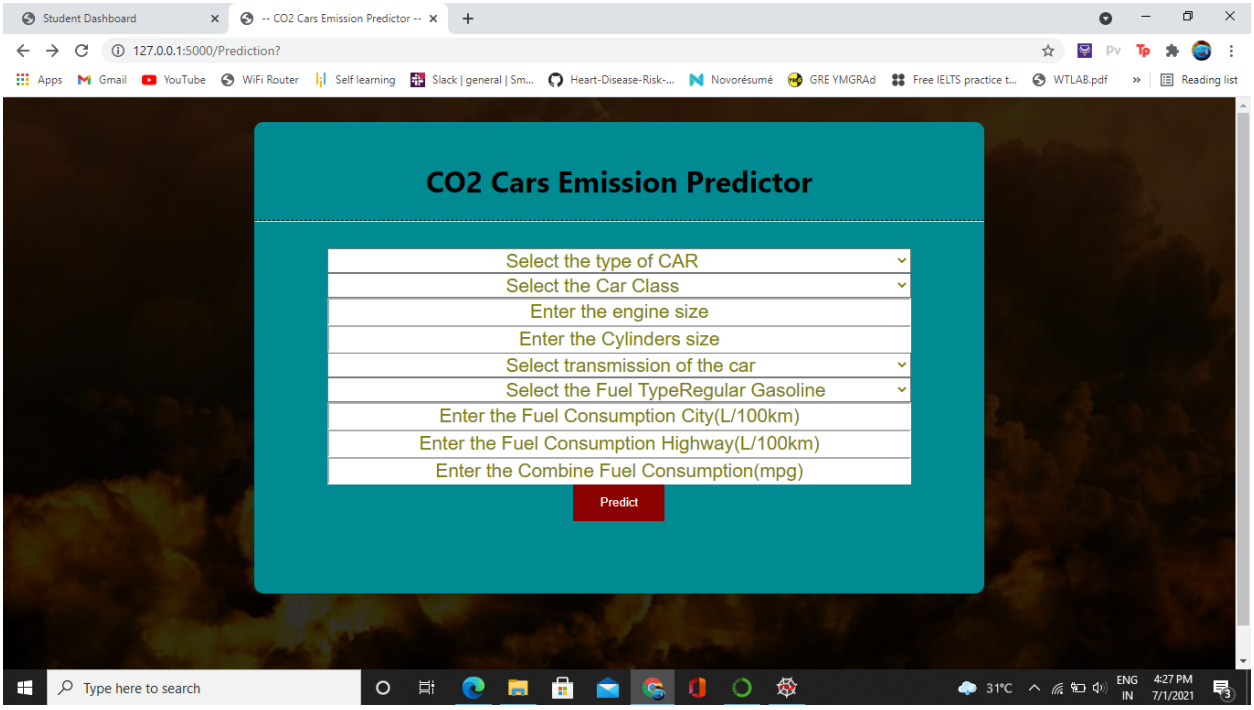

Train Set
Inputs
Data
UI
Output
ML
Algorithm
Evaluation
Model
Data
Preprocessing
Test Set
User

