Development Phase
Sprint 3 delivery

Date	18 November 2022
Team ID	PNT2022TMID21553
Project Name	Project – Car Resale Value Prediction

Sprint 3:

The third sprint involves the creation of a Flask application that links the Machine Learning model developed and the HTML page that gets the user inputs for prediction.

Code:

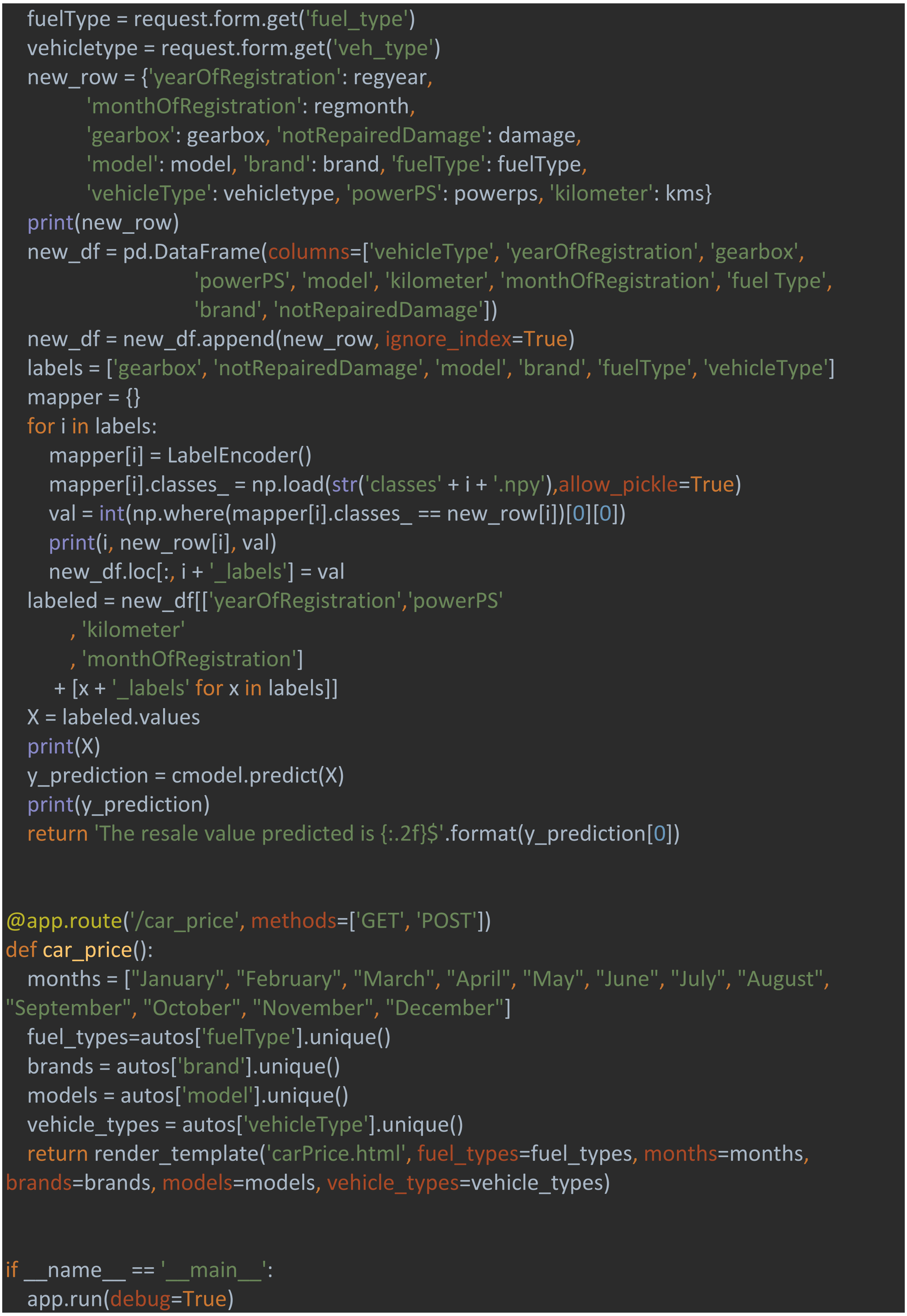
app.py:

```
from flask import Flask, render_template, request
import pickle
import pandas as pd
import numpy as np
from sklearn.preprocessing import LabelEncoder

app = Flask(__name__)
cmodel = pickle.load(open('resale_model.pkl', 'rb'))
autos = pd.read_csv('car_resale_preprocessed.csv')


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

@app.route('/c_predict', methods=['POST'])
def c_predict():
    months = ["January", "February", "March", "April", "May", "June", "July", "August",
"September", "October", "November", "December"]
    regyear = int(request.form['reg_year'])
    powerps = float(request.form['car_power'])
    kms = float(request.form['kilo_driven'])
    regmonth = int(months.index(request.form.get('reg_month')))+1
    gearbox = request.form['gear_type']
    damage = request.form['car_condition']
    model = request.form.get('model')
    brand = request.form.get('brand')
```

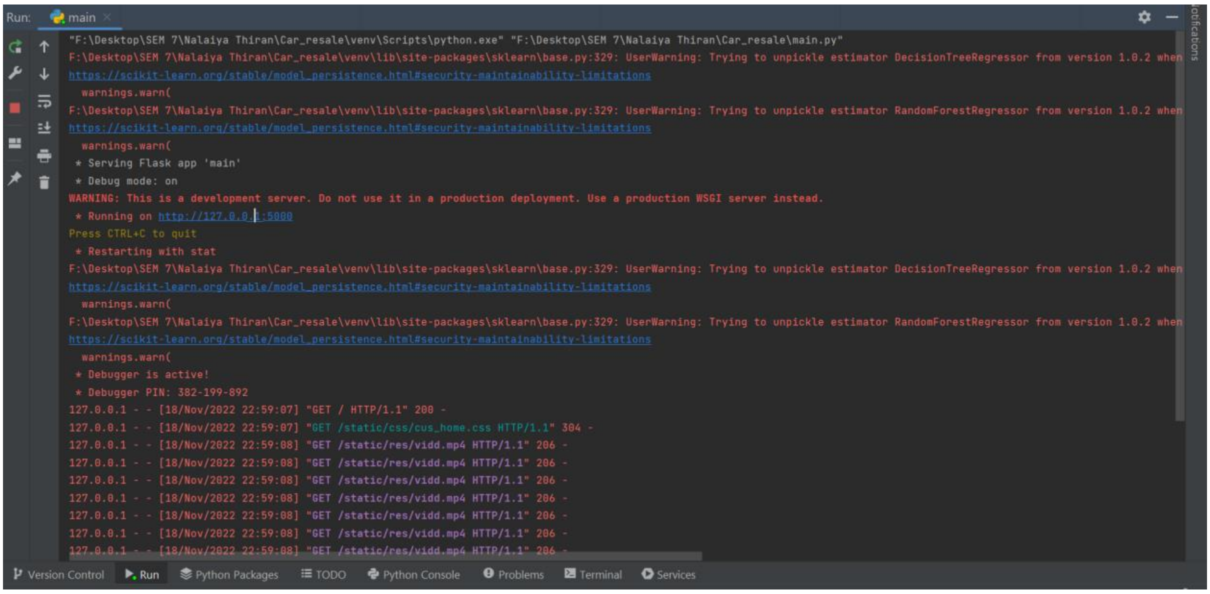


```
    fuelType = request.form.get('fuel_type')
    vehicletype = request.form.get('veh_type')
    new_row = {'yearOfRegistration': regyear,
               'monthOfRegistration': regmonth,
