HOMEWORK 1
ECE/CS 7720 MACHINE LEARNING AND PATTERN RECOGNITION

Question 1.

a) Given a four-class dataset[1], compute the mean and covariance for each class. Compare the covariance you obtained *"by hand"* with the one obtained with the Matlab[2] built-in function *'cov'*. Did you obtain the same results? If *"not"*, explain why. If *"yes"*, why do you think I am asking this question? (i.e. what could have gone wrong?)

b) Write a Matlab[2] function to compute both the eigenvectors and eigenvalues for each class. (you can NOT use any Matlab[2] function or toolbox, but only the basic operations: +, -, *, /, etc...)

c) Plot the four-class data using different colors and display the principal vector of each class. (you may use any Matlab[2] function for plotting)

Question 2.

a) Do problems 2.3, 2.5 and 2.7 on pages 65-66 of the textbook.

[1]the dataset is available from http://vigir.ee.missouri.edu/~gdesouza/ece7720/data_class4.mat
[2]you may use any computer language/package, but the rules on what you may use in terms of built-ins or libs are the same