

## LVC 3 - Glossary of Notations

$\mathbf{X}_i$  = Vector containing values of input features corresponding to the  $i^{th}$  record, where  $i$  ranges from 1 to  $n$

$Y_i$  = Value of the output variable corresponding to the  $i^{th}$  record

$\hat{Y}$  = The predicted value of the output variable

$E$  = Expected value or average

$\phi(X)$  = A transformed version of feature vector  $X$

$h(X)$  = Non-linear classifier function

$\theta^T$  = Transpose of vector  $\theta$

$\mu_k$  = Mean vector for class  $k$

$C_k$  = Covariance matrix for class  $k$

$\pi_k$  = Probability of a data point belonging to class  $k$ . These are called **prior probabilities**

$N(\mu_k, C_k)$  = Normal distribution with mean  $\mu_k$  and covariance  $C_k$

$\gamma_k$  = Normalizing constant for class  $k$  in the normal distribution equation

$P(Y = k | X)$  = Probability of data point belonging to class  $k$  given the input features  $X$ . These are called **posterior probabilities**

$P(X | Y = k)$  = Probability of  $X$  given the output class  $Y = k$

$C$  = When covariances of all the classes are the same

$C_{def}$  = The cost of someone being a defaulter

$C_{lost}$  = The cost of losing a customer

$\hat{\pi}_k = \frac{\text{Number of samples of class } k}{\text{Total number of samples}} = \text{Estimate of } \pi_k$

$\hat{\mu}_k = \text{Estimate of } \mu_k$

$\hat{C}_k = \text{Estimate of } C_k$

$L(data; \theta)$  = Likelihood function of the observed data

$\gamma$  = Regularization hyperparameter

$\mathbf{w}$  = Weight in the likelihood equation for unbalanced data

$||x||$  = Distance of a point  $x$  from the origin

$w$  = Weight in the weighted distance metric