

## Computer Networking

### Homework#3

1. Suppose that a Web server runs in host C on port 80. Suppose this Web server uses persistent connections, and is currently receiving requests from two different hosts, A and B. Are all of the requests being sent through the same socket at host C? If they are being passed through different sockets, do both of the sockets have port 80? Discuss and explain.
2. Suppose Host A sends two TCP segments back to back to Host B over a TCP connection. The first segment has sequence number 90; the second has sequence number 110.
  - a. 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?
  - b. How much data is in the first segment?
3. Consider the GBN protocol with a sender window size of 3 (packets) and a sequence number range of 1,024. Suppose that at time  $t$ , the next in-order packet that the receiver is expecting has a sequence number of  $k$ . Assume that the medium does not reorder messages. Then, what are the possible sets of sequence numbers inside the sender's window at time  $t$ ? Justify your answer.
4. Host A and B are directly connected with a 200 Mbps link. There is one TCP connection between the two hosts, and Host A is sending to Host B an enormous file over this connection. Host A can send application data into the link at 100 Mbps but Host B can read out of its TCP receive buffer at a maximum rate of 50 Mbps. Describe the effect of TCP flow control.
5. For TCP's estimation of RTT. Why do you think TCP avoids measuring the **SampleRTT** for retransmitted segments?