               'gearbox': gearbox, 'notRepairedDamage': damage,
               'model': model, 'brand': brand, 'fuelType': fuelType,
               'vehicleType': vehicletype, 'powerPS': powerps, 'kilometer': kms}
    print(new_row)
    new_df = pd.DataFrame(columns=['vehicleType', 'yearOfRegistration', 'gearbox',
                                   'powerPS', 'model', 'kilometer', 'monthOfRegistration', 'fuel Type',
                                   'brand', 'notRepairedDamage'])
    new_df = new_df.append(new_row, ignore_index=True)
    labels = ['gearbox', 'notRepairedDamage', 'model', 'brand', 'fuelType', 'vehicleType']
    mapper = {}
    for i in labels:
        mapper[i] = LabelEncoder()
        mapper[i].classes_ = np.load(str('classes' + i + '.npy'),allow_pickle=True)
        val = int(np.where(mapper[i].classes_ == new_row[i])[0][0])
        print(i, new_row[i], val)
        new_df.loc[:, i + '_labels'] = val
    labeled = new_df[['yearOfRegistration','powerPS'
            , 'kilometer'
            , 'monthOfRegistration']
         + [x + '_labels' for x in labels]]
    X = labeled.values
    print(X)
    y_prediction = cmodel.predict(X)
    print(y_prediction)
    return 'The resale value predicted is {:.2f}$'.format(y_prediction[0])


@app.route('/car_price', methods=['GET', 'POST'])
def car_price():
    months = ["January", "February", "March", "April", "May", "June", "July", "August",
"September", "October", "November", "December"]
    fuel_types=autos['fuelType'].unique()
    brands = autos['brand'].unique()
