SRI AKILANDESWARI WOMEN'S COLLEGE, WANDIWASH

MATHEMATICAL STATISTICS

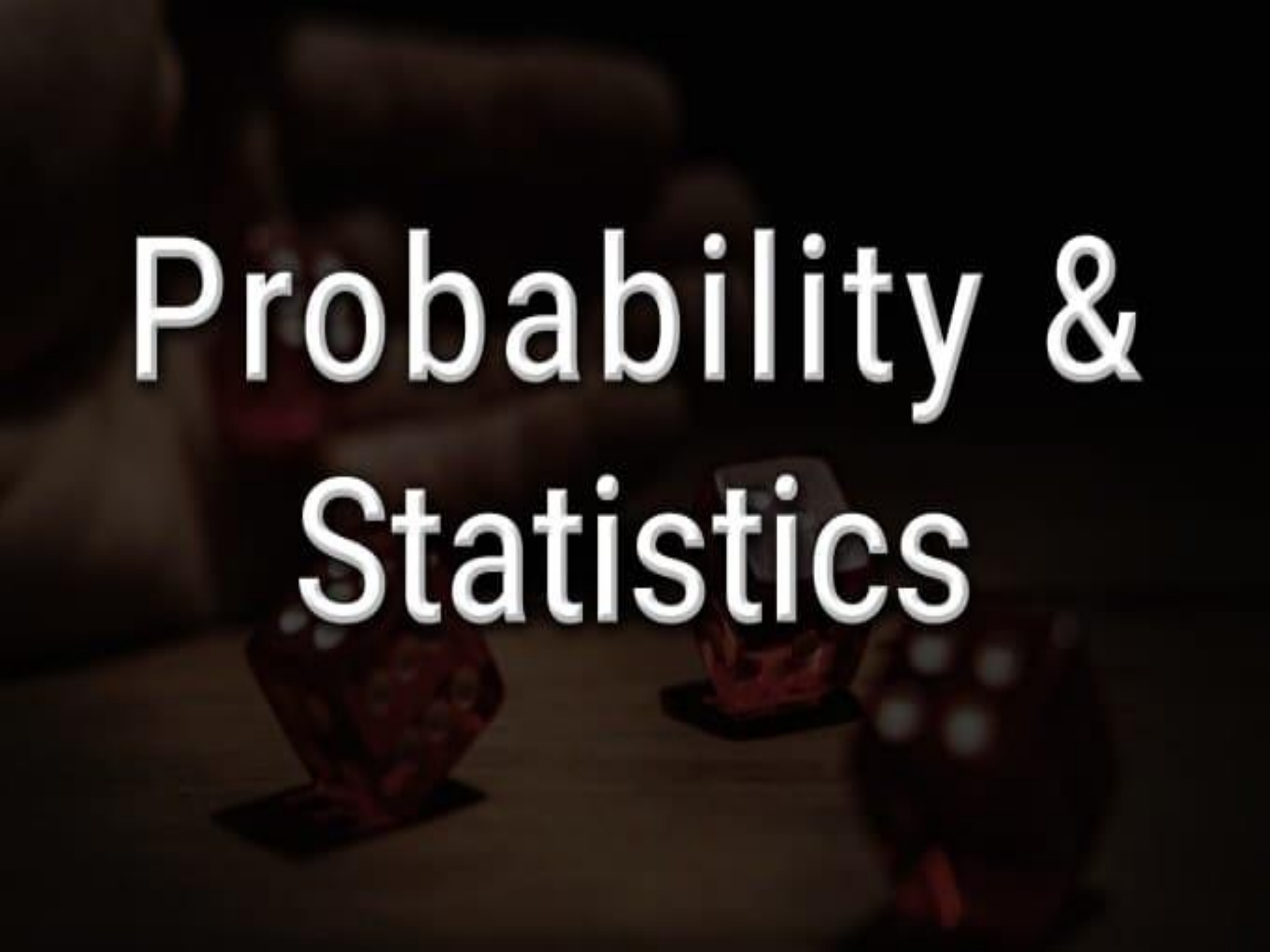
CLASS : II UG MATHEMATICS

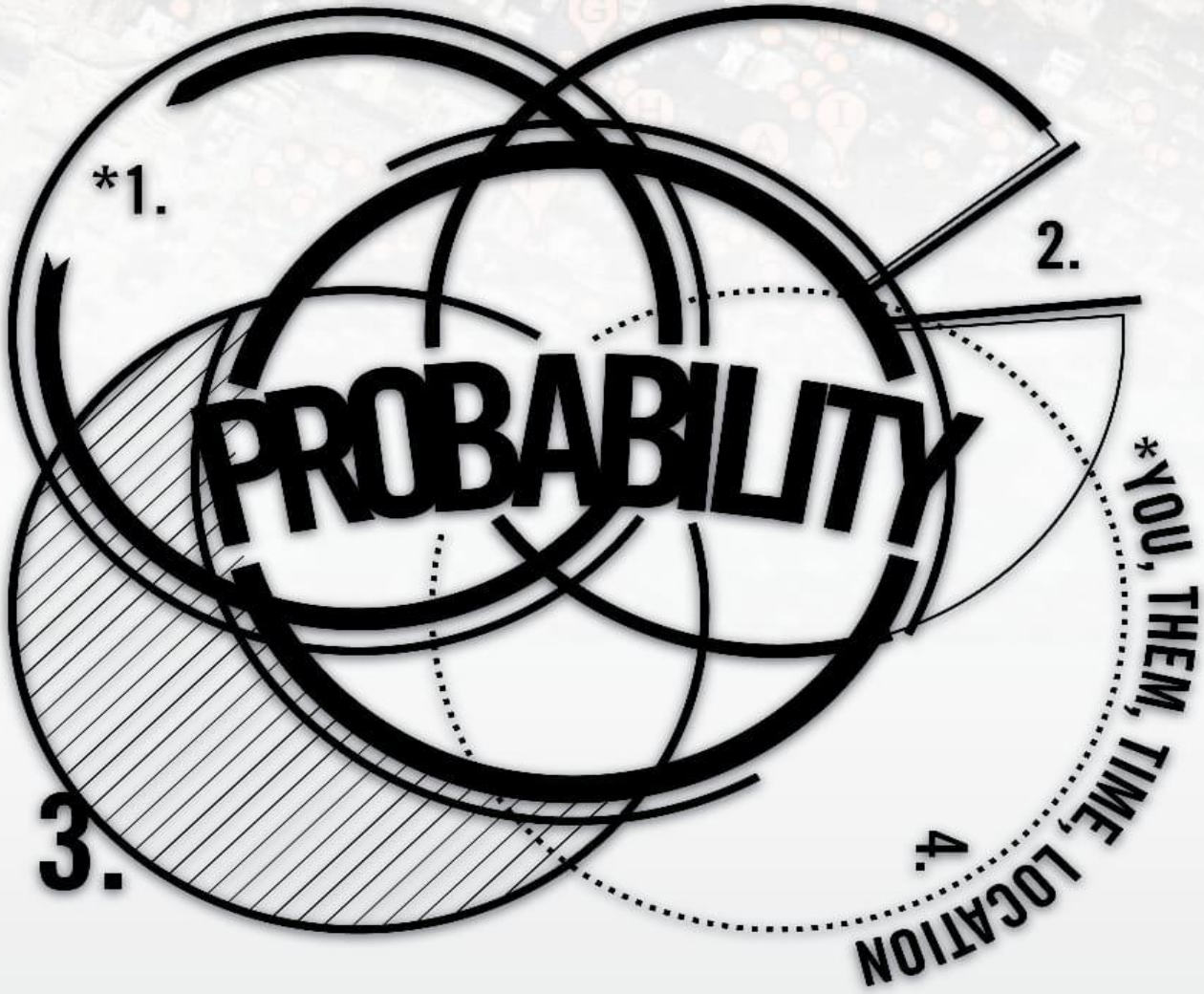
SAMUNDEESWARI E

ASSISTANT PROFESSOR

DEPARTMENT OF MATHEMATICS

SWAMY ABEDHANADHA EDUCATIONAL TRUST, WANDIWASH


Probability &
Statistics


*1.
2.
PROBABILITY
3.
4.
*YOU, THEM, TIME, LOCATION

PROBABILITY:

- Probability is simply how likely something is to happen.
  Whenever we are unsure about the outcome of an event, we can talk about the probabilities of certain outcomes how likely they are.

