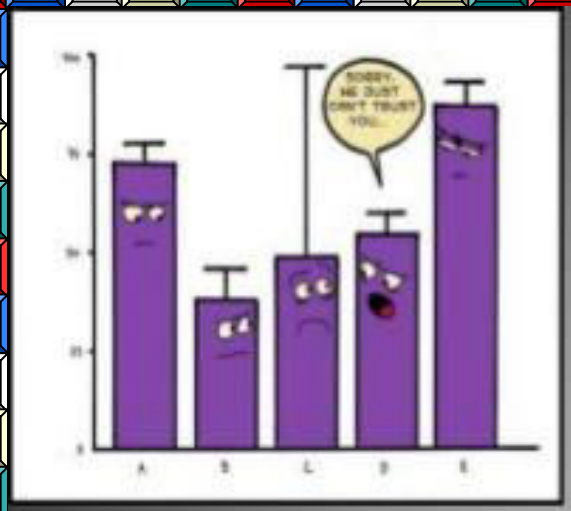
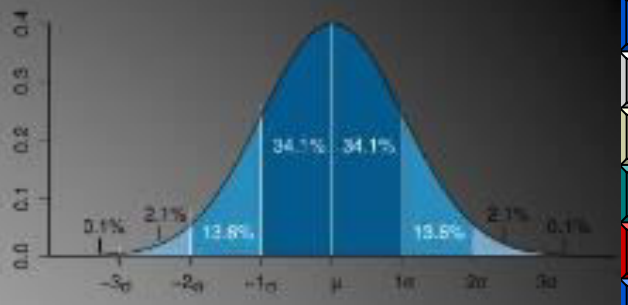
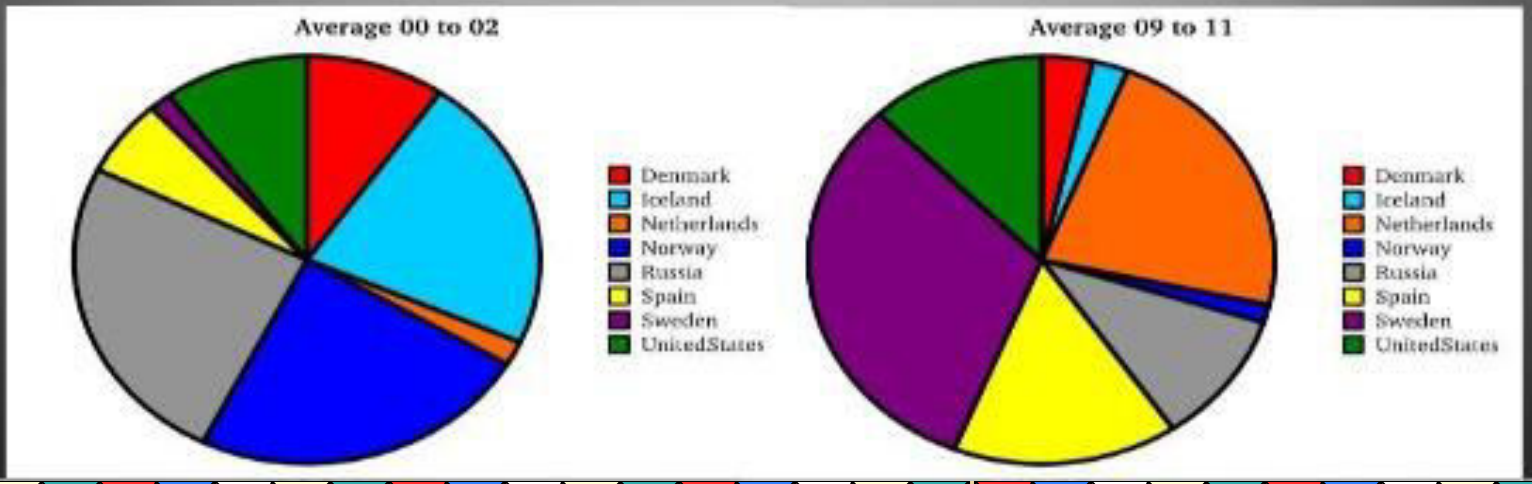