    models = autos['model'].unique()
    vehicle_types = autos['vehicleType'].unique()
    return render_template('carPrice.html', fuel_types=fuel_types, months=months,
brands=brands, models=models, vehicle_types=vehicle_types)


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

Test case:



```
"F:\Desktop\SEM 7\Nalaiya Thiran\Car_resale\venv\Scripts\python.exe" "F:\Desktop\SEM 7\Nalaiya Thiran\Car_resale\main.py"
F:\Desktop\SEM 7\Nalaiya Thiran\Car_resale\venv\lib\site-packages\sklearn\base.py:329: UserWarning: Trying to unpickle estimator DecisionTreeRegressor from version 1.0.2 when
https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitations
  warnings.warn(
F:\Desktop\SEM 7\Nalaiya Thiran\Car_resale\venv\lib\site-packages\sklearn\base.py:329: UserWarning: Trying to unpickle estimator RandomForestRegressor from version 1.0.2 when
https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitations
  warnings.warn(
 * Serving Flask app 'main'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
 * Restarting with stat
F:\Desktop\SEM 7\Nalaiya Thiran\Car_resale\venv\lib\site-packages\sklearn\base.py:329: UserWarning: Trying to unpickle estimator DecisionTreeRegressor from version 1.0.2 when
https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitations
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F:\Desktop\SEM 7\Nalaiya Thiran\Car_resale\venv\lib\site-packages\sklearn\base.py:329: UserWarning: Trying to unpickle estimator RandomForestRegressor from version 1.0.2 when
