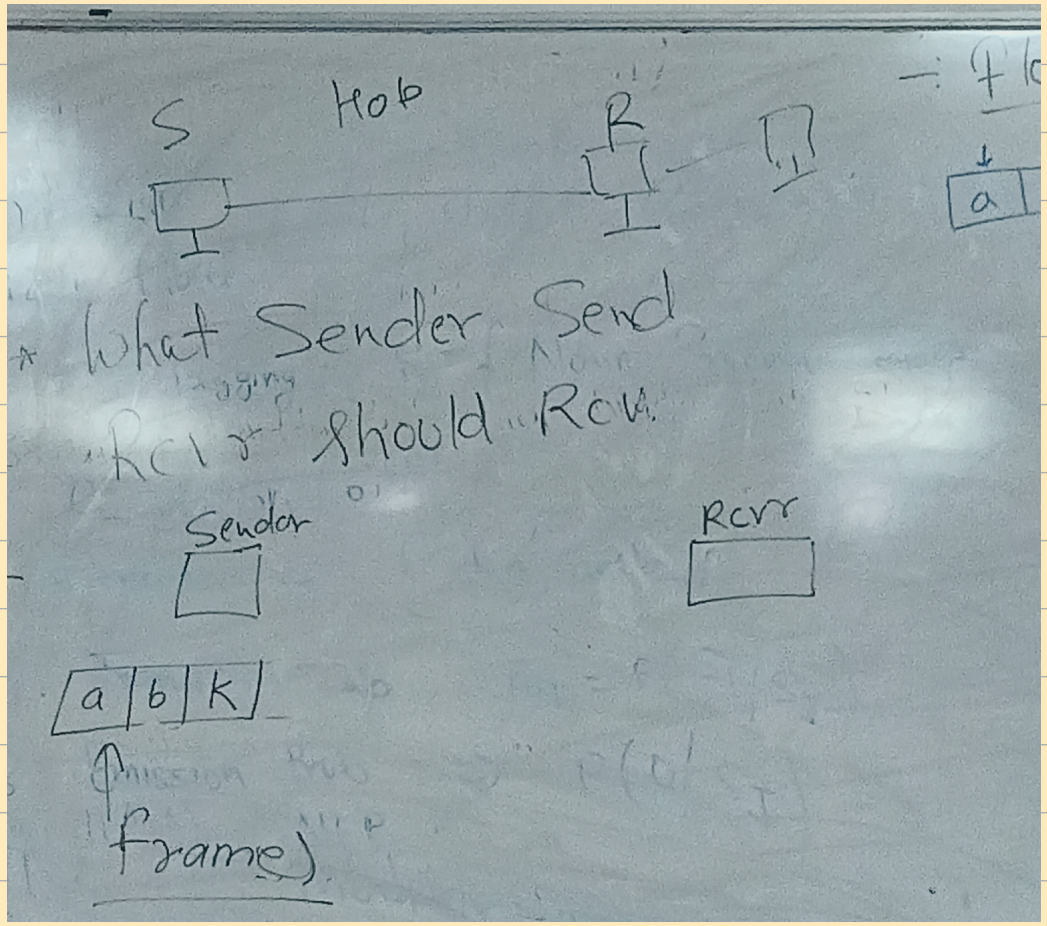
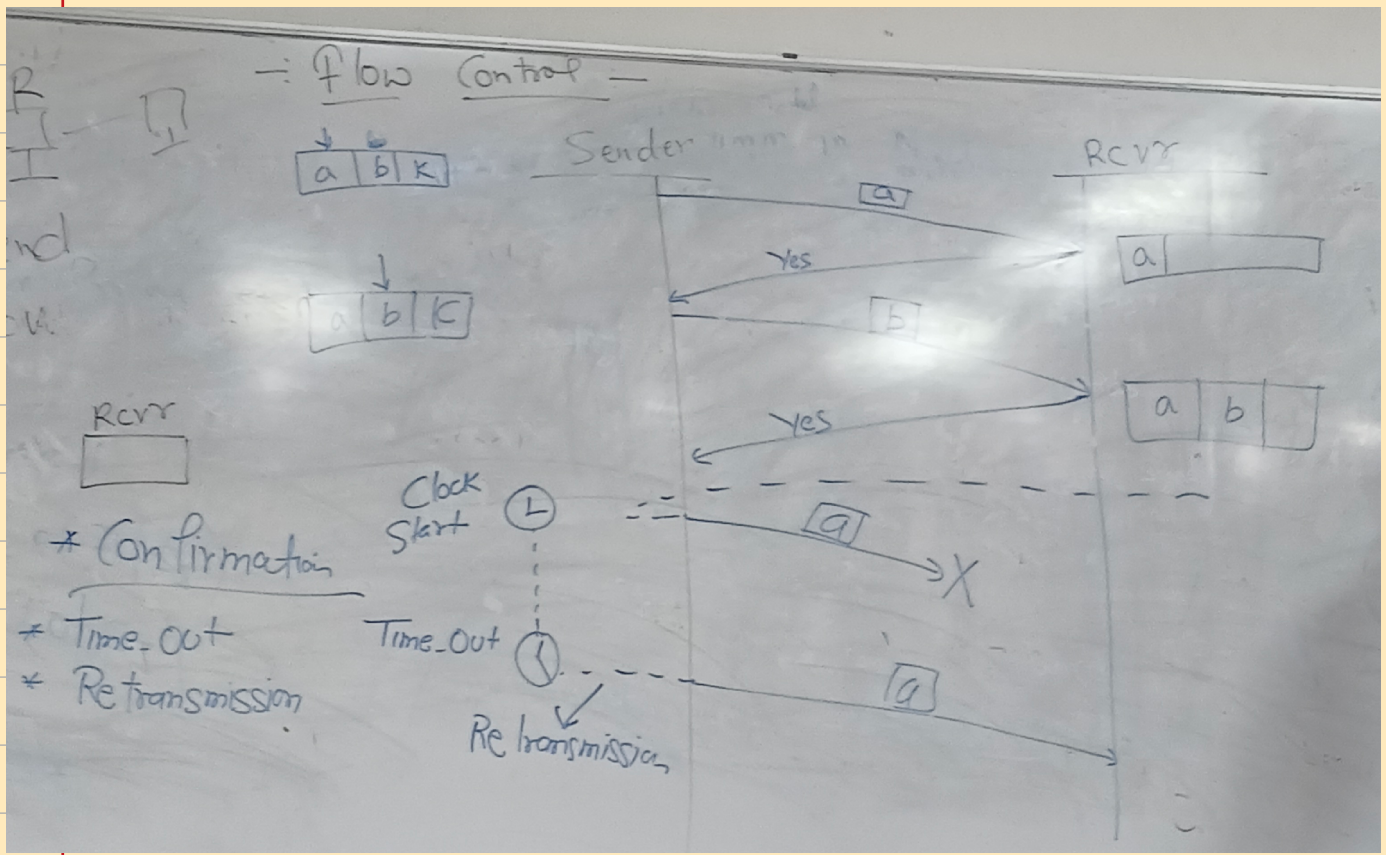
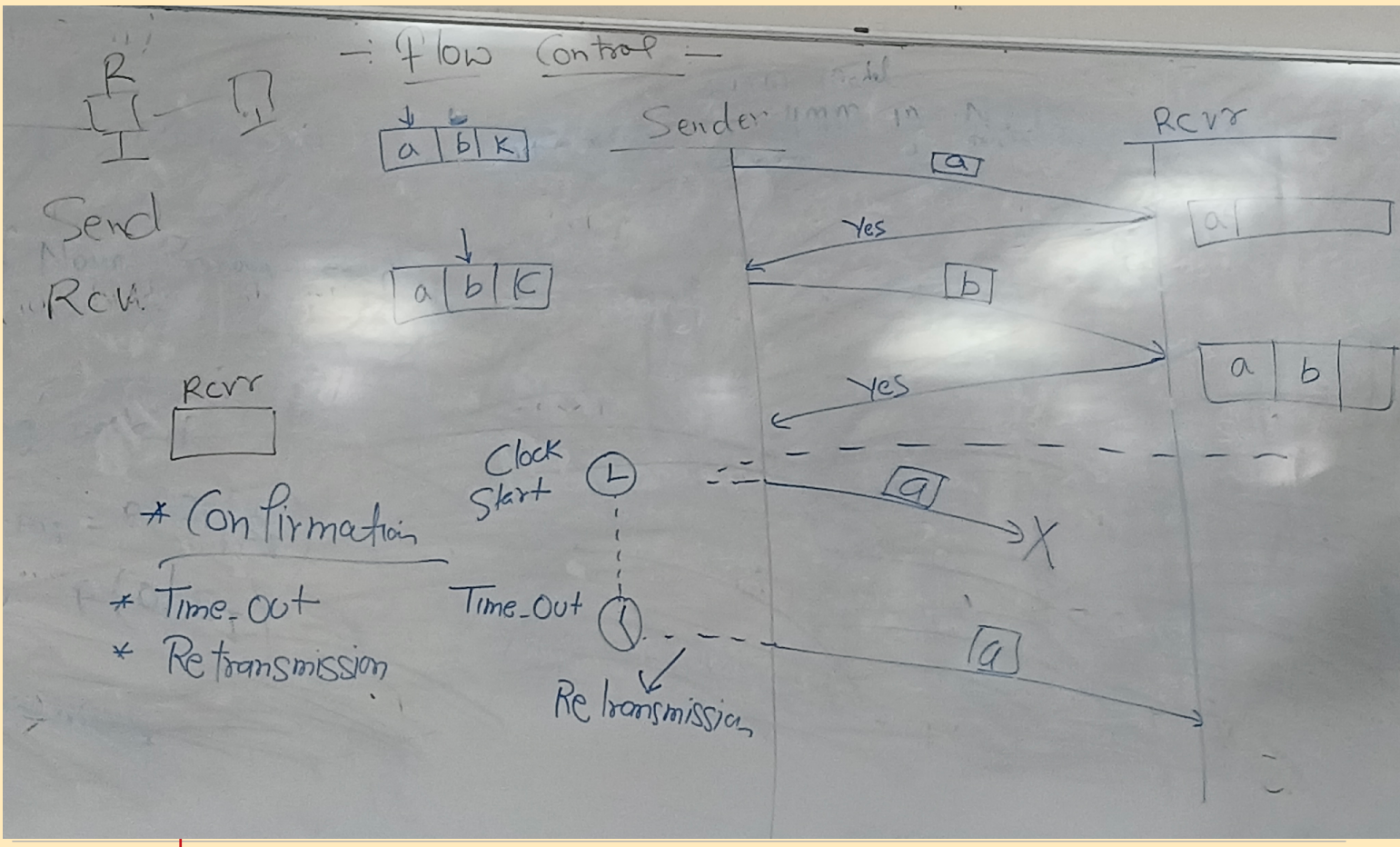
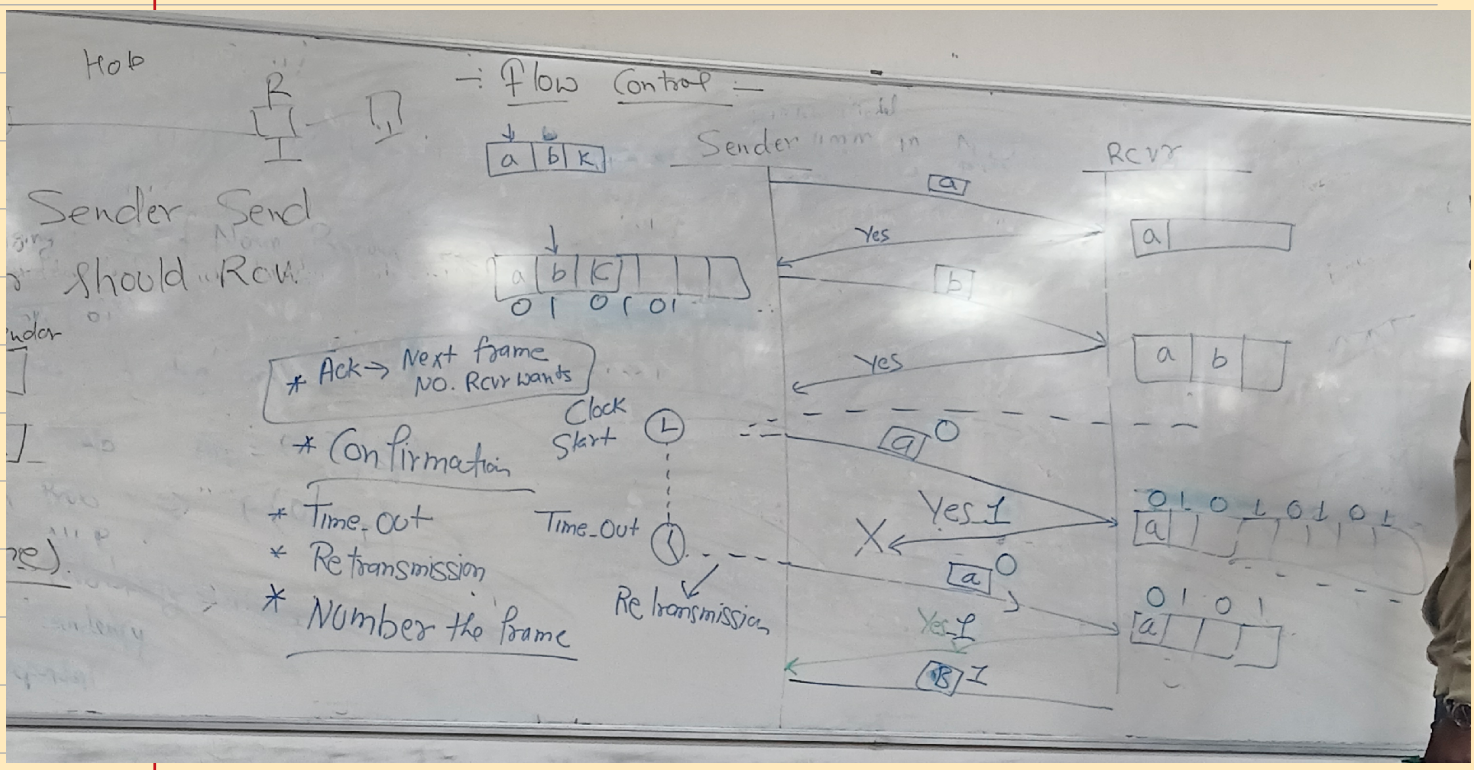
27/01/26



