

IS733_DataMining_Week5

Week-5

Naive Bayes

$$P(\text{Evade}|x) = \frac{P(\text{Evade}|x) \cdot P(x)}{P(x)}$$

Team-3

A = Spam

$$P(\text{Spam} | \text{win}, \text{click}, \text{team}, \text{claim}, \text{reminder})$$

$$\propto P(\text{Spam}) \times P(\text{Spam} | \text{win}) \times P(\text{Spam} | \text{click}) \times P(\text{Spam} | \text{team}) \times P(\text{Spam} | \text{claim}) \times P(\text{Spam} | \text{reminder})$$

$$\propto \frac{7}{15} \times$$

$$P(\text{Spam} | \text{click}) = 1/7$$

$$P(\text{Spam} | \text{team}) = 1/7$$

$$P(\text{Spam} | \text{win}) = 3/7$$

$$P(\text{Spam} | \text{claim}) = 4/7$$

$$P(\text{Spam} | \text{reminder}) = 7/7$$

$$\propto \frac{7}{15} \times \frac{1}{7} \times \frac{1}{7} \times \frac{3}{7} \times \frac{4}{7} \times \frac{7}{7}$$

$$\propto 0.46 \times 0.14 \times 0.14 \times 0.42 \times 0.57 \times 1$$

$$\propto 0.0021$$

$$B = P(\text{Ham} | \tilde{\text{win}}, \text{click}, \text{team}, \tilde{\text{claim}}, \tilde{\text{reminder}})$$

$$\propto \frac{8}{15}$$

$$P(\text{Ham} | \tilde{\text{win}}) = \frac{8}{8}$$

$$P(\text{Ham} | \text{click}) = \frac{4}{8} = \frac{1}{2}$$

$$P(\text{Ham} | \text{team}) = \frac{6^3}{8^4} = \frac{3}{4}$$

$$P(\text{Ham} | \tilde{\text{claim}}) = \frac{8}{8}$$

$$P(\text{Ham} | \tilde{\text{reminder}}) = \frac{5}{8}$$

$$\propto \frac{8}{15} \times 1 \times \frac{1}{2} \times \frac{3}{4} \times 1 \times \frac{5}{8}$$

$$\propto 0.53 \times 1 \times 0.5 \times 0.75 \times 1 \times 0.625$$

$$\propto 0.124$$

$$\begin{aligned} \frac{P(A)}{P(A)} &= \frac{A}{A+B} = \frac{0.0021}{0.0021 + 0.124} = \frac{0.0021}{0.1261} \\ &= 0.0166 \end{aligned}$$

$$\begin{aligned} \frac{P(B)}{P(B)} &= \frac{B}{A+B} = \frac{0.124}{0.1261} = \underline{\underline{0.983}} \end{aligned}$$