Kurtosis :- [Presence of outliers]

$$\boxed{K = \frac{1}{n} \sum_{i=1}^{n} \left(\frac{x_i - u}{\sigma} \right)}$$

It measures the tailedness (or) peakness of data visualization.

Types of kurtosis :-

→ Mesokurtic ($K=3$) :-

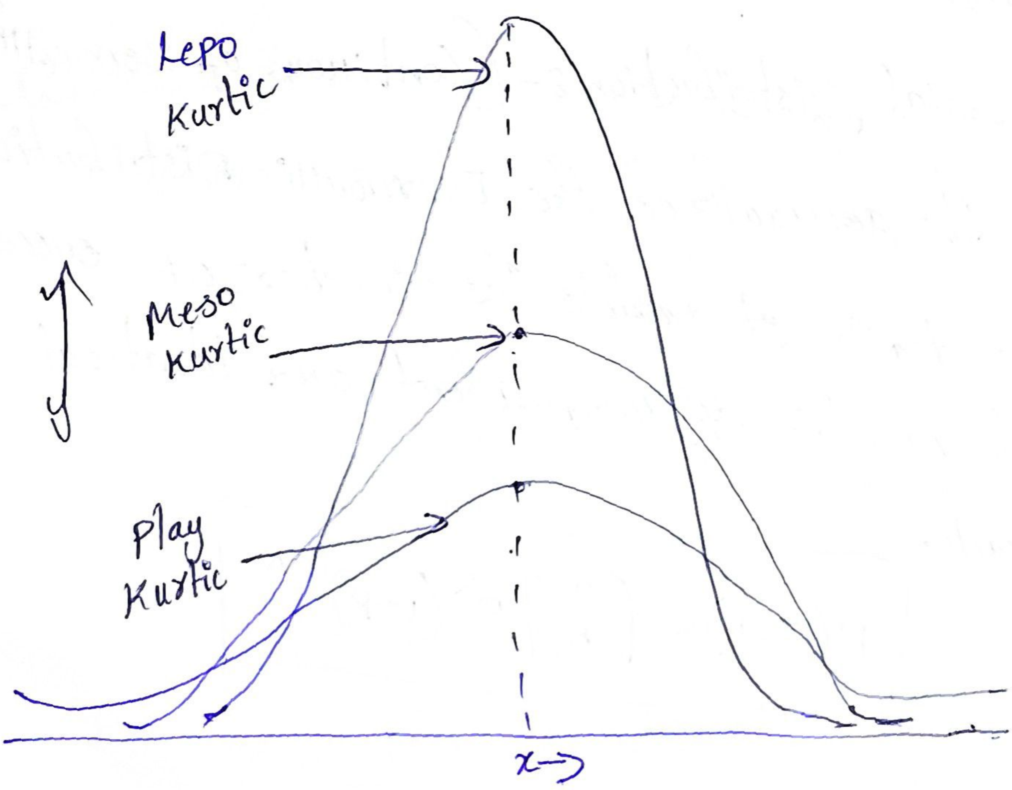
* Normal Distribution
* No outliers
* Moderate tail and Peak.

→ Lepokurtic ($K>3$) :-

* Heavy tails and sharp peak.
* More outliers

→ Platy kurtic ($K<3$) :-

* Light tails and flat peak
* Fewer Outliers.



→ Bernoulli Distribution :-

It is the simplest form of a discreate Probability distribution and models a random Experiment with Exactly 2 Outcomes.

→ Success denoted by $= P$
→ failure denoted by $= 1-P$

Total Probability is 1.
The range is 0-1.

$P(T) = \frac{1}{2} = 0.5$ for 1 trail
$P(H) = \frac{1}{2} = 0.5$ for 1 trail

→ It ~~pdf~~ Purpose only to do ~~only~~ one trail, can't for many trail.

