A treatment is given to $N = 25$ people, and the sample mean score for the treatment group was $\overline{X} = 48$, with $SS = 864$. Compute a 95% confidence interval for μ, the population mean score of the treatment group.

Belsky et al. (2001) reported on the effects of preschool childcare on the development of young children. One result suggests that children who spend more time away from their mothers are more likely to show behavioral problems in kindergarten. Using a standardized scale, the average rating of behavioral problems for kindergarten children is 35. A sample of $N = 16$ kindergarten children who had spent at least 20 hours per week in childcare during the previous year produced a mean score of $\overline{X} = 42.7$ with an estimated standard deviation of $\hat{\sigma} = 6.5$.

- Compute a 95% confidence interval for μ, the population mean score for children who have spent at least 20 hours per week away from their mothers.
- Can we conclude that children who spend at least 20 hours per week away from their mothers show significantly more behavioral problems than typical children?

Two groups of $N = 18$ are enrolled in an experimental trial. The first group (who receives an experimental drug) had a mean score of $\overline{X}_1 = 86.4$ with $SS_1 = 1550$. The second group (a control group who received a placebo) had a mean score of $\overline{X}_2 = 78.8$ with $SS_2 = 1204$. Compute a 95% confidence interval for $\mu_1 - \mu_2$, the population mean difference between the experimental and control groups.

In a study examining the weight of college football players, Mathews and Wagner (2008) found that offensive and defensive linemen typically exceed the at-risk criterion for body mass index (BMI). In the study, a samples of $N = 15$ offensive linemen had an average BMI of $\overline{X}_1 = 34.4$ with $SS_1 = 256$. A sample of $N = 14$ defensive linemen had an average BMI of $\overline{X}_2 = 31.9$ with $SS_2 = 220$.

- Compute a 95% confidence interval for $\mu_1 - \mu_2$, the population mean difference in weights between offensive and defensive linemen.
- Can we conclude that there is a significant difference in weight between offensive and defensive linemen?