ECE 358, S'16 — Assignment 7

Total # Points = 13, Due: Tue, July 26, 11:59:59pm

Instructions Your submission must be typeset and in pdf.

1. (2 points) What is a meaningful correctness property for rdt 3.0 (Slide 34, Lecture 5) ? (Your property may comprise subproperties.)
2. (2 points) Does GBN, as described around Slides 43–44 of Lecture 5, deal correctly with reordered packets? Justify briefly. By 'reordered packets,' we mean that a packet x may be held up in the network. While a packet y that was sent at a later time by the sender arrives at the receiver. Followed later by the arrival at the receiver of packet x.
3. (2 points) Consider the 'dilemma' from which SR suffers, see Slide 50 of Lecture 5. Does GBN as described earlier in the slides suffer from the same issue? Justify briefly.
4. (2 points) In TCP:
   (a) Why do we avoid measuring the SampleRTT for retransmitted segments?
   (b) Why does Fast Retransmit wait for 3 ACKs of the same sequence number?
5. (2 points) Consider Slide 74 of Lecture 5, labelled "Transport Layer 3-79," with the title, "Agreeing to establish a connection." In what way does TCP's 3-way handshake mitigate the problems depicted on that slide.
6. (3 points) Ignoring the slow-start phase, the average throughput of a TCP connection whose cwnd ranges between $W/2$ and W is $T = \frac{0.75 \cdot W}{RTT}$. Show that $T \approx \frac{1.22 \cdot MSS}{RTT\sqrt{L}}$ for a loss rate L.