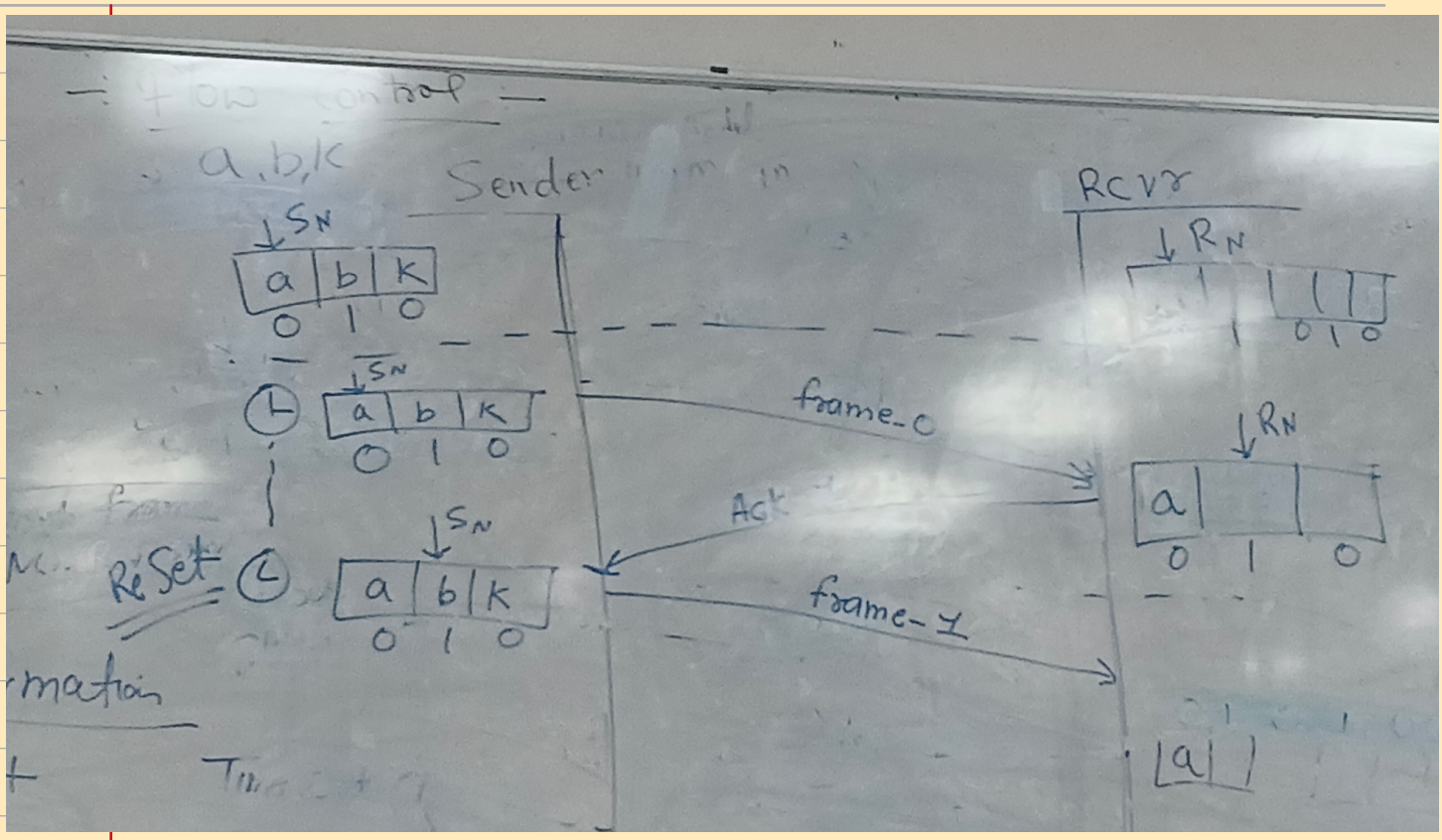


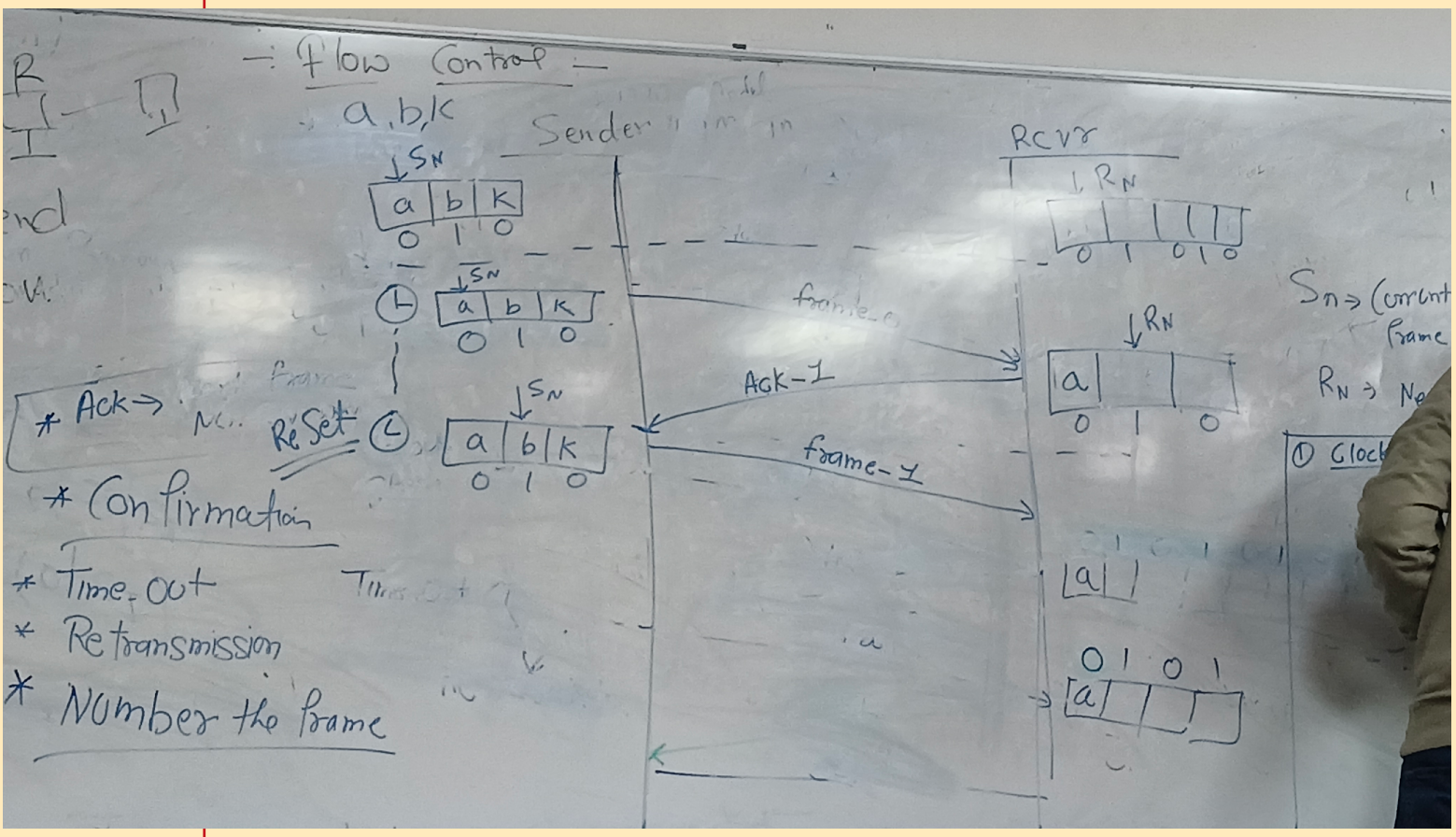
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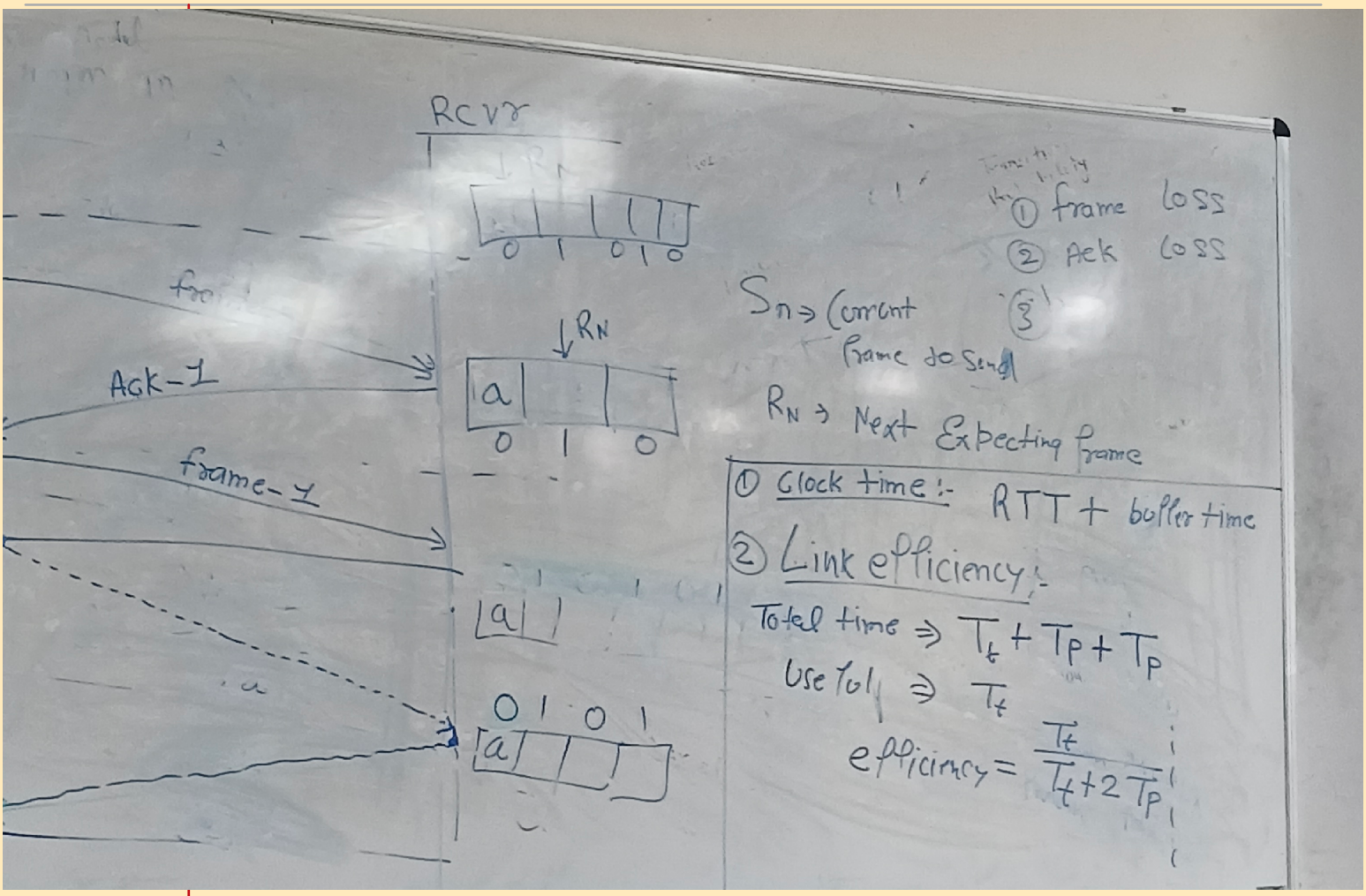


