Homework6----Xiaoyu Xia
xix90@pitt.edu

1.

(a)

A subnet with pre x 128.119.40.192/26 means 32-26=6 bits to use → $2^6=64$ addresses.
In practice, I get 64-2=62 addresses that can be assigned to hosts (all 0s and all 1s cases are special).
So, in the range of 128.119.40.193----128.119.40.254, we can assign 128.119.40.222 to a device in this network.

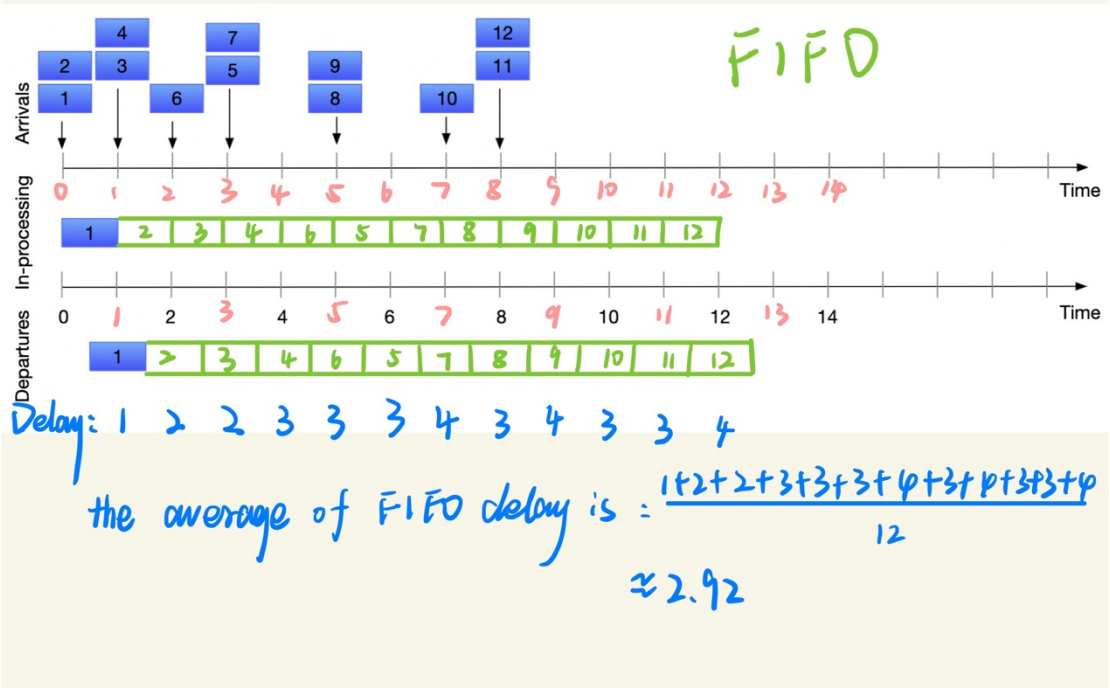
(b)

We want to create four subnets from this block, so we need 2 bits for that. So the prefix should be a.b.c.d/28 (because 26+2=28). For each subnet, it can include $2^4=16$ hosts.

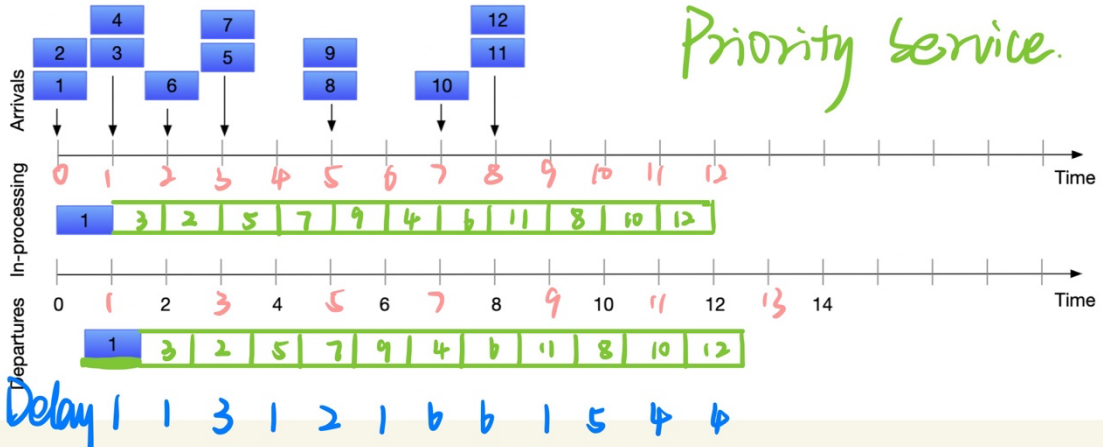
1. *128.119.40.192/28*
2. *128.119.40.208/28*
3. *128.119.40.224/28*
4. *128.119.40.240/28*

2.

