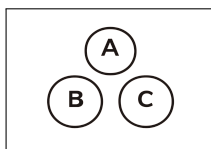


10 Discrete Distribution Posterior Probabilities

N

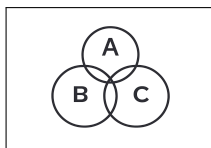


$$P(H) = 0.30$$

$$P(L) = 0.70$$

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

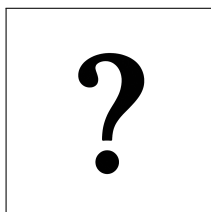
$$P(A|L) = 0.20$$



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

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

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



$$P(A) = 0.25$$

$$P(B) = 0.35$$

$$P(C) = 0.40$$

$$P(D|A) = 0.05$$

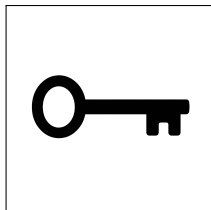
$$P(D|B) = 0.04$$

$$P(D|C) = 0.02$$

$$P(A|D) = ?$$

10 Discrete Distribution Posterior Probabilities

N



$$P(A) = 0.25$$

$$P(B) = 0.35$$

$$P(C) = 0.40$$

$$P(D|A) = 0.05$$

$$P(D|B) = 0.04$$

$$P(D|C) = 0.02$$

$$P(A|D) = ?$$

$$\begin{aligned} P(D) &= P(D|A)P(A) + P(D|B)P(B) + P(D|C)P(C) \\ &= (0.05)(0.25) + (0.04)(0.35) + (0.02)(0.40) \\ &= 0.03 \end{aligned}$$

$$P(A|D) = \frac{P(D|A)P(A)}{P(D)} = \frac{(0.05)(0.25)}{0.03} = 0.36$$