

## LVC 1 - Glossary of Notations

$\mathcal{X}$  = A vector of categorical data

$y$  = Outcome class (categorical)

$f: \mathcal{X} \rightarrow y$  = Decision Rule, i.e.,  $f$  is a function that is mapping the independent features to the target values

$x_i = i^{th}$  row of the vector  $\mathcal{X}$

$y_i = i^{th}$  row of vector  $y$

$N$  = Natural number

$\in$  = Belongs to

$\Sigma$  = The summation

$\neq$  = Not equal to

$R(f)$  = Empirical Error (generalization error) of a Decision Rule

$R^*(f)$  = Probabilistic Error of a Decision Rule

$\frac{1}{N} \sum_i^N I(f(x_i) \neq y_i)$  = The average number of misclassifications. The  $I()$  function is 1 in

case of a misclassification and 0 otherwise

$\mathcal{C}$  = It is a subclass of data points

$k$  = Subset of all feature indices in the subclass

$Z$  = Random Variable

$X, Y$  =  $X$  represent the independent features and  $Y$  represents the target feature

$P(Z)$  = Probability mass function of the random variable  $Z$

$E$  = Expected value

$P(x, y)$  = It represents the joint distribution of  $X$  and  $Y$

$H(Z)$  = Entropy of  $Z$

$H(X, Y)$  = Joint Entropy of random variables  $X$  and  $Y$

$H(X | Y)$  = Conditional Entropy of  $X$  given  $Y$

$IG(Y | X)$  = Information Gain of  $Y$  given  $X$

$X \perp Y$  =  $X$  is perpendicular to  $Y$

$X(m)$  = A feature from the  $X$

$S_1 = \{(y_i \mid x_i(m) = 0)\} = \text{Splitting outcome based on class 0}$

$S_2 = \{(y_i \mid x_i(m) = 1)\} = \text{Splitting outcome based on class 1}$