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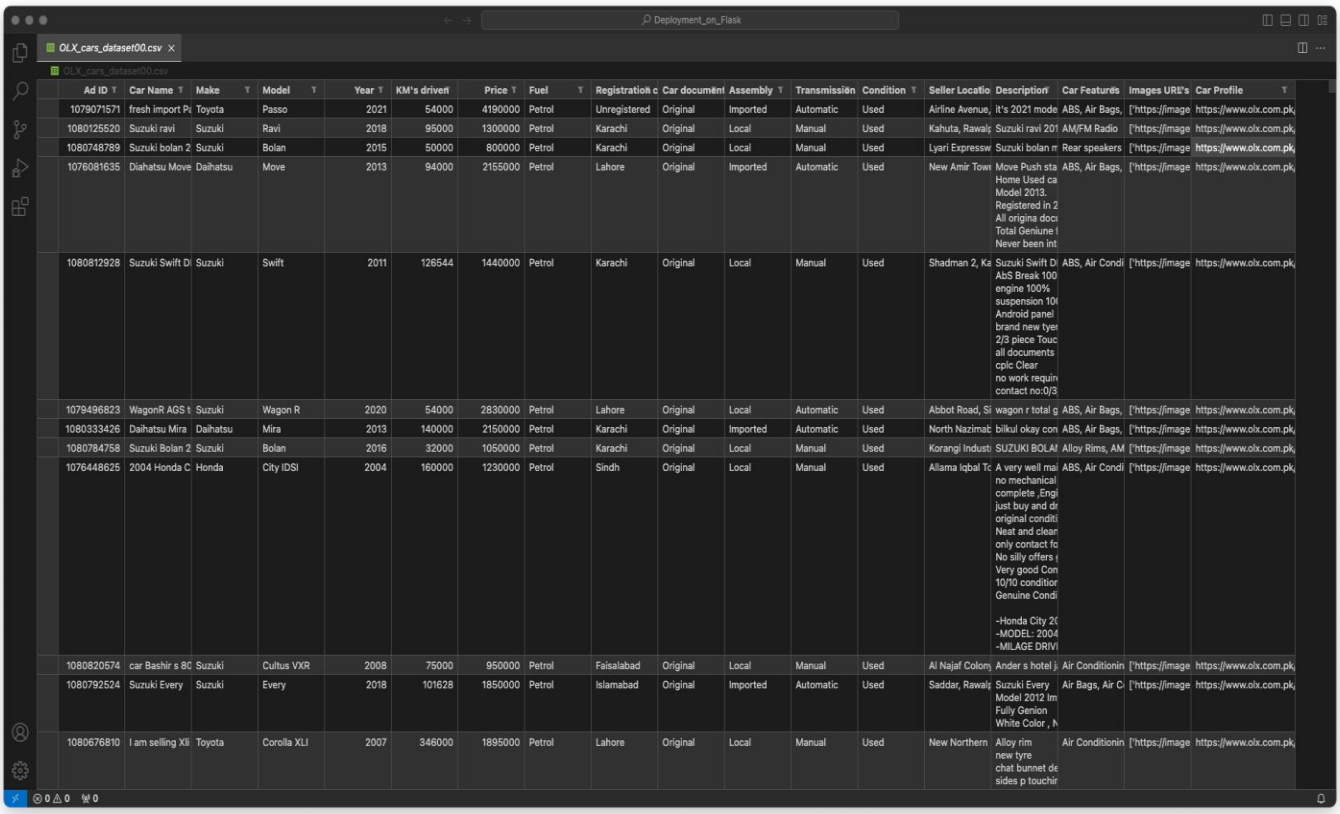
Batch Code: LISUM28

Submission Date: 27/12/2023

Submitted to: Data Glacier

Subject: Machine Learning Model Deployment on Heroku (API and Web based)

