

Homework 8

S520

Upload your answers as a PDF or HTML through the Assignments tab on Canvas by 4 pm, Thursday 24th March.

Trosset question numbers refer to the hardcover textbook. Draw all graphs in R and include all R code. You may work with others, but you must write up your homework independently — you should not have whole sentences in common with other students or other sources.

This is a long homework! Get started!

1. Trosset chapter 10 Problem Set A (5 points.)
2. Trosset chapter 10 Problem Set B (10 points.)
3. Trosset chapter 10 Problem Set D (10 points.)
4. (5 points.) A researcher wanted to see if live reggae music improved students' math test scores.¹ He selected a sample of 61 students from his university and gave them a math test. The students then studied for two and a half hours while an acoustic reggae band played quietly. The students then took another math test of the same difficulty.

The researcher's variable was the *change* in test score for each student — a positive change meant the student did better after listening to reggae, while a negative change meant a student did worse. He found that the changes had an approximately normal distribution with mean 6.5 and standard deviation 12.

- (a) Assuming the sample is random, test the hypothesis that the population average is positive.
- (b) Does the study provide convincing evidence that live reggae music improves students' math test scores? Explain why or why not.

¹I am not making this up.