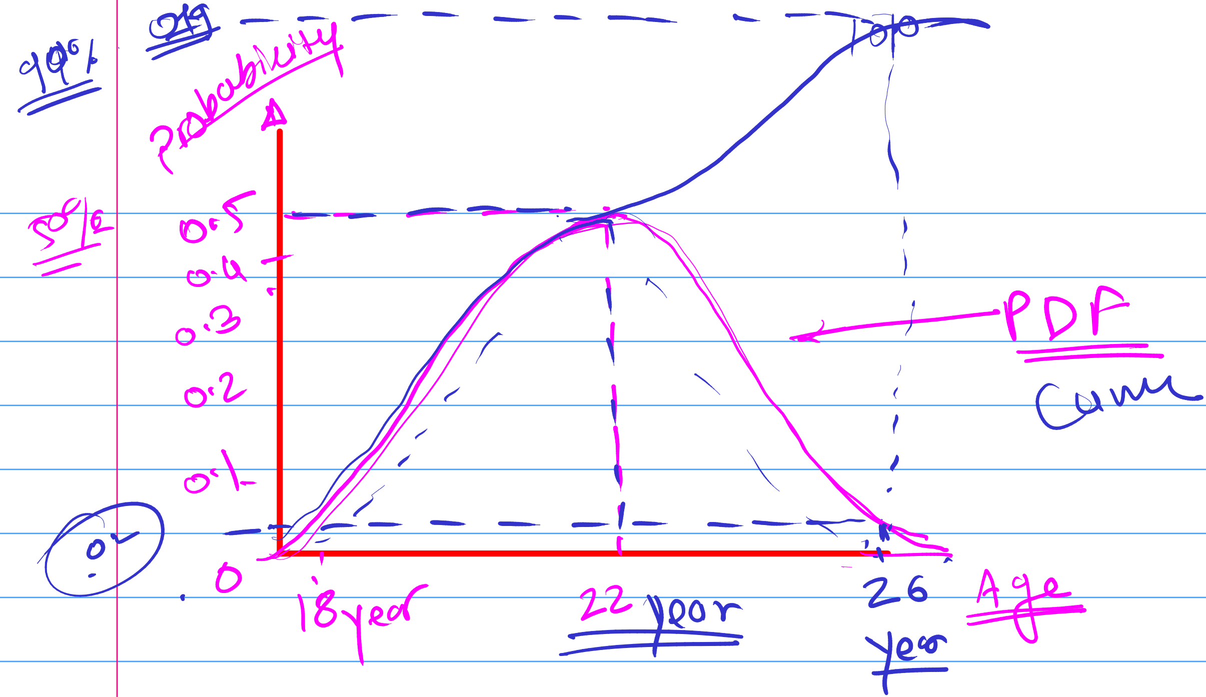


Types of probability Distribution

1. Bernoulli Distribution :→

- :→ It is a discrete probability Distribution
- :→ It Concerned with PMF

It applies to events that have one trial and Two possible outcome.

