TOBB ETU Department of Economics

Fall 2019

İKT 253:   Homework 4

Question 1.

A random sample of 61 economics students was asked to rate on a scale from 1 (not important) to 5 (extremely important) transportation benefits as a job characteristic. The sample mean rating was 2.42, and the sample standard deviation was 1. Assume that the population is normally distributed.

a) Make a two-sided test (at the 5% significance level) for the null hypothesis that the population mean rating is 2.0.

b) What is the p-value of the test in part a?

c) For the test in part a, compute the probability of Type II Error and also the power of the test when the true population mean is 2.047.

Question 2.

If a random sample of 45 college students in a city, 36 students said that the second year of the college education was the most difficult year in terms of course load.
a) Test the hypothesis that the second year of the college education is the most difficult year in terms of course load for at least 70% of college students, at 10% significance level.

b) Calculate the p-value of the test in part a.

c) For the test in part a, compute the Type II Error and the power when the true population percentage is 60.

Question 3.

It is believed that the grades in a large class follows a normal distribution with a standard deviation 15. For a random sample of 10 students chosen from this class, the standard deviation of grades was calculated to be 22.
a) Test the hypothesis that the population standard deviation is at most 15.0 at a significance level of 0.05.

b) Calculate the p-value of the test in part a.

Question 4.

The instructor of a history course given in two sections observes the following grade data after all exams are over:

	Section 1	Section 2
# of Students:	16	20
Standard Deviation:	20	16

Test if there is a difference between the grade variances of Sections 1 and 2 at a significance level of 0.10.

Question 5.

Using the dataset "Data-HW4" on the course webpage and the commands "describe", "summarize", "ci", "ttest", "prtest", do the following:

a) Describe the dataset
b) Find the mean, standard deviation, min and max values for the variables income and retire.
c) Build 90% confidence intervals for the variables income and retire.
d) Test H0: population mean of income = 21.5
   Test H0: population mean of income = 22
   Test H0: population mean of income = 23.5
e) Test H0: population proportion of retire = 58
   Test H0: population proportion of retire = 59
   Test H0: population proportion of retire = 61