PROJECT REPORT

PROJECT TITLE	: **Car Resale value Prediction**
TEAM ID	**:** PNT2022TMID103604
TEAM MEMBERS	**: GEORGE RIYAS (LEADER)** DEVA PRAVEEN JOEL T ABRAHAM GOKUL V R

1.INTRODUCTION

1.1 Project overview

The Car Valuation Tool is a free tool designed to help you get the estimated resale value of your car within seconds. Our automobile valuation algorithm is real-time updated, so it keeps up with the most recent modifications and market trends. However, the amounts displayed during the online assessment are only estimates and might alter when the retailer inspects your automobile. You don't even need to register to have your automobile valued; all you need to do is provide some basic information about it, such as its make, model, amount of miles driven, city of residence, and contact information.

1.2 Purpose

In 2019, the Indian used automobile resale industry was valued at $24.2 billion USD. There is a critical need to close this gap between sellers and buyers due to the enormous demand for used automobiles and the shortage of professionals who can evaluate the proper valuation. The goal of this research is to create a system that can impartially forecast a car's resale value based on little information such as the number of miles travelled and the year of purchase.The process of determining the current used automobile pricing in a certain location is known as used car value. By selecting the brand, model, year, trim, and the number of kilometers travelled, a user of OBV may quickly determine the used car's price. The value of a used automobile is based on a number of variables, including its state right now, when it was bought, etc. Used automobile valuation will never have a precise price; instead, it will always fall within a reasonable price range.

2.LITERATURE SURVEY 2.1Existing problem

Car Resale value prediction is one of the best to sell our in this market for an best and better price. Rather than giving our car to an less price , the customer those who uses the car will be benefited and the seller will also be benefitted. The goal of this research is to create a system that can impartially forecast a car's resale value based on little information such as the number of miles travelled and the year of purchase. You don't even need to register to have your automobile valued; all you need to do is provide some basic information about it, such as its make, model, amount of miles driven, city of residence, and contact information.

2.2 References

[1] Pudaruth Sameerchand , Pudaruth Sameerchand , Predicting the price of Used Car Using Machine Learning Techniques

[2] Enis gegic, Becir ,Isakovic, Dino Keco, ,Zerina Masetic,Jasmin Kevric Car Price Prediction Using Machine Learning

[3] Ning sun,Hongxi Bai,Yuxia Geng,Huizhu Shi Price Evaluation model in second hand car system

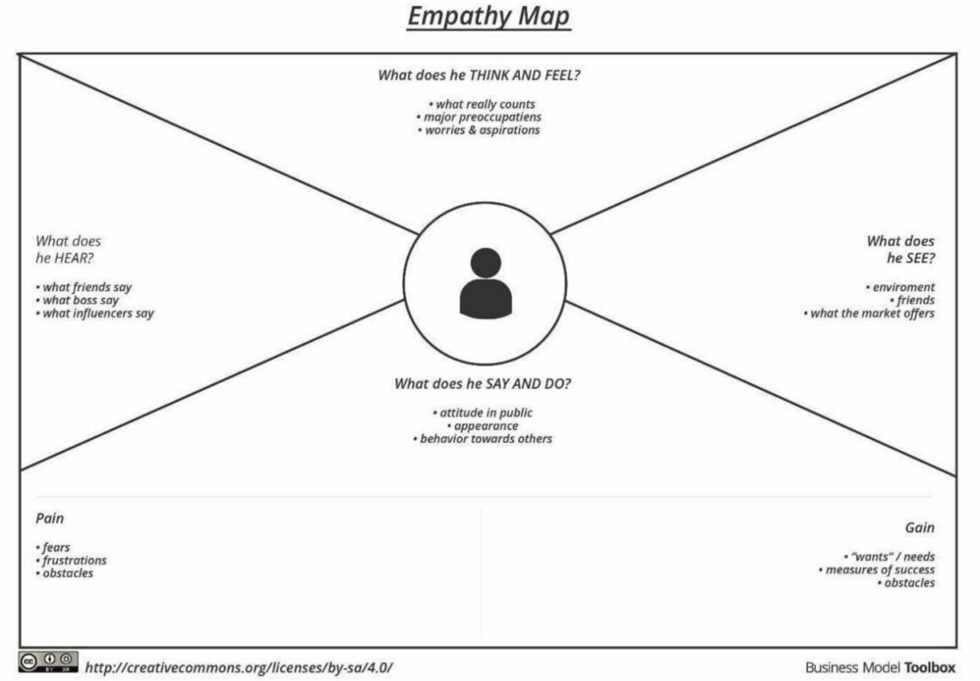
[4] Doan Van Thai, Luong Ngoc Son, Pham Vu Tien, Nguyen Nhat Anh, Nguyen Thi Ngoc Anh Prediction car prices using qualify qualitative data and knowledge-based system

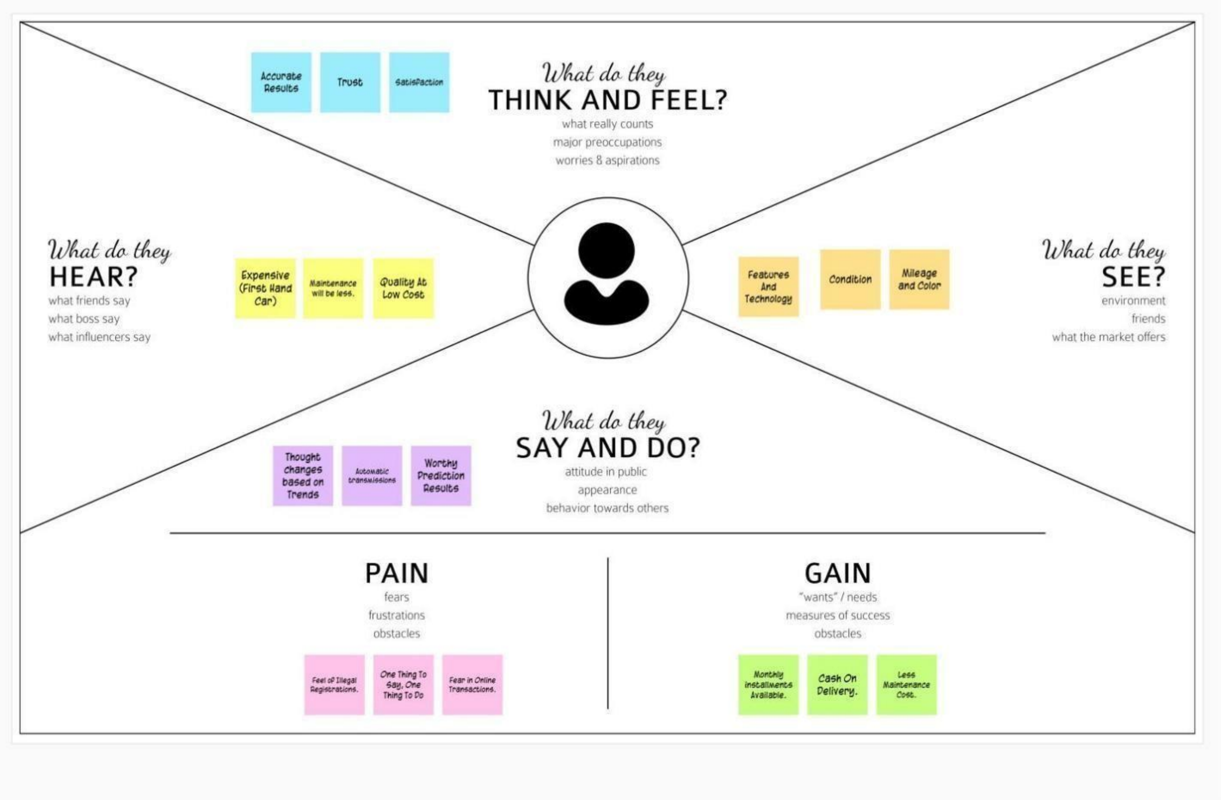
2.3 Problem Statement Definition

Car Resale value prediction is used to predict the value of the used cars to an reasonable price which satisfies the customer.

