Class3_Binary

January 15, 2025

[1]:
```
from sklearn.datasets import load_iris
from sklearn.linear_model import SGDClassifier
from sklearn.model_selection import (
        train_test_split,
        cross_val_predict,
    )
from sklearn.metrics import (
        confusion_matrix,
        accuracy_score
    )

import itertools
import numpy as np
import matplotlib.pyplot as plt
```

[2]:
```
def displayConfusionMatrix(cm, cmap=plt.cm.GnBu):
    classes=["Other Type","Type 0"]
    plt.imshow(cm,interpolation='nearest',cmap=cmap)
    plt.title("Confusion Matrix")
    plt.colorbar()
    trick_marks=np.arange(len(classes))
    plt.xticks(trick_marks,classes)
    plt.yticks(trick_marks,classes)
    thresh=cm.max()/2
    for i , j in itertools.product(range(cm.shape[0]),range(cm.shape[1])):
        plt.text(j,i,format(cm[i,j],'d'),
        horizontalalignment='center',
        color='white' if cm[i,j]>thresh else 'black')

    plt.tight_layout()
    plt.ylabel('Actually')
    plt.xlabel('Prediction')
    plt.show()
```

[3]:
```
iris = load_iris()

print("Columns:", list(iris.keys()))
```

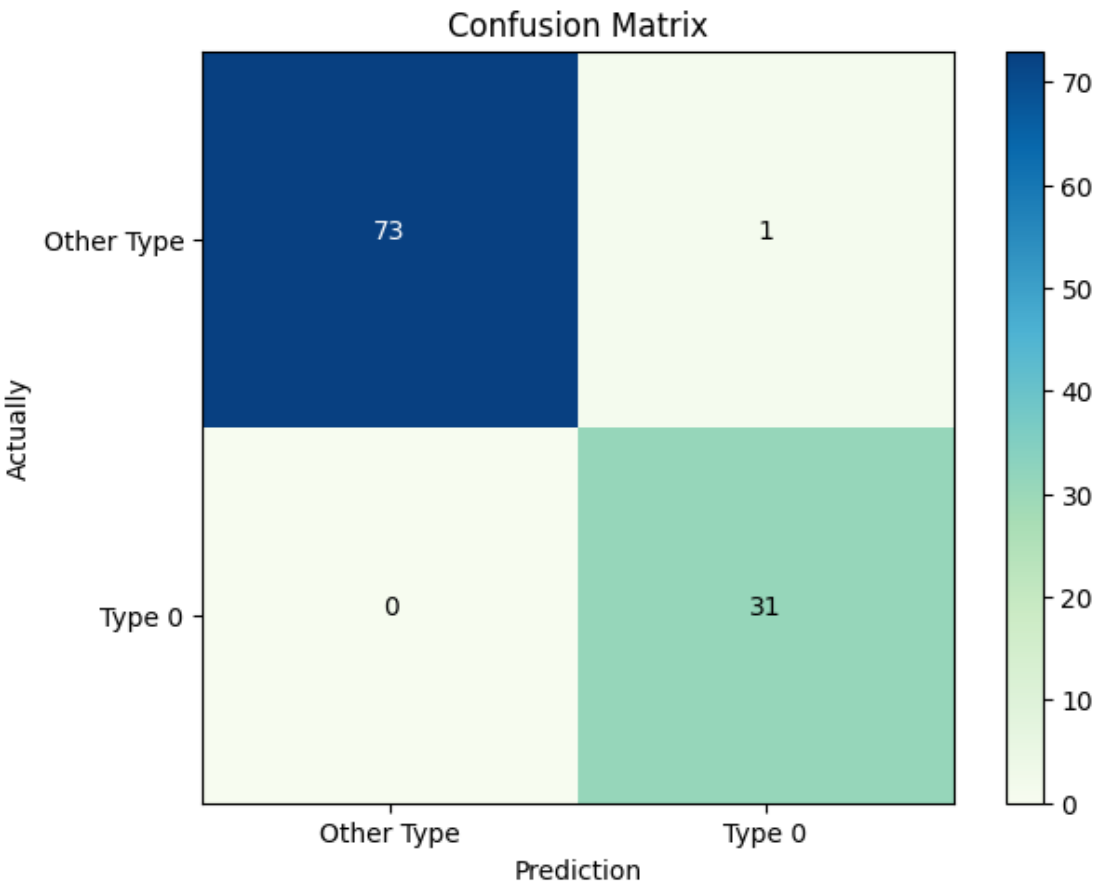
```
print("Dataset's Target:", set(iris["target"]))
print("Dataset's Quantity:", len(iris["target"]))
```

```
Columns: ['data', 'target', 'frame', 'target_names', 'DESCR', 'feature_names',
'filename', 'data_module']
Dataset's Target: {np.int64(0), np.int64(1), np.int64(2)}
Dataset's Quantity: 150
```

[4]:
```
np.random.seed(42)

x, y = iris["data"], iris["target"]
x_train, x_test, y_train, y_test = train_test_split(x, y, shuffle=True,␣
 ↪test_size=0.3)

# Choose class 0 as an positive target
y_train = (y_train==0)
y_test = (y_test==0)

sgd_clf = SGDClassifier()
sgd_clf.fit(x_train,y_train)

y_train_pred = cross_val_predict(sgd_clf, x_train, y_train, cv=3)
cm = confusion_matrix(y_train, y_train_pred)

y_test_pred = sgd_clf.predict(x_test)

print("Accuracy Score = ",accuracy_score(y_test, y_test_pred)*100)
```

```
Accuracy Score =  100.0
```

[5]:
```
displayConfusionMatrix(cm)
```


Confusion Matrix
Other Type
Type 0
Actually
73
1
0
31
Other Type
Type 0
Prediction
70
60
50
40
30
20
10
0