

L106 Conditional Probability

martedì 14 marzo 2023

17:07

$$X = \{A, B\}$$

$$Y = \{\text{Yes}, \text{No}\}$$

$$P(X=A) = 0.5$$

$$P(X=B) = 1 - P(X=A) = 0.5$$

$$P(Y=\text{Yes} \text{ GIVEN } X=A) = P(\text{Yes} | A) = 0.8$$

$$P(X=A \text{ AND } Y=\text{Yes}) = ? = \cancel{P(A) \cdot P(\text{Yes})}$$

$$P(A \cap \text{Yes}) = P(A) \cdot P(\text{Yes} | A)$$

$$P(A \cap \text{Yes}) = 0.5 \cdot 0.8 = 0.4$$

$$\bullet P(X \cap Y) = P(X) \cdot P(Y | X)$$

$$\bullet P(Y | X) = \frac{P(X \cap Y)}{P(X)} \quad \text{AND}$$

GIVEN