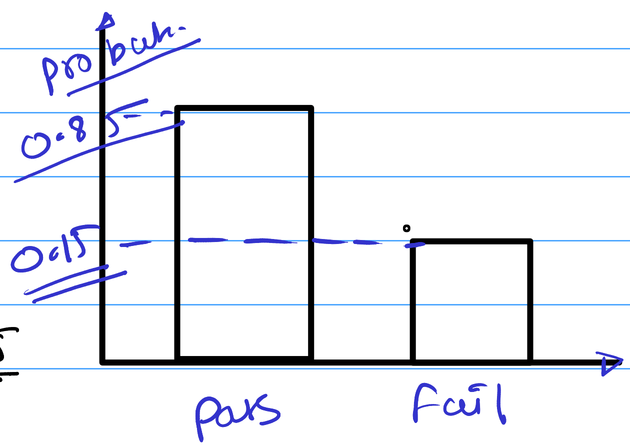
Tossing a coin = {H, T}

Total probability = P(H) + P(T) = 1

eg= P(H) = 0.8   P(T) = 0.2

Pass | Fail

P(Pass) = 0.85   P(Fail) = 0.15



Column/BAR

2. Binomial Distribution

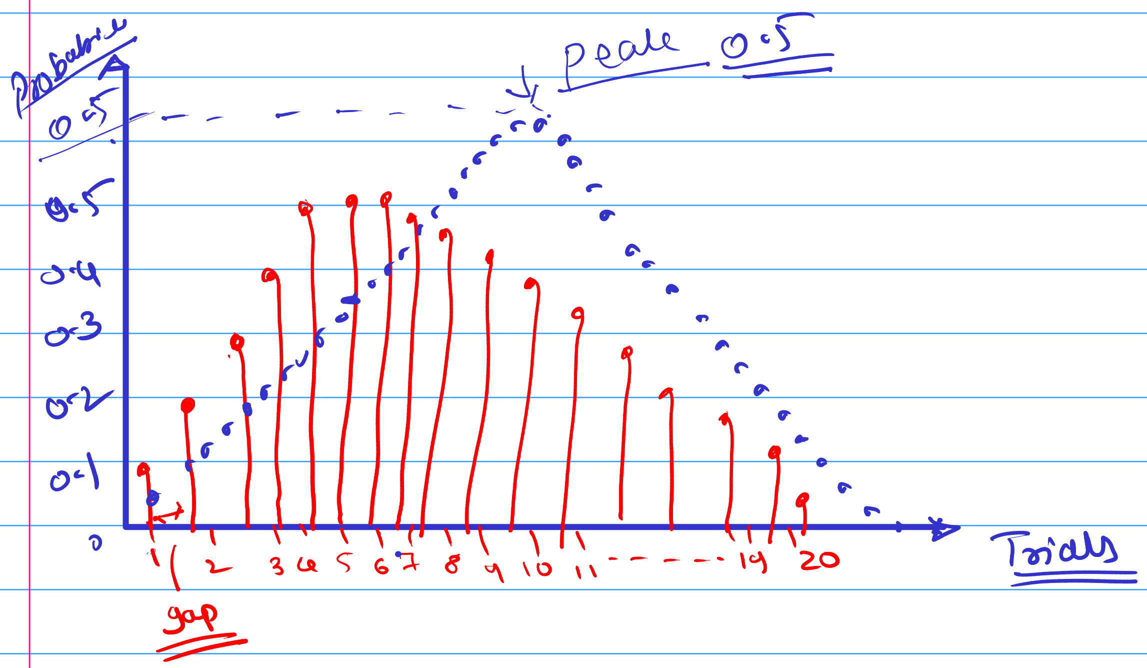
:→ It is a discrete Random Variable

- Concerned with PMF
- There are n no. of trials and two possible outcome.

eg – Tossing a Coin 20 times → H, T

eg – Edison Try 1000 Time to build a bulb.
↳ Success | Fail

P(H) = [0.1, 0.2, 0.3, 0.4, 0.4, 0.4, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.6, 0.7, 0.8, 0.9, 1]



