Q1: Given the data file "Q1-Data.xlsx"

a) Implement the K-means clustering algorithm for K=5.
b) Implement the GMM algorithm with 5 Gaussians.

Report the clusters centers and determine the Gaussian parameters.

Q2: In this problem, you will perform K-means clustering manually, with K = 2, on a small example with n = 6 observations and p = 2 features. The observations are as follows.

Obs.	X1	X2
1	1	4
2	1	3
3	0	4
4	5	1
5	6	2
6	4	0

(a) Plot the observations using MATLAB or any other software package.

(b) Randomly assign a cluster label to each observation. Report the cluster labels for each observation.

(c) Compute the centroid for each cluster.

(d) Assign each observation to the centroid to which it is closest, in terms of Euclidean distance. Report the cluster labels for each observation.

(e) Repeat (c) and (d) until the answers obtained stop changing.

(f) In your plot from (a), color the observations according to the cluster labels obtained.