DISCRETE

CONTINUOUS

Baye's Th^m

p

prob(success)

q

prob(failure)

Binomial

Poisson

Integration

Normal

Integration

Joint Distribution

$$\text{H/T} \qquad \text{Prob}(\text{Head}) = \frac{1}{2}$$

$$\text{WED} \longrightarrow \overset{\text{NAGAON}}{\text{SUNNY}} \quad \overset{\text{WED}}{\underset{\text{Next}}{}} \quad \text{SUNNY/RAINY}$$

Markov Chain

$$\underset{\text{JRT}}{\text{RAINY}} \quad \overset{\text{WED}}{\underset{\text{Next}}{}} \quad \text{SUNNY/RAINY}$$
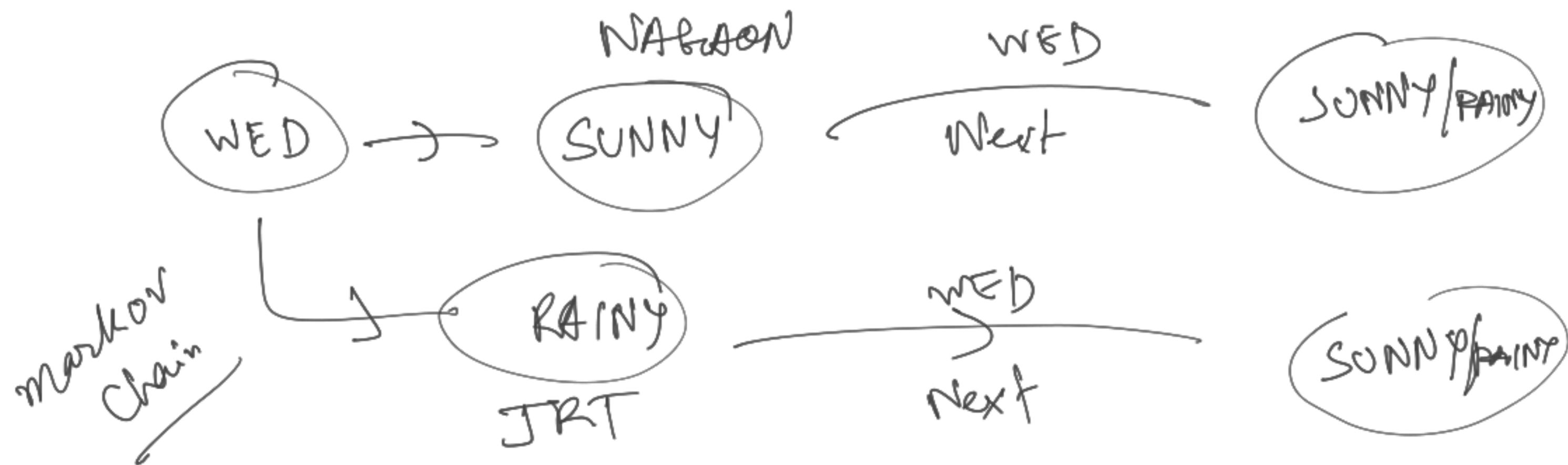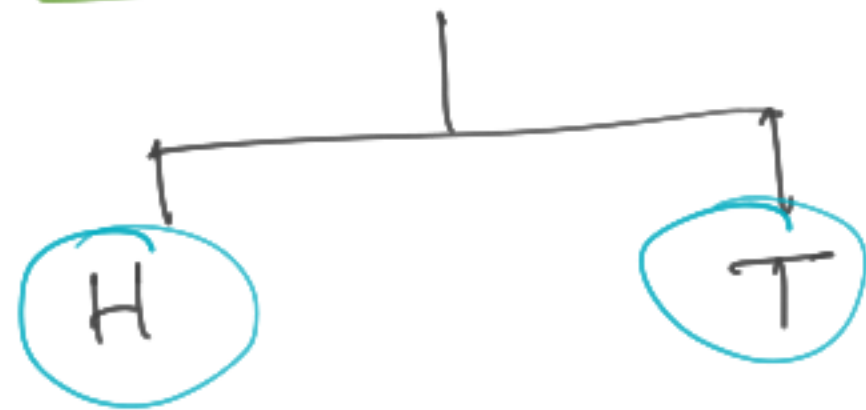
Trial & Events

If an experiment is repeated under essentially the same conditions and if result in any one of the several possible outcomes, then the experiment is called a trial and the possible outcomes are known as events.

Eg: Tossing of a coin   Trial

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          ┌─────────┴─────────┐
          ↓                   ↓
        (H)                 (T)        Events
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Sample Space

The set of all possible outcomes of an experiment is called sample space. It is denoted by s.

eg: Tossing of a coin

$$S = \{H, T\}$$

$$\underset{\text{ordered pair}}{\{\underset{1st}{(H}, \overset{2nd\,coin}{T)}\}} = \{\underset{1st}{\overset{2nd}{HT}}\}$$

Exhaustive Events

The outcomes of a random experiment is called exhaustive event if it covers all the possible outcomes of the event.

Throwing a die	Tossing a coin
$S = \{1, 2, 3, 4, 5, 6\}$	$S = \{H, T\}$
$E_1 = $ getting an even no.	$E_1 = $ getting a head
$E_2 = $ getting an odd no.	$E_2 = $ getting a tail.
$E_1 = \{2, 4, 6\}$, $E_2 = \{1, 3, 5\}$	$E_1 \cup E_2 = S$
$E_1 \cup E_2 = \{1, 2, 3, 4, 5, 6\} = S$ $\Rightarrow E_1$ & E_2 are exhaustive event	$\Rightarrow E_1$ & E_2 are exhaustive events

Favourable Events

The events which entail the required happening are called favourable events.

eg: In throwing of a pair of dice, the number of favourable events of getting a sum 7 is 6.

$\hookrightarrow$ $(1, 6)$, $(2, 5)$, $(3, 4)$, $(4, 3)$, $(5, 2)$, $(6, 1)$

Mutually Exclusive Events

H/T (circled)

$\boxed{A}$ $\boxed{T}$

Unbiased $\longrightarrow$

1. $\dfrac{H/T}{}$

mutually **M.E** excecsive

2. $\dfrac{H/T}{}$

Independent Events

H/T (circled)

$\boxed{A}$ $\boxed{T}$ H/T (circled)

independent

1. $\dfrac{H/T}{} \longleftrightarrow$ 1. $\dfrac{H/T}{}$

Independent events

Mutually Exclusive Events

Two or more events are said to be mutually exclusive if occurrence of one of them excludes the occurrence of the other. eg: while tossing a coin we either get a head or a tail but not both.

Independent Events

Two or more events are said to be independent if occurrence or non-occurrence of one doesn't depend on occurrence or non-occurrence of the other. eg: Two coins

tossed at the same time, the outcome of one is independent of the outcome of the other.

Equally likely events

Two events are said to be equally likely if there is no reason to expect anyone with preference to other. eg: Head and tail are equally likely to come.