Model Deployment using Flask

Name: Richa Mishra

Batch code: LISUM30

Submission date: 08/13/2023

Overview

- Deploying your basic machine learning model
- Learn how to use Flask to deploy a machine learning model into production
- Model deployment is a core topic in data scientist interviews – so start learning!

Abstract

This project has been written for the beginners of model deployment. With a simple linear regression example, a model was created on Spyder using Flask.

Model Deployment?

Deployment is the method by which you integrate a machine learning model into an existing production environment to make practical business decisions based on data. In this way, we turn the model we have created into a product. At the same time, we offer the product to the user side.

What is Flask?

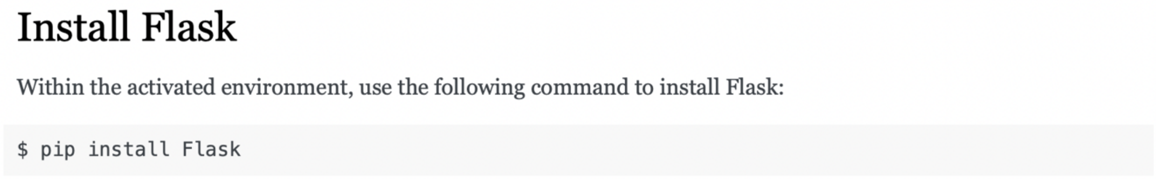
Flask

web development,
one drop at a time

Flask is a micro web framework written in Python. It is classified as a microframework because it does not require particular tools or libraries. Extensions exist for object-relational mappers, form validation, upload handling, various open authentication technologies, and several common framework-related tools. The only feature that distinguishes Flask from other frameworks is that it is very easy to use.

Installing Flask on your Machine

Installing Flask is simple and straightforward. I generally use pip installed.



Install Flask

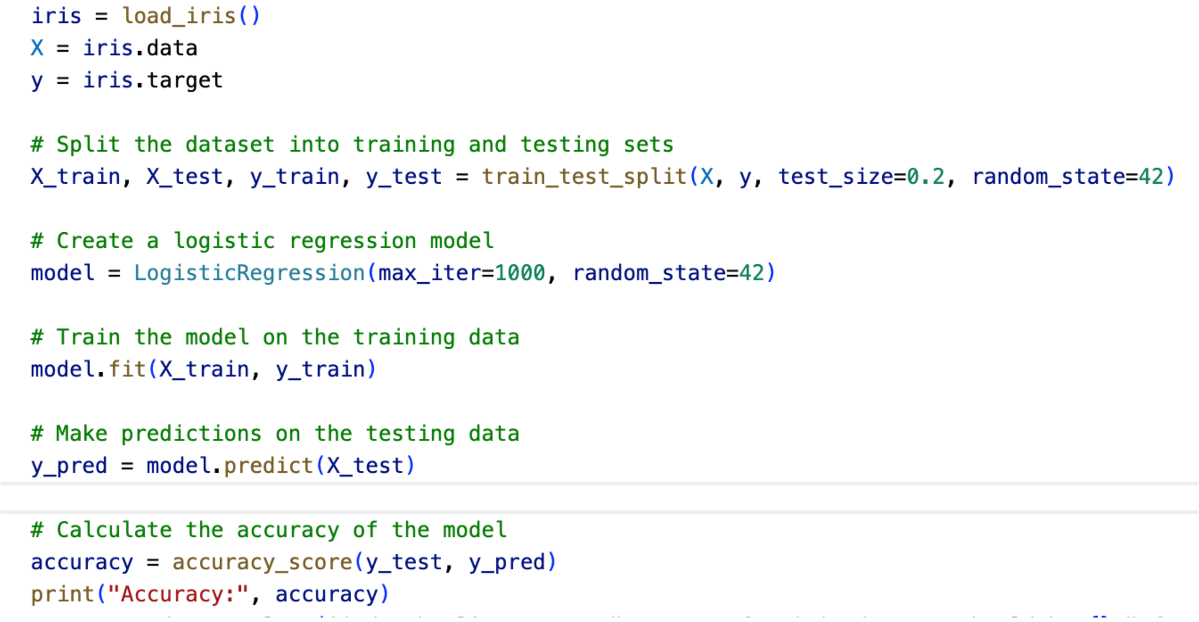
Within the activated environment, use the following command to install Flask:

```
$ pip install Flask
```

That's it. We are ready to deploying your machine learning model.

