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	127.2	202.1746
10	121	143.7445
15	122.4	101.0095
20	125.2	74.2188
25	126	119.4486
30	126.6	125.1189
40	128.6	102.059
50	127.6	86.05563
75	110.8	65.09081
100	136	44.10425

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

The optimal timeout value that could be chosen here would be a timeout of ***10ms.***

The impact of retransmission timeout on the number of retransmissions is that the number of retransmissions decrease with the increase in timeout time as the sender will wait for longer time to receive the acknowledgement from the receiver.

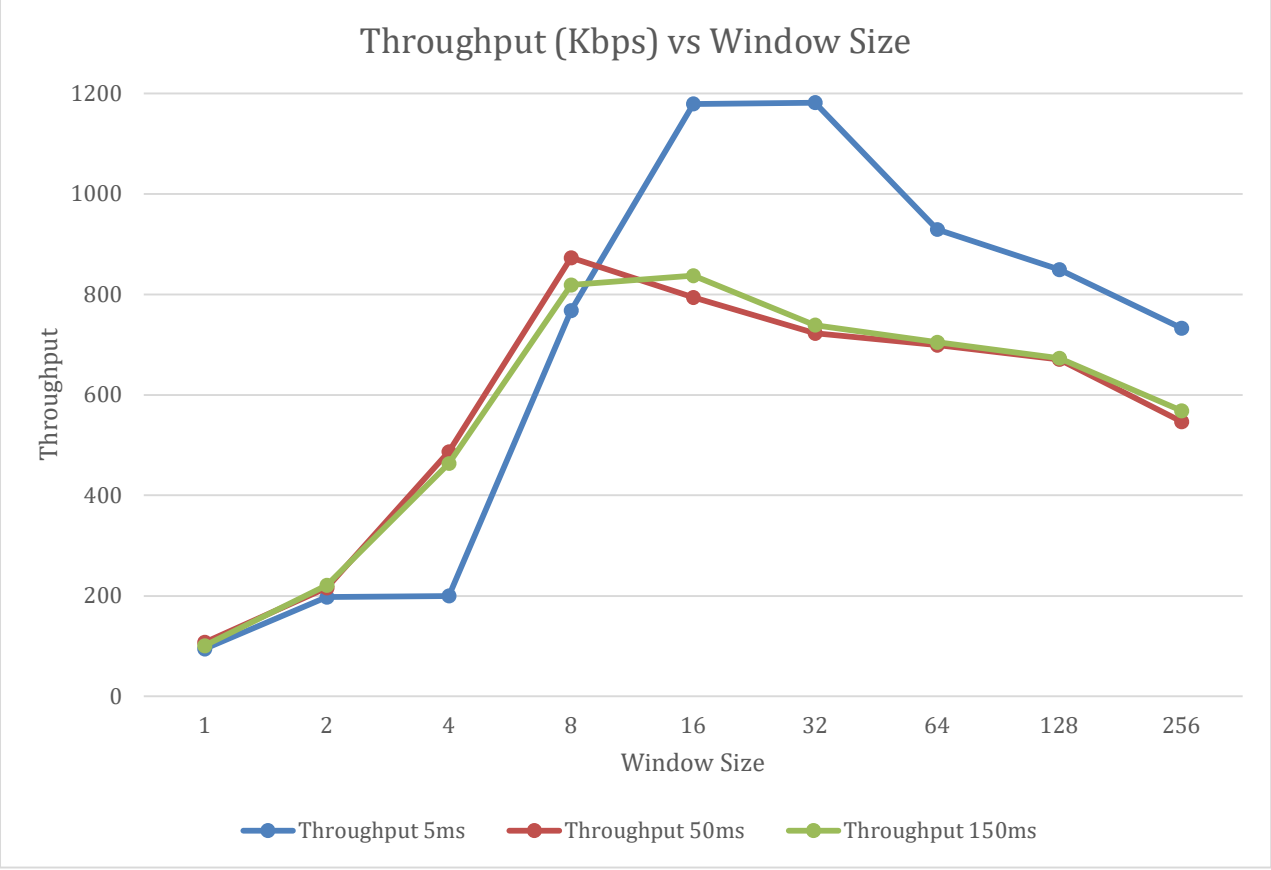
The impact of retransmission time on the throughput is that the throughput decreases with the increase in timeout time as the sender can now wait a longer time to receive ACK from receiver.

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	94.35017812	107.4685087	100.9799346
2	197.4539277	215.8471208	221.1892222
4	199.9405647	487.3259818	463.7314294
8	767.8567491	872.955424	819.1073065
16	1179.471233	793.8690829	837.5810007
32	1181.558083	722.6346507	738.6165096
64	929.6285801	699.267228	705.0580244
128	849.0447248	670.8865669	673.3986991
256	732.5183714	546.9069255	568.5083336

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 observe that the throughput increases with the increase in window size upto a certain optimum value after which it decreases. When the delay is 5ms, we achieve the maximum throughput at window size 16 and 32, while in the case of delay 50ms and 150ms at window sizes 8 and 16 respectively. Throughput with 50ms and 150ms has similar values. In all 3 cases, throughput has similar values with window sizes 1 and 2.