(13) Multinomial Event Model Naive Bayes :

Multinomial Naive Bayes ⇒ • No Binary value

(Text classification) • Frequency tf (t,d)

t = term

d = document

tf = term frequency

Normalized Term Freq = $\frac{tf(t,d)}{n_d}$

n_d = no of docs

tf (t,d) = Raw freq of t in d

$$P(y|x) = \pi \; P(x|y) \; P(y)$$

$$\hat{P}(x_i|w) = \hat{P}(x_i|y=c) = \frac{\sum tf(x_i, d \in C)}{\sum N_{d \in c}}$$

Multinomial Naive Bayes Conditional probability :

$$\hat{P}(x_i|w) = \frac{\sum tf(x_i, d \in C) + |\alpha| 1}{\sum N_{d \in C} + |\alpha| V}$$

1 : laplace α = Hyper parameter

V : vocab size $\alpha = 1$: laplace smoothing