A sample of $N = 16$ people from a population with mean equal to 50 is given a treatment. After the treatment, we find a sample mean of $\overline{X} = 51$ with $SS = 296$.

- Compute a 95% confidence interval for μ, the population mean score of the treatment group.
- Perform a hypothesis test to determine whether the treatment results in a significant increase over the mean score for the general population.

Consider the following sample of scores: $6, 1, 4, 2, 3, 4, 6, 6$

- Compute a 95% confidence interval for μ, the mean of the population from which this sample was obtained.
- Perform a hypothesis test to determine whether $\mu > 3$.

The librarian at the local elementary school claims that, on average, the books in the library are more than 20 years old. To test this claim, a student takes a sample of $N = 30$ books and records the publication date for each. The sample produces an average age of $\overline{X} = 23.8$ years with $SS = 1957$.

- Compute a 95% confidence interval for μ, the population mean age of the books in the library.
- Perform a hypothesis test to determine whether the average age of the library books is significantly greater than 20 years old?

A sample of $N = 16$ individuals is selected from a population with mean 70 and given a treatment. After treatment, the sample mean is found to be $\overline{X} = 73.6$ with $SS = 960$. Let μ represent the population mean of the treatment group.

- Perform a hypothesis test to determine whether $\mu > 70$.
- Perform a hypothesis test to determine whether $\mu \neq 70$.