- Module 1: The Basics of R and Introduction to the Course
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Constructing Confidence Intervals, Case I - Quiz

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Question 1

1/1 point (graded)

Suppose you are sampling from a normal distribution with a known variance and you want to construct a confidence interval for the mean. You have an estimator for the mean $\bar{X}$, which has a normal distribution with mean 10 and variance 4. What are the bounds on the corresponding 95% confidence interval?

Please round your answers to 2 decimal points, i.e. if the answer is 2.2123, please round to 2.21 or if it is 2.2167, please round to 2.22.

A. Lower Bound

6.08

✔ **Answer:** 6.08

6.08

B. Upper Bound

13.92

✔ **Answer:** 13.92

- [Module 5: Moments of a Random Variable, Applications to Auctions, & Intro to Regression]
- [Module 6: Special Distributions, the Sample Mean, the Central Limit Theorem, and Estimation]
- **Module 7: Assessing and Deriving Estimators - Confidence Intervals, and Hypothesis Testing**

Assessing and Deriving Estimators
Finger Exercises due Nov 14, 2016 at 05:00 IST

Confidence Intervals and Hypothesis Testing
Finger Exercises due Nov 14, 2016 at 05:00 IST

Module 7: Homework
Homework due Nov 07, 2016 at 05:00 IST

13.92

Explanation

Since you know the underlying distribution from which you are sampling is $N(10, 4)$, you can use the formula given by Professor Ellison in class:

$$[\bar{X} + \Phi^{-1}(\alpha/2)\sigma, \bar{X} - \Phi^{-1}(\alpha/2)\sigma]$$

By either using R, or the standard normal distribution table, you know that the critical value $(\Phi^{-1}(\frac{1-0.95}{2}))$ for the 95% confidence interval is 1.96. Plugging in the relevant quantities:

$$[10 - 1.96(\sqrt{4}), 10 + 1.96(\sqrt{4})] = [6.08, 13.92]$$

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Question 2

1/1 point (graded)

True or False: Based on the confidence interval you obtained in question 1, you know that the true mean is definitely between A (the lower bound) and B (the upper bound).

- Exit Survey

a. True

b. False ✔

Explanation

Recall that we construct confidence intervals based on a probability statement, so you cannot be sure that the true mean lies within your interval, because on average, this is only true 95% of the time. In other words, it means that if you compute the confidence interval in repeated samples, then $(1-\alpha)$ percent of the time, the interval will bracket the true mean. Note: your interval is random, but the population mean is fixed.

Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

Discussion

Topic: Module 7 / Constructing Confidence Intervals, Case I - Quiz

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[STAFF] what is the sample size?

question posted about 14 hours ago by **jmknow**

Without knowing the sample size how is one to find the upper and lower bounds of the interval unless you want each as a function of n?

This post is visible to everyone.

Add A Response

1 response

TabiM

21 minutes ago

Use n=1

Add a comment

Showing all responses

Add a response:

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Clarify wording - Confidence Intervals Case 1s

discussion posted 3 days ago by **Margaret_Niehaus**

The wording for Question 1 seems off? If you know the mean for the estimator (uppercase X-bar) then you already have the mean for the population,...

This post is visible to everyone.

+ Expand discussion

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