Build Machine Learning Model

I have take a sample iris data set and applied logistic regression to it :

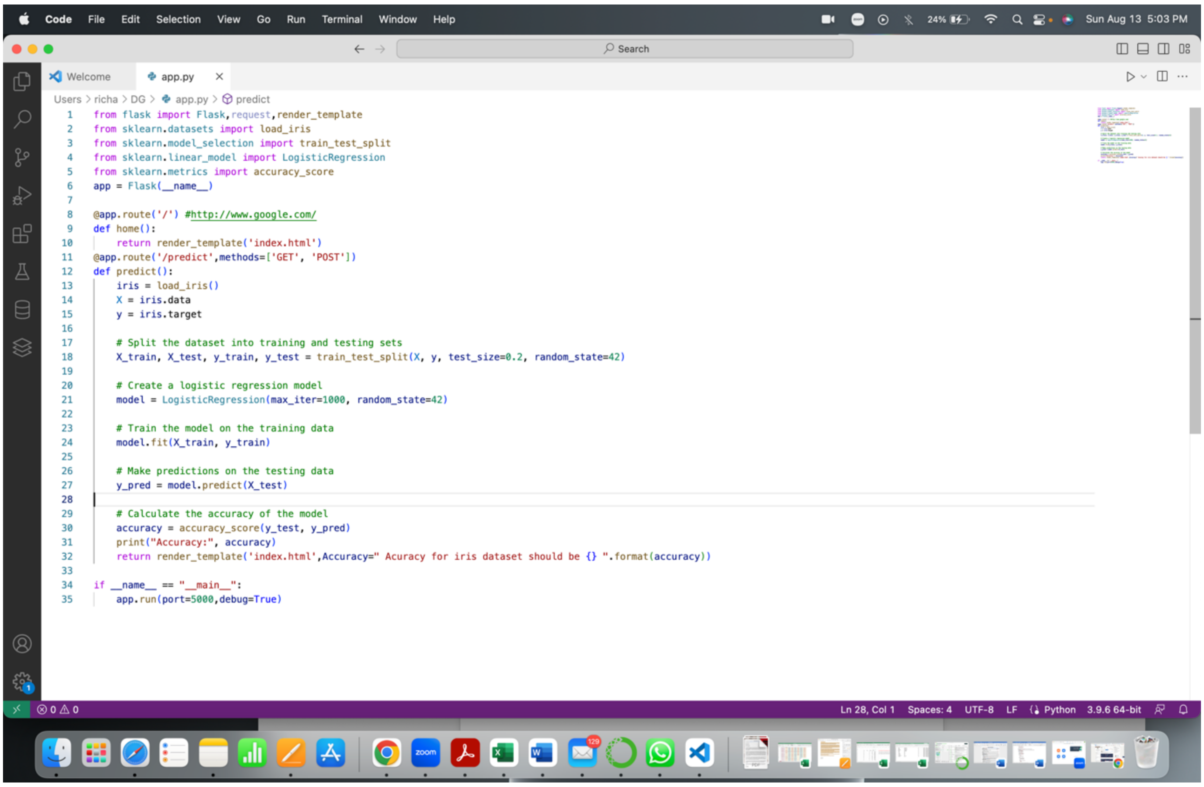


```
iris = load_iris()
X = iris.data
y = iris.target

# Split the dataset into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# Create a logistic regression model
model = LogisticRegression(max_iter=1000, random_state=42)

# Train the model on the training data
model.fit(X_train, y_train)

# Make predictions on the testing data
y_pred = model.predict(X_test)
```

```
# Calculate the accuracy of the model
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
```

Here I have trained the dataset using model.fit and then tried to predict the model using model.predict.

