Stat 2060   Examples for Confidence Interval

1. An article in the *Journal of testing and Evaluation* presents the following 20 measurements on residual flame time (in seconds) of treated specimens of children's nightwear:
   9.85, 9.93, 9.75, 9.77, 9.67, 9.87, 9.67, 9.94, 9.85, 9.75, 9.83, 9.92, 9.74, 9.99, 9.88, 9.95, 9.95, 9.93, 9.92, 9.89

   Assume that the residual flame time is normally distributed with $\sigma=0.1$. Find the 90%, 95% and 99% confidence interval for μ.

   (The sample mean can be calculated from the data above, it's 9.8475)

2. If we want the width of the 95% C.I. no more than 0.05, what could we do?

3. Suppose we don't know $\sigma=0.1$, what's the 95% C.I. for μ based on the sample given above? (it can be calculated from the sample that s=0.0954)

4. In a random sample of 100 light bulbs, the sample mean and standard deviation of bulb life was found to be 540 hours and 12.6 hours. Compute a 90% C.I. for μ, whatever the distribution is for the lifetime of such bulbs.

5. A manufacturer of electronic calculators is interested in estimating the fraction of defective units produced. A random sample of 8000 calculators contains 18 defectives. Compute a 99% C.I. for the fraction defective.

6. A study is to be conducted of the percentage of homeowners who own at least two television sets. How large a sample is required if we wish to be 99% confident that the error in estimating this quantity is less than 0.01.

7. The wall thickness of 25 2-liter glass bottles was measured by a quanlity control engineer. The sample mean is 4.05 millimeter, sample standard deviation is 0.08 millimeter. Find a 95% confidence interval for the mean wall thickness. Interpret the interval that you obtain.