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Internship Batch code: LISUM19

Submitted date: 27th March 2023

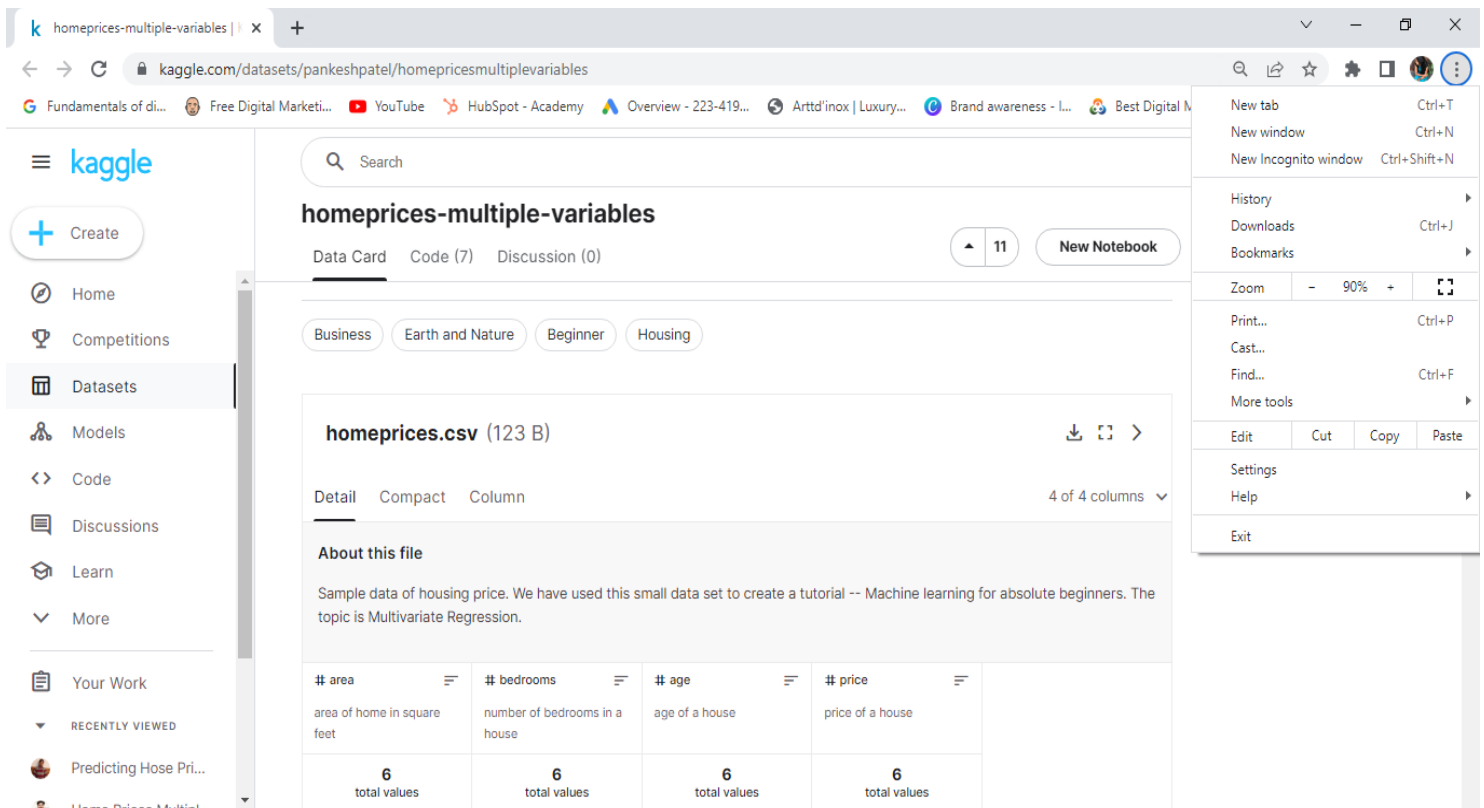
Submitted to: Data Glacier

Project Title: Flask deployment (Predictive analysis on Home Prices)