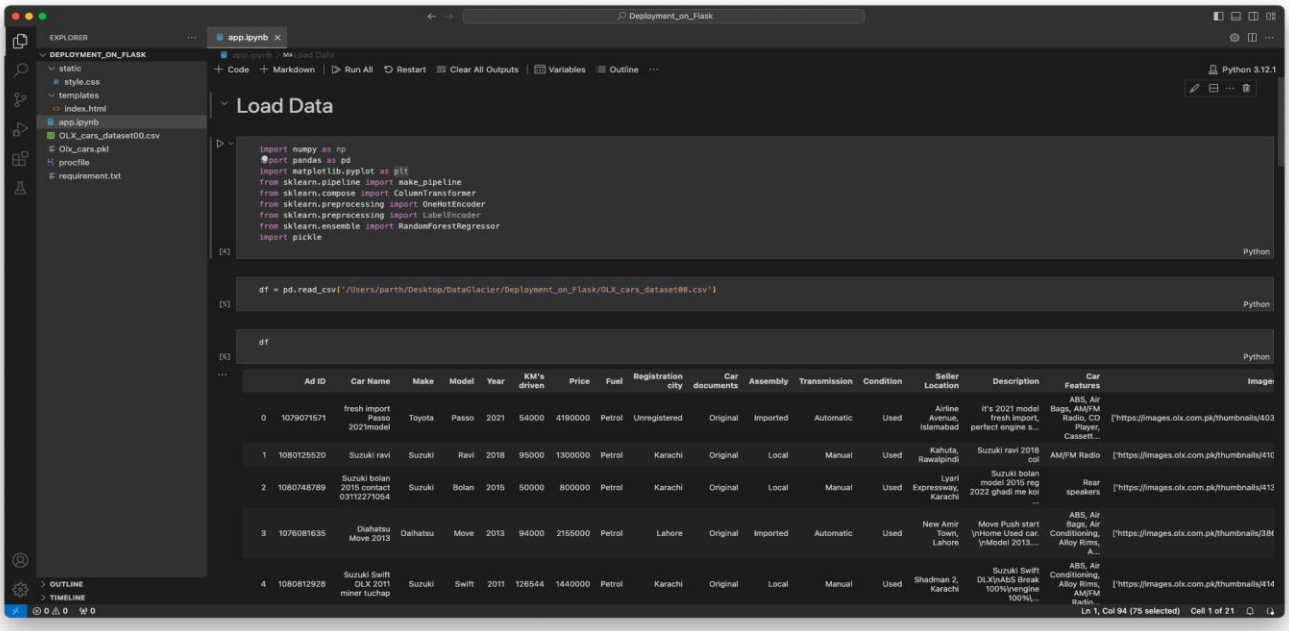
Step 1: Selecting Toy Dataset from Kaggle



Ad ID	Car Name	Make	Model	Year	KM's driven	Price	Fuel	Registration c	Car document	Assembly	Transmission	Condition	Seller Locatio	Description	Car Features	Images URL's	Car Profile
1079071571	fresh import P	Toyota	Passo	2021	54000	4190000	Petrol	Unregistered	Original	Imported	Automatic	Used	Airline Avenue,	it's 2021 mode	ABS, Air Bags,	["https://image	https://www.olx.com.pk
1080125520	Suzuki ravi	Suzuki	Ravi	2018	95000	1300000	Petrol	Karachi	Original	Local	Manual	Used	Kahuta, Rawalp	Suzuki ravi 201	AM/FM Radio	["https://image	https://www.olx.com.pk
1080748789	Suzuki bolan 2	Suzuki	Bolan	2015	50000	800000	Petrol	Karachi	Original	Local	Manual	Used	Lyari Expressw	Suzuki bolan m	Rear speakers	["https://image	https://www.olx.com.pk
1076081635	Diahatsu Move	Daihatsu	Move	2013	94000	2155000	Petrol	Lahore	Original	Imported	Automatic	Used	New Amir Town	Move Push sta Home Used ca Model 2013. Registered in 2 All origina docu Total Geniune Never been int	ABS, Air Bags,	["https://image	https://www.olx.com.pk
1080812928	Suzuki Swift D	Suzuki	Swift	2011	126544	1440000	Petrol	Karachi	Original	Local	Manual	Used	Shadman 2, Ka	Suzuki Swift D AbS Break 100 engine 100% suspension 10 Android panel brand new tyer 2/3 piece Touc all documents cpic Clear no work requir contact no:0/3	ABS, Air Condi	["https://image	https://www.olx.com.pk
1079496823	WagonR AGS t	Suzuki	Wagon R	2020	54000	2830000	Petrol	Lahore	Original	Local	Automatic	Used	Abbot Road, Si	wagon r total g	ABS, Air Bags,	["https://image	https://www.olx.com.pk
1080333426	Daihatsu Mira	Daihatsu	Mira	2013	140000	2150000	Petrol	Karachi	Original	Imported	Automatic	Used	North Nazimab	bilkul okay con	ABS, Air Bags,	["https://image	https://www.olx.com.pk
1080784758	Suzuki Bolan 2	Suzuki	Bolan	2016	32000	1050000	Petrol	Karachi	Original	Local	Manual	Used	Korangi Indust	SUZUKI BOLA	Alloy Rims, AM	["https://image	https://www.olx.com.pk
1076448625	2004 Honda C	Honda	City IDSI	2004	160000	1230000	Petrol	Sindh	Original	Local	Manual	Used	Allama Iqbal Tc	A very well mai no mechanical complete ,Engi just buy and dr original conditi Neat and clean only contact fo No silly offers Very good Con 10/10 condition Genuine Condi -Honda City 2(-MODEL: 2004 -MILAGE DRIV	ABS, Air Condi	["https://image	https://www.olx.com.pk
1080820574	car Bashir s 80	Suzuki	Cultus VXR	2008	75000	950000	Petrol	Faisalabad	Original	Local	Manual	Used	Al Najaf Colony	Ander s hotel j	Air Conditionin	["https://image	https://www.olx.com.pk
1080792524	Suzuki Every	Suzuki	Every	2018	101628	1850000	Petrol	Islamabad	Original	Imported	Automatic	Used	Saddar, Rawalp	Suzuki Every Model 2012 im Fully Genion White Color , N	Air Bags, Air C	["https://image	https://www.olx.com.pk
1080676810	I am selling Xli	Toyota	Corolla XLI	2007	346000	1895000	Petrol	Lahore	Original	Local	Manual	Used	New Northern	Alloy rim new tyre chat bunnet de sides p touchir	Air Conditionin	["https://image	https://www.olx.com.pk