https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitations
  warnings.warn(
 * Debugger is active!
 * Debugger PIN: 382-199-892
127.0.0.1 - - [18/Nov/2022 22:59:07] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [18/Nov/2022 22:59:07] "GET /static/css/cus_home.css HTTP/1.1" 304 -
127.0.0.1 - - [18/Nov/2022 22:59:08] "GET /static/res/vidd.mp4 HTTP/1.1" 206 -
127.0.0.1 - - [18/Nov/2022 22:59:08] "GET /static/res/vidd.mp4 HTTP/1.1" 206 -
127.0.0.1 - - [18/Nov/2022 22:59:08] "GET /static/res/vidd.mp4 HTTP/1.1" 206 -
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127.0.0.1 - - [18/Nov/2022 22:59:08] "GET /static/res/vidd.mp4 HTTP/1.1" 206 -
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127.0.0.1 - - [18/Nov/2022 22:59:08] "GET /static/res/vidd.mp4 HTTP/1.1" 206 -
```
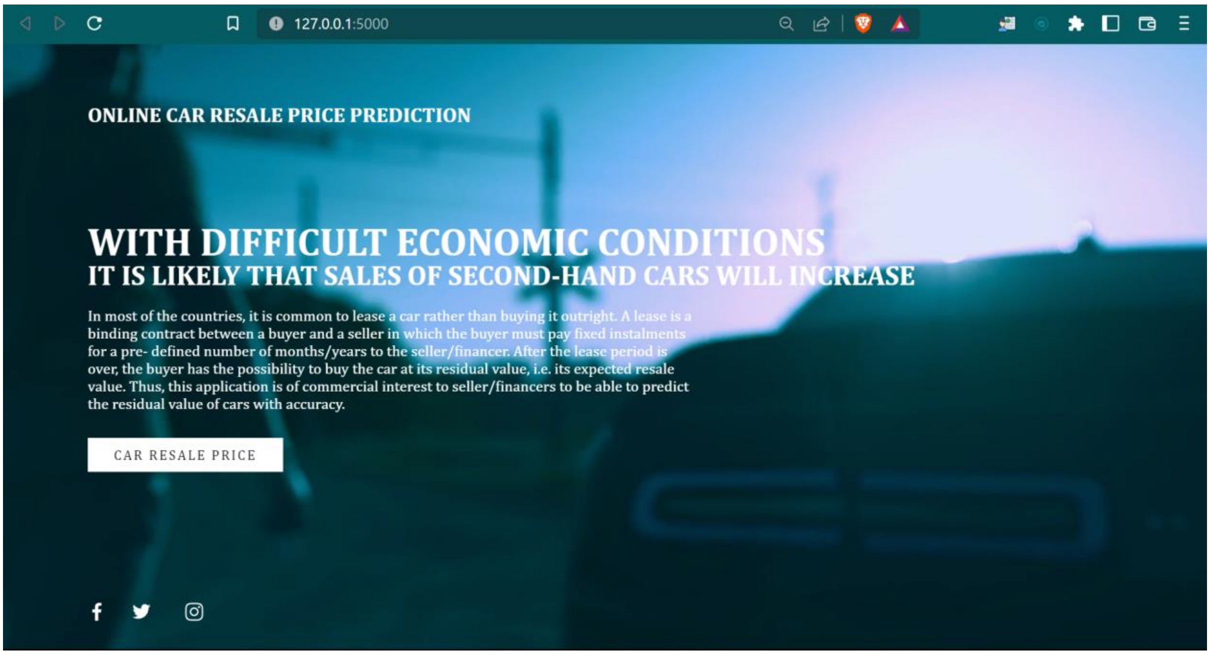
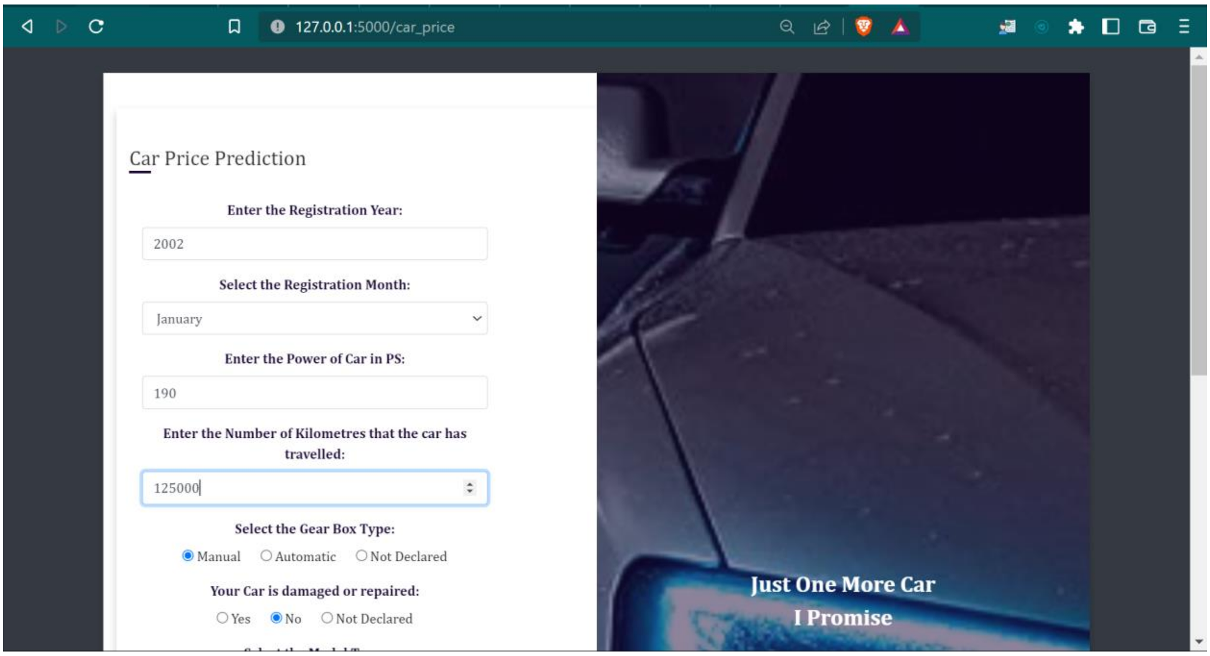



ONLINE CAR RESALE PRICE PREDICTION

WITH DIFFICULT ECONOMIC CONDITIONS
IT IS LIKELY THAT SALES OF SECOND-HAND CARS WILL INCREASE

In most of the countries, it is common to lease a car rather than buying it outright. A lease is a binding contract between a buyer and a seller in which the buyer must pay fixed instalments for a pre- defined number of months/years to the seller/financer. After the lease period is over, the buyer has the possibility to buy the car at its residual value, i.e. its expected resale value. Thus, this application is of commercial interest to seller/financers to be able to predict the residual value of cars with accuracy.



