EXPERIMENT 9A

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A PYTHON PROGRAM TO IMPLEMENT KNN MODEL

AIM:

TO IMPLEMENT A PYTHON PROGRAM TO IMPLEMENT KNN MODEL

CODE:

```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
dataset = pd.read_csv('/content/Mall_Customers.csv')
X = dataset.iloc[:,[3,4]].values
print(dataset)

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_)
# Plot the graph to visualize the Elbow Method to find the optimal number of cluster
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 = 'k-means++', max_iter = 300, n_init = 10, random_state
= 0)
y_kmeans = kmeans.fit_predict(X)
y_kmeans

type(y_kmeans)

y_kmeans
```

```python
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 = 'Cluster 2')

plt.scatter(X[y_kmeans == 2, 0], X[y_kmeans == 2, 1], s = 100, c = 'green', label = 'Cluster3')

plt.scatter(X[y_kmeans == 3, 0], X[y_kmeans == 3, 1], s = 100, c = 'cyan', label = 'Cluster 4')

plt.scatter(X[y_kmeans == 4, 0], X[y_kmeans == 4, 1], s = 100, c = 'magenta', label = 'Cluster 5')
plt.scatter(kmeans.cluster_centers_[:, 0], kmeans.cluster_centers_[:, 1], s = 300, c = 'yellow', label = 'Centroids')
plt.title('Clusters of customers')
plt.xlabel('Annual Income (k$)')
plt.ylabel('Spending Score (1-100)')
plt.legend()
plt.show()


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 = 'Cluster 2')
plt.scatter(X[y_kmeans == 2, 0], X[y_kmeans == 2, 1], s = 100, c = 'green', label = 'Cluster 3')
