

Assignment 3 - COL334

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1 Changing different Congestion Protocols

1.1 For each protocol, generate a plot having Congestion window size on the y-axis and time on the x-axis(till t=30s).

The following 4 plots have been obtained for the the different congestion protocols that have been mentioned in the assignment statement. The protocols are:

1. Tcp NewReno
2. Tcp HighSpeed
3. Tcp Veno
4. Tcp Vegas

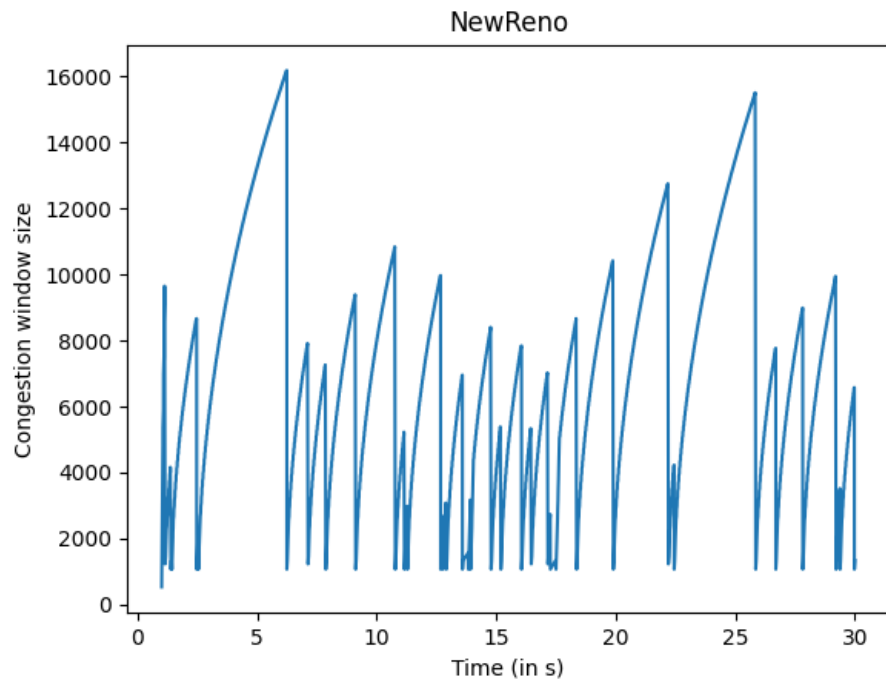


Figure 1: For the TCP New Reno protocol

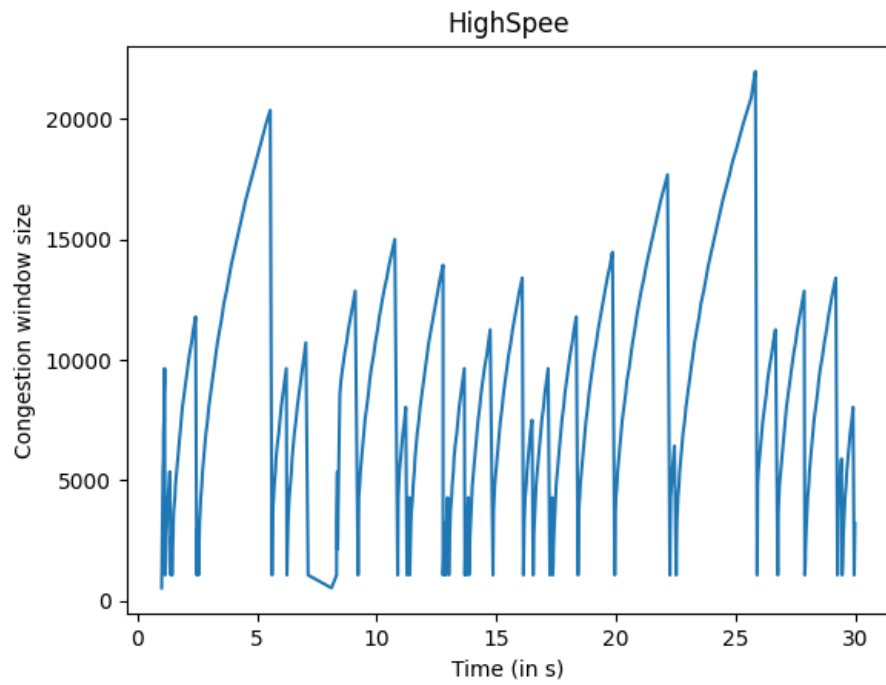


Figure 2: For the TCP High Speed protocol

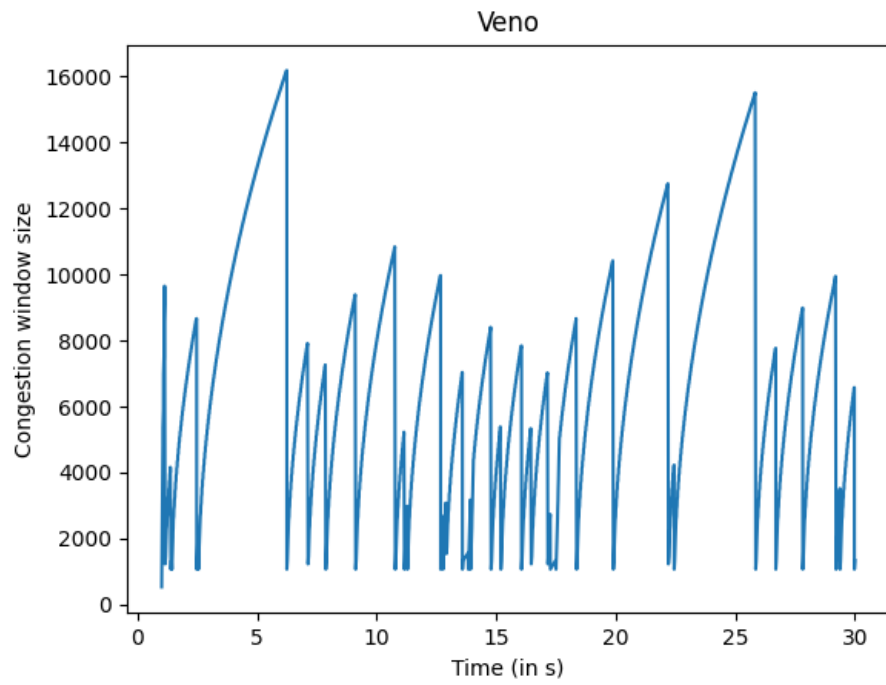


Figure 3: For the TCP Veno protocol

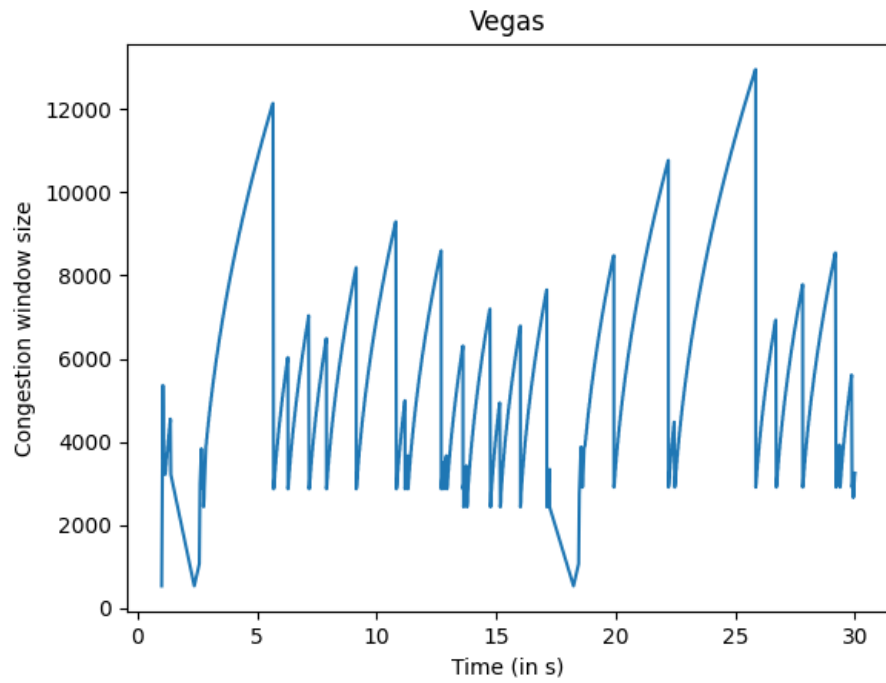


Figure 4: For the TCP Vegas protocol

1.2 For each protocol, find the number of dropped packets in total. What is your inference?

1. Tcp NewReno: 38
2. Tcp HighSpeed: 38
3. Tcp Veno: 38
4. Tcp Vegas: 39

1.3 For each protocol, describe what you observed (4-5 sentences per protocol is enough). You can talk about the trend you observed in the above plot, the algorithms they used for different phases etc.

2 Changing different Data Rate and Application Data Rate

2.1 Changing the Data Rate

The Application Data Rate is fixed to 2Mbps in this section.

