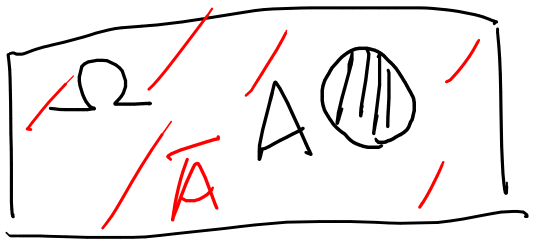
S eventi elementari $n(S)$

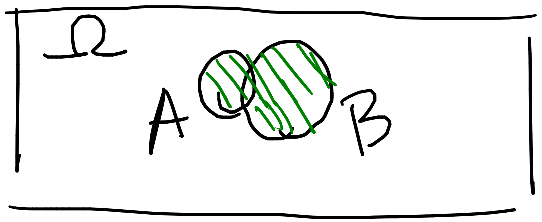
S^K spazio degli eventi elementari ripetuto K volte

A uno dei possibili eventi di S $A \subset S$



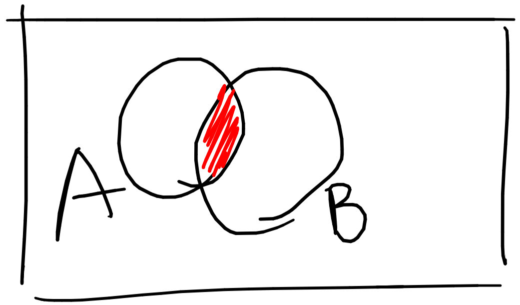
Spazio degli eventi

$\bar{A}$ NOT(A)



$A \cup B$ $A+B$

A or B



$A \cap B$ $\quad$ A AND B

eventi disgiunti

se $A \cap B = \emptyset$

n eventi si dicono mutuamente esclusivi

se $A_i \cap A_j = \emptyset \quad \forall\, i \neq j$

Prodotto cartesiano tra A e B

$$A \times B$$

(a_1, a_2) coppie ordinate

$$a_1 \in A$$
$$a_2 \in B$$

$$P(A) \in [0,1]$$

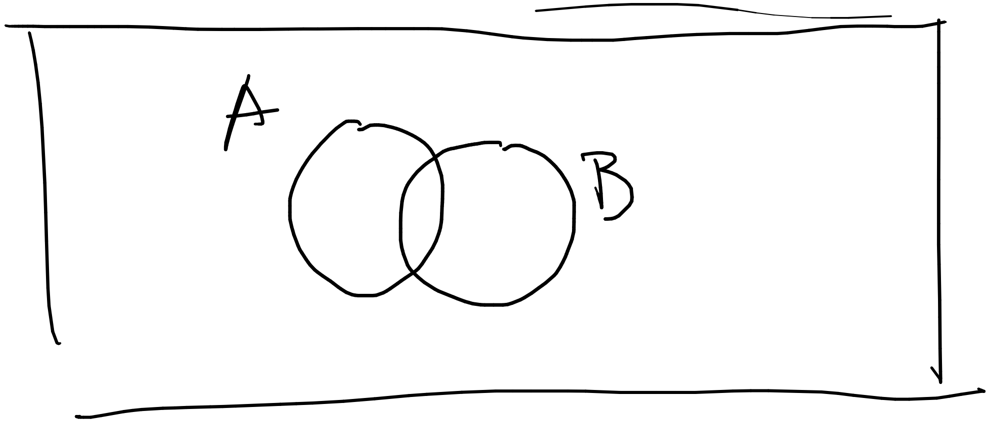
$$P: \Omega \longrightarrow \mathbb{R}$$

$$P(A) \geq 0 \quad \forall A \in S$$

$$P(S) = 1$$

$$A \cap B = \emptyset \qquad P(A \cup B) = P(A) + P(B)$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$



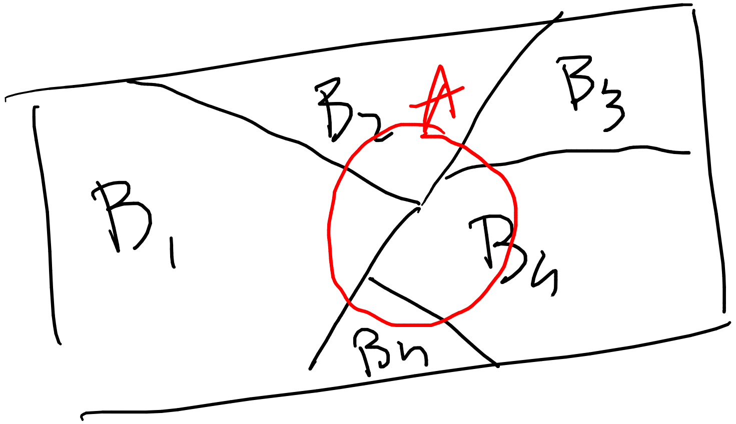
$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

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

A e B sono indip. se

$$P(A|B) = P(A)$$

$$P(B|A) = P(B)$$



$$\{B_1, B_2, \ldots, B_n\} \qquad B_i \cap B_j = \emptyset \quad \forall i \neq j$$

$$B_1 \cup B_2 \cup \ldots \cup B_n = S$$

$$P(B_i) \neq \emptyset \qquad \forall i$$

$$P(A) = P(A|B_1)P(B_1) + P(A|B_2)P(B_2) + \ldots + P(A|B_n)P(B_n)$$

$A = \{ \text{Re} \}$

$B = \{ \text{Picche} \}$

$$P(A \cap B) = \frac{1}{52}$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B) = \frac{4}{52} + \frac{13}{52} - \frac{1}{52}$$

C_1 : estraggo una donna

$\overline{C_1}$: estraggo un'altra carta

C_2 : estraggo una donna al second Tent.

$$P(C_2) = P(C_2|C_1) \cdot P(C_1) +$$

$$+ P(C_2|\overline{C_1})\, P(\overline{C_1}) =$$

$$= \frac{3}{51} \cdot \frac{4}{52} + \frac{4}{51} \cdot \frac{48}{52}$$

Urna 1: 2 palle rosse, 1 palla nera

Urna 2: 3 palle rosse, 2 nere

A: pallina nera

B_1: scelta U_1

B_2: scelta U_2

$$P(A) = P(A|B_1)P(B_1) + P(A|B_2)P(B_2) =$$

$$= \frac{1}{3}\cdot\frac{1}{2} + \frac{2}{5}\cdot\frac{1}{2} = \frac{11}{30}$$

$$P(B|A) = \frac{P(A \cap B)}{P(A)} = \frac{P(AB)}{P(A)}$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{P(AB)}{P(B)}$$

$$P(B|A)P(A) = P(A|B)P(B)$$

$$P(B|A) = \frac{P(A|B)P(B)}{P(A)}$$

$$P(U_1|A) = \frac{P(A|U_1)\,P(U_1)}{P(A)} =$$

$$= \frac{P(A|U_1)\,P(U_1)}{P(A|U_1)\,P(U_1) + P(A|U_2)\,P(U_2)} =$$

$$= \frac{\frac{1}{3} \cdot \frac{1}{2}}{\frac{11}{30}} = \frac{5}{11}$$