



Statistical Computing

and

Simulation HW3

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Experiment with as many variance reduction techniques as you can think of to apply the problem of evaluating .



Hammersley and Handscomb (1964) used the integration of $

as a test problem of variance reduction techniques (which is about 0.4180233).

Achieve as large a variance reduction as you can. (They achieved 4 million.)



Let be independent exponential random variables each with mean 1,

and consider the quantity $\theta$ defined by .

Propose at least three simulation methods to estimate $\theta$ and compare their variances.



First, simulate 100 observations from and then use 3 density estimating methods to smooth the observations. You need to specify the parameters in the smoothing methods, and compare the results.



Let be 100 equally spaced points on and let with .

Apply at least 3 linear smoothers and compare the differences, with respect to mean squares error

(i.e., and variance) from 1,000 simulation runs.

* 附錄 (R code)

Github : <https://github.com/CaoCharles/Statistical-Computing-and-Simulation-HW3>

R Markdown :