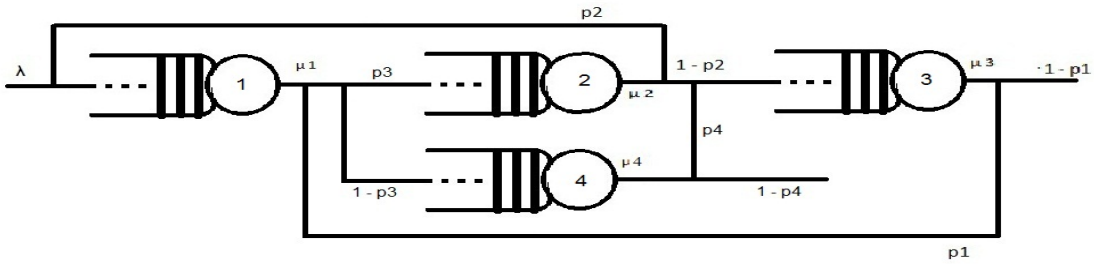
Example:

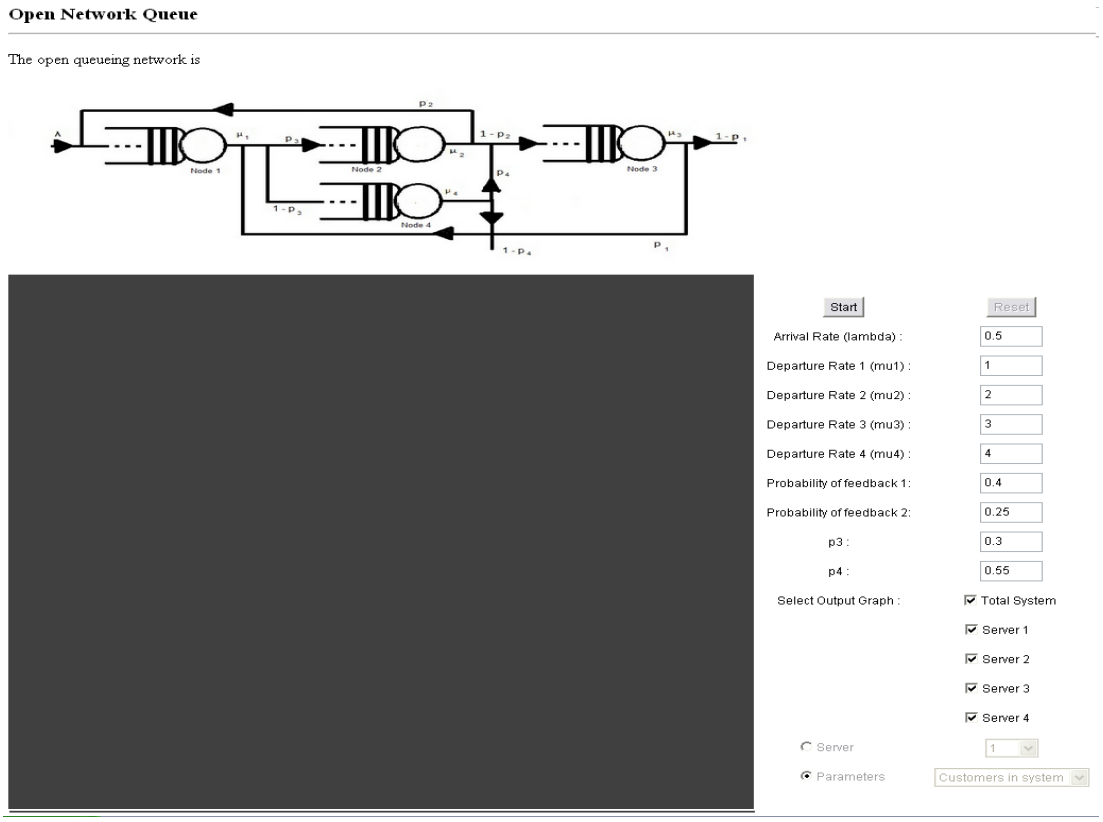
Consider a repair facility shared by a large number of machines, such that each machine has few stages of repair. The machines arrive at the repair facility at the rate of 0.5/hr. After completion at node 1, the machines are sent to node 2 (node 4) with probability 0.3 (0.7). The repair rate at node 2 is 2/hr. There is a possibility that the machine is not successfully repaired at node 2, the probability being 0.4. Hence the machine is sent back to node 1. With probability 0.6, the machine is successfully repaired and is sent to node 3 for the next stage of repair. Also, from node 4, if the machine is not completely repaired, then the machine is directed to node 3, with probability 0.55. After reaching node 3, if the repair is successfully completed, then with probability 0.75, the machines leave the repair system. Else, with probability 0.25, they are redirected to node 2. The repair rate at node i is i/hr, $i = 1, 2, 3, 4$. The capacity of the queue at each node is assumed to be infinite. Obtain the measures of effectiveness for such a system given that the system can be modeled as a tandem queue with feedback as shown in the diagram below:



