

Esercizio 2

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$$P(A) = \frac{1}{3}$$

$$P(B) = \frac{1}{4}$$

$$P(A \cap B) = \frac{1}{8}$$

⊕ Sono indipendenti?

$$P(A \cap B) = P(A) \cdot P(B)$$

$$P(A) \cdot P(B) = \frac{1}{3} \cdot \frac{1}{4} = \frac{1}{12}$$

$$P(A \cap B) = \frac{1}{8}$$

A e B **Non** Sono indipendenti

① $P(A \cup B)$, Siccome sono indipendenti

$$\begin{aligned} P(A \cup B) &= [P(A) + P(B) - P(A \cap B)] \\ &= \frac{1}{3} + \frac{1}{4} - \frac{1}{8} = \frac{8+6-3}{24} = \frac{11}{24} \end{aligned}$$

② *Now* ESSENDO A e B *independent*!

$$\begin{aligned} \bullet P(A \cap \bar{B}) &= P(A) - P(A \cap B) \\ &= \frac{1}{3} - \frac{1}{8} = \frac{8-3}{24} = \frac{5}{24} \end{aligned}$$

$$\begin{aligned} \bullet P(\bar{A} \cap B) &= P(B) - P(A \cap B) \\ &= \frac{1}{4} - \frac{1}{8} = \frac{2-1}{8} = \frac{1}{8} \end{aligned}$$

$$\begin{aligned} \bullet P(\bar{A} \cap \bar{B}) &= 1 - P(A) - P(B) + P(A \cap B) \\ &= 1 - \frac{1}{3} - \frac{1}{4} + \frac{1}{8} = \frac{24-8-6+3}{24} = \frac{13}{24} \end{aligned}$$

$$\begin{aligned} \textcircled{3} P(\bar{A} \cup \bar{B}) &= P(\bar{A} \cup \bar{B}) = [P(\bar{A}) + P(\bar{B}) - P(\bar{A} \cap \bar{B})] \\ &= \frac{2}{3} + \frac{3}{4} - \frac{13}{24} = \frac{16+18-13}{24} = \frac{21}{24} = \frac{7}{8} \end{aligned}$$