Toy Dataset

Step 2: Model Building and Model Saving

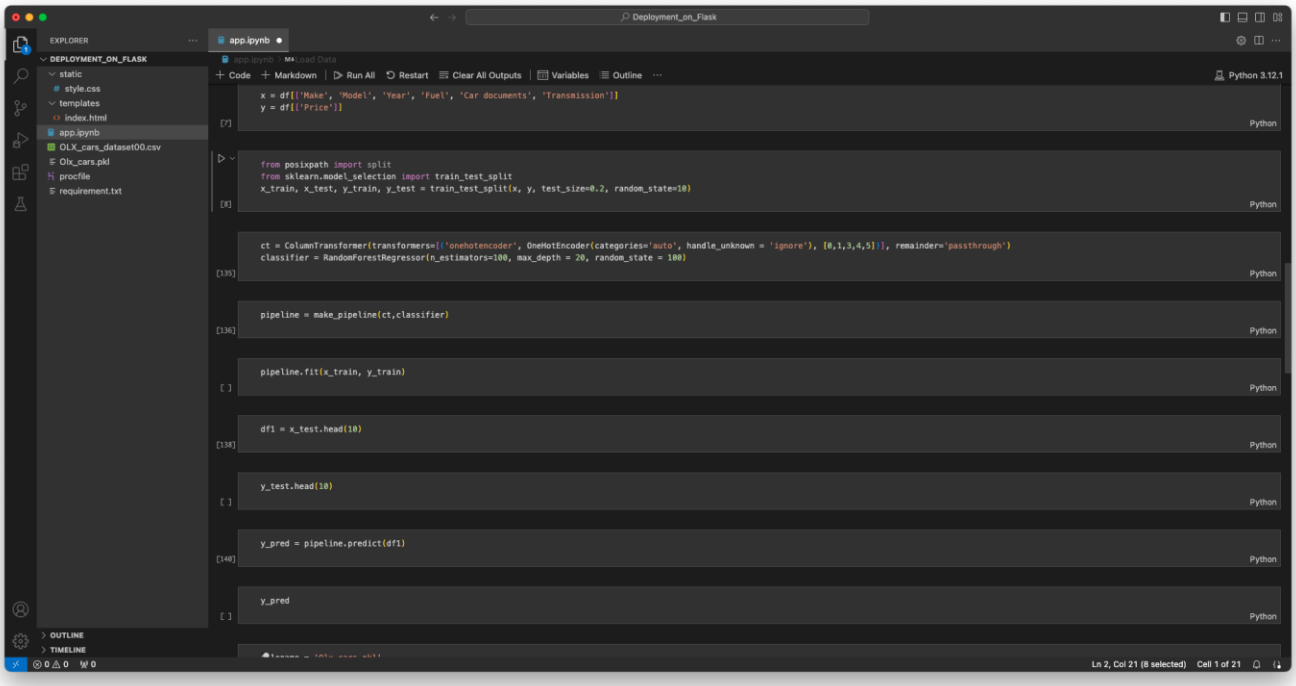


```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.pipeline import make_pipeline
from sklearn.compose import ColumnTransformer
from sklearn.preprocessing import OneHotEncoder
from sklearn.preprocessing import LabelEncoder
from sklearn.ensemble import RandomForestRegressor
import pickle
```

```
df = pd.read_csv('/Users/parth/Desktop/DataGlacier/Deployment_on_Flask/OLX_cars_dataset08.csv')
```

```
df
```

