CN-3530/CS 301 Assignment 2

1. Stop and Wait Protocol

Question 1 – Number of retransmissions and throughput with different retransmission timeout values with stop-and-wait protocol. For each value of retransmission timeout, run the experiments for **5 times** and write down the average **number of retransmissions** and **average throughput**.

Retransmission timeout (ms)	Average number of re-transmissions	Average throughput (Kilobytes per second)
5	182	198.486
10	159.8	177.18
15	159.4	155,784
20	159.8	143.1024
25	163.6	116.044
30	161.6	108.3744
40	153.6	95.4258
50	156	80.9886
75	164	57.26
100	166.6	46.224

Question 2 – Discuss the impact of retransmission timeout value on number of retransmissions and throughput. Indicate the optimal timeout value from a communication efficiency viewpoint (i.e., the timeout that minimizes the number of retransmissions and keeps the throughput as high as possible).

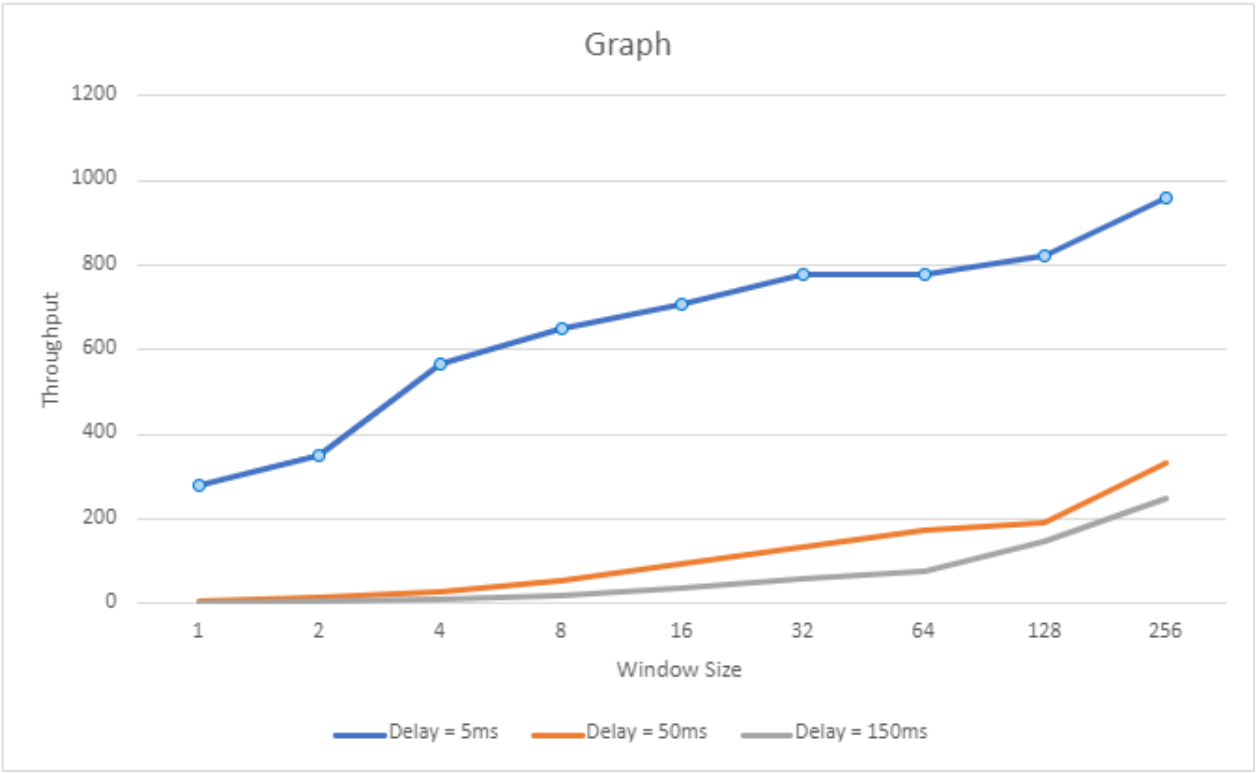
With the increase in timeout time we can see that there is a decrease in the number of retransmissions but as we can see from the above data we can see that no of retransmissions tend to converge. This is because we have kept the buffer size as 100 and the client sends packets faster than the server can read which overflows the buffer so the client needs to send those packets again. So the final retransmissions are due to low buffer size and not due to low re transmission time

2. Go back N Protocol

Question 1 – Experimentation with Go-Back-N. For each value of window size, run the experiments **5 times** and write down the **average throughput**.

	Average throughput (Kilobytes per second)		
Window Size	**Delay = 5ms**	**Delay = 50ms**	**Delay = 150ms**
1	278.9906	6.95	2.43
2	350.095	14.166	4.81
4	566.099	28.29	9.63
8	651.86	54.77	19.19
16	707.49	93.91	35.11
32	776.63	135.04	56.49
64	779.26	172.44	74.56
128	820.23	189.355	147.0738
256	958.0106	334.52	248.459

Create a graph similar to the one shown below using the results from the above table: (Edit: change delays to 5ms, 50ms and 150 ms as mentioned in the assignment statement)



Question 2 – Discuss your results from Question 1.

We can see that as we increase the window size the throughput increases as the sender does not need to wait for the acknowledgement of the first packet and send the window size number of packets at a time. As we increase the delay as expected the throughput decreases because the socket waits for a long time which decreases the throughput.