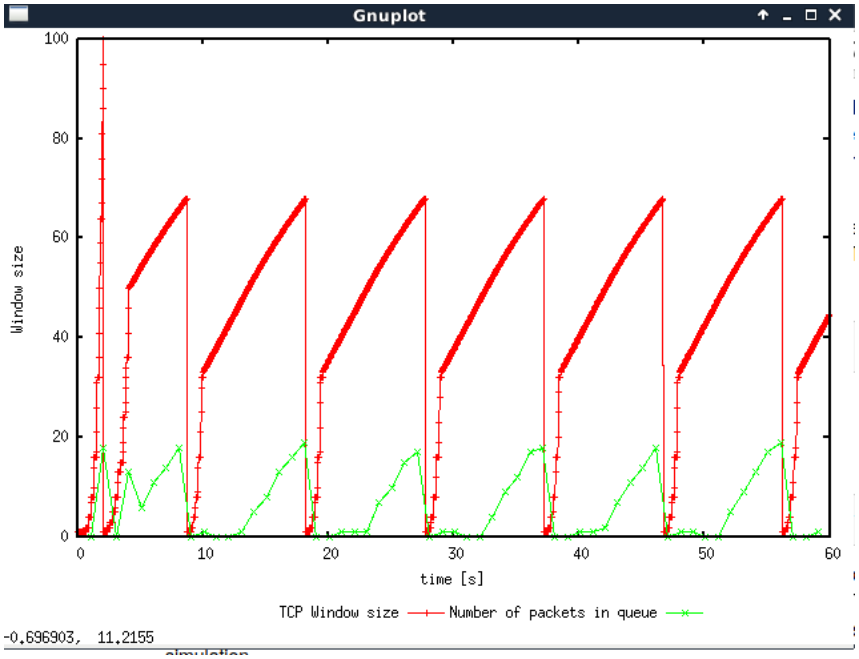
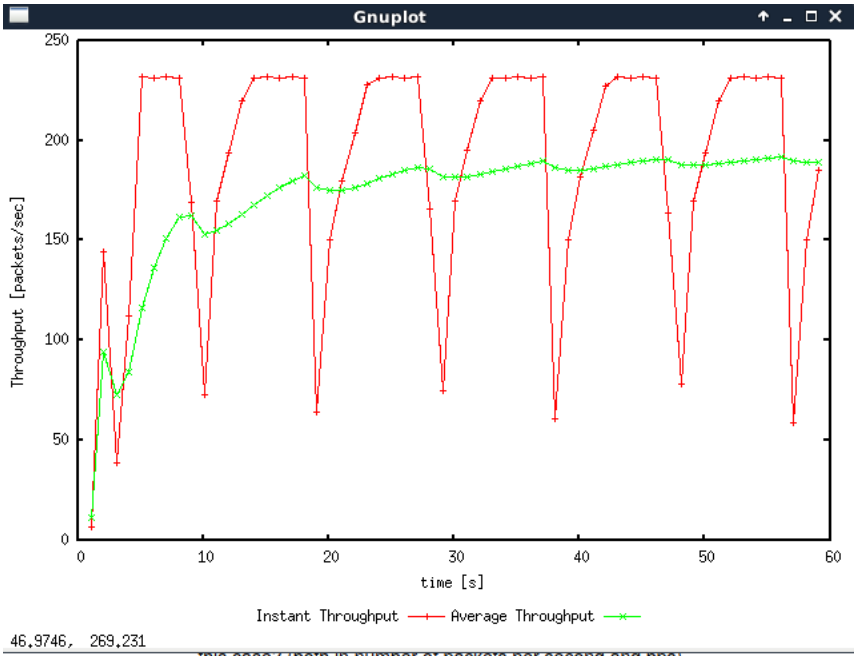
Lab5 Nian Li comp3331
Exercise 1
Question 1:
The maximum size of congestion window reached is 100. When the congestion window reach this value, the packets that are queued up get dropped from the queue because the queue is full and a lost event happens. And the congestion window will be reset to 1 and the threshold will also be reset. And the window size will increase again until the maximum value.

