

Laboratory 6
Simulation techniques

Exercise 1

Suppose,

$$y_n = \alpha + \beta x_n + e_n.$$

Lets denote by $\theta = [\alpha, \beta, \sigma^2]'$ a vector of model parameters.

- Propose a MC experiment, which could be used to construct the 95% confidence intervals around the estimator of β , assuming that $\theta = [1, 0.5, 2]'$ and $e_n \sim N(0, \sigma^2)$. Use the sample of length $N = 50$.
- Propose a bootstrap counterpart approximation of the 95% confidence intervals, using the data seta dataLab6 (assuming that $\theta = [1, 0.5, 2]'$).
- Suppose, you don't know the exact parameter values of θ . Propose asemi-parametric bootstrap and MC algorithm to construct the confidence intervals. Do the results differ from the estimates computed in previous points?