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* What Sender

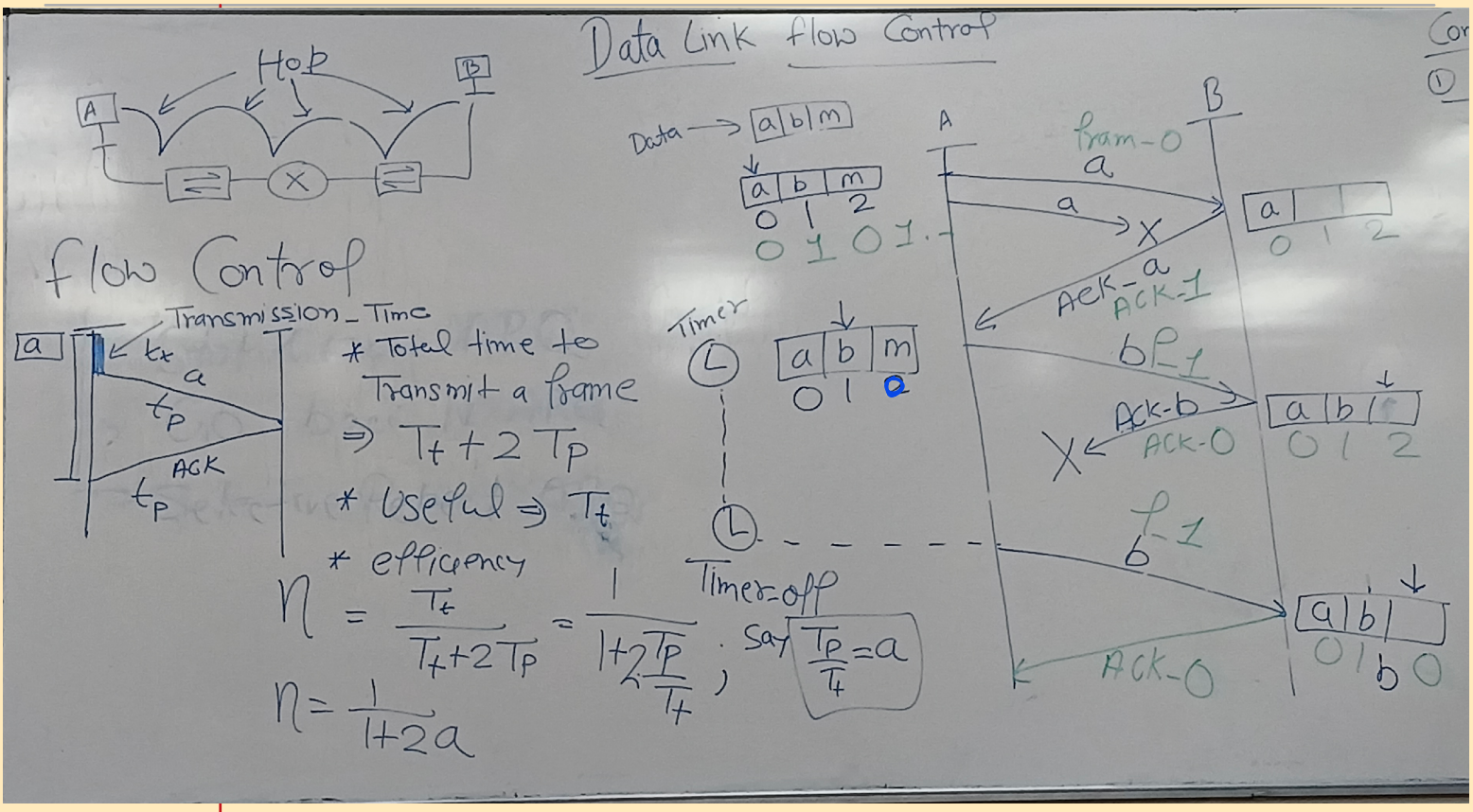
$$\mu = \frac{T_t}{T_t + 2T_p}$$

$$\mu = \frac{1}{1 + 2\frac{T_p}{T_t}}$$

$$\mu = \frac{1}{1 + 2a} \qquad \frac{T_p}{T_t} = a$$

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30/01/26



Condition

① One frame at a time

* Acknowledgement

Data→ 01111101

01111001

* Timer

A→B ⇒ $T_t + T_p$

B→A → T_p

*Timer = $T_t + 2TP$ + buffer

n | flag | Exec

* Seq No

* Commulative ACK

⇒ Ack for the Next desired Frame

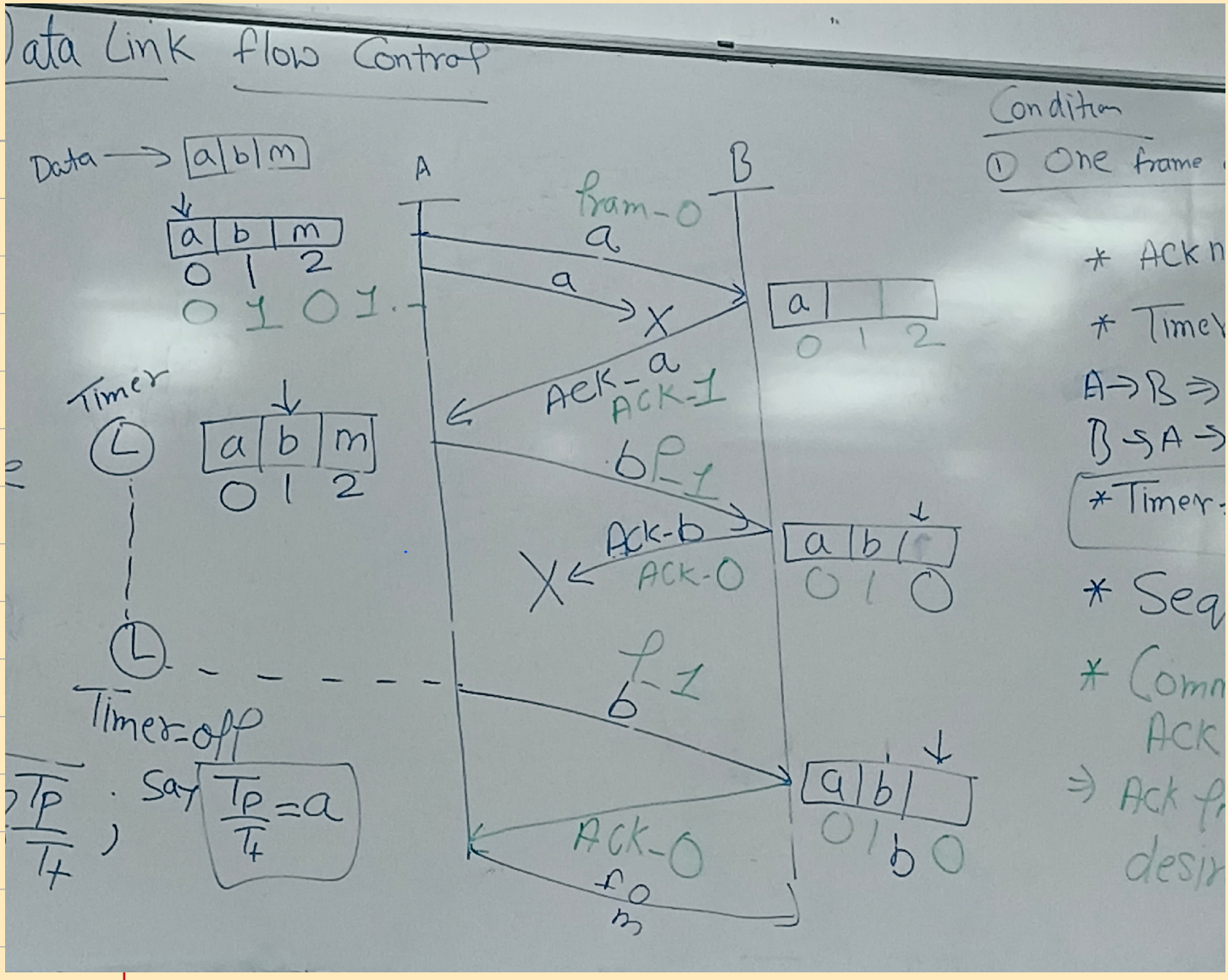
L = 1mb, B = 10mbps, L = 10Km.

S = $0.7 \times 3 \times 10^8$ m/sec

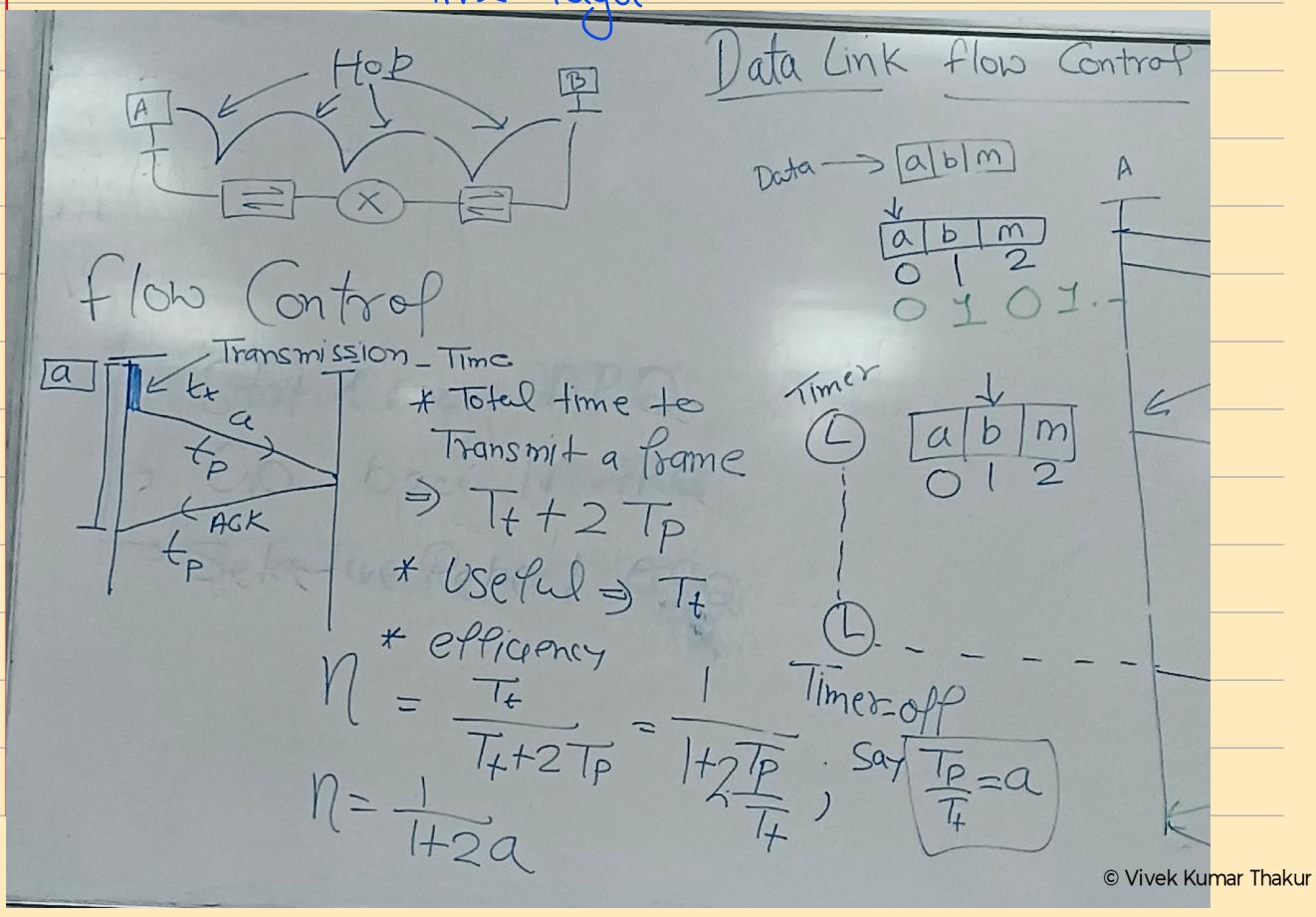
find η for stop & wait

$T_t = \frac{L}{B} = \frac{1 \times 10^6}{10 \times 10^6}$ | $T_p = \frac{10 \times 10^3}{7 \times 3 \times 10^8}$

