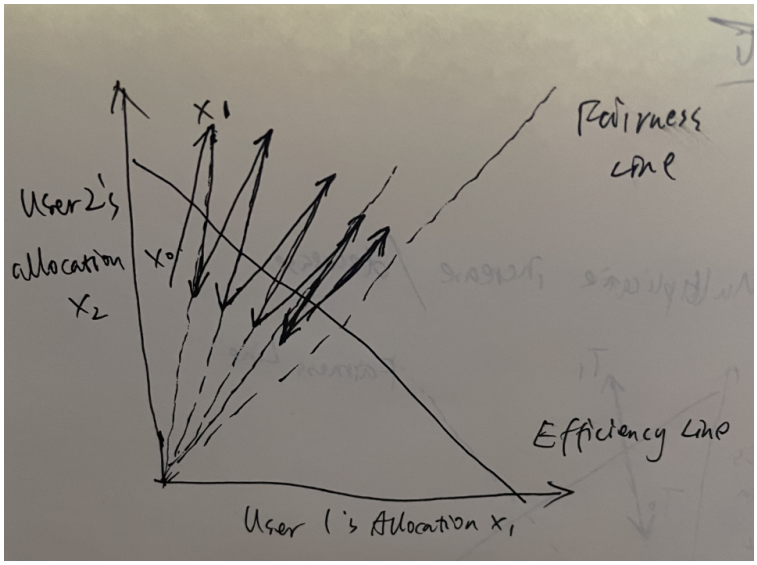
Part D

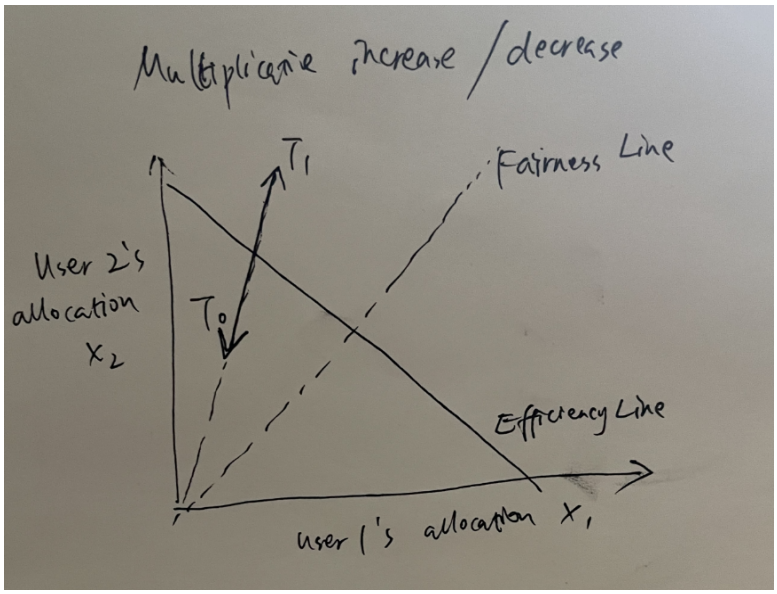
Despite the initial slow-start period when a connection begins and assuming that losses are indicated by triple duplicate ACKs rather than timeouts, TCP's congestion control consists of a linear (additive) increase in cwnd of 1 MSS per RTT and then a halving (multiplicative decrease) of cwnd on a triple duplicate-ACK event. TCP linearly increases its congestion window size (and hence its transmission rate) until a triple duplicate-ACK event occurs. It then decreases its congestion window size by a factor of two but then again begins increasing it linearly, probing to see if there is additional available bandwidth.

1. Multiplicative Increase Additive Decrease



2. Multiplicative Increase Multiplicative Decrease

Both X1 and X2 increase by the same factor over time



3. Additive increases, Additive decreases, are not fair.
   Both X1 and X2 increase/ decrease by the same amount over time. Additive increase improves fairness and additive decrease reduces fairness.