TELCOM 2310 Fall 2022
HW 6: Chapter 4

Due Sunday Nov 13, 2022. Please show your steps/reasoning (otherwise we cannot assign partial credit).

You may use your textbook and notes to complete this assignment, and may discuss *concepts* with other students or use online resources that help you better understand the concepts involved. **You are NOT permitted look at other students' solutions, or online solutions to substantially similar problems. Similarly, you are not permitted to share your solutions with other students, or post your solutions online. Ask the TA/instructor if you have any questions about this policy.**

1. Recall our discussion of IP addresses and subnets from Lecture 9.

   (a) Consider a subnet with prefix 128.119.40.192/26. Give one IP address (of the form xxx.xxx.xxx.xxx) that can be assigned to a device in this network

   (b) Suppose an ISP owns the block of addresses of the form 128.119.40.192/26. Suppose it wants to create four subnets from this block, with each block having the same number of IP addresses. What should the prefixes (of form a.b.c.d/x) for the four subnets be?

2. Problem P6 on page 369 from the textbook. Consider Fig. 1.

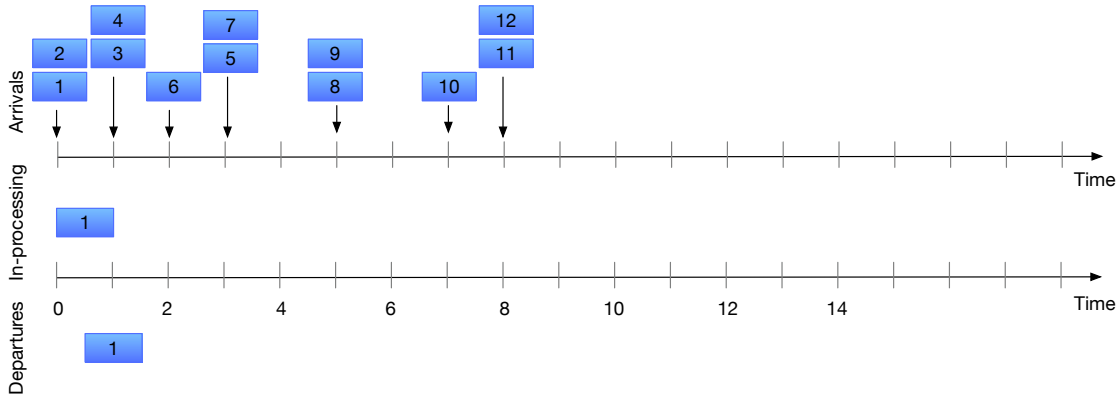

Figure 1: Packet arrivals, processing and departures - shown only for the first packet

   (a) Assuming FIFO service, indicate the time at which packets 2 through 12 each leave the queue. For each packet, what is the delay between its arrival and the beginning of the slot where it departs? What is the average of this delay?

   (b) Now assume a priority service and that odd numbered packets are of higher priority than even numbered packets. Indicate the time at which packets 2 through 12 each leave the queue. For each packet, what is the delay between its arrival and the beginning of the slot where it departs? What is the average of this delay?

(c) Now assume round-robin service where packets 1,2,3,6,11,12 are from Class 1 and 4,5,7,8,9,10 are from class 2. Indicate the time at which packets 2 through 12 each leave the queue. For each packet, what is the delay between its arrival and the beginning of the slot where it departs? What is the average of this delay?

(d) Finally assume WFQ. Let odd-numbered packets be from Class 1 with weight 2 and even-numbered packets be from Class 2 with weight 1. It may not be possible to achieve perfect weighting, so clearly state why you picked a packet to go into service. For each packet, what is the delay between its arrival and the beginning of the slot where it departs? What is the average of this delay?

(e) Compare the average delays in all of the 4 cases and comment.