(Sec-1) **Probability & Statistics** **L3**

Random Experiments. (RE)

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

$\downarrow$

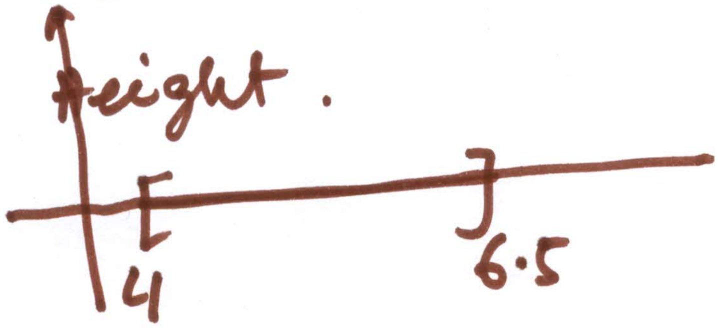
(σ-field)

$\downarrow$

Some events are more likely than others.

Need & the concept of σ-field

Exp. 1 height.



$[5,6] \subseteq [4, 6.5]$

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

Exp.

$\rightarrow$ Throwing a dart.

RE —
- → Ω is countable | Discrete
- → Ω is uncountable | Continuous

Discrete Probability measure.

Ω – contable.

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

$$P : \mathcal{P}(\Omega) \longrightarrow [0,1]$$

(i) $P(\Omega) = 1,$

$P(\Phi) = 0$

(ii) P is σ-additive

$$P\left(\bigcup_{j=1}^{\infty} A_j\right) = \sum_{j=1}^{\infty} P(A_j)$$

when A_j's ~~are~~ is a disjoint collection

Q. What are all possible probability measures on a discrete ~~sp~~ sample space!!

Let $\Omega = \{\omega_1, \ldots, \omega_N\}$

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

Let $P : \mathcal{A} \to [0,1]$ any probability measure defined on $\mathcal{A}$.

Obs. If P is a probability measure on $\mathcal{P}(\Omega)$ then the numbers p_j,

$$p_j = P(\{j\}) = P(\{\omega_j\})$$

satisfy the following

$$0 \leq p_j \leq 1, \quad \sum_{j=1}^{N} p_j = 1$$