Date: 29/6/2021 Assignment-2

1) Why Sample variance is divided by n-1 ?

Population (N)

$$\mu = \frac{\sum_{i=1}^{N} x_i}{N}$$

Sample (n)

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

variance

$$\sigma^2 = \frac{\sum_{i=1}^{N} (x_i - \mu_n)^2}{N}$$

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

Because, when Sample variance is also divided by 'n' will vary alot. Whereas, the Experimentation done by the Researcher in the case of Skewed Data. & by picking the samples randomly and done dividing it by n-1, n-2, n-3, ... After multiple iterations. They successfully done that while dividing sample variance by n-1, The population variance & sample variance is approximately equal. i.e., $\sigma^2 \approx s^2$ where by n-2, n-3, ... it is also doing Same work but the differention is very. Finally, They came to conclusion that sample Variance must divided by 'n-1' rather than n. it is also called unbiased estimation.

BY
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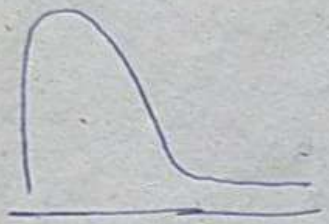
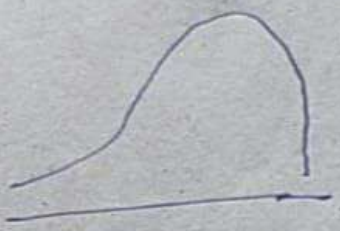
2) Relationship b/w Mean, Median, Mode in the Case of Right skewed & Left skewed at log Normal distribution.



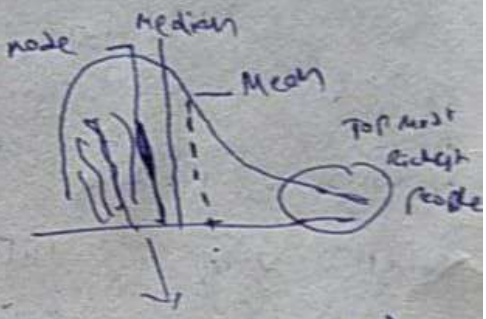
Right skew distribution



Left skew distribution

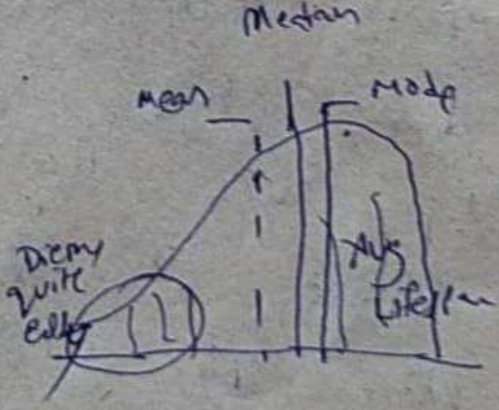
Eg: Wealth Distribution

Right skew (or) Positive skew Distn



Relationship: Mean > Median > Mode

Eg: Life span of Human Being

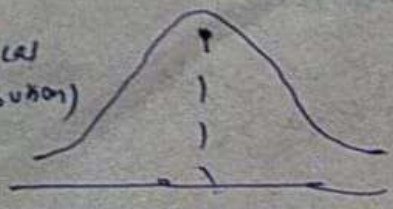


Avg life span ↑

Avg = 50-70

Relationship: Mode > Median > Mean

Eg: Age, weight, Height (Symmetrical Distribution)



Normal distn: Mean ≈ Median ≈ Mode