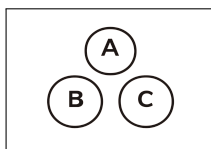


10 Discrete Distribution Posterior Probabilities

J

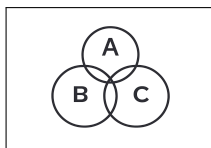


$$P(H) = 0.30$$

$$P(L) = 0.70$$

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

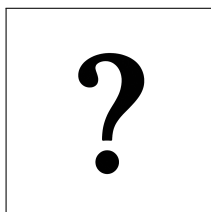
$$P(A|L) = 0.20$$



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

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

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



$$P(S) = 0.10$$

$$P(N) = 0.90$$

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

$$P(D|N) = 0.01$$

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

10 Discrete Distribution Posterior Probabilities

J



$$\begin{aligned}P(S) &= 0.10 \\P(N) &= 0.90 \\P(D|S) &= 0.05 \\P(D|N) &= 0.01 \\P(S|D) &= ?\end{aligned}$$

$$\begin{aligned}P(D) &= P(D|S)P(S) + P(D|N)P(N) \\&= (0.05)(0.10) + (0.01)(0.90) \\&= 0.01\end{aligned}$$

$$P(S|D) = \frac{P(D|S)P(S)}{P(D)} = \frac{(0.05)(0.10)}{0.01} = 0.5$$