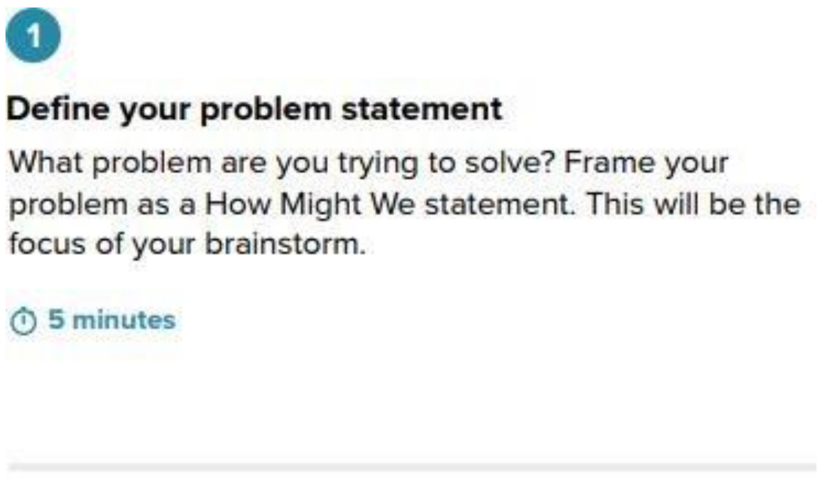
3 IDEATIOIN AND PROPOSED SOLUTION

3.1 Empathy Map Canvas





3.2 Ideation & Brainstroming

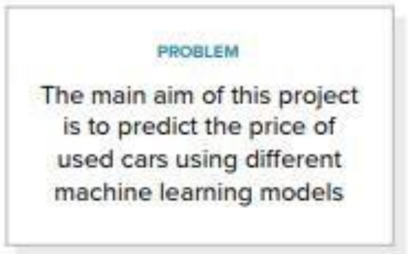


1

Define your problem statement

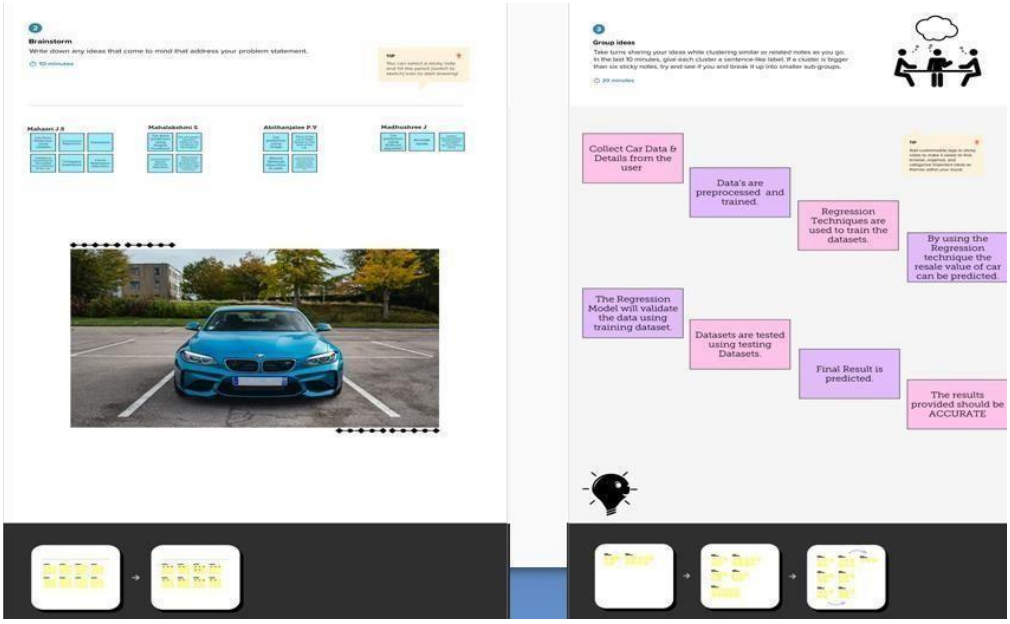
What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes



PROBLEM

The main aim of this project is to predict the price of used cars using different machine learning models



2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

Mahasri J.S

Mahalakshmi S

Abithanjalee P.V

Madhushree J

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

Collect Car Data & Details from the user

Data's are preprocessed and trained.

Regression Techniques are used to train the datasets.

By using the Regression technique the resale value of car can be predicted.

The Regression Model will validate the data using training dataset.

Datasets are tested using testing Datasets.

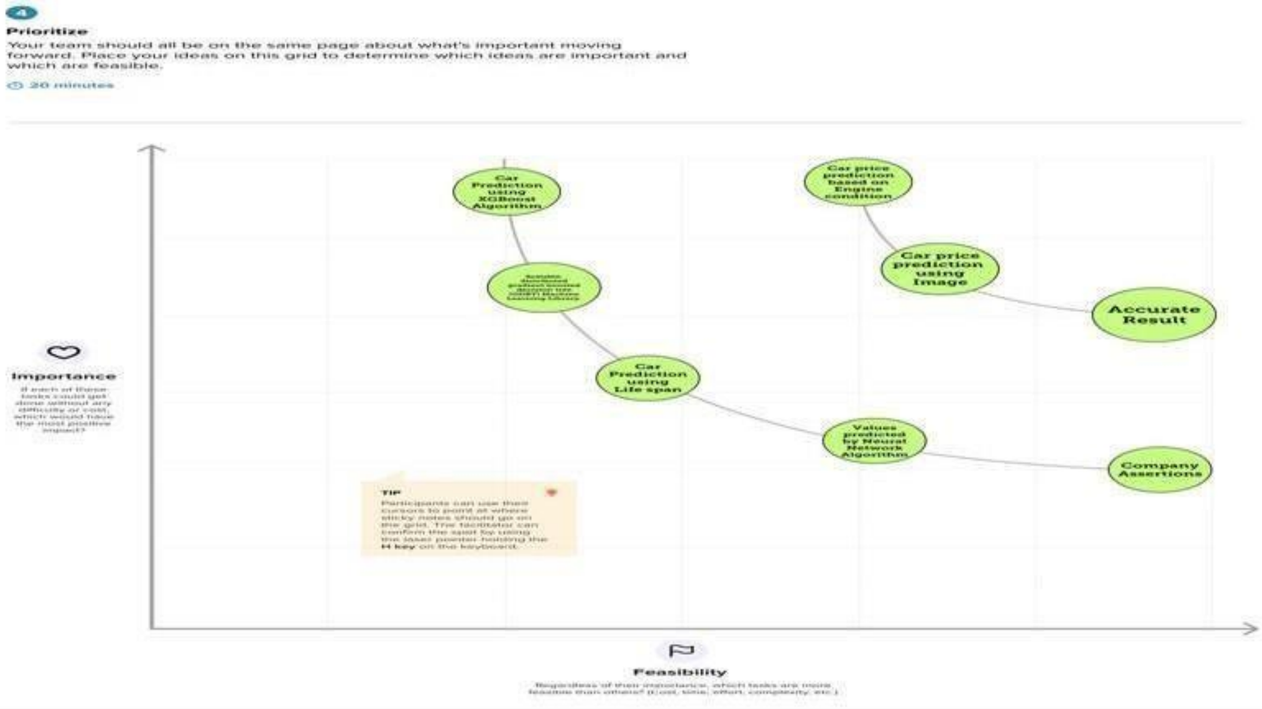
Final Result is predicted.

