Statistical Methods for Machine Learning
Assignment 2

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II.1 Classification

II.1.1 Linear discriminant analysis

We have implemented the LDA algorithm according to the slides from the Linear Classification lecture. We also checked with the MATLAB *predict* function from the *ClassificationDiscriminant* class and we have similar results with only a 10^{-3} error. As expected the train error is lower than the test error

$$train_{ERR} = 0.1500$$

$$test_{ERR} = 0.2105$$

II.1.2 Linear discriminant analysis

We normalized both data sets and applied the LDA algorithm. We noticed that we get the same results as the non-normalized data. This would imply that the normalization has no effect on the accuracy of the LDA classifier. This happens because in

$$\delta_k(x) = x^T \Sigma^{-1} \mu_k - 1/2 {\mu_k}^T \Sigma^{-} 1 \mu_k + lnPr(Y = C_k)$$