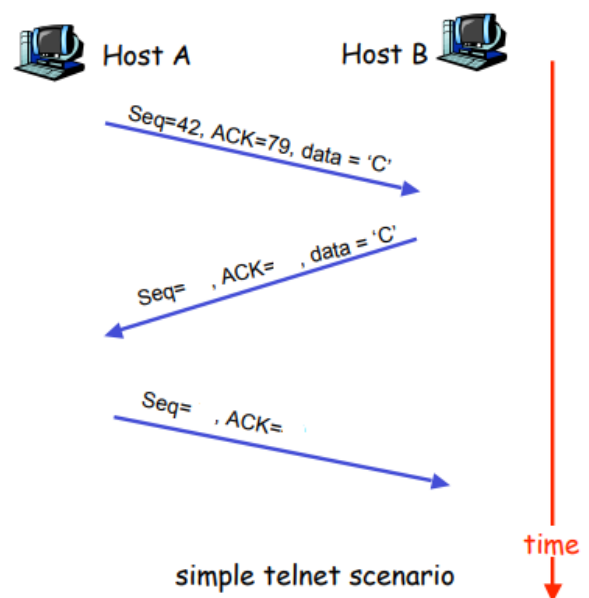
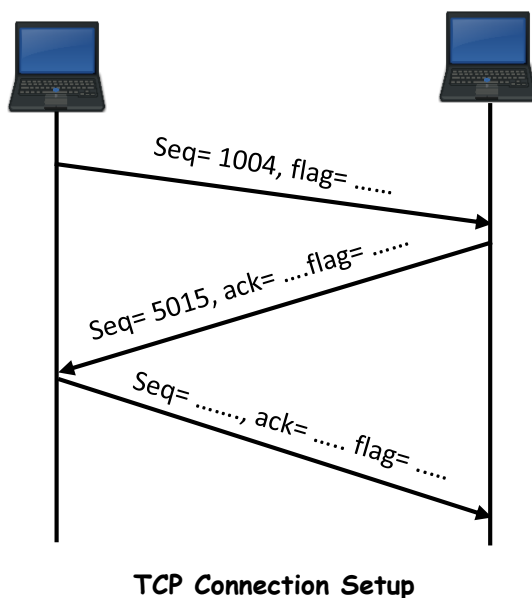


Assignment 3

Covered Topics:-
Transport Layer (TCP)

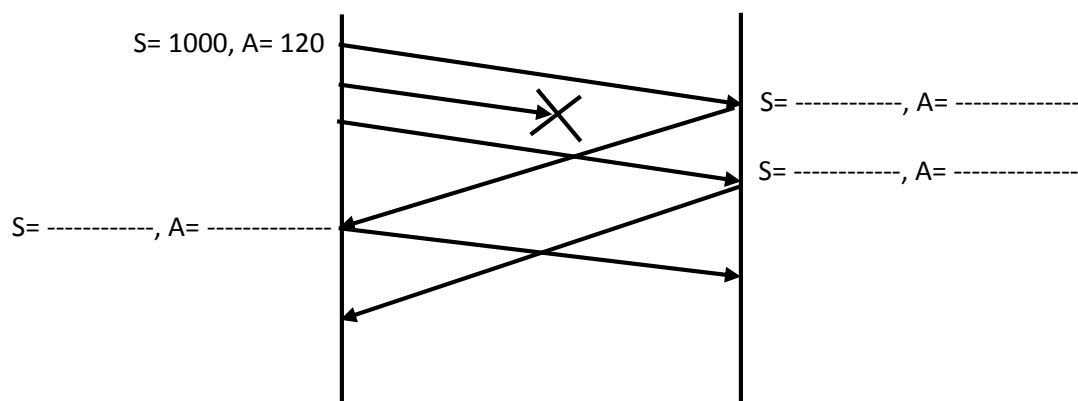
Problem 1

Fill in the missing sequence numbers and acknowledgement numbers, knowing that each character is 1 Byte long.



Problem 2

The following figure shows two hosts X and Y communicating over a channel using TCP. Hosts X and Y are sending data to each other. If each TCP segment contains 100 bytes of data and the 2nd segment sent by X is lost, complete the below figure by adding the missing sequence numbers and acknowledgment numbers



Problem 3

Consider the effect of using slow-start on a line with 20ms RTT and no congestion. The receiver window is 40 KB and the maximum segment size is 1 KB, the slow-start threshold is equal to 16 KB. How long does it take before the 1st full window can be sent?

Problem 4

Consider the graph below which shows the size of the TCP sender congestion control window as a function of time (transmission round) in an idealized timing scenario where the sender sends a window worth of packets and then receives ACKs (if any) at the end of the RTT.

- Why does the congestion window curve have one form from rounds 1 to 6, and then another form from rounds 6 through 16?
- What event occurs at $t=16$, given that the result of this event is the sender cutting its congestion control window in half.

- c) What event occurs at $t=23$, given that the result of this event is the sending cutting its congestion window to 1? How is this event different from that which happened at $t=16$?

