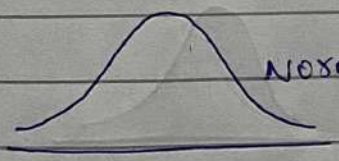
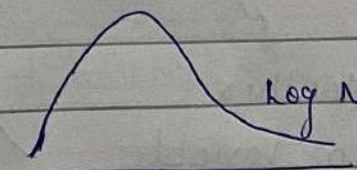
Central Limit Theorem

→ The central limit theorem says that the sampling distribution of the mean will always be normally distributed, as long as, the sample size is large enough. Regardless of whether the population has a normal, log normal or any other distribution, the sampling distribution of mean will always be normal.

Eg: Consider X random variable following or not following Normal/Gaussian distribution and if we take multiple samples ($S_1, S_2, S_3, \cdots S_m$) of some sample size (n) and if we calculate the mean of all samples and then plot it, then the sample mean will follow a normal/gaussian distribution.





$S \rightarrow$ with n sample size ($n \geq 30$)

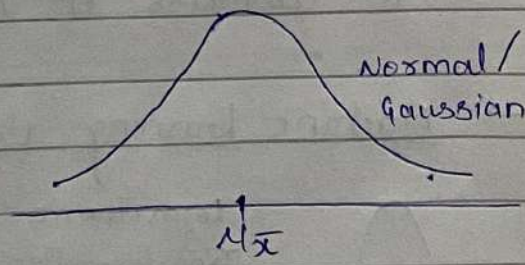
($n \geq 30$)

$S_1 = \{x_1, x_2, \cdots, x_n\} \rightarrow \bar{x}_1$

$S_2 = \{x_1, x_2, \cdots, x_n\} \rightarrow \bar{x}_2$

⋮

$S_m = \{x_1, x_2, \cdots x_n\} \rightarrow \bar{x}_m$



Sampling distribution of mean