

SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai



Department of Computer Science and Engineering

Course Code & Title : 23AD0201 - Data Science Fundamentals

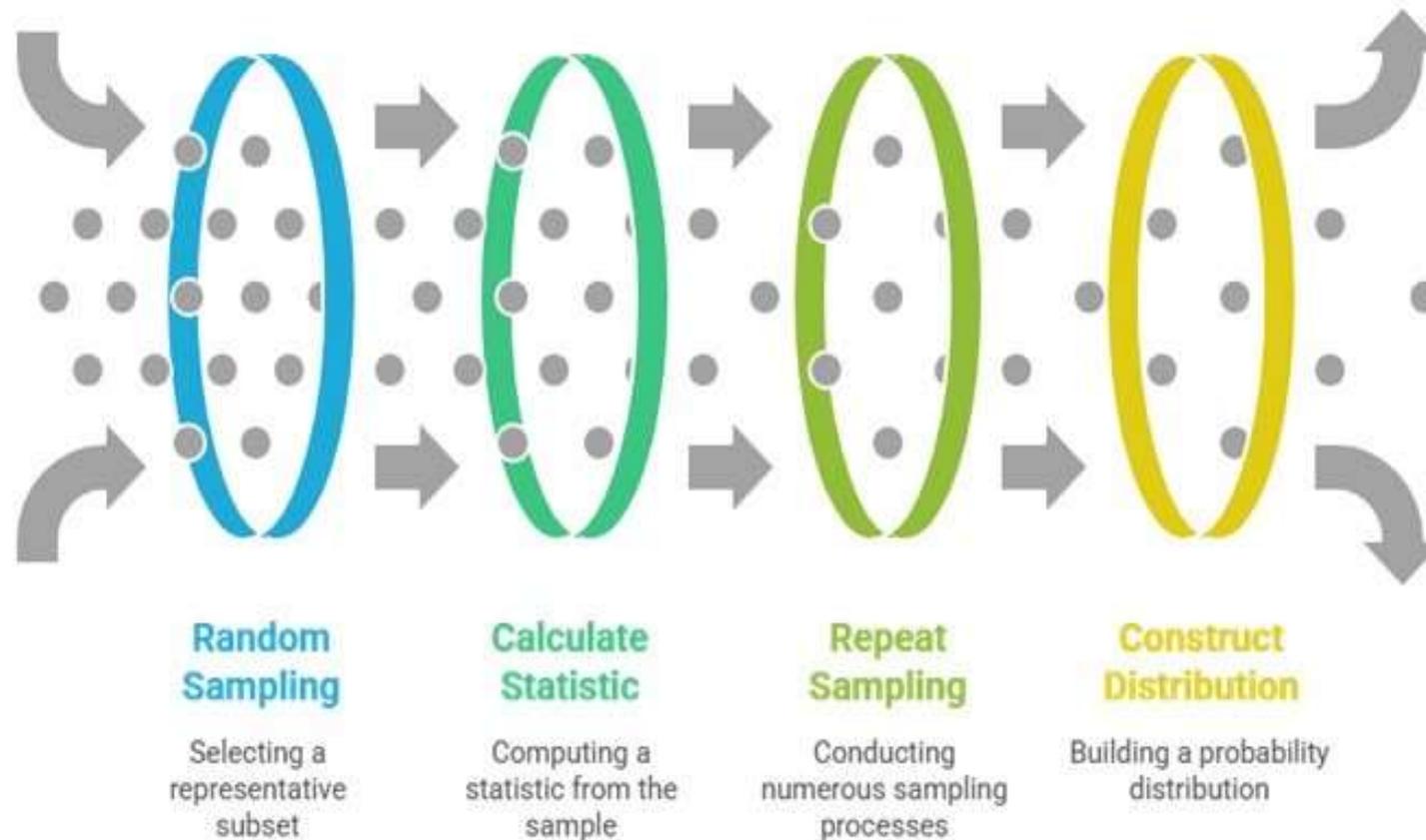
III YEAR / VI SEMESTER - ECE

Unit 3 - INFERENCE STATISTICS

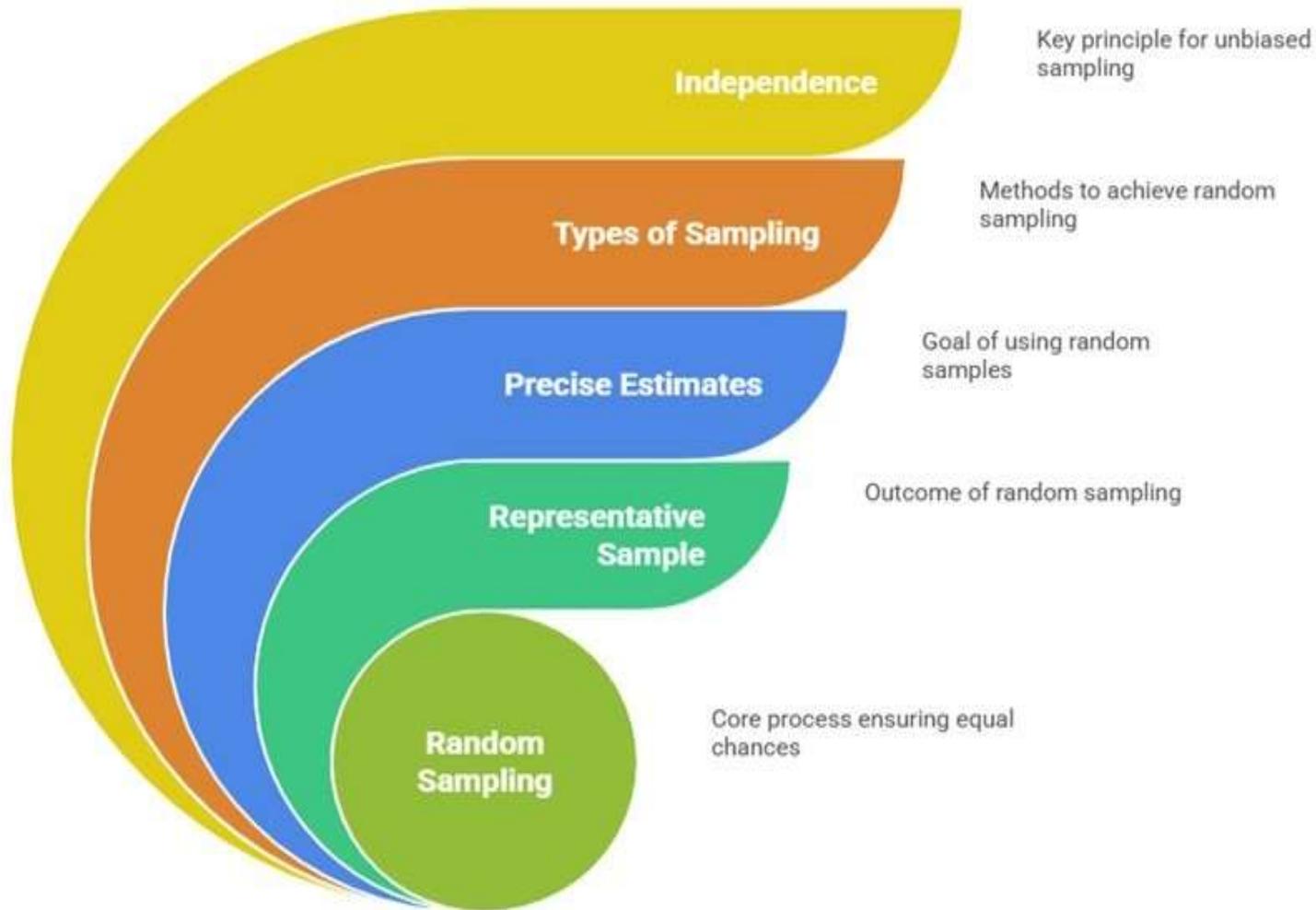
Topic : Random Sampling and Sampling Distribution

