Go-Back NQR

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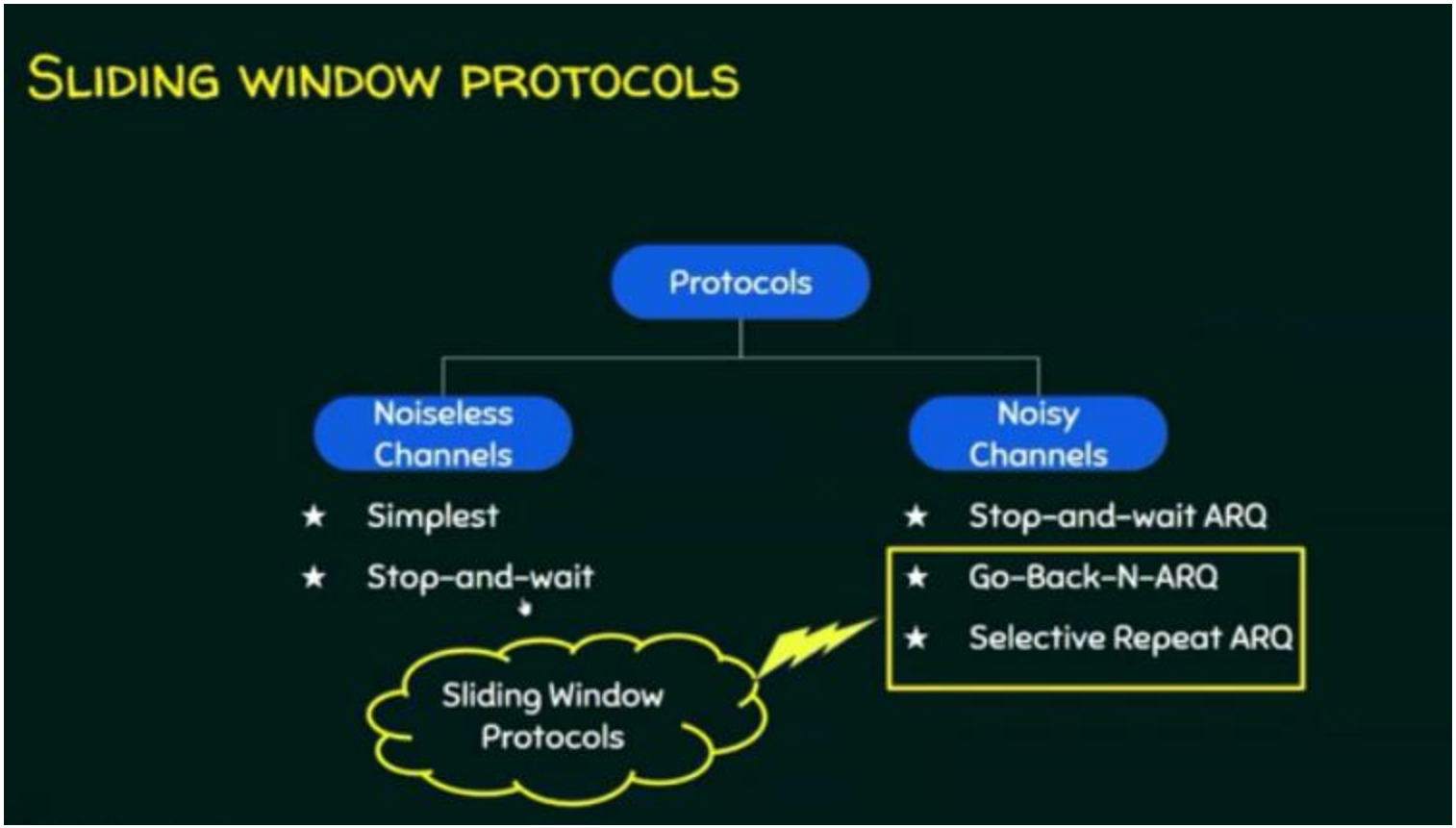
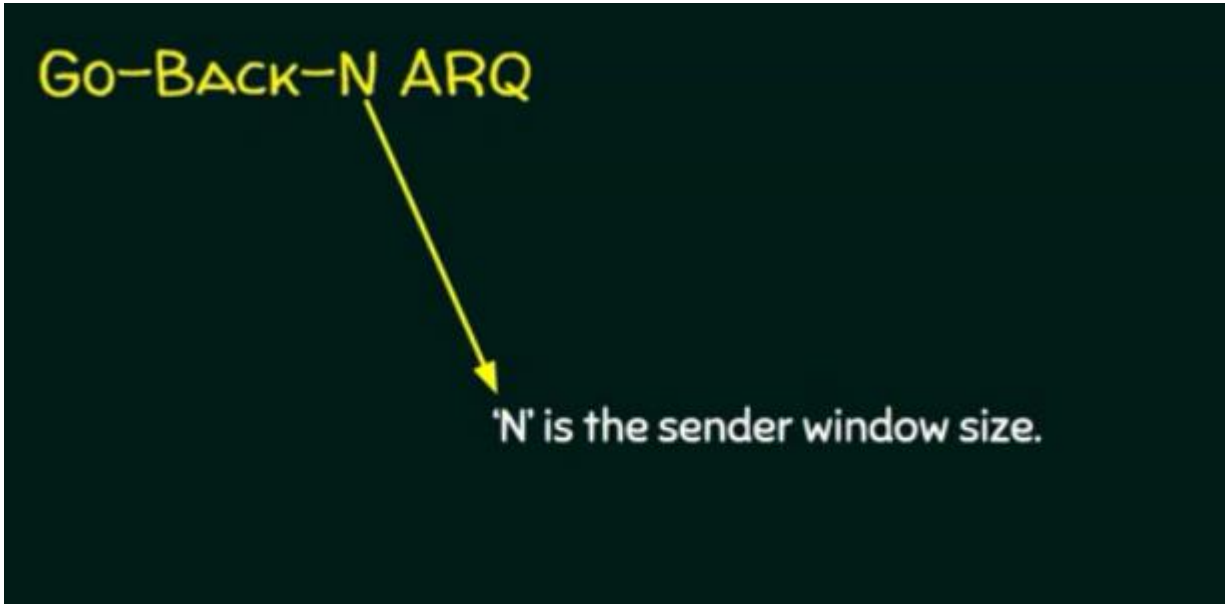
COMPUTER NETWORKS
A Bottom up approach
Go-Back-N ARQ