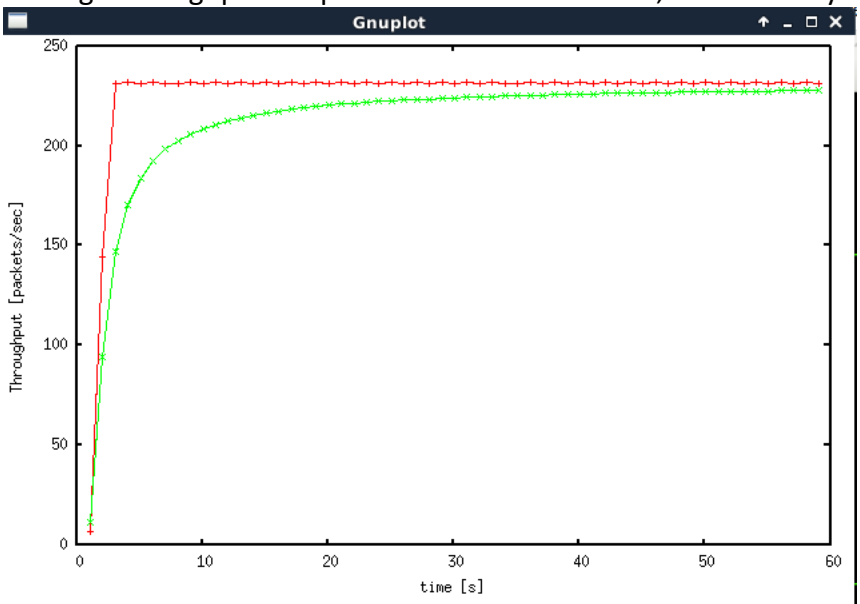


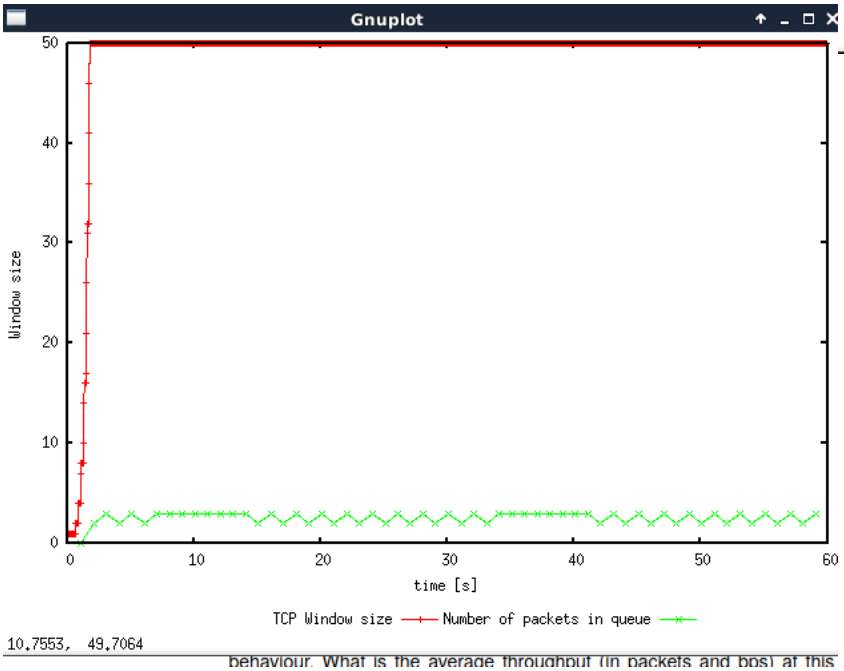
Question 2:

The BPS is around 540*8 *190=820800
Number of packet per sec is around 190



Question 3:
As the congestion window size decreases the number of packets in queue decreases as well as the oscillation.
50 is the maximum congestion at which TCP stops oscillating.
Average throughput in packets is 225
Average throughput in bps is 225*540*8 = 972000, which is very close to the link capacity.

