CMPT 371: Homework Assignment 2

1. Consider a channel that can somehow duplicate a packet (i.e., you send packet $x$, and another copy of $x$ can be generated without you knowing. This can happen to ACKs as well. Is this a problem? You can assume that we are using go-back-N with packet losses and bit errors possible.

2. What is the maximum size of a TCP packet? What is the maximum amount of data it can carry? How about UDP? Research.

3. Argue that if the sequence space is at least twice the size of the sender’s window in selective repeat, then the receiver can always tell if a packet is new or a retransmission.

4. Consider the TCP procedure for estimating RTT. Let $\alpha = 0.1$. Let $sampleRTT_1$ be the most recent sample RTT, $sampleRTT_2$ the next most recent, etc.

   Consider four acknowledgements giving $sampleRTT_1 \ldots sampleRTT_4$. Express estimated $RTT$ in terms of these four values. Then generalize this to $n$ sample RTTs. Finally, what happens as $n$ goes to infinity?