The results provided should be ACCURATE

TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

Idea prioritation :



4

Prioritize

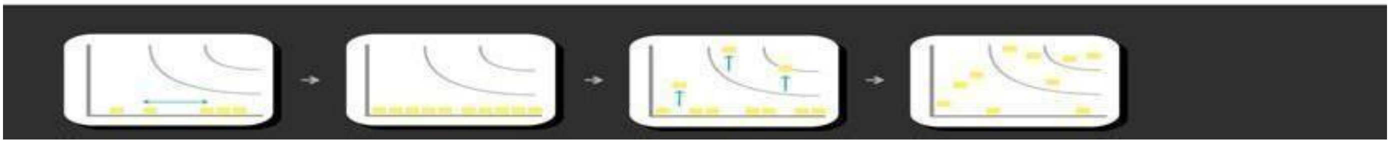
Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

TIP

Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the **H key** on the keyboard.

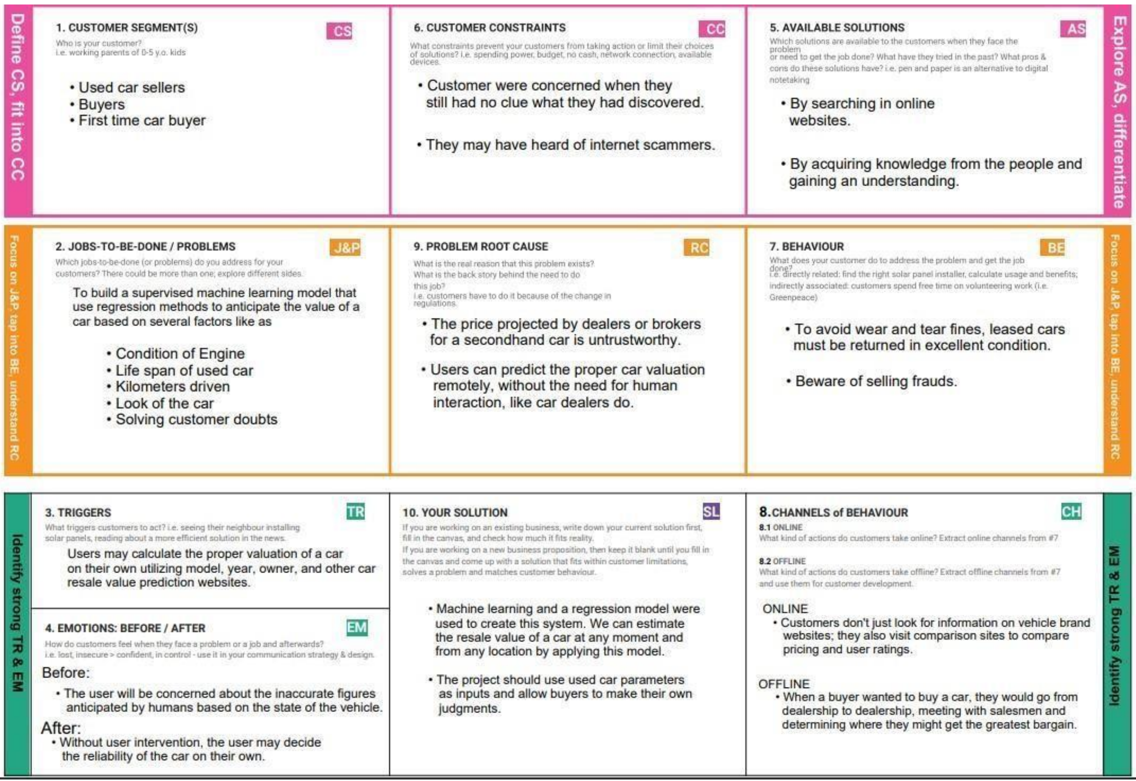
Car Prediction using XGBoost Algorithm
Car price prediction based on Engine condition
Car price prediction using Image
Accurate Result
Car Prediction using Life span
Values predicted by Neural Network Algorithm
Company Assertions
Importance
If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?
Feasibility
Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)



3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	To predict the resale value of second hand car or used car considering its features.
2.	Idea / Solution description	To develop a Machine learning algorithm which predicts the resale value of any used car which is shown in web design.
3.	Novelty / Uniqueness	The model predicts the resale value of car with high accuracy.
4.	Social Impact / Customer Satisfaction	A good platform with more reliability and portability.
5.	Business Model (Revenue Model)	The model deployed in cloud so anyone can access it anywhere and anytime.
6.	Scalability of the Solution	It is a web page model so it can be viewed and accessed in both computer as well as mobile phones.

3.4 Problem Solution Fit


Define CS, fit into CC
CS
CC
AS
Explore AS, differentiate
Focus on J&P, tap into BE, understand RC
J&P
RC
BE
Focus on J&P, tap into BE, understand RC
Identify strong TR & EM
TR
EM
SL
CH
Identify strong TR & EM

1. CUSTOMER SEGMENT(S)

Who is your customer?
i.e. working parents of 0-5 y.o. kids

- Used car sellers
- Buyers
- First time car buyer

6. CUSTOMER CONSTRAINTS

What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.

- Customer were concerned when they still had no clue what they had discovered.
- They may have heard of internet scammers.

5. AVAILABLE SOLUTIONS

Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking

- By searching in online websites.
- By acquiring knowledge from the people and gaining an understanding.

2. JOBS-TO-BE-DONE / PROBLEMS

Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

To build a supervised machine learning model that use regression methods to anticipate the value of a car based on several factors like as

- Condition of Engine
- Life span of used car
- Kilometers driven
- Look of the car
- Solving customer doubts

9. PROBLEM ROOT CAUSE

What is the real reason that this problem exists? What is the back story behind the need to do this job?
i.e. customers have to do it because of the change in regulations.

- The price projected by dealers or brokers for a secondhand car is untrustworthy.
- Users can predict the proper car valuation remotely, without the need for human interaction, like car dealers do.

7. BEHAVIOUR

What does your customer do to address the problem and get the job done?
i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)

- To avoid wear and tear fines, leased cars must be returned in excellent condition.
- Beware of selling frauds.

3. TRIGGERS

What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.

Users may calculate the proper valuation of a car on their own utilizing model, year, owner, and other car resale value prediction websites.

4. EMOTIONS: BEFORE / AFTER

How do customers feel when they face a problem or a job and afterwards?
i.e. lost, insecure > confident, in control - use it in your communication strategy & design.

Before:

- The user will be concerned about the inaccurate figures anticipated by humans based on the state of the vehicle.

After:

- Without user intervention, the user may decide the reliability of the car on their own.

10. YOUR SOLUTION

If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality.
If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.

- Machine learning and a regression model were used to create this system. We can estimate the resale value of a car at any moment and from any location by applying this model.
- The project should use used car parameters as inputs and allow buyers to make their own judgments.

8. CHANNELS of BEHAVIOUR

8.1 ONLINE
What kind of actions do customers take online? Extract online channels from #7

8.2 OFFLINE
What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.

ONLINE

- Customers don't just look for information on vehicle brand websites; they also visit comparison sites to compare pricing and user ratings.

OFFLINE

- When a buyer wanted to buy a car, they would go from dealership to dealership, meeting with salesmen and determining where they might get the greatest bargain.