Outcomes

Upon the completion of this session, the learner will be able to

★ Understand the working of Go-back-N ARQ.


SLIDING WINDOW PROTOCOLS
Protocols
Noiseless Channels
Noisy Channels
★ Simplest
★ Stop-and-wait
★ Stop-and-wait ARQ
★ Go-Back-N-ARQ
★ Selective Repeat ARQ
Sliding Window Protocols

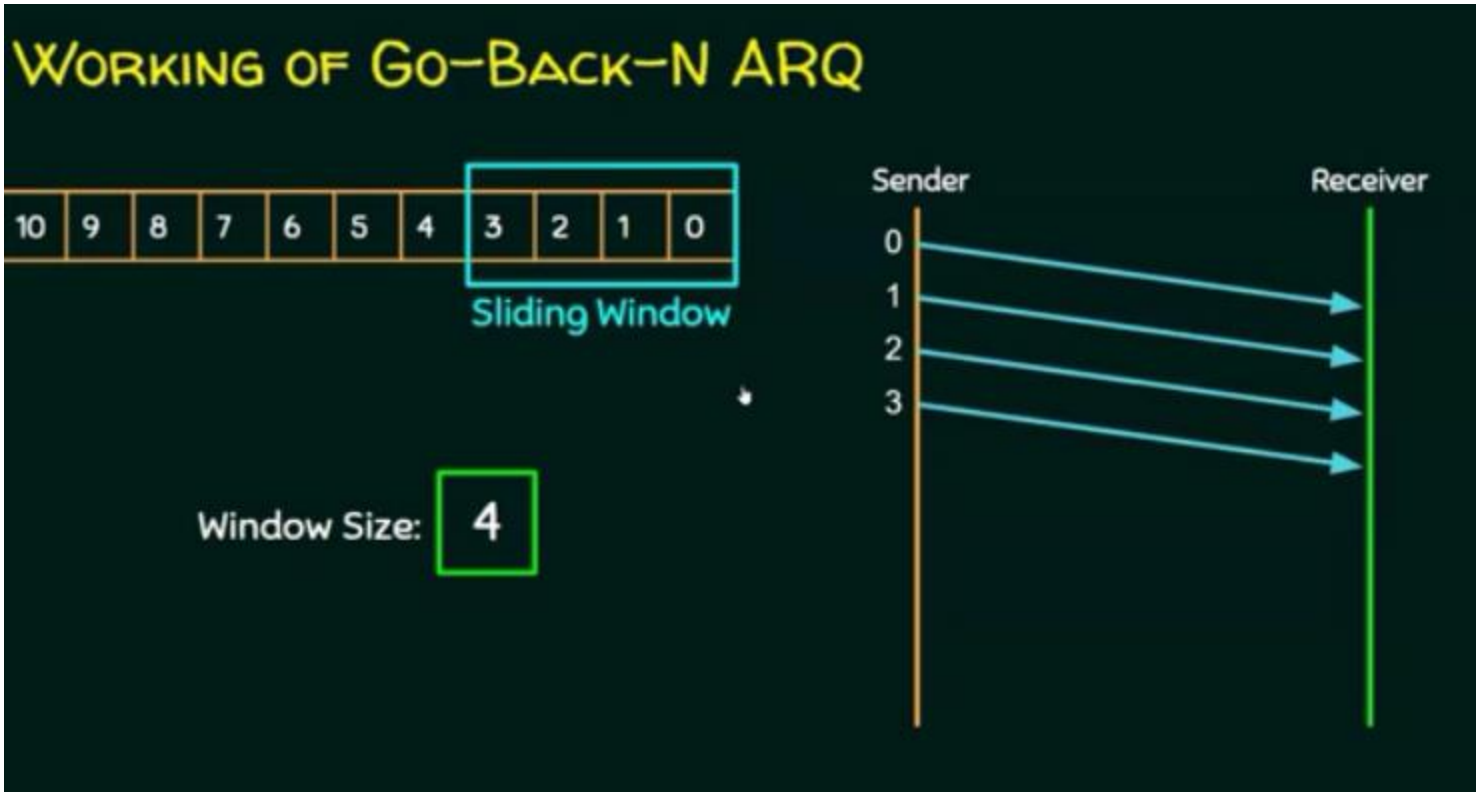

Go-Back-N ARQ
'N' is the sender window size.

