qbn3llhwk

April 29, 2024

[ ]:
```
import pandas as pd
import numpy as np
from sklearn.linear_model import LogisticRegression
from sklearn.model_selection import train_test_split
import seaborn as sns
import matplotlib.pyplot as plt

dataset= pd.read_csv("diabetes_dataset.csv")
```

[ ]:
```
dataset.describe()
```

[ ]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	\
count	768.000000	768.000000	768.000000	768.000000	768.000000	
mean	3.845052	120.894531	69.105469	20.536458	79.799479	
std	3.369578	31.972618	19.355807	15.952218	115.244002	
min	0.000000	0.000000	0.000000	0.000000	0.000000	
25%	1.000000	99.000000	62.000000	0.000000	0.000000	
50%	3.000000	117.000000	72.000000	23.000000	30.500000	
75%	6.000000	140.250000	80.000000	32.000000	127.250000	
max	17.000000	199.000000	122.000000	99.000000	846.000000	

	BMI	DiabetesPedigreeFunction	Age	Outcome
count	768.000000	768.000000	768.000000	768.000000
mean	31.992578	0.471876	33.240885	0.348958
std	7.884160	0.331329	11.760232	0.476951
min	0.000000	0.078000	21.000000	0.000000
25%	27.300000	0.243750	24.000000	0.000000
50%	32.000000	0.372500	29.000000	0.000000
75%	36.600000	0.626250	41.000000	1.000000
max	67.100000	2.420000	81.000000	1.000000

[ ]:
```
from sklearn.model_selection import train_test_split
X= dataset.drop("Outcome", axis=1)
y= dataset[["Outcome"]]
X_train, X_test, y_train, y_test = train_test_split(X,y,test_size=0.30,␣
↪random_state=7)
```

[ ]:
```
model = LogisticRegression()
model.fit(X_train, y_train)
y_predict = model.predict(X_test)
model_score= model.score (X_test, y_test)
model_score
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:1143:
DataConversionWarning: A column-vector y was passed when a 1d array was
expected. Please change the shape of y to (n_samples, ), for example using
ravel().
  y = column_or_1d(y, warn=True)
/usr/local/lib/python3.10/dist-packages/sklearn/linear_model/_logistic.py:458:
ConvergenceWarning: lbfgs failed to converge (status=1):
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.

Increase the number of iterations (max_iter) or scale the data as shown in:
    https://scikit-learn.org/stable/modules/preprocessing.html
Please also refer to the documentation for alternative solver options:
    https://scikit-learn.org/stable/modules/linear_model.html#logistic-
regression
  n_iter_i = _check_optimize_result(
```

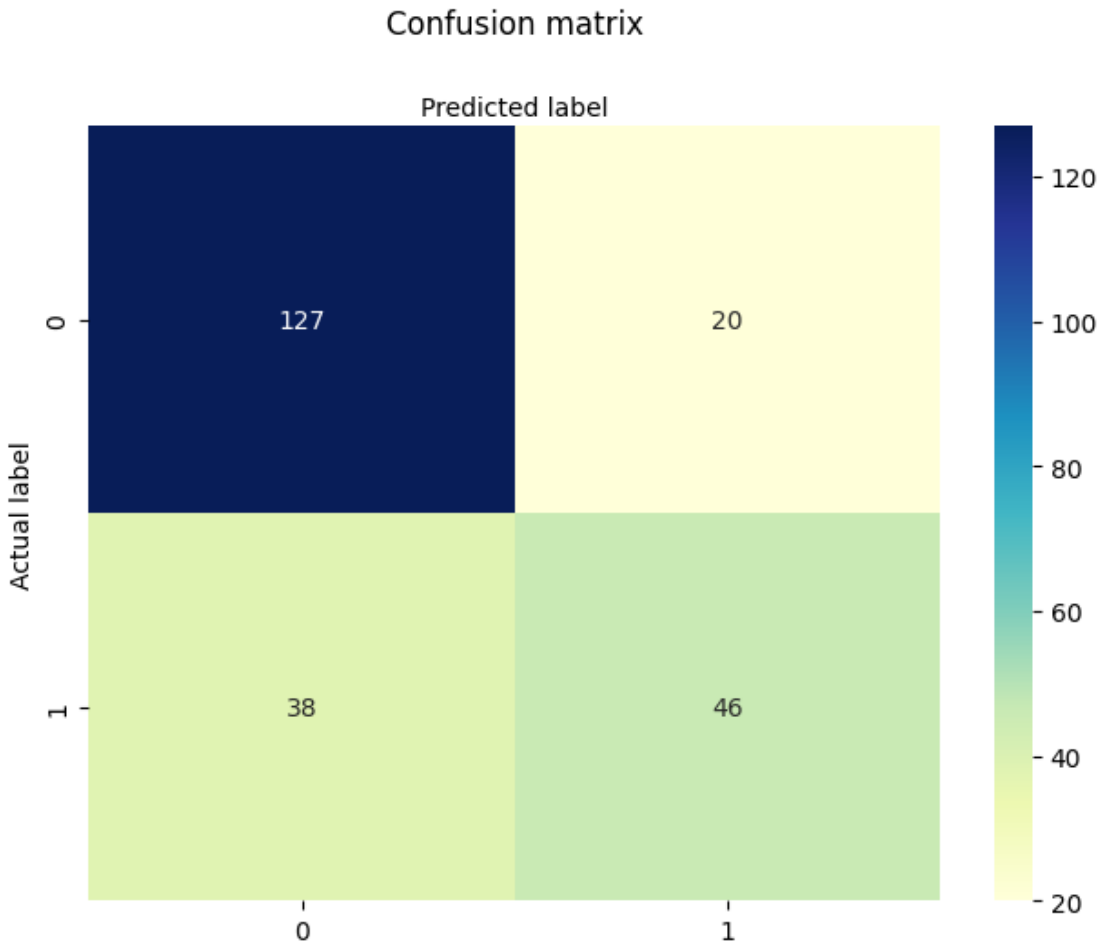
[ ]:
```
0.7489177489177489
```

[ ]:
```
from sklearn import metrics
cnf_matrix = metrics.confusion_matrix(y_test, y_predict)
print(cnf_matrix)
```

```
[[127  20]
 [ 38  46]]
```

[ ]:
```
class_names=[0,1]
fig, ax = plt.subplots()
tick_marks = np.arange(len(class_names))
plt.xticks(tick_marks, class_names)
plt.yticks(tick_marks, class_names)
sns.heatmap(pd.DataFrame(cnf_matrix), annot=True, cmap="YlGnBu" ,fmt='g')
ax.xaxis.set_label_position("top")
plt.tight_layout()
plt.title('Confusion matrix', y=1.1)
plt.ylabel('Actual label')
plt.xlabel('Predicted label')
```

[ ]:
```
Text(0.5, 427.9555555555555, 'Predicted label')
```



[ ]:
```
true_neg, false_pos, false_neg, true_pos = cnf_matrix.ravel()
true_neg, false_pos, false_neg, true_pos
total = true_neg + false_pos + false_neg + true_pos
```

[ ]:
```
accuracy = (true_pos + true_neg)/total
print(accuracy)
```

```
0.7489177489177489
```

[ ]:
```
precision = true_pos/(true_pos + false_pos)
print(precision)
```

```
0.696969696969697
```

[ ]:
```
recall = true_pos/(true_pos + false_neg)
print(recall)
```

```
0.5476190476190477
```

[ ]:
```
f1_score = (2*precision*recall)/(precision+recall)
print(f1_score)
```

```
0.6133333333333334
```