What is inferential statistics?
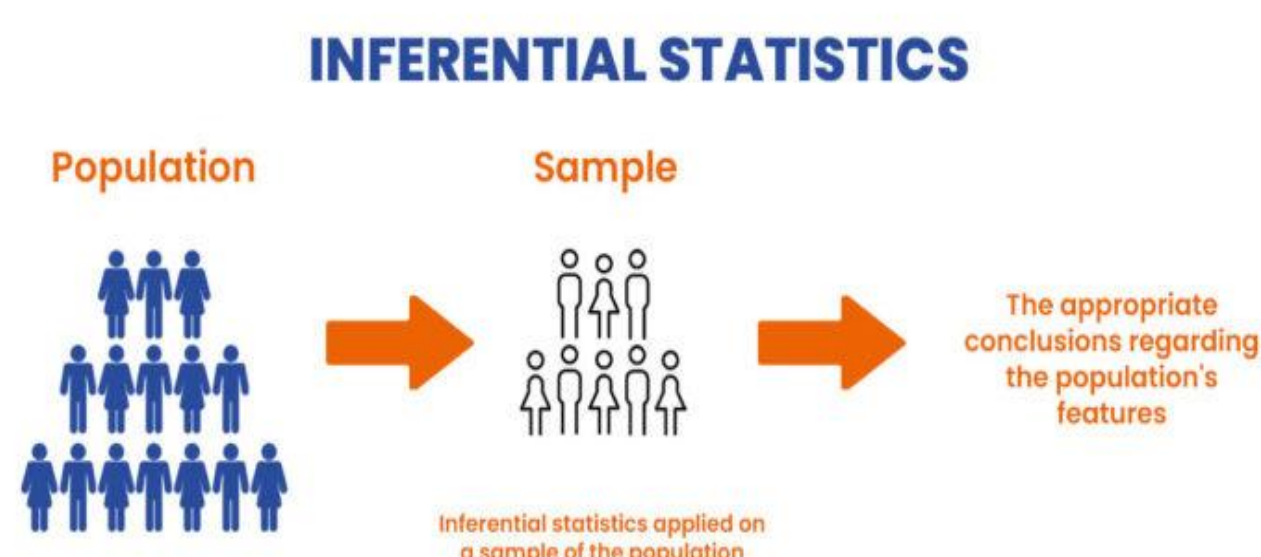
It is the process of generating conclusion about a population from sample(s) from the population.

What is population?

It is a set of similar items or events which is of interest for some question or experiment.

Example: ① All voters in India

② Part-time students in Bengaluru

INFERENTIAL STATISTICS

Population → Sample → The appropriate conclusions regarding the population's features

Inferential statistics applied on a sample of the population

Motivating examples:

① Who is going to win the next general election in India?

population: the voters who will vote for candidate. The voters can be in in a particular group - city, district, state.

② How likely is that 50% or more population think that Indian economy is getting worse.

population:- Indian citizens or the voters in India. Again they can be in a particular group.

To answer the above question, let us take a sample of 250 people. One can then take sample mean to arrive to a conclusion.

① Can we directly use this sample mean as the population mean?

② What other information do we need to know?

③ Will we be able to make 100% correct estimation? or we have to go with approximate value?

We can work this out in two ways

① We draw whole lot of samples of size 250. Take the average of the sample mean of the each sample.

Challenges :- since the population involves people, taking lots of samples may be difficult and costly. there is an element of uncertainty as how well the sample represents the population. the way the sample is taken matters.

② Other way to work out this problem is to use probability theory.

The second approach is widely popular. For this we need to understand the fundamentals of probability and random variable.