Ex No. 7	Implementation of K-Nearest Neighbor Algorithm
Date:	

Aim

To write a program to implement k-nearest neighbor algorithm to classify the data set.

Definition

K-nearest neighbor algorithm

The k-nearest neighbors algorithm, also known as KNN or k-NN, is a non-parametric, supervised learning classifier, which uses proximity to make classifications or predictions about the grouping of an individual data point. While it can be used for either regression or classification problems, it is typically used as a classification algorithm, working off the assumption that similar points can be found near one another.

Procedure

Open PyCharm Community Edition.

Go to File menu → New Project → Specify the project name → Press "Create" button.

Right Click on Project name → New → Python File → Specify the file name → Press Enter.

Type the following codes. Right click on file name or coding window → Select "Run" to view the result.

knearest.py

```
import numpy as np
import pandas as pd

import matplotlib.pyplot as plt

from sklearn.datasets import make_blobs
from sklearn.neighbors import KNeighborsClassifier
from sklearn.model_selection import train_test_split

X, y = make_blobs(n_samples = 500, n_features = 2, centers = 4,cluster_std = 1.5, random_state = 4)
plt.style.use('seaborn')
plt.figure(figsize = (10,10))
plt.scatter(X[:,0], X[:,1], c=y, marker= '*',s=100,edgecolors='black')
plt.show()

X_train, X_test, y_train, y_test = train_test_split(X, y, random_state = 0)

knn5 = KNeighborsClassifier(n_neighbors = 5)
knn1 = KNeighborsClassifier(n_neighbors=1)

knn5.fit(X_train, y_train)
knn1.fit(X_train, y_train)

y_pred_5 = knn5.predict(X_test)
y_pred_1 = knn1.predict(X_test)

from sklearn.metrics import accuracy_score
print("Accuracy with k=5", accuracy_score(y_test, y_pred_5)*100)
print("Accuracy with k=1", accuracy_score(y_test, y_pred_1)*100)

plt.figure(figsize = (15,5))
plt.subplot(1,2,1)
plt.scatter(X_test[:,0], X_test[:,1], c=y_pred_5, marker= '*', s=100,edgecolors='black')
plt.title("Predicted values with k=5", fontsize=20)

plt.subplot(1,2,2)
plt.scatter(X_test[:,0], X_test[:,1], c=y_pred_1, marker= '*', s=100,edgecolors='black')
plt.title("Predicted values with k=1", fontsize=20)
plt.show()
```

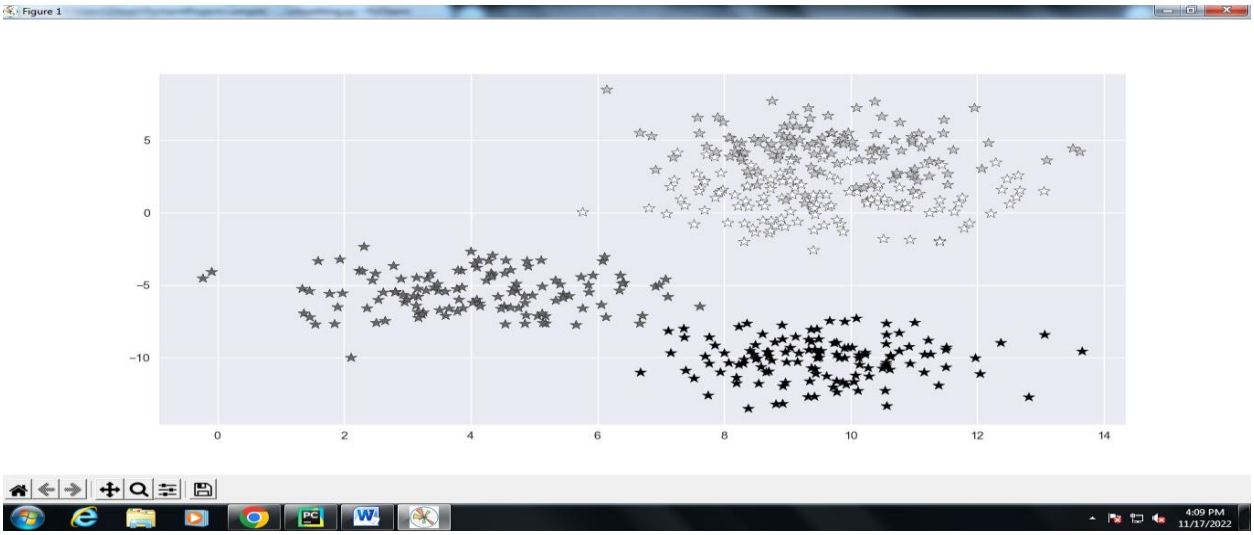
Output

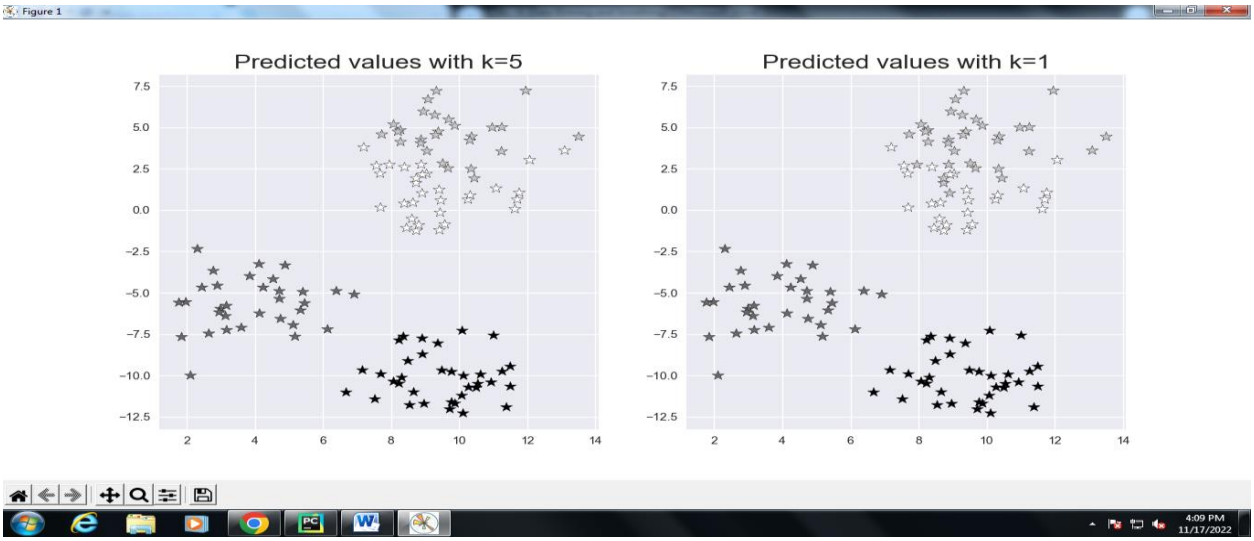
C:\Users\2mca1\PycharmProjects\sample\venv\Scripts\python.exe
C:/Users/2mca1/PycharmProjects/sample/smoothing.py

Accuracy with k=5 93.60000000000001

Accuracy with k=1 90.4

Process finished with exit code 0





Result

Thus, k-nearest neighbor algorithm in machine learning has implemented successfully.