Car Price Prediction

Enter the Registration Year:

2002

Select the Registration Month:

January

Enter the Power of Car in PS:

190

Enter the Number of Kilometres that the car has travelled:

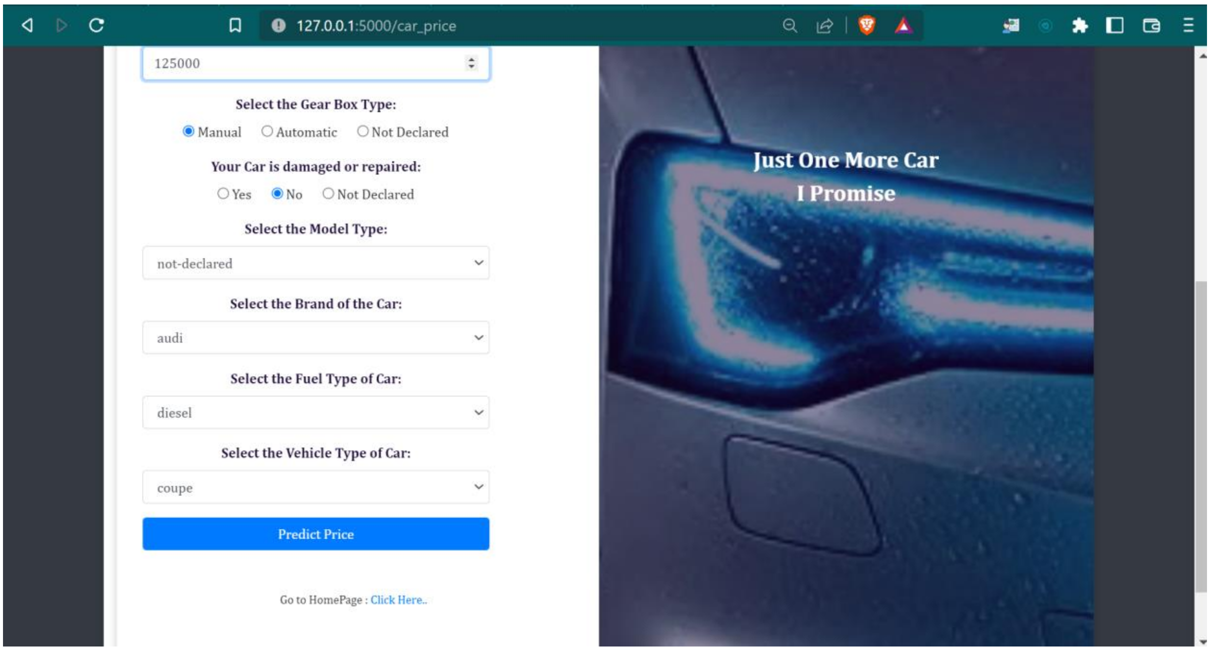
125000

Select the Gear Box Type:

● Manual ○ Automatic ○ Not Declared

Your Car is damaged or repaired:

○ Yes ● No ○ Not Declared



125000

Select the Gear Box Type:

● Manual ○ Automatic ○ Not Declared

Your Car is damaged or repaired:

○ Yes ● No ○ Not Declared