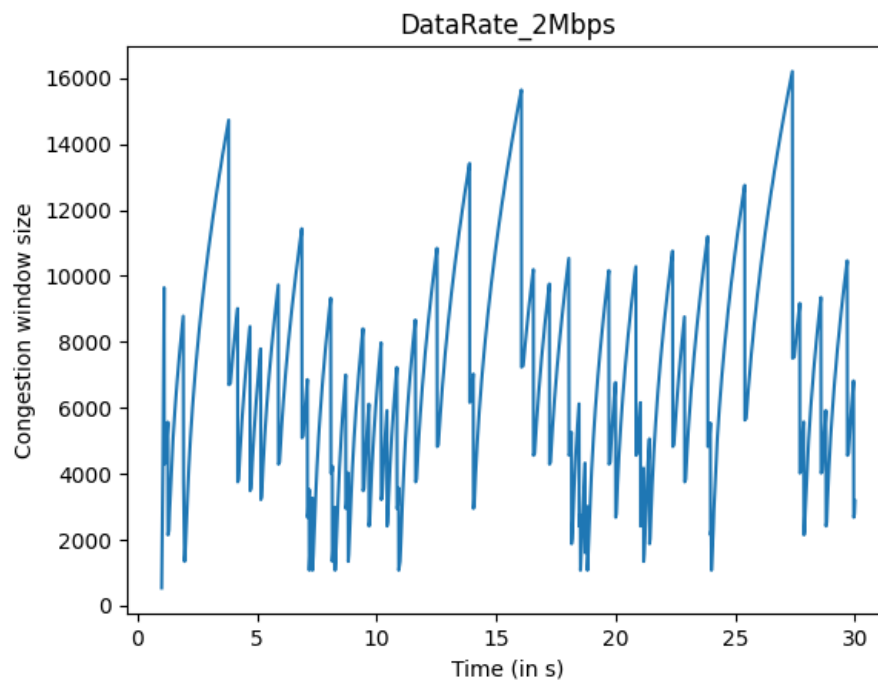


Figure 5: Data Rate has been fixed to 2Mbps

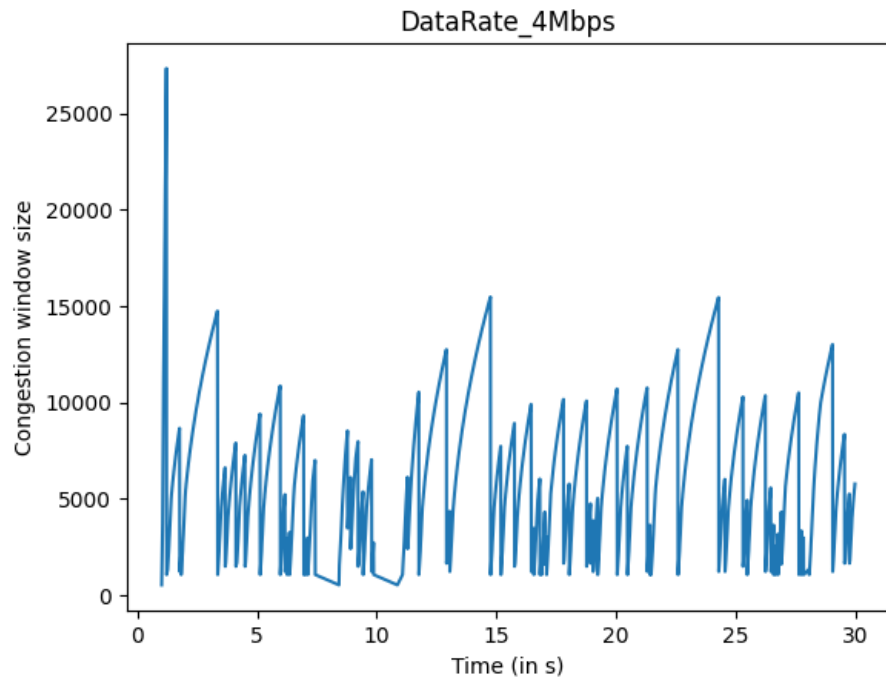


Figure 6: Data Rate has been fixed to 4Mbps

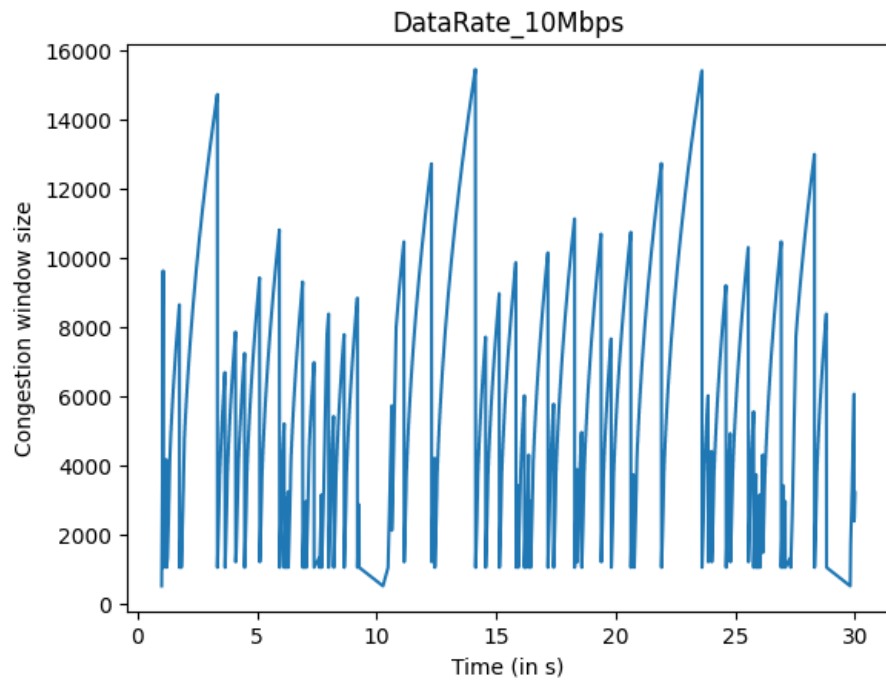


Figure 7: Data Rate has been fixed to 10Mbps

