Tutorial 8

Week of March 11, 2019

P-Value of a Two-Sided Test

To do: Review definition of a p-value.

Suppose we have a sample of $n = 20$ observations that come from a normal distribution with known σ^2. We wish to test whether the true mean of the distribution is different from 5. Based on this sample, the sample mean is $\overline{x} = 4$. A p-value of 0.034 is obtained from this hypothesis test. Express this p-value as a probability using the distribution of $\overline{X}$ under H_0 .

To do: Review Type II error and power of a hypothesis test.

Question 8.3.37, Page 345

Using the given data on compressive strength of concrete:

112.3 97.0 92.7 86.0 102.0 99.2 95.8 103.5 89.0 86.7

(a) Is it plausible that the compressive strength for this type of concrete is normally distributed?

(b) Suppose the concrete will be used for a particular application unless there is strong evidence that true average strength is less than 100 MPa. Should the concrete be used? Carry out a test of appropriate hypotheses.

Question 8.4.49, Page 351

A plan for an executive travelers' club has been developed by an airline on the premise that 5% of its current customers would qualify for membership. A random sample of 500 customers yielded 40 who would qualify.

(a) Using this data, test at level 0.01 the null hypothesis that the company's premise is correct against the alternative that it is not correct.

(b) What is the probability that when the test of part (a) is used, the company's premise will be judged correct when in fact 10% of all current customers qualify?