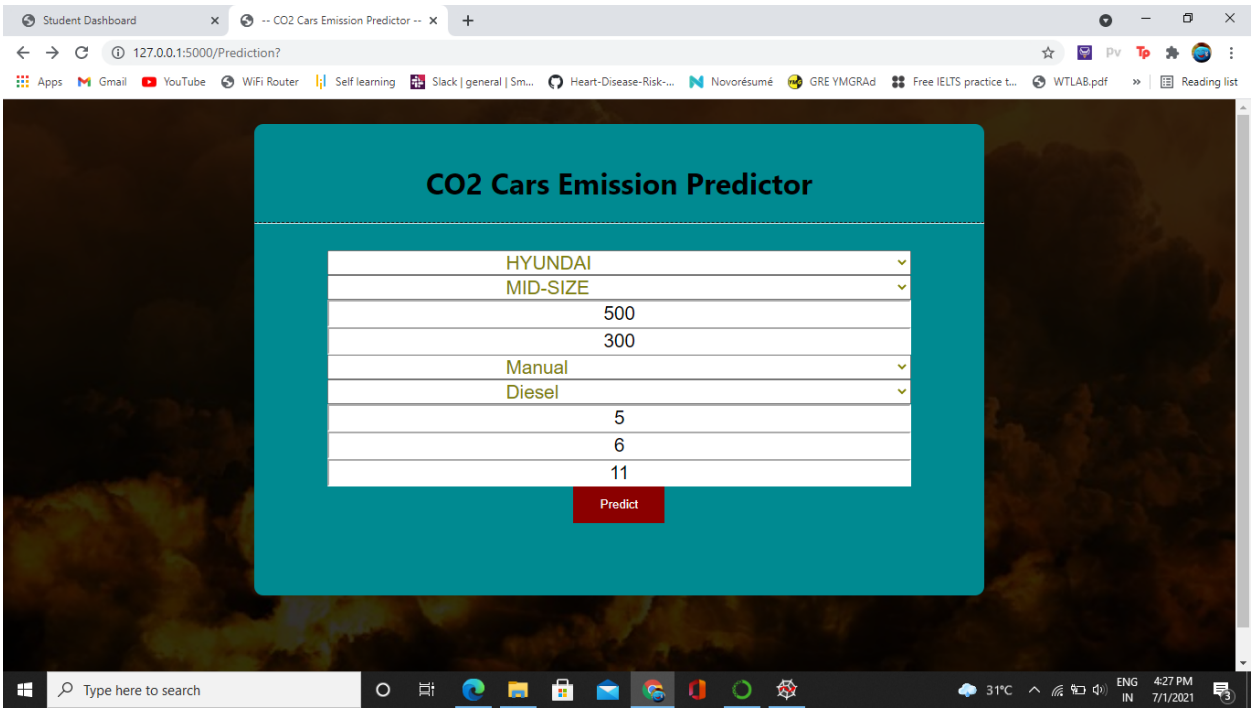
FLOW CHART:

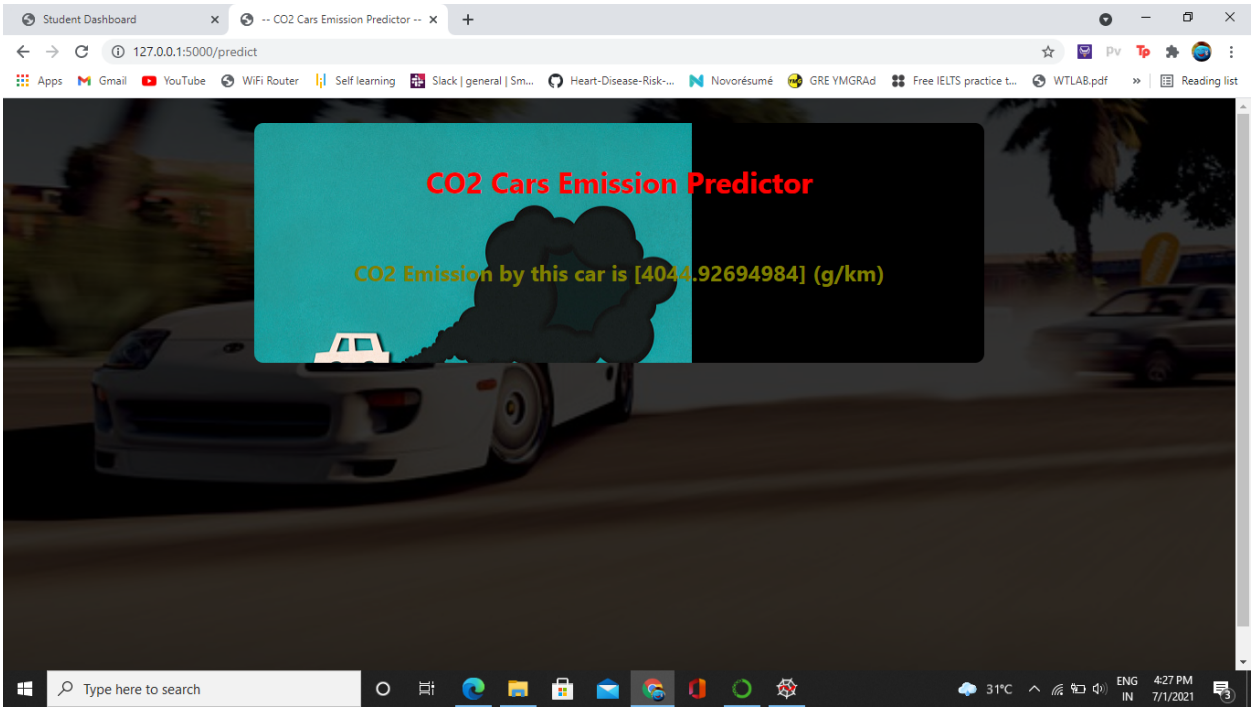

Collection of dataset
Import Libraries
Data Pre-Processing
Reading & Analyzing dataset
Handling Null values & Categorical Data
Data Visualization
Splitting of Data
Model Building
Model Evaluation
Application Building
Flask App
Build HTML Pages
RUN Application

