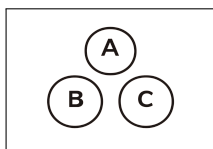


9

Discrete Distribution
Conditional Probabilities

D



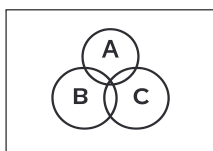
$$H = 60$$

$$U = 100$$

$$P(M \cap H) = 0.10$$

$$P(H) = 60/100 = 0.60$$

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



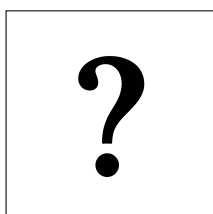
$$H = 60$$

$$U = 100$$

$$P(M \cap H) = 0.10$$

$$P(H) = 60/100 = 0.60$$

$$P(M|H) = P(M \cap H)/P(H) = 0.10/0.60 = 1/6 \approx 0.17$$



$$P(T|F) = 0.40$$

$$P(F) = 0.01$$

$$P(T) = 0.20$$

$$P(T^c|F^c) = ?$$

9

Discrete Distribution
Conditional Probabilities

D



$$P(T|F) = 0.40$$

$$P(F) = 0.01$$

$$P(T) = 0.20$$

$$P(T^c|F^c) = ?$$

$$P(F^c) = 1 - P(F) = 1 - 0.01 = 0.99$$

$$P(T^c) = 1 - P(T) = 1 - 0.20 = 0.80$$

$$P(T \cap F) = P(T|F) \times P(F) = 0.40 \times 0.01 = 0.004$$

$$P(T \cap F^c) = P(T) - P(T \cap F) = 0.20 - 0.004 = 0.196$$

$$P(T^c \cap F^c) = P(F^c) - P(T \cap F^c) = 0.99 - 0.196 = 0.794$$

$$P(T^c|F^c) = \frac{P(T^c \cap F^c)}{P(F^c)} = \frac{0.794}{0.99} \approx 0.80$$