Go-Back-N ARQ

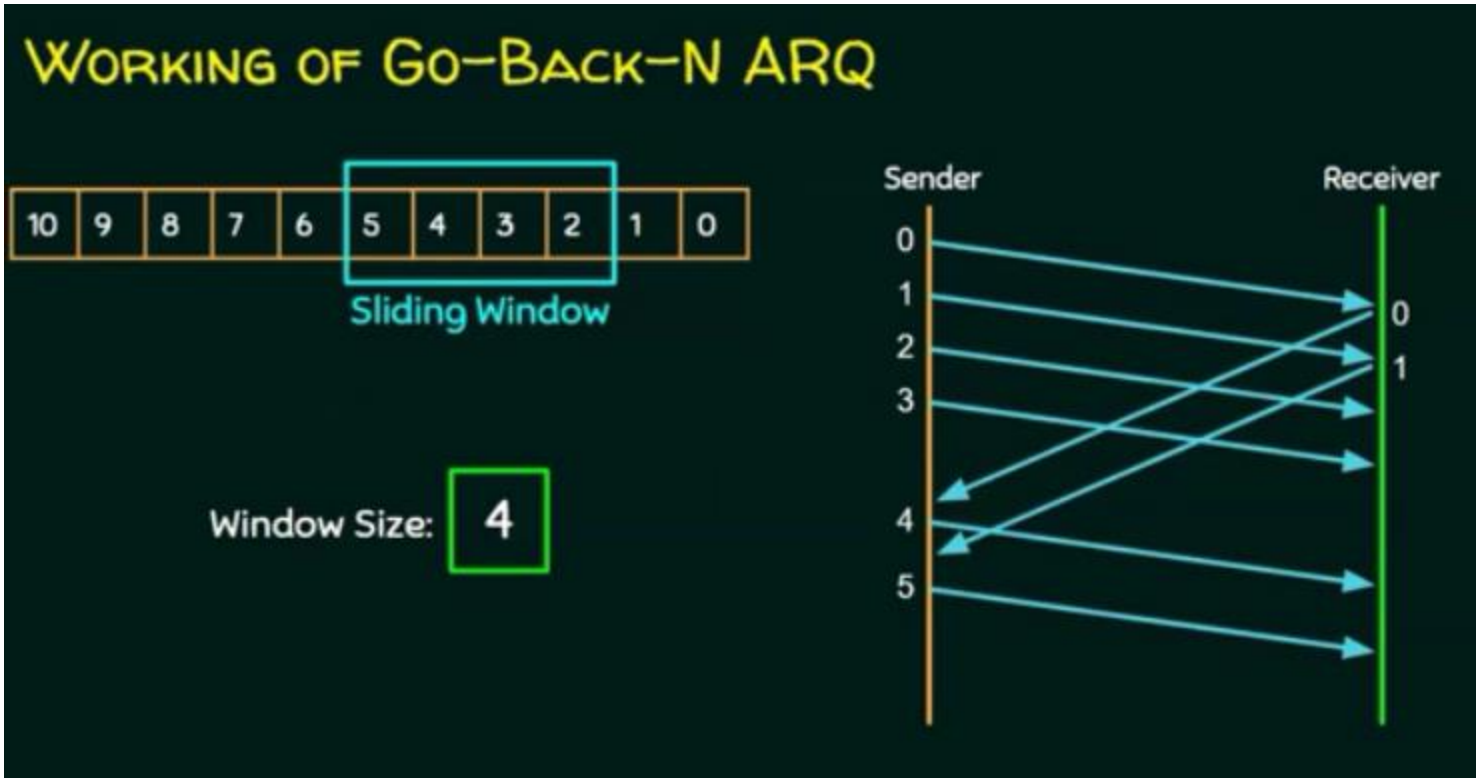
- ★ Go - Back - N ARQ uses the concept of protocol pipelining i.e. the sender can send multiple frames before receiving the acknowledgment for the first frame.
- ★ There are finite number of frames and the frames are numbered in a sequential manner.
- ★ The number of frames that can be sent depends on the window size of the sender.
- ★ If the acknowledgment of a frame is not received within an agreed upon time period, all frames in the current window are transmitted.