Select the Model Type:

not-declared

Select the Brand of the Car:

audi

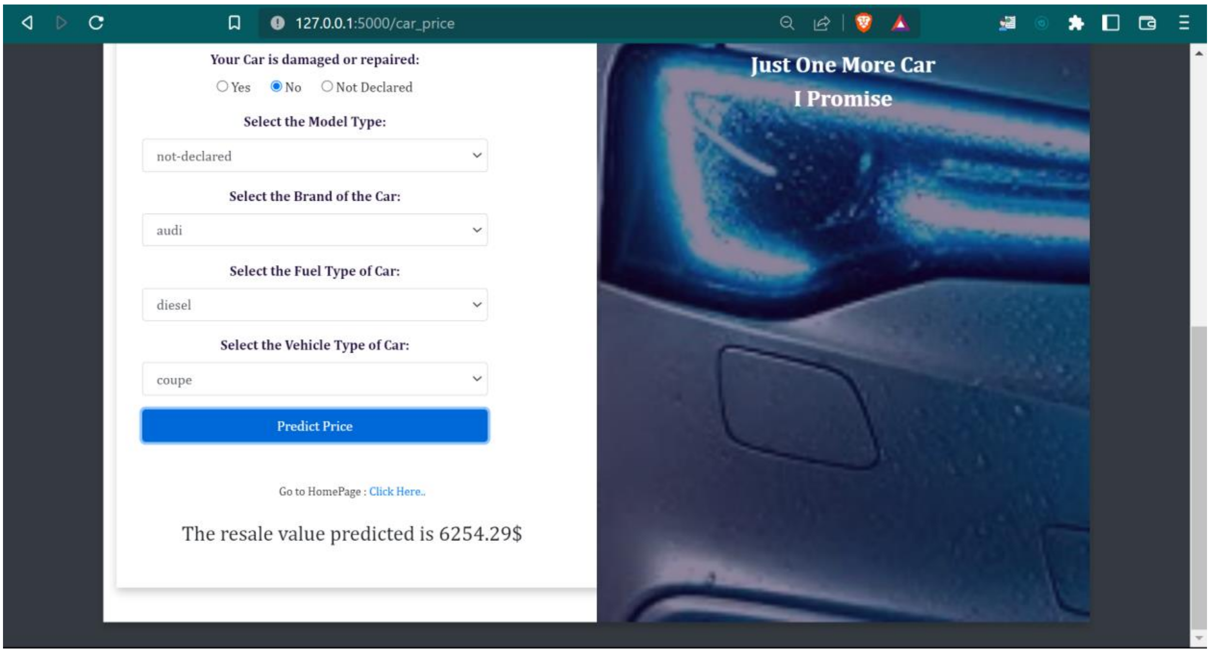
Select the Fuel Type of Car:

diesel

Select the Vehicle Type of Car:

coupe

Go to HomePage : Click Here..



Your Car is damaged or repaired:

○ Yes ● No ○ Not Declared

Select the Model Type:

not-declared

Select the Brand of the Car:

audi

Select the Fuel Type of Car:

diesel

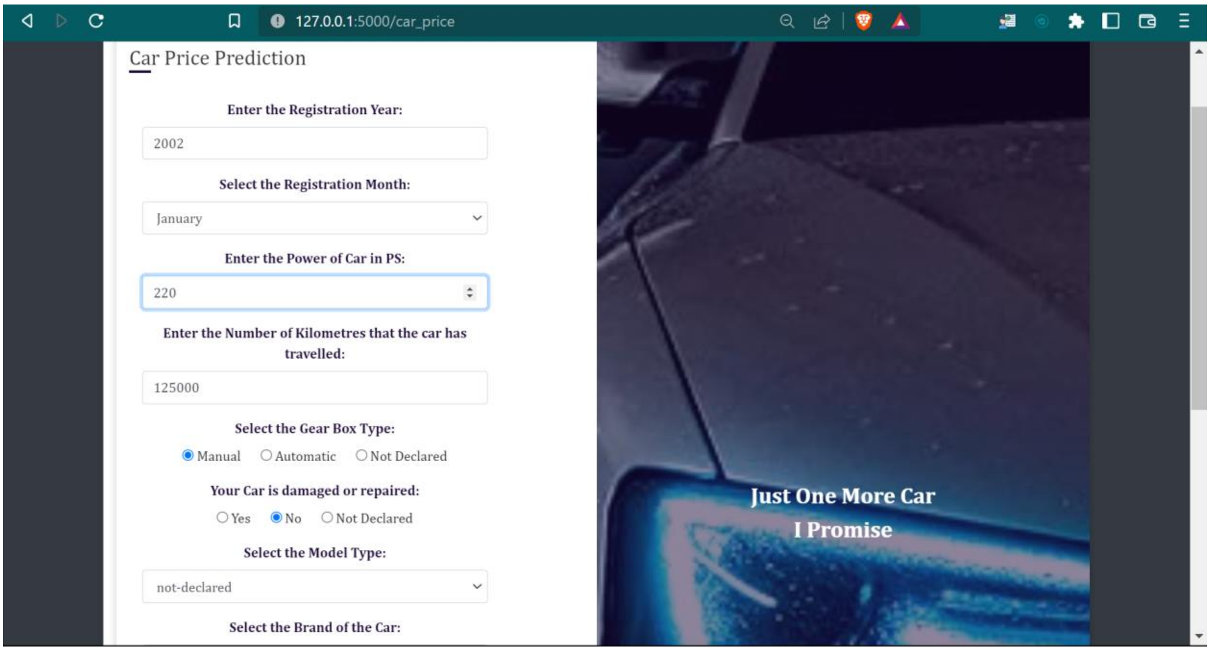
Select the Vehicle Type of Car:

coupe

Go to HomePage : Click Here..

