

BIOS 545 “Introduction to R programming” lab: Statistical simulation using R

This lab practices statistical simulation using R. There are mainly two tasks:

1. Run the provided script for simulation. This only requires copy-pasting, but you need to understand the meaning of each line and look at the output (tables, figures, results) carefully.
2. **This will be part of the homework.** Mimic the linear regression simulation, perform simulation to check the coverage rate of 95% confidence interval.

A **confidence interval** (CI) is a **random** interval estimated from the observed data. In theory, the probability of a 95% confidence interval covering the true parameter is 95%. Perform a simulation, under the same linear regression setting as the example in the class, to confirm that the 95% confidence interval for the slope has the correct coverage rate, e.g., 95% of the time the interval covers the true parameter.

Hint: after linear regression, use `confint` function to obtain the CI.