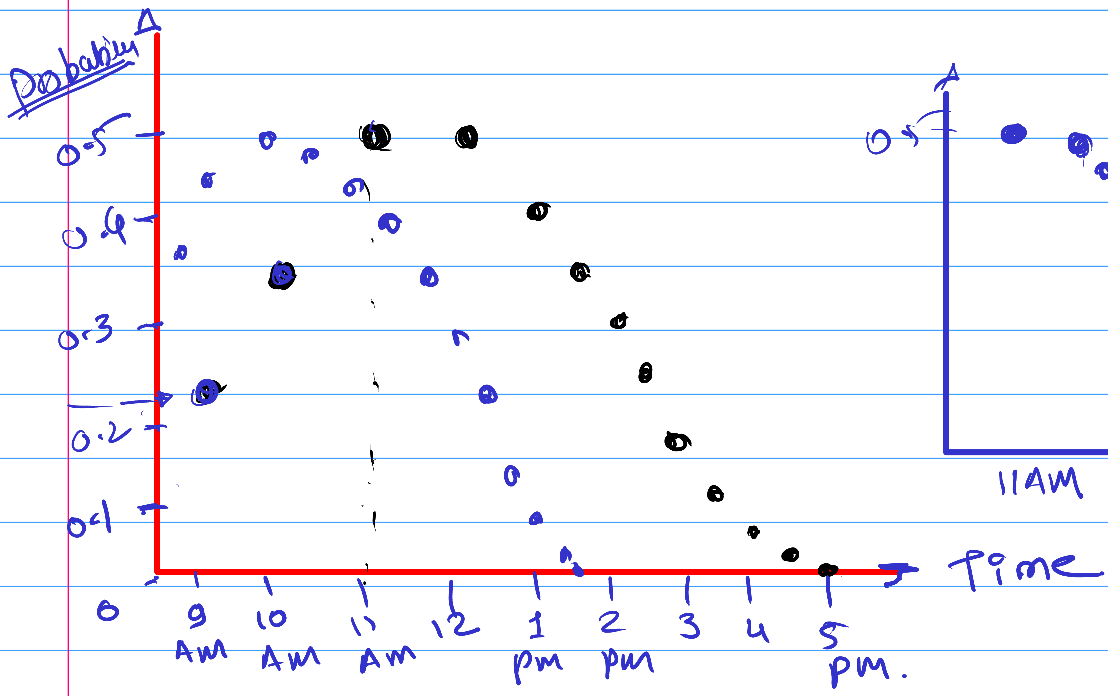
3. Poisson Distribution.

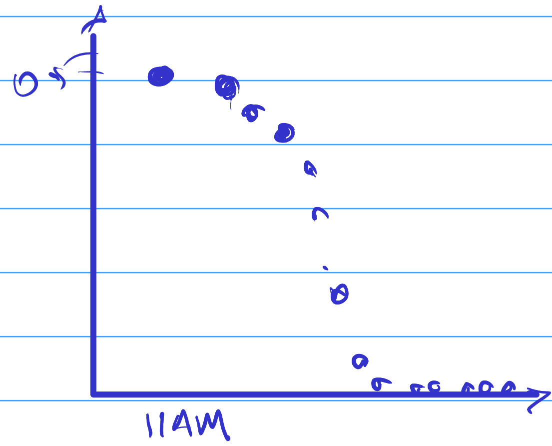
8→ It Concerned with a