Data storage location:

https://github.com/HarikaReddyB/ML_model_deployment_on_Flask

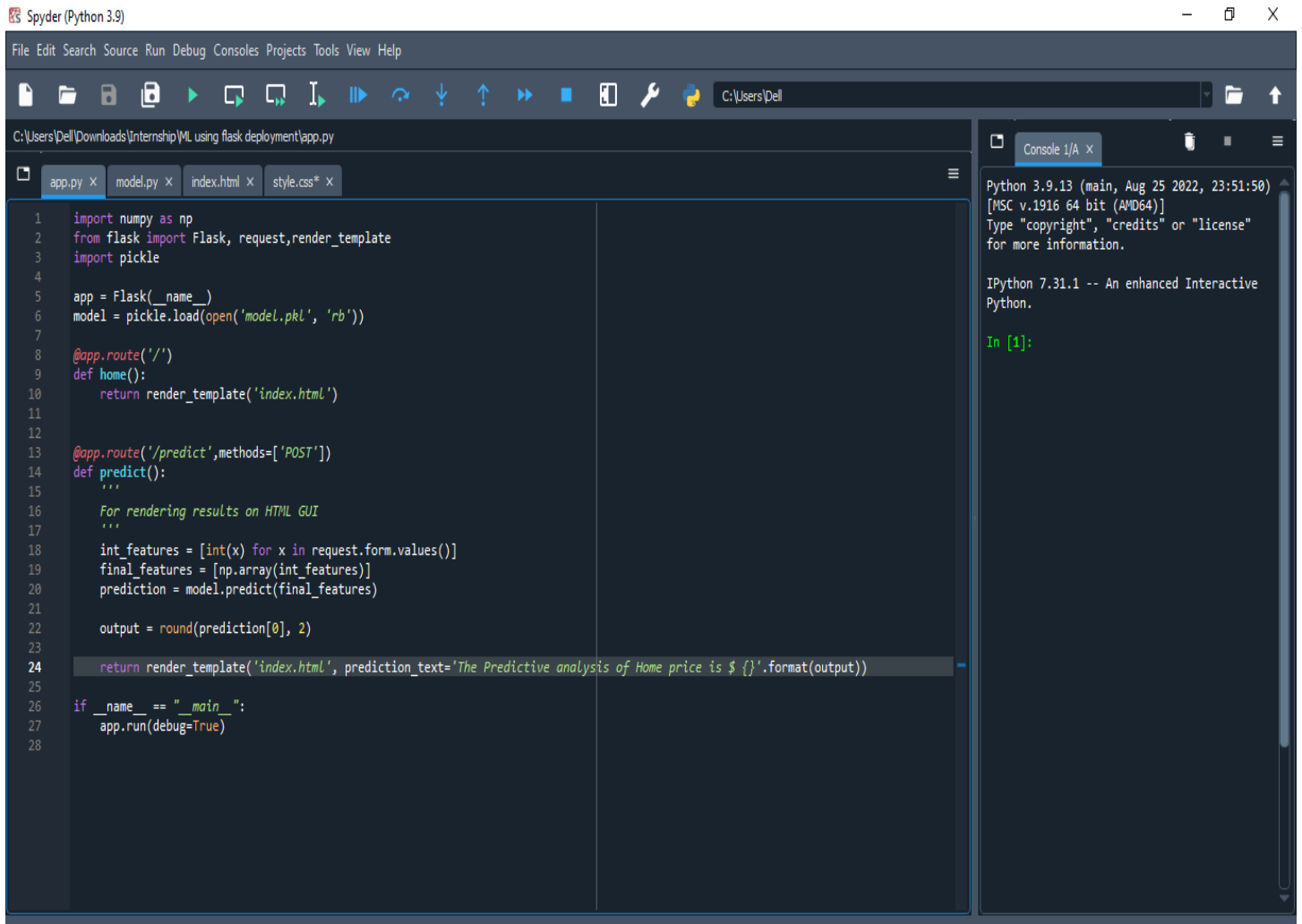
Downlaoding the dataset by Kaggle datasets:



The screenshot shows the Kaggle website interface. The browser address bar displays the URL: kaggle.com/datasets/pankeshpatel/homepricesmultiplevariables. The page title is "homeprices-multiple-variables". The left sidebar contains navigation links: Home, Competitions, Datasets (selected), Models, Code, Discussions, Learn, and More. Below these are "Your Work" and "RECENTLY VIEWED" sections. The main content area shows the dataset details for "homeprices.csv" (123 B). It includes a "Detail" tab, a "Compact" view, and a "Column" view. The "About this file" section states: "Sample data of housing price. We have used this small data set to create a tutorial -- Machine learning for absolute beginners. The topic is Multivariate Regression." Below this is a table showing the number of total values for each column:

# area	# bedrooms	# age	# price
area of home in square feet	number of bedrooms in a house	age of a house	price of a house
6 total values	6 total values	6 total values	6 total values

app.py for flask deployment



The image shows the Spyder Python IDE interface. The main editor displays the code for `app.py`, which is a Flask web application. The code imports `numpy`, `Flask`, and `pickle`. It initializes a Flask app, loads a pre-trained model from `model.pkl`, and defines two routes: a home page and a `/predict` endpoint. The `/predict` endpoint takes a POST request, processes the input features, and returns a prediction rounded to two decimal places. The console on the right shows the Python version (3.9.13) and the IPython version (7.31.1).

```
1 import numpy as np
2 from flask import Flask, request, render_template
3 import pickle
4
5 app = Flask(__name__)
6 model = pickle.load(open('model.pkl', 'rb'))
7
8 @app.route('/')
9 def home():
10     return render_template('index.html')
11
12
13 @app.route('/predict', methods=['POST'])
14 def predict():
15     """
16     For rendering results on HTML GUI
17     """
18     int_features = [int(x) for x in request.form.values()]
19     final_features = [np.array(int_features)]
20     prediction = model.predict(final_features)
21
22     output = round(prediction[0], 2)
23
24     return render_template('index.html', prediction_text='The Predictive analysis of Home price is $ {}'.format(output))
25
26 if __name__ == "__main__":
27     app.run(debug=True)
28
```

Python 3.9.13 (main, Aug 25 2022, 23:51:50)
[MSC v.1916 64 bit (AMD64)]
Type "copyright", "credits" or "license"
for more information.

IPython 7.31.1 -- An enhanced Interactive
Python.

In [1]:

Model.py

Spyder (Python 3.9)

File Edit Search Source Run Debug Consoles Projects Tools View Help

C:\Users\Dell

C:\Users\Dell\Downloads\Internship\ML using flask deployment\model.py

app.py x model.py x index.html x style.css* x

```
1 # Importing the libraries
2 import pandas as pd
3 import pickle
4
5 dataset = pd.read_csv('https://raw.githubusercontent.com/HarikaReddy8/Flask_deployment/main/homeprices.csv')
6
7 dataset = dataset[['area', 'bedrooms', 'age', 'price']]
8
9 # Replacing missing values
10 dataset['area'].fillna(dataset['area'].mean(), inplace=True)
11 dataset['bedrooms'].fillna(0, inplace=True)
12
13 X = dataset.iloc[:, :3]
14
15
16 y = dataset.iloc[:, -1]
17
18 from sklearn.linear_model import LinearRegression
19 regressor = LinearRegression()
20
21 #Fitting model with training data
22 regressor.fit(X, y)
23
24 # Saving model to disk
25 pickle.dump(regressor, open('model.pkl', 'wb'))
26
27 # Loading model to compare the results of analysis
28 model = pickle.load(open('model.pkl', 'rb'))
29 print(model.predict([[2200, 2, 5]]))
30
31
32
```

Console 1/A x

Python 3.9.13 (main, Aug 25 2022, 23:51:50)
[MSC v.1916 64 bit (AMD64)]
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IPython 7.31.1 -- An enhanced Interactive
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In [1]:

LSP Python: starting conda (Python 3.9.13) Line 6, Col 1 ASCII CRLF RW Mem 85%

Index.html

Spyder (Python 3.9)