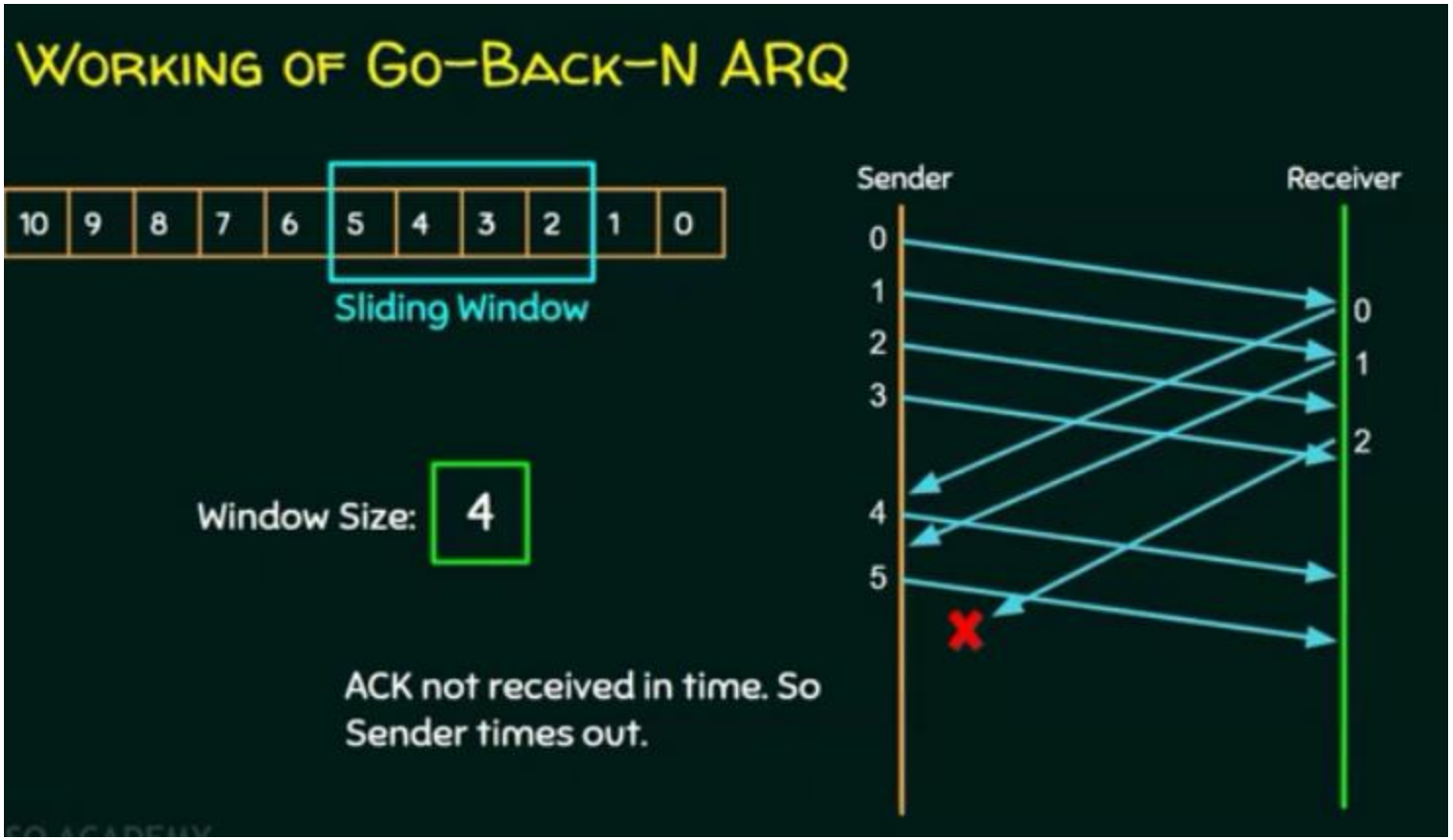
Go-Back-N ARQ

- ★ N – Sender's Window Size.
- ★ For example, if the sending window size is 4 (2^2), then the sequence numbers will be 0, 1, 2, 3, 0, 1, 2, 3, 0, 1, and so on.
- ★ The number of bits in the sequence number is 2 to generate the binary sequence 00, 01, 10, 11.


Working of Go-Back-N ARQ
10 9 8 7 6 5 4 3 2 1 0
Sliding Window
Window Size: 4
Sender
Receiver
0
1
2
3


Working of Go-Back-N ARQ
10 9 8 7 6 5 4 3 2 1 0
Sliding Window
Window Size: 4
Sender
Receiver
0
1
2
3
4
0


Working of Go-Back-N ARQ
10 9 8 7 6 5 4 3 2 1 0
Sliding Window
Window Size: 4
Sender
Receiver
0
1
2
3
4
5
0
1


WORKING OF GO-BACK-N ARQ
10 9 8 7 6 5 4 3 2 1 0
Sliding Window
Window Size: 4
ACK not received in time. So Sender times out.
Sender
Receiver
0
1
2
3
4
5
0
1
2


WORKING OF GO-BACK-N ARQ
10 9 8 7 6 5 4 3 2 1 0
Sliding Window
Go-Back to 2
Window Size: 4
Sender
Receiver
0
1
2
3
4
5
2
3
4
5
0
1
2
X

