

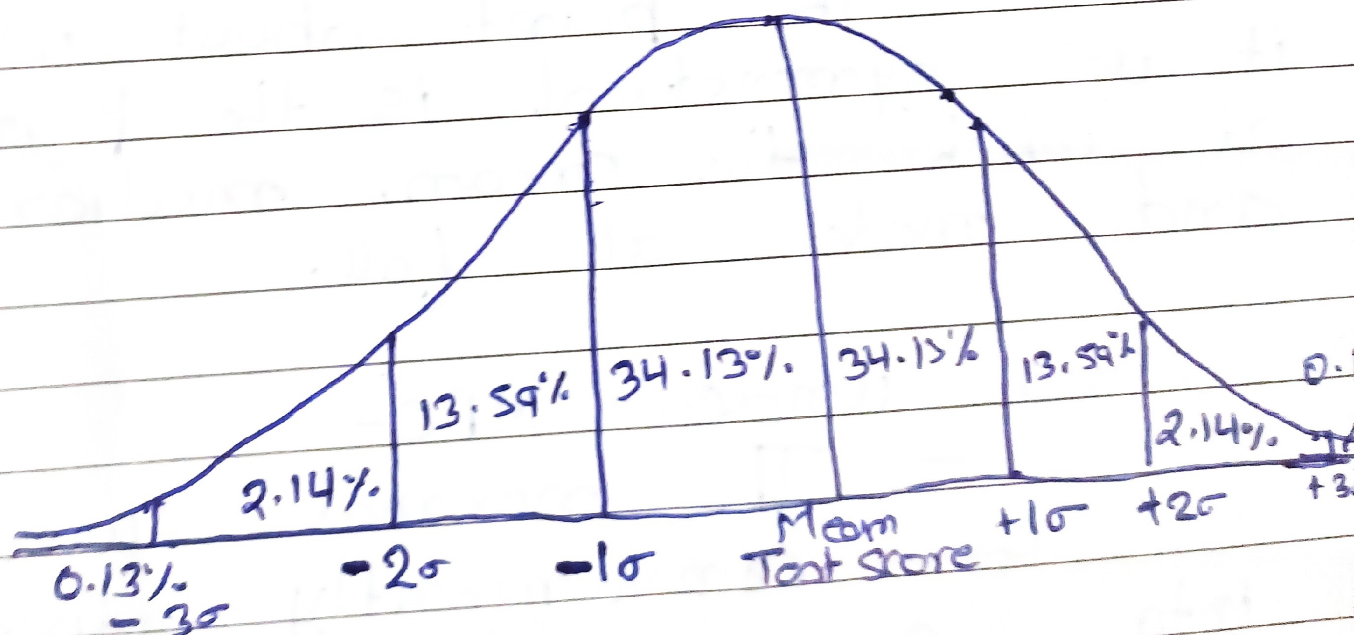
Normal distribution

- frequency distribution that follows a normal curve.

⇒ Normal Curve :-

- Specific, mathematically defined, bell-shaped frequency distribution that is symmetrical.

- Also known as the Normal curve or Normal distribution or Gaussian distribution after the astronomer Karl Friedrich Gauss.



⇒ ASYMPTOTIC —

— The NPC is an open ended curve i.e it does not touch the X axis from both the sides.

⇒ Symmetrical in nature —

— NPC is symmetrical about the midpoint of the horizontal axis. Thus, it has equal number of data on each side.

⇒ Mean = Median = Mode —

— The point about which it is symmetrical is the point at which the mean, median and mode all fall.

⇒ Area under NPC —

— The normal curve can be conveniently divided into areas defined in units of standard deviation.

- 50% of the scores occur above the mean and 50% of the scores occur below the mean.

⇒ Zero Skewness -

- Skewness = Lack of symmetry

- The NPC tapers equally on both the sides of its peak.

- It shows no skewness or in other words it is a Zero skewed curve.

- If the distribution is skewed, the mean cannot be trusted.