K.KARTHIKEYAN AP /CSE

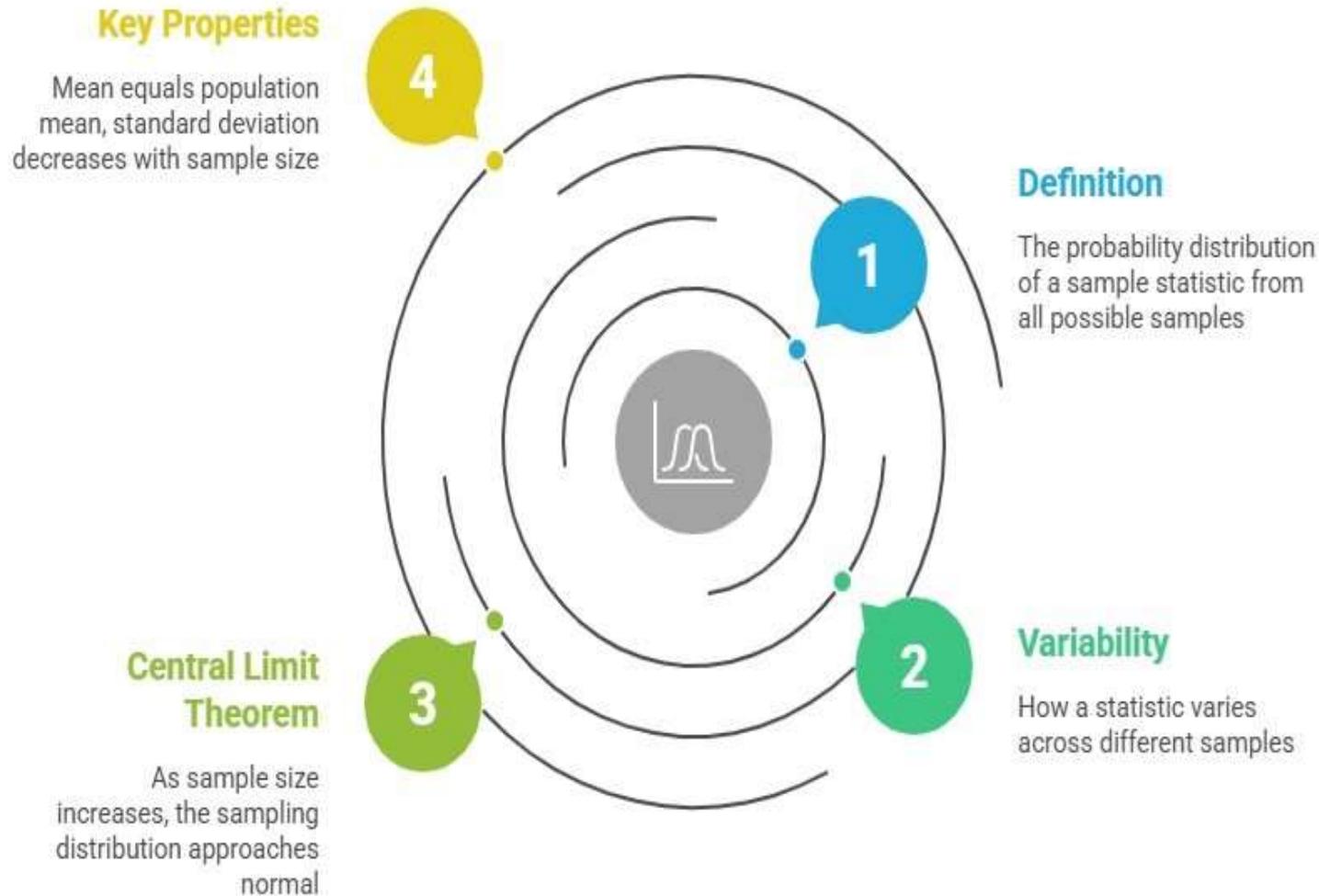
From Random Sample to Sampling Distribution