QUESTION

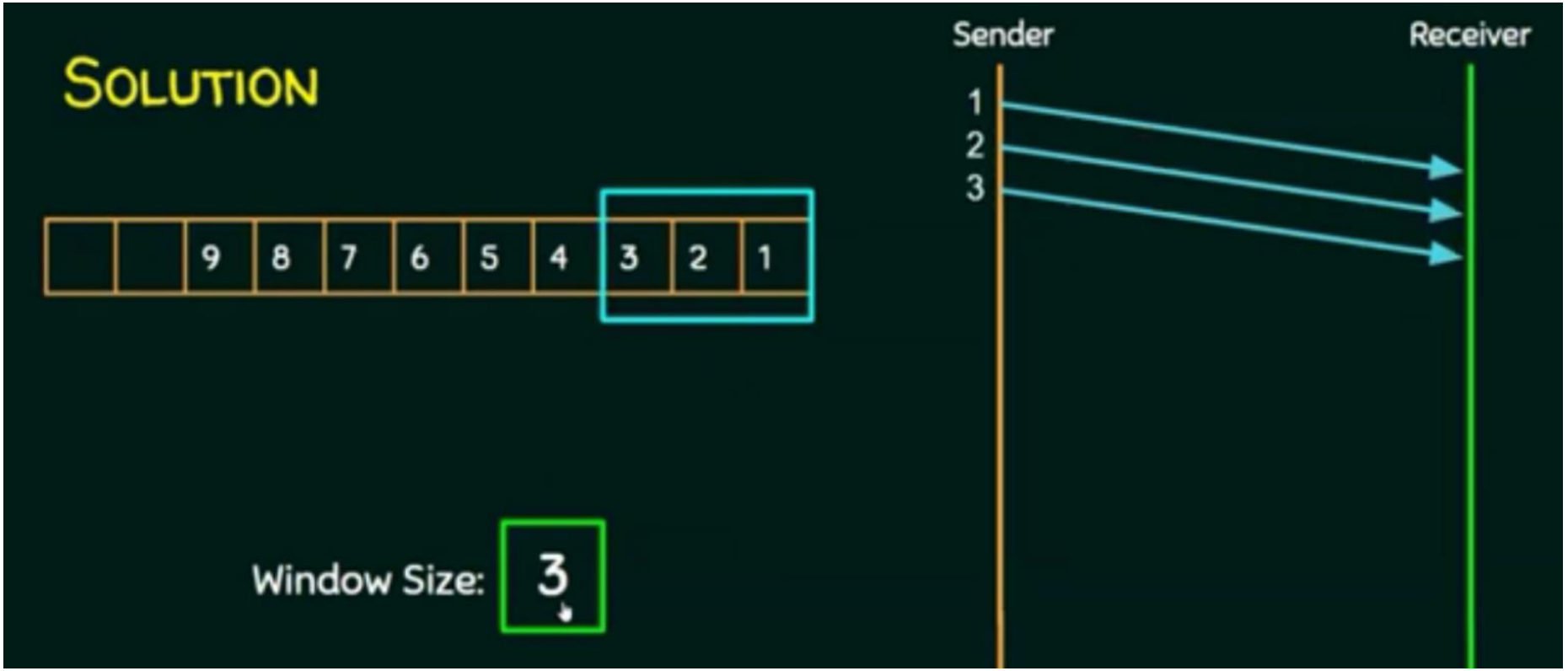
Station A needs to send a message consisting of 9 packets to station B using a sliding window (window size 3) and go-back-n error control strategy. All packets are ready and immediately available for transmission. If every 5th packet that A transmits gets lost (but no ACKs from B ever get lost), then what is the number of packets that A will transmit for sending the message to B? [GATE CS 2006]

