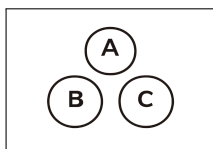


10 Discrete Distribution Posterior Probabilities

H

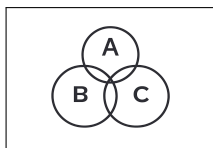


$$P(H) = 0.30$$

$$P(L) = 0.70$$

$$P(A|H) = 0.40$$

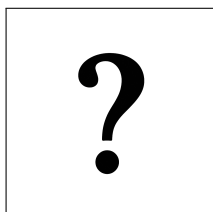
$$P(A|L) = 0.20$$



$$P(A) = P(A|H)P(H) + P(A|L)P(L)$$

$$P(A) = (0.4)(0.3) + (0.2)(0.7) = 0.12 + 0.14 = 0.26$$

$$P(H|A) = \frac{P(A|H)P(H)}{P(A)} = \frac{(0.4)(0.3)}{0.26} = \frac{0.12}{0.26} = \frac{6}{13} \approx 0.4615$$



$$P(S) = 0.50$$

$$P(H) = 0.30$$

$$P(C) = 0.20$$

$$P(I|S) = 0.30$$

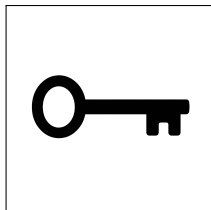
$$P(I|H) = 0.10$$

$$P(I|C) = 0.20$$

$$P(S|I) = ?$$

10 Discrete Distribution Posterior Probabilities

H



$$P(S) = 0.50$$

$$P(H) = 0.30$$

$$P(C) = 0.20$$

$$P(I|S) = 0.30$$

$$P(I|H) = 0.10$$

$$P(I|C) = 0.20$$

$$P(S|I) = ?$$

$$\begin{aligned} P(I) &= P(I|S)P(S) + P(I|H)P(H) + P(I|C)P(C) \\ &= (0.30)(0.50) + (0.10)(0.30) + (0.20)(0.20) \\ &= 0.22 \end{aligned}$$

$$P(S|I) = \frac{P(I|S)P(S)}{P(I)} = \frac{(0.30)(0.50)}{0.22} = 0.68$$