Name:

Pitt ID:

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**`ss` output**

**After running the `ss` command, copy here the following information:**

* data flow information:
* control flow information:

**Find the following information in the output about the data flow:**

* the current CWND of this flow (in MSS):
* the slow start threshold of this flow (in MSS):
* the number of retransmitted segments:

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**“Sawtooth” pattern experiment**

Using your plot and/or experiment data, explain how the behavior of TCP is different in the "Slow Start" and "Congestion Avoidance" phases. Also, using your plot, explain what happens to both the congestion window and the slow start threshold when multiple duplicate ACKs are received

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**Additional exercises: low delay congestion control**

Make a note of the iperf3 throughput and the round trip time estimated by ping during the TCP Vegas flow:

Make a note of the throughput reported by iperf3 for each flow:

Comment about ‘fairness’ between users if different protocols used at the same time:

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**BBR**

“if you look at the raw ss data for the BBR and the Reno/Cubic flows, you'll note that the BBR flows see a much lower RTT, since they do not fill the queue.”

Comments (something about comparison of the values):

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**Explicit congestion notification (ECN)**

Compare (comment on) the delay performance of Reno with ECN (this experiment) to your previous experiment showing the delay performance without ECN:

“transfer the packet captures to your laptop with scp, and look for the ECN-related fields in the IP header and TCP header, during connection establishment and during data transfer.” And note them here: