Assignment 4

Due: Friday February 12, 2021 11:59 PM (Atlantic Standard Time)

Submit your assignment

Help

After you have completed the assignment, please save, scan, or take photos of your work and upload your files to the questions below. Crowdmark accepts PDF, JPG, and PNG file formats.

Q1 (4 points)

Generate 20 random samples, each of size $n = 30$, from a normal distribution with mean $\mu = 100$ and standard deviation $\sigma = 15$. For each sample, compute a 95% confidence interval for μ, *assuming that σ is known*. (The relevant R code is on the last page of class 09.)

(a) How many intervals do you expect to cover the true value 100 of μ?

(b) *Before you generate the samples*, what is the probability that your first interval will include the true value of μ?

(c) *Before you generate the samples*, what is the probability that at least 19 of your calculated intervals will contain the true value of μ?

(c) How many intervals you calculated actually contain the true value of μ? (A simple number suffices; no need to include your code or output.)

Q2 (4 points)

Exercise 8 on page 391.

Q3 (4 points)

Exercise 12 on page 399. (Interpret the confidence interval in a hypothetical scenario of a large number of samples.)

Q4 (4 points)

Exercise 23 on page 400. Use a 90% confidence level instead, and use the traditional approximate CI formula (8.11) .

Q5 (4 points)

Exercise 34b on page 407. In addition, predict the ACT score of a student by calculating a 90% confidence interval.