discrete Random Variable (PMF).

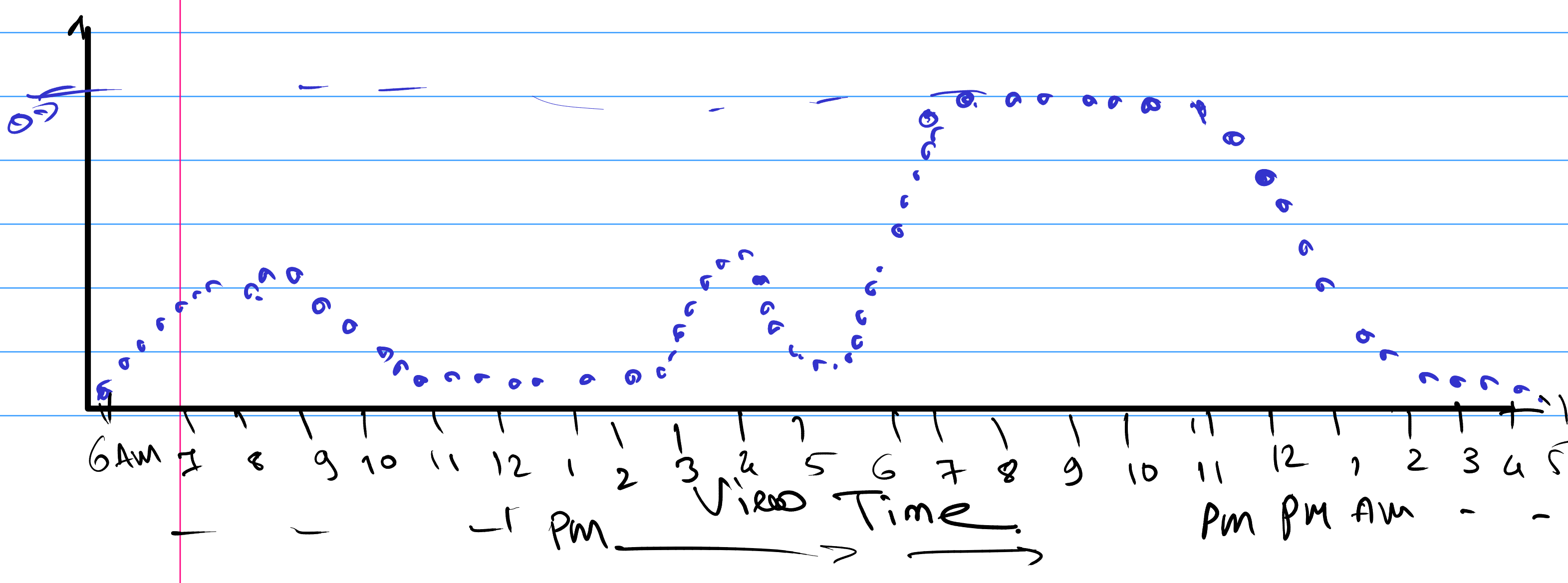
- The no. of event occurring in a fixed time interval.