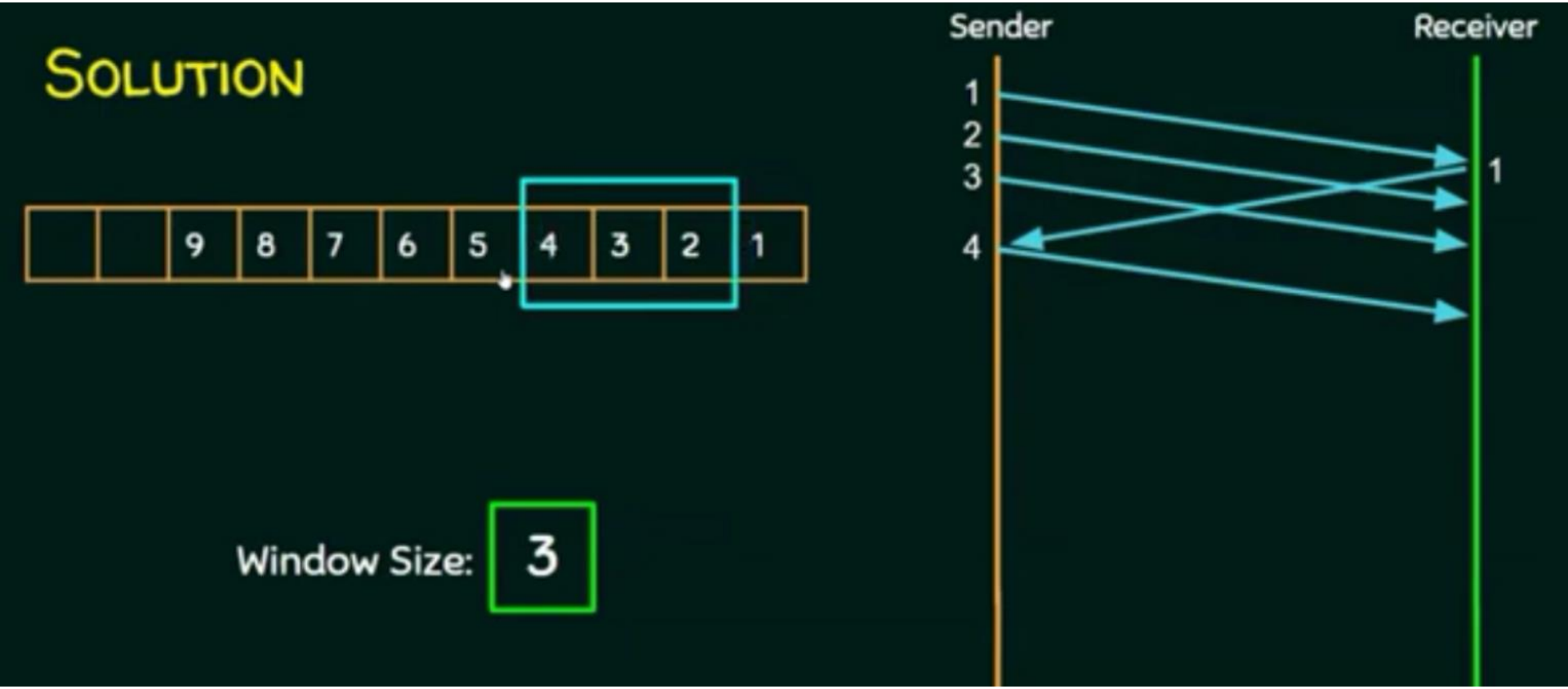
(A) 12

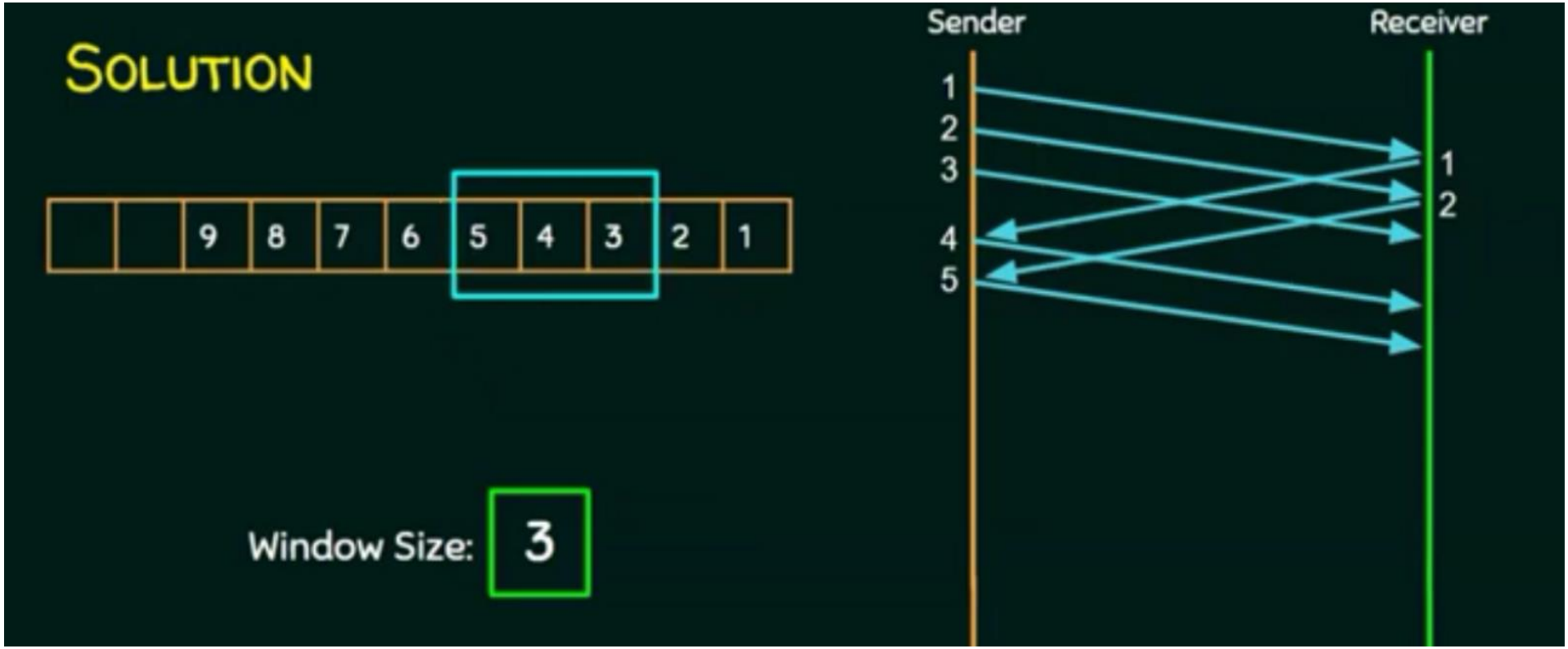
(B) 14

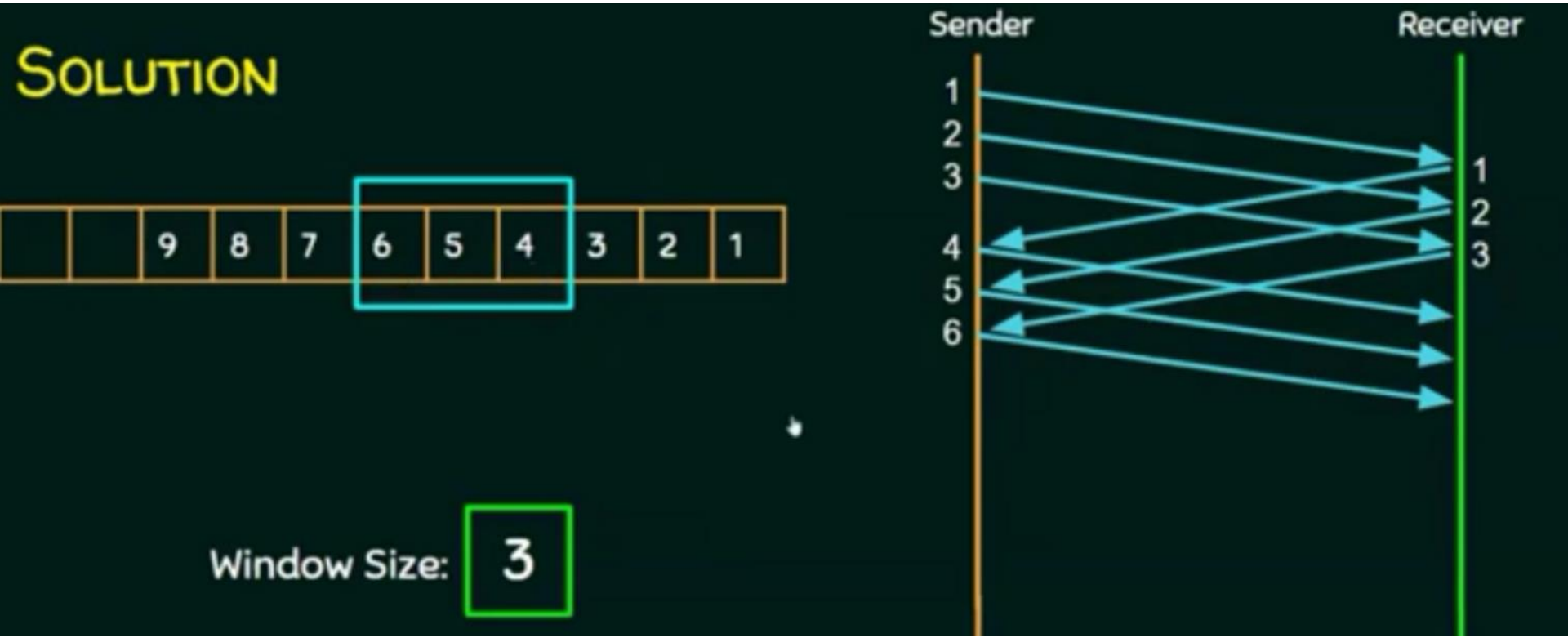
