

PROBABILITY

① Random Experiment:
→ Any task which you performed
② Throwing a die, Tossing a coin

1. What are the possible values?
2. What is the value we get?

② Outcome: the possible results of the Experiment

1, 2, 3, 4, 5, 6 → Outcomes of die

Sets:

$$A = \{1, 2, 3, 4\}$$

$$B = \{3, 4, 5, 6\}$$

$$A \cup B \Rightarrow A \text{ or } B \Rightarrow \{1, 2, 3, 4, 5, 6\} \Rightarrow \text{Combination } A \text{ or } B$$

$$A \cap B \Rightarrow A \text{ and } B \Rightarrow \{3, 4\} \Rightarrow \text{common } A \text{ \& B}$$

③ Sample space / Outcome space:

$$\Omega = \{1, 2, 3, 4, 5, 6\}$$

④ Event: Any subset of Sample space is called event.

Subset: Any small set which comes from a set

$$A_1 = \{1\} \Rightarrow \text{subset of } \Omega$$

$$A_2 = \{2\} \Rightarrow \text{subset of } \Omega$$

$$A_{13} = \{1, 3\} \Rightarrow \text{subset of } \Omega$$

$$A_{123456} = \{1, 2, 3, 4, 5, 6\} \Rightarrow \text{subset of } \Omega$$

$$\emptyset = \{ \} \Rightarrow \text{null set}$$

$\rightarrow \emptyset$ is a subset of every set

$\rightarrow \emptyset$ is an event of Ω

Outcome \rightarrow is not a set it is number.

outcome \rightarrow element of an event.

Getting 1 is an event of incident

probability: It is calculated only of the events

$$P(E) = \frac{\# \text{ no. of favourable elements in the event}}{\# \text{ no. of elements in the sample space.}}$$

throwing 2 die's, what are the possible outcomes?

$$\Omega = \{ (1,1), (1,2), (1,4), (1,5), \dots, (6,6) \}$$

\rightarrow Every subset is become an event when it is from the sample space

$$P(1) = P(\{1\}) = \frac{1}{6}$$

outcome \rightarrow events \rightarrow probability calculated on events not outcomes.

$$P(2) = \frac{1}{6}, P(3) = \frac{1}{6}, P(5) = \frac{1}{6}, P(6) = \frac{1}{6}$$