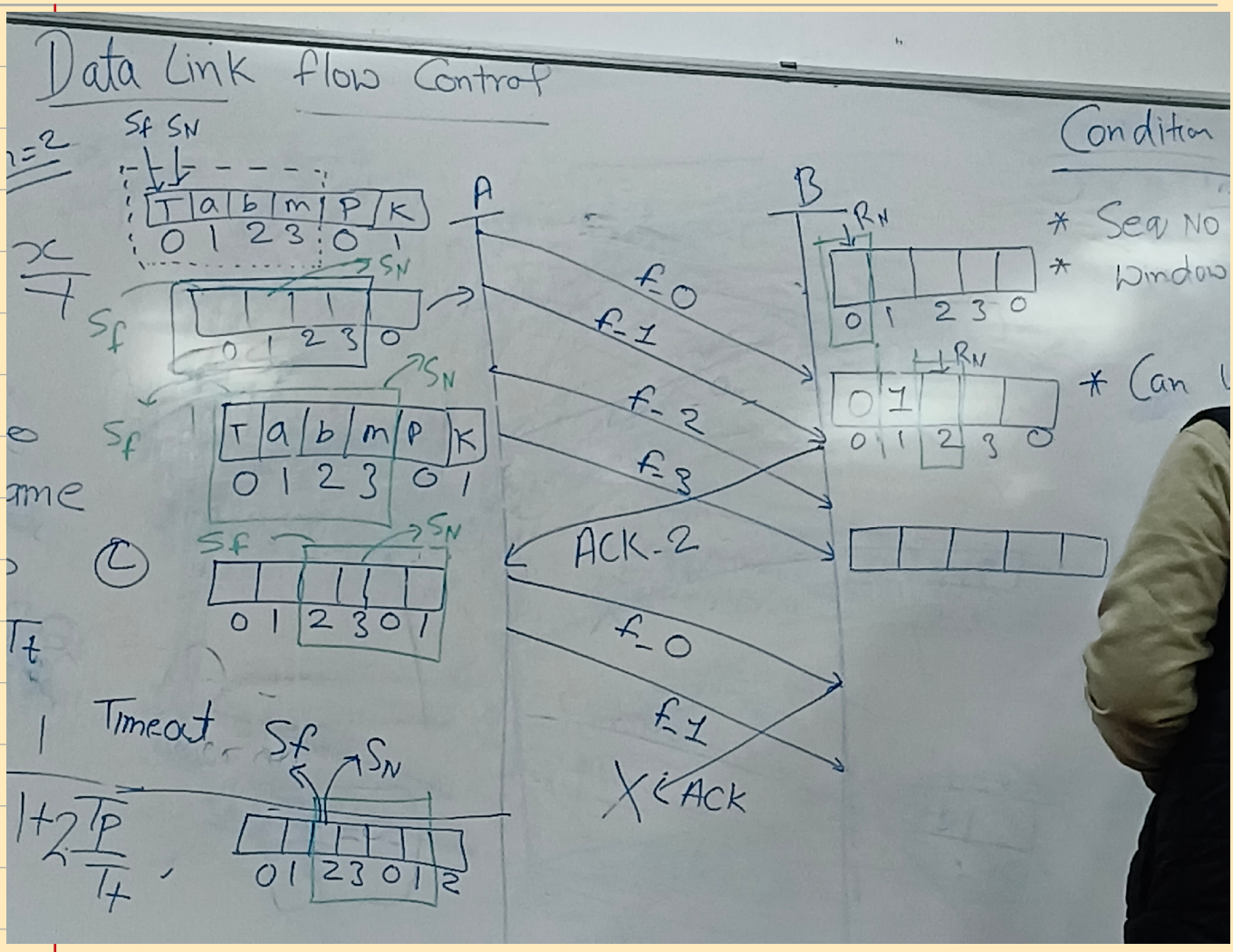
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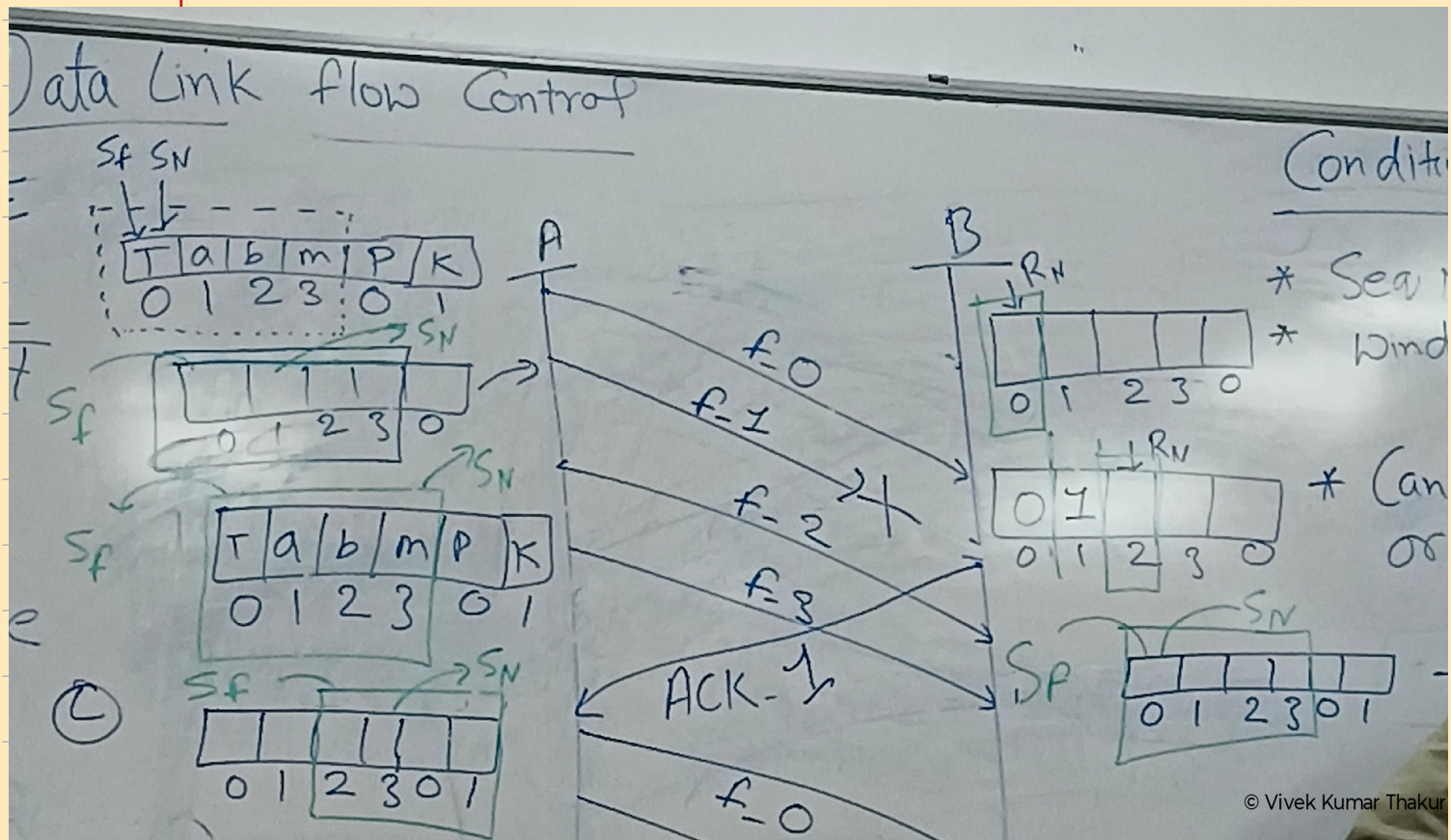


