



Data Glacier

Your Deep Learning Partner

Deployment on Flask

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Steps

1. Select toy data.
2. Create a simple model and save it.
3. Deploy the model on Flask.
4. Web app results.

Data

```
|  total_bill  sex smoker    day    time  size  tip
0      12.16  1.0   Yes  Friday  Lunch    2  2.20
1      21.50  1.0    No  Sunday  Dinner    4  3.50
2      10.33  0.0    No Thursday  Lunch    2  2.00
3      14.78  1.0    No  Sunday  Dinner    2  3.23
4      18.04  1.0    No  Sunday  Dinner    2  3.00
..      ...   ...   ...    ...    ...   ...   ...
194     18.28  1.0    No  Thursday  Lunch    2  4.00
195     17.29  1.0    No  Thursday  Lunch    2  2.71
196     18.43  1.0    No  Sunday  Dinner    4  3.00
197     18.78  0.0    No  Thursday  Dinner    2  3.00
198     15.98  0.0    No  Friday  Lunch    3  3.00
```

```
[199 rows x 7 columns]
```

- The tip data was used for this process.
- Only 4 columns were considered to keep the model simple (total_bill, sex, size and tip)

Model

- A linear model was used and saved for the deployment purpose.

```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
import pickle

df = pd.read_csv('my_tipdata.csv')
pd.DataFrame(df, columns=['total_bill', 'sex', 'smoker', 'day', 'time', 'size', 'tip'])
df.sex = df.sex.astype('category')

X = df[['total_bill', 'sex', 'size']]
Y = df['tip']

from sklearn.linear_model import LinearRegression
regressor = LinearRegression()
regressor.fit(X, Y)
pickle.dump(regressor, open('model.pkl', 'wb'))
model = pickle.load(open('model.pkl', 'rb'))
```

The html and CSS

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="UTF-8">
  <title>Deployment Tutorial with Flask</title>
  <link href='https://fonts.googleapis.com/css?family=Pacifico' rel='stylesheet' type='text/css'>
  <link href='https://fonts.googleapis.com/css?family=Arimo' rel='stylesheet' type='text/css'>
  <link href='https://fonts.googleapis.com/css?family=Open+Sans+Condensed:300' rel='stylesheet' type='text/css'>
  <link rel="stylesheet" href="{{ url_for('static', filename='css/style.css') }}">
</head>

<body style="background: #000;">
  <div class="login">
    <h1>Tip Forecasting</h1>

    <!-- Main Input For Receiving Query to our ML -->
    <form action="{{ url_for('predict') }}" method="post">
      <input type="text" name="Total Bill" placeholder="Total bill" required="required" />
      <input type="text" name="Gender" placeholder="0 - Female 1 - Male" required="required" />
      <input type="text" name="Size" placeholder="Size of people" required="required" />
      <button type="submit" class="btn btn-primary btn-block btn-large">Predict tip </button>
    </form>

    <br>
    <br>
    {{ prediction_text }}

  </div>
</body>
</html>
```

```
html { width: 100%; height:100%; overflow:hidden; }

body {
  width: 100%;
  height:100%;
  font-family: 'Helvetica';
  background: #000;
  color: #fff;
  font-size: 24px;
  text-align:center;
  letter-spacing:1.4px;
}

.login {
  position: absolute;
  top: 40%;
  left: 50%;
  margin: -150px 0 0 -150px;
  width:400px;
  height:400px;
}

.login h1 { color: #fff; text-shadow: 0 0 10px rgba(0,0,0,0.3); letter-spacing:1px; text-align:center; }

input {
  width: 100%;
  margin-bottom: 10px;
  background: rgba(0,0,0,0.3);
  border: none;
  outline: none;
  padding: 10px;
  font-size: 13px;
  color: #fff;
  text-shadow: 1px 1px 1px rgba(0,0,0,0.3);
  border: 1px solid rgba(0,0,0,0.3);
  border-radius: 4px;
```

The App

```
import numpy as np
from flask import Flask, request, jsonify, render_template
import pickle

app = Flask(__name__)
model = pickle.load(open('model.pkl', 'rb'))

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

@app.route('/predict', methods=['POST'])
def predict():

    int_features = [float(x) for x in request.form.values()]
    final_features = [np.array(int_features)]
    prediction = model.predict(final_features)

    output = round(prediction[0], 2)

    return render_template('index.html', prediction_text='Tip should be $ {}'.format(output))

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

Deployment

```
* Serving Flask app "app" (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: on
* Restarting with stat
* Debugger is active!
* Debugger PIN: 268-131-083
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
127.0.0.1 - - [16/Mar/2021 14:13:38] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [16/Mar/2021 14:14:58] "POST /predict HTTP/1.1" 200 -
127.0.0.1 - - [16/Mar/2021 14:15:14] "POST /predict HTTP/1.1" 200 -
127.0.0.1 - - [16/Mar/2021 14:15:21] "POST /predict HTTP/1.1" 200 -
```

Web app



Tip Forecasting

Total bill

0 - Female 1 - Male

Size of people

Predict tip

Try examples



Tip Forecasting

23.17

1

4

Predict tip

Predict



Tip Forecasting

Total bill

0 - Female 1 - Male

Size of people

Predict tip

Tip should be \$ 3.49