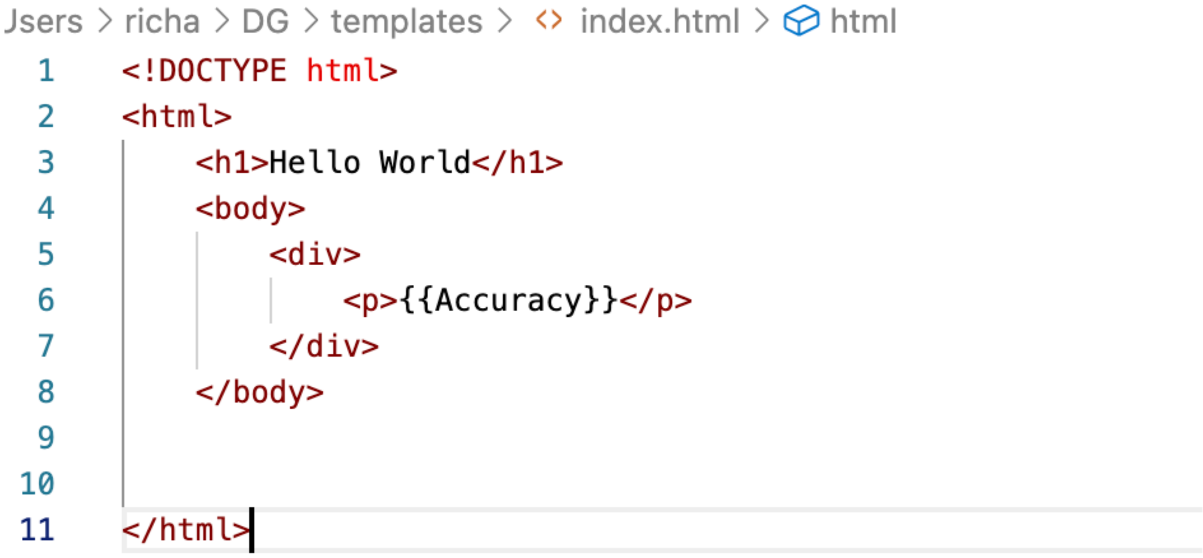
Project Snapshots



Code File Edit Selection View Go Run Terminal Window Help
Sun Aug 13 5:03 PM
Search
Welcome
app.py
Users > richa > DG > app.py > predict
Ln 28, Col 1 Spaces: 4 UTF-8 LF Python 3.9.6 64-bit

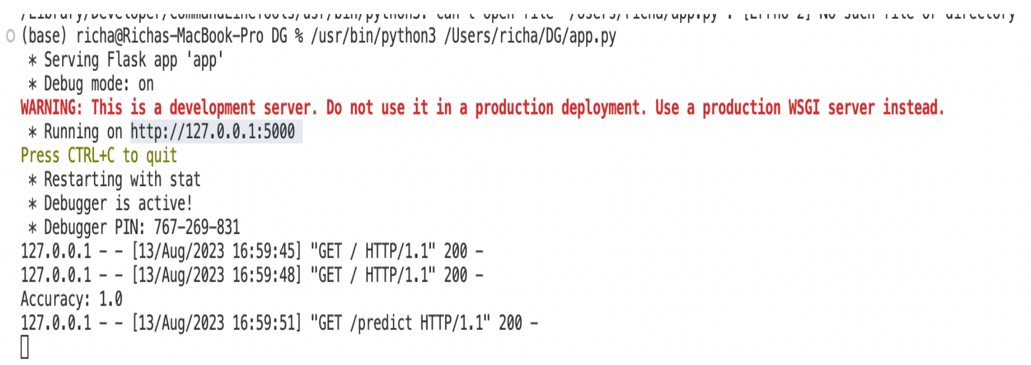
```python
from flask import Flask,request,render_template
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score
app = Flask(__name__)

@app.route('/') #http://www.google.com/
def home():
    return render_template('index.html')
@app.route('/predict',methods=['GET', 'POST'])
def predict():
    iris = load_iris()
    X = iris.data
    y = iris.target

    # Split the dataset into training and testing sets
    X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

    # Create a logistic regression model
    model = LogisticRegression(max_iter=1000, random_state=42)

    # Train the model on the training data
    model.fit(X_train, y_train)

    # Make predictions on the testing data
    y_pred = model.predict(X_test)

    # Calculate the accuracy of the model
    accuracy = accuracy_score(y_test, y_pred)
    print("Accuracy:", accuracy)
    return render_template('index.html',Accuracy=" Acuracy for iris dataset should be {} ".format(accuracy))

if __name__ == "__main__":
    app.run(port=5000,debug=True)
```

The basic Index.html



```html
<!DOCTYPE html>
<html>
    <h1>Hello World</h1>
    <body>
        <div>
            <p>{{Accuracy}}</p>
        </div>
    </body>


</html>
```

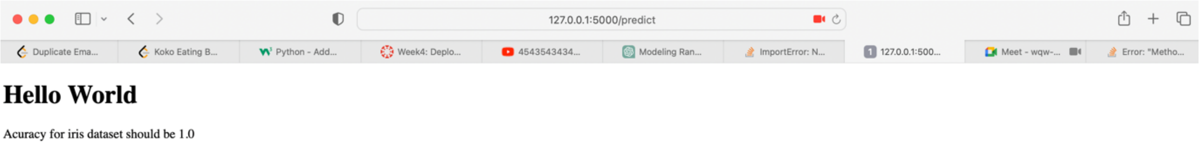
The model running on the following port : http://127.0.0.1:5000



```
/Library/Developer/CommandLineTools/usr/bin/python3: can't open file '/Users/richa/app.py': [Errno 2] No such file or directory
○ (base) richa@Richas-MacBook-Pro DG % /usr/bin/python3 /Users/richa/DG/app.py
 * 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
 * Debugger is active!
 * Debugger PIN: 767-269-831
127.0.0.1 - - [13/Aug/2023 16:59:45] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [13/Aug/2023 16:59:48] "GET / HTTP/1.1" 200 -
Accuracy: 1.0
127.0.0.1 - - [13/Aug/2023 16:59:51] "GET /predict HTTP/1.1" 200 -
▯
```

Working of the Deployed Model

We have successfully started the Flask server! Open your browser and go to this address – http://127.0.0.1:5000/predict. You will see that the Flask server has rendered the default template.



Hello World

Acuracy for iris dataset should be 1.0