- Useful time: Sender ko send karne me kitna time laga

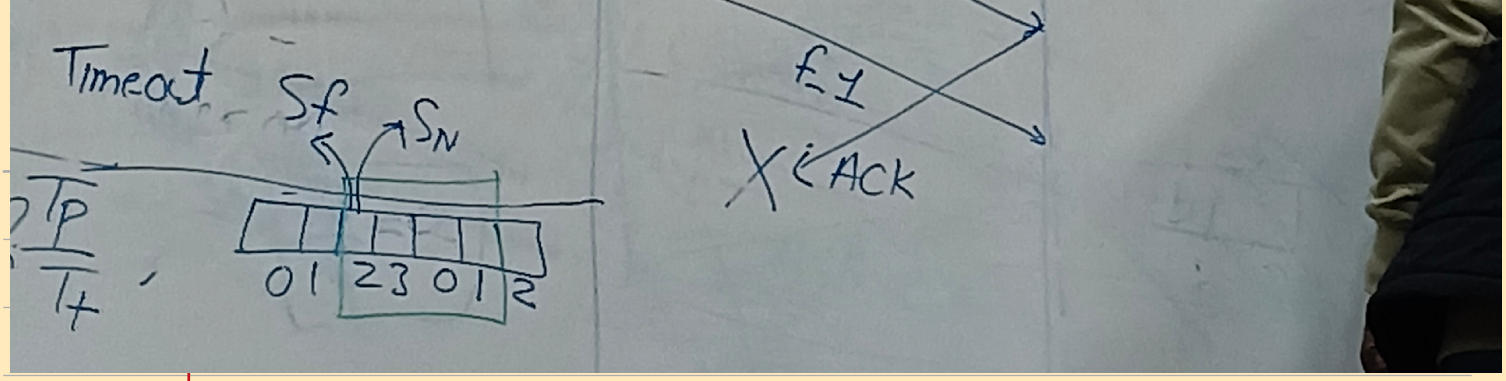


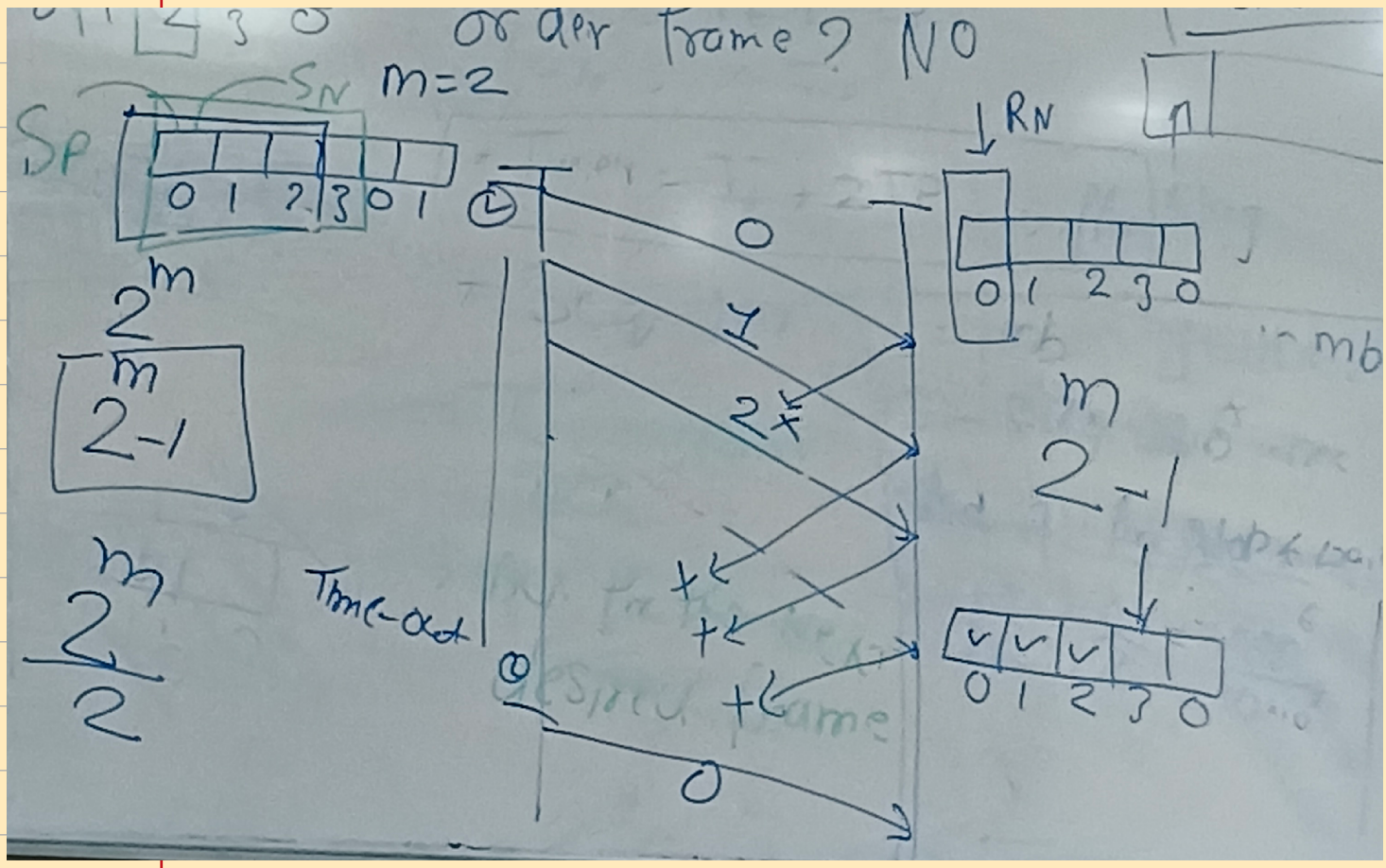
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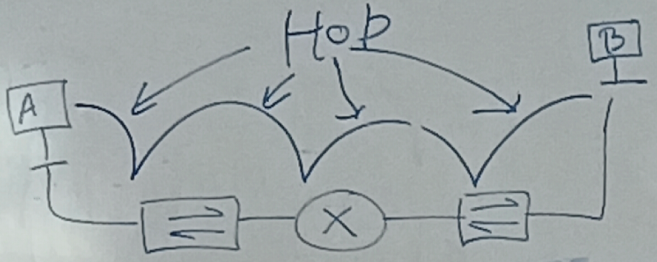
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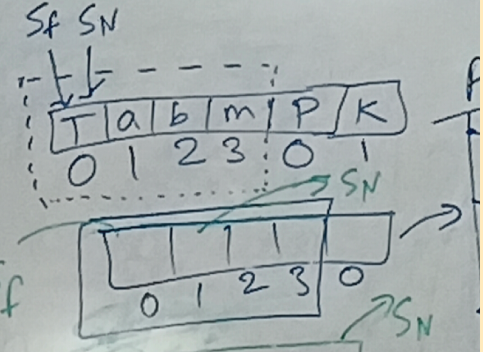
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Data Link flow Con

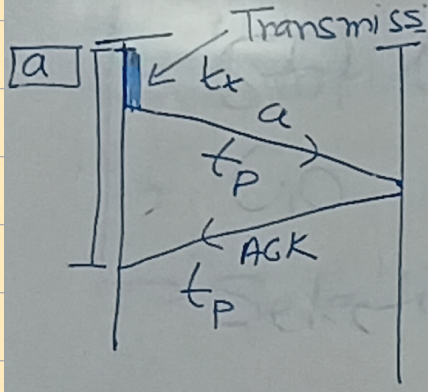


$m=2$

$\therefore 2 = \frac{x}{4}$

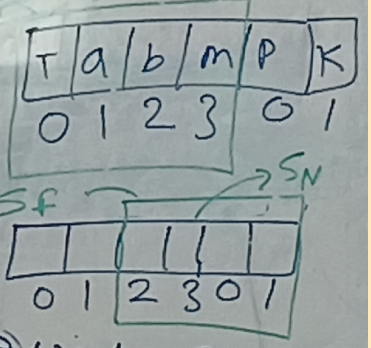


flow Control



* Total time to Transmit a frame

$\Rightarrow T_t + 2T_p$ (L)