File Edit Search Source Run Debug Consoles Projects Tools View Help

C:\Users\Del

C:\Users\Del\Downloads\Internship\ML using flask deployment\templates\index.html

```
app.py x model.py x index.html x style.css x
1 <!DOCTYPE html>
2 <html >
3 <head>
4   <meta charset="UTF-8">
5   <title>ML API</title>
6   <link href='https://fonts.googleapis.com/css?family=Pacifico' rel='stylesheet' type='text/css'>
7   <link href='https://fonts.googleapis.com/css?family=Arimo' rel='stylesheet' type='text/css'>
8   <link href='https://fonts.googleapis.com/css?family=Hind:300' rel='stylesheet' type='text/css'>
9   <link href='https://fonts.googleapis.com/css?family=Open+Sans+Condensed:300' rel='stylesheet' type='text/css'>
10  <link rel="stylesheet" href="{{ url_for('static', filename='css/style.css') }}">
11
12
13 </head>
14
15 <body>
16   <div class="Login">
17     <h1>Predictive analysis of Home Price</h1>
18
19     <!-- Main Input For Receiving Query to our ML -->
20     <form action="{{ url_for('predict')}}" method="post">
21       <input type="text" name="Area" placeholder="Area (in square feet)" required="required" />
22       <input type="text" name="no.of bed rooms" placeholder="Bed Rooms" required="required" />
23       <input type="text" name="age" placeholder="Age" required="required" />
24
25       <button type="submit" class="btn btn-primary btn-block btn-large">Predict</button>
26     </form>
27
28     <br>
29     <br>
30     {{ prediction_text }}
31
32   </div>
33
34 </body>
35 </html>
36
```

Console 1/A x

Python 3.9.13 (main, Aug 25 2022, 23:51:50)
[MSC v.1916 64 bit (AMD64)]
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for more information.

IPython 7.31.1 -- An enhanced Interactive
Python.

In [1]:

conda (Python 3.9.13) Line 28, Col 8 ASCII CRLF RW Mem 91%

Style.css

Spyder (Python 3.9)

File Edit Search Source Run Debug Consoles Projects Tools View Help

C:\Users\Del

C:\Users\Del\Downloads\Internship\ML using flask deployment\static\css\style.css

```
app.py x model.py x index.html x style.css* x
1 @import url('https://fonts.googleapis.com/css?family=Open+Sans');
2 .btn { display: inline-block; *display: inline; *zoom: 1; padding: 4px 10px 4px; margin-bottom: 0; font-size: 13px; line-height: 18px; color: #333333; text-
3 .btn:hover, .btn.active, .btn.active, .btn.disabled, .btn[disabled] { background-color: #e6e6e6; }
4 .btn-large { padding: 9px 14px; font-size: 15px; line-height: normal; -webkit-border-radius: 5px; -moz-border-radius: 5px; border-radius: 5px; }
5 .btn:hover { color: #333333; text-decoration: none; background-color: #e6e6e6; background-position: 0 -15px; -webkit-transition: background-position 0.1s lin
6 .btn-primary, .btn-primary:hover { text-shadow: 0 -1px 0 rgba(0, 0, 0, 0.25); color: #ffffff; }
7 .btn-primary.active { color: rgba(255, 255, 255, 0.75); }
8 .btn-primary { background-color: #4a77d4; background-image: -moz-linear-gradient(top, #6eb6de, #4a77d4); background-image: -ms-linear-gradient(top, #6eb6de,
9 .btn-primary:hover, .btn-primary.active, .btn-primary.active, .btn-primary.disabled, .btn-primary[disabled] { filter: none; background-color: #4a77d4; }
10 .btn-block { width: 100%; display: block; }
11
12 * { -webkit-box-sizing: border-box; -moz-box-sizing: border-box; -ms-box-sizing: border-box; -o-box-sizing: border-box; box-sizing: border-box; }
13
14 html { width: 100%; height: 100%; overflow: hidden; }
15
16 body {
17     width: 100%;
18     height: 100%;
19     font-family: 'Open Sans', sans-serif;
20     color: #fff;
21     font-size: 18px;
22     text-align: center;
23     letter-spacing: 1.2px;
24     background: #383838 !important;
25     filter: progid:DXImageTransform.Microsoft.gradient( startColorstr='#3E1D6D', endColorstr='#092756', GradientType=1 );
26
27 }
28 .login {
29     position: absolute;
30     top: 40%;
31     left: 50%;
32     margin: -150px 0 0 -150px;
33     width: 400px;
34     height: 400px;
35 }
36
37 .login h1 { color: #fff; text-shadow: 0 0 10px rgba(0,0,0,0.3); letter-spacing: 1px; text-align: center; }
38
39 input {
40     width: 100%;
41     height: 40px;
42     border: 1px solid #ccc;
43     border-radius: 5px;
44     margin-top: 10px;
45     margin-bottom: 10px;
46     padding: 5px 10px;
47     font-size: 14px;
48     font-family: 'Open Sans', sans-serif;
49     color: #333;
50     background-color: #fff;
51     background-image: -moz-linear-gradient(to top, #fff 49%, #f9f9f9 49%, #f9f9f9 51%, #fff 51%);
52     background-image: -ms-linear-gradient(to top, #fff 49%, #f9f9f9 49%, #f9f9f9 51%, #fff 51%);
53     background-image: linear-gradient(to top, #fff 49%, #f9f9f9 49%, #f9f9f9 51%, #fff 51%);
54     background-size: 100% 3px;
55     background-position: bottom, top, top, bottom;
56     background-repeat: repeat, repeat, repeat, repeat;
57 }
```