(a)FIFO service:



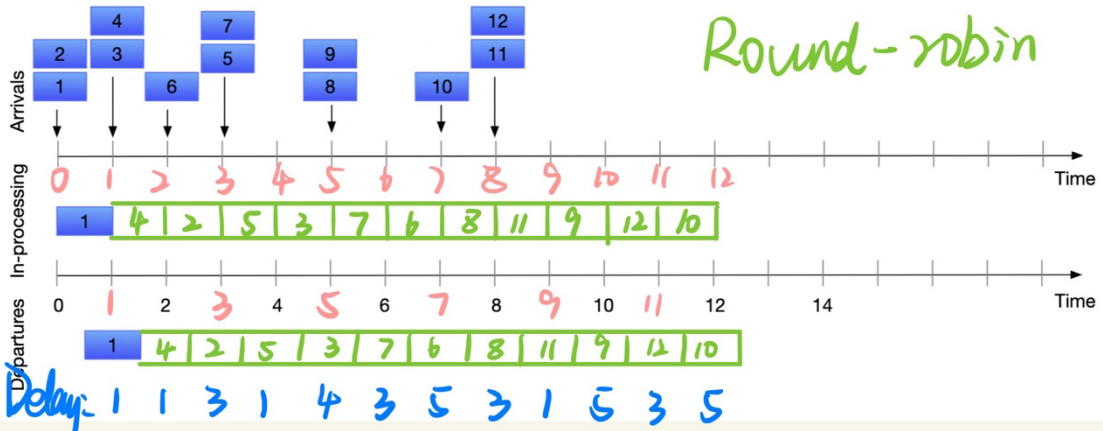
(b)priority service:



the average of Priority Service delay is:

$$2.92 \approx \frac{1+1+3+1+2+1+6+6+1+5+4+4}{12}$$

(c)round-robin service:

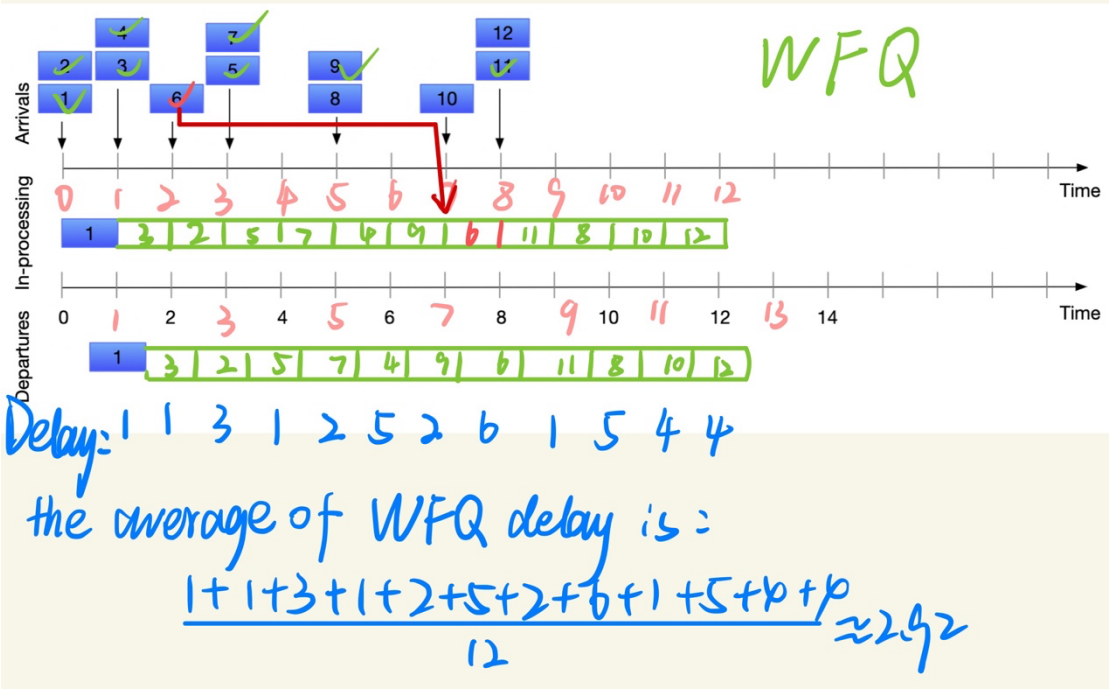


the average of round-robin delay is:

$$\frac{1+1+3+1+4+3+5+3+1+5+3+5}{12} = \frac{35}{12} \approx 2.92$$

(d)WFQ:

In this situation, the position of packet 6, it's supposed to be packet 11(but it hasn't arrived which means the queue for class 1 is empty), so for the next processing we should choose it from class 2. At that time, the first packet in class2 is packet 6, so we pick packet 6 to go into service.



(e)comparison:

As we can see, the average delay for all these four services is the same.

FIFO does not classify messages; FIFO lets messages enter the queue in the order they arrive at the interface, and lets messages exit the queue in the order they entered, with first-in messages going out first and last-in messages going out second.

P (Priority) scheduling is the scheduling of queues in order of priority.

RR scheduling uses polling for multiple queues. RR polls multiple queues in a circular fashion. If the polled queue is not empty, a message is fetched from that queue; if the queue is empty, the queue is skipped directly, and the scheduler does not wait.

Advantages of WFQ.

1 Different queues get a fair chance of scheduling, which balances the delay of each flow in general.

2、Short and long messages get fair scheduling: If multiple long and short messages are waiting to be sent simultaneously between different queues, let the short messages get priority scheduling, thus reducing the inter-message jitter of each stream in general.

3. Statistically speaking, the smaller the weight, the less bandwidth is allocated. The larger the weight, the more bandwidth is allocated.