Question 1:

Suppose flow $f$ is transferring a stream of data at a specific rate. How should $f$ ideally react (increase/decrease rate) to a packet loss if

a) $f$ is responsible for most of the congestion.

b) the packet is dropped at a shallow buffer on a link with high BDP and low utilization.

c) there is a parallel higher-rate competing flow.

d) random non-congestion loss.

Question 2:

Suppose, PCC is currently sending data at rate $r$. If PCC is in a decision-making state and has 4 controlled trials (micro-experiments) to decide the next sending rate, how does it run the trials? Keep in mind that the network conditions might change independent of thee sender’s actions.

Question 3:

What is PCC’s utility function? What are some of the metrics that it takes into account? Give an example of a very simple utility function for maximizing throughput ($T$) and minimizing loss rate ($L$) at the same time.

Question 4:

From the TCP ex Machina paper we know that automatically generated congestion control algorithms can have very good performance in terms of achievable throughput and latency. On the figure below we see that the performance of 3 generated congestion control algorithms is much better that many of the currently used algorithms. Where do the performance benefits come from? When does it make sense to replace existing algorithms with Remy-based solutions?

Question 5:

The figure below shows how RTT and throughput varies with the amount of data in flight (data sent but not yet acknowledged).

a) What does each region separated by the dashed vertical lines in the plot signify?
b) At which point along the x-axis does loss-based congestion control operate?

c) What is the optimal point along the x-axis, that BBR aims to operate at, for minimizing RTT and maximizing throughput?

We are happy to give individual feedback in person on request.