ex – no. of people visiting hospital every hr.

ex = no. of people visiting Bank per Hr.



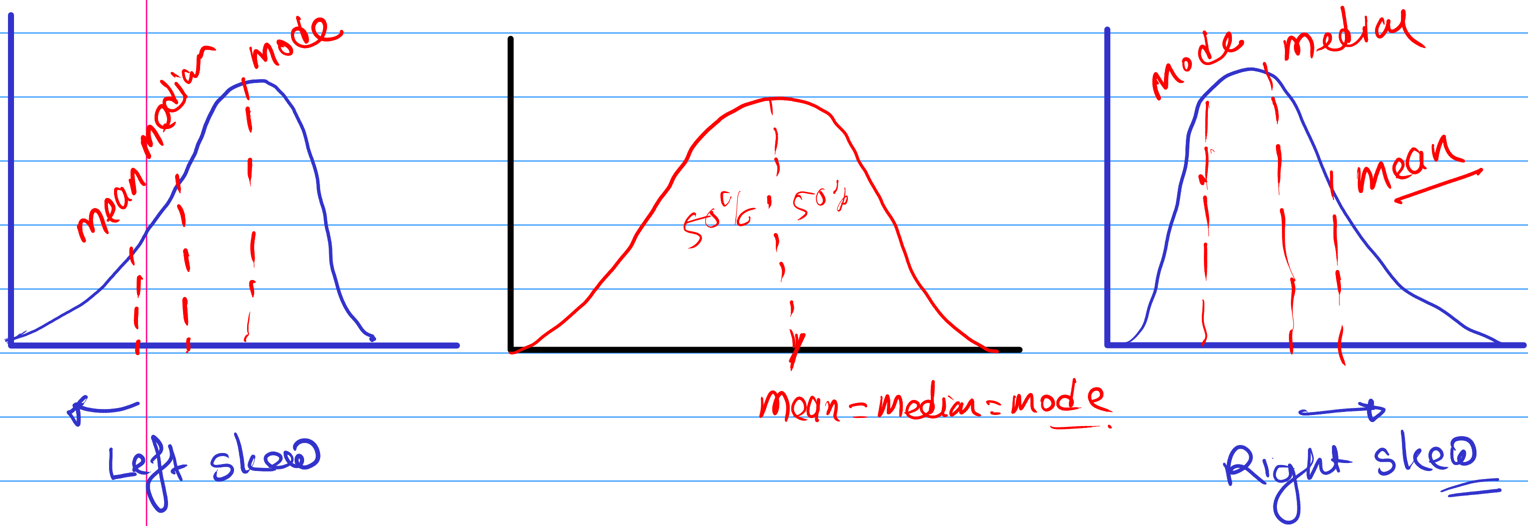




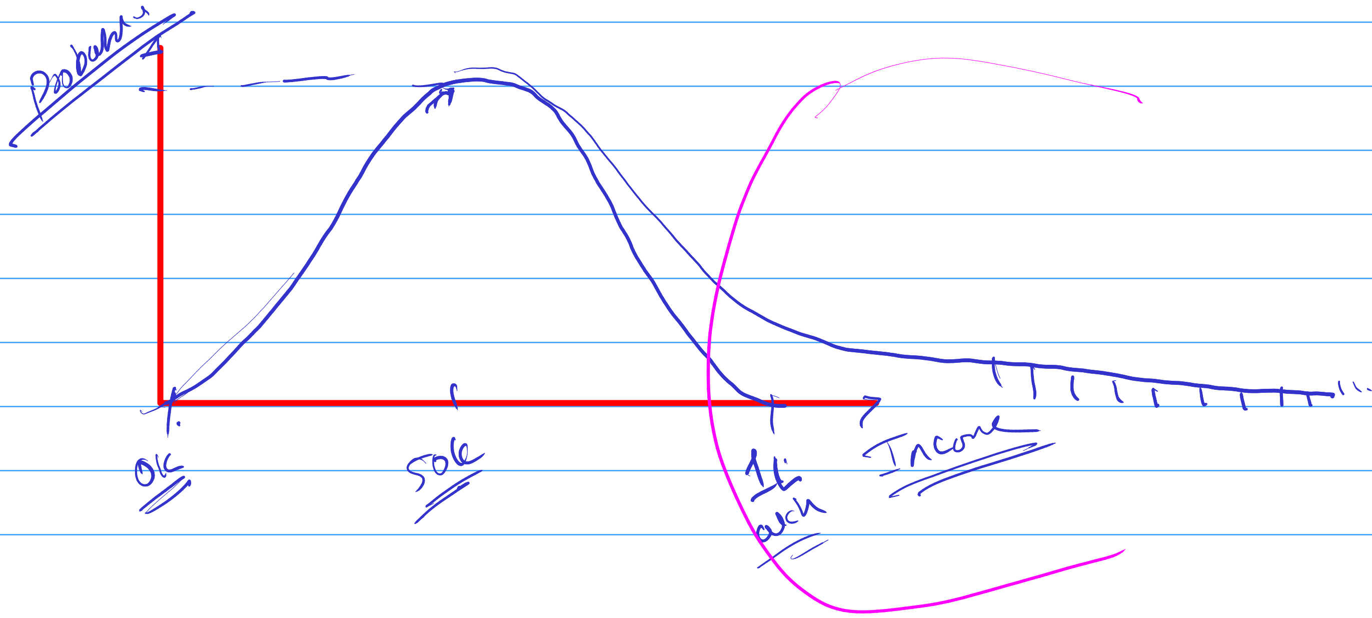
4. Normal Distribution / Gaussian Distribution
or

- It concerned with Continuous Random Variable (PDF)

- Normal Distributions are Symmetrical.
- Mean = Median = Mode.



eg = Blood pressure., Height, Weight.
Marks in class room.