4 REQUIREMENT ANALYSIS

4.1 Functional requirement

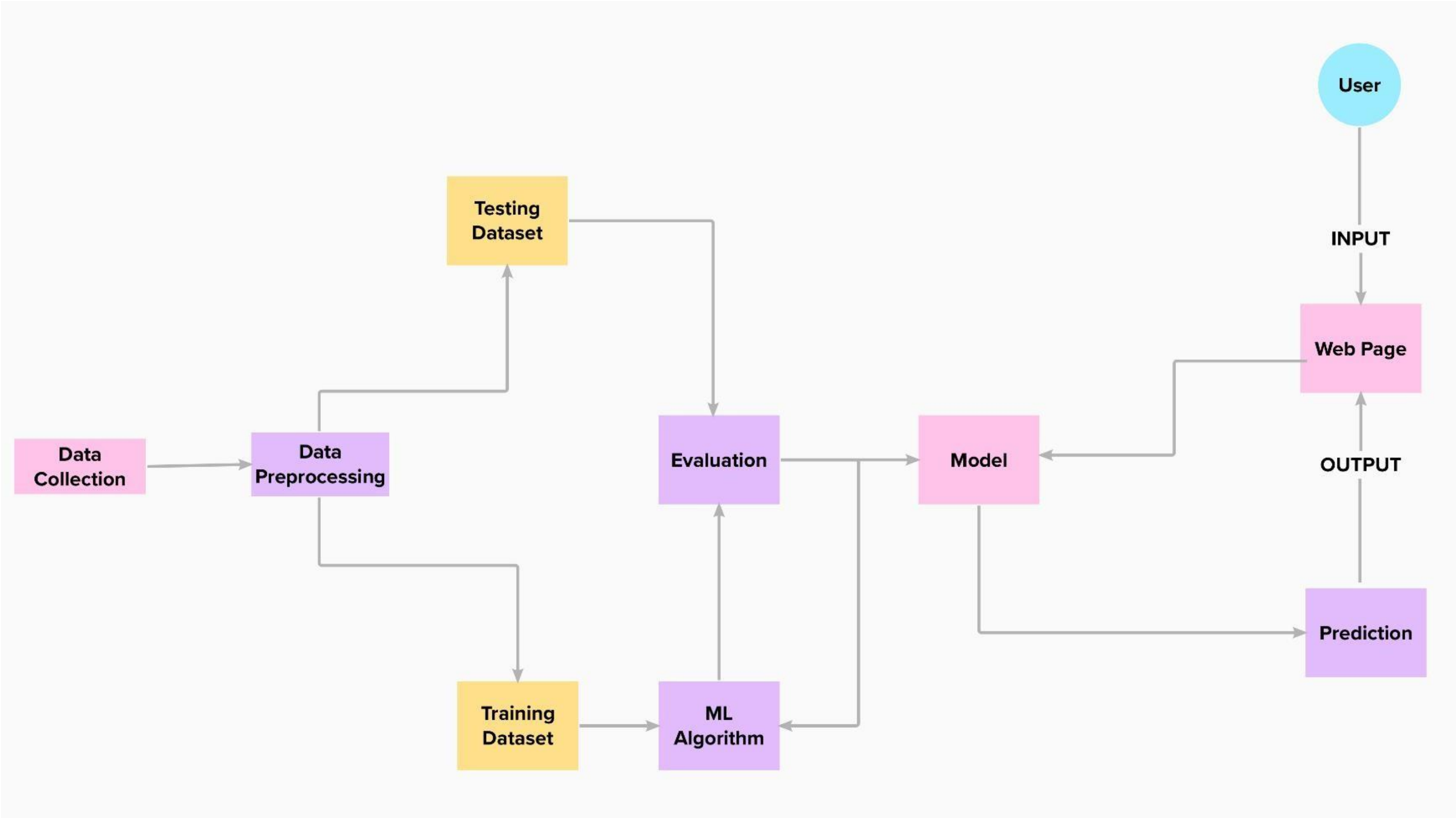
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Website
FR-2	User Confirmation	Confirmation via Website
FR-3	Car Registration	Registration through Website
FR-4	Car Information	Getting the car details through Website
FR-5	Value Prediction	Shows the resale value of the car through website

4.2 Non-Functional requirement

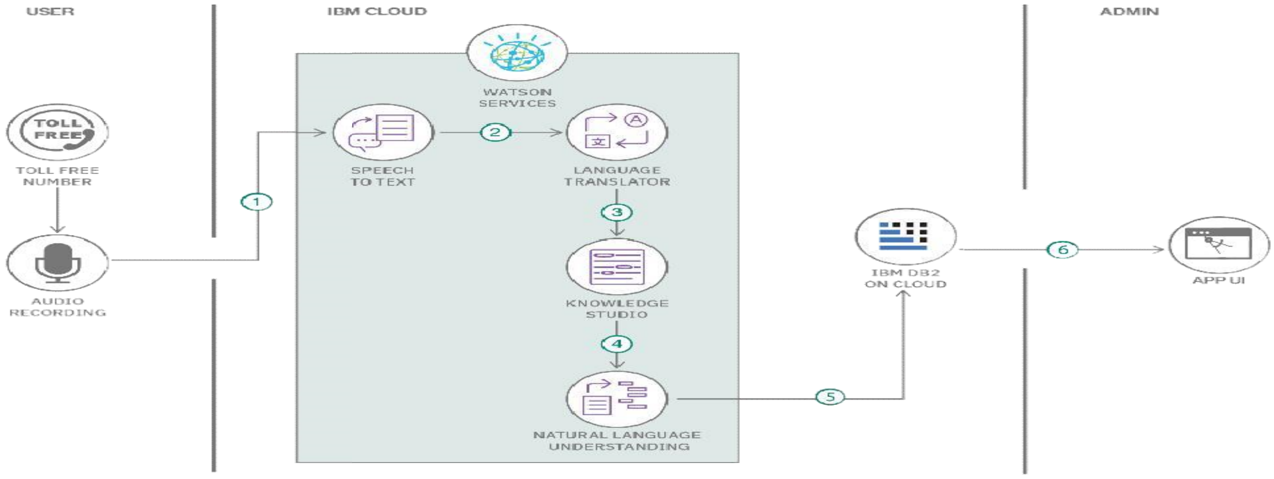
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The model predicts the resale value of the car with more accuracy.
NFR-2	**Security**	Protect the user information as well as their car details.
NFR-3	**Reliability**	The model performs consistently well and also it begins trust to the user.
NFR-4	**Performance**	The model performance has high accuracy and with portable from one machine to another machine.
NFR-5	**Availability**	The model can be available anywhere at anytime.
NFR-6	**Scalability**	The model can be viewed and accessed in both computer as well as mobile phone.

5 PROJECT DESIGN

5.1 Data Flow Diagram



5.2 Solution & Technical Architecture



User Stories

User Type	Functional requirement	User story number	User story/task	Acceptance criteria	Priority	Release
Customer (Mobile user, Web user, Care executive, Administrator)	Registration	USN-1	As a user, I can register for the application by entering my mail, password, and confirming my password	I can access my account/ dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
	Dashboard	USN-3	As a user, I can register for the application through internet	I can register & access the dashboard with Internet login	Low	Sprint-2
		USN-4	As a user, I can register	I can confirm the	Medium	Sprint-1

			for the application through Gmail	registration in Gmail		
	Login	USN-5	As a user, I can log into the application by entering email & password	I can login with my id and password	High	Sprint-1

6 PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Resources Initialization	We have to create and initialize accounts in various public APIs like OpenWeatherMap API.	1	LOW	George Riyas Gokul V R
Sprint-1	Local Server/Software Run	Write a Python program that outputs results given the inputs like weather and location through the software	1	MEDIUM	George Riyas Gokul V R
Sprint-2	Push the server/software to cloud	Push the code from Sprint 1 to cloud so it can be accessed from anywhere	2	MEDIUM	Deva Praveen Joel T Abraham