FORMULA:

- P(A) = n(A)/n(B)
- Where, P(A) is the probability of an event ``A'' n(A) is the number of favourable outcomes. n(S) is the total number of events in the sample space.

EXAMPLE:

- A life saving drug is administered to a patient admitted in a hospital. The patient's relatives may like to know the probability with which the drug will work; they will be happy if the doctor tells that out of 100 patients treated with the drug, it worked well with more than 80 patients. This percentage of success is illustrative of the concept of probability; it is based on the frequency of occurrence. It helps one to arrive at a conclusion under uncertain conditions. Probability is thus a way of quantifying or measuring uncertainty.

TRAIL:

- Rolling a dice and flipping a coin are trial.
- A trial is an action which results in one or several outcomes.

OUTCOMES:

- While flipping a coin we get head or tail.
- Head and Tail are called outcomes.
- The results of the trial is called an outcomes.

SAMPLE POINT:

- While flipping a coin, each outcome H or T are the sample points.
- Each outcome of a random experiment is called a sample point.

SAMPLE SPACE:

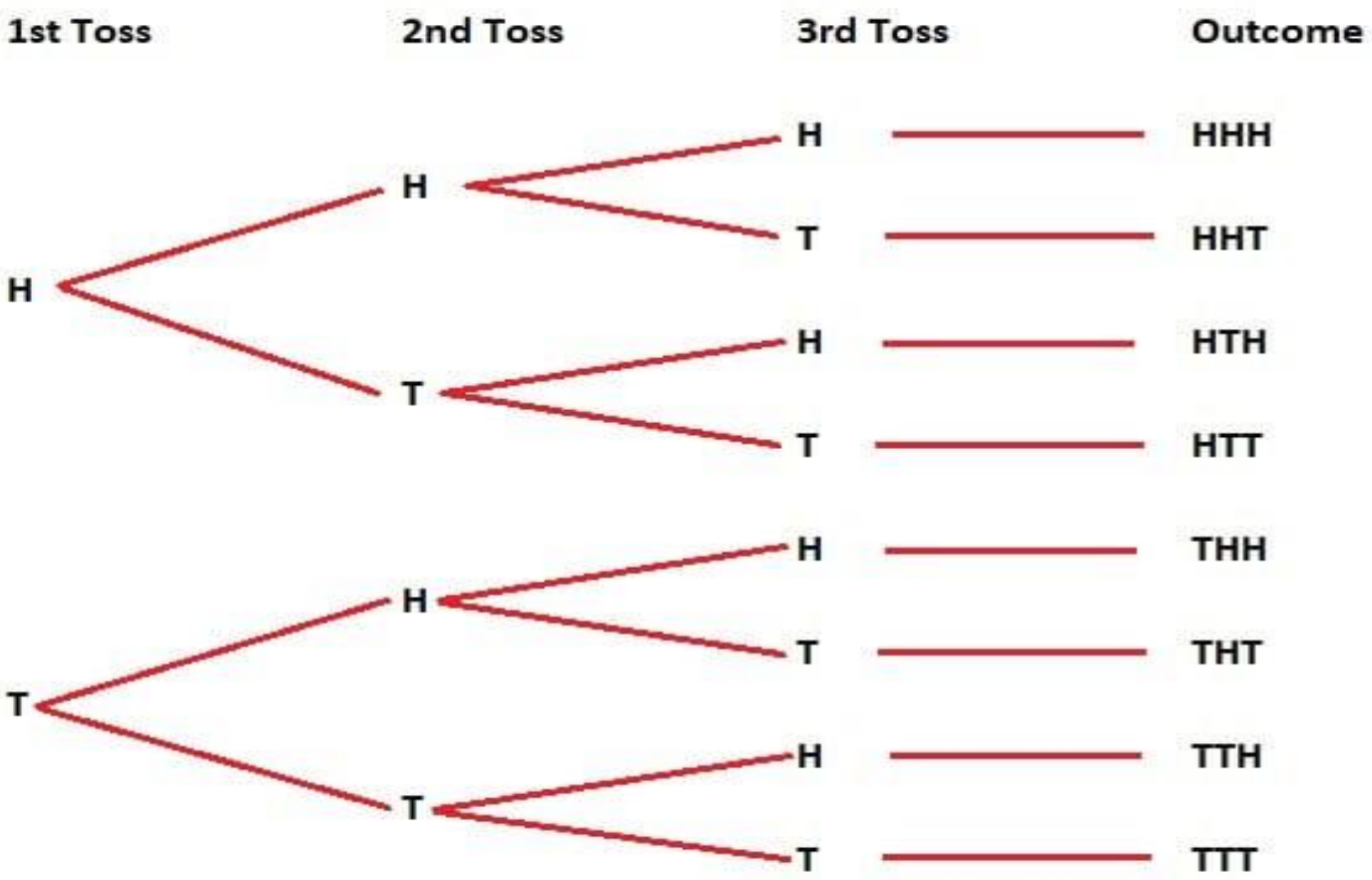
- The set of all possible outcomes (or sample points) of a random experiment is called the sample space.
- It is denoted by S. The numbers of elements in it are denoted by n(S).