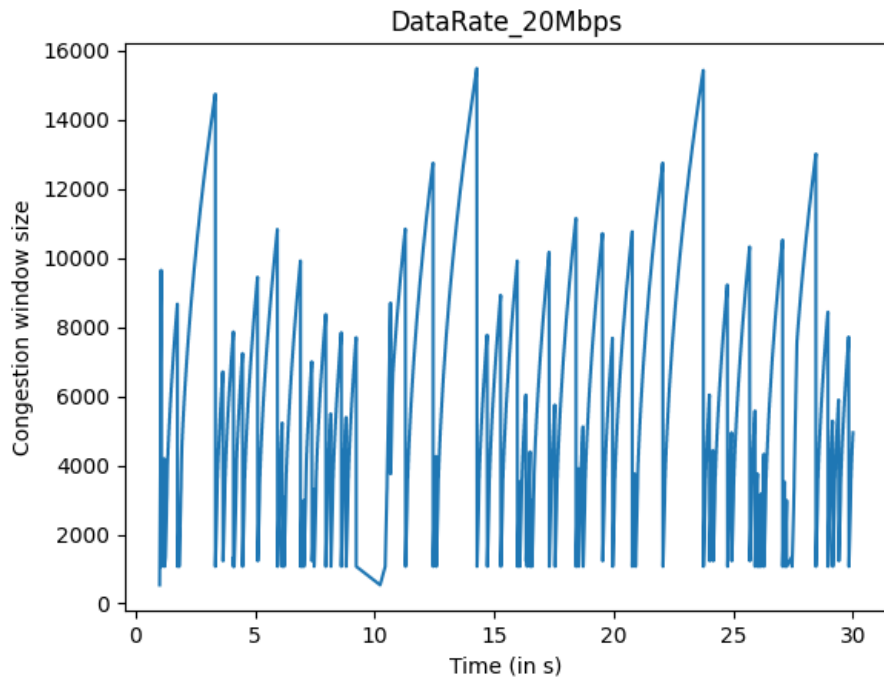


Figure 8: Data Rate has been fixed to 20Mbps

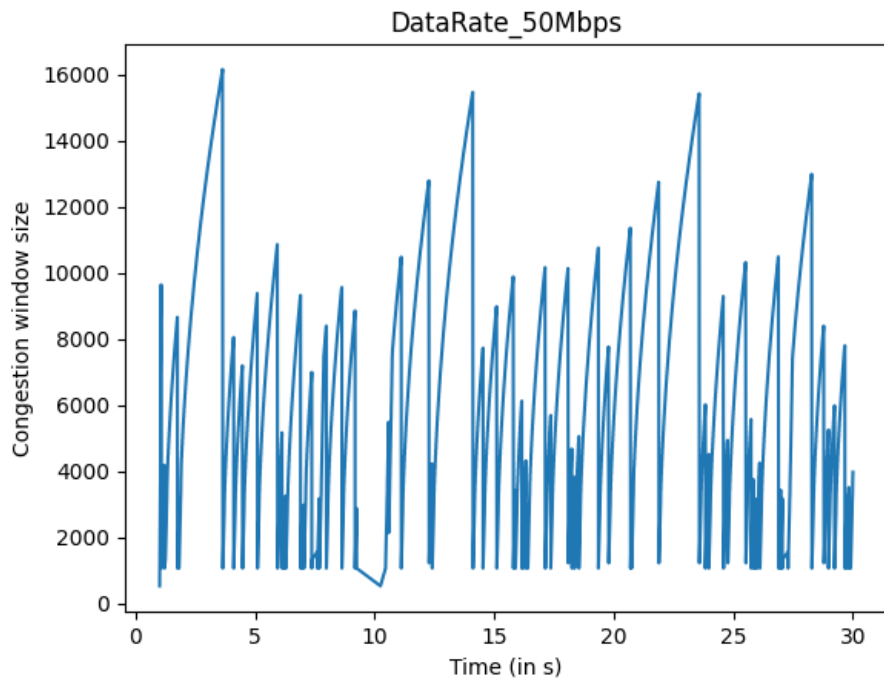


Figure 9: Data Rate has been fixed to 50Mbps

2.2 Changing the Application Data Rate

The channel data rate has been fixed to 6Mbps in this part of the question.

