STAT:1020 discussion - week 15

Issac Lee

April 22, 2019

Chap. 14 Confidence Intervals for Means

Problem 1. Tips

A waiter believes the distribution of his tips has a model that is slightly skewed to the right, with a mean of $ 9.60 and a standard deviation of $ 3.30.

a) Explain why you cannot determine the probability that a given party will tip him at least $20.

b) Can you estimate the probability that the next 4 parties will tip an average of at least $ 15? Explain.

c) Is it likely that his 9 parties today will tip an average of at least $ 15? Explain.

Problem 2. Find critical value

Using the t table estimate

a) the critical value of t for a 90% confidence interval with $df = 17$

b) the critical value of t for a 98% confidence interval with $df = 88$

c) Describe how the shape, center, and spread of t-models change as the number of degrees of freeedom increases.

d) Describe how the critical value of t for a 95% condfidence interval changes as the number of degrees of freedom increases.

Problem 3. Home sales (Unknown σ)

The housing market recovered slowly from the economic crisis of 2008. Recently, in one large community, realtors randomly sampled 36 bids from potential buyers to estimate the average loss in home value. The sample showed the average loss from the peak in 2008 was $ 9560 with a standard deviation of $ 1500.

a) What assumptions and conditions must be checked before finding a confidence interval for the mean loss in value per home.

b) Find a 95% confidence interval for the mean loss in value per home.

c) In the previous exercise, you found a 95% confidence interval. Suppose the s.d. had been $ 3000 instead of $ 1500. What would the larger s.d. do to the width of the confidence interval (assuming the same level of confidence)?

d) Your classmate suggests that the margin of error in the interval could be reduced if the confidence level were changed to 90% instead of 95%. Do you agree with this statement? Why or why not?

e) Instead of changing the level of confidence, would it be more statistically appropriate to draw a bigger sample?