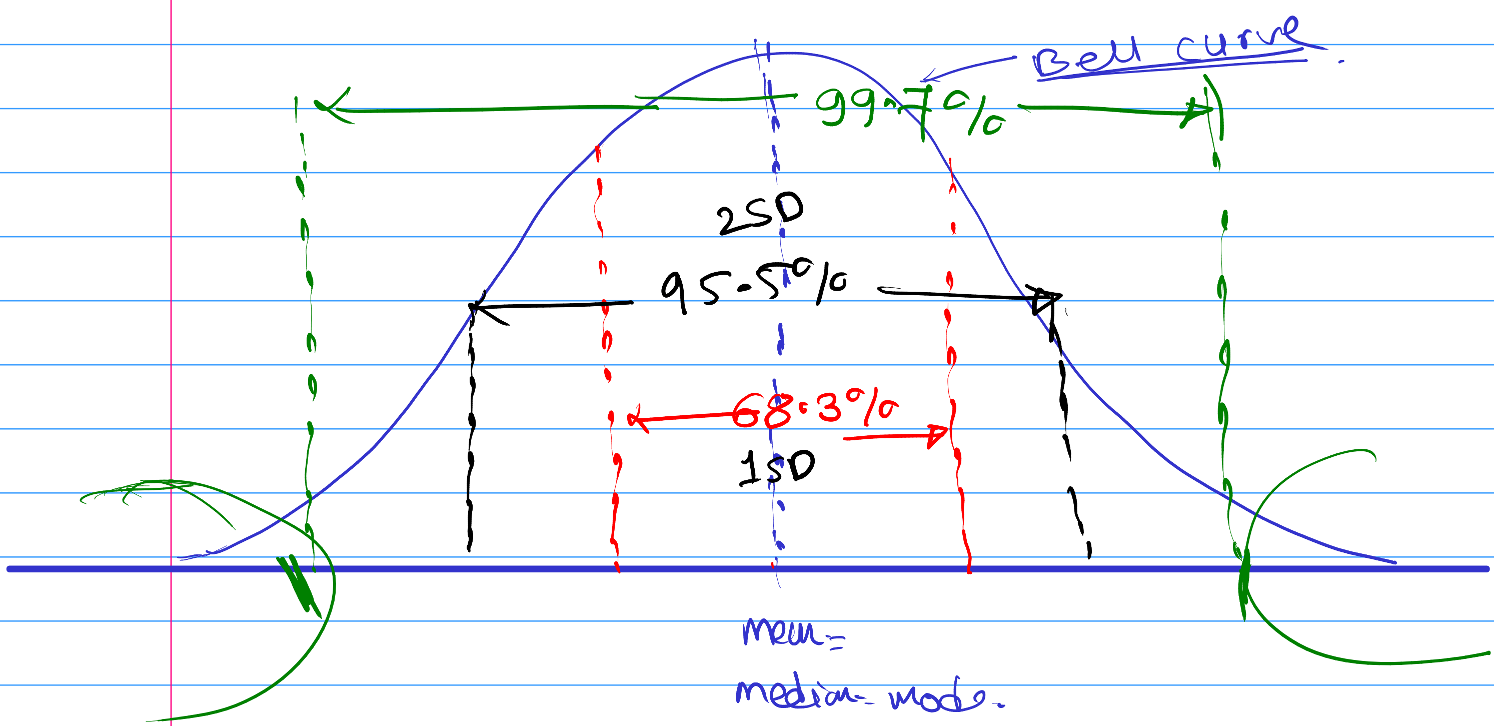
Empirical Rule of Normal Distribution.

It also known as 68, 95 & 99 Rule

It mean by 68.3% of data lies between first standard deviation.

95.5% data lies between 2nd standard deviation.

99.7% data lies between 3rd standard deviation.



Standard Normal Distribution.

It is a distribution where mean=0 & SD = 1.

→ Symmetrical, Bell-shaped.

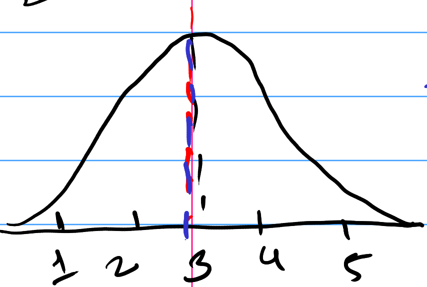
$$Z \text{ score} = \frac{(x_i - \mu)}{\sigma}$$

$x \rightarrow$ data point $\quad \mu \rightarrow$ mean

$\sigma \rightarrow$ standard deviation.

