Mokhtari (9831143) – Computer Networks 2 - HW 07

P5 from Chapter **4** of Kurose & Ross's Computer Networking, A Top-Down Approach, **8**th edition:

a) We presum that the weights of the three classes are 0.5, 0.25, and 0.25, respectively.

   If two or more classes have the same weight, give the highest priority to the first choice class.

   The three classes were served in the following order: 1 2 1 3 1 2 1 3....

   Another possible order for the three classes is: 1 1 2 1 1 3 1 1 2 1...

b) Consider the scenario where the buffer only contains a small number of packets from classes 1 and 2, but none from class 3.

   To obtain the WFQ weights, the following order might be used to serve the three classes: 1 1 2 1 1 2 1 1 2...

   For the three classes to receive the WFQ weights, another sequential sequence might be used: 1 1 3 1 1 3 1 1...

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P6 from Chapter **4** of Kurose & Ross's Computer Networking, A Top-Down Approach, **8**th edition:

a) The table below describes the time elapsed between packet arrival and the start of the slot in which it is transmitted:

Packet	Arrival time	Leaving time	Delay Time (= leaving time-arrival time)
1	0	0	0
2	0	1	1
3	1	2	1
4	1	3	2
5	3	5	2
6	2	4	2
7	3	6	3
8	5	7	2
9	5	8	3
10	7	9	2
11	8	10	2
12	8	11	3

The average delay across all packets is $\frac{0+1+1+2+2+2+3+2+3+2+2+3}{12} = 1.9166$

b) The table below describes the time elapsed between packet arrival and the start of the slot in which it is transmitted:

Packet	Arrival time	Leaving time	Delay Time (= leaving time-arrival time)
1	0	0	0
2	0	2	2
3	1	1	0
4	1	6	5
5	3	4	1
6	2	7	5
7	3	3	0
8	5	9	4
9	5	5	0
10	7	10	3
11	8	8	0
12	8	11	3

The average delay across all packets is $\frac{0+2+0+5+1+5+0+4+0+3+0+3}{12} = 1.9166$

c) The table below describes the time elapsed between packet arrival and the start of the slot in which it is transmitted:

Packet	Arrival time	Leaving time	Delay Time (= leaving time-arrival time)
1	0	0	0
2	0	2	2
3	1	4	3
4	1	1	0
5	3	3	0
6	2	6	4
7	3	5	2
8	5	7	2
9	5	9	4
10	7	11	4
11	8	8	0
12	8	10	2

The average delay across all packets is $\frac{0+2+3+0+0+4+2+2+4+4+0+2}{12} = 1.9166$

d) The table below describes the time elapsed between packet arrival and the start of the slot in which it is transmitted:

Packet	Arrival time	Leaving time	Delay Time (= leaving time-arrival time)
1	0	0	0
2	0	2	2
3	1	1	0
4	1	5	4
5	3	3	0
6	2	7	5
7	3	4	1
8	5	9	4
9	5	6	1
10	7	10	3
11	8	8	0
12	8	11	3

The average delay across all packets is $\frac{0+2+0+4+0+5+1+4+1+3+0+3}{12} = 1.9166$

e) The average delay time is the same in all cases, but the packet value delays differ for FIFO, RR, priority, and WFQ.