

EX NO : 11

DATE :

## IMPLEMENTATION OF CLUSTERING

### TECHNIQUES K-MEANS

AIM :

To Implement a K-Means clustering technique using python language.

PROGRAM :

```
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt
from sklearn.datasets import samples_generator
import make_blobs
from sklearn.cluster import KMeans
X, y = make_blobs(n_samples=300, centers=4,
                  cluster_std=0.60, random_state=0)
plt.scatter(X[:, 0], X[:, 1])
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_)
```



```

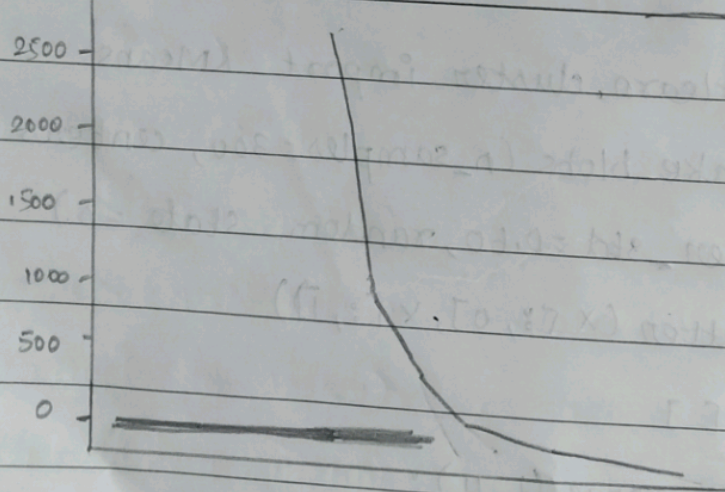
plt.plot(range(1, 11), wcss)
plt.title('Elbow method')
plt.xlabel('Number of clusters')
plt.ylabel('WCSS')
plt.show()

kmeans = KMeans(n_clusters = 4, init = 'k-means++',
                 max_iter = 300, n_init = 10, random_state = 0)
pred_y = kmeans.fit_predict(x)
plt.scatter(x[:, 0], x[:, 1])
plt.scatter(kmeans.cluster_centers_[:, 0], kmeans.
            cluster_centers_[:, 1], s = 300, c = 'red')
plt.show()

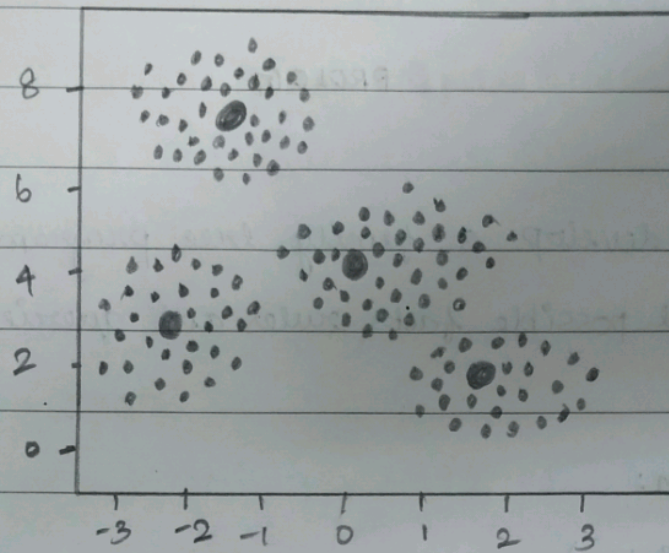
```

OUTPUT :

warnings.warn(message, futurewarning)







RESULT :

To implement clustering techniques K-means  
python program is executed and the output  
is verified.