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import pandas as pd
import sklearn
from sklearn import preprocessing
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.neural_network import MLPClassifier
from sklearn.metrics import classification_report, confusion_matrix
url = 'https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data'
names = ['sepal-length', 'sepal-width', 'petal-length', 'petal-width', 'Class']
irisdata = pd.read_csv(url, names=names)
X = irisdata.iloc[:, 0:4]
y = irisdata.select_dtypes(include=[object])
X.head()
y.head()
y.Class.unique()
le = preprocessing.LabelEncoder()
y = y.apply(le.fit_transform)
y.head()
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.20)
scaler = StandardScaler()
scaler.fit(X_train)
X_train = scaler.transform(X_train)
X_test = scaler.transform(X_test)
mlp = MLPClassifier(hidden_layer_sizes=(10, 10, 10), max_iter=1000)
mlp.fit(X_train, y_train.values.ravel())
predictions = mlp.predict(X_test)
print(predictions)
print(confusion_matrix(y_test,predictions))
print(classification_report(y_test,predictions))
url = 'https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data'
arr = ['SepalLength', 'SepalWidth', 'PetalLength', 'PetalWidth', 'Species']
df = pd.read_csv(url, names=arr)
print(df.head())
a = df.iloc[:, 0:4]
b = df.select_dtypes(include=[object])
b = df.iloc[:,4:5]
training_a, testing_a, training_b, testing_b = train_test_split(a, b, test_size = 0.25)
myscaler = StandardScaler()
myscaler.fit(training_a)
training_a = myscaler.transform(training_a)
testing_a = myscaler.transform(testing_a)
m1 = MLPClassifier(hidden_layer_sizes=(12, 13, 14), activation='relu', solver='adam', max_iter=2500)
m1.fit(training_a, training_b.values.ravel())
predicted_values = m1.predict(testing_a)
print(confusion_matrix(testing_b,predicted_values))
print(classification_report(testing_b,predicted_values))
```

```
[1 0 1 1 1 0 1 0 1 1 2 0 0 0 2 0 2 0 0 2 0 0 1 1 1 2 1 1 2 2]
[[11  0  0]
 [ 0 11  0]
 [ 0  1  7]]
              precision    recall  f1-score   support

           0       1.00      1.00      1.00        11
           1       0.92      1.00      0.96        11
           2       1.00      0.88      0.93         8

    accuracy                           0.97        30
   macro avg       0.97      0.96      0.96        30
weighted avg       0.97      0.97      0.97        30

   SepalLength  SepalWidth  PetalLength  PetalWidth      Species
0          5.1         3.5          1.4         0.2  Iris-setosa
1          4.9         3.0          1.4         0.2  Iris-setosa
2          4.7         3.2          1.3         0.2  Iris-setosa
3          4.6         3.1          1.5         0.2  Iris-setosa
4          5.0         3.6          1.4         0.2  Iris-setosa
[[13  0  0]
 [ 0 11  2]
 [ 0  2 10]]
                 precision    recall  f1-score   support

    Iris-setosa       1.00      1.00      1.00        13
Iris-versicolor       0.85      0.85      0.85        13
 Iris-virginica       0.83      0.83      0.83        12

       accuracy                           0.89        38
      macro avg       0.89      0.89      0.89        38
   weighted avg       0.89      0.89      0.89        38
```