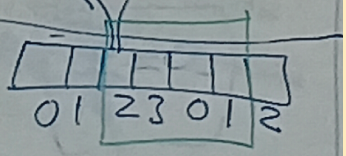


* Useful $\Rightarrow T_t \times W_s \rightarrow$ Window Size

* efficiency

$$\eta = \frac{T_t W_s}{T_t + 2T_p} = \frac{1.W_s}{1+2\frac{T_p}{T_t}}$$

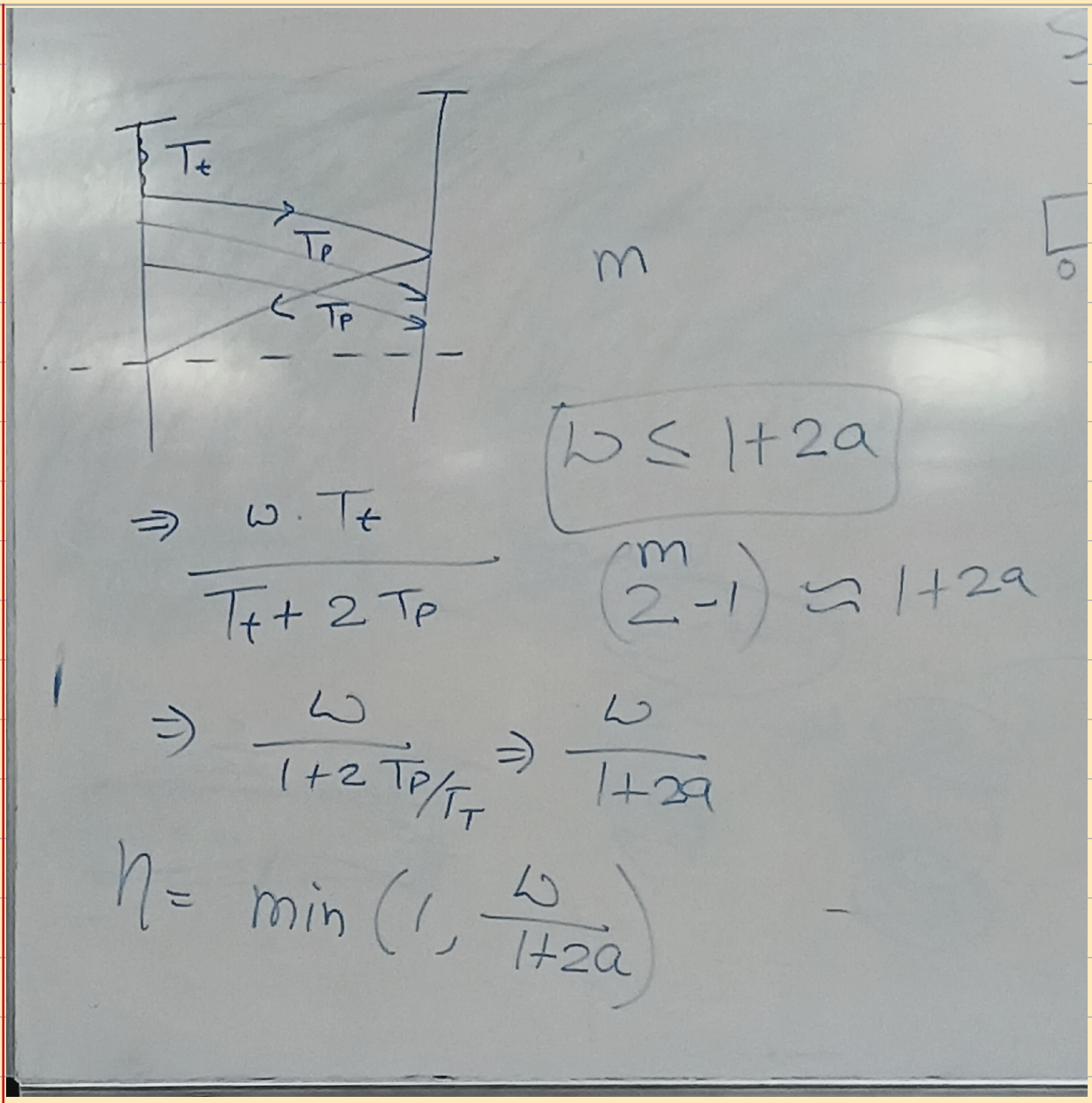
