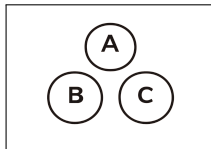


10 Discrete Distribution Posterior Probabilities

M

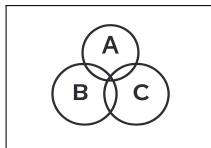


$$P(H) = 0.30$$

$$P(L) = 0.70$$

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

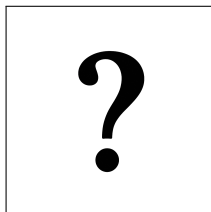
$$P(A|L) = 0.20$$



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

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

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



$$P(R) = 0.70$$

$$P(R^C) = 0.30$$

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

$$P(F|R^C) = 0.10$$

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

10 Discrete Distribution Posterior Probabilities

M



$$\begin{aligned}P(R) &= 0.70 \\P(R^C) &= 0.30 \\P(F|R) &= 0.60 \\P(F|R^C) &= 0.10 \\P(R|F) &= ?\end{aligned}$$

$$\begin{aligned}P(F) &= P(F|R)P(R) + P(F|R^C)P(R^C) \\&= (0.60)(0.70) + (0.10)(0.30) \\&= 0.45\end{aligned}$$

$$P(R|F) = \frac{P(F|R)P(R)}{P(F)} = \frac{(0.60)(0.70)}{0.45} = 0.93$$