12 September 2023

Probability

⇒ Objective and Subjective Approach

IQ

⇒ Random Experiment / Observances-

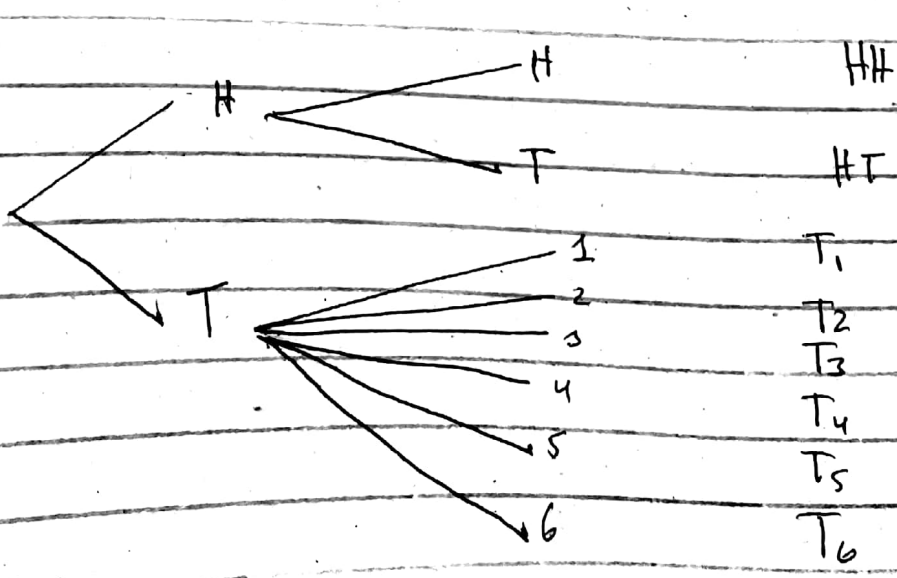
Sample Space :-

Set of all possible outcomes of a statistical experiment seperated by commas and closed in brackets and it is represented by S.