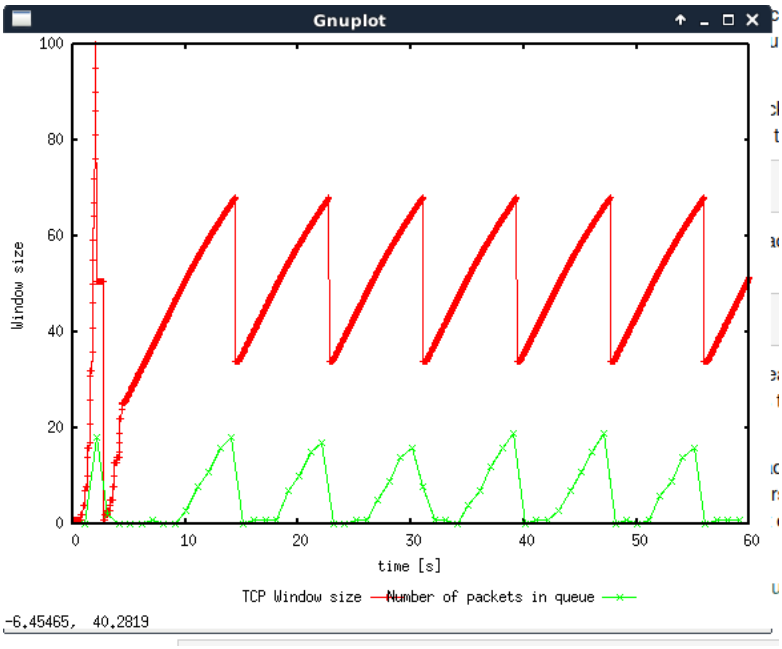




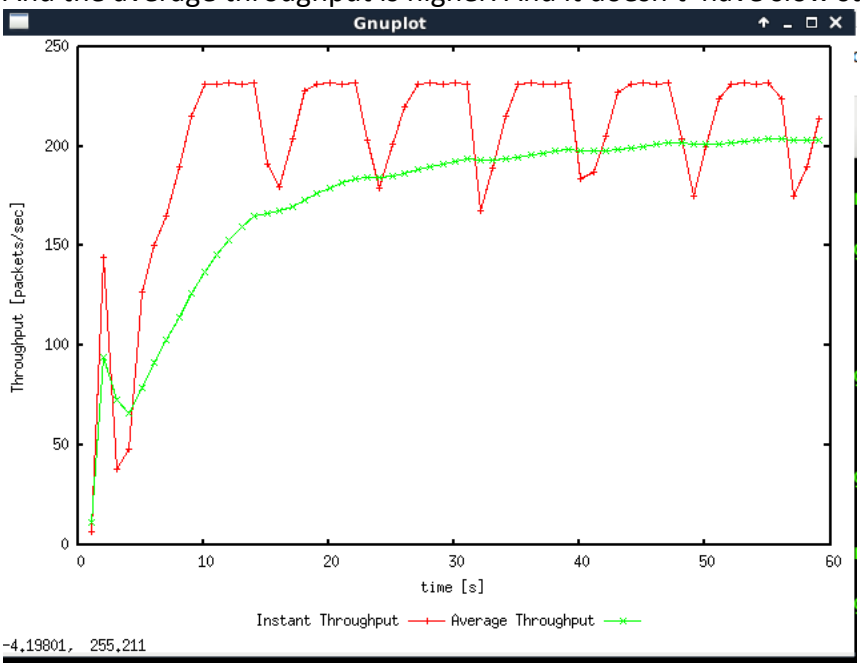
behaviour. What is the average throughput (in packets and bps) at this

Question 4:

For the first graph, they are similar, however, the window side doesn't drop to one for the graph below. And it only drops to half and keep in the congestion avoidance stage.

