Homework 1

Simulation and Performance Evaluation – University of Trento

DEADLINE: March 25, 2024

You can solve the following assignments using any programming language. As the first homework, this is mainly to "cut your teeth," expose possible issues and unveil misunderstandings, rather than to evaluate you on what you can or cannot do. To do so, it is important that you do the homework by yourself, without any help from AI tools.

Upload a **short** report on moodle where you describe your findings (no more than 2 pages).

Exercise 1

Use simulation to prove Chebyshev's inequality for a Poisson random variable of parameter $\lambda = 15$. What do you observe for $\lambda = 1$ instead?

Exercise 2

Use simulation to find the probability that a random variable uniformly distributed in the interval $[3, 5]$ is greater than a random variable uniformly distributed in the interval $[2, 4]$. What about the reverse?

(*Facultative:* Can you prove the simulation result is ok using theoretical arguments?)