

## Deployment on Flask

In this report, a demo of creating a simple machine learning model and deploy it using flask is created. The used dataset is derived from Kaggle. It discusses the probability of a patient to get a heart attack or not using Logistic regression. The model takes 13 features – various heart rate reading including blood sugar and pressure -. An HTML form is created to take the patient readings. The values of the form are sent to the web app to interact with the model, then return the result back to the HTML page.

### The model code (model\_creation.py):

```

1 #Imports
2 import pandas as pd
3 import numpy as np
4 from sklearn.preprocessing import StandardScaler
5 from sklearn.model_selection import train_test_split
6 from sklearn.linear_model import LogisticRegression
7 from sklearn.pipeline import Pipeline
8 import pickle
9 #Read dataset
10 data = pd.read_csv('heart.csv')
11 #Split dataset
12 y = data["target"]
13 X = data.drop('target',axis=1)
14 X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.20, random_state = 0)
15 # Create and train the model
16 pipe = Pipeline([('scaler', StandardScaler()), ('Logistic Regression', LogisticRegression())])
17 pipe.fit(X_train, y_train)
18 #Save the model
19 pickle.dump(pipe, open('pipemodel.pkl', 'wb'))

```

### HTML page code (index.html):

```

151 </head>
152 <body>
153 <div class="container">
154   <form id="contact" action="{ url_for('predict') }" method="post">
155     <h3>Heart Attack Predictor</h3>
156     <input placeholder="Age" name="age" type="text" required autofocus>
157     <input placeholder="Sex: 0-female 1-male" name="sex" type="text" required>
158     <input placeholder="chest pain type: 0-3" name='cp' type="text" required>
159     <input placeholder="resting blood pressure: 94-200" name='trestbps' type="text" required>
160     <input placeholder="serum cholestoral in mg/dl: 120-560" name='chol' type="text" required>
161     <input placeholder="fasting blood sugar > 120 mg/dl: 0-1" name='fbs' type="text" required>
162     <input placeholder="resting electrocardiographic results: 0-2" name='restecg' type="text" required>
163     <input placeholder="maximum heart rate achieved:70-202" name='thalach' type="text" required>
164     <input placeholder="exercise induced angina: 0-1" name='exang' type="text" required>
165     <input placeholder="ST depression induced by exercise relative to rest: 0-6.2" name='oldpeak' type="text" required>
166     <input placeholder="the slope of the peak exercise ST segment: 0-2" name='slope' type="text" required>
167     <input placeholder="number of major vessels: 0-3" name='ca' type="text" required>
168     <input placeholder="thal: 1-normal 2-fixed defect 3-reversible defect" name='thal' type="text" required>
169     <button name="submit" type="submit" id="contact-submit">Predict</button>
170   </form>
171 </div>
172 <h1> 1: More likely to get a heart attack</h1>
173 <h1> 0: Less likely to get a heart attack</h1>
174 <h1> {{ prediction_text }}</h1>
175 </body>
176
177 </html>

```

**Web app code (app.py):**

```
app.py
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('pipemodel.pkl', 'rb'))
7
8 @app.route('/')
9 def home():
10     return render_template('index.html')
11
12 @app.route('/predict', methods=['POST'])
13 def predict():
14     """
15     For rendering results on HTML GUI
16     """
17     int_features = [x for x in request.form.values()]
18     temp = int_features[0:13]
19     int_feature = [int(float(x)) for x in temp]
20     final_features = [np.array(int_feature)]
21     prediction = model.predict(final_features)
22     string = "Status: {}".format(prediction)
23     return render_template('index.html', prediction_text=string)
24
25 if __name__ == "__main__":
26     app.run(debug=True)
```

**Output:**

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### Heart Attack Predictor

Age
Sex: 0-female 1-male
chest pain type: 0-3
resting blood pressure: 94-200
serum cholestoral in mg/dl: 120-560
fasting blood sugar > 120 mg/dl: 0-1
resting electrocardiographic results: 0-2)
maximum heart rate achieved: 70-202
exercise induced angina: 0-1
ST depression induced by exercise relative to rest: 0-6.2
the slope of the peak exercise ST segment: 0-2
number of major vessels: 0-3
thal: 1-normal 2-fixed defect 3-reversible defect

Predict

**1: More likely to get a heart attack**  
**0: Less likely to get a heart attack**

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### Heart Attack Predictor

22
0
1
100
100
1
1
100
1
3
1
1
1

Predict

**1: More likely to get a heart attack**  
**0: Less likely to get a heart attack**

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### Heart Attack Predictor

Age
Sex: 0-female 1-male
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the slope of the peak exercise ST segment: 0-2
number of major vessels: 0-3
that: 1-normal 2-fixed defect 3-reversible defect

Predict

**1: More likely to get a heart attack**  
**0: Less likely to get a heart attack**  
**Status: [1]**