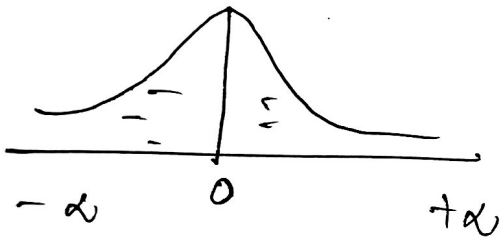
32/07/17

Kurtosis

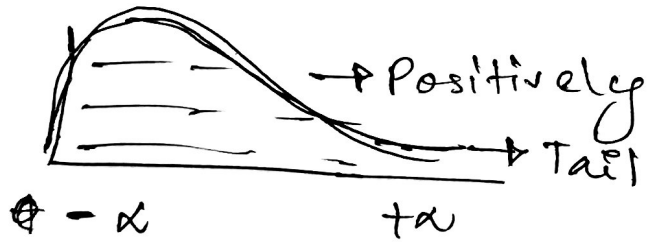
Skewness → shape of the distribution

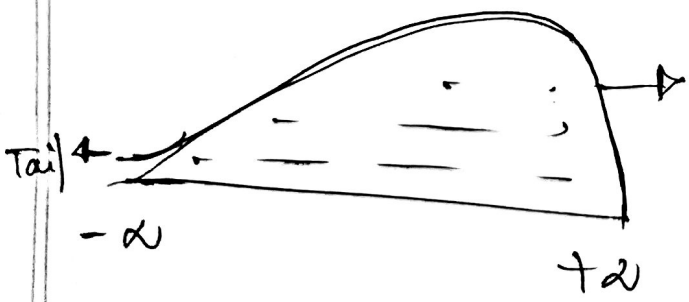


→ Symetric
(equal করে -∞ to +∞)

Asymmetric

Neg দিকে লেজ থাকলে & Postive দিকে লেজ থাকলে →





→ Tail যে দিকে থাকে সেই দিকে skewed.

Kurtosis

↳ একটি distribution এর hight টিকে measure করে।

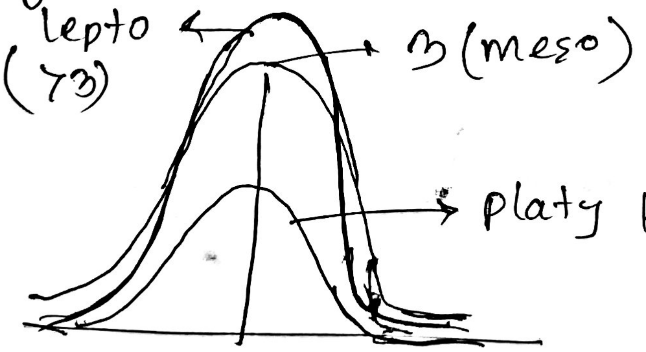
3 types of kurtosis →

(1) lapto kurtic

(2) Meso kurtic

(3) platy kurtic

⇒ Symmetric distribution এর একটি standard hight আছে যা accurate 3 হয় then meso kurtic.



→ lapto হলে standard hight > 3 হবে

→ plato " " " < 3 "

→ meso " " " = 3 "

Coefficient of kurtosis: (β_2)

$$\beta_2 = \frac{\mu_4}{(\mu_2)^2}$$

μ_r = moments

$$\mu_r = \frac{\sum_{i=1}^{N} (x_i - \bar{x})^r}{N}$$

3, 5, 2 को लेते हैं,

$$\mu_4 = \frac{\sum_{i=1}^{N} (x_i - \bar{x})^4}{N}$$

Here = $N = 3$

$$\mu_2 = \frac{\sum_{i=1}^{N} (x_i - \bar{x})^2}{N}$$

$$\bar{x} = (3+5+2)/3 = 3.3$$

$$\beta_2 = \frac{\mu_4}{(\mu_2)^2}$$

$$= \frac{(*)}{(*)^2}$$

= ? → এদের compare করে—

বলতে হবে lapto, platy নাকি Meso.

Q: 10, 12, 18, 15, 20, 6

Find the coefficient of Kurtosis.

x_i	$x_i - \bar{x}$	$(x_i-\bar{x})^2$	$(x_i-\bar{x})^4$
10	−3.5	12.25	150.0625
12	−1.5	2.25	5.0625
18	4.5	20.25	410.0625
15	1.5	2.25	5.0625
20	6.5	42.25	1785.0625
6	−7.5	56.25	3164.0625
$\bar{x}=13.5$		135.5	5519.375

$$\mu_4 = \frac{\sum_{i=1}^{N} (x_i - \bar{x})^4}{N}$$

$$= \frac{5519.375}{6}$$

$$\therefore \mu_4 = 919.89$$

$$\mu_2 = \frac{\sum_{i=1}^{N} (x_i - \bar{x})^2}{N}$$

$$= \frac{135.5}{6}$$

$$\therefore \mu_2 = 22.58$$

* Now,

$$\beta_2 = \frac{\mu_4}{(\mu_2)^2} = \frac{919.89}{(22.58)^2} = 1.804$$