

The University of Melbourne
CVEN30008 Engineering Risk Analysis

Tutorial 7

Confidence Intervals

Quality Risk

1. A supplier sells synthetic fibers to a manufacturing company. A random sample of 81 fibers is selected from a shipment (first shipment). The average breaking strength of them is 29N, and the standard deviation is 9N.
 - a). Find a 95% confidence interval for the mean breaking strength of all the fibers in the shipment? Verify your results by using MATLAB.
 - b). How many fibers must be sampled so that a 95% confidence interval specifies the mean to within ± 1
 - c). What is the confidence level of the interval (27.5, 30.5) based on the sample size of 81?

Quality Risk

2. The same supplier sells second shipment to the manufacturing company. A sample of 10 measurements is taken. The breaking strengths of the 10 measurements, in N, are:

25, 26, 28, 30, 32, 29, 29, 30, 33, 26

Find a 95% confidence interval for the breaking strength based on the 10 samples, and verify your results by using MATLAB

Quality Risk

3. There are third and fourth shipments delivered to the manufacturing company by the supplier at the same time. 50 samples were taken from each shipment. The average breaking strengths of the fibers are 27, 31 for the third and fourth shipments respectively. The standard deviations are 9 and 10 for the third and fourth shipments respectively. Find the 95% confidence interval for the difference between the breaking strength of these two shipments. Verify your results by using MATLAB.