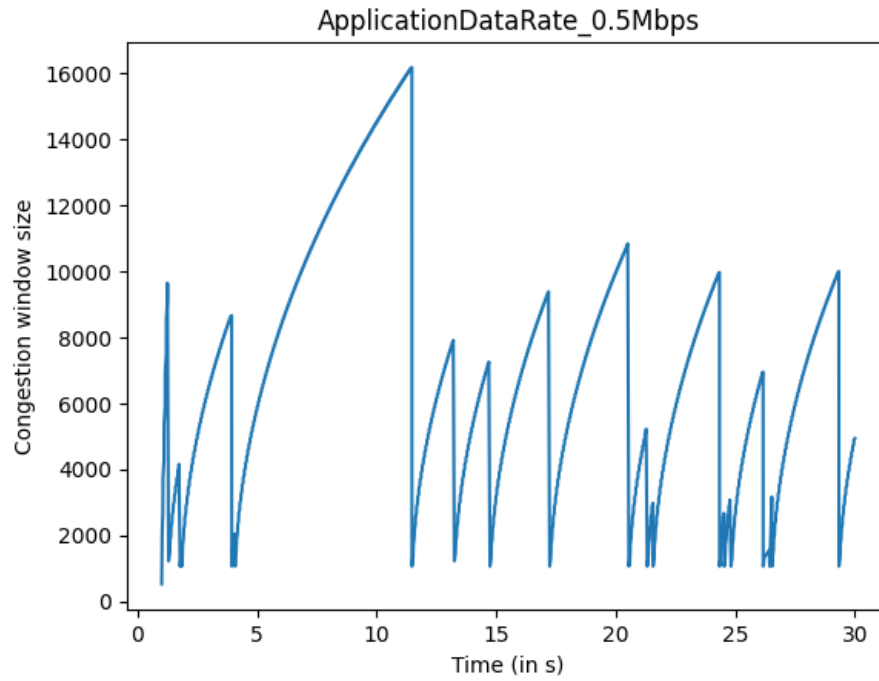


Figure 10: Application Data Rate has been fixed to 0.5Mbps

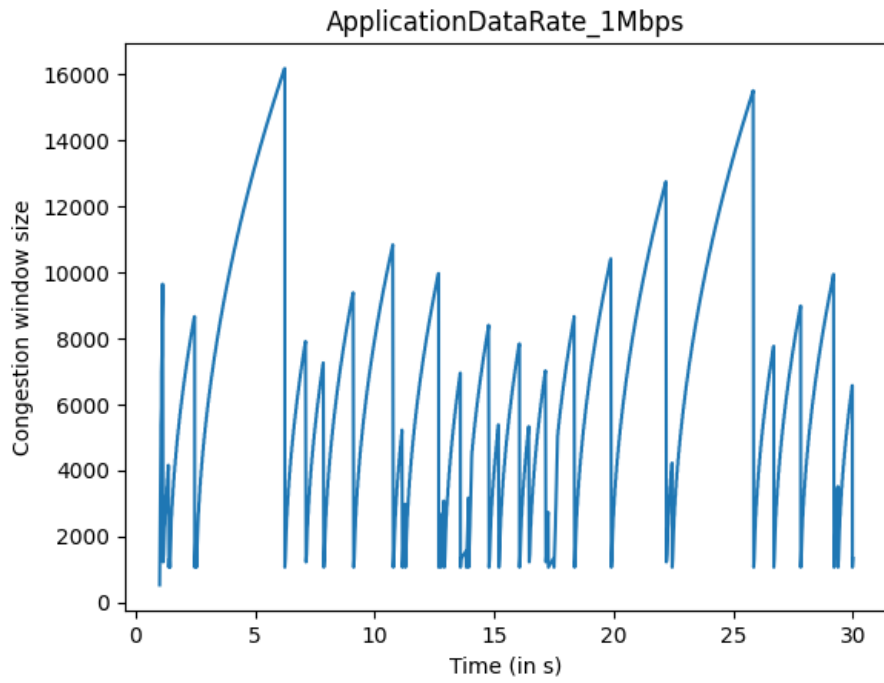


Figure 11: Application Data Rate has been fixed to 1Mbps

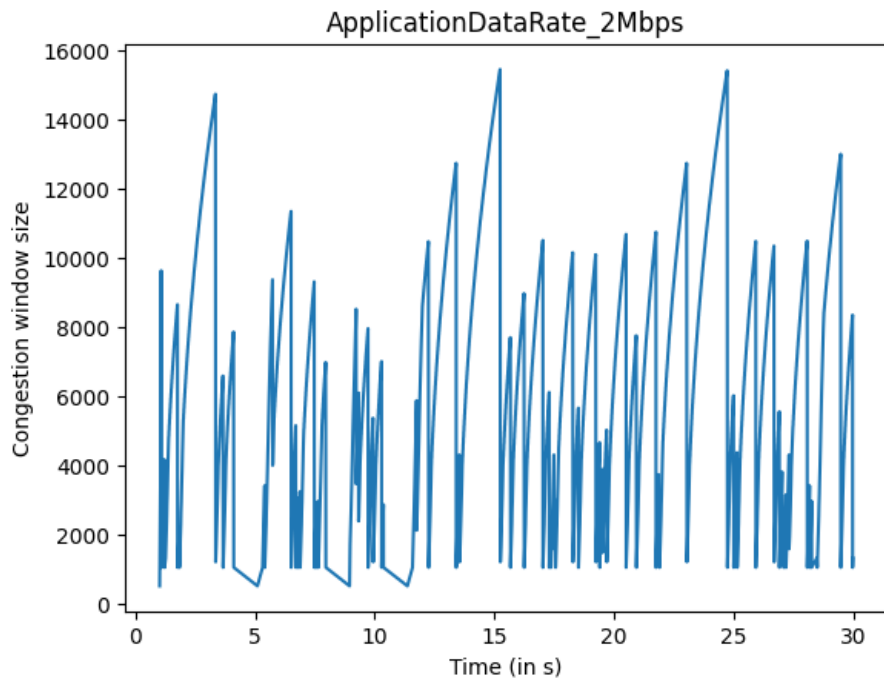


Figure 12: Application Data Rate has been fixed to 2Mbps

