Population & Sample

Parameter & Statistic

Population

All items, elements or observations of interest having Similar Properties are known as Population.

Types

(Census)

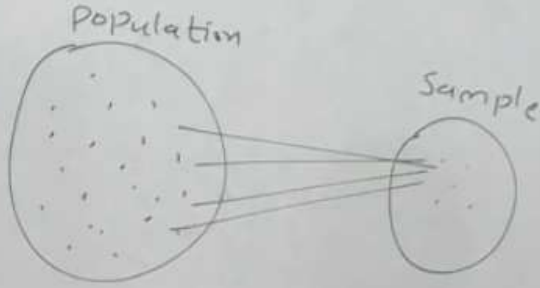
1) Finite Population

Ex. ① No. of students in a class.
② Students enrolled for PG course in Particular City.

2) Infinite Population

Sample

Subset of Population.



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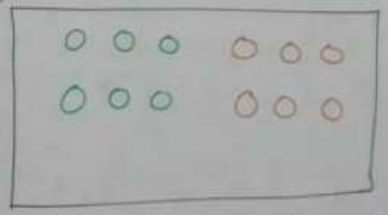
Representative Sample

12 balls



representative Sample contains

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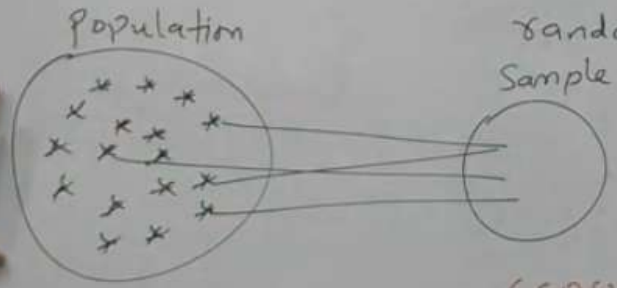


(SRSWR)

Simple random Sampling with Replacement

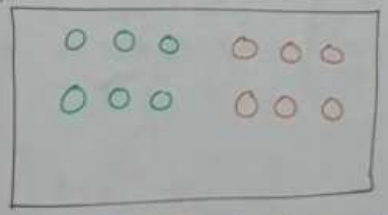
" " " without Replacement (SRSWOR)

Sample

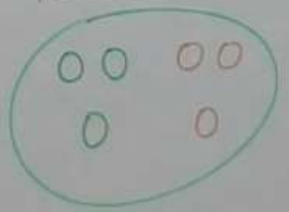
Subset of Population.

Representative Sample

12 balls



representative Sample contains



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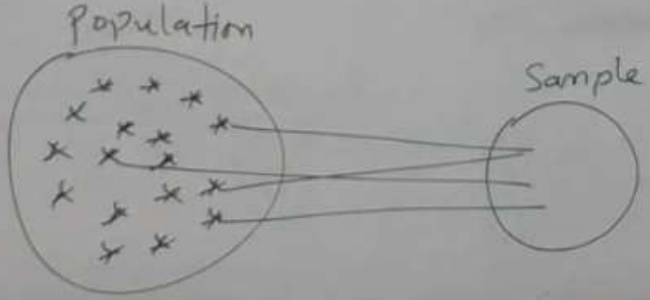

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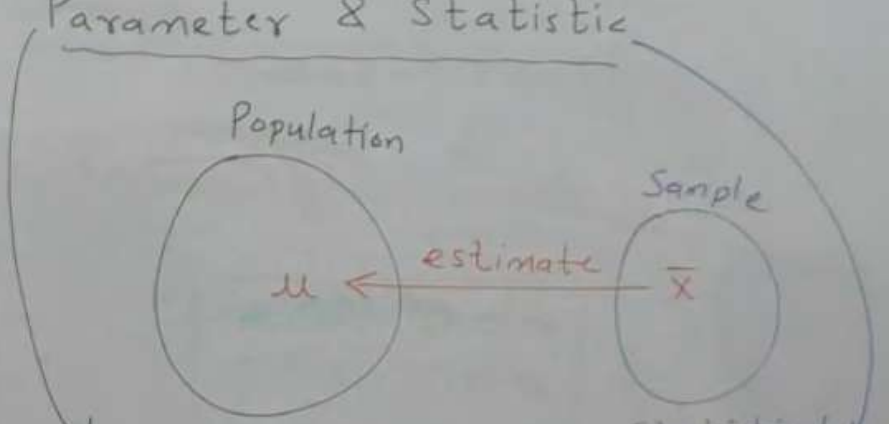


Population Size = N	Sample size = n
Population mean = μ	Sample mean = $\bar{x}$
Population SD = σ	Sample SD = S
" Variance = σ^2	" Var = S^2
" Proportion = P	" Proportation = $\hat{P}$ or p