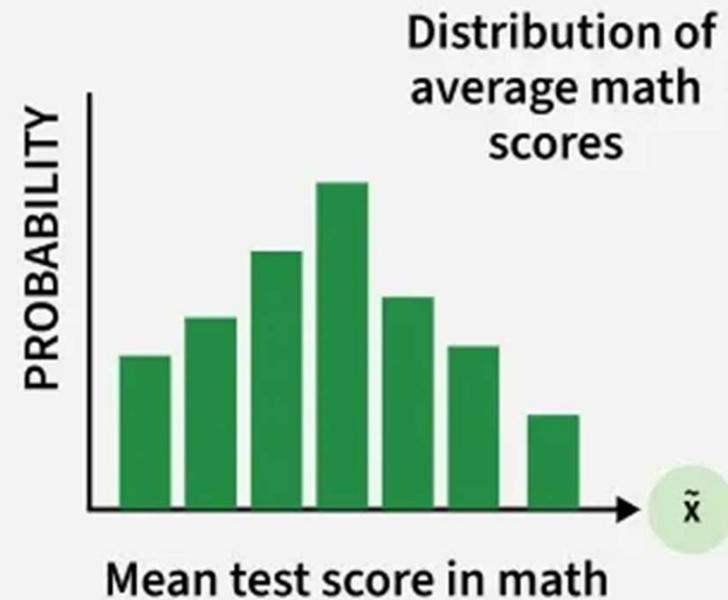
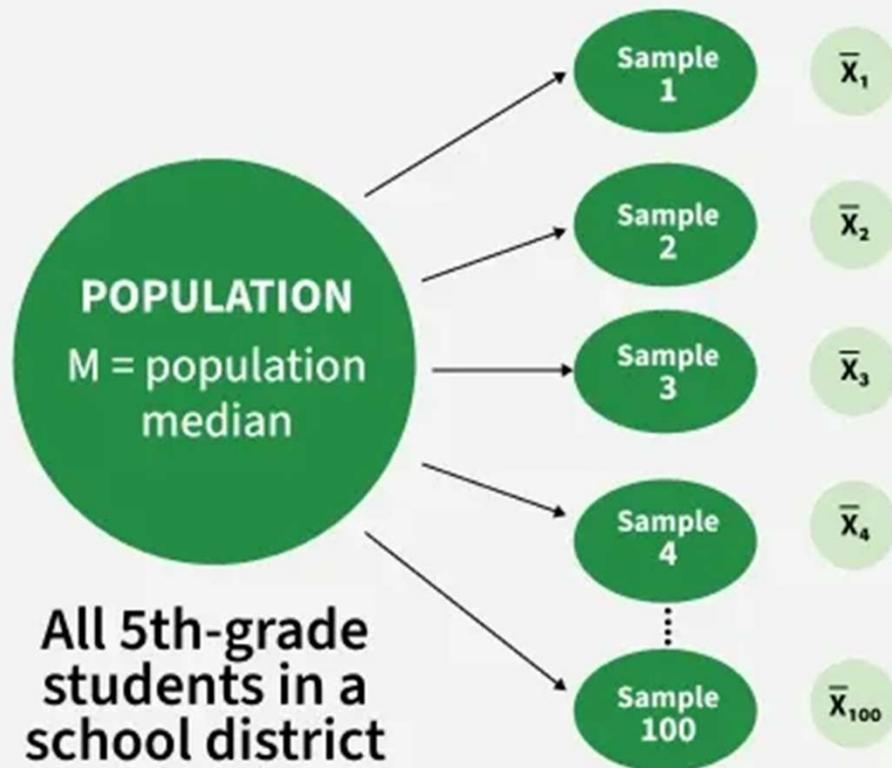
Random Sampling Concepts



Understanding Sampling Distributions



Randomly Drawn Samples n = 50



Solved Examples of Sampling Distribution

Example 1: Mean and standard deviation of the tax value of all vehicles registered in a certain state are $\mu = \$13,525$ and $\sigma = \$4,180$. Suppose random samples of size 100 are drawn from the population of vehicles. Find

- Mean $\mu_{\bar{x}}$
- Standard deviation $\sigma_{\bar{x}}$ of the sample mean \bar{x}

Solution:

Since $n = 100$, the formulas yield

$$\mu_{\bar{x}} = \mu = \$13,525$$

$$\sigma_{\bar{x}} = \sigma / \sqrt{n} = \$4180 / \sqrt{100}$$

$$\sigma_{\bar{x}} = \$418$$

Activity

Question 2: A population has a mean of 5.75 and a standard deviation of 1.02.

1. Random samples of size 81 are taken. Find the mean and standard deviation of the sample mean.
2. How would the answers to part
3. Change if the size of the samples were 25 instead of 81?

MCQ

Random Sampling – MCQ

1. What is Random Sampling?

- A) Selecting samples based on convenience
- B) Selecting samples where every member has an equal chance of being chosen
- C) Selecting only large samples
- D) Selecting samples from one group

Answer: B

2. Which of the following is a type of random sampling?

- A) Stratified sampling
- B) Cluster sampling
- C) Simple random sampling
- D) All of the above

Answer: D

MIND MAP

REFERENCE BOOKS

1.Allen B. Downey, “Think Stats: Exploratory Data Analysis in Python”, Green Tea Press, 2014.

2.Sanjeev J. Wagh, Manisha S. Bhende, Anuradha D. Thakare, “Fundamentals of Data Science”, CRC Press, 2022.

3.Chirag Shah, “A Hands-On Introduction to Data Science”, Cambridge University Press, 2020.

4.Vineet Raina, Srinath Krishnamurthy, “Building an Effective Data Science Practice: A Framework to Bootstrap and Manage a Successful Data Science Practice”, A press, 2021.

