Programming Assignment 3 (due Nov 13)

Instructions:

- Due Date: WED Nov 13, 11.55 pm,
- To be done in groups of 4,
- The institute plagiarism policy applies,
- Grading will be done based on submitted material, plus face-to-face interaction with TAs,
- Programming language: Java, C, C++, or Python
- Platform: Linux OS
- Your submission must be a zipped file named after your roll number and name. For eg, EX3_2017***_name.zip. The zipped file will contain:
  - Source code
  - README.md that contains instructions to run your code.
  - A two page report with your analysis and explanation.

This programming assignment is to help you gain good understanding with data link layer protocols by implementing Protocol 5 (Go-back N protocol). This protocol was discussed in class. You will of course use the experience gained while implementing a simple application using the client server model as part of programming exercise 2. The client-server model allows a DL entity to send DL layer frames to the corresponding DL entity, and vice-versa.

In order for you to implement the GoBack-N protocol, you will:

1. Messages are generated and send by both device 1 (say the client) and device 2 (the server).
2. You decide whether you wish to assume that the network layer always has a packet to send, OR as discussed in the description of GoBack-N protocol in book/class.
3. Force frames to be dropped with probability P – you have to decide what that probability should be so that a few frames are indeed dropped, and are re-transmitted as necessary.
4. Introduce a certain delay EITHER at the transmitter end or at the receiver end (or both) so as to simulate queuing and propagation delay – what should that be, you decide. This is over and above the delay experienced by messages sent from client to server, or vice-versa.
5. (Suggestion) use a sequence numbering scheme that is modulo-8, with a transmit-window size of 7.
6. (suggestion) you decide whether you wish to use one timer, or one for every sequence number.
7. One question that you have to address is how is a time implemented with the set of time operations. A related question: how does one wait for “event” to occur – possibly keep check the actual clock.
8. Do you think you will need to synchronize the clocks at the client and server ends?

You are required to:

a. observe and record the times that correspond to time when a frame was first sent, and the time when the frame was first received at the other end,

b. average number of times a frame was sent.

c. Repeat the above for two significantly different values of drop probability and two different delay.

That is it

End of document