

Arab Academy For Science and Technology & Maritime Transport

College of Engineering & Technology

Computer Engineering Department



EXAMINATION PAPER – Week 7

Course Title: Pattern Recognition

Course Code: CC716

Date: Wed. Dec, 17-2014

Lecturer: Dr. Manal Helal

Time allowed: 3 Hours

Start Time: 06:00 p.m.

Student's name:

Reg.# :

Question #	Marks	
	Available	Actual
Data Exploration	6	
Bayes Classification	7	
Linear Classification	7	
Total	20	
Lecturer	Name : Dr. Manal Helal	
	Signature :	
	Date:	

MPC6/1-1

Exam Instructions:

- Download the exam dataset from the moodle web site, from week 11 section.
- The dataset is composed of 100 observations (rows), of 2 features each (column 1 and column 2), and a class label in the third column (1, 2).
- In all exam questions, submit all generated plots, figures, and results generated to answer the question.
- The exam will be curve graded on best effort, and worth 15% of your final mark.

Data Exploration:**[6 points]****1) Experiment with the data exploration techniques studied to find out the following:**

- a. Analyze the data and submit information describing it.
- b. Submit a scatter plot for the data showing 2 different icons for both classes.
- c. Fit the 2 features (column 1 and 2) to the known their probability density functions, then estimate the parameters to find out the best fit.
- d. If the data is non-parametric, specify how to handle this type of data.

Hints: Matlab functions: skewness, kurtosis, mean, median, mode, gscatter, fitdist, mle, dfittool, ksdensity.

Bayes Classification:**[7 points]****2) Apply a Bayes classifier on 80% of the data as a training data set, and use the remaining data set to test the accuracy of the classifier.**

Hints: Book Example 1.9.1 , or easier use Matlab function fitNaiveBayes and dfittool to visualize.

Linear Classification:**[7 points]****3) If the dataset is linearly separable, apply a linear classifier on 80% of the data as a training data set, and use the remaining data set to test the accuracy of the classifier. Show the decision boundary image.**

Hints: Book Examples 2.2.1 & 2.4.1, and easier to use matlab classify function, and Basic fitting tool to visualise.