

Name: Faris Chaudhry
Batch Code: LISUM25
Submission Date: 08/31/23

Repository: <https://github.com/farischaudhry/heroku-demo>

Toy Data Set, Model Training, Flask Code (From Week 4)

Diabetes data set (https://scikit-learn.org/stable/datasets/toy_dataset.html)

442 samples; 10 features (described below) along with target value.

Features are scaled by mean and std deviation; no null entries or wrong data.

Number of Instances:	442
Number of Attributes:	First 10 columns are numeric predictive values
Target:	Column 11 is a quantitative measure of disease progression one year after baseline
Attribute Information:	<ul style="list-style-type: none">• age age in years• sex• bmi body mass index• bp average blood pressure• s1 tc, total serum cholesterol• s2 ldl, low-density lipoproteins• s3 hdl, high-density lipoproteins• s4 tch, total cholesterol / HDL• s5 ltg, possibly log of serum triglycerides level• s6 glu, blood sugar level

The MEANS Procedure			
Variable	N	Mean	Std Dev
age	442	48.5180995	13.1090278
sex	442	1.4683258	0.4995612
bmi	442	26.3757919	4.4181216
bp	442	94.6470136	13.8312834
s1	442	189.1402715	34.6080517
s2	442	115.4391403	30.4130810
s3	442	49.7884615	12.9342022
s4	442	4.0702489	1.2904499
s5	442	4.6414109	0.5223906
s6	442	91.2601810	11.4963347
y	442	152.1334842	77.0930045

Name: Faris Chaudhry
Batch Code: LISUM25
Submission Date: 08/31/23

Standard training parameters used.

70% used as training data, 30% as testing data.

Model saved using pickle.

Saved as 'model.pkl'

```
import pandas as pd
import pickle
from sklearn.datasets import load_diabetes
from sklearn.model_selection import train_test_split
from xgboost import XGBClassifier
from sklearn.preprocessing import LabelEncoder

X, y = load_diabetes(return_X_y=True, as_frame=True)
X.head()

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=0)
model = XGBClassifier(random_state=0)
le = LabelEncoder()
y_train = le.fit_transform(y_train)
model.fit(X_train, y_train)

XGBClassifier(base_score=0.5, booster='gbtree', colsample_bylevel=1,
               colsample_bynode=1, colsample_bytree=1, gamma=0, gpu_id=-1,
               importance_type='gain', interaction_constraints='',
               learning_rate=0.300000012, max_delta_step=0, max_depth=6,
               min_child_weight=1, monotone_constraints='()',
               n_estimators=100, n_jobs=0, num_parallel_tree=1,
               objective='multi:softprob', random_state=0, reg_alpha=0,
               reg_lambda=1, scale_pos_weight=None, subsample=1,
               tree_method='exact', validate_parameters=1, verbosity=None)

print(X_train.head())

pickle.dump(model, open('./model.pkl', 'wb'))
```

Name: Faris Chaudhry
Batch Code: LISUM25
Submission Date: 08/31/23

app.py (scale factors are from the MEANS approach above)

Port restriction had to be removed in app.run().

```
1  from flask import Flask, request, render_template
2  import numpy as np
3  import pandas as pd
4  import math
5  import pickle
6
7  scale_factor = math.sqrt(442)
8  app = Flask(__name__)
9  model = pickle.load(open('./model.pkl', 'rb'))
10
11 # home endpoint
12 @app.route('/')
13 def home():
14     return render_template('index.html')
15
16 # prediction endpoint
17 @app.route('/predict', methods=['POST'])
18 def predict():
19     int_features = [float(x) for x in request.form.values()]
20     final_features = [np.array(int_features)]
21
22     # each feature has to be scaled by some specific variable found here:
23     # https://www4.stat.ncsu.edu/~boos/var.select/diabetes.read.tab.out.txt
24     df = pd.DataFrame({ 'age': (final_features[0][0] - 48.5180995) / ( 13.1090278 * scale_factor),
25                          'sex': (final_features[0][1] - 1.4683258) / (0.4995612 * scale_factor),
26                          'bmi': (final_features[0][2] - 26.3757919) / (4.4181216 * scale_factor),
27                          'bp': (final_features[0][3] - 94.6470136) / (13.8312834 * scale_factor),
28                          's1': (final_features[0][4] - 189.1402715) / (34.6080517 * scale_factor),
29                          's2': (final_features[0][5] - 115.4391403) / (30.4130810 * scale_factor),
30                          's3': (final_features[0][6] - 49.7884615) / (12.9342022 * scale_factor),
31                          's4': (final_features[0][7] - 4.0702489) / (1.2904499 * scale_factor),
32                          's5': (final_features[0][8] - 4.6414109) / (0.5223906 * scale_factor),
33                          's6': (final_features[0][9] - 152.1334842) / (77.093004 * scale_factor)},
34                        index=[0])
35
36     prediction = model.predict(df)
37     return render_template('index.html', prediction_text='Regression value is {}'.format(prediction))
38
39 if __name__ == '__main__':
40     app.run()
```

