Write a program for FCM.
PART-I

- *Input:* Number of Objects = 6   Number of clusters = 2

X	Y	C1	C2
1	6	0.8	0.2
2	5	0.9	0.1
3	8	0.7	0.3
4	4	0.3	0.7
5	7	0.5	0.5
6	9	0.2	0.8

PART-II

1) Load modules and training data from sklearn import datasets

   In this case (wine dataset): from sklearn.datasets import load_wine

2) Define parameters
   Number of Clusters
   k = 5
   Maximum number of iterations
   MAX_ITER = 100
   Number of data points
   n = len(df)
   Fuzzy parameter
   m = 1.7 #Select a value greater than 1 else it will be crisp clustering

3) Scatter Plots
4) Initialize membership matrix
5) Calculate Cluster Center
6) Update Membership Value
7) Fuzzy C-Means with cluster centres
   i.   at origin (When the initialization is at the origin all points converge into one cluster and for the other 2 cases we get the clusters as we have initialized before)
   ii. at random locations within a multi-variate Gaussian distribution with zero-mean and unit-variance.
   iii. at random vectors chosen from the data.
8) Calculate the Accuracy
9) Plot Data