(C) 16

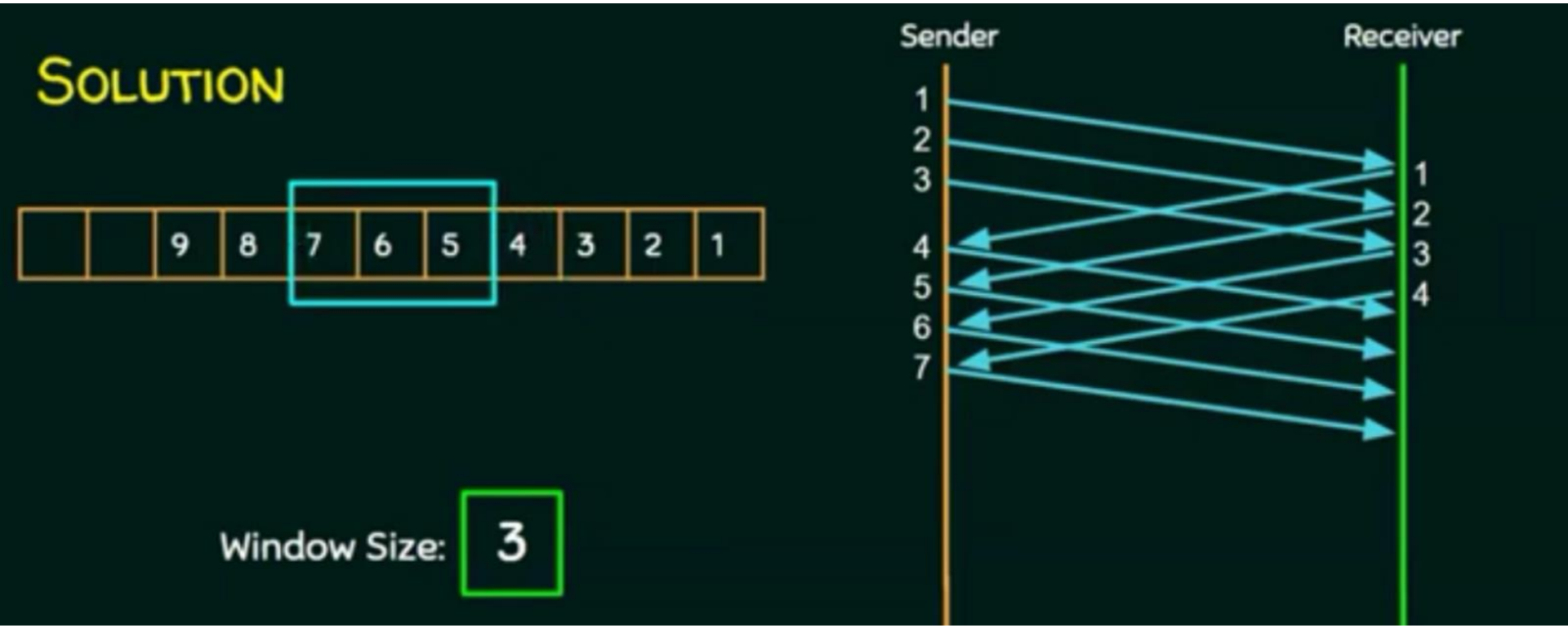
(D) 18

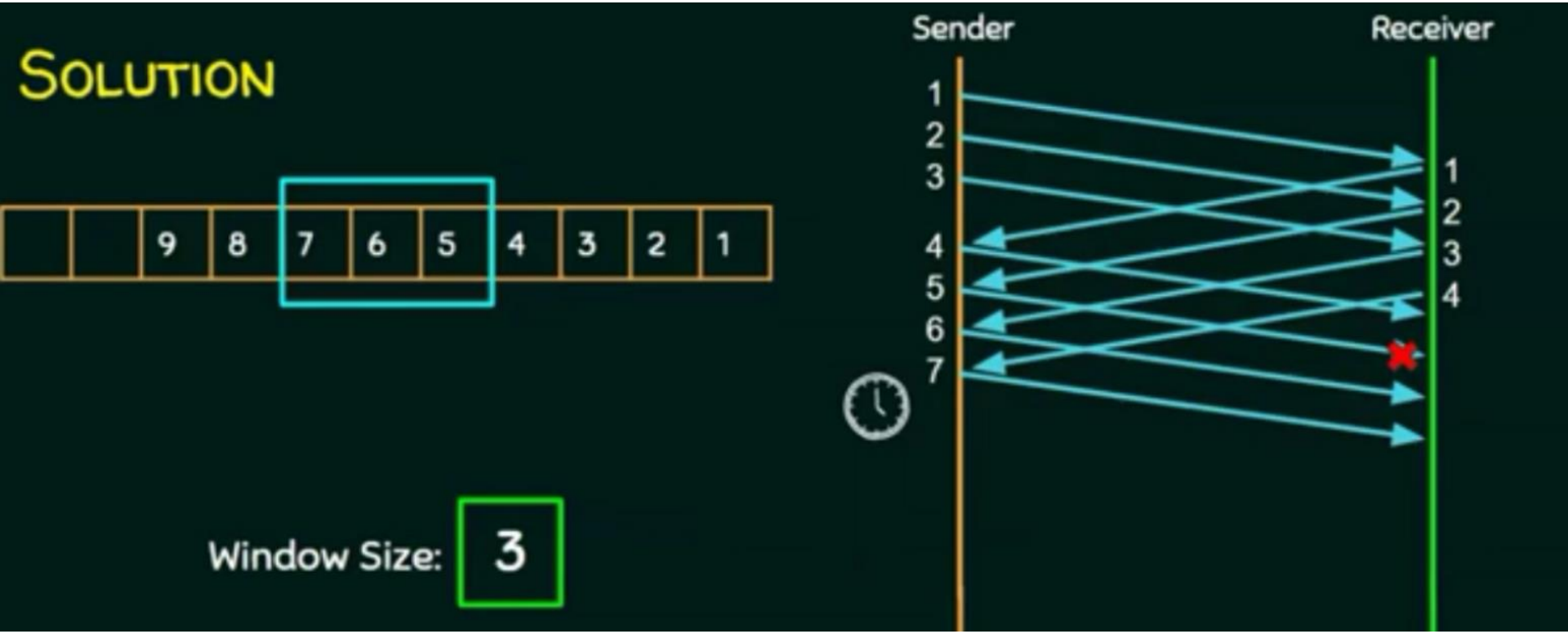

SOLUTION
Sender
Receiver
1
2
3
9
