MAT453 - Assignment 2

Spring 2025

Assignment Due (by 11:59 P.M.): Friday, January 24

Directions: You may discuss the exercises with other students and with the instructor, but the work you turn in must be your own. You will need the to submit your R code and answers to the questions below in **one** word or pdf file.

Data: 44 elementary school students were randomly assigned to one of two methods of teaching reading comprehension. Their reading comprehension was tested before and after 6 weeks in a class. Each student's comprehension change (post minus pre) is given here:

Method: Basal 1, 1.5, -2.5, -2.5, -1, -5.5, -2.5, -4.5, 0, -1, -2, -1.5, -3.5, 1, -2, -0.5, -3.5, -3.5, -2.5, -3.5, -0.5, 0

Method: DRTA 2, -1, 0, 0.5, -1.5, -1, 2, 1.5, -0.5, -1.5, 0, -0.5, 2, -0.5, 1, 4.5, 2, -1.5, 2.5, 0.5, 1.5, 1

Exercises: (10 points total) Test whether the [average] reading comprehension change induced by the two methods is the same, using a two-sample t-test with a pooled variance estimate (i.e., assuming equal variances).

Report the following:

1. Null and alternative hypotheses (you may refer to parameters μ_{Basal} and μ_{DRTA}).
2. The "Distribution" plot of the two groups' values (including histograms and boxplots).
3. Report the p-value.
4. Conclusion in context of these data (not just "reject" or "fail to reject", but what can you conclude about the two methods' effects on reading comprehension?)