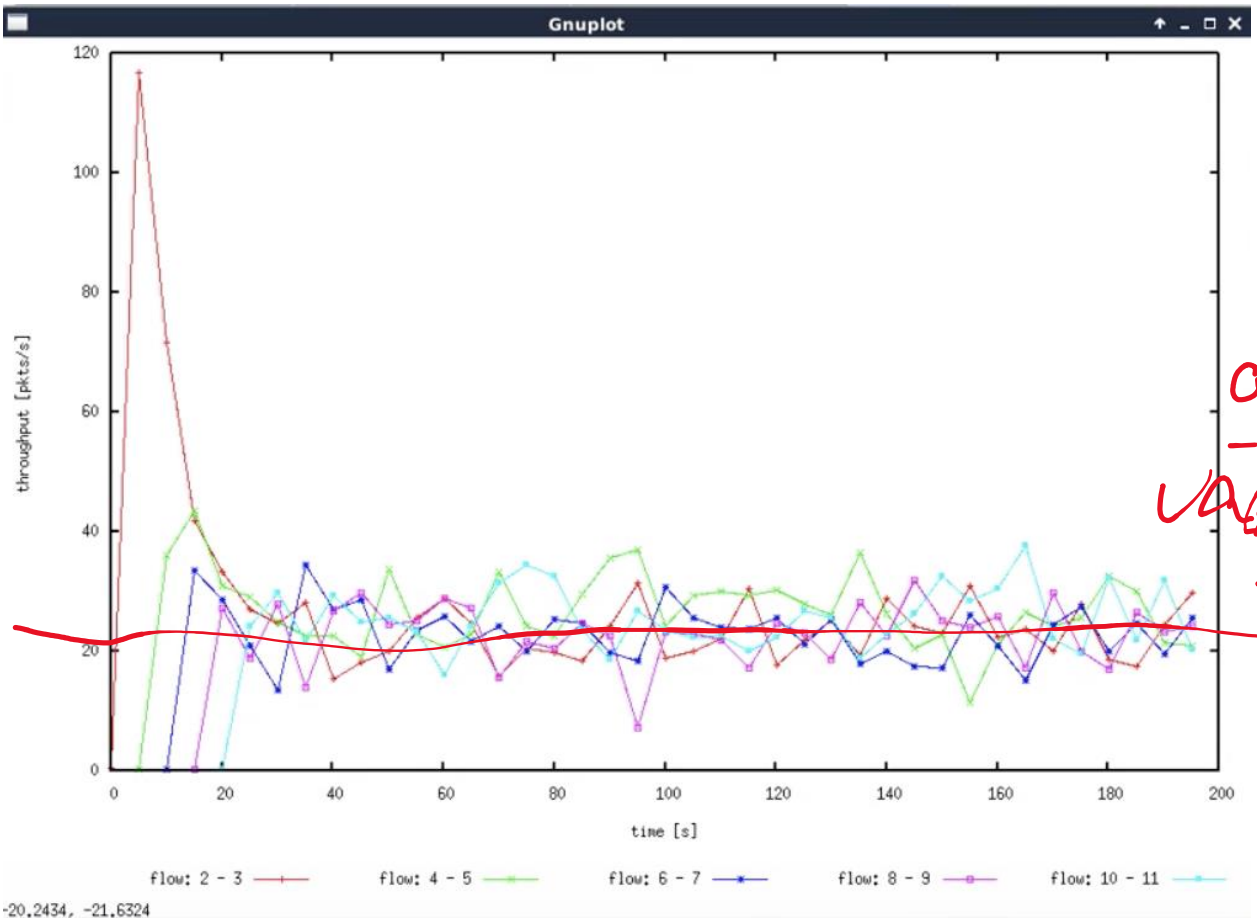


For the second one, the difference in the graph below is that it doesn't drop all the way to one. And the average throughput is higher. And it doesn't have slow start.