8
7
6
5
4
3
2
1
Window Size:
3

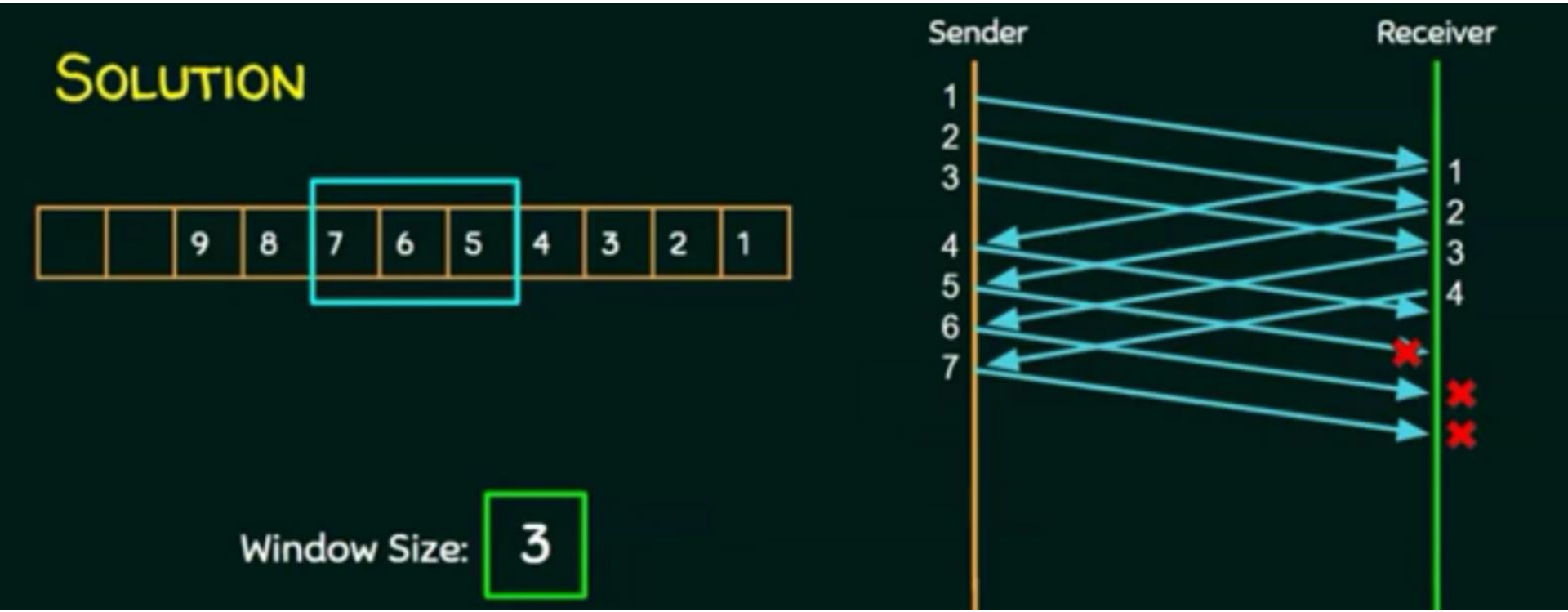

SOLUTION
9
8
7
6
5
4
3
2
1
Window Size:
3
Sender
Receiver
1
2