Problem set-9

Queueing net

Please use the Qps9.m which is part of this problem set material.
The code is representing a closer simulation code for the queueing system in comparison to what we have so far used in our problem sets problems. Here the events are scheduled in relation to the system time and the server state which can be idle=empty or busy. Study the code carefully before you attempt to answer following questions.

Q1

A) What kind of system is simulated in Qps9.m; how do you argue about your answer?

B) Show the number of customers during the simulation measurement and calculate the average number of customers.

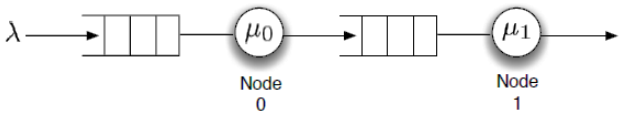
C) Show distribution of 'que length' during the simulation measurement as accurate as possible and calculate the longest que length of the system during this time.

D) Show distribution of 'spending time of each customer in the system' during the simulation as accurate as possible and calculate how much time at its max a customer can expect to be in the system.

E) What is the probability of events when there is no que in the system during simulation?

Q2

Now Assume we would like to simulate a new system according to the following figure.



You can use the code Qps9.m and modify it to be able to simulate the new system.

A) Compare the distribution of interval departure time of node 0 and node 1 as accurate as possible.

B) Compare the distribution of que length of node 0 and node 1 as accurate as possible.

C) Compare the distribution of 'spending time of each customer in the system' for node 0 and node 1 as accurate as possible.

D) Are the results from A-C as you expected from theoretical point of view? Comment it.