Probability & Statistics L2

Random Experiments (RE)

Probaleility theory is a tool to model (RE) following A. N. Kolmogorov.

Probability Space.

$$(\Omega, \mathcal{A}, P)$$

$$P : \mathcal{A} \to [0, 1]$$

$\mathcal{A} \subseteq \mathcal{P}(\Omega)$

(i) $\emptyset \in \mathcal{A}$

(ii) $A \in \mathcal{A} \Rightarrow A^c \in \mathcal{A}$.

(iii) $A_1, \ldots, A_n, \ldots \in \mathcal{A}$

then $\bigcup_{j=1}^{\infty} A_j \in \mathcal{A}$.

Φ → impossible event

Ω → certain event.

$\mathcal{A}$

In order to define $(\Omega, \mathcal{A}, P)$ in particular $\mathcal{A}$, to perform an analysis of the corresponding R.E,

first collect all the events, you are interested in and then define the smallest σ-field which contains all those events.

is also called the σ-field generated by the given set of events.