Statistics 411/511
Homework 4
Due in Lab Monday and Tuesday, October 24 and 25

- **Homework Guidelines** Homework must be typed and stapled. Please see the syllabus for more guidelines.
- **Academic Integrity** You are encouraged to *discuss* the homework with other students, but what you turn in must be your own work in your own words. The syllabus contains more details and links to OSU's Student Conduct Code.

1. Problem 20, pages 107-8. The Sleuth3 packages is missing the data. You can find them in ex0318.csv. Feel free to submit your R code and output on this one. Please use comments

   ```
   > # This is a comment. It follows the "#"
   ```

   to direct the reader to the items requested, except in part (c), just give the test statistic T rather than the Z statistic.

2. Problem 21, page 108. Again, it's OK to submit commented R code and output for this one.

3. Problem 22, page 108. Assume the two populations are identical except for a shift δ. Find a (two-sided) 95% confidence interval for δ. Commented R code and output is fine here too.

4. Perform a one-sided Welch's t-test and obtain a two-sided 95% confidence interval using the same data. Report the t-statistic, approximate degrees of freedom, p-value, and confidence interval. Are the results noticeably different than with the rank-sum procedures?

5. For Darwin's data in problem 28, page 108 perform a sign test of the hypothesis that the population of differences in plant height is symmetric about 0. Don't give R code or output here. Instead, write a carefully-worded conclusion.