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**Class:** SYMCA **Div:** B

**Roll No:** 45 **Batch:** B2

**Course:** ML Lab

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**Assignment No: 7**

**Problem Statement:**

Implement K-Means Clustering on the following data set. We have given a collection of 8 points. P1=[0.1,0.6], P2=[0.15,0.71] ,P3=[0.08,0.9], P4=[0.16,0.85], P5=[0.2,0.3], P6=[0.25,0.5], P7=[0.24, 0.1] ,P8=[0.3,0.2] . Perform the k-mean clustering with initial centroids as m1=P1=Cluster#1=C1 and m2=P8=Cluster#2=C2. Answer the following

a) Which cluster does P6 belongs to?

b) What is the population of cluster around m2?

c) What is updated value of m1 and m2?

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**Code:**

import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

from sklearn.cluster import KMeans

df = pd.DataFrame({'X': [0.1,0.15,0.08,0.16,0.02,0.25,0.24,0.3],

'y': [0.6,0.71,0.9,0.85,0.3,0.5,0.1,0.2]})

f1 = df['X'].values

f2 = df['y'].values

X = np.array(list(zip(f1,f2)))

print(X)

#centroid points

c\_x = np.array([0.1,0.3])

c\_y = np.array([0.6,0.2])

colmap = {1: 'r', 2: 'b'}

plt.scatter(f1,f2, color='k')

plt.scatter(c\_x[0], c\_y[0], marker='\*', s=200, c='r')

plt.scatter(c\_x[1], c\_y[1], marker='\*', s=200, c='b')

plt.show()

#centroid

C = np.array([[c\_x[0],c\_y[0]], [c\_x[1], c\_y[1]]])

print("Centroid Points are:\n",C)

model = KMeans(n\_clusters=2,init=C,n\_init=1)

model.fit(X)

labels = model.labels\_

print("Clusters are:\n",labels)

print("P6 belongs to cluster", model.labels\_[5])

#using labels find population around centroid

count=0

for i in range(len(labels)):

if(labels[i]==1):

count = count+1

print("Number of population around cluster 2 is: ",count)

