

**ECE 465/565 Computer Networks and Protocols  
Fall 05**

Dr. Thinh Nguyen

**Homework 2  
Due 11/01/05 at the beginning of the class**

1. Problem 11 from the problem section of chapter 3 from the text book (2 pts)
2. Problem 12 from the problem section of chapter 3 from the text book (2 pts)
3. Problem 18 from the problem section of chapter 3 from the text book (2 pts)
4. Problem 31 from the problem section of chapter 3 from the text book (2 pts)

**Programming Assignment (4pts)**

In this programming assignment, you are asked to implement a simple reliable data transfer protocol at the SENDER, similar to rdt 3.0 in the book. Rather than using unreliable UDP, you are asked to use TCP. Although TCP is a reliable protocol, we simulate the packet loss at the receiver. Your assignment is to write the sender's protocol to retransmit the lost packets appropriately.

The receiver's IP and port are flip.cs.orst.edu and 6789.

Here are the specifications for the sender protocol.

1. The sender sends 10 consecutive packets with the sequence number from 0 to 9. The format of the packets are shown below.
2. The sender sends only one packet at a time and waits for an ACK/NACK from the receiver. The format of an ACK is "1\n" while the format of a NACK is "0\n". If the sender receives an ACK, it immediately sends the next packet. If the sender receives a NACK, the sender immediately retransmits the corrupted packet.
3. If the sender does not receive any ACK/NACK from the receiver for more than one second, the sender retransmits the last packet and waits again. Note that this scenario simulates packet loss.

4. The process continues until all 10 packets are successfully sent.
5. Terminate the connection.

Here are the formats of the data packets.

Data packet includes a sequence number, immediately followed by an end of line. For example, "0\n", "1\n", "2\n" are the valid format for packets 0, 1, and 2.

**Bonus question.** (1pt)

Can you accurately calculate the packet loss rate and packet corrupt rate? (Hint: sending only a few packets is not enough.)