

# Workbook



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# Introduction to Sampling

## Sampling Techniques

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### Questions

- 1) A college is studying tendency towards depression among its first-year students. They choose 25 students from this year's cohort at random. What is the population? What sampling technique was used?
- 2) A toy company chooses 5 toys at random from each of their 10 models to test for quality control. What sampling technique was used?
- 3) A researcher is studying opinions about abortion among adults aged 25-40 in the southeastern United States. She randomly selects 4 states from this region and then within those states chooses a simple random sample of adults aged 25-40. What is the study's population? What sampling technique was used?
- 4) A candidate for Congress polls his friends for their opinions about gun control. What sampling technique was used?

### Answer Key

- 1) Population: all first-year students at this college.  
Technique: Simple random sample.
- 2) Stratified random sample.
- 3) Population: all adults aged 25-40 in southeastern United States.  
Technique: Clustered random sample.
- 4) Convenience sample.

## Statistics and Parameters

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### Statistics and Parameters: What's the Difference?

	Statistic (sample)	Parameter (population)
Average or mean	$\bar{x}$	$\mu$
Standard deviation	$s$	$\sigma$
Proportion	$\hat{p}$	$p$

**Example** (solution in the recording)

25% of a state's voters are thought support a new bill to legalize medical marijuana. Two hundred voters are sampled and asked whether they support this initiative, and 56 of those voters indicate their support for the bill.

- What is the population?
- What is the variable?
- What parameter is mentioned here?
- What statistic is mentioned here?

**Questions**

- 1) In the following table we have the probability distribution of the number of flat-screen TV's, owned by all families in Alphaville. We sample 4 families from this population and then find that these families have' on average, 2 flat-screen TV's.  
Give an example of a parameter and of a statistic shown here.

No. of Families	No. of Flat-Screen TV's
50	0
250	1
350	2
300	3
50	4

- 2) Assume that 20% of a large company's employees have graduate degrees. 10 employees are randomly selected from the company, and three of them have graduate degrees.
- What is the population?
  - What is the variable?
  - What is the parameter?
  - What is the statistic?
- 3) 10 students are sampled from all students at college who completed Statistics 101. The average course grade for all students is 78, with a standard deviation of 15. The average grade among the students in the sample is 80 with a standard deviation of 18.
- What is the population?
  - What is the variable?
  - What parameters are included here?
  - What is the sample size?
  - What statistics will be used here?

**Answer Key:**

- 1)  $\mu = 2.05, \bar{x} = 2$
- 2) a. Large company's employees.                      b. Proportion of employees with grade degrees.  
c.  $p = 20\%$     d.  $\hat{p} = 30\%$
- 3) a. All the students who completed Stats 101.    b. Course grade.    c.  $\mu = 78, \sigma = 15$   
d.  $n = 10$                       e.  $\bar{x} = 80, s = 18$