**ISE 316 Homework #3**

**Introduction to Networking**

**Spring 2023**

**Computer Science Department**

**Stony Brook University**

**Rubrics: 30 pts**

**Questions:**

1. (6 pts) Host A and host B alternate between sending messages to each other over a TCP connection. All of host A’s messages (which we’ll call A1, A2, . . . ) are 30 bytes long; all of host B’s messages (which we’ll call B1,B2, . . . ) are 20 bytes long. Each host includes a new message along with the ACK for the previously received message.

Diagram

Description automatically generated

A1 has a sequence number of 5 and B1 has a sequence number of 20. What are the values of the sequence number and acknowledgement number fields of the TCP segments for the first 6 segments in the exchange? (Assume the first segment’s ACK field is 0.)

1. (6 pts) Consider the sliding window protocol in the Figure below.
2. Does this figure indicate that GBN is being used, SR or there is not enough information to decide? Explain.

Diagram

Description automatically generated

1. Consider the sliding window protocol in the Figure below. Does this figure indicate that GBN is being used, SR or there is not enough information to decide? Explain.

Chart, diagram, line chart

Description automatically generated

1. (6 pts) Let’s assume that two hosts A and B have established a TCP connection. The current sequence number for A is 100, while that of B is 600. A sends a 100-byte segment to B. After receiving acknowledgment of that segment, A sends a second 100-byte segment, which B host echoes back. Assuming no segments are lost, corrupted, or unreasonably delayed. Draw a diagram of the segments exchanged, label in each with sequence number, ack number and data length.
2. (4 pts) Assume that the RTT is always the same between a sender and a receiver. Also, suppose that the sender knows this RTT. Would a timeout timer still be needed in a rdt protocol assuming that packets may get lost? Explain your answer.
3. (8 pts) Assume that we are using TCP protocol. Suppose that host A has 10 packets to send to B, each of 100 Bytes. Suppose that A sends a segment the first segment with sequence # 100 and received the ACK back from B. Next A sends all 9 packets. Sometime later, it receives ACKs with sequence numbers 400, 400, 600, 600, 600, 600, 600 Draw the diagram representing the above behavior. What will the next sequence # that A will send? What would you expect the next ACK number send by B?