The resale value predicted is 6254.29$

Now, the power of the car alone is changed to 220 from 190. Then, the price predicted is also changed.



Car Price Prediction

Enter the Registration Year:

2002

Select the Registration Month:

January

Enter the Power of Car in PS:

220

Enter the Number of Kilometres that the car has travelled:

125000

Select the Gear Box Type:

● Manual ○ Automatic ○ Not Declared

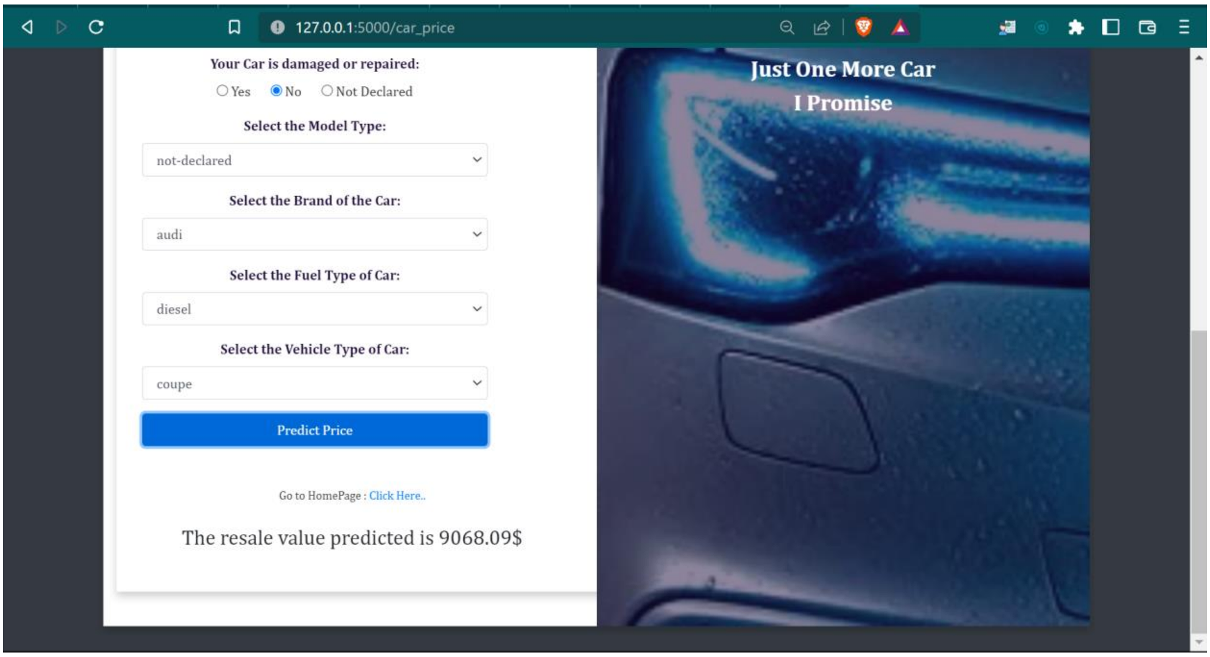
Your Car is damaged or repaired:

○ Yes ● No ○ Not Declared

Select the Model Type:

not-declared

Select the Brand of the Car:



Your Car is damaged or repaired:

○ Yes ● No ○ Not Declared

Select the Model Type:

not-declared

Select the Brand of the Car:

audi

Select the Fuel Type of Car:

diesel

Select the Vehicle Type of Car:

coupe

Go to HomePage : Click Here..

The resale value predicted is 9068.09$