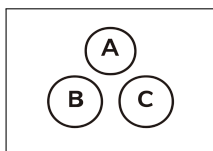


10 Discrete Distribution Posterior Probabilities

D

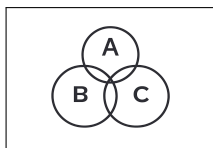


$$P(H) = 0.30$$

$$P(L) = 0.70$$

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

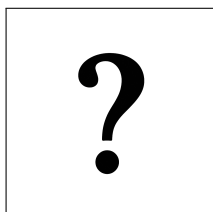
$$P(A|L) = 0.20$$



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

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

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



$$P(H) = 0.20$$

$$P(L) = 0.30$$

$$P(N) = 0.50$$

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

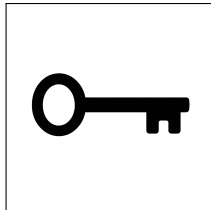
$$P(D|L) = 2p$$

$$P(D|H) = 4p$$

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

10 Discrete Distribution Posterior Probabilities

D



$$P(H) = 0.20$$

$$P(L) = 0.30$$

$$P(N) = 0.50$$

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

$$P(D|L) = 2p$$

$$P(D|H) = 4p$$

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

$$P(V) = P(D|H)P(H) + P(D|L)P(L) + P(D|N)P(N)$$

$$P(V) = (4p)(0.20) + (2p)(0.30) + (p)(0.50)$$

$$P(V) = 0.80p + 0.60p + 0.50p$$

$$P(V) = 1.90p$$

$$P(H|D) = \frac{P(D|H) \times P(H)}{P(D)} = \frac{(4p)(0.20)}{(1.90p)} = \frac{0.80}{1.90} \approx 0.42$$