plt.scatter(X[y_kmeans == 3, 0], X[y_kmeans == 3, 1], s = 100, c = 'cyan', label = 'Cluster 4')
plt.scatter(X[y_kmeans == 4, 0], X[y_kmeans == 4, 1], s = 100, c = 'magenta', label = 'Cluster 5')
plt.scatter(kmeans.cluster_centers_[:, 0], kmeans.cluster_centers_[:, 1], s = 300, c = 'yellow', label = 'Centroids')
plt.title('Clusters of customers')
plt.xlabel('Annual Income (k$)')
plt.ylabel('Spending Score (1-100)')
plt.legend()
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```
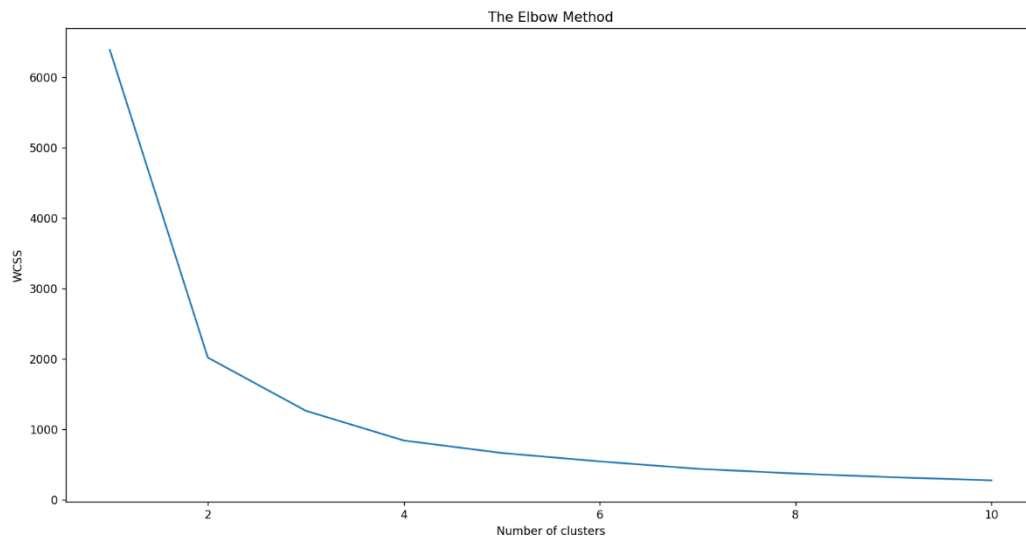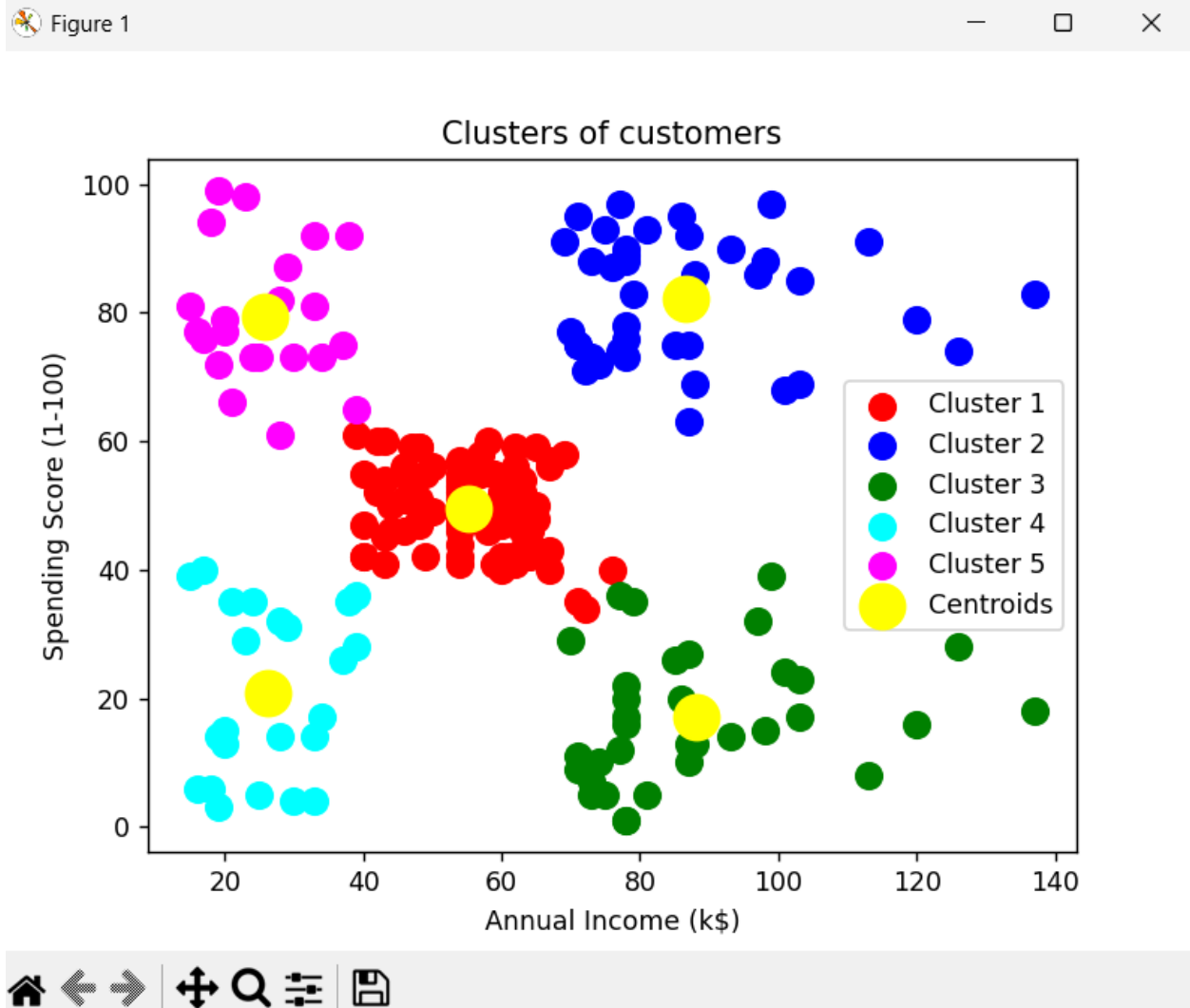
OUTPUT:

```
Python 3.12.3 (tags/v3.12.3:f6650f9, Apr  9 2024, 14:05:25) [MSC v.1938 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/itzdi/OneDrive/Documents/ML_Codes/Exp_9a.py
      variance  skewness  curtosis  entropy  class
0      3.62160   8.66610   -2.8073 -0.44699      0
1      4.54590   8.16740   -2.4586 -1.46210      0
2      3.86600  -2.63830    1.9242  0.10645      0
3      3.45660   9.52280   -4.0112 -3.59440      0
4      0.32924  -4.45520    4.5718 -0.98880      0
...        ...       ...       ...      ...    ...
1367   0.40614   1.34920   -1.4501 -0.55949      1
1368  -1.38870  -4.87730    6.4774  0.34179      1
1369  -3.75030 -13.45860   17.5932 -2.77710      1
1370  -3.56370  -8.38270   12.3930 -1.28230      1
1371  -2.54190  -0.65804    2.6842  1.19520      1

[1372 rows x 5 columns]
```

Clusters of customers

RESULT:

TO IMPLEMENT A PYTHON PROGRAM TO IMPLEMENT KNN MODEL AS BEEN ANALYSED AND VERIFIED