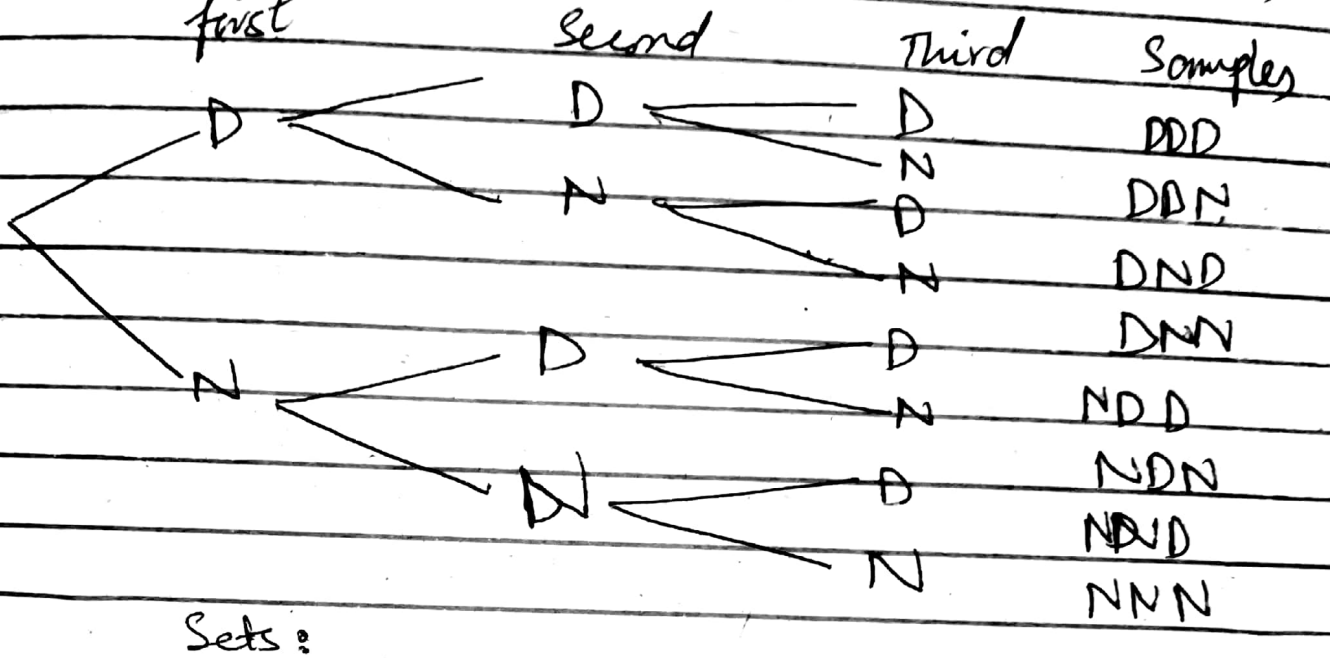
Example :-

Tossing a coin. If head, toss again. If not, roll dice

$\{HH, HT, T_1, T_2, T_3, T_4, T_5, T_6\}$



Example:- Checking 3 items and deciding if it is defective or not defective (D vs N)



Sets:

$S = \{$ DDD, DDN, DND, DNN, NDD, NDN, NND, NNN $\}$

(Q#1) Make a subset of defective items with more than 1

$K = \{$ DNN, NDN, NND, NNN $\}$

K is a subset of S

K is an event of S

Events :-

Subset of a sample set

IQ For example

$S = \{ 1,2,3,4 \ldots \}$ ← Sample Space

$SS = \{ 1,2,3 \}$ ← event

Complement :-

Complement of an event wrt "

Intersection :-

common elements in sets

$(A \cap B)$ Not mutually exclusive

Mutually Exclusive / Disjoint

if $A \cap B = \phi$

If two events have no elements in common.

e.g Head and tail cannot occur at a time.

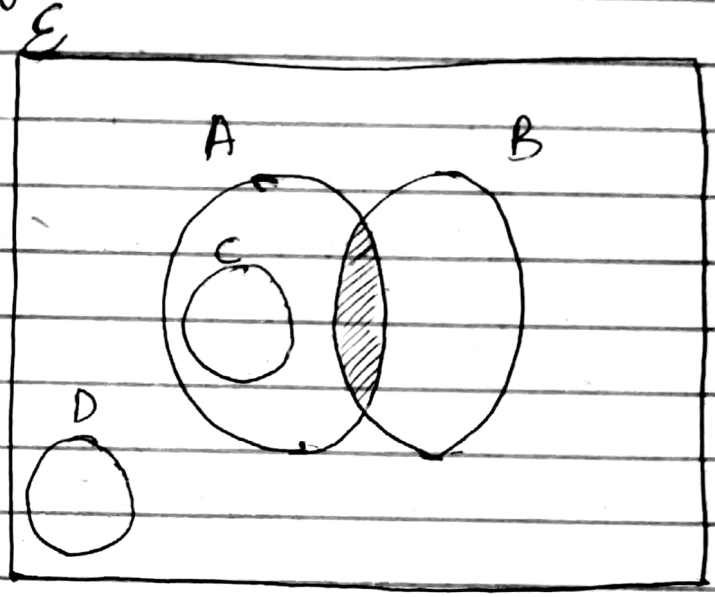
⇒ If they are joint event or can occur simultaneously.

Union :- A ∪ B

A set whose element belong
A super set -

A ∪ B = A and B

Venn Diagrams :-



★ Probability is to measure the chance or deduce an approximation of an occurance of an event given that the uncertainity is measurable

★ Quantifying the uncertainity of the occurance of events in experiments / statical experiment / random exp.

★ A quick brown fox jumps over the lazy dog

Counting Sample Points :-

IQ

→ multiplication Rule
→ Permutation
→ combination

★ To count the occurances or find the total outcomes by counting as a technique

★ find total number

Rule of Multiplication:-

$(n_1 \times n_2)$

⇒ Roll 2 dies

⇒ Total outcomes = 36

(1,1) (1,2) (1,3) (1,4) (1,5) (1,6)
(2,1) (2,2) (2,3) (2,4) (2,5) (2,6)
(3,1) (3,2) (3,3) (3,4) (3,5) (3,6)
(4,1) (4,2) (4,3) (4,4) (4,5) (4,6)
(5,1) (5,2) (5,3) (5,4) (5,5) (5,6)
(6,1) (6,2) (6,3) (6,4) (6,6) (6,6)

Total different types of events

Q⇒