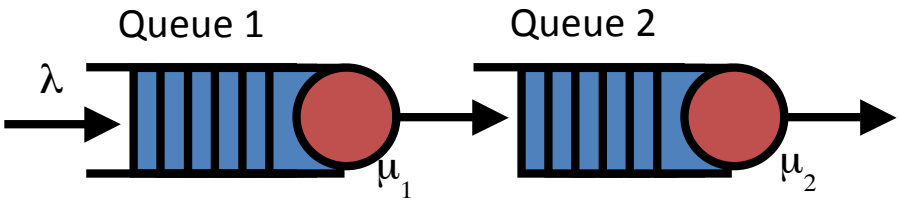
Network modeling – 2013-2014
Lab. 2: Performance of a queuing networks

In this lab activity, we practice on the simulator coding by considering relatively complex systems.
Starting from the simulator of single queues developed in the previous lab, we derive a simulator of a simple queuing network composed of two queues,



By plotting and analyzing the results, the student will observe and get familiar with some networking phenomena that are quite frequently encountered in real networks.

Task 1: Two M/M/1 queues

Consider two M/M/1 queues in sequence. Implement the simulator to derive the steady state behavior of the system.
Verify the product form solution.

Task 2: Effect of the service time distribution and first moment

- Consider the case of two queues with different service rate. Evaluate and compare the average buffer occupancy of the two queues when $\mu_1 > \mu_2$ and when $\mu_1 \leq \mu_2$.
- Consider the case of deterministic service times with $\mu_1 \leq \mu_2$, evaluate and compare the average buffer occupancy and the buffer occupancy distribution for the two queues.