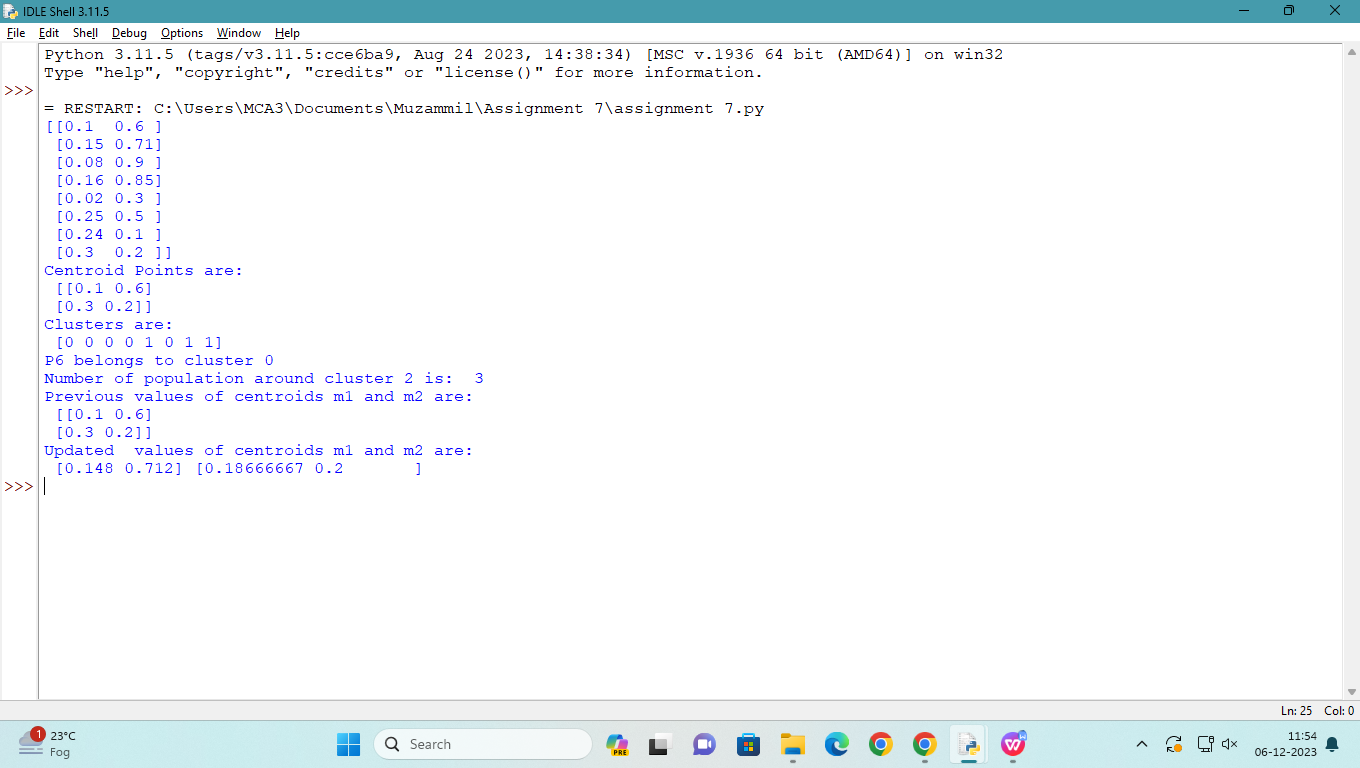
#updated values of centroids

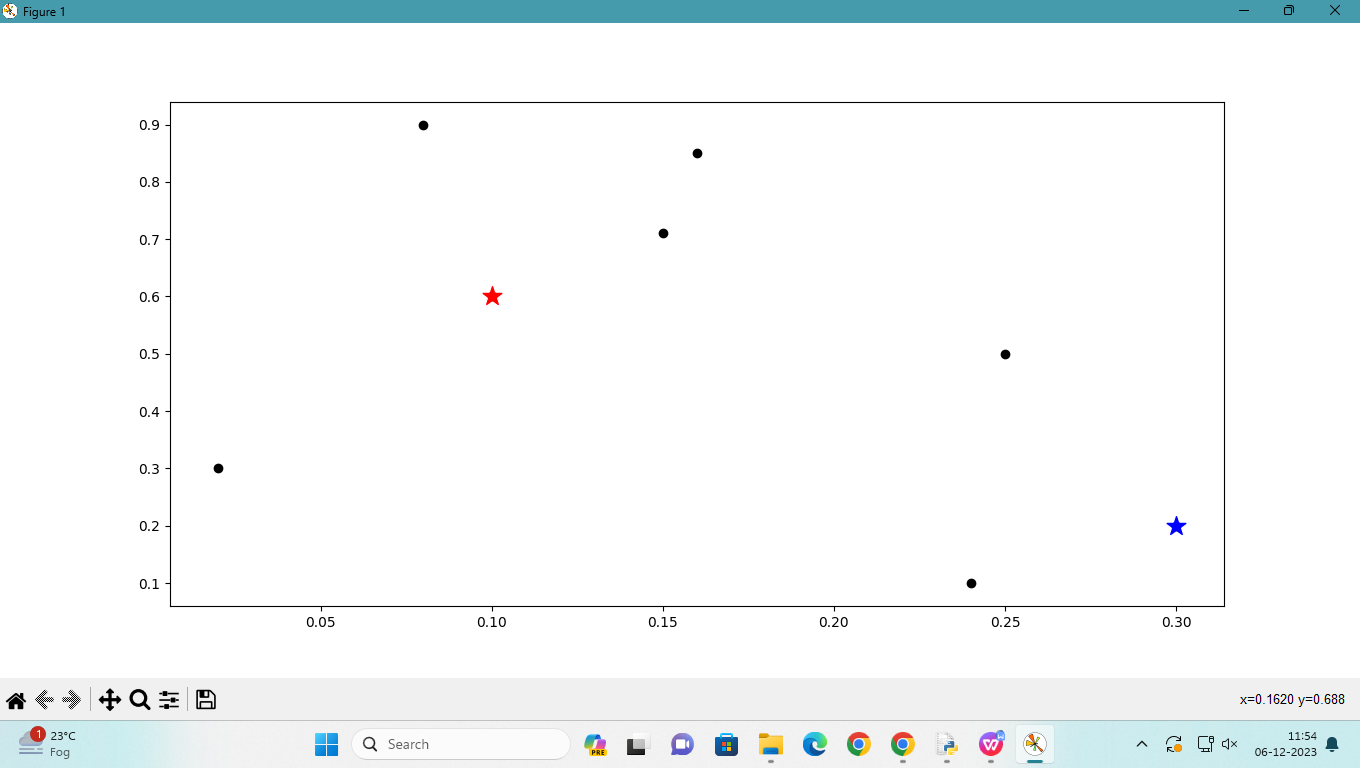
new\_centroids = model.cluster\_centers\_

print("Previous values of centroids m1 and m2 are:\n", C)

print("Updated values of centroids m1 and m2 are:\n", new\_centroids[0], new\_centroids[1] )

**Output:**

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