Pattern Recognition (CENG509)

Assignment Question 2

Deadline April 4th, 2015

Consider Gaussian density models in different dimensions. Using the data given in the table below do:

Write a MATLAB program to find the maximum likelihood values μ and σ^2. Apply your program individually to each of the three features x_i of each class in the table below. (As you assume each feature in each class in independent, you should get 9 values for μ and σ^2).

Modify your program to apply to three-dimensional Gaussian data. Run your program to get the μ and Σ values for each class.

- Compare your results for the mean of each feature calculated in the above ways. Explain why they are the same or different.
- Compare your results for the variance of each feature σ^2 calculated in the above ways. Explain why they are the same or different.

point	ω_1			ω_2			ω_3		
	x_1	x_2	x_3	x_1	x_2	x_3	x_1	x_2	x_3
1	0.42	-0.087	0.58	-0.4	0.58	0.089	0.83	1.6	-0.014
2	-0.2	-3.3	-3.4	-0.31	0.27	-0.04	1.1	1.6	0.48
3	1.3	-0.32	1.7	0.38	0.055	-0.035	-0.44	-0.41	0.32
4	0.39	0.71	0.23	-0.15	0.53	0.011	0.047	-0.45	1.4
5	-1.6	-5.3	-0.15	-0.35	0.47	0.034	0.28	0.35	3.1
6	-0.029	0.89	-4.7	0.17	0.69	0.1	-0.39	-0.48	0.11
7	-0.23	1.9	2.2	-0.011	0.55	-0.18	0.34	-0.079	0.14
8	0.27	-0.3	-0.87	-0.27	0.61	0.12	-0.3	-0.22	2.2
9	-1.9	0.76	-2.1	-0.065	0.49	0.0012	1.1	1.2	-0.46
10	0.87	-1.0	-2.6	-0.12	0.054	-0.063	0.18	-0.11	-0.49