**Inferential Statistics**

**Inferential Statistics** focuses on making inferences about a population based on sample data. It uses mathematical methods and models to estimate characteristics.

This relies on Probability Theory and Distribution to predict population values.

**What is Distribution?**

Distribution is the function that shows the possible values for a variable and how often they occur.

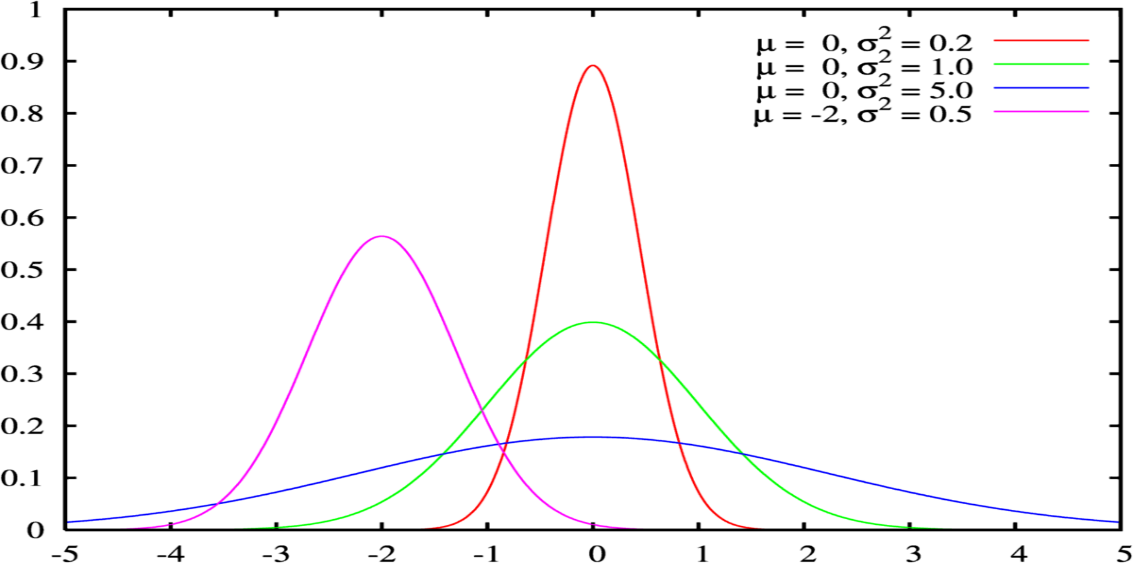
Probability Distribution provides a Mathematical description of the likelihood of different outcomes for a random variable.

1. **Discrete Probability distribution** – Is the probability distribution that describes the likelihood of outcomes for Discrete Random Variables (one which takes on a finite or countable infinite set of distinct values).

* **Binomial Distribution**- models the number of successes in a fixed number of independent trials.
* **Poisson Distribution**- use to model number of events occurring within a fixed interval of time, space or other dimensions.

1. **Continuous Probability Distribution**- It deals with variable that can take on an infinite number of values within a given range.

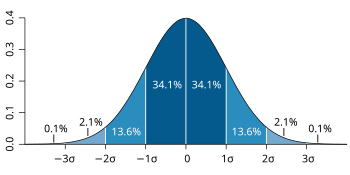
* **Normal Distribution**- Gaussian Distribution, the distribution of a dataset show is the frequency at which possible values occur.



* **Uniform Distribution-** all outcomes in a range are equally likely.
* **Exponential distribution**- Models the time between events in a Poisson process.

Normal Distribution or bell curve

* When mean = median = mode then there is no skewness the graph will be perfectly around mean.



Mean = median = mode

* Lower mean will result in the same shape of the distribution but on the left side of the pane.

A graph of a distribution of value

Description automatically generated

* Bigger the mean will result in the same shape of the distribution but on the right side of the pane

A graph of a normal distribution

Description automatically generated

Normal distribution is widely used it is only appropriate for certain types of data those that are continuous and symmetrically distributed around a mean.

Standard Normal Distribution – standardization is the process of transforming to one with a mean 0 and standard deviation to 1.

Standardized variable is called **Z- Score.**