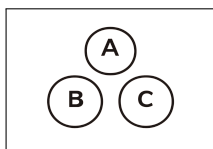


10 Discrete Distribution Posterior Probabilities

L

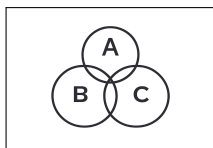


$$P(H) = 0.30$$

$$P(L) = 0.70$$

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

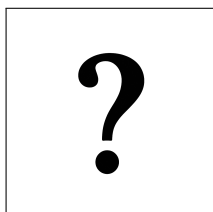
$$P(A|L) = 0.20$$



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

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

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



$$P(W) = 0.40$$

$$P(T) = 0.35$$

$$P(O) = 0.25$$

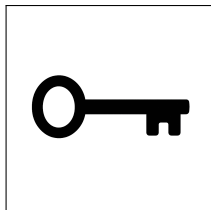
$$P(F|W) = 0.30$$

$$P(F|T) = 0.60$$

$$P(F|O) = 0.50$$

$$P(W|F) = ?$$

10 Discrete Distribution Posterior Probabilities



$$\begin{aligned}P(W) &= 0.40 \\P(T) &= 0.35 \\P(O) &= 0.25 \\P(F|W) &= 0.30 \\P(F|T) &= 0.60 \\P(F|O) &= 0.50 \\P(W|F) &= ?\end{aligned}$$

$$\begin{aligned}P(F) &= P(F|W)P(W) + P(F|T)P(T) + P(F|O)P(O) \\&= (0.30)(0.40) + (0.60)(0.35) + (0.50)(0.25) \\&= 0.46\end{aligned}$$

$$P(W|F) = \frac{P(F|W)P(W)}{P(F)} = \frac{(0.30)(0.40)}{0.46} = 0.26$$