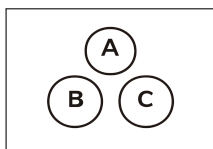


10 Discrete Distribution Posterior Probabilities

C

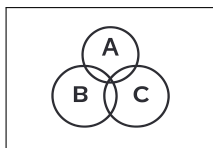


$$P(H) = 0.30$$

$$P(L) = 0.70$$

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

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



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

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

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



$$P(C) = 0.10$$

$$P(S) = 0.30$$

$$P(T) = 0.60$$

$$P(V|C) = 0.60$$

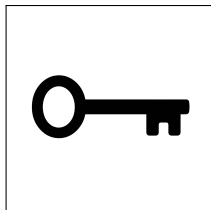
$$P(V|S) = 0.90$$

$$P(V|T) = 0.99$$

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

10 Discrete Distribution Posterior Probabilities

C



$$P(C) = 0.10$$

$$P(S) = 0.30$$

$$P(T) = 0.60$$

$$P(V|C) = 0.60$$

$$P(V|S) = 0.90$$

$$P(V|T) = 0.99$$

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

$$\begin{aligned} P(V) &= P(V | C)P(C) + P(V | S)P(S) + P(V | T)P(T) \\ &= (0.60)(0.10) + (0.90)(0.30) + (0.99)(0.60) \\ &= 0.06 + 0.27 + 0.594 \\ &= 0.924 \end{aligned}$$

$$P(S|V) = \frac{P(V|S) \times P(S)}{P(V)} = \frac{(0.90)(0.30)}{0.924} \approx 0.29$$