ENGR 421 Homework 6 report

1- K means: I implemented the algorithm recursively. At first I obtain the mean and covariance matrix from the sample points, and initialise randomly 5 centroids to start my iterative algorithm with. Additionally, I implemented a function Cluster(), which takes a number of iterations. In every iteration, I update the class membership then I update the centroids by obtaining the mean of the same points belonging for each cluster and call cluster() function again with interactions - 1. Eventually, if the iterations equals to 0, I obtain the labels and return them.

2- EM clustering: As required by the homework, I run the k-means algorithm for two iterations and the use the estimated class membership in the initial step for EM clustering algorithm. I followed a recursive, and a similar way to k-means. I used the numpy library for finding the covariance and the means, and used Scipy for finding the class density according the estimated covariance and mean.