Lab. 8 - Stochastic Discrete Simulation

Do the exercises below in the Octave IDE. Make sure the files and the programs are in the same working directory.

1. Adapt Random Walk

Adapt the implementation of Random Walk simulation, presented in the slides of class 8, (available from the web page), so that the probability to step forward is **p_for** (for example, p = 80% , not 50% as in the slides). Use signature

```
function m = simulate_walk(max_stp, max_pos, p_for)
```

2. Study Random Walk

Use the implementation of the previous item to study the probability of reaching a certain forward position, max_pos, in a maximum number of steps, max_stp. Use signature

```
function m = probability_walk(max_stp, max_pos, p_for)
```

3. Complete the Queueing System

Complete the implementation of the queueing system with 1 server and no buffers, provided in the web page (cf. slides of class 8), namely the functions invoked by the simulation and transition functions.

Make unitary tests to the specified functions to be ascertained that they are correct.

4. Use the Queueing System

Study the behaviour of the system with arrival requests following an exponential distribution (assess the behaviour with different **mean** values), and a server timing following a uniform distribution between **lo** and **up** (again, assess the behaviour with different **lo** and **up** values).

Note: Make sure you simulate the system for a sufficient large time so as to obtain a good approximation of the stationary behaviour of the queue system.