DEVIATION FROM NORMALCY

⇒ There are two main ways in which a distribution can deviate from normal :

1) Skewness :-

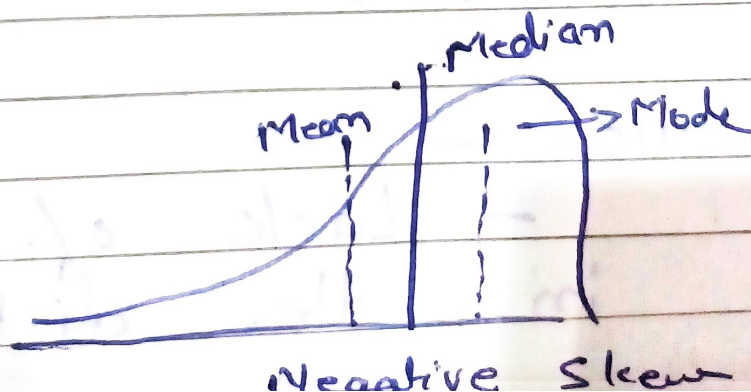
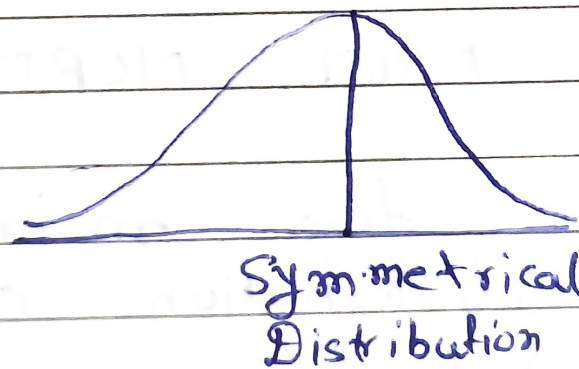
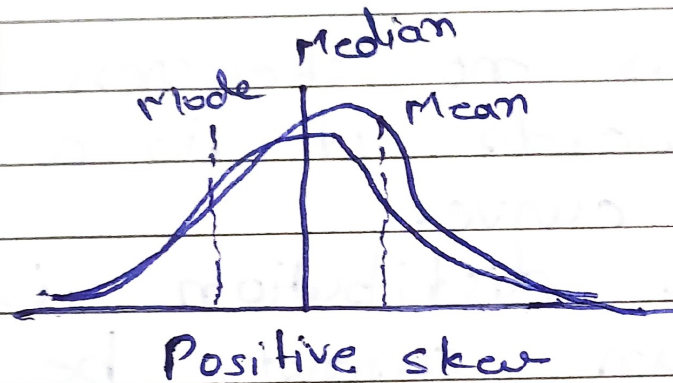
- Lack of symmetry in the distribution

$$\text{Formula} = \frac{3(\text{mean} - \text{Median})}{\text{SD}} \quad \text{or}$$

$$= \frac{P_{90} + P_{10}}{2}$$

2. Kurtosis

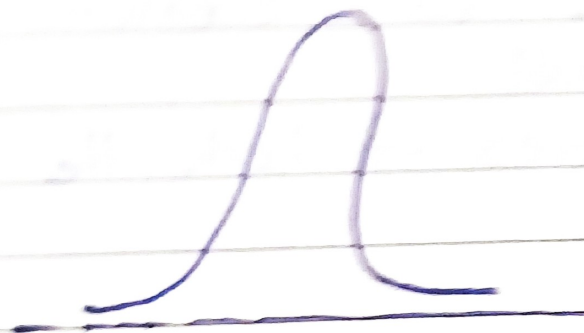
— Degree to which scores cluster at the end (tails) of the distributions



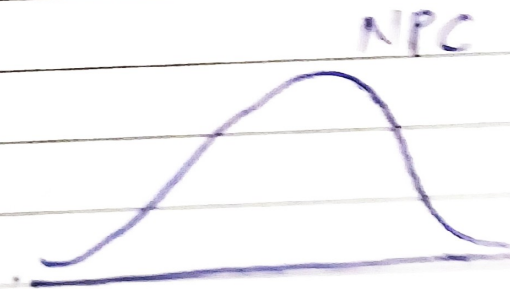
SKENESS

Leptokurtic Distributions

- Has more values in the tail (heavy-tailed distribution)
- Pointy than normal
- Also known as positive kurtosis



Heavy tail
Positive kurtosis



Mesokurtic

Platykurtic



Thin tailed