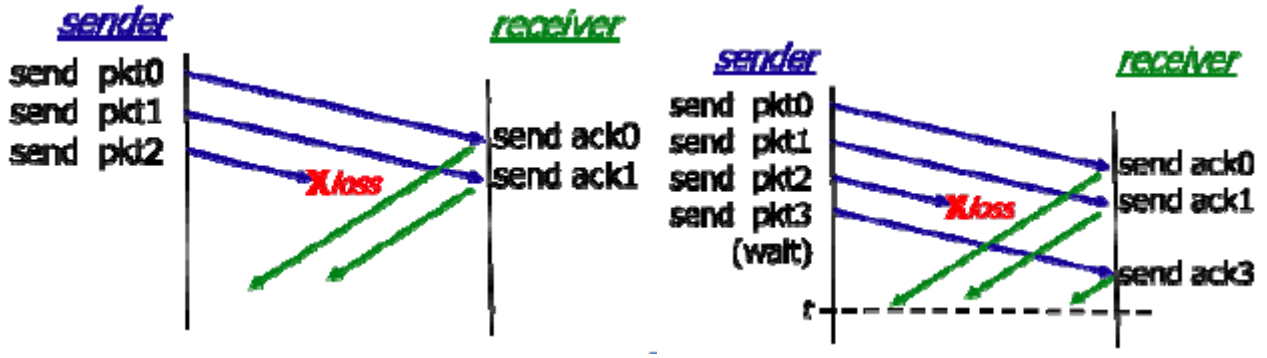
FAST- National University of Computer and Emerging Sciences, Karachi.
FAST School of Computing
Spring 2022, Quiz - II -- Solution

Course Code: CS3001	Course Name: Computer Networks
Instructor Name: Mr. Shoaib Raza	
Student Roll No:	Section:

Time Allowed: 30 Minutes. **Maximum Points: 30 points**

Question # 1: Consider the sliding window protocol in the following figures. Do these figures indicates that Go-Back-N is being used, Selective Repeat is being used, or there in not enough information to tell? Use left & right hand figure as reference in your answer.



Solution:
In left hand figure, there is not enough information to tell, since both GBN and SR will individually ACK each of the first two messages as they are received correctly.
In right hand figure, this must be the SR protocol since pkt 3 is acked even though pkt 2 was lost. GBN uses cumulative ACKs and so would not generate an ACK 3 if pkt 2 was missing.

Question 2: Suppose Host A sends two TCP segments back to back to Host B over a TCP connection. The first segment has sequence number 1001; the second has sequence number 2010.

a) How much data is in the first segment?
Solution:
1009 bytes of data would be sent.

b) Suppose that the first segment is lost but the second segment arrives at B. In the acknowledgment that Host B sends to Host A, what will be the acknowledgment number?
Answer:
The acknowledgement number will be 1001.

Question 3: TCP connection has currently estimated RTT of 25 ms with a deviation of 2.8 ms .What is the value of the retransmission timer after the next acknowledgement coming in after 30 ms?
Solution:

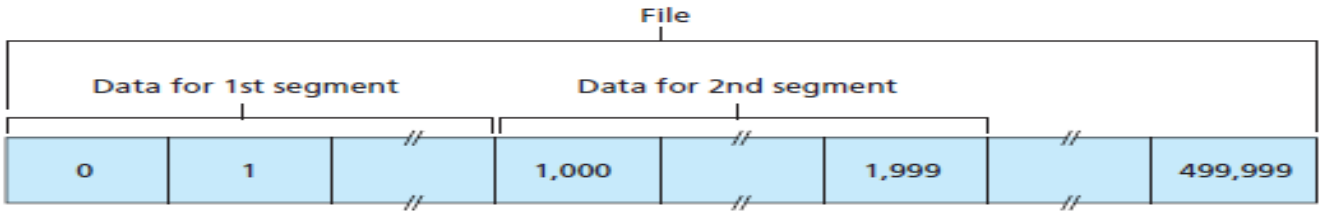
EstimatedRTT = (1-α) * EstimatedRTT + α * SampleRTT
= 0.875x25 ms + 0.125x30 ms = 25.625 ms

DevRTT = (1-β) * DevRTT + β*|SampleRTT-EstimatedRTT|
= 0.75 x 2.8 ms + 0.25 x |30 ms – 25.625 ms| = 3.19375 ms

RTO = EstimatedRTT + 4*DevRTT
= 25.625 ms + 4x3.19375 ms = 38.4 ms

Question 4: Does UDP require a mechanism to estimate the RTT between sender and receiver? Explain your answer?
Solution:
No, UDP does not perform retransmissions and, thus, does not require an RTT-based timeout timer.

Question 5: Figure below shows how Data file is divided into TCP segments. What will the sequence number of the first 5 TCP segments?

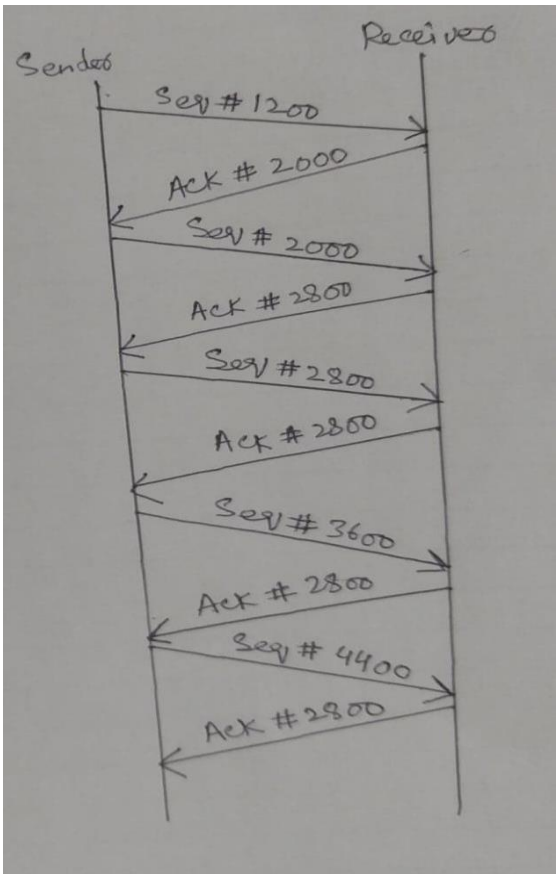


Solution:

Sequence#1: 0, Sequence#2: 1000, Sequence#3: 2000, Sequence#4: 3000, Sequence#5: 4000.

Question 6: Assume a TCP sender transmits 5 TCP segments with respective sequence numbers 1200, 2000, 2800, 3600, 4400. The sender receives five acknowledgements with the following sequence numbers, 2000, 2800, 2800, 2800, 2800.Draw the diagram to show what TCP segments are exchanged between sender and receiver.

Solution:



BEST OF LUCK!