MINIPROJECT 1
ECE/CS 7720 MACHINE LEARNING AND PATTERN RECOGNITION

Question 1.

a) Given a four-class dataset[1] with 5 dimensions, 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 all 5 eigenvectors and eigenvalues for each class. (you can NOT use any Matlab[2] function or toolbox, but the basic operations: +, -, *, /, and a polynomial solver);

c) Plot the first two dimensions of each of the four-classes in the dataset using different colors and display the corresponding principal vectors of each class. (you may use any Matlab[2] function for plotting);

d) If you had to 'guess' the Priors of each class, what would they be? Why? (what assumptions are you making?)

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[1]the dataset is available from http://vigir.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. Let us know if you need the data in a different format