$x = \{1, 2, 3, 4, 5\}$

$\boxed{\mu = 3}$ $\quad \boxed{sd = 1}$



$$Z = \frac{x_i - \mu}{\sigma}$$

$$Z(1) = \frac{1-3}{1} = -2$$

$$Z(2) = \frac{2-3}{1} = -1$$

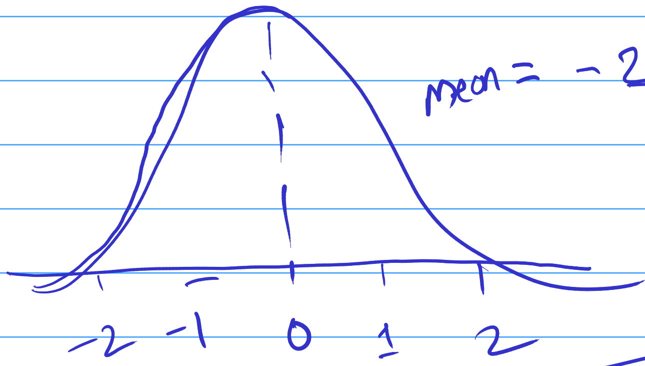
$$Z(3) = \frac{3-3}{1} = 0$$

$$Z(4) = \frac{4-3}{1} = 1$$

$$Z(5) = \frac{5-3}{1} = 2$$

after z score data

$data = \{-2, -1, 0, 1, 2\}$



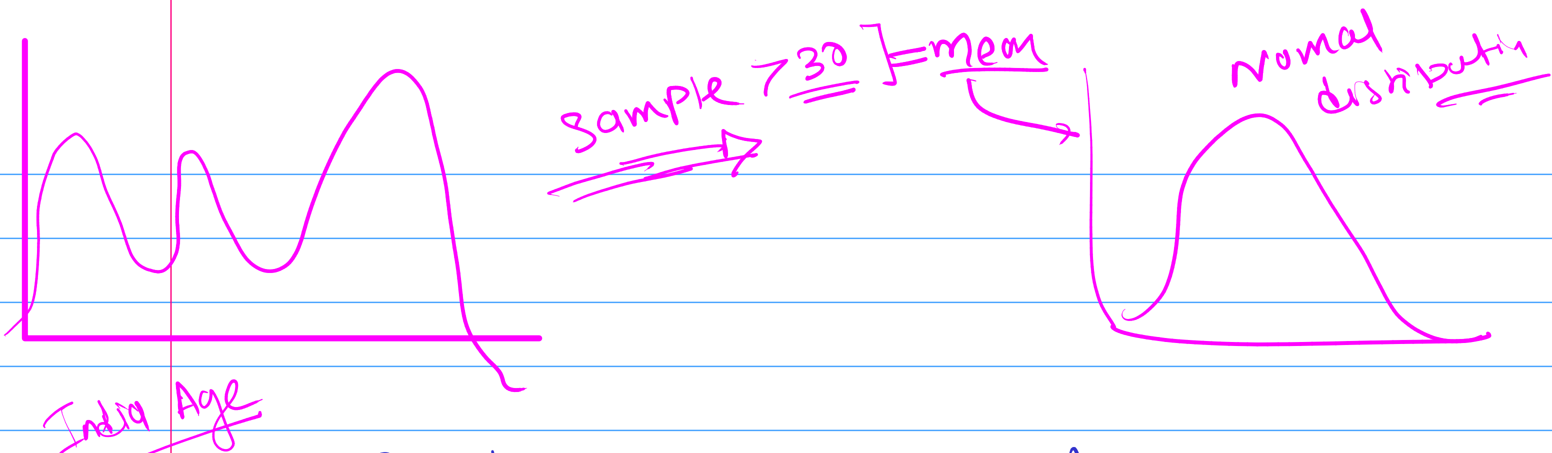
$$mean = \frac{-2 - 1 + 0 + 1 + 2}{5} = 0$$

$\boxed{sd = 1}$

$\boxed{mean = 0}$

Central Limit Theorem

:→ For large sample size (≥ 30), the sampling distribution of mean will approximate to normal distribution even if population distribution is not normal.



Sample always greater than 30.

- Sample are independent.

1. What is Central Limit Theorem in Statistics?
Central Limit Theorem in statistics states that whenever we take a large sample size of a population then the distribution of sample mean approximates to the normal distribution.
2. When does Central Limit Theorem apply?
Central Limit theorem applies when the sample size is larger usually greater than 30.
3. Why is Central Limit Theorem important?
Central Limit Theorem is important as it helps to make accurate prediction about a population just by analyzing the sample.
4. How to solve Central Limit Theorem?
The Central Limit Theorem can be solved by finding Z score which is calculated by using the formula.