Sampling Distribution & Standard Error

k-sample

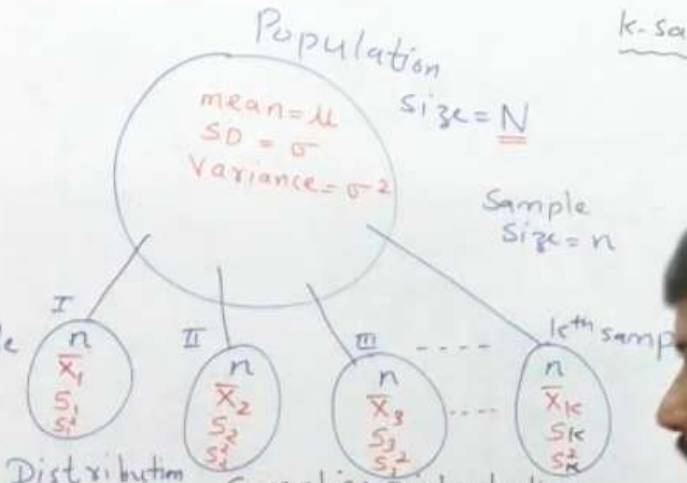
SRSWR $k = N^n$

SRSWOR $k = {}^{N}C_n$

Ex. $N = 4$ (Population)
$n = 2$ (sample size)

$k = 4^2 = 16$

$k = {}^{4}C_2 = \frac{4!}{2!\,2!} = 6$



Sampling Distribution of mean

$\bar{X}$	$P(\bar{X})$
$\bar{X}_1$	$P(\bar{X}_1)$
$\bar{X}_2$	$P(\bar{X}_2)$
$\bar{X}_3$	$P(\bar{X}_3)$
⋮	⋮
$\bar{X}_k$	$P(\bar{X}_k)$

Sampling Distribution of SD

S	P(S)
S_1	$P(S_1)$
S_2	$P(S_2)$
S_3	$P(S_3)$
⋮	⋮
S_k	$P(S_k)$

S.E. $(\bar{X})$ or $\sigma_{\bar{X}}$

Standard deviation of Sampling distribution is called Standard error.

Sampling Distribution & Standard Error

k-sample

SRSWR $k = N^n$

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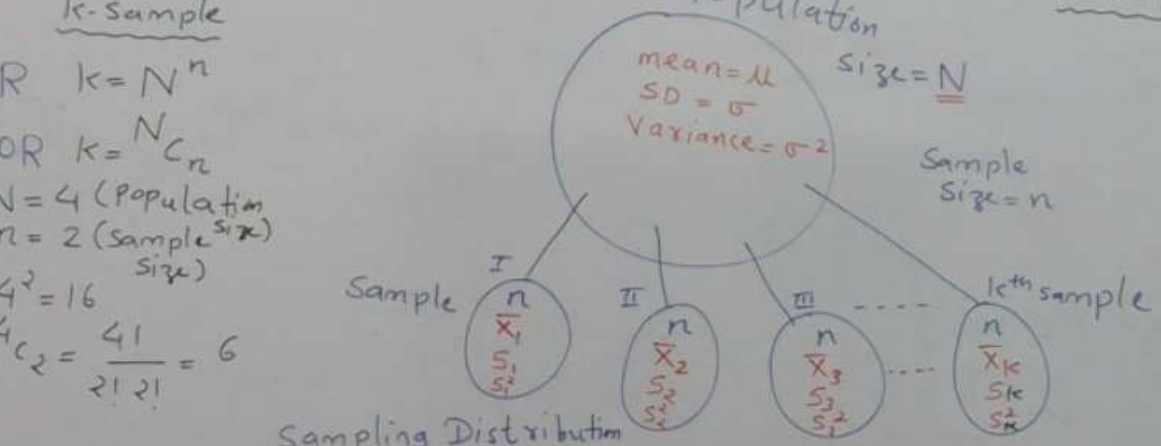
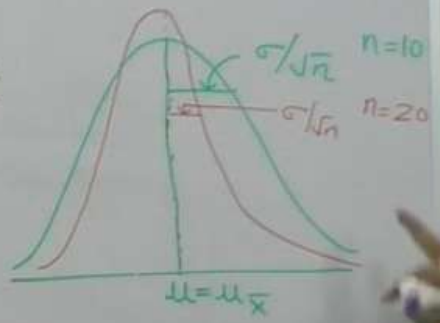


k-sample



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⋮	⋮
$\bar{X}_k$	$P(\bar{X}_k)$

S.E.$(\bar{x})$ or $\sigma_{\bar{x}}$

Standard deviation of Sampling distribution is called Standard error.

mean of sampling Distribution of mean, $\mu_{\bar{x}} = \mu$

(Population mean)

S.D. of sampling Distribution of mean, (Standard error of mean)

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$$

(Population S.D., Sample size)