	Ad ID	Car Name	Make	Model	Year	KM's driven	Price	Fuel	Registration city	Car documents	Assembly	Transmission	Condition	Seller Location	Description	Car Features	Image
0	1079071571	fresh import Passo 2021model	Toyota	Passo	2021	54000	4190000	Petrol	Unregistered	Original	Imported	Automatic	Used	Airline Avenue, Islamabad	it's 2021 model fresh import, perfect engine s...	ABS, Air Bags, AM/FM Radio, CD Player, Casset...	['https://images.olx.com.pk/thumbnails/403
1	1080125520	Suzuki ravi	Suzuki	Ravi	2018	95000	1300000	Petrol	Karachi	Original	Local	Manual	Used	Kahuta, Rawalpindi	Suzuki ravi 2018 col	AM/FM Radio	['https://images.olx.com.pk/thumbnails/410
2	1080748789	Suzuki bolan 2015 contact 03112271054	Suzuki	Bolan	2015	50000	800000	Petrol	Karachi	Original	Local	Manual	Used	Lyari Expressway, Karachi	Suzuki bolan model 2015 reg 2022 ghadi me koi ...	Rear speakers	['https://images.olx.com.pk/thumbnails/413
3	1076081635	Diahatsu Move 2013	Daihatsu	Move	2013	94000	2155000	Petrol	Lahore	Original	Imported	Automatic	Used	New Amir Town, Lahore	Move Push start \nHome Used car. \nModel 2013....	ABS, Air Bags, Air Conditioning, Alloy Rims, A...	['https://images.olx.com.pk/thumbnails/386
4	1080812928	Suzuki Swift DLX 2011 miner tuchap	Suzuki	Swift	2011	126544	1440000	Petrol	Karachi	Original	Local	Manual	Used	Shadman 2, Karachi	Suzuki Swift DLX\nABS Break 100%\nengine 100%\...	ABS, Air Conditioning, Alloy Rims, AM/FM Radio...	['https://images.olx.com.pk/thumbnails/414



```
x = df[['Make', 'Model', 'Year', 'Fuel', 'Car documents', 'Transmission']]
y = df[['Price']]
```

```
from posixpath import split
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.2, random_state=10)
```

```
ct = ColumnTransformer(transformers=[('onehotencoder', OneHotEncoder(categories='auto', handle_unknown = 'ignore'), [0,1,3,4,5])], remainder='passthrough')
classifier = RandomForestRegressor(n_estimators=100, max_depth = 20, random_state = 100)
```

```
pipeline = make_pipeline(ct,classifier)
```

```
pipeline.fit(x_train, y_train)
```

