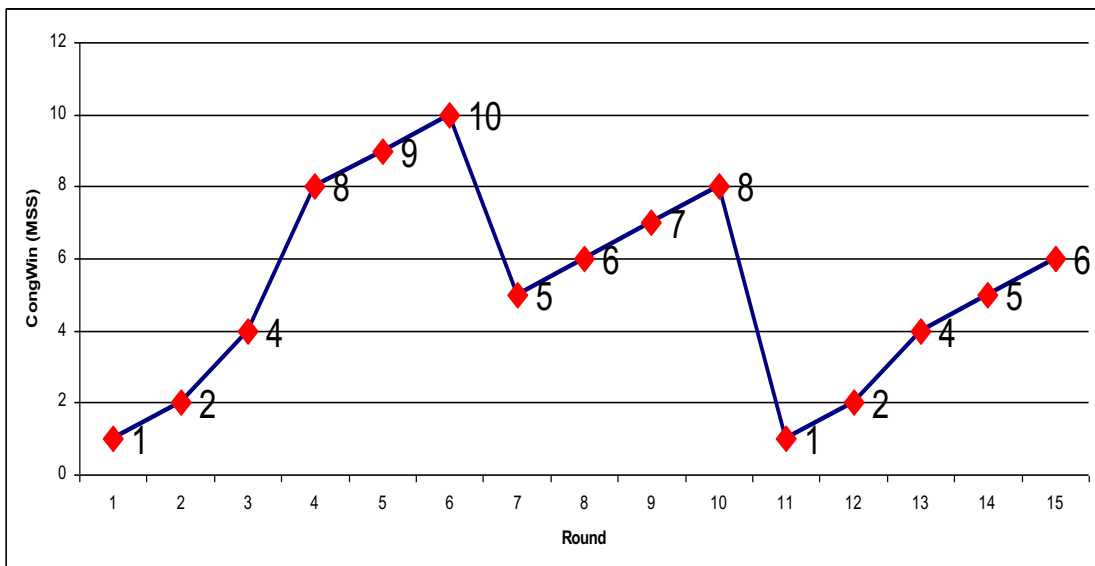


CSCI4211 – Spring 2019
Assignment #2
Due Date: March 25th

1. (10pt.)
Please describe the TCP closing sequence. Please also justify why these steps are required.
2. (10pt.)
Is it possible for an application to enjoy reliable data transfer even when the application runs over UDP? If so, how? Hint: Consider the reliable in-order delivering data in application layer. What do you need to include the application layer protocol?
3. (10pt.) Consider two hosts are linked by a 4Mbps (4×10^6) channel and RTT is 0.04 sec. Assume the size of each packet is 8000 bits. Answer the following questions for ARQ schemes:
 - a) Assume that the link is error-free, what is the possible maximum rate of transmission for Stop-and-wait, GBN, and SR, respectively? Why?
 - b) For GBN and SR, in order to allow sender to continuously send packets without any waiting, what is the minimum window size in terms of the number of packets?
 - c) For b), what should be the minimum number of bits for the sequence number for GBN and SR, respectively?
 - d) Suppose that we are continuously transmitting packets end-to-end start from the 3rd packet, and the 7th packet is lost. Assume there is no other packet lost or ACK lost. For stop-and-wait, GBN, and SR, which packets need to be retransmitted?
4. (10pt.)
 - (a) What happened during round 4, 6-7, 10-11, 13?
 - (b) Can you write down the CongWin & Threshold values at each round?



- 5 (10pt)
Can you complete the finite state machine of client for 3-way handshake as listed in Slide 21 of Transport Layer: Part I?