EVENT:

- If a dice is rolled, it shows 4 which is called an outcome (since, it is a result of a single trail).
- In the some experiment the event of getting an even number is (2,4,6). So any subset of a sample space is called an event.
- Hence an event can be one or more than one outcome.

COIN:

PROBABILITY OF COIN:



EXAMPLE:

- When a single coin is tossed, find the probability of getting a head?

Sample space(S) = (H,T)

total no of exhaustive cases = 2

total no of favourable cases = 1

P(Getting a head) = 1/2

P(A) = 0.5

DICE:

EXAMPLE:

- A dice is thrown twice what is the probability of getting same numbers?

Total no of exhaustive cases = 36

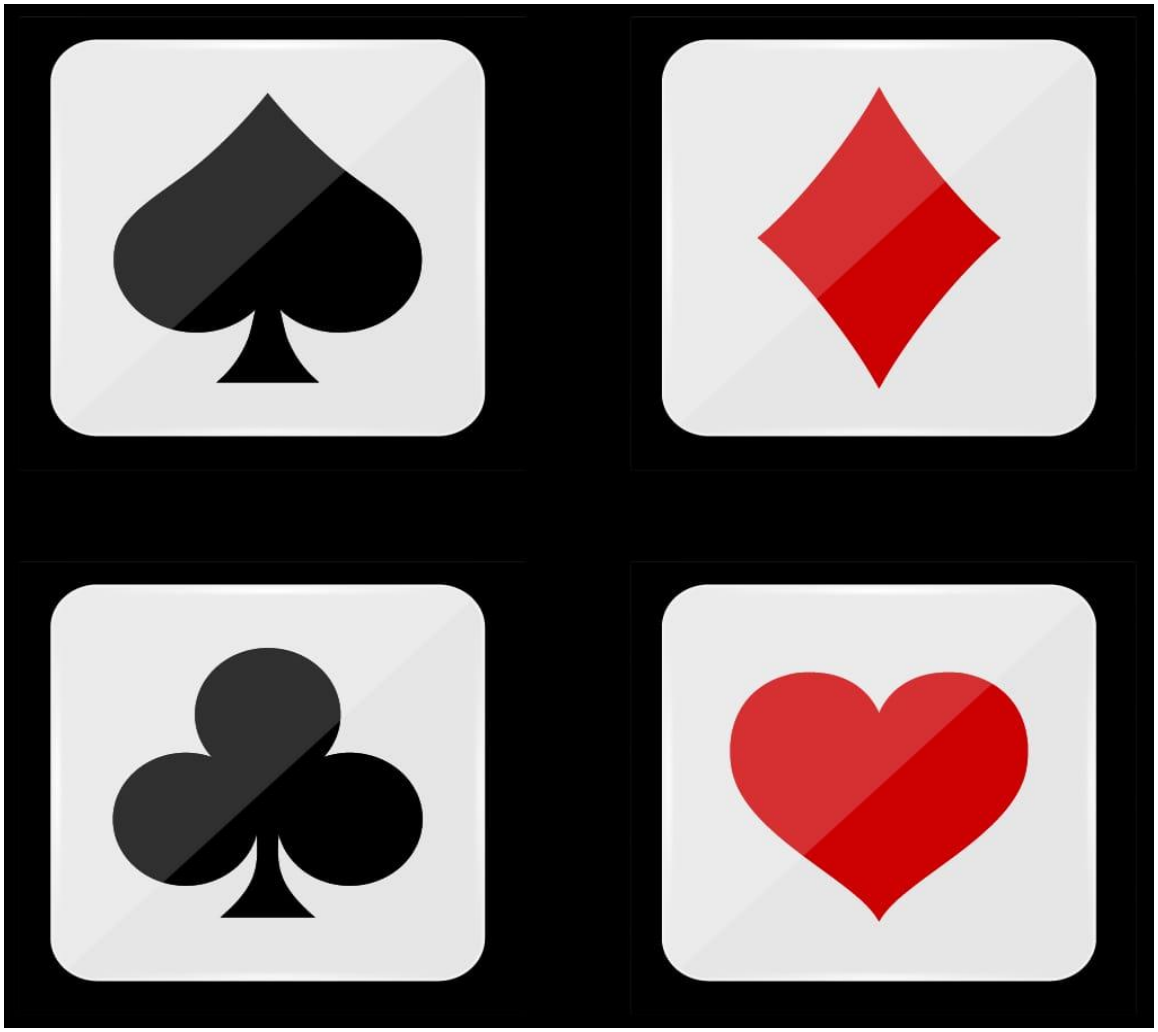
Total no of favourable cases = 6

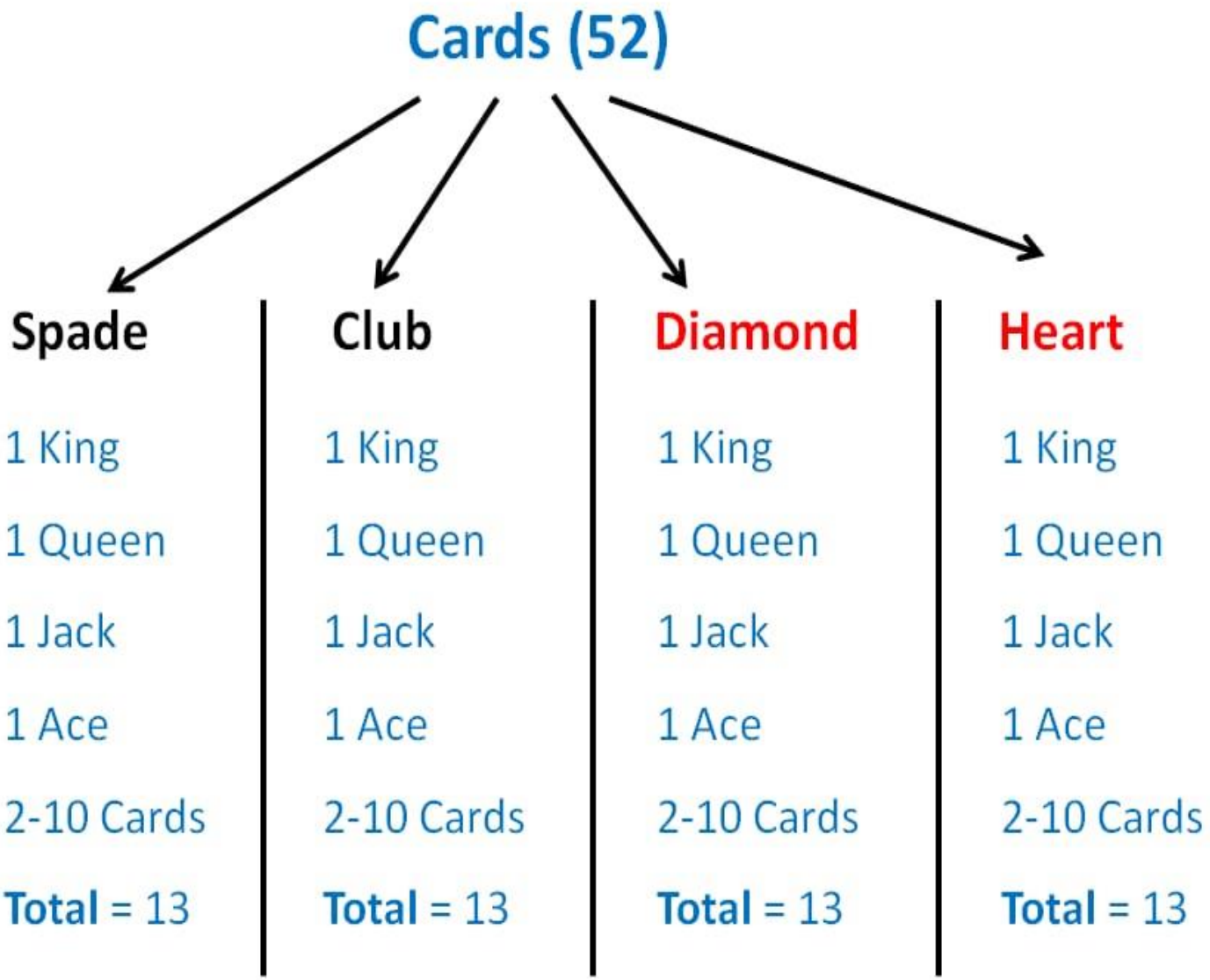
{(1,1),(2,2),(3,3),(4,4),(5,5),(6,6)}

P(Getting a same number) = 6/36

P(A) = 1/6

CARDS:




Cards (52)
Spade
1 King
1 Queen
1 Jack
