Week-5

Naive Bayes

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

Team-3

A =

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

$\propto \frac{8}{15} \; P(\text{team}) \times P(\text{spam} \mid win) \times P(\text{spam})$

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

$P(Spam \mid click) = 1/7$

$P(Spam \mid team) = 1/7$

$P(Spam \mid win) = 3/7$

$P(Spam \mid claim) = 4/7$

$P(Spam \mid reminder) = 7/7$

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

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

$\propto 0.0021$

B =

P(Ham | w̃in, click, team, c̃laim, r̃eminder)

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

$$P(Ham \mid w̃in) = \frac{8}{8}$$

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

$$P(Ham \mid team) = \frac{63}{84} = \frac{3}{4}$$

$$P(Ham \mid c̃laim) = \frac{8}{8}$$

$$P(Ham \mid r̃eminder) = \frac{5}{8}$$

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

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

$$\propto \underline{0.124}$$

$$P(A) = \frac{A}{A+B} = \frac{0.0021}{0.0021+0.124} = \frac{0.0021}{0.1261}$$

$$= 0.0166$$

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