2000080110_ML Skill8

September 2, 2021

[56]:
```
import pandas as pd
import numpy as np
from sklearn.datasets import load_iris
iris = load_iris()
#excluding one class
iris_x=iris['data'][:100]
iris_y=iris['target'][:100]
print(iris_x[:50])
iris_y
```

```
[[5.1 3.5 1.4 0.2]
 [4.9 3.  1.4 0.2]
 [4.7 3.2 1.3 0.2]
 [4.6 3.1 1.5 0.2]
 [5.  3.6 1.4 0.2]
 [5.4 3.9 1.7 0.4]
 [4.6 3.4 1.4 0.3]
 [5.  3.4 1.5 0.2]
 [4.4 2.9 1.4 0.2]
 [4.9 3.1 1.5 0.1]
 [5.4 3.7 1.5 0.2]
 [4.8 3.4 1.6 0.2]
 [4.8 3.  1.4 0.1]
 [4.3 3.  1.1 0.1]
 [5.8 4.  1.2 0.2]
 [5.7 4.4 1.5 0.4]
 [5.4 3.9 1.3 0.4]
 [5.1 3.5 1.4 0.3]
 [5.7 3.8 1.7 0.3]
 [5.1 3.8 1.5 0.3]
 [5.4 3.4 1.7 0.2]
 [5.1 3.7 1.5 0.4]
 [4.6 3.6 1.  0.2]
 [5.1 3.3 1.7 0.5]
 [4.8 3.4 1.9 0.2]
 [5.  3.  1.6 0.2]
 [5.  3.4 1.6 0.4]
 [5.2 3.5 1.5 0.2]
```

```
[5.2 3.4 1.4 0.2]
[4.7 3.2 1.6 0.2]
[4.8 3.1 1.6 0.2]
[5.4 3.4 1.5 0.4]
[5.2 4.1 1.5 0.1]
[5.5 4.2 1.4 0.2]
[4.9 3.1 1.5 0.2]
[5.  3.2 1.2 0.2]
[5.5 3.5 1.3 0.2]
[4.9 3.6 1.4 0.1]
[4.4 3.  1.3 0.2]
[5.1 3.4 1.5 0.2]
[5.  3.5 1.3 0.3]
[4.5 2.3 1.3 0.3]
[4.4 3.2 1.3 0.2]
[5.  3.5 1.6 0.6]
[5.1 3.8 1.9 0.4]
[4.8 3.  1.4 0.3]
[5.1 3.8 1.6 0.2]
[4.6 3.2 1.4 0.2]
[5.3 3.7 1.5 0.2]
[5.  3.3 1.4 0.2]]
```

[56]:
```
array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1])
```

[43]:
```
from sklearn.model_selection import train_test_split
datasets = train_test_split(iris_x, iris_y,test_size=0.2)
train_data, test_data, train_labels, test_labels = datasets
```

[44]:
```
#staderdize the data
from sklearn.preprocessing import StandardScaler
scaler = StandardScaler()
scaler.fit(train_data)
train_data = scaler.transform(train_data)
test_data = scaler.transform(test_data)
```

[45]:
```
from sklearn.neural_network import MLPClassifier
# creating an classifier from the model:
mlp = MLPClassifier(hidden_layer_sizes=(10, 5), max_iter=1000)
# let's fit the training data to our model
mlp.fit(train_data, train_labels)
```

[45]:
```
MLPClassifier(hidden_layer_sizes=(10, 5), max_iter=1000)
```

[46]:
```
from sklearn.metrics import accuracy_score
predictions_train = mlp.predict(train_data)
print("Training accuracy:",accuracy_score(predictions_train, train_labels))
predictions_test = mlp.predict(test_data)
print("Testing accuracy:",accuracy_score(predictions_test, test_labels))
```

```
Training accuracy: 1.0
Testing accuracy: 1.0
```

[50]:
```
from sklearn.metrics import confusion_matrix
print("confusion matrix of training data")
print(confusion_matrix(predictions_train, train_labels))
print("confusion matrix of testing data")
print(confusion_matrix(predictions_test, test_labels))
```

```
confusion matrix of training data
[[42  0]
 [ 0 38]]
confusion matrix of testing data
[[ 8  0]
 [ 0 12]]
```

[47]:
```
from sklearn.metrics import classification_report
print(classification_report(predictions_test, test_labels))
```

```
              precision    recall  f1-score   support

           0       1.00      1.00      1.00         8
           1       1.00      1.00      1.00        12

    accuracy                           1.00        20
   macro avg       1.00      1.00      1.00        20
weighted avg       1.00      1.00      1.00        20
```