

# DISI – UNIVERSITY OF TRENTO

Master in Computer Science AA 2014/2015

Simulation and Performance Evaluation

## Simulation of a simple queuing network

Configuration for Riccardo Fontanari

### Arrival Process

Customers arrive following a triangular distribution between 0 and 1 with negative slope. i.e., the arrival time of customers are i.i.d. RV that follows the law

$$f_T(t) = 2(1 - t); \quad 0 \leq t \leq 1$$

### Stations

QS1:  $-/M/1/5/FIFO$ ; the service time follows a Rayleigh distribution with  $\sigma = 0.2$ , i.e., the service times of customers are i.i.d. RV that follows the law

$$f_T(t) = \frac{t}{\sigma^2} e^{-\frac{t^2}{2\sigma^2}}; \quad t \geq 0; \quad \sigma = 0.2$$

QS2:  $-/G/2/20/FIFO$ ; the service time is uniformly distributed between 0 and 10.

QS3:  $-/M/\infty$ ; average service rate (per server)  $\mu = 0.1$ .

### Routing probabilities

$p_{i,j}$  is the probability that a customer services in queue  $i$  goes to queue  $j$ .

		j		
		1	2	3
i	1	0.0	1.0	0.0
	2	0.0	0.0	1.0
	3	0.1	0.0	0.0
		$p_{ij}$		