

# DA-Session-9-DPP

## Assignment Questions



## Basics of Sampling

### Question 1

Suppose you want to study customer satisfaction in a mall. Explain how you would use **systematic sampling** to select participants.

### Question 2

A school has 5 grades, each with different numbers of students. Describe how you would use **stratified sampling** to estimate the average exam score of all students.

### Question 3

A school has 800 students: 400 in junior grades, 250 in senior grades, and 150 in advanced grades. You want to survey 100 students, ensuring proportional representation from each group. How many students should be sampled from each grade?

### Question 4

A store wants to survey its customers. It has a list of 1,000 customer transactions and wants to sample every 20th transaction. If the starting point is transaction #7, list the first 10 transactions in the sample.

### Question 5

A city has 200 neighborhoods. You want to estimate the average electricity consumption per household. You select 10 neighborhoods at random and survey all households in these neighborhoods. What is the main advantage of cluster sampling in this scenario?

## Standard Error Calculation

### Question 6

In a population of students, the average study time is 10 hours per week, with a standard deviation of 3 hours. You take a sample of size 36. Calculate the standard error of the mean.

### Question 7

If the factory's light bulb lifespans have a mean of 1,200 hours and a standard deviation of 200 hours, calculate the **standard error** for samples of size 50.

## Effect of Sample Size on Variability

### Question 8

A population has a mean of 50 and a standard deviation of 10. Compare the standard error for sample sizes of 16, 64, and 256. Discuss how increasing the sample size affects variability.

## Real-World Applications

### Question 9

A company sends out a survey to 1,000 customers and receives responses from 150.

- Identify the type of sampling method used.
- Discuss potential biases in the sample.

## Question 10

A researcher collects 10 random samples of size 30 from a population. The means are 75, 78, 74, 76, 77, 75, 79, 76, 74, and 77. Create a sampling distribution of the mean and calculate its mean and standard deviation.

## Probability Using CLT

### Question 11

The average weight of apples in an orchard is 200g with a standard deviation of 50g. A random sample of 36 apples is taken.

- What is the probability that the sample mean is greater than 210g?