Sprint-3	Hardware initialization	Integrate the hardware to be able to access the cloud functions and provide inputs to the same.	2	HIGH	Deva Praveen Gokul V R
Sprint-4	UI/UX Optimization & Debugging	Optimize all the shortcomings and provide better user experience.	2	LOW	George Riyas Joel T Abraham

Sprint	Functional Requirement(Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Home Page	USN-1	Description about car resale process	2	Low	George Riyas
Sprint-3	Registration/Login	USN-2	As a user, I can register for the application byentering my username, email, phone number, and password and verify it. As a user, I can log in to the web application by entering my Username &password.	5	Medium	Gokul V R
Sprint-3	Form Page	USN-3	As a user, I submit my car details.	5	Medium	Joel T Abraham
Sprint-3	Result	USN-4	The predicted resale price for the given carmodel will be displayed.	9	High	Deva Praveen
Sprint-1	Data collection andData preprocessing	USN-5	Collect the required data and read the data.	6	High	Gokul V R
Sprint-1	Data collection andData preprocessing	USN-6	Clean and analyse the data to avoid duplications	9	High	George Riyas

6.2 Sprint Delivery Schedule

Sprint-1	Data collection andData preprocessi ng	USN-7	Split the data into Dependent and Independentvariables	6	High	Deva Praveen
Sprint-2	Model Building	USN-8	Build the model using a Random Forestregression to classify the data.	9	High	Joel T Abraham
Sprint-2	Model Building	USN-9	Check the metrics	7	High	Gokul V R Joel T Abraham
Sprint-2	Model Building	USN-10	Save the model	5	High	Gokul V R Deva Praveen
Sprint-4	Deploy the model	USN-11	Deployment of ML model using IBM WatsonStudio, object storage.	13	High	George Riyas Deva Praveen
Sprint-4	Integrate the webapp with the IBM model	USN-12	Use flask for the integrationpurpose.	8	Medium	George Riyas Joel T Abraham

7 CODING & SOLUTIONING

7.1 Feature 1

- IoT device
- IBM Watson Platform
- Node red
- Cloudant DB
- Web UI
- MIT App Inventor
- Python code

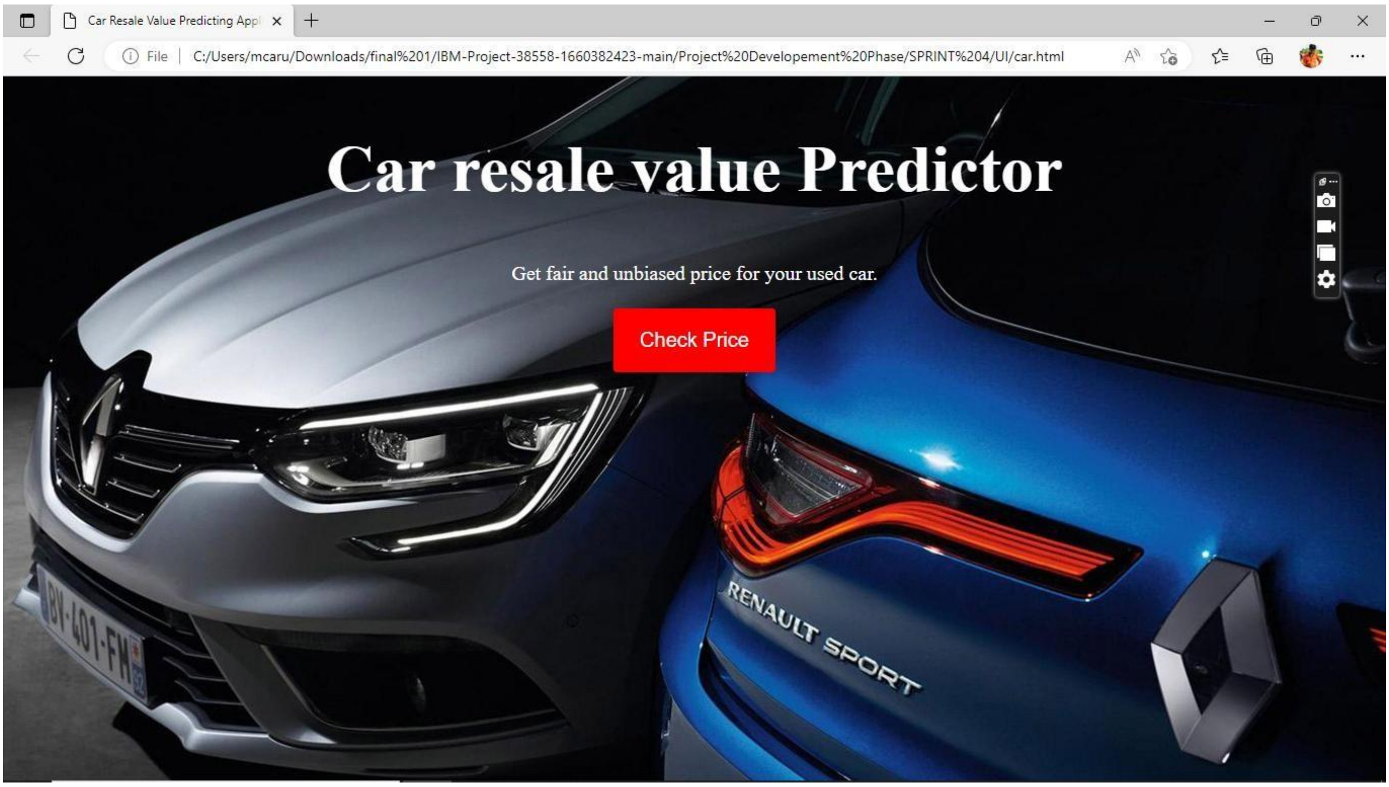
7.2 Feature2

- Login
- Wokwi

8 TESTING AND RESULTS

8.1 Test Cases

Test case 1:

