**Population Mean vs Sample Mean**

Population Mean is basically the sum of a specific value of each item in the population divided by the population value.

μ = 1/N\*Σxi

Sample mean is the same thing as population means except that it's calculated for a sample subset rather than the whole population.

x̄ = 1/n\*Σxi (here n is a subset of N)

Realtime example of sample mean is "Exit Polls"

Initially Sample Mean will be less than Population Mean, and as the size of the sample increases it Sample Mean comes closer to Population Mean.

**Random Variables**

* Discrete Random Variable
* Continuous Random Variable

Discrete Random Variable is a whole number, can't be a floating number. Eg. population of a country

Continuous Random Variable can be any number from a range of numbers, it can be whole number or decimal. Eg. height of a person

**Gaussian/Normal Distribution**

Before we understand what's Gaussian distribution, we need to understand the below terms.

Mean μ = ( Σ Xi ) / N Variance σ2 = Σ ( Xi – μ )2 / N Standard Deviation σ = sqrt(Variance)

Variance and Standard Deviation help us to find out how far is an element from the mean (μ) Eg. the element is 1σ to left or 1σ to the right or 2σ to the left or 2σ to the right.

If a random variable x belongs to a Gaussian distribution, then it follows the below curve with centre point as μ. So, the other points can be treated as μ-σ, μ+σ, μ-2σ, μ+2σ