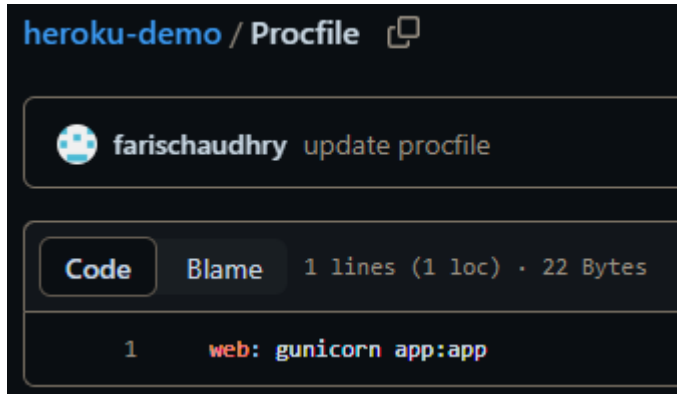
Index.html and style.css modified from <https://www.w3docs.com/learn-html/html-form-templates.html> (free to copy and use)

CSS: <https://github.com/farischaudhry/heroku-demo/blob/master/static/css/style.css>

HTML: <https://github.com/farischaudhry/heroku-demo/blob/master/templates/index.html>

Name: Faris Chaudhry
Batch Code: LISUM25
Submission Date: 08/31/23

Heroku Deployment

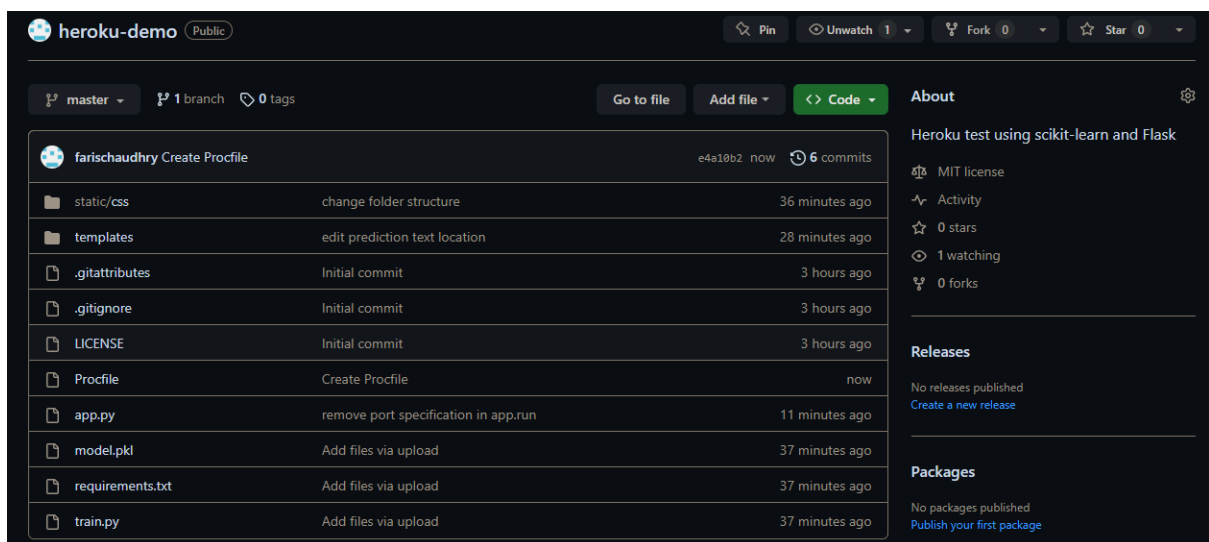


heroku-demo / Procfile

farischaudhry update procfile

Code Blame 1 lines (1 loc) · 22 Bytes

```
1 web: gunicorn app:app
```



heroku-demo (Public)