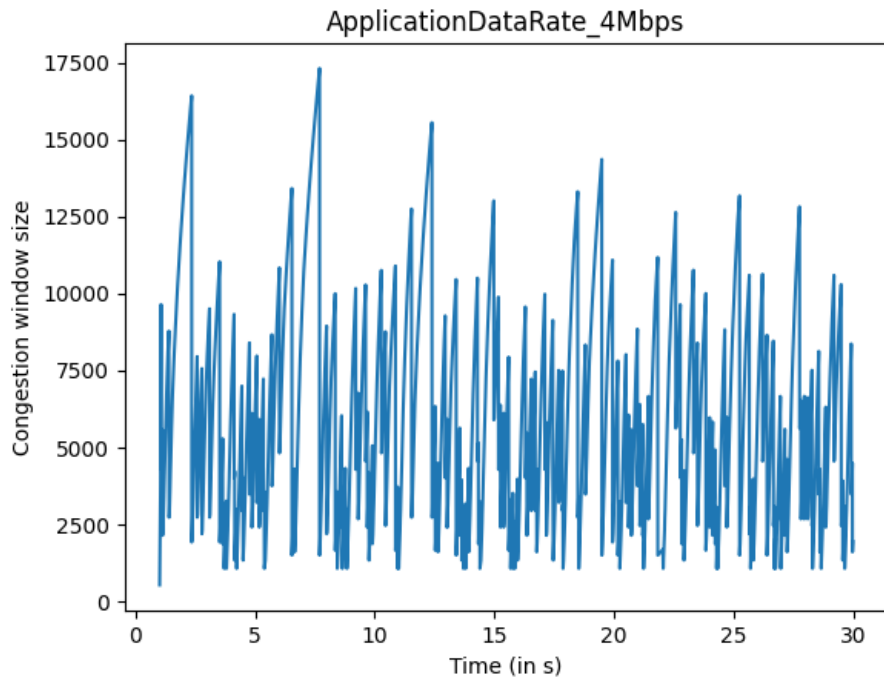


Figure 13: Application Data Rate has been fixed to 4Mbps

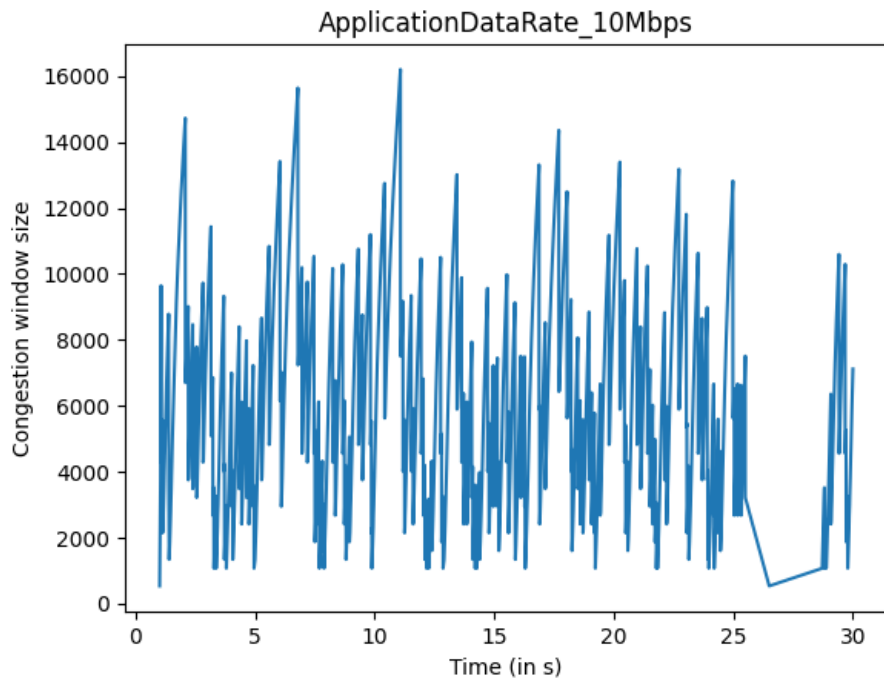


Figure 14: Application Data Rate has been fixed to 10Mbps

3 Implementing TcpNewRenoCSE

The files have been included with the submission which contain the code for SlowStart and Congestion Avoidance

