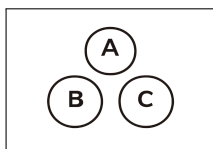


10 Discrete Distribution Posterior Probabilities

K

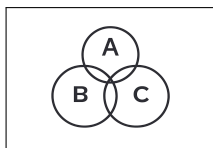


$$P(H) = 0.30$$

$$P(L) = 0.70$$

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

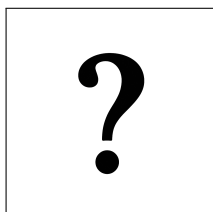
$$P(A|L) = 0.20$$



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

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

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



$$P(C) = 0.80$$

$$P(C^C) = 0.20$$

$$P(T|C) = 0.90$$

$$P(T|C^C) = 0.05$$

$$P(C|T) = ?$$

10 Discrete Distribution Posterior Probabilities

K



$$\begin{aligned}P(C) &= 0.80 \\P(C^C) &= 0.20 \\P(T|C) &= 0.90 \\P(T|C^C) &= 0.05 \\P(C|T) &= ?\end{aligned}$$

$$\begin{aligned}P(T) &= P(T|C)P(C) + P(T|C^C)P(C^C) \\&= (0.90)(0.80) + (0.05)(0.20) \\&= 0.73\end{aligned}$$

$$P(C|T) = \frac{P(T|C)P(C)}{P(T)} = \frac{(0.73)(0.80)}{0.73} = 0.99$$