

Tutorial 8: Questions

March 14, 2018

Remember to go back and do all the odd numbered problems in sections 8.1 to 8.4 and compare your solutions to those in the solution manual to verify that you have a solid understanding of the fundamentals. Not understanding QQ plots? Take a look [here](#).

Question 8.1.14, Page 326

A new design for the braking system on a certain type of car has been proposed. For the current system, the true average braking distance at 40 mph under specified conditions is known to be 120 ft. It is proposed that the new design be implemented only if sample data strongly indicates a reduction in true average braking distance for the new design.

- (a) Define the parameter of interest and state the relevant hypotheses.
- (b) Suppose braking distance for the new system is normally distributed with $\sigma = 10$. Let \bar{X} denote the sample average braking distance for a random sample of 36 observations. Which values of \bar{x} are more contradictory to H_0 than 117.2, what is the p -value in this case, and what conclusion is appropriate if $\alpha = 0.10$?
- (c) What is the probability that the new design is not implemented when its true average braking distance is actually 115 ft and the test from part (b) is used?

Question 8.4.52, Page 352

In a sample of 171 students at an Australian university that introduced the use of plagiarism-detection software in a number of courses, 58 students indicated a belief that such software unfairly targets students. Does this suggest that a majority of students at the university do not share this belief? Test appropriate hypotheses.

Question 8.S.66, Page 358

The accompanying observations on residual flame time (seconds) for strips of treated children's nightwear were given in an article. Suppose a true average flame time of at most 9.75 had been mandated. Does the data suggest that this condition has not been met? Carry out an appropriate test after first investigating the plausibility of assumptions that underlie your method of inference.

9.85	9.93	9.75	9.77	9.67	9.87	9.67
9.94	9.85	9.75	9.83	9.92	9.74	9.99
9.88	9.95	9.95	9.93	9.92	9.89	

Mass of Pizza Pockets

Suppose it is known that pizza pockets across brands are normally distributed with population standard deviation 20. In addition, it is known that brand-name pizza pockets have a mean of 100 grams. A researcher is interested in seeing if store-brand pizza pockets have less mass than brand-name pockets. The researcher obtains a sample of 20 store-brand pizza pockets and records that the average mass of the pizza pockets is 91.65.

- (a) Test the appropriate hypotheses using the p -value method (assume the level of significance is 5%).
- (b) What is the power of a test at the 5% level of significance if the true mean mass of store-brand pizza pockets is 95?