

Ex: No: 13

## Implementation of Clustering Techniques k-Means

Aim:-

To implement a k-Means clustering technique using python language.

Source code:-

```
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt
from sklearn.datasets.samples_generator import make_blobs
from sklearn.cluster import KMeans
x, y = make_blobs(n_samples=300, centers=
    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=
        random_state=0)
    kmeans.fit(x)
    wcss.append(kmeans.inertia_)
plt.title('Elbow Method')
plt.xlabel('Number of cluster')
plt.ylabel('wcss')
plt.show()
pred_y = kmeans.fit_predict(x)
plt.scatter(x[:, 0], x[:, 1])
```

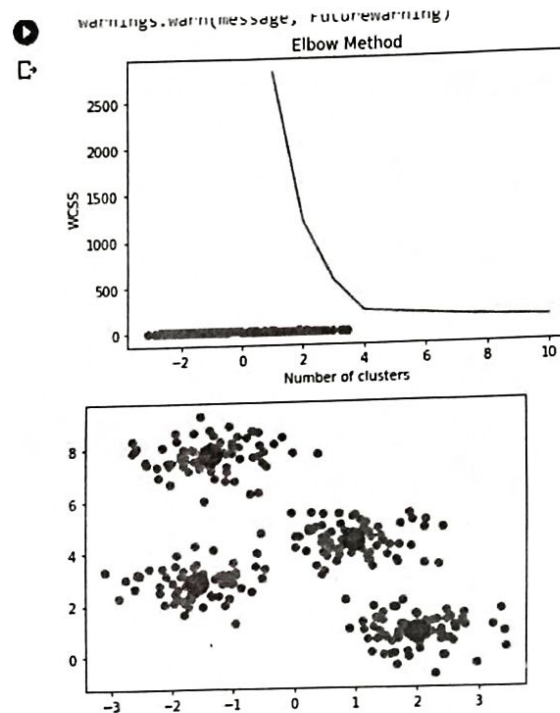
```

plt.scatter(kmeans.cluster_centers_[:,0],
            kmeans.cluster_centers_[:,1], s=300,
            c='red')
plt.show()

```

Output:

### OUTPUT:



Result:-

Thus, the program is executed successfully and the o/p is verified.