master 1 branch 0 tags

Go to file Add file <> Code

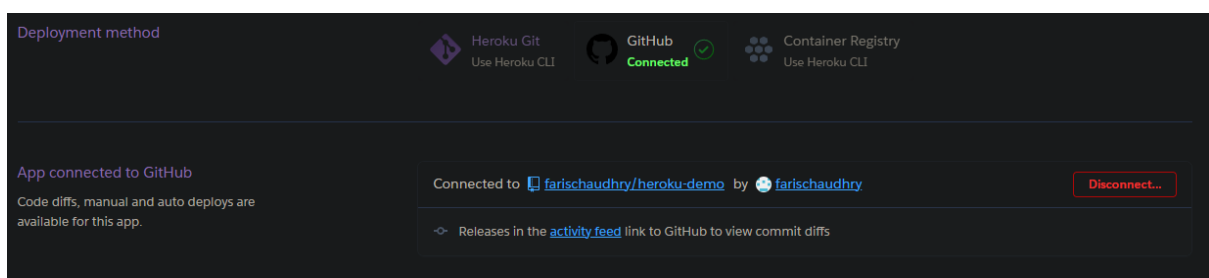
About Heroku test using scikit-learn and Flask

- MIT license
- Activity
- 0 stars
- 1 watching
- 0 forks

Releases No releases published Create a new release

Packages No packages published Publish your first package

File	Commit Message	Time Ago
static/css	change folder structure	36 minutes ago
templates	edit prediction text location	28 minutes ago
.gitattributes	Initial commit	3 hours ago
.gitignore	Initial commit	3 hours ago
LICENSE	Initial commit	3 hours ago
Procfile	Create Procfile	now
app.py	remove port specification in app.run	11 minutes ago
model.pkl	Add files via upload	37 minutes ago
requirements.txt	Add files via upload	37 minutes ago
train.py	Add files via upload	37 minutes ago



Deployment method

Heroku Git Use Heroku CLI

GitHub Connected

Container Registry Use Heroku CLI

App connected to GitHub

Code diffs, manual and auto deploys are available for this app.

Connected to farischaudhry/heroku-demo by farischaudhry

Disconnect...

Releases in the activity feed link to GitHub to view commit diffs

Name: Faris Chaudhry
Batch Code: LISUM25
Submission Date: 08/31/23

```
heroku-demo / requirements.txt

farischaudhry add xgboost to reqs

Code Blame 12 lines (12 loc) · 198 Bytes Code 55% faster with GitHub Copilot

1 Flask>2.2.2
2 gunicorn==19.9.0
3 itsdangerous>=2.1.2
4 Jinja2>=3.0
5 MarkupSafe>=2.0
6 Werkzeug>=2.2.2
7 numpy>=1.23.5
8 scipy>=1.11.2
9 scikit-learn>=0.18
10 matplotlib>=1.4.3
11 pandas>=0.19
12 xgboost>=1.7.6
```

Manual deploy

Deploy the current state of a branch to this app.

Deploy a GitHub branch

This will deploy the current state of the branch you specify below. [Learn more](#).

Choose a branch to deploy

master

Deploy Branch

Receive code from GitHub

✓

Build master d624695d

✓

Release phase

✓

Deploy to Heroku

✓

Your app was successfully deployed.