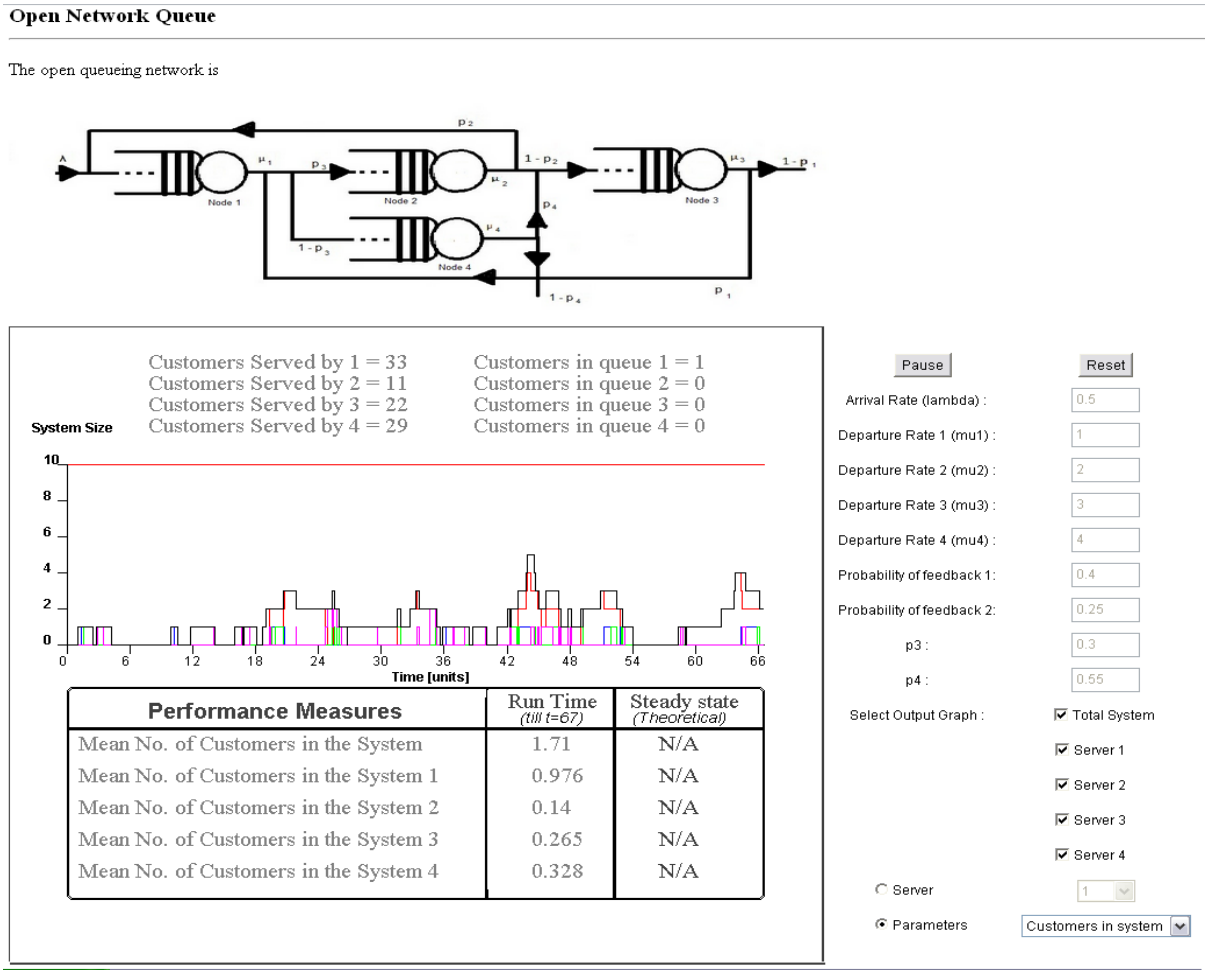
Solution:

The arrival rate of the customer is $\lambda = 0.5$ and the service rate at node i is i/hr. In order to obtain the measures of effectiveness, in steady state as well as via simulation, we follow the steps as shown below:

- Open the page where the experimentation is to be performed
- Feed the data as shown:



- Next, click on the **'Start'** button to obtain the desired measures of effectiveness



- In the simulator, we are able to see graphs of the number of customer at each node (since Server1, Server 2 and Server 3 are ticked on the right side of the window)
- We also see an option for **'Parameters'** from where we can choose the measure of effectiveness required.