IS8055556: Data and Computer Communications	**Recitation 5b**
Semester 2 5786	**19 May 2026**
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Sliding Window

1 Simple Sliding Window

Draw a timeline diagram for the sliding window algorithm with SWS = RWS = 3 with 8 frames for the following situations. Use a timeout interval of 2× RTT.

(a) All packets arrive ok.

(b) Frame 4 is lost.

(c) Frames 4 and 5 are lost.

To be more concrete, let's choose some numbers for the parameters. Each frame is 1KB, the medium has a 2Mbps bandwidth, and the RTT is 100ms. ACK frames are 100B.

2 Sliding Window with Duplicate ACKs

Modify the time lines from the previous question using the following modification to the sliding window algorithm (a *fast retransmit modification*):

> The receiver sends a duplicate acknowledgement if it does not receive the expected frame. For example, it sends `DUPACK[1]` when it expects to see `FRAME[2]` but receives `FRAME[3]` instead. When the sender receives a `DUPACK` message, it immediately sends the (assumed) lost message.

Continue with the existing assumption that the receiver sends a cumulative acknowledgment after it receives all the outstanding frames. For example, it sends `ACK[4]` when it receives the lost frame `FRAME[2]` after it already received `FRAME[3]` and `FRAME[4]`. Use a timeout interval of about 2×RTT.

(a) Frame 4 is lost, but the sender works with the fast retransmit modification.

(b) Frames 4 and 5 are lost, but the sender works with the fast retransmit modification.

Let's choose numbers for the parameters. There are 8 frames total. Each frame is 1KB, the medium has a 2Mbps bandwidth, and the RTT is 100ms. ACK frames are 100B.

Does using the fast retransmit modification make a difference?

