Examples from the book: D.C. Montgomery and G.C. Runger: Applied Statistics and Probability for Engineers, 5th edition, 2011, Wiley

4-61. The line width for semiconductor manufacturing is assumed to be normally distributed with a mean of 0.5 micrometer and a standard deviation of 0.05 micrometer.
(a) What is the probability that a line width is greater than 0.62 micrometer? (0.0082)
(b) What is the probability that a line width is between 0.47 and 0.63 micrometer? (0.72109)
(c) The line width of 90% of samples is below what value? (0.564**)**

8-31. An article in *Obesity Research* ["Impaired Pressure Natriuresis in Obese Youths" (2003, Vol. 11, pp. 745–751)] described a study in which all meals were provided for 14 lean boys for three days followed by one stress (with a video-game task). The average systolic blood pressure (SBP) during the test was 118.3 mm HG with a standard deviation of 9.9 mm HG. Construct a 99% one-sided upper confidence interval for mean SBP. ((-∞,125.312])

8-15. A civil engineer is analyzing the compressive strength of concrete. Compressive strength is normally distributed with variance of $1000(psi)^2$. A random sample of 12 specimens has a mean compressive strength of 3250 psi.
(a) Construct a 95% two-sided confidence interval on mean compressive strength. ([3232.11, 3267.89])
(b) Construct a 99% two-sided confidence interval on mean compressive strength. Compare the width of this confidence interval with the width of the one found in part (a). ([3226.4, 3273.6])

8-47. The percentage of titanium in an alloy used in aerospace castings is measured in 51 randomly selected parts. The sample standard deviation is 0.37. Construct a 95% two sided confidence interval for the standard deviation. **(** [0.31, 0.46])

8-44. A rivet is to be inserted into a hole. A random sample of 15 parts is selected, and the hole diameter is measured. The sample standard deviation of the hole diameter measurements is 0.008 millimetres. Find a 99% lower confidence bound on the standard deviation. ([0.0055, ∞))