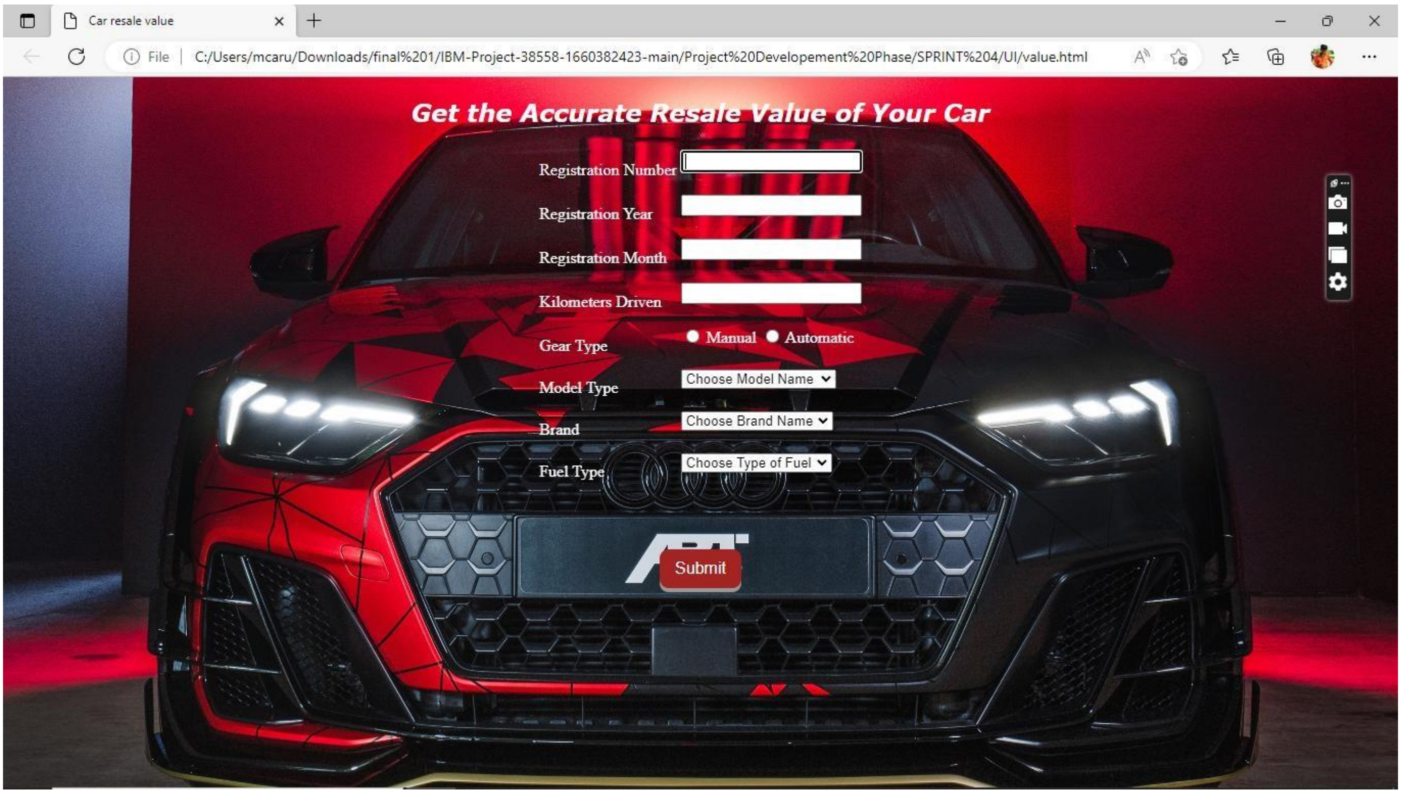


C:/Users/mcaru/Downloads/final%201/IBM-Project-38558-1660382423-main/Project%20Developement%20Phase/SPRINT%204/UI/car.html

Car resale value Predictor

Get fair and unbiased price for your used car.

Test case 2:


Car resale value
File
C:/Users/mcaru/Downloads/final%201/IBM-Project-38558-1660382423-main/Project%20Developement%20Phase/SPRINT%204/UI/value.html

Get the Accurate Resale Value of Your Car

Registration Number

Registration Year

Registration Month

Kilometers Driven

Gear Type ○ Manual ○ Automatic

Model Type Choose Model Name

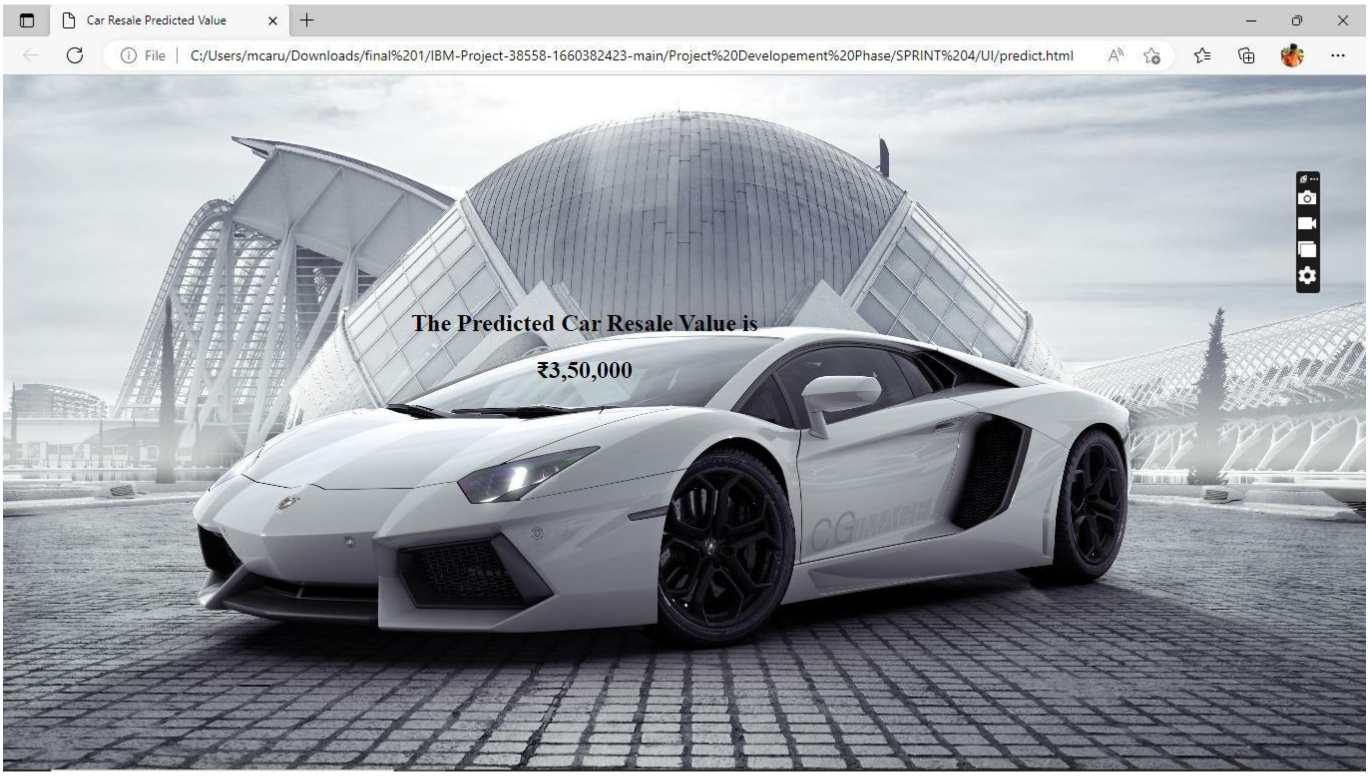
Brand Choose Brand Name

Fuel Type Choose Type of Fuel

Submit

9 Result

10.


Car Resale Predicted Value
File
C:/Users/mcaru/Downloads/final%201/IBM-Project-38558-1660382423-main/Project%20Developement%20Phase/SPRINT%204/UI/predict.html

The Predicted Car Resale Value is

₹3,50,000

10.1 ADVANTAGES

- This will reduced installation cost.
- It will monitor 24/7.
- Very useful to sale the car for reasonable price

10.2 DISADVANTAGES

- Car Resale value can not be used by the person who doesn’t have access to the internet.
- Very hard to use for targeted range of people

11 CONCLUSION

Price prediction analyses a good or service based on its attributes, demand, and current market trends using an algorithm. The pricing is then adjusted by the programme at a level that it believes would both draw people and optimise sales. The method is known as price forecasting or predictive pricing in some quarters.

12 FUTURE SCOPE

When compared to February 2020, average prices were up 42.5% in September 2022. While it's possible that used vehicle prices have peaked, new car prices are expected to be high through the end of 2022. Prices are anticipated to drop for both newand used automobiles in 2023, by 2.5% to 5% for new cars and 10% to 20% for used cars.

