

University of Colorado
Department of Civil, Environmental and Architectural Engineering
CVEN 5454 Quantitative Methods

Homework #4

Due Dec 1st, 2025

Topics: Confidence Intervals, Hypothesis Testing. Chapters 8, 9, 10 and Chapters 3-6 of
Helsel online book

You can find the data for the problems in the Helsel and Hirsch book at

<https://www.sciencebase.gov/catalog/item/5bf30260e4b045bfcae0c205>

[The Helsel and Hirsch book problems below are from the version without R](#)

1. Problem 8-92 (also find a 95% CI on the variance of the coefficient of restitution)
2. Problem 8-88 (sample size)
3. Problem 8-94 (CI on proportions)
4. Problem 3.4 of Helsel and Hirsch book (confidence interval for mean and median)
Also compute the confidence interval for the 75th percentile
5. Problem 9-141 (Hypothesis test of mean of single sample)
6. Problem 9-147 (Hypothesis test of variance of single sample)
7. Problem 9-125 (Hypothesis test on proportion of single sample)
8. Problem 9-105 (Contingency Table)
9. Problem 10-76 (Hypothesis test on difference in variance)
10. Problem 10-77 (Hypothesis test on mean difference – paired test)
11. Problem 10-79 (Hypothesis test on proportion difference)
12. Problem 10-93 (Hypothesis test on mean difference with unequal variance)

Nonparametric Tests

13. Problem 6.1 of Helsel and Hirsch book
14. Problem 5.5 of Helsel and Hirsch book
15. Problem 6.3 of Helsel and Hirsch book
16. Using bootstrap (a) compute the confidence interval for mean and variance of the all India summer monsoon rainfall (in cm) and (b) test the difference in mean and variance of rainfall between pre-1980 and post-1980 periods. The data can be found at <http://civil.colorado.edu/~balajir/CVEN5454/HWs/aismr-1871-2016-rain.txt>