Solutions to Assignment 3 Questions

1) Problem R8, R7 and R11, Chapter 3

a) Yes. The application developer can put reliable data transfer into the application layer protocol. This would require a significant amount of work and debugging, however.

b) Yes, both segments will be directed to the same socket. For each received segment, at the socket interface, the operating system will provide the process with the IP addresses to determine the origins of the individual segments.

c) Sequence numbers are required for a receiver to find out whether an arriving packet contains new data or is a retransmission.

2) Problem R14, Chapter 3

a) false

b) true

c) false

d) true

e) false

f) false

g) false

3) Problem R16, R15 and R17, Chapter 3

a) 20 bytes

b) 90

c) 3

d) False, it is set to half of the current value of the congestion window

4) Problem P8, Chapter 3

No, the receiver cannot be absolutely certain that no bit errors have occurred. This is because of the manner in which the checksum for the packet is calculated. If the corresponding bits (that would be added together) of two 16-bit words in the packet were 0 and 1 then even if these get flipped to 1 and 0 respectively, the sum still remains the same. Hence, the 1s complement the receiver calculates will also be the same. This means the checksum will verify even if there was transmission error.

5) Problem P23, Chapter 3

a) In the second segment from Host A to B, the sequence number is 409, source port number is 1028 and destination port number is 80

b) If the first segment arrives before the second, in the acknowledgement of the first arriving segment, the acknowledgement number is 409, the source port number is 80 and the destination port number is 1028

c) If the second segment arrives before the first segment, in the acknowledgement of the first arriving segment, the acknowledgement number is 359, indicating that it is still waiting for bytes 359 and onwards