

MA 69204 Statistical Software Lab

Assignment No. 7

- Find a 90% confidence interval for the mean of a normal distribution with $\sigma = 3$, given the sample (3.3, -0.3, -0.6, -0.9). What would be the confidence interval if σ were unknown?
- To estimate the average number of pounds of copper recovered per ton of ore mined, a sample of 150 tons of ore is monitored. A sample mean of 11 pounds with a sample s.d. of 3 pounds is obtained. Construct a 95% confidence interval on the mean number of pounds of copper recovered per ton of ore mined.
- A certain amount of natural gas is produced with each barrel of crude oil. This gas escapes from the oil near the top of the well pipe. In an attempt to estimate the amount of natural gas available from wells in Kuwait these data are obtained on X, the number of cubic feet of gas obtained per barrel of crude oil :

290 610 790 670 770 420 600 350 800 920 410 810 620 560 550
 610 510 390 480 630 470 380 550 570 730 680 530 650 1000 720

Find a 99% confidence interval for the average volume of natural gas produced per barrel of crude oil by wells in Kuwait.

- When programming from a terminal, one random variable of concern is the response time in seconds. These data are obtained for one particular installation:

1.48 1.26 1.52 1.56 1.48 1.46 1.30 1.28 1.43 1.43 1.55 1.57 1.51 1.53 1.68
 1.37 1.47 1.61 1.49 1.43 1.64 1.51 1.60 1.65 1.60 1.64 1.51 1.51 1.53 1.74

Find a 95% confidence interval for σ^2 .

- A study of report writing by engineers is conducted. A scale that measures the intelligibility of engineers' English is devised. This scale called an "index of confusion", is devised so that low scores indicate high readability. These data are obtained on articles randomly selected from engineering journals and from unpublished reports written in 1979 :

Journals	Unpublished Reports
1.79 1.75 1.67 1.65	2.39 2.51 2.86 2.14
1.87 1.74 1.94	2.56 2.29 2.49
1.62 2.06 1.33	2.36 2.58 2.33
1.96 1.69 1.70	2.62 2.41 1.94

Find a 90% confidence interval on $\mu_1 - \mu_2$.

6. Five pairs of tests are conducted to compare two methods of making rope. Each sample batch contains enough hemp to make two ropes. The tensile strength measurements are:

Tests	1	2	3	4	5
Method 1	14	12	18	16	15
Method 2	16	15	17	16	14

Find a 95% confidence interval for the mean difference in tensile strengths between ropes made by two methods.

7. In pouring glass for use in automobile windshields uniformity of thickness is desirable to prevent distortion. If a random sample of 100 wind shields yields a sample standard deviation of 0.01 inch, construct a 95% confidence interval on the standard deviation in thickness.