

PRACTICAL NUMBER: 5

Aim: Write a program to implement k-Nearest Neighbour algorithm to classify the iris dataset.

Code:

```
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import classification_report
from sklearn.metrics import confusion_matrix
import pandas as pd
import numpy as numpy
from sklearn import datasets

#Loading the iris dataset

iris = datasets.load_iris()

iris_data = iris.data

iris_labels = iris.target

#The train_test_split function is for splitting a single dataset for two different
#purposes: training and testing. The testing subset is for building your model. The
#testing subset is for using the model on unknown data to evaluate the performance
#of the model. The first parameter is the dataset you're selecting to use.
#test_size: This parameter specifies the size of the testing dataset.

X_train,X_test,y_train,y_test = (train_test_split(iris_data,iris_labels,test_size=0.3))

# Classifier implementing the k-nearest neighbors.

classifier = KNeighborsClassifier(n_neighbors=13)

classifier.fit(X_train,y_train)

y_pred = classifier.predict(X_test)

print("Accuracy is: ")

print(classification_report(y_test,y_pred))

print("Confusion matrix is:")

print(confusion_matrix(y_test,y_pred))
```

Output:

```
Python 3.7.9 Shell
File Edit Shell Debug Options Window Help
Python 3.7.9 (tags/v3.7.9:13c94747c7, Aug 17 2020, 18:58:18) [MSC v.1900 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:/MSc IT/Sem3/ML Pracs/Prac5.py =====
Accuracy is:
      precision    recall  f1-score   support

         0         1.00      1.00      1.00         14
         1         0.93      0.88      0.90         16
         2         0.88      0.93      0.90         15

   accuracy
macro avg      0.94      0.94      0.94         45
weighted avg      0.93      0.93      0.93         45

Confusion matrix is:
[[14  0  0]
 [ 0 14  2]
 [ 0  1 14]]
>>>
```

1. Explain ID3 Algorithm
2. Explain K-Nearest Neighbour Algorithm