3.1 Plot Congestion window size vs time (from t=1 to t=30 seconds)

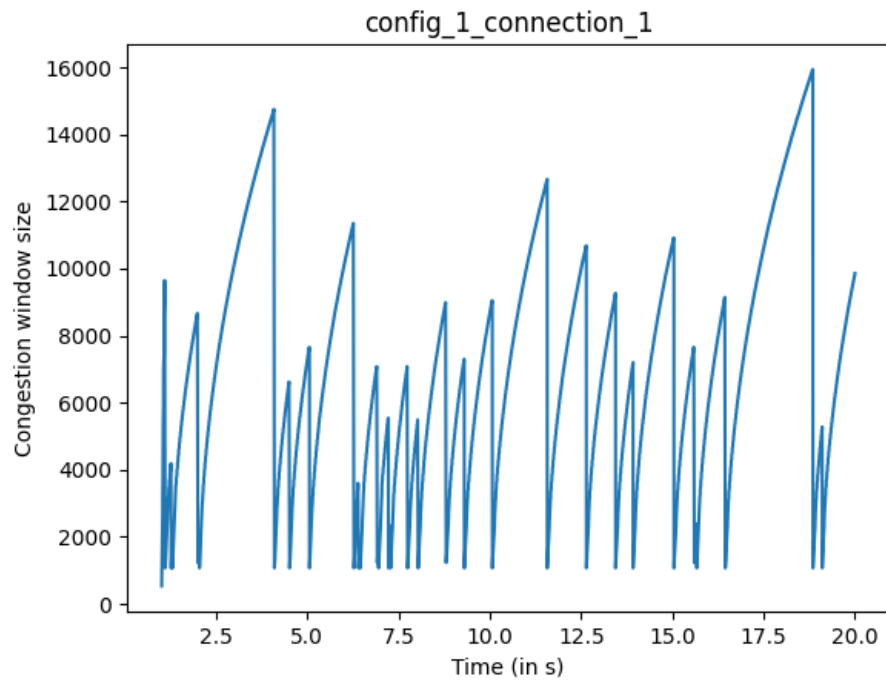


Figure 15: Plot for Configuration 1 and Connection 1

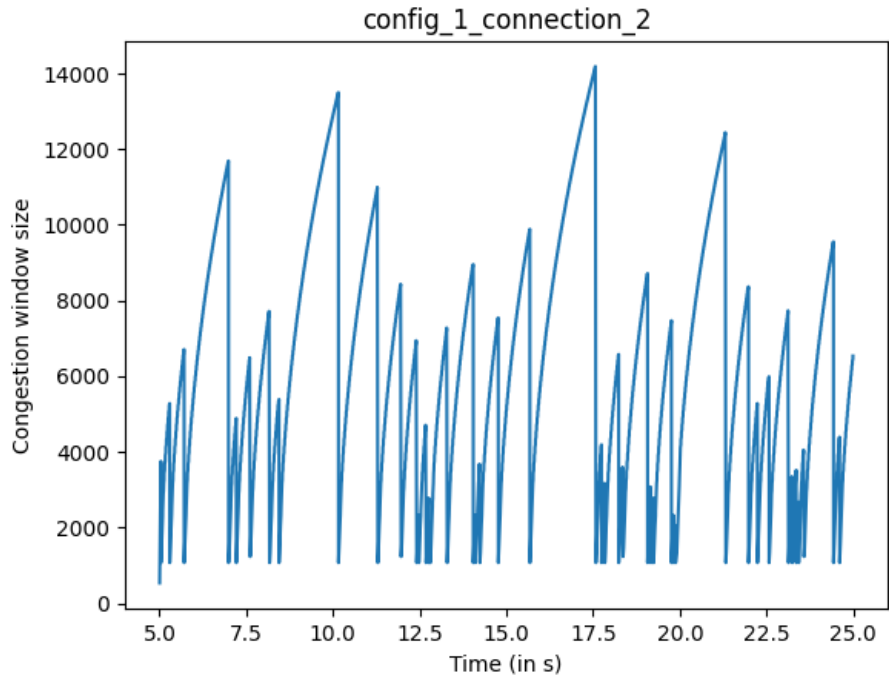


Figure 16: Plot for Configuration 1 and Connection 2

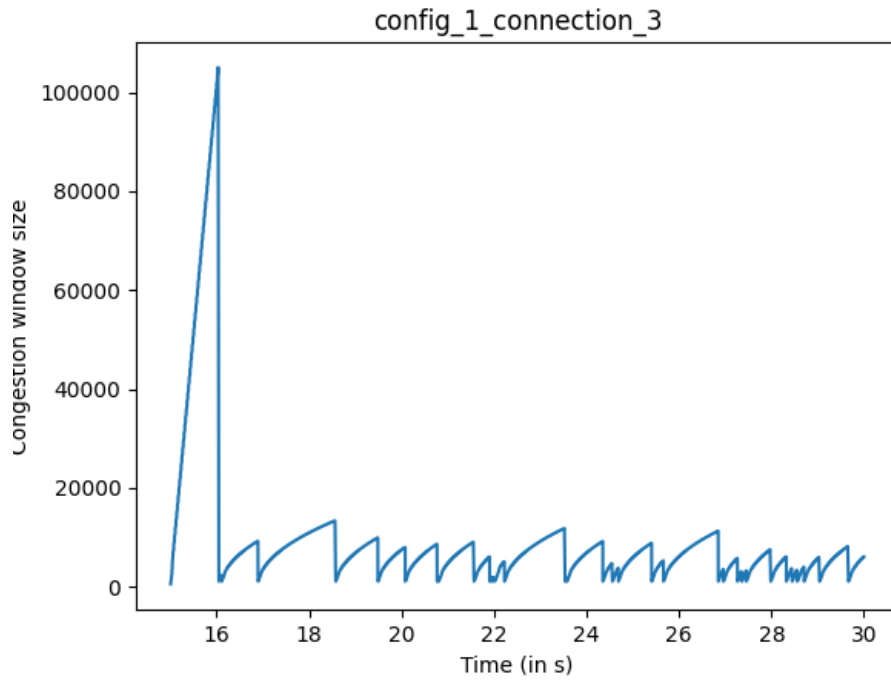


Figure 17: Plot for Configuration 1 and Connection 3

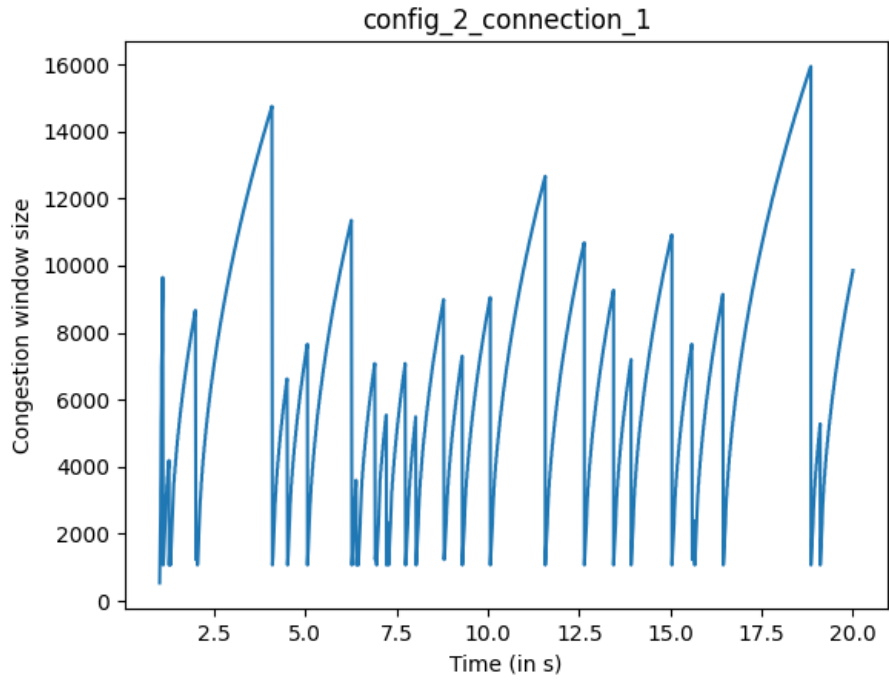


Figure 18: Plot for Configuration 2 and Connection 1

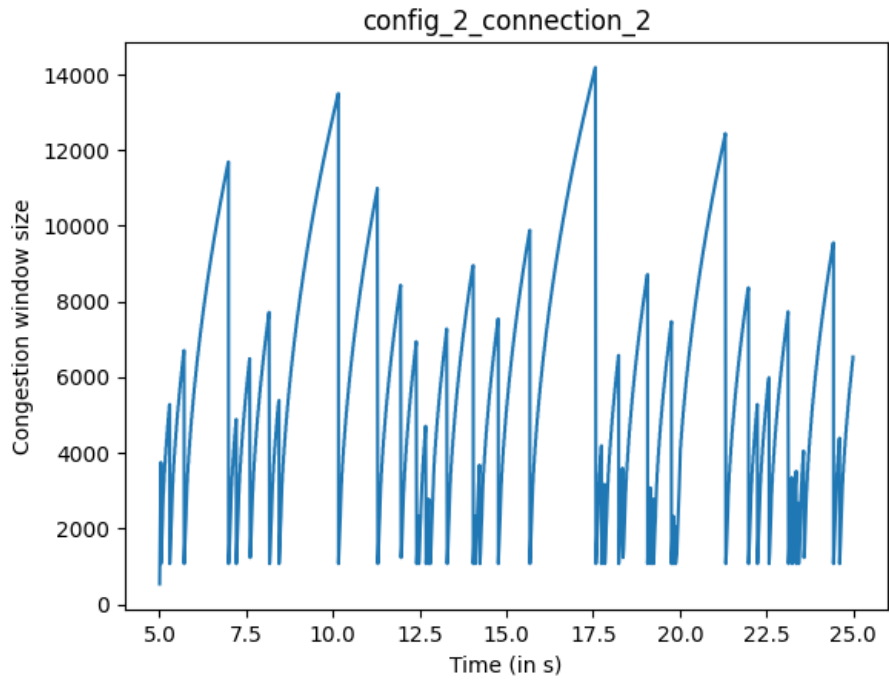


Figure 19: Plot for Configuration 2 and Connection 2

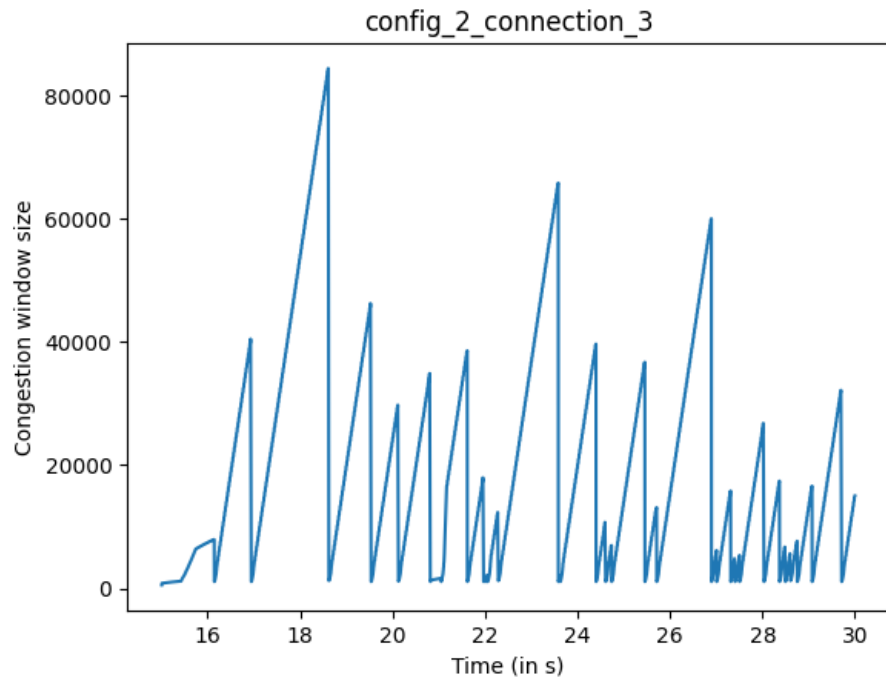


Figure 20: Plot for Configuration 2 and Connection 3