→ Bionomial Distribution :- (Continous of Bernoulli)

It generalizes the Berrnoulli Distribution to multiple trails. It models the number of success in a fixed number of independent and identical Bernoulli trails.

$$\boxed{P(x=k) = \binom{n}{k} p^k (1-p)^{n-k}}$$

K = no of success

n = no of trails

P = Probability of success

(1-P) = Probability of failure

Poison Distribution :-

It is used to model the number of Events that occur in a fixed time interval. (or) space, and occur independently the parameter λ represents the avg number of Event in the interval.

$$\boxed{P(X=k) = \frac{\lambda^k e^{-\lambda}}{k!}}$$

λ is the avg no of Events

k is the no. of ~~arguments~~ occurances

** Inferential Statistics :-

⇒ Probability :-

It measures likelyhood of an Event.

Eg :- Dice = {1, 2, 3, 4, 5, 6}

$$p(x) = \frac{\text{No of favourable Outcomes}}{\text{total no of Outcomes}}$$

$$p(3) = \frac{1}{6}$$

$p(2,4,5) = ?$ $P(2)+P(4)+P(5)$

$= \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = 3/6 = 1/2 = 0.5$

→ If we toss the 2 coins at a time

$\{HH, H,T, T,H, TT\}$

① what is the probability of getting only 1H?

$$P(H) = \frac{2}{4} = 1/2$$

② both Tails?

$$P(T) = 1/4.$$

→ ~~There are 2 types~~ :-

→ There are 2 rules in probability.

* Addition Rule :- OR
* Multiplication Rule :- AND

Addition Rule (OR) :-

1) Mutual Exclusive Events
2) Non Mutual Exclusive Event

→ There is no chance to getting multiple different Events at a same time → Mutual Exclusive. Exg :- coins, dice

→ There is a chance for getting multiple different Events at a same time occur → Non mutual Exclusive Event

Eg :- Cards. → Diamonds — 13 — K 10
clubs — 13
Hearts — 13
Spades — 13

Ex :- If you toss the coin what is the probability of landing on heads (or) tails.

$\boxed{P(A \text{ or } B) = P(A)+P(B)}$ for (ME).

$P(H \text{ or } T) = P(H) + P(T)$

$= 1/2 + 1/2 = 1/1$

Ex: - Picking the cards from the deck of cards. what is the probability of getting Jack (or) heart?

$\boxed{P(J \text{ or } H) = P(J) + P(H) - P(J \cap H)}$

H D S C

K Q J A . . . .

$= \frac{4}{52} + \frac{13}{52} - \frac{1}{52}$

$17 - 52$

$= \frac{16}{52}$

$= 0.31$

$\boxed{P(A \text{ or } B) = P(A)+P(B)-P(A \cap B)}$ for NME

Multiplication Rule:-

→ Independent Event

→ Dependent Event

Independent Event:-

Here all the values have the same priority after n numbers trails also.

(or)

1 Event depend on another Event.

Ex: 1st toss the coin.

$P_1(H) = 1/2$

7th time toss the coin.

$P_7(H) = 1/2$

Ex:- What is the probability of Dice rolling and getting a 5 and then 4?

$$\boxed{P(A \text{ and } B) = P(A) * P(B)}$$

$$P(5 \text{ and } 4) = P(5) * P(4)$$

$$= 1/6 * 1/6$$

13) 100 (0.1

$$= \frac{1}{36} = 0.027$$

$$= \frac{0.027}{100} = 2.7\% \text{ in percentage}$$

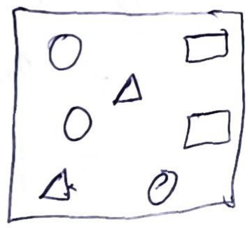
⇒ Dependent Event

Present Event is depend on the previous event.

Ex:

For 1st time

$$P(O) = \frac{3}{7} = 0.43$$



t = 7

for 2nd time

$$P(\Delta) = \frac{2}{6} = 0.3$$

for 3rd time

$$P(\square) = \frac{2}{5} = 0.5$$

for 4th time

$$P(O) = \frac{2}{4} = 0.5$$

→ From a deck cards what is the probability of getting a king and then 8?

$$\boxed{P(\overset{K}{A} \text{ an } \overset{8}{B}) = P(A) * P(B/A)}$$