Ex.No: 9a

Date: 11/11/2025

## A python program to implement KNN model

Aim:

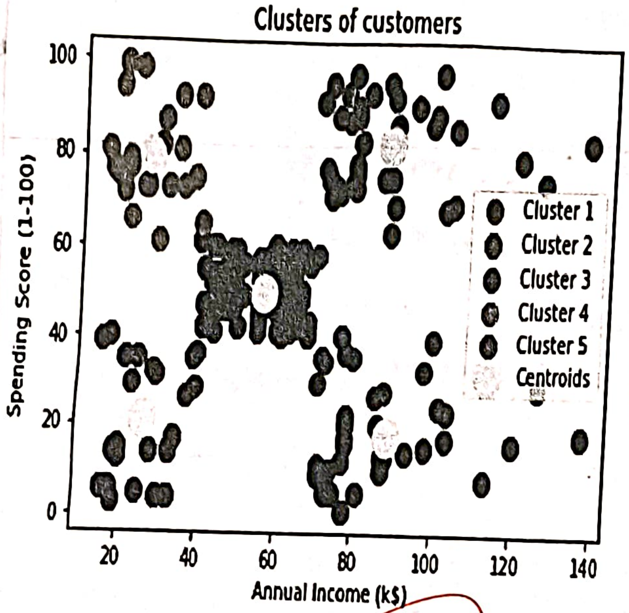
To implement a python programe using a KNN Algorithm to a model.

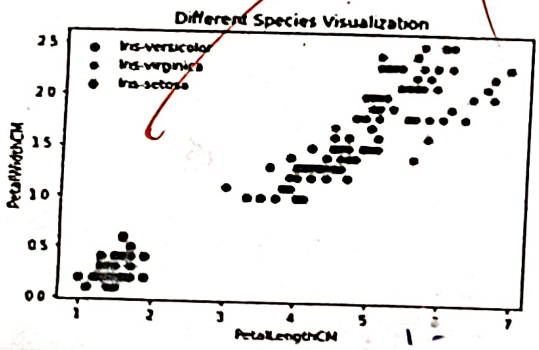
Algorithm:

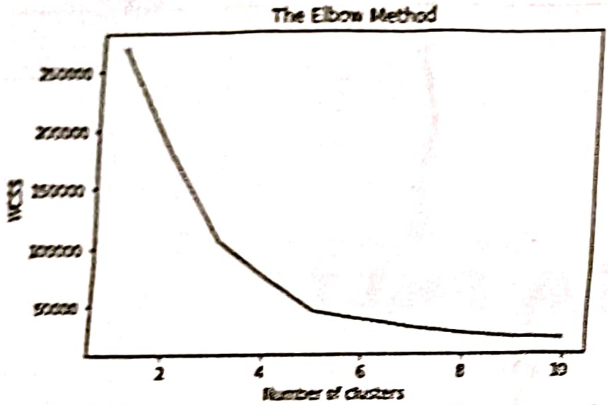
1. Import Necessary Libraries
2. Load and Explore the Dataset
3. preprocess the Data.
4. Train the KNN Model.
5. Make predictions.

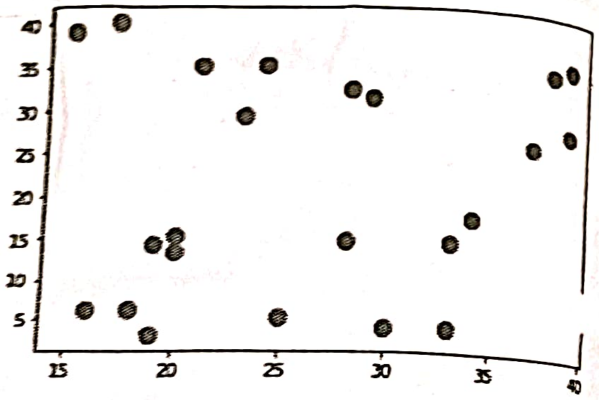
Program:-

```
Import numpy as np
Import matplotlib.pylot as plt
Import pandas a pd.
dataset = Pd read. csv ('......')
X = dataset.iloc [:,[3,4]] values
print (dataset)
```


Clusters of customers
Spending Score (1-100)
100
80
60
40
20
0
20
40
60
80
100
120
140
Annual Income (k$)
Cluster 1
Cluster 2
Cluster 3
Cluster 4
Cluster 5
Centroids


Different Species Visualization
Iris-versicolor
Iris-virginica
Iris-setosa
PetalWidthCM
2.5
2.0
1.5
1.0
0.5
0.0
1
2
3
4
5
6
7
PetalLengthCM





```
array([4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3,
       4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 1,
       4, 3, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 0, 2, 1, 2, 0, 2, 0, 2,
       1, 2, 0, 2, 0, 2, 0, 2, 0, 2, 1, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2,
       0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2,
       0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2, 0, 2,
       0, 2], dtype=int32)
```

```
from sklearn.cluster import Kmeans
 wcss = []
for i in range (1,11):
      kmeans = kmeans (n.clusters = i,
 init = 'k.means++', max_iter =300, n.init=10,
 random_state =0)
        kmeans.fit (x)
        wcss.append (kmeans.inertia_)
 plt.plot (range (1,11), wcss)
 plt.title ('The Elbow method')
 plt.xlabel ('Number of clusters)
 plt.ylabel ('wcss')
 plt.show ()
 Kmeans = kmeans (n.clusters =5, init ='kmeans++',
 max_item =300, n.init =10, random_state =0)
 y_kmeans =kmeans.fit_predict (x)
 y_kmeans.
  type (y_kmeans)
  y_kmeans
  plt.scatter (x[y_kmeans=0,0], x [y_kmeans = = 0,1]
        s=100, c= 'red', label= 'cluster 1')
  plt.scatter (x[y_kmeans = =1,0], x[y_kmeans==1,1]
        s=100, c= 'blue', label ='cluster2')
  plt.scatter (x [y_kmeans = = 2,0], x[y_kmeans==2,1]
        s=100, c= 'green', label = 'cluster 3')
```

```
plt. scalter (x [y. kmeans = = 3, 0], x[y_kmeans = = 3, 1]
      s=100, c= 'cyan', labled = 'duster 4')

plt.scalter (x[y_kmeans = = 4, 0], x[y.kmeans = = 4, 1]
      s=100, s= 'magansta', labled = 'duslas')

plt.scalla (kmeans, duster, centers_[:, 0],
    kmeans duster.centers.[:, 1], s = 300,
    c= 'yellow', labled= 'centroids')
plt.tittle ('dusters of customers')
plt.xlabel ('Annual Income (k$)')
plt.ylabled ('spending score (1-100)')
plt.legend ()
plt.show ()
```

Result:

Thus the python program to implement KNN model has been successfully.