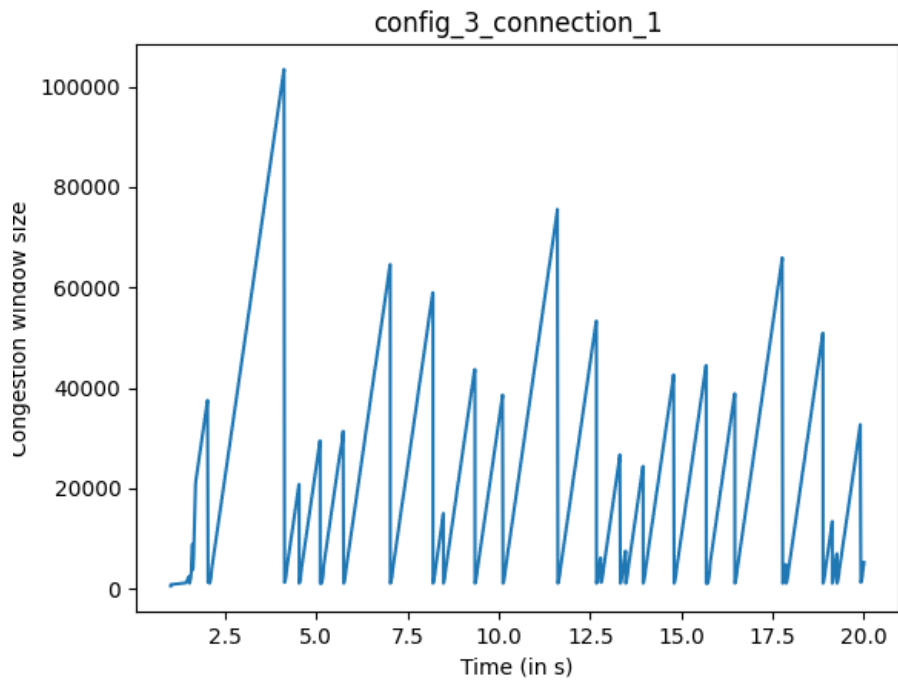


Figure 21: Plot for Configuration 3 and Connection 1

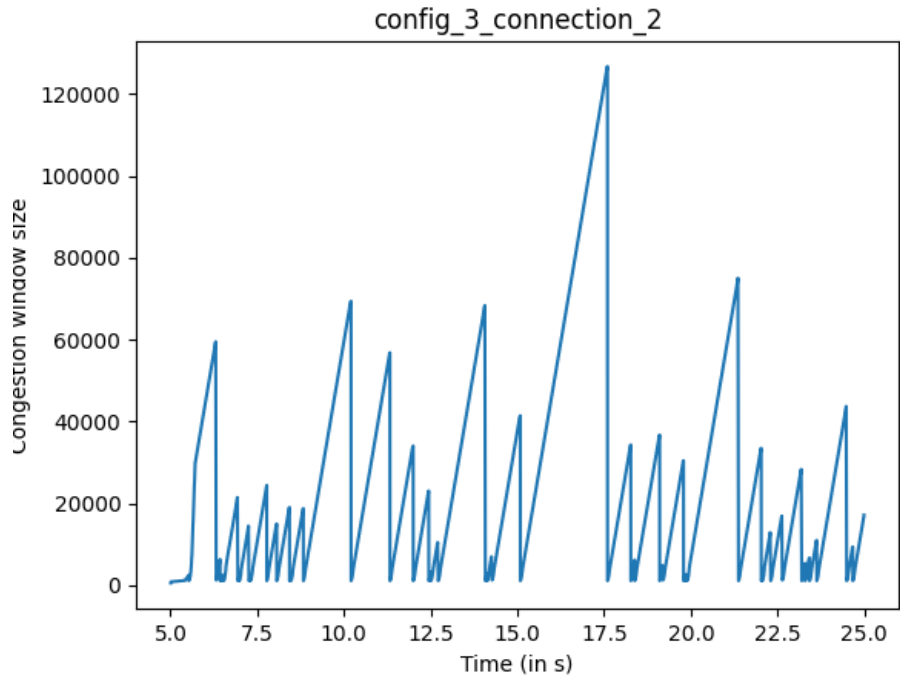


Figure 22: Plot for Configuration 3 and Connection 2

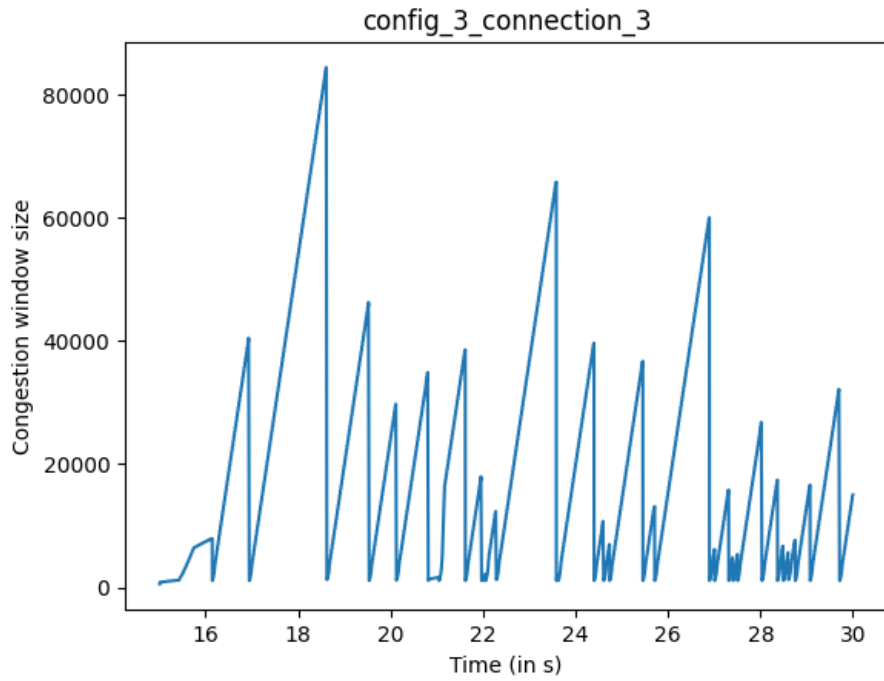


Figure 23: Plot for Configuration 3 and Connection 3

3.2 Analyze the number of dropped packets for each connection separately.

1. Configuration 1: 113
2. Configuration 2: 112
3. Configuration 3: 110

3.3 How does the congestion avoidance phase vary on the same sender when using TCPNewRenoCSE vs TCPNewReno? Explain the observed trends. How does it impact the entire network?

4 Directory Structure

As specified in the problem statement. I have submitted a plot.py, the instructions of how to use it have been given in the README.md. Apart from that the outputs have been stored in the following format, in the outputs folder of each question:

- dropped: It contains the information regarding which how many packets have been dropped for a particular part
- toplot: This contains the time vs the old congestion window size vs the new window size. My plotting script takes all the files present in this and plots them.
- plots: This contains the plots. Look at the titles of the plots for information about them.

Further instructions on how to run have been given in the README.md in a well detailed manner.