CS 2200 Homework 10

Fall 2018

Rules:

- Please print a copy of the assignment and hand write your answers. No electronic submissions are allowed. **Please print as one double-sided page. Do NOT staple multiple sheets together.** There will be a **100** point penalty if you do not.
- This is an individual assignment. You may discuss concepts but not the answers.
- Due Date: **November 14th – 6:00 PM**. Bring your BuzzCard. Show up on time.

Name:_____ **GT Username:**_____ **Section:**_____

Problem 1:

A. Mark each statement as applying to **TCP**, **UDP**, or **BOTH**

a) _____ Connection oriented
b) _____ Transport layer protocol
c) _____ Sends acknowledgements
d) _____ Unreliable delivery
e) _____ Detects errors
f) _____ Preserves order of packets
g) _____ Sends a header along with data

B. Assume that packets have a header that is 36 bytes long and a payload of 64 bytes. If you wish to send a message that is 2048 bytes long, how many packets will be required? How many bytes in total will need to be sent?

Problem 2:

A. A computer needs to send 3000 packets, each with size 128 bytes, across a reliable connection using the stop-and-wait protocol. If the round trip time is 2μs and 1 in every 5 packets is lost, how long will it take to successfully transmit all of the packets?

B. How many bytes does the sender transmit in total?

C. The connection is modified to reduce the round trip time to 1.5μs, but now 1 in every 4 packets is lost. With this modification, how long will it take to successfully transmit every packet? Is this a beneficial change?

Problem 3:

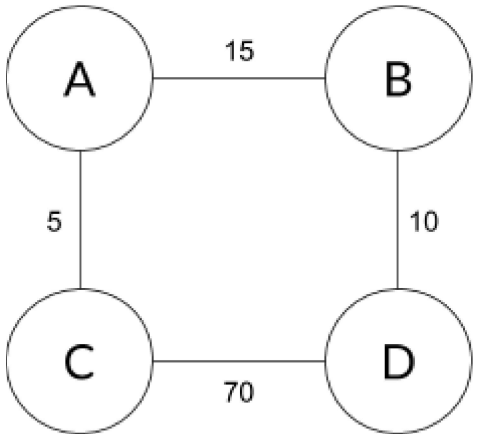
Consider the a connection with the following parameters:

Wire Bandwidth	64 Mbps (64 x 10^6 bits per second), full-duplex
Time of Flight	90 ms (90 x 10^-3 seconds)
Send Overhead	500 µs (500 x 10^-6 seconds)
Receiver Overhead	500 µs (500 x 10^-6 seconds)

We are sending a **3200 byte** message (this size includes the header and the data).
What is the observed throughput?

Problem 4:

Consider the network shown below. There are four routers, A, B, C, and D. The lines indicate links between the routers, with the numbers representing the link's associated cost.



The table below shows the initial state of the distance vector algorithm. Run the distance-vector algorithm until the all costs converge, and show the final costs to each node in the table below (scratch out and write the new costs):

Node	Distance to Node			
	A	B	C	D
A	0	15	5	∞
B	15	0	∞	10
C	5	∞	0	70
D	∞	10	70	0