Timeout Sf SN

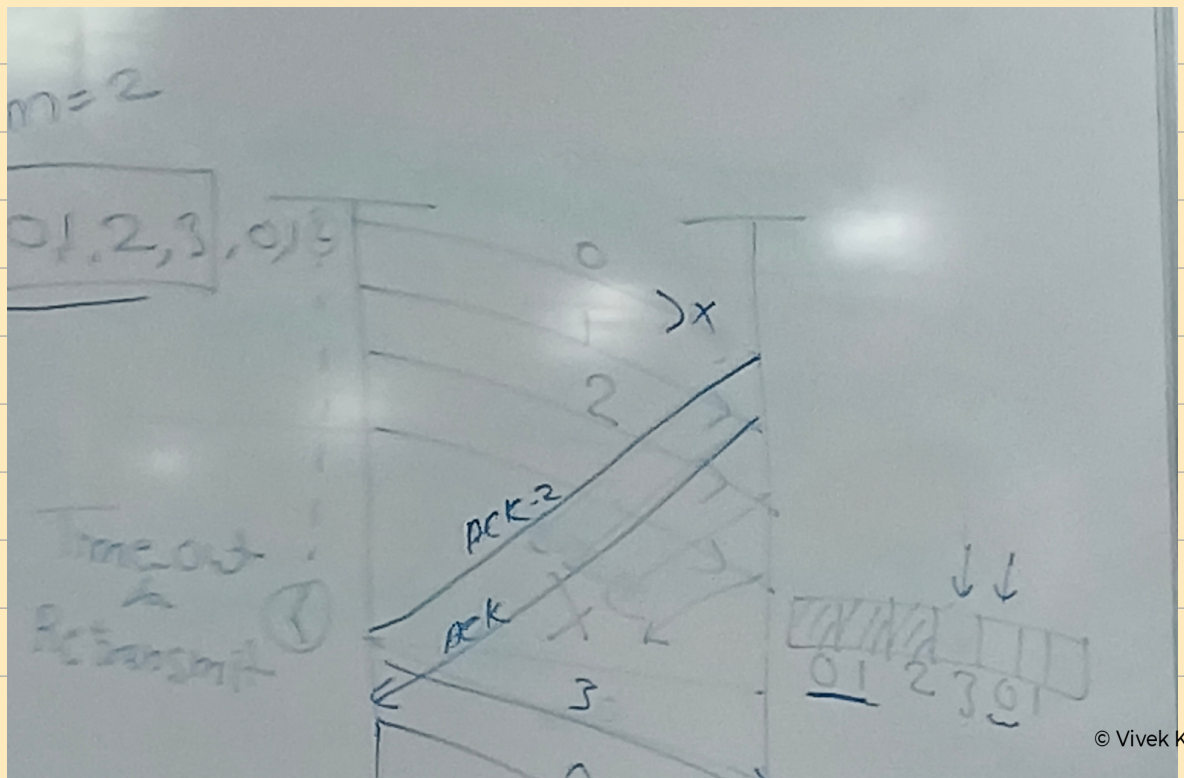


$$\eta = \frac{W_s}{1+2a}$$

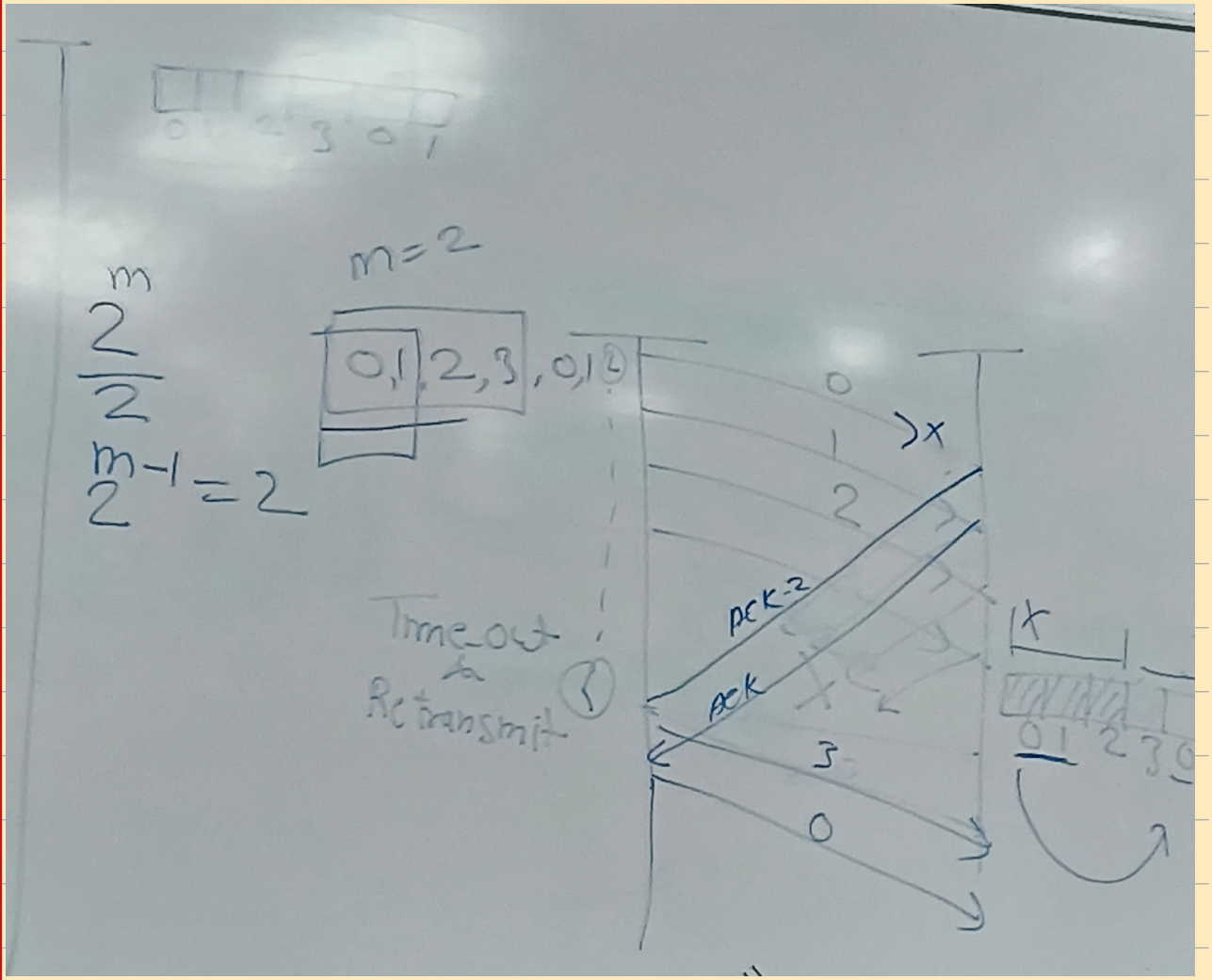
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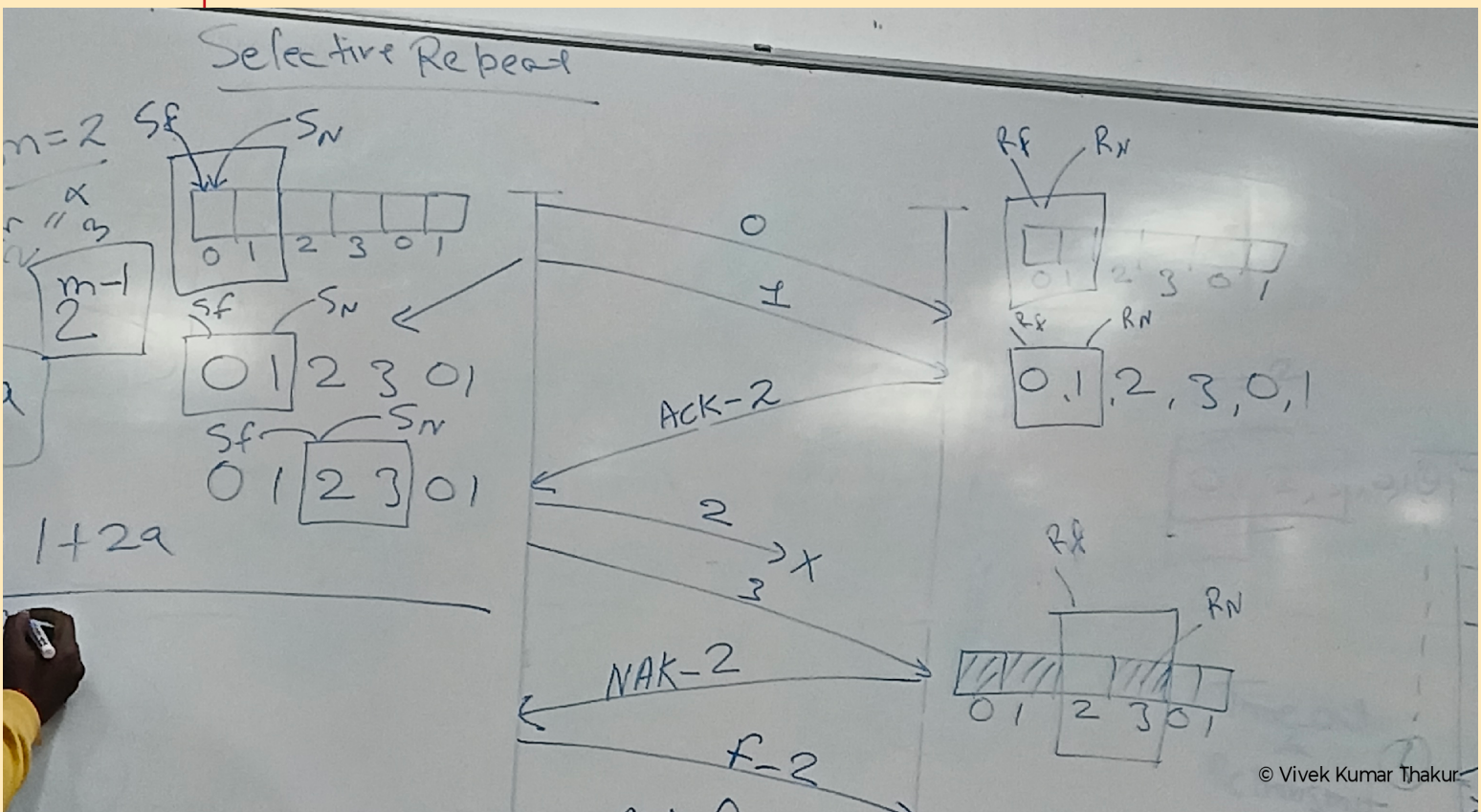
03/02/26