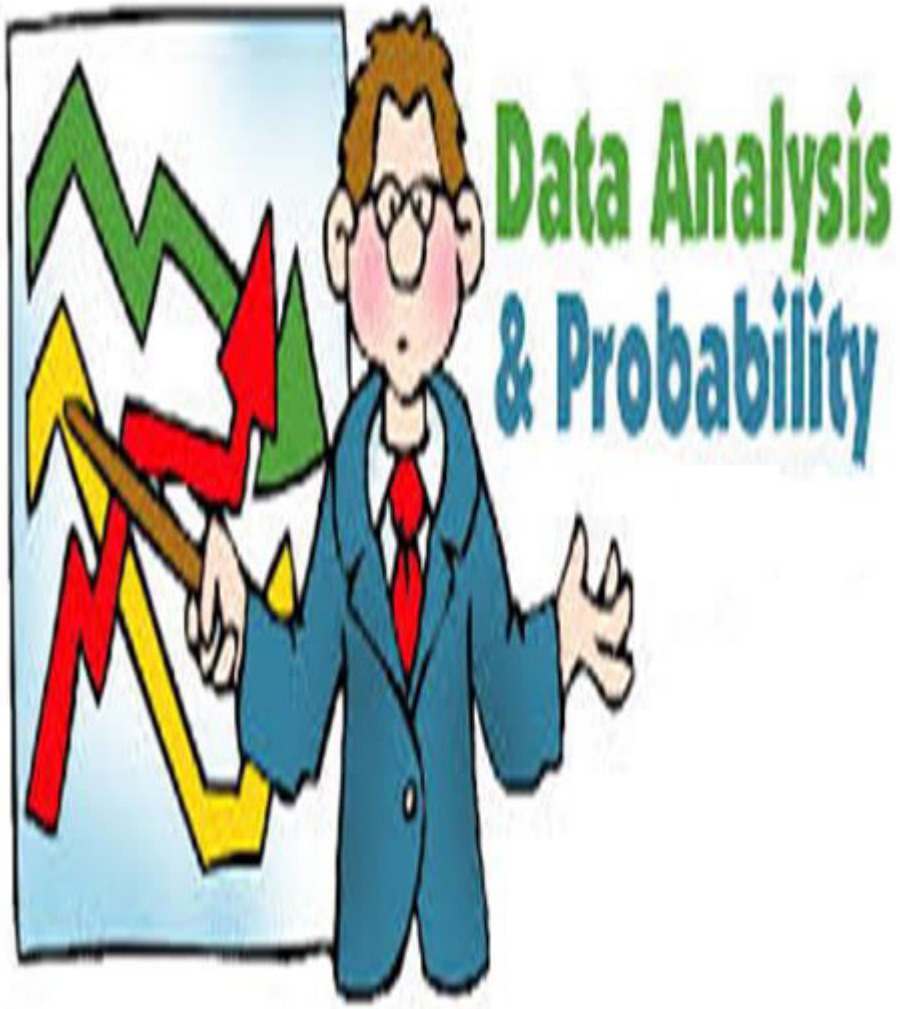
TOPIC



DATA HANDLING



ATOMIC ENERGY EDUCATION SOCIETY



MONTH : July

CLASS : Eight

SUBJECT : Mathematics

TOPIC

Data Handling

MODULE: 5/5

PREPARED BY

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TERMS RELATED TO PROBABILITY

Probability is used to describe RANDOM or CHANCES of events to occur.

Every day we are faced with probability statements involving the words:

1. What is the ***likelihood*** that X will occur?
2. What is the *chance* that Brazil will win the 2014 World Cup?

Random Experiment

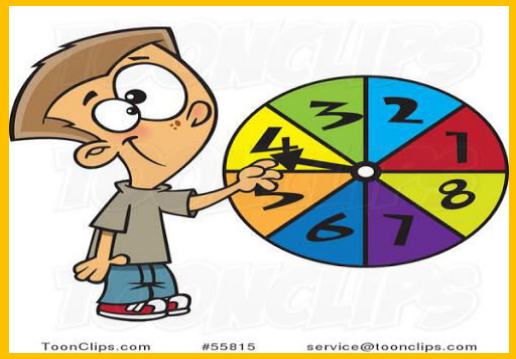
- A **random experiment** is one whose outcome cannot be predicted exactly in advance
  Example: Throwing a dice
  Tossing the coin

  Equally Likely outcome
  Outcomes of an experiment are **equally likely** if each has the same chance of occurring
  Example
  In tossing the coin, both head and tail can come equally likely
  In throwing the dice, all the number 1, 2,3,4,5,6 can come equally likely

One or more outcomes of an experiment make an event.

1. Getting a tail in tossing a coin is an event

2. Getting a green sector in spinning a wheel



3. Getting an odd number in a throw of dice is also an event.

4. Getting a red ball from a bottle of balls.

THE EQUAL-LIKELIHOOD MODEL

- This model applies when the possible outcomes of an experiment are equally likely to occur.

- Suppose there are N equally likely possible outcomes from an experiment.

- Then the probability that a specified events equals the number of ways, *f*, that the event can occur, divided by the total number, N, of possible outcomes.

The probability is

$$\frac{f}{N}$$

f = No. of ways event can occur
N = Total number of possible outcomes.

In other words, in a situation where several different outcomes are possible, we define the probability for any particular outcome as a fraction of the proportion.

Probability is calculated as

$$Probability\ of\ an\ event = \frac{Number\ of\ outcomes\ that\ makes\ the\ event}{Total\ number\ of\ outcomes\ of\ the\ experiment}$$

This is applicable when the all outcomes are equally likely

PROBABILITY EXAMPLE

Example A jar contains 1000 marbles, 800 are black and 200 are red. What is the probability of drawing a black marble out of the jar.

Solution:

Here 800 is the number of possible outcomes, *f*

The total number of possible outcomes is 1000, *N*

Thus the probability is

$$p(\text{black}) = \frac{800\,\text{black marbles}}{1000\,\text{total marbles}} = \frac{8}{10} = 0.8$$

and

$$p(\text{red}) = \frac{200\,\text{black marbles}}{1000\,\text{total marbles}} = \frac{2}{10} = 0.2$$

The probability of drawing a black marble is much higher than the probability of you picking a red marble because there are more black marbles in the jar.

Example

When a die is thrown, Find the probability of the following

(a) getting prime number

(b) getting not a prime number.

(c) getting a number greater than 4

(d) getting a number not greater than 4.

- **Solution**

Total outcome from the dice are 1,2,3,4,5, 6. So 6

a) getting prime number

2,3,5 are the prime number

So probability = 3/6= 1/2

b) getting not a prime number

1,4,6 are not prime number

So Probability = 3/6= 1/2

c) getting a number greater than 4 : 5,6 satisfies the requirement

So probability = 2/6= 1/3

d) getting a number less than 4

1,2 ,3 satisfies the requirement

So probability = 3/6= 1/2

Example

- Find the Probability of getting an ace from a well shuffled deck of 52 playing cards.

ANS :There are 4 aces in a deck of 52 playing cards.

So, probability of getting an ace = 4/52

= 1/13


Thank
you
very
much!