- Report in maximum of 2 pages
- The total value of the assignment is 6 points
- You can write your answers either in Finnish, Swedish or English
- Deadline for this assignment is Thursday, March 22nd, 2018 at 16:00.
- Return your report via MyCourses

Assignment 3.1 – Common random numbers

Consider the simulation of a queueing system with m parallel servers. Customers arrive at exponentially distributed inter-arrival times with rate λ. The service rate of server i is μ_i. Each server has its own queue with FIFO discipline. An arriving customer will always select the server with least customers present. If ties exist, the customer selects the server randomly.

Simulate the system to estimate the expected difference in the average queueing delay of customers for the following cases:

1. λ=1, m=2, μ_1=0.6, μ_2=0.6
2. λ=1, m=2, μ_1=0.3, μ_2=0.9

Terminate the simulation in both designs, when 100 customers have left the system.

First, define the difference in queuing delays by performing 100 independent replications for the two designs. Then, apply common random numbers to see, whether you can improve the accuracy of your estimate without increasing the amount of simulation replications.