STA 2023 Supplementary Exercise Chapter 7-A

1. According to the norms established for a reading comprehension test, eighth graders should average 83.2 with a standard deviation of 8.6. If 45 randomly selected 8th graders from a certain school district averaged 86.9, check the district superintendent's claim that his eighth graders are above average. Test at a significance level of .01.

2. A psychologist hypothesizes that college students today sleep less during the night than college students of a generation ago. To test this hypothesis, he randomly selects 400 college students and asks them to record the hours they sleep each night for a semester (similar to a study done 25 years ago). The previous study showed college students sleeping an average of 7.32 hours each night with a standard deviation of 1.08 hours. If the current study yielded a mean of 7.24 hours, what conclusions can you draw with .05 significance?

3. A sociologist examining a large apartment complex wishes to determine if the average number of persons per family unit differs significantly from the national mean of 4.8. She interviews 100 families in the complex, obtaining a mean of 4.7 with a standard deviation of 0.8. What conclusions can you draw with a .02 level of significance?

STA 2023 Supplementary Exercise Chapter 7-B

1. A method currently used by doctors to screen women for possible breast cancer fails to detect cancer in 12% of the women who actually have the disease. A new screening method has been developed that researchers hope will be able to detect cancer more accurately. A random sample of 200 women known to have breast cancer were screened using the new method. Of these, the new method failed to detect cancer in 18. Do the data provide sufficient evidence to indicate that the new screening method is better than the one currently in use? Use a significance level of .05.