

WHY SAMPLE VARIANCE FORMULA IS DIVIDED BY $n-1$
RATHER THAN n ?

$$\left[\text{Population Variance } \sigma^2 = \sum_{i=1}^N \frac{(x_i - \mu)^2}{N} \right] \left[\text{Sample Variance } s^2 = \sum_{i=1}^n \frac{(x_i - \bar{x})^2}{n-1} \right]$$

* In a Gaussian normal distribution, both the Population Variance and Sample Variance tend to be the same, if the sample variable is divided by n .

* But if the distribution is SKEWED, either to the left or to the right, the s^2 computed by using n had huge difference with the Population variance σ^2 .

* So to reduce the difference, s^2 calculation was changed to $n-1$, which is called Bessel's Correction

s^2 should be an UNBIASED ESTIMATOR OF σ^2 .