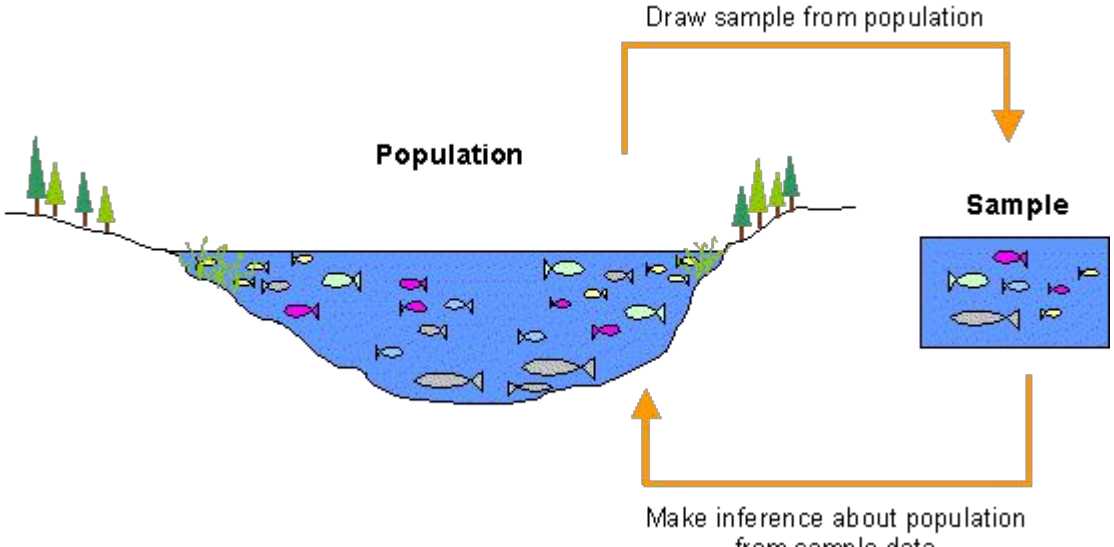
Statistical Sampling

Good sample techniques

Sampling

Sampling is process of selection of a subset of individuals from within a population to make inferences/conclusions on the whole population



Sampling

- Opinion polls and exit polls
- Online surveys
- Coming up with a new drug
- Tasting the curry

Why Sampling

- Time
- Cost
- Physically impossible
- Destructive nature of items

Bad Sample

Consider a school head (SH) has been assigned the job of finding out the favorite sport of all the students in the school, but he goes to only tenth class students and collected their opinion

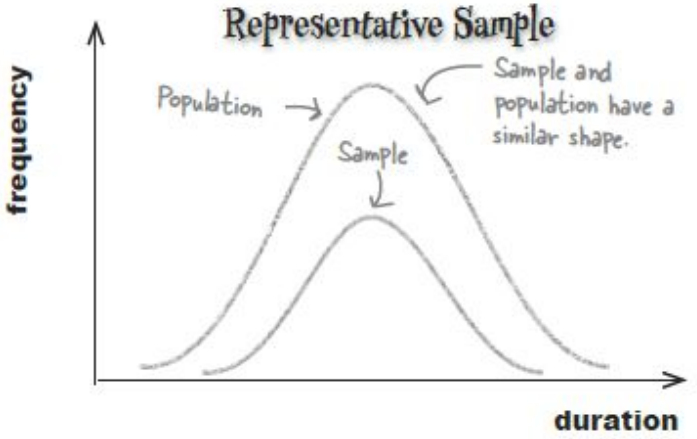
Bias

A sample is said to be biased if the items(objects or members) selected from the population are not the correct representative of the target population

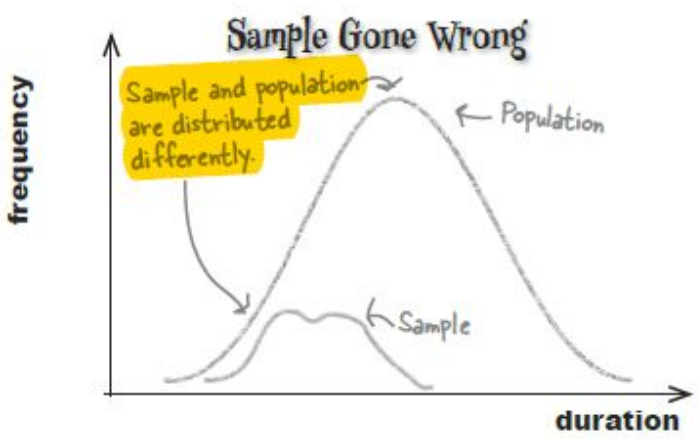
Good sample vs Bad sample

INTERNSHIPSTUDIO

We want this:



Instead of this:



Sampling Methods

a) Simple random sampling

b) Stratified sampling

c) Cluster sampling

d) Systematic sampling

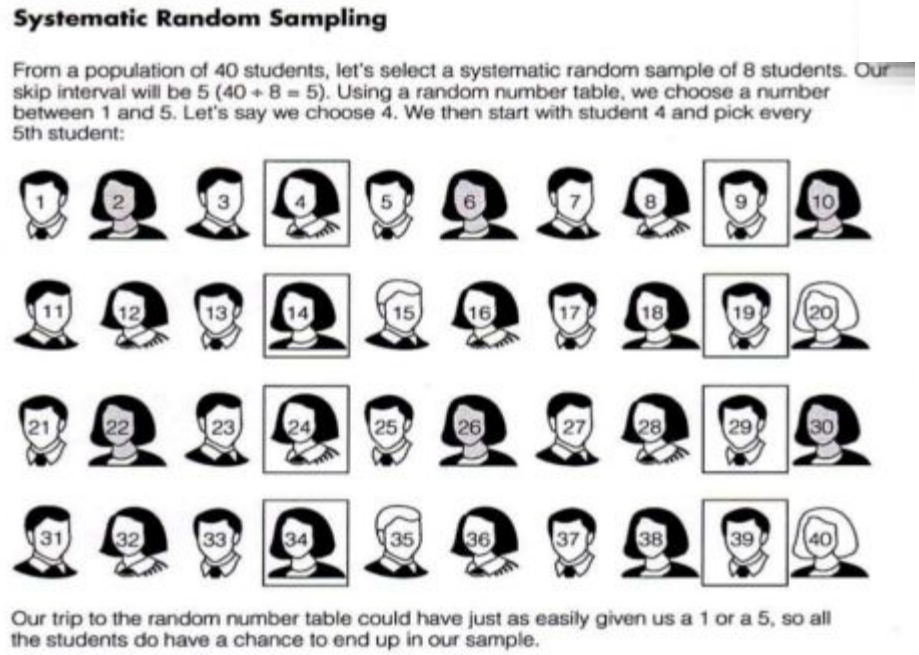
Simple random sampling

- If we randomly pick 40 gems(sample) from the total 400 gems (population), then this is simple random sampling without replacement(SRSWOR).

- If after picking each gem, we put it back and then pick again, then this simple random sampling with replacement(SRSWR)

Systematic sampling

The sampling starts by selecting an element from the list at random and then eve element is selected, where k, is the interval



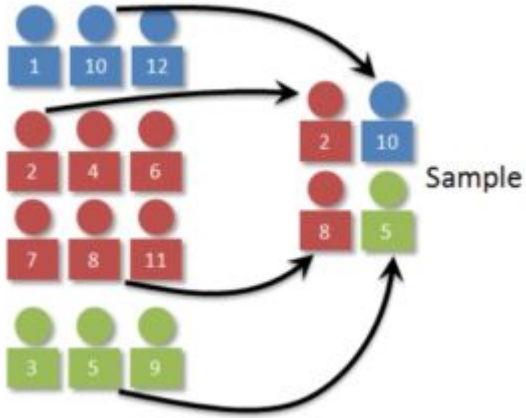
Systematic sampling

- This way of sampling is fairly quick and easy, but it doesn’t mean that your sample will be representative of the population

- This sort of sampling can only be used effectively if there are no repetitive patterns or organization in the sample

Stratified sampling

The population is divided into several subgroups, then samples are randomly selected from each subgroup



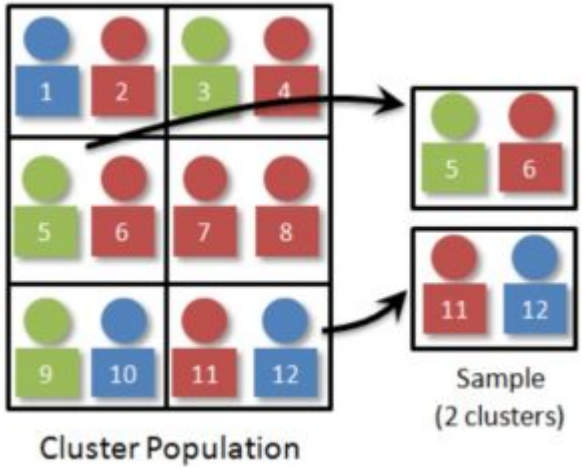
INTERNSHIPSTUDIO

Stratified sampling

- Provides greater precision
- Requires a smaller sample, saves money.
- More appropriate for heterogeneous populations
- But here you need to know the different sub groups

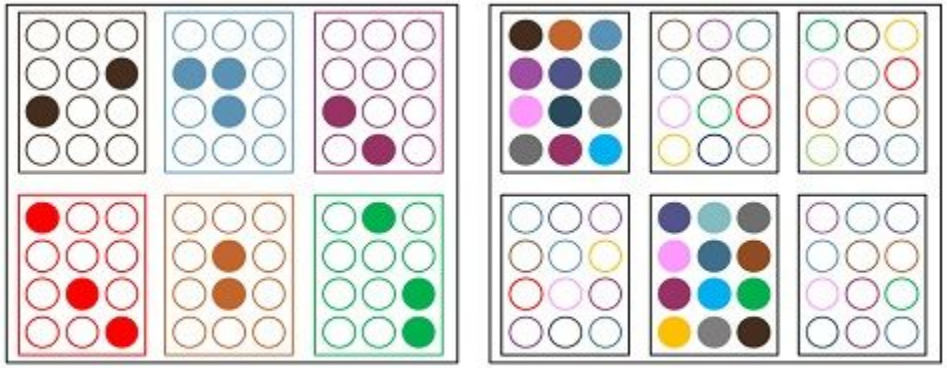
Cluster sampling

The population is broken into small groups or clusters, then some of the clusters are randomly selected



Cluster vs stratified sampling

In cluster sampling, the sample consists of elements from the selected clusters only, while in stratified sampling, the sample comes from each subgroup



Stratified Sampling Vs Cluster Sampling

Conclusion

The primary aim of all the sampling techniques is to reduce the bias in the sample and make it more representative of the target population