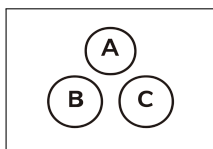


10 Discrete Distribution Posterior Probabilities

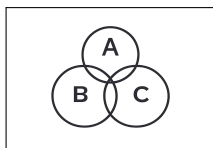


$$P(H) = 0.30$$

$$P(L) = 0.70$$

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

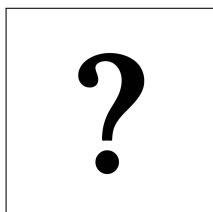
$$P(A|L) = 0.20$$



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

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

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



$$P(K) = 0.40$$

$$P(K^C) = 0.60$$

$$P(P|K) = 0.80$$

$$P(P|K^C) = 0.40$$

$$P(K|P) = ?$$

10 Discrete Distribution Posterior Probabilities



$$\begin{aligned}P(K) &= 0.40 \\P(K^C) &= 0.60 \\P(P|K) &= 0.80 \\P(P|K^C) &= 0.40 \\P(K|P) &= ?\end{aligned}$$

$$\begin{aligned}P(P) &= P(P|K)P(K) + P(P|K^C)P(K^C) \\&= (0.80)(0.40) + (0.40)(0.60) \\&= 0.56\end{aligned}$$

$$P(K|P) = \frac{P(P|K)P(K)}{P(P)} = \frac{(0.80)(0.40)}{0.56} = 0.57$$