

CS335 Winter 2020 Computer Networks

Assignment one (Due on September 25, 2020)

NOTE: *All assignments are to be submitted to URCourses. Please note that the due time of each assignment is at 10:00 pm (URCourses time) on the due date. Please make sure to “save the changes” after uploading your files. You must delete the uploaded file if you want to upload a new version. All uploaded files will be submitted automatically after the deadline and your update time is your submission time. You will be unable to change your files after deadline.*

You may see partial markings from URCourses. Please do not complaint the marking until the announcement of completion marking. You should inform me any errors within 7 days of the announcement. Any request made after that will not be considered.

1. Read Chapters 1-2 and answer review questions. (0 point)
2. (P2 on page 70) Equation 1.1 (page 24) gives a formula for the end-to-end delay of sending one packet of length L over N links of transmission rate R . Generalize this formula for sending P such packets back-to-back over the N links. (10 points)
3. (P5 on page 71). Review the car-caravan analogy in Section 1.4. Assume a propagation speed of 100 km/hour.
 - a) Suppose the caravan travels 150 km, beginning in front of one tollbooth, passing through a second tollbooth, and finishing just after a third tollbooth. What is the end-to-end delay?
 - b) Repeat (a), now assuming that there are eight cars in the caravan instead of ten. (10 points)
4. (P20 on page 74) Consider the throughput example corresponding to Figure 1.20(b) (Page 46). Now suppose that there are M client-server pairs rather than 10. Denote R_s , and R_c , and R for the rates of the server links, client links, and network link. Assume all other links have abundant capacity and that there is no other traffic in the network besides the traffic generated by the M client-server pairs. Derive a general expression for throughput in terms of R_s , R_c , R and M . (10 points)
5. (P28 on page 69) Suppose Alice and Bob are sending packets to each other over a computer network. Suppose Trudy positions herself in the network so that she can capture all the packets sent by Alice and send whatever she wants to Bob, she can also capture all the packets sent by Bob and send whatever she wants to Alice. List some of the malicious things Trudy can do from this position. (5 points)
6. Create some review questions in the format of multiple choice, true or false, concept matching, filling blanks, etc. that are suitable for quizzes. (option, bonus up to 5 points)
7. Practise with Wireshark labs (0 point)