Université catholique de Louvain
Institut de Statistique

LSTAT: 2150
Statistique non paramêtrique:
Méthodes de lissage

Project Number 30

Project on estimation of cdf vs. pdf

Task: Discuss non-parametric estimation of the cumulative distribution and the density function of an exponentially distributed random variable. For the density estimator, consider two different cases, the one of a second-order kernel and the one of a fourth-order kernel.

Perform a Monte Carlo simulation study on the IMSE of your estimators. By varying the sample size n (e.g. $n = 25, 50, 100, 500, 1000$) try to investigate the different rates of convergence of the IMSE of the three different estimators. What do you find, do your simulation results confirm the theoretical behaviour?

Hint: Use the "rule-of-thumb" (normal reference) bandwidth selection procedure for your pdf estimators.

Requirements: The front page should contain the name of the course, the title of the project, the name of the student, and the date. Be explicit in the description of your work. Explain all the steps. Do not write unneeded theory. Your work should be consistent. However, do not exceed 10 pages of main project description (additional figures, tables and code can be put into an annex if necessary). Provide numerical and/or graphical results when needed. Write appropriate description for the tables and figures and do not forget to use `legend()`. Provide your [R] code in the annex to the project with short comments.
Date of Submission: see announcement on the Moodle site.