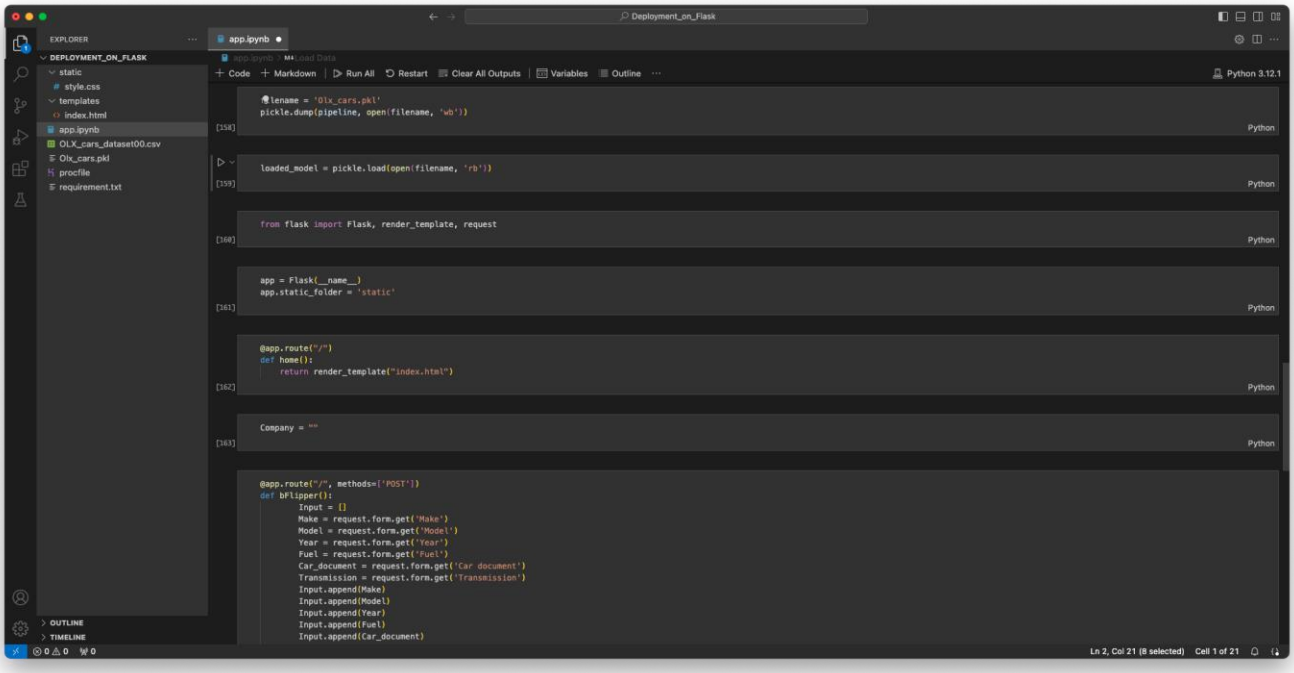
```
df1 = x_test.head(10)
```

```
y_test.head(10)
```

```
y_pred = pipeline.predict(df1)
```

```
y_pred
```

Step 3: Building Flask App



```
filename = 'Olx_cars.pkl'
pickle.dump(pipeline, open(filename, 'wb'))
```

```
loaded_model = pickle.load(open(filename, 'rb'))
```

