**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)

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:

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Original Label Predicted Label Correct/Wrong

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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

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Confusion Matrix:

[[12 0 0]

[ 0 13 2]

[ 0 0 13]]

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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

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Accuracy of the classifier is 0.93

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