Week 7 Quiz - Hypothesis Testing - Questions

FIT5197 teaching team

Note you will need to use the z- and t- tables in the unit Formula Sheet (https://lms.monash.edu/mod/resource/view.php?id=7439150) to answer the following questions.

Question 1

1,500 men followed the Atkin's diet for a month. A random sample of 29 men gained an average of 6.7 pounds. Test the hypothesis that the average weight gain per man for the month was over 5 pounds. The standard deviation for the population of the 1500 men is known to be 7.1.

Question 2

A premium golf ball production line must produce all of its balls to 1.615 ounces in order to get the top rating (and therefore the top dollar). Samples are drawn hourly and checked. If the production line gets out of sync with a statistical significance of more than 1%, it must be shut down and repaired. This hour's sample of 18 balls has a mean of 1.611 ounces and a standard deviation of 0.065 ounces. Do you shut down the line?

Question 3 ¶

There is some variability in the amount of phenobarbital in each capsule sold by a manufacturer. However, the manufacturer claims that the mean value is 20.0 mg. To test this, a sample of 25 pills yielded a sample mean of 19.7 with a sample standard deviation of 1.3. What inference would you draw from these data? In particular, are the data strong enough evidence to discredit the claim of the manufacturer? Use the 5 percent level of significance.

Question 4

Twenty years ago, entering male high school students of Central High could do an average of 24 pushups in 60 seconds. To see whether this remains true today, a random sample of 36 freshmen was chosen. If their average was 22.5 with a sample standard deviation of 3.1, can we conclude that the mean is no longer equal to 24? Use the 5 percent level of significance.

R code hackers brain-melting challenge

Solve this problem using calculations in R and the relevant built in cdf function.

An economist was curious to see if women were not satisfied with their jobs. A random sample of 25 women gave an average job satisfaction score of 46 out of 100. Given that the population standard deviation of female job satisfaction scores is 5, test the hypothesis that the average female job satisfaction score is less than or equal to 50 out of 100.