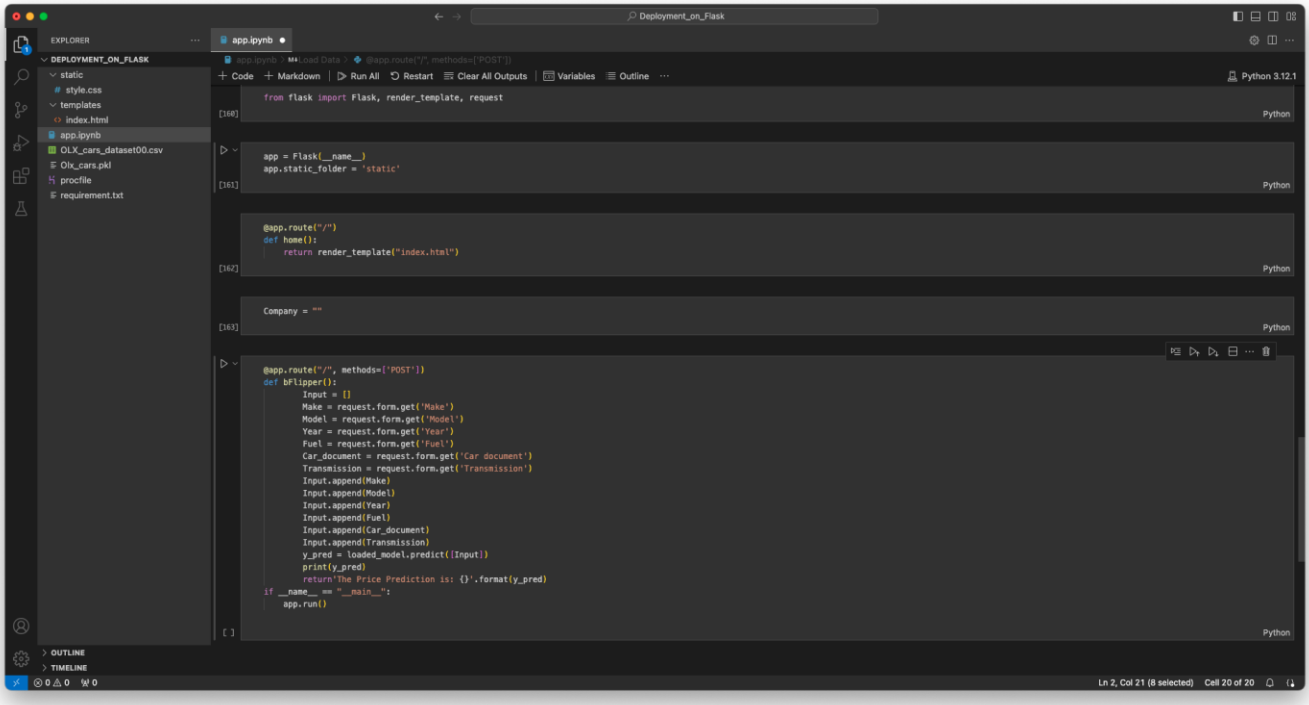
```
from flask import Flask, render_template, request
```

```
app = Flask(__name__)
app.static_folder = 'static'
```

```
@app.route("/")
def home():
    return render_template("index.html")
```

```
Company = ""
```

```
@app.route("/", methods=['POST'])
def bFlipper():
        Input = []
        Make = request.form.get('Make')
        Model = request.form.get('Model')
        Year = request.form.get('Year')
        Fuel = request.form.get('Fuel')
        Car_document = request.form.get('Car document')
        Transmission = request.form.get('Transmission')
        Input.append(Make)
        Input.append(Model)
        Input.append(Year)
        Input.append(Fuel)
        Input.append(Car_document)
```



