Hypothesis Tests about a Single Population Mean: Exercises

*Exercise 1*:

A company has a tech support staff that helps employees handle computer issues. In the past, the average time to resolve a computer issue was 7 minutes. The company has gathered enough historical data over time on computer issue resolutions to be confident that the population standard deviation is 4 minutes.

The company instituted a new ticketing system for computer issues, with the goal of decreasing the time it takes to resolve them. Once the ticketing system was in place, a random sample of 35 issues was taken and the mean time to resolution in the sample was calculated as 5.5 minutes.

Can the company conclude, at an significance level, that the population mean time to resolution has actually decreased?

*Exercise 2*:

A sports equipment manufacturer produces a line of 20 lb kettlebells. The manufacturing process can sometimes go out of adjustment. When this happens, it can make kettlebells that are on average too light or too heavy. In order to check whether the process is working properly, the manufacturer takes a random sample of 30 kettlebells, weighs each of them, and finds that the mean of the sample is 20.26 lbs. From the specification of its manufacturing equipment, the manufacturer knows that the population standard deviation in this manufacturing process is 0.78 lbs.

Perform and interpret a hypothesis test to check whether the manufacturing process is turning out kettlebells that weigh 20 lbs on average at the significance level. Should the process be adjusted?