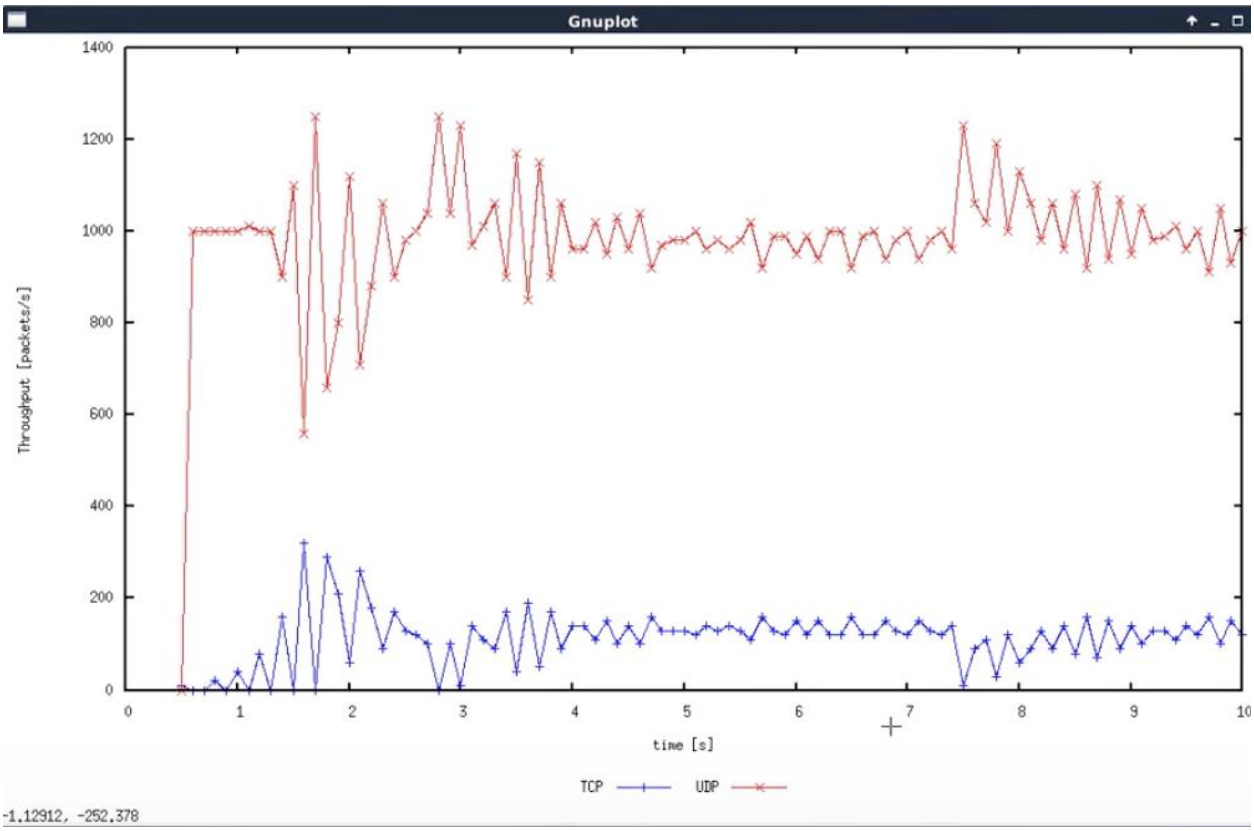
Exercise 2

Question 1:
They are equally sharing the capacity of the common link. So TCP is fair. The reason is because I observe all the flows are relatively stable around the same value.



Question 2: When a new flow created, all the pre-existing TCP flows will drop. The mechanism will eventually make all the flows have the similar amount throughput, which is very fair mechanism.

Exercise 3



Question1 and 2

The throughput of UDP will be much higher than TCP because it doesn't have any congestion control and it doesn't care the packets dropped. While TCP has the mechanisms to control the sending rates to make sure it's not congesting the links. And their wont be a fair share between these two.

Question3

Pro:

1.higher speed

2.UDP can keep sending the packets no matter the congestion.

Con:

1.UDP don't restrict the sending rate, so it can win when it is against TCP

2. less reliability

If everyone uses UDP, there will have heavy congestion, but UDP don't handle packet dropping, so most of the packets in the internet will be missing. So the internet will be extremely unreliable.