Console 1/A x

Python 3.9.13 (main, Aug 25 2022, 23:51:50)
[MSC v.1916 64 bit (AMD64)]
Type "copyright", "credits" or "license"
for more information.

IPython 7.31.1 -- An enhanced Interactive
Python.

In [1]:

conda (Python 3.9.13) Line 22, Col 20 ASCII CRLF RW Mem 86%

Executing the Flask on Command Prompt

```
Command Prompt - python app.py
C:\Users\Dell\Downloads>cd internship
C:\Users\Dell\Downloads\Internship>cd ml using flask deployment
C:\Users\Dell\Downloads\Internship\ML using flask deployment>python app.py
C:\Users\Dell\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\base.py:318: UserWarning: Trying to unpickle estimator LinearRegression from version 0.2
2.1 when using version 1.2.2. This might lead to breaking code or invalid results. Use at your own risk. For more info please refer to:
https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitations
  warnings.warn(
* Serving Flask app 'app'
* 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
C:\Users\Dell\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\base.py:318: UserWarning: Trying to unpickle estimator LinearRegression from version 0.2
2.1 when using version 1.2.2. This might lead to breaking code or invalid results. Use at your own risk. For more info please refer to:
https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitations
  warnings.warn(
* Debugger is active!
* Debugger PIN: 252-841-195
127.0.0.1 - - [27/Mar/2023 12:15:59] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [27/Mar/2023 12:16:01] "GET /static/css/style.css HTTP/1.1" 200 -
127.0.0.1 - - [27/Mar/2023 12:16:22] "POST /predict HTTP/1.1" 200 -
127.0.0.1 - - [27/Mar/2023 12:16:23] "GET /static/css/style.css HTTP/1.1" 304 -
127.0.0.1 - - [27/Mar/2023 12:16:38] "POST /predict HTTP/1.1" 200 -
127.0.0.1 - - [27/Mar/2023 12:16:38] "GET /static/css/style.css HTTP/1.1" 304 -
127.0.0.1 - - [27/Mar/2023 12:16:43] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [27/Mar/2023 12:16:43] "GET /static/css/style.css HTTP/1.1" 304 -
```

Testing for analysis:

ML API

127.0.0.1:5000

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Predictive analysis of Home Price

Area (in square feet)

Bed_Rooms

Age

Predict

ML API

x +

127.0.0.1:5000/predict

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Predictive analysis of Home Price

Area (in square feet)

Bed_Rooms

Age

Predict

The Predictive analysis of Home price is \$
6113926.9