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from flask import Flask, render_template, request
```

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```

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@app.route("/")
def home():
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Company = ""
```

```
@app.route("/", methods=['POST'])
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        Input = []
        Make = request.form.get('Make')
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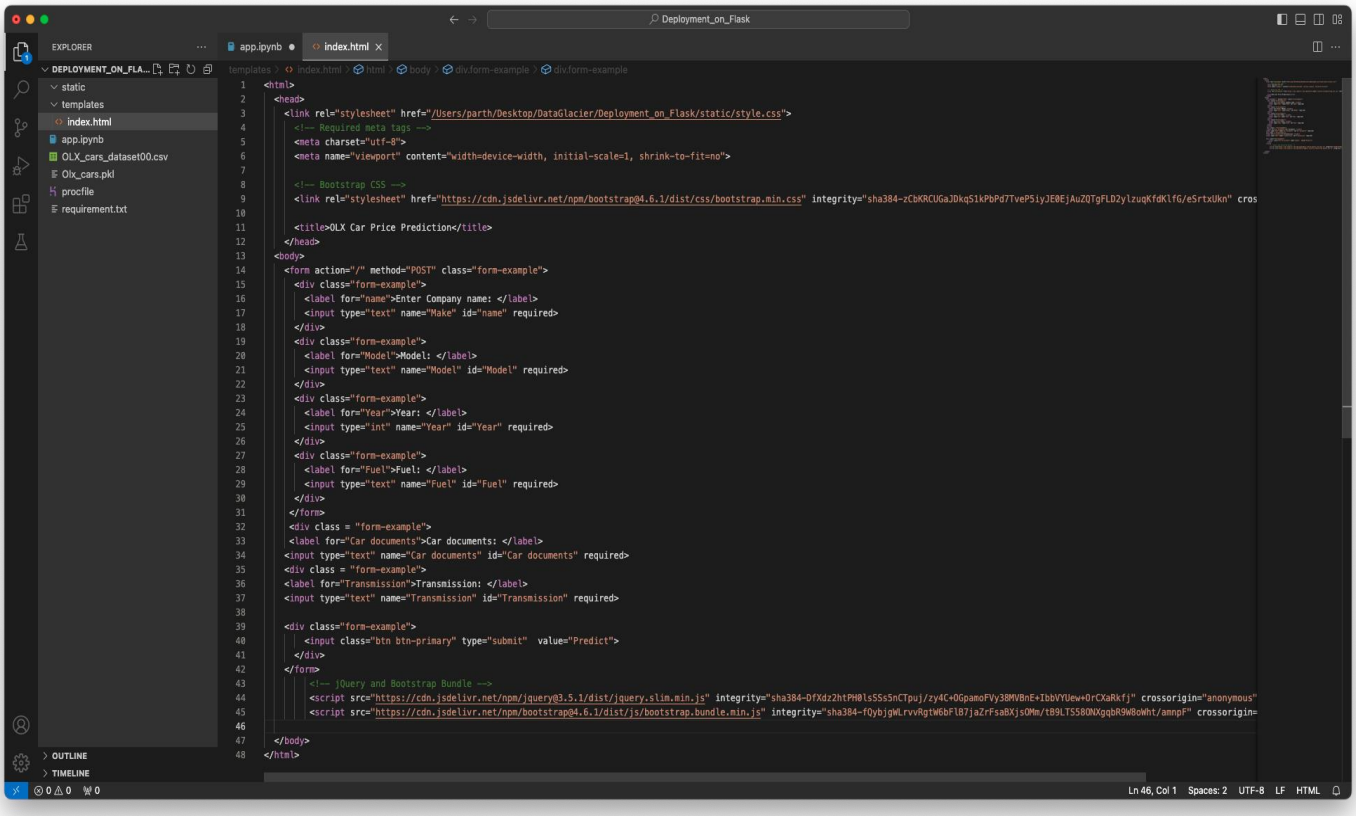
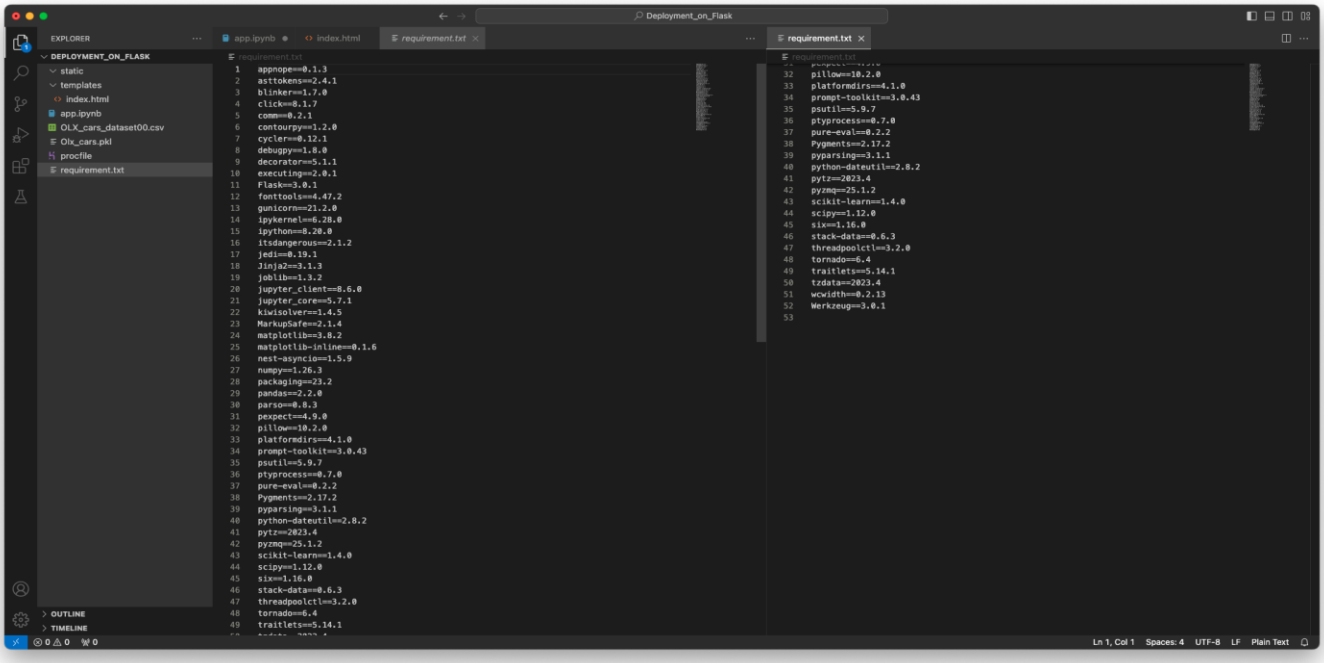
        Year = request.form.get('Year')
        Fuel = request.form.get('Fuel')
        Car_document = request.form.get('Car document')
        Transmission = request.form.get('Transmission')
        Input.append(Make)
        Input.append(Model)
        Input.append(Year)
        Input.append(Fuel)
        Input.append(Car_document)
        Input.append(Transmission)
        y_pred = loaded_model.predict([Input])
        print(y_pred)
        return'The Price Prediction is: {}'.format(y_pred)
if __name__ == "__main__":
    app.run()
```

