**Simulation Project – 2nd Assignment**

*Please note that any exchange of code with another student is discouraged as it constitutes cheating*. *We will run Moss to verify that there has not been code sharing.*

**1. Project description**

Write a program to simulate the system described in the previous assignment. Use a high-level language of your choice. You can develop your program on your laptop, but you need to make sure that it runs on eos.

The main problem you need to address is that you have to setup a simple mechanism to compare the clocks each time and find the one with the smallest value. Then, according to the event occurring, you have to branch out to the appropriate part of your code to execute the related logic. You can use a linked list if you are familiar with tit. Otherwise, use an array to hold all the clocks. Make sure it is long enough, since the number of active events will vary.

You will also have to use a pseudo-random number generator, and sample variates from an exponential distribution with a given mean. Use the pseudo-random number generator provided in the programming language that you are using. Make sure you understand what is the required input and whether the output is in [0,1]. If not, you will have to normalize the output so that the resulting pseudo-number is in the range [0,1]. Do not use the computer’s clock as a seed for the pseudo-random number generator!!!

Setup a prompt system through which you can specify the inputs to the simulation. Currently, these inputs are:

* N: Number of packets that departed from the client queue. (It is used to control the length of the simulation.)
* DH: Time to transmit a packet from the server at high rate. This is assumed to be constant, since all packets are at maximum length.
* DL: Time to transmit a packet from the server at low rate. This is assumed to be constant, since all packets are at maximum length.
* 1/μd: Mean service time in the infinite server queue. The service time in the infinite server is assumed exponentially distributed.
* 1/μq: Mean service time in the client queue. The service time is assumed exponentially distributed.
* TL and TH: Low and high threshold level in the server queue.

Make sure that your clocks are defined as real variables. Run your simulation model for 30 departures. The starting conditions are the same as in the hand simulation. Each time an event occurs, print out a line of output as in the hand simulation. Check your output by hand to make sure that the simulation advances correctly from event to event.

For this assignment, use the following vales: N = 30, DH = 1, DL = 2, 1/μd = 10, 1/μq = 1.5, TL = TH = 3.

Save the output of your simulation in a text file and submit it along with your code.