Pattern Recognition - Coursework 1

February 6, 2018

0.1 Part 1

0.1.1 Parzen density estimation

The parzen window probability estimate for the three sample classes is as follows

0.1.2 Prior estimations

Using the equation for the prior

$$P(w_k) \approx \frac{n_k}{n}$$

in conjunction with the data in the sample classes the priors for each class was calculated. The values used were: $n_1 = 20, n_2 = 34, n_3 = 33$, and $n = 87$

0.1.3 Posterior plots for d_1, d_2, d_3

Using the formula

$$P(w_k|x) = \frac{P(x|w_k)P(w_k)}{P(x)}$$

for each sample class, the posteriors were calculated in Matlab and the following graphs were plotted:

0.1.4 Posterior calculations for samples

Using the samples [-2, 0, 2, 4, 6, 8, 10] the posterior was calculated

Sample	Posterior, class 1	Posterior, class 2	Posterior, class 3	Classification and Summary
-2				
0				
2				
4				
6				
8				
10				

0.2 Part 2

0.2.1 k-nearest neighbours for d_1, d_2, d_3

Sample	$k = 1$	$k = 5$
-2		
0		
2		
4		
6		
8		
10		

0.3 Part 3