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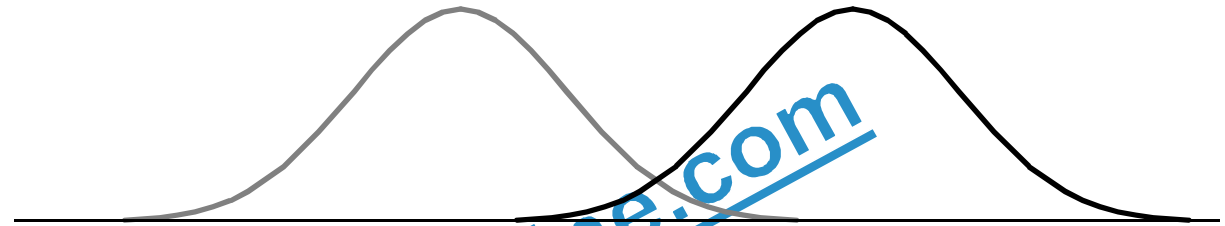
P R I S T I N E

Quantitative Methods - I

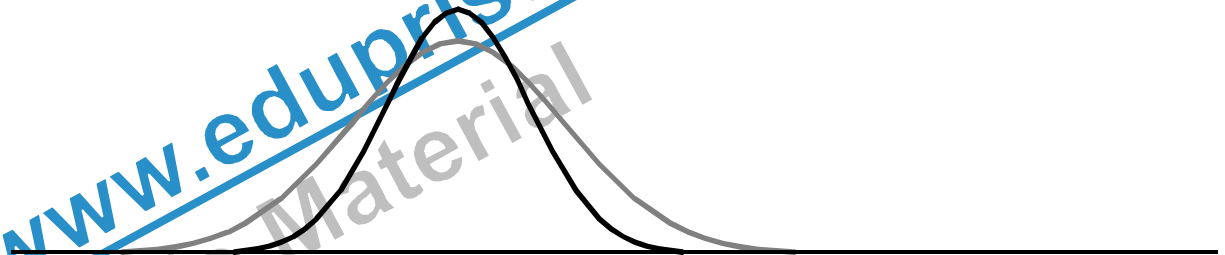
- Descriptive Statistics
- Statistical Concepts
- Measure of Central Tendency
- Measure of Dispersion
- Skewness and Kurtosis
- Chebyshev's Inequality
- Probability Concepts
- Conditional Probability
- Sum rule and Bayes Theorem

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Sample Material

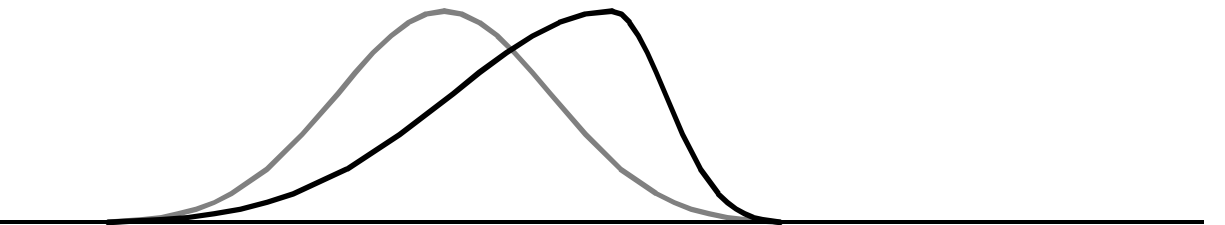
**Central Tendency
(Location)**



Variation (Dispersion)



Shape



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Sample Material

- **Measures of Central Tendency** summarize the location on which the data are centered.

- **Population Mean:** calculated as

$$\mu_X = \frac{1}{N} \sum_{i=1}^N X_i$$

- Where there are N members in the population and each observation is X_i $i=1, 2, \dots, N$.
- Sum of all the deviations is zero.

- **Sample Mean:** calculated as

$$\bar{X} = \frac{1}{n} \sum_{i=1}^n X_i$$

- where there are n observations in the sample and each observation is X_i , $i=1, 2, \dots, n$. It is also the arithmetic mean of the sample observations.

- **Median:** calculated as the middle observation in a group that has been ordered in either ascending or descending order.

- In an odd-numbered group this is the $(n+1)/2$ position.
- In an even numbered group it is the average of the values in the $n/2$ & $(n+2)/2$ positions.

- **Mode:** is the most frequently occurring value in the distribution. A distribution may have one, more than one, or no mode.

- Measures of central tendency summarize the location on which the data are centered.
- **Weighted Mean:** calculated as

$$\bar{X}_{weighted} = \sum_{i=1}^n w_i X_i$$

- Where there are n observations, each observation is X_i , and the weight associated with each observation is w_i $i = 1, 2, \dots, n$. If $w_i = 1/n$, then this is the sample mean. If w_i is the probability of X_i occurring then this weighted mean is the expected value of the random variable X .

- **Geometric Mean:** calculated as

- Where there are n observations and each observation is X_i .

$$G = \sqrt[n]{X_1 \times X_2 \times X_3 \times \dots \times X_n}$$

- Compound Annual Growth Rate(CAGR): It's the geometric mean of the returns.
 - Example: The returns on the equity portfolio had been 10%, 15% and 20% from last 3 years.
 - Calculate CAGR?