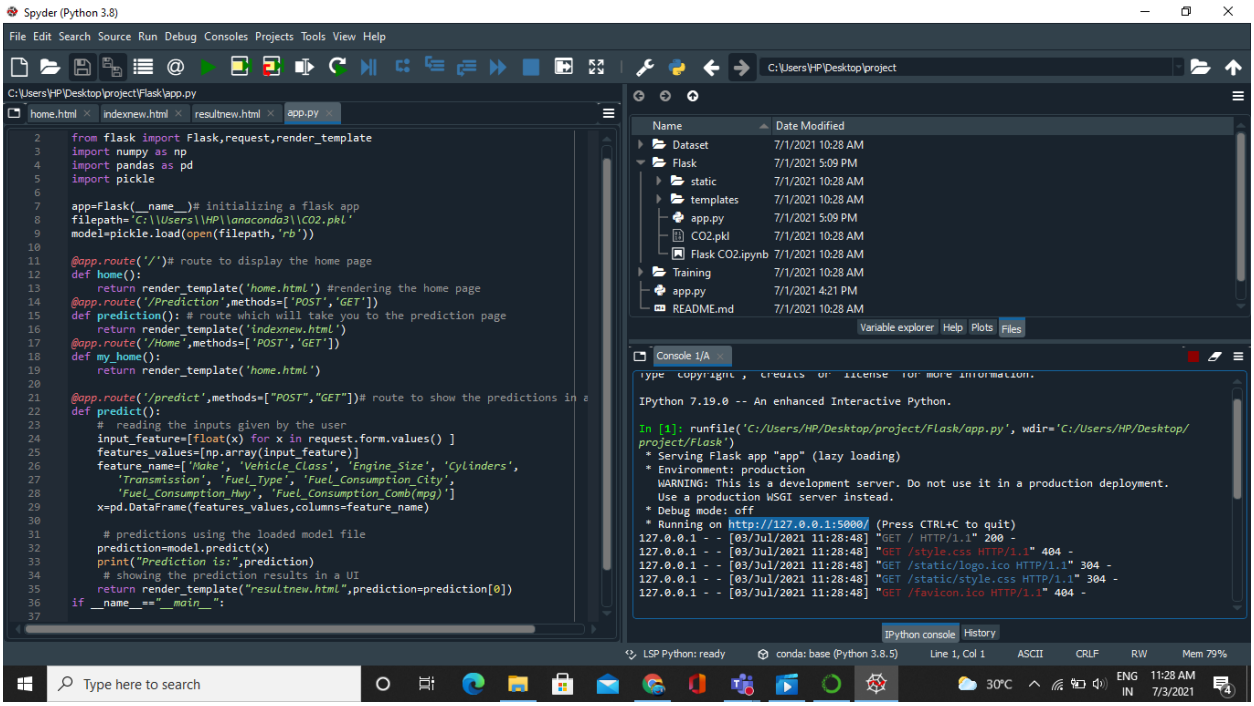
RESULT:


Student Dashboard
127.0.0.1:5000
127.0.0.1:5000
Smart Internz
Prediction
CO2 EMISSION FROM CARS
Type here to search


Student Dashboard
-- CO2 Cars Emission Predictor --
127.0.0.1:5000/Prediction?
CO2 Cars Emission Predictor
Select the type of CAR
Select the Car Class
Enter the engine size
Enter the Cylinders size
Select transmission of the car
Select the Fuel TypeRegular Gasoline
Enter the Fuel Consumption City(L/100km)
Enter the Fuel Consumption Highway(L/100km)
Enter the Combine Fuel Consumption(mpg)
Predict
Type here to search


Student Dashboard
-- CO2 Cars Emission Predictor --
127.0.0.1:5000/Prediction?
CO2 Cars Emission Predictor
HYUNDAI
MID-SIZE
500
300
Manual
Diesel
5
6
11
Predict
Type here to search
31°C
ENG
IN
4:27 PM
7/1/2021


Student Dashboard
-- CO2 Cars Emission Predictor --
127.0.0.1:5000/predict
CO2 Cars Emission Predictor
CO2 Emission by this car is [4044.92694984] (g/km)
Type here to search
31°C
ENG
IN
4:27 PM
7/1/2021



For the dataset, using Linear Regression model with dependent variable Co2 Emissions and Independent variables of the car features, the model has given an accuracy of 92% for the prediction.