STAT 340

Chapter 14 - Practice Questions Part IV

Hypothesis Testing

1. We want to make sure that aspirin tablets are on average, 325 mg as labeled on the bottle. We took a sample of 10 tablets and found that the mean weight is 326.9 mg. Suppose we know that the population of aspirin tablets are normally distributed, with a standard deviation of 5 mg.

a) What type of test (one-sided, two-sided) is this? (*Hint: Write the null and alternative hypotheses*)

b) In words, what does μ represent?

c) Conduct a hypothesis test to determine if the tablets are being manufactured incorrectly. Use a significance level of 0.01.

$\sigma =$

$n =$

$\bar{x} =$

$$\bar{X} \sim N(\quad , \quad)$$

$$Test\ statistic: z = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}} =$$

$p - value = 2 \times P(Z \geq |z|) = 2 \times [1 - P(Z \leq |z|)]$

$\alpha =$

Conclusion:

Since p-value is ……. than the significance level α (0.01), we ……..

the null hypothesis. We ……. enough evidence to show the

tablets are being manufactured incorrectly.

2. Agricultural researchers at K-State sometimes study how diets affect the weight gain of animals. Suppose a standard diet gives an average weight gain of 20 lbs. Assume the population weight gain is normally distributed with a standard deviation of 10. We would like to know whether a new diet gives a greater average weight gain than this. Use a significance level of 0.05.

   X =

   μ =

a) In one study, we have a random sample of 30 animals. The sample mean is 22. What is the one-sided p-value for the test? Do we reject or fail to reject the null hypothesis?

b) In another study, we have a random sample of 100 animals. Again, the sample mean is 22. What is the one-sided p-value? Do we reject or fail to reject the null hypothesis?

c) All other things being equal, if we take a larger sample size do we get a larger or smaller p-value?

2. A recent study of 130 healthy adults found an average body temperature of 98.25 degrees with population standard deviation 0.6.

a) Construct a 95% confidence interval (95% confidence, alpha of 0.05) to determine where we would expect the population mean body temperature to be.

b) Is this a significantly different result from the classic 98.6 degree body temperature?