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

$\widehat{Y}$ = 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_k = 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

γ_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

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

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