13 APPENDIX

Source Code

HTML FILES:

home.hmtl

```
<!DOCTYPE html>
<html lang="en">
  <style>    a:link,
    a:visited
      {  background-color:
      white;color:    black;
      border:    2px    solid
      black;border-radius:
      25px; padding:
      10px 20px;
```

```
     text-align: center; text-
     decoration: none;display:
     inline-block;
    }

    a:hover,    a:active    {
     background-color:
     beige;color:     black;
     text-decoration: none;
    }
    </style>

<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge"> <link
rel="styleshe et"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.3.1/dist/css/bootstrap.min.css"
integrity="sha384-
ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/iJTQUOhcWr7x9JvoRx
T2MZw1T" crossorigin="anonymous">
  <link rel="stylesheet" type="text/css" href="{{ url_for('static', filename='style.css') }}" />

  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Home</title>
</head>

<body>
  <div class="col-md-8">
    {% with messages = get_flashed_messages(with_categories=true) %}
    {% if messages %}
{% for category, message in messages %} <div
   class="alert alert-{{category}}">
             {{ message }}
           </div>
       {% endfor %}
    {% endif %}
  {% endwith %}
    {% block content %} {% endblock %}
  </div>
  <center>
  <h1>Car Resale Value Predictor</h1> <br>
  <a href="{{ url_for('login') }}">Click to Login</a><br> <br>
  <a href="{{ url_for('register') }}">Register here</a><br> <br>
  <a href="{{ url_for('update') }}">Update Password</a><br> <br>
  </center>

                         <script       src="https://code.jquery.com/jquery-
3.3.1.slim.min.js"                                          integrity="sha384-
q8i/X+965DzO0rT7abK41JStQIAqVgRVzpbzo5smXKp4YfRvH+8abtTE1Pi
6jizo" crossorigin="anonymous"></script>
          <script
                    src="https://cdn.jsdelivr.net/npm/popper.js@1.14.7/dist/umd/p
                    o
pper.min.js" integrity="sha384-
UO2eT0CpHqdSJQ6hJty5KVphtPhzWj9WO1clHTMGa3JDZwrnQq4sF86
dIHNDz0W1" crossorigin="anonymous"></script>
          <script src="https://cdn.jsdelivr.net/npm/bootstrap@4.3.1/dist/js/bootst
rap.min.js"integrity="sha384-
JjSmVgyd0p3pXB1rRibZUAYoIIy6OrQ6VrjIEaFf/nJGzIxFDsf4x0xIM+B0
7jRM" crossorigin="anonymous"></script>
</body>

</html>
```

Welcome.html(taking in inputs from the user)

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

<head>
    <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.3.1/dist/css/bootstrap.min.css"
integrity="sha384-
ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/iJTQUOhcWr7x9JvoRx
T2MZw1T" crossorigin="anonymous">
  <link rel="stylesheet" type="text/css" href="{{ url_for('static', filename='style.css') }}" />
  <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>Welcome Page</title>
</head>

<body>
  <marquee>Welcome!</marquee> <br>
  <center>
  <h3>Enter Car details</h3>
  </center>

  <center>
  <form method="POST" action="/predict">
    <label for="sell">Choose a Seller:</label>
    <select id="sell" name="sell">
    <option value=0>Commercial</option>
    <option value=1>Private</option>
    </select>
    <br>
    <label for="ot">Choose a OfferType:</label>
    <select id="ot" name="ot">
    <option value=0>Offer</option>
    <option value=1>Request</option>
    </select>
    <br>
    <label for="vt">Choose a Vehicle type:</label>
    <select id="vt" name="vt">
    <option value=3>Coupe</option>
```

```
<option value=1>Combination</option>
<option value=0>Bus</option>
<option value=2>Convertible</option>
<option value=4>Limousine</option>
<option value=7>Small</option>
```

```
<option value=8>SUV</option>
<option value=6>Others</option>
<option value=5>Not Declared</option>
</select>
<br>
<label for="gb">Choose a Gearbox:</label>
<select id="gb" name="gb">
<option value=0>Automatic</option>
<option value=1>Manual</option>
<option value=2>Not Declared</option>
</select>
<br>
<p>PowerPs</p>
<input name="pps" required>
<p>kilometers</p>
<input name="km" required>
<br>
<label for="ft">Choose a FuelType:</label>
<select id="ft" name="ft">
<option value=7>Petrol</option>
<option value=1>Diesel</option>
<option value=0>CNG</option>
<option value=4>LPG</option>
<option value=3>Hybrid</option>
<option value=2>Electric</option>
<option value=5>Not Declared</option>
<option values=6>Others</option>
</select>
<br>
```

```
<label for="brand">Choose a Brand:</label>
<select id="brand" name="brand">
<option value=0>Alpha Romeo</option>
<option value=1>Audi</option>
<option value=2>BMW</option>
```

```
<option value=3>Chevrolet</option>
<option value=4>Chrysler</option>
<option value=5>Citroen</option>
<option value=6>Dacia</option>
<option value=7>Daewoo</option>
<option value=8>Daihatsu</option>
<option value=9>Fiat</option>
<option value=10>Ford</option>
<option value=11>Honda</option>
<option value=12>Hyundai</option>
<option value=13>Jaguar</option>
<option value=14>Jeep</option>
<option value=15>Kia</option>
<option value=16>Lada</option>
<option value=17>Lancia</option>
<option value=18>Land Rover</option>
<option value=19>Mazda</option>
<option value=20>Mercedes</option>
<option value=21>Mini</option>
<option value=22>Mitsubishi</option>
<option value=23>Nissan</option>
<option value=24>Opel</option>
<option value=25>Peugeot</option>
<option value=26>Porsche</option>
<option value=27>Renault</option>
<option value=28>Rover</option>
<option value=29>Saab</option>
<option value=30>Seat</option>
<option value=31>Skoda</option>
```

```
<option value=34>Subaru</option>
<option value=35>Suzuki</option> <option value=36>Toyota</option>
<option value=38>Volkswagen</option>
<option value=39>Volvo</option>
```

```
         </select>
         <br>
         <label for="nr">Repaired?</label>
         <select id="nr" name="nr">
         <option value=1>Yes</option>
         <option value=0>No</option>
         <option value=2>Not Declared</option>
         </select>
         <br>
         <p>Age(in months)</p>
         <input name="age" required>
         <br>
         <br>
         <button type="submit">Submit</button>
      </form>
      </center>

      <br>
      <br>
      <a href="{{url_for('logout')}}">Press here to logout</a>

                              <script       src="https://code.jquery.com/jquery-
3.3.1.slim.min.js"                                            integrity="sha384-
q8i/X+965DzO0rT7abK41JStQIAqVgRVzpbzo5smXKp4YfRvH+8abtTE1Pi
6jizo" crossorigin="anonymous"></script>
            <script
                  src="https://cdn.jsdelivr.net/npm/popper.js@1.14.7/dist/umd/p
                  o
pper.min.js" integrity="sha384-
```

```
UO2eT0CpHqdSJQ6hJty5KVphtPhzWj9WO1clHTMGa3JDZwrnQq4sF86
dIHNDz0W1" crossorigin="anonymous"></script>
        <script
                src="https://cdn.jsdelivr.net/npm/bootstrap@4.3.1/dist/js/bootst
rap.min.js"integrity="sha384-
JjSmVgyd0p3pXB1rRibZUAYoIIy6OrQ6VrjIEaFf/nJGzIxFDsf4x0xIM+B0
7jRM" crossorigin="anonymous"></script>
</body>

</html>
```

Predict.html(For displaying the output)

```
 <!DOCTYPE html>
 <html lang="en">
   <style>
     body{
       background-color:
       pink;color:black;
     }
   </style>
<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>Car Value</title>
</head>
<body>
   <h1>Car Value Predicted is</h1>

   <h1>{{predict1}}</h1>
  <br>
  <br>


</body>
</html>
```

app-ibm.py(FLASK FRAMEWORK)

```
from flask import Flask,request, render_template, url_for, redirect, flash from
flask_login import UserMixin, login_user, LoginManager, login_required,
logout_user,current_user
```

```
from wtforms.validators import InputRequired, Length,
ValidationErrorfrom flask_bcrypt import Bcrypt
```