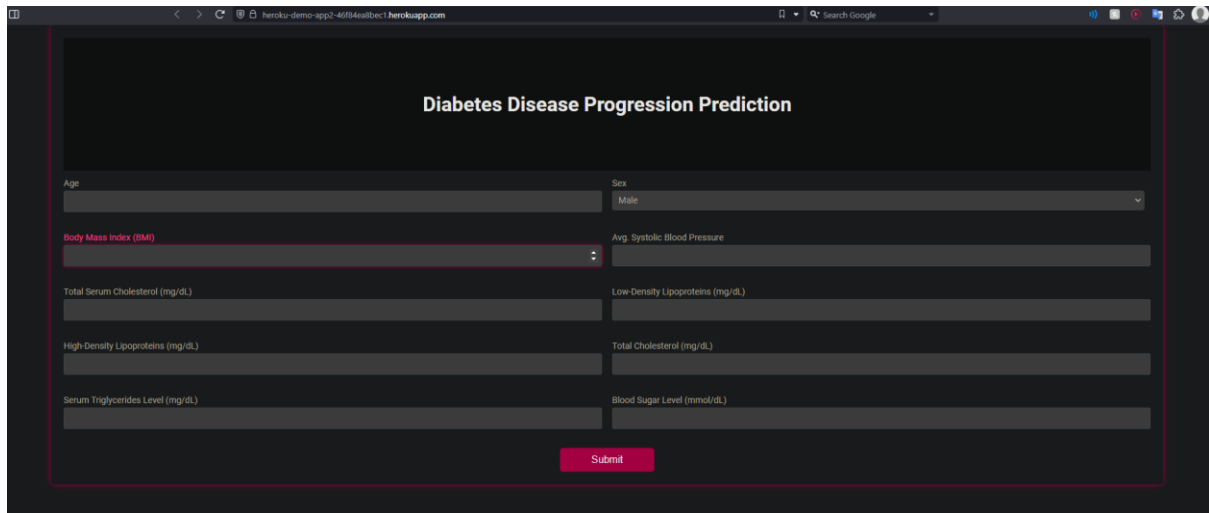
View

```
PS C:\Users\faris\Documents\projects\heroku-demo> heroku ps:scale web=1 --app heroku-demo-app2
» Warning: heroku update available from 7.53.0 to 8.4.1.
Scaling dynos... done, now running web at 1:Basic
```

```
2023-08-30T15:22:58.993202+00:00 app[api]: Release v15 created by user faris.chaudhry@outlook.com
2023-08-30T15:23:12.318962+00:00 heroku[web.1]: Starting process with command `gunicorn app:app`
2023-08-30T15:23:12.977310+00:00 app[web.1]: [2023-08-30 15:23:12 +0000] [2] [INFO] Starting gunicorn 19.9.0
2023-08-30T15:23:12.977544+00:00 app[web.1]: [2023-08-30 15:23:12 +0000] [2] [INFO] Listening at: http://0.0.0.0:59750 (2)
2023-08-30T15:23:12.977578+00:00 app[web.1]: [2023-08-30 15:23:12 +0000] [2] [INFO] Using worker: sync
2023-08-30T15:23:12.977799+00:00 app[web.1]: <frozen os>:1031: RuntimeWarning: line buffering (buffering=1) isn't supported in binary mode, the default buffer size will be used
2023-08-30T15:23:12.979355+00:00 app[web.1]: [2023-08-30 15:23:12 +0000] [7] [INFO] Booting worker with pid: 7
2023-08-30T15:23:13.069291+00:00 app[web.1]: [2023-08-30 15:23:13 +0000] [8] [INFO] Booting worker with pid: 8
2023-08-30T15:23:13.555074+00:00 heroku[web.1]: State changed from starting to up
2023-08-30T15:23:40.000000+00:00 app[api]: Build succeeded
```

Name: Faris Chaudhry
Batch Code: LISUM25
Submission Date: 08/31/23

Final Site



The screenshot shows a web browser window with the address bar displaying 'heroku-demo-app2-46f84aa1bec1.herokuapp.com'. The page title is 'Diabetes Disease Progression Prediction'. The form contains the following fields:

Diabetes Disease Progression Prediction	
Age	Sex Male
Body Mass Index (BMI)	Avg. Systolic Blood Pressure
Total Serum Cholesterol (mg/dL)	Low-Density Lipoproteins (mg/dL)
High-Density Lipoproteins (mg/dL)	Total Cholesterol (mg/dL)
Serum Triglycerides Level (mg/dL)	Blood Sugar Level (mmol/dL)
Submit	