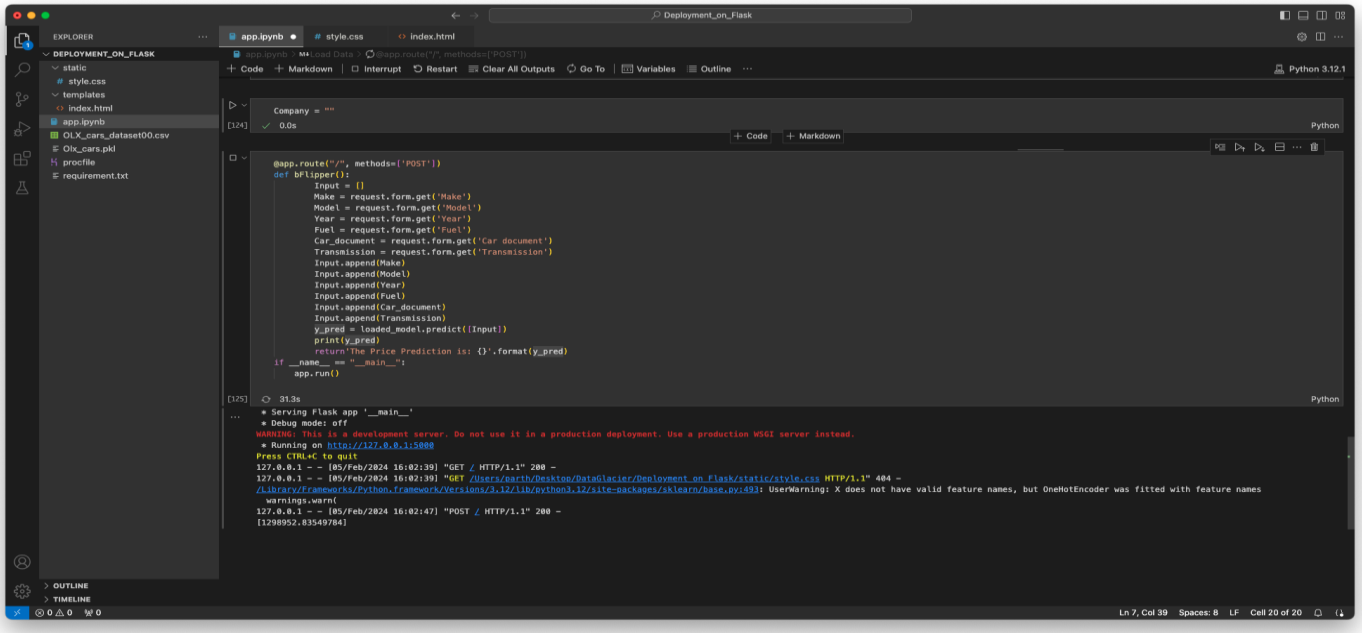
Step 4: Building HTML file



Step 5: Creating Requirment.txt file for deploying Flask app

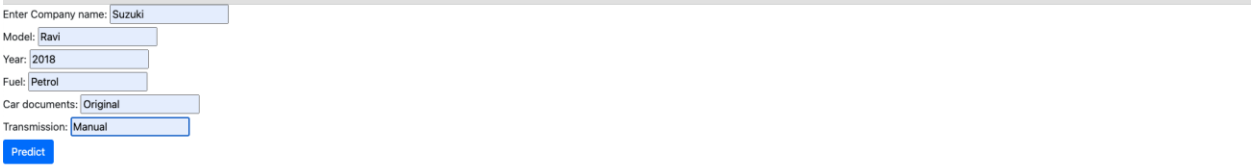


Step 6: Running Flask App



Step 7: Deployed Flask App

(1) Home Page



(2) Predicted Result