```
from wtforms import StringField, PasswordField,
SubmitField, IntegerFieldfrom flask_wtf import FlaskForm
import sqlite3 import joblib
from sklearn.preprocessing import
OrdinalEncoderimport pandas as pd
import requests

# NOTE: you must manually set API_KEY below using information retrieved from
your IBM Cloud account.
API_KEY = "iX5xF0JyPhYIfWGg37VPe14p1D7OMDPgPG1cl1yQJfJg"
token_response = requests.post('https://iam.cloud.ibm.com/identity/token',
data={"apikey":API_KEY, "grant_type":
'urn:ibm:params:oauth:granttype:apikey'}) mltoken =
token_response.json()["access_token"] header = {'Content-Type':
'application/json', 'Authorization': 'Bearer ' +

mltoken} app = Flask( name _ )
bcrypt = Bcrypt(app)
app.config['SECRET_KEY'] = 'B7-
1A3E'


login_manager = LoginManager()
login_manager.init_app(app)
login_manager.login_view =
'login' @login_manager.user_loa
derdef load_user(user_id): conn =
connect_db() user =
conn.execute('SELECT   *   FROM
user WHERE id = ?',
              (user_id,)).fetchone()
  usr_obj = User(user[0], user[1],
  user[2])return usr_obj
```

```
def         connect_db():
  conn =
  sqlite3.connect('database.db')

return conn class User:

  def__init (self, id, email,
    username):self.id = id
    self.username          =
    usernameself.email  =
    email

  def to_json(self):
    return {"username":
        self.username,"email":
        self.email}

  def
    is_authenticated(self):
    return True

  def
    is_active(sel
    f):return
    True

  def          is_anonymous(self):
    return False
  def get_id(self):
    return
    str(self.id)

class
  RegisterForm(FlaskForm):
  email =
  StringField(validators=[
    InputRequired(),          Length(min=4,          max=50)],
  render_kw={"placeholder": "Email"})username =
  StringField(validators=[
                    InputRequired(), Length(min=4, max=20)], render_kw={"placeholder":
"Username"})       rollnumber       =
  StringField(validators=[
    InputRequired(), Length(min=5, max=10)], render_kw={"placeholder":
  "RollNumber"})password = PasswordField(validators=[
                    InputRequired(), Length(min=8, max=20)], render_kw={"placeholder":
"Password"})       submit       =

  SubmitField('Register')

  def validate_username(self,
    username):conn = connect_db() existing_user_username =
    conn.execute('SELECT * FROM user WHERE username =
    ?',(username.data,)).fetchone()
    conn.comm
    it()
    conn.close()
    if
      existing_user_usern
      ame:raise
      ValidationError(
        'That username already exists. Try another one.')


class          LoginForm(FlaskForm):
  username =
  StringField(validators=[
                    InputRequired(), Length(min=4, max=20)], render_kw={"placeholder":
```

```
"Username"}) password =

   PasswordField(validators=[

   InputRequired(), Length(min=8,

   max=20)], render_kw={"placeholder":

"Password"})        submit        =

   SubmitField('Login')


class UpdateForm(FlaskForm):
  username = StringField(validators=[
                    InputRequired(), Length(min=4, max=20)], render_kw={"placeholder":
"Username"})

  oldpassword = PasswordField(validators=[
         InputRequired(),                 Length(min=8,                 max=20)],
render_kw={"placeholder": "PreviousPassword"})

  password = PasswordField(validators=[
                    InputRequired(), Length(min=8, max=20)], render_kw={"placeholder":
"Password"})        submit        =

  SubmitField('Update')


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


@app.route('/login',
methods=['GET', 'POST'])def
login(): form = LoginForm()
  if
    form.validate_on_submit    ():conn    =    connect_db()    user    =
    conn.execute('SELECT * FROM user WHERE username = ?',
               (form.username.data,)).fetchone()
    conn.comm
```

```
it()
conn.close()
if user:
  if bcrypt.check_password_hash(user[4],
    form.password.data):usr_obj = User(user[0],
    user[1], user[2]) login_user(usr_obj) return
    redirect(url_for('welcome'))
```

```
      else:
        print('Hi') flash(f'Invalid credentials, check and try logging
        in again.',
        'danger')return          redirect(url_for('login'))

  return render_template('login.html', form=form)


@app.route('/welcome', methods=['GET',
'POST'])@login_required def welcome():
return render_template('welcome.html')

@app.route('/predict',
methods=['POST'])def
predictSpecies():
  sell                                         =
  float(request.form['sell'])ot
  = float(request.form['ot'])
  vt =
  float(request.form['vt'])
  gb =
  float(request.form['gb'])
  pps=float(request.form['p ps'])
  km=float(request.form['k m'])
  ft=float(request.form['ft'])
  brand=float(request.form['brand']
  ) nr=float(request.form['nr'])
  age=float(request.form['age']) arr
```

```
   = [[sell, ot, vt,
   gb,pps,km,ft,brand,nr,age]]


                  payload_scoring =    {"input_data":   [{"field":   [['sell',    'ot',     'vt',
'gb','pps','km','ft','brand','nr','age']], "values":arr}]}

                                                              response_scoring

=requests.post('https://ussouth.ml.cloud.ibm.com/ml/v4/deployments/a4a92034-8fcd-
4e79-ab7c-
```

```
          521a5d8cb7d5/predictions?version=2022-11-15', json=payload_scor
ing,headers={'Authorization': 'Bearer ' + mltoken})
  print(response_scoring) predictions =
  response_scoring.json() pr =
  predictions['predictions'][0]['values'][0][0]
  print("final prediction",pr) return
  render_template('predict.html',predict1=pr)



@app.route('/logout', methods=['GET',
'POST'])@login_required
def logout(): logout_use
  r() return
  redirect(url_for('login'))


@ app.route('/register', methods=['GET',
'POST'])def register(): form =
  RegisterForm()
  conn =
  connect_db() if
  form.validate_on_submit():
    hashed_password = bcrypt.generate_password_hash(form.password.data)
    conn.execute('INSERT INTO user (email, username, roll_number,
    pass_word) VALUES (?,
?, ?, ?)',
            (form.email.data, form.username.data,
      form.rollnumber.data, hashed_password))conn.commit()
      conn.close() return redirect(url_for('login'))
    return render_template('register.html', form=form)


@ app.route('/update', methods=['GET',
'POST'])def update():
    form =
    UpdateForm()conn             =
    connect_db()                 if
    form.validate_on_submit():
      conn = connect_db() user = conn.execute('SELECT * FROM user
      WHERE username = ?',
                  (form.username.data,)).fetchone()
      if user:
        if bcrypt.check_password_hash(user[4],
          form.oldpassword.data):print(user)
          hashed_password1 =
            bcrypt.generate_password_hash(form.passw
            ord.data)
         conn.execute('UPDATE user set pass_word = ? where username = ?',
                  (hashed_password1,
          form.username.data)) conn.commit()
          conn.close() flash(f'Password changed
          successfully.',
          'success')return      redirect(url_for('home'))
        else:
          flash(f'Invalid password, Enter valid password.',
          'danger')return      redirect(url_for('update'))
      else:
        flash(f'Invalid user, Enter valid User.',
        'danger')return        redirect(url_for('update'))
    return render_template('update.html', form=form)


  if name == " main ": app.run(debug=True)
```

13.1 GitHub & Project Demo Link:

https://github.com/IBM-EPBL/IBM-Project-30991-1660193960

DEMO LINK:

https://drive.google.com/file/d/1z0LOt
uJ0KoiLS8zVh1SyrXrXZgh0oJpF/vie
w?usp=sharing