1 Ace
2-10 Cards
Total = 13
Club
1 King
1 Queen
1 Jack
1 Ace
2-10 Cards
Total = 13
Diamond
1 King
1 Queen
1 Jack
1 Ace
2-10 Cards
Total = 13
Heart
1 King
1 Queen
1 Jack
1 Ace
2-10 Cards
Total = 13

EXAMPLE:

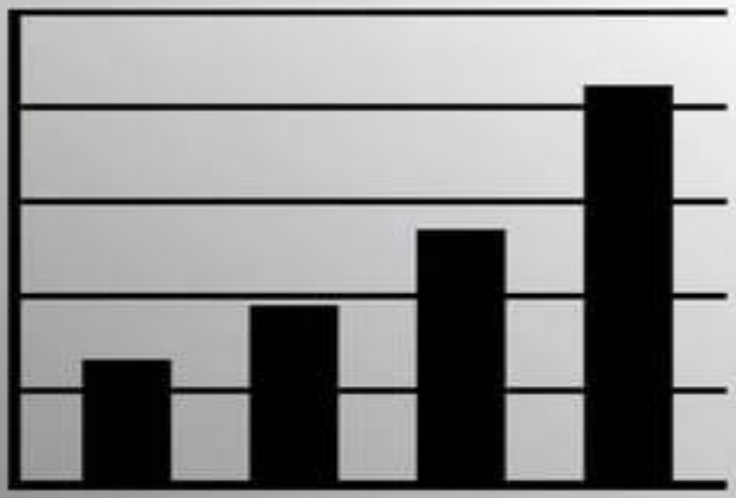
- A single card is drawn from a well shuffled pack of 52 cards what is the probability of getting a king?

Total no of exhaustive event = 52

Total no of favourable event = 4

P(Getting a king) = 4/52

P(A) = 1/13



STATISTICS

STATISTICS:

- Statistics is the study of the collection, analysis, interpretation, presentation, and organization of data.
- In other words, it is a mathematical discipline to collect, summarize data.

MEAN:

- Mean is the average of the given numbers and is calculated by diving the sum of given numbers by the total number of numbers.
- Mean = (Sum of all the observations/Total number of observations)

EXAMPLE:

- What is the mean of 2,4,6,8, and 10?

first add all the numbers.

$$2+4+6+8+10 = 30$$

Now divided by 5 (total number of observation).

$$\text{Mean} = 30/6 = 6$$

MEDIAN:

- Median is the middle value of the given number of observations, that divides it into exactly two parts.

EXAMPLE:

- Find the median of the below distribution

  8,14,23,35,45,76,89,90,120,200.

  Number of data points in the distribution = 10

  Locating the two points in middle = 45 and 76

  Average of two mid-data points = 45+76/2

  Median = 60.5

MODE:

- A mode is defined as the value that has a higher frequency in a given set of values.
- It is the value that appears the most number of times.

EXAMPLE:

- Find the mode of the given data set:3,3,6,9,15,15,15,27,27,37,48.

In the following list of numbers,

3,3,6,9,15,15,15,27,27,37,48

15 is the mode since it is appearing more number of times in the set compared to other number.

THANK YOU!