CS348 Computer Networks
Lab Excercises 1

Indian Institute of Technology, Patna
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Instructions: You have to upload the code along with the output graphs for this assignment in a tar file using the lab submission website on or before 18.01.2018. The file name should be assign1.tgz.

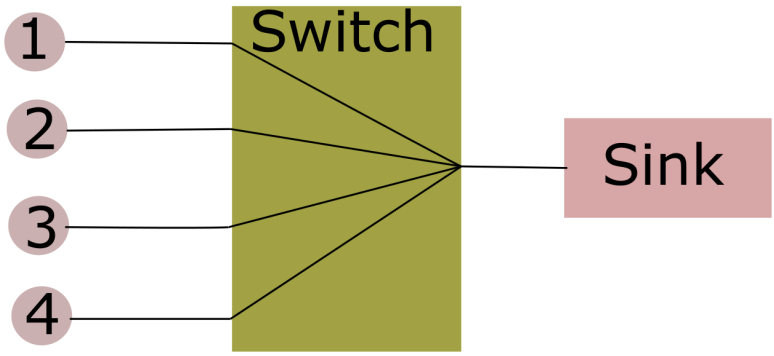

Figure 1: A switching network

Write a program to simulate the functioning of a switching network consisting of n number of sources (denoted by S in the figure 1) that are connected to a *Sink* through a switch. The number of sources can vary as desired by the user. You have to create the following objects:

1. **Source**: Every source must have an *id* that is automatically assigned. It must have a constant *packet sending rate*. Each source will be connected to the switch through a link that must have a given *bandwidth*.

2. **Switch**: The task of the switch is to service the arriving packets from the sources to the input ports and dispatch the same to the sink through a common output port. Although the link from the input port to the output port has infinite bandwidth but the link to the sink has a given finite *bandwidth*. The switch operates using packet switched technology. In packet switched mode, the switch uses a single *queue* at the output port. Packets arriving from the sources are inserted in the queue in order of their arrival and dispatched to the sink by dequeuing one at a time.

3. **Packets**: Each packet must have a source id and a time stamp when it is generated. The packets have same given size that is provided by the user.

You are free to create additional objects if you want. Assume that the queues are infinitely large and all components follow a common global time. The simulation will run for a fixed given duration of time.

You have to record the following as output:

1. The average delay of the sources with respect to the loadfactor

2. If the queue size is fixed, then the packet loss rate at the switch with respect to the laod factor