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Long Question 3 - Scrabble Pizza Party

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You and your friend decide throw a scrabble pizza party. You don't know how many pizzas to order, so you want to obtain an estimate of slices each person would eat. You perform a poll of ten randomly selected patrons to see how many slices they each ate. Their responses are denoted X_i , $i = 1, \dots, 10$, and

$$\bar{X} = \frac{1}{10} \sum_{i=1}^{10} X_i = 4.3$$

$$s^2 = \frac{1}{9} \sum_{i=1}^{10} (X_i - \bar{X})^2 = 2.7$$

Question 11

0.0/1.0 point (graded)

Assuming that the X_i s are *i.i.d.* normal, construct a **95** confidence interval for the mean of the X_i s. Enter the lower and upper bounds on the interval $[a, b]$.

Please round your answer to 2 decimal points

Lower bound **a**:

✖ Answer: 3.12

Functions of Random Variable

- ▶ 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
- ▶ Module 8: Causality, Analyzing Randomized Experiments, & Nonparametric Regression

3.28

Upper bound **b**:

5.32

✖ Answer: 5.48

5.32

Explanation

$$\bar{X} \pm t_{0.025, n-1} \frac{s}{\sqrt{n}}$$

Plugging in the relevant numbers from the table:

$$4.3 \pm 2.26 \frac{\sqrt{2.7}}{\sqrt{10}}$$

[3.12, 5.48]

- ▶ Module 9: Single and Multivariate Linear Models
- ▶ Module 10: Practical Issues in Running Regressions, and Omitted Variable Bias
- ▶ Module 11: Intro to Machine Learning and Data Visualization
- ▶ Module 12: Endogeneity, Instrumental Variables, and Experimental Design
- ▶ Exit Survey

▼ Final Exam

Final Exam

Final Exam due Dec 19, 2016
05:00 IST



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Question 12

0.0/1.0 point (graded)

How many patrons would you have had to poll to limit the width of the confidence interval to one slice?

Please round your answer to the nearest whole number.

42

✖ Answer: 692

42

Explanation

$$2 \frac{2\sqrt{2.7}}{\sqrt{n}} < 0.25 \implies n > \left(\frac{4\sqrt{2.7}}{0.25} \right)^2 \implies n > 692$$

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Question 13

1.0/1.0 point (graded)

True or False? Suppose your friend gives you the additional information that the X_i s have a uniform distribution on $[0, \theta]$ instead. Unfortunately, he has already thrown away the original data and kept the sample mean and the sample variance he computed. You can still construct a **95%** confidence interval for the mean of the X_i s.

☒ True ✓

☐ False

Explanation

You can still construct a **95%** confidence interval for the mean of the X_i , you can just use $2\bar{X}$ as an estimate for θ .

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