CSE 322: Computer Networks Sessional

Assignment 2

Implementation of Data Link Layer Functionalities

In this assignment, you will implement a data transmission system with the functionalities performed by data link layer. You have to use JAVA programming language only for the implementation.

Tasks

User login, management and file transfer will be as it was in assignment 1.

Framing

-Implement bit-stuffing. Note that each frame is delimited by the special bit pattern '01111110' (i.e., decimal 126). The goal of bit-stuffing is to ensure that this special bit sequence does not occur inside the frame. To see what happens without bit-stuffing, use the character '~' in the payload.
-Implement the function of the bitDestuff for bit de-stuffing.

Flow Control

-Acknowledgement management (Feedback based flow control)

Protocol

-Implement protocol Go-Back-N (A1/B1)

-Implement protocol Stop and Wait (A2/B2)

-Timer based retransmission
-Keep option for iIntroducing random lost frame (%)

Error Detection and correction

-Implementation of frame checksum calculation and checksum verification.
-Implement the function hasChecksumError for checksum verification at receiver

Checking

-Implementation of suitable Graphical User Interface (GUI). (Preferable)
-Show the frame to send, then show the frame after stuffing was performed, then show it after it arrived on the receiver side (possibly with errors); then show what the receiver does with the frame – discarding or de-stuffing it (correspondingly to

finding errors or not with checksum), sending acknowledgements, passing payload of frame; show timers and sequence numbers, etc.

The frame format might look like.

| kind of frame (Data/ack)| seqNo | ackNo | payload | checksum |

where, a. each of the fields: kind, seqNo, ackNo and checksum are of 1 byte

b. payload field is of variable size determined by the size of the 'packet' as given by the network layer.

SubmissionDeadline:

October 29, 2017 (Sunday, 10:00 PM)Deadline will not be extended at any request. Please start early.