

9

Discrete Distribution
Conditional Probabilities

A



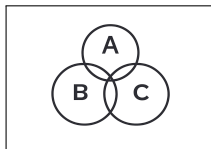
$$H = 60$$

$$U = 100$$

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

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

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



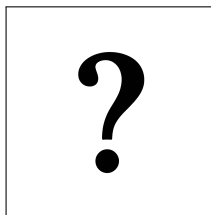
$$H = 60$$

$$U = 100$$

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

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

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



$$P(A) = 0.70$$

$$P(A^c) = 1 - 0.70 = 0.30$$

$$P(S) = 0.20$$

$$P(S | A) = 0.15$$

$$P(A^c \cap S^c) = ?$$

9

Discrete Distribution
Conditional Probabilities

A



$$P(A) = 0.70$$

$$P(A^c) = 1 - 0.70 = 0.30$$

$$P(S) = 0.20$$

$$P(S | A) = 0.15$$

$$P(A^c \cap S^c) = ?$$

$$P(A \cap S) = P(S | A) \cdot P(A) = 0.15 \cdot 0.70 = 0.105$$

$$P(S) = P(A \cap S) + P(A^c \cap S)$$

$$P(A^c \cap S) = P(S) - P(A \cap S) = 0.20 - 0.105 = 0.095$$

$$P(A^c) = 0.30 \quad \text{and} \quad P(A^c \cap S) = 0.095$$

$$P(A^c \cap S^c) = P(A^c) - P(A^c \cap S) = 0.30 - 0.095 \approx 0.21$$