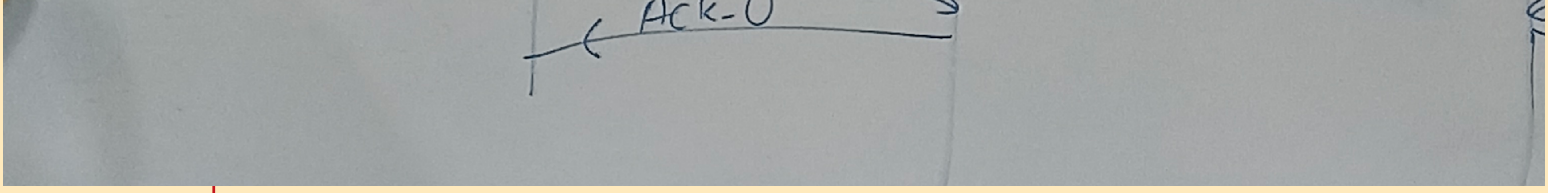


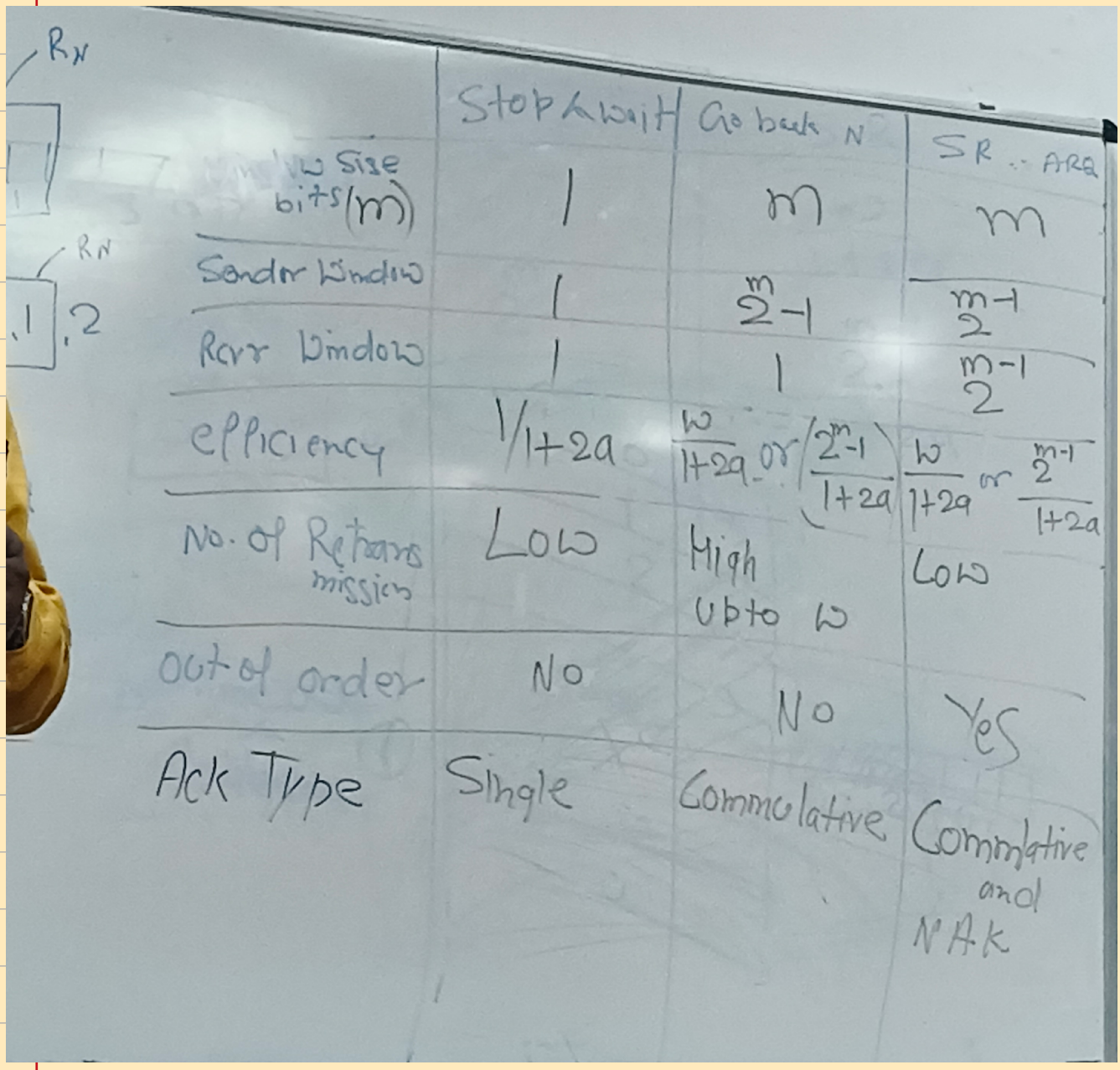


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m=2
2^m
$\frac{2}{2}$
$2^{m-1}=2$
0,1,2,3,0,1
Timeout
&
Retransmit
ACK-2
ACK


Selective Repeat
m=2
2^{m-1}
Sf
SN
RF
RN
0 1 2 3 0 1
0 1 2 3 0 1
0 1 2 3 0 1
0 1 2 3 0 1
ACK-2
NAK-2
1+2a
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	Stop & wait	Go back N	SR - ARQ
W size bits (m)	1	m	m
Sender Window	1	$2^m - 1$	$\frac{2^m - 1}{2}$
Recr Window	1	1	$\frac{2^m - 1}{2}$
efficiency	$1/1+2a$	$\frac{W}{1+2a}$ or $\frac{2^m - 1}{1+2a}$	$\frac{W}{1+2a}$ or $\frac{2^m - 1}{1+2a}$
No. of Retrans mission	Low	High upto W	Low
out of order	No	No	Yes
Ack Type	Single	Commulative	Commulative and NAK

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