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

 \mathbf{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

 θ^T = Transpose of vector θ

 μ_{k} = Mean vector for class k

 C_{ν} = Covariance matrix for class k

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

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

 $\boldsymbol{\gamma}_k$ = Normalizing constant for class k in the normal distribution equation

 $P(Y = k \mid X)$ = Probability of data point belonging to class k given the input features X. These are

called posterior probabilities

 $P(X \mid Y = k)$ = 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

$$\widehat{\pi_k} = \frac{\textit{Number of samples of class } k}{\textit{Total number of samples}} = \text{Estimate of } \pi_k$$

$$\widehat{\mu_k}$$
 = Estimate of μ_k

$$\widehat{C_k}$$
 = Estimate of C_k

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

 γ = 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