Experiment-8

AIM: Write a program to implement k-Nearest Neighbor algorithm to classify the iris data set. Print both correct and wrong predictions.

Program:

```
import numpy as np

import pandas as pd

from sklearn import datasets

from sklearn.model_selection import train_test_split

from sklearn.neighbors import KNeighborsClassifier

from sklearn import metrics


iris = datasets.load_iris()

X = iris.data

y = iris.target


Xtrain, Xtest, ytrain, ytest = train_test_split(X, y, test_size=0.20, random_state=42)


classifier = KNeighborsClassifier(n_neighbors=5)

classifier.fit(Xtrain, ytrain)


ypred = classifier.predict(Xtest)
```

```python
print("\n----------------------------------------------------------------------")
print('%-25s %-25s %-25s' % ('Original Label', 'Predicted Label', 'Correct/Wrong'))
print("----------------------------------------------------------------------")


target_names = iris.target_names
for label, prediction in zip(ytest, ypred):
    original_class = target_names[label]
    predicted_class = target_names[prediction]
    print('%-25s %-25s' % (original_class, predicted_class), end="")
    if label == prediction:
        print('%-25s' % ('Correct'))
    else:
        print('%-25s' % ('Wrong'))
print("----------------------------------------------------------------------")


print("\nConfusion Matrix:\n", metrics.confusion_matrix(ytest, ypred))
print("----------------------------------------------------------------------")


print("\nClassification Report:\n", metrics.classification_report(ytest, ypred))
print("----------------------------------------------------------------------")


print('Accuracy of the classifier is %0.2f' % metrics.accuracy_score(ytest, ypred))
print("----------------------------------------------------------------------")
```

Output:

Original Label   Predicted Label   Correct/Wrong

Iris-setosa   Iris-setosa   Correct

Iris-setosa   Iris-setosa   Correct

Iris-versicolor   Iris-versicolor   Correct

Iris-setosa   Iris-setosa   Correct

Iris-virginica   Iris-versicolor   Wrong

Iris-versicolor   Iris-versicolor   Correct

Iris-versicolor   Iris-versicolor   Correct

Iris-setosa   Iris-setosa   Correct

Iris-setosa   Iris-setosa   Correct

Iris-setosa   Iris-setosa   Correct

Confusion Matrix:

 [[12 0 0]

 [0 13 2]

 [0 0 13]]

Classification Report:

            precision   recall f1-score   support

      0.0   1.00   1.00   1.00   12

1.0	1.00	0.87	0.93	15
2.0	0.87	1.00	0.93	13
accuracy			0.93	40
macro avg	0.96	0.96	0.96	40
weighted avg	0.95	0.93	0.93	40

Accuracy of the classifier is 0.93