

Ex no 7

16/9/25

CLUSTERING

Aim:

= To perform customer segmentation using K-means clustering on the Mall customers dataset, and to implement and evaluate ensemble clustering (cspn) on the wine dataset for improved clustering accuracy and visualization.

Program Code:

```
import pandas as pd  
import matplotlib.pyplot as plt  
from sklearn.cluster import KMeans  
from sklearn.preprocessing import StandardScaler  
import seaborn as sns  
df = pd.read_csv(r"\\Users\\DELL\\Desktop\\Mall Customer.csv")
```

distortion = []

for i in range(1,11):

Km = KMeans(n_clusters=i, random_state=42)

distortion.append(Km.inertia_)

plt.plot(range(1,11), distortion, marker='o')

plt.title('Elbow method')

plt.xlabel('Number of Clusters')

plt.ylabel('Inertia')

plt.show()



Shot on OnePlus

Elbow Methods

20 49 60 80 17.00 0.120
(bottom was 17.00 on 11-12-0)

Annual Income (K\$)

ensemble_labels = spectral clustering C

n_clusters = 3,

affinity = 'precomputed';

random_state = 42)

return ensemble_labels

ensemble_labels = CSPA_ensemble(base_clustering)

print('silhouette score:', silhouette_score(ensemble_labels))

x_PCA = PCA.fit(x_scaled)

plt.figure(figsize=(10, 6))

plt.scatter(x_PCA[:, 0], x_PCA[:, 1],

C=ensemble_labels, cmap='viridis',

plt.title("CSPA")

Ensemble Clustering on wine
Dataset (PCA-reduced))

plt.xlabel("PCA Component 1")

plt.colorbar(label='Cluster Label')

plt.grid(True)

plt.show()

Result:

The Kmeans algorithm successfully
segmented mall customers into distinct
groups based on income & spending



Shot on OnePlus creating clear Customer Clusters.