(12) Multivariate Bernoulli Naive Bayes :

Text Classification

- (Documents)

D1 = "like I like to swim" [1 1 0 1 1]

D2 = " I like coding" [1 1 1 0 0]

vocab = [I , like , coding , swim , to]

// Bag of words model

D1 => y = "sports" (class)

D2 => y = "Code" (class)

b (1−b)

$$P(x \mid y=c) = \prod p(x_i \mid y=c)\,(1 - P(x_i \mid y=c))$$

= (0.2) (1) . (0.3) (1) (1) . (0.9)

[1 1 0 1 1]

- $$p(y=c \mid x) = \prod p(x_i \mid y=c)\; p(y=c)$$

$$P(x_i \mid y=c) = df_{x_i,\, y=c}$$

laplace smoothing

$$= \frac{\text{count of docs having class } c \text{ and contain } x_i + 1}{\text{count of docs in class } c + 2}$$

+ 2 => bernoulli's model