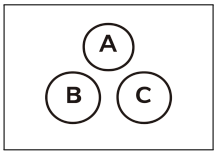
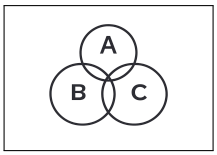
10 Discrete Distribution Posterior Probablities E



$P(H) = 0.30$
$P(L) = 0.70$
$P(A|H) = 0.40$
$P(A|L) = 0.20$

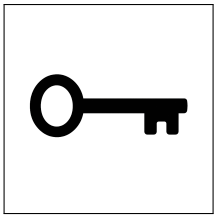


$P(A) = P(A|H)P(H) + P(A|L)P(L)$
$P(A) = (0.4)(0.3) + (0.2)(0.7) = 0.12 + 0.14 = 0.26$

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

$P(T) = 0.08$
$P(Y) = 0.16$
$P(M) = 0.45$
$P(S) = 0.31$
$P(C|T) = 0.15$
$P(C|Y) = 0.08$
$P(C|M) = 0.04$
$P(C|S) = 0.05$
$P(Y|C) = ?$

10 Discrete Distribution Posterior Probablities E



$P(T) = 0.08$
$P(Y) = 0.16$
$P(M) = 0.45$
$P(S) = 0.31$
$P(C|T) = 0.15$
$P(C|Y) = 0.08$
$P(C|M) = 0.04$
$P(C|S) = 0.05$
$P(Y|C) = ?$

$P(C) = P(C|T)P(T) + P(C|Y)P(Y) + P(C|M)P(M) + P(C|S)P(S)$
$P(C) = (0.15)(0.08) + (0.08)(0.16) + (0.04)(0.45) + (0.05)(0.31)$
$P(C) = 0.012 + 0.0128 + 0.018 + 0.0155$
$P(C) = 0.0583$

$$P(Y|C) = \frac{P(D|H) \times P(H)}{P(D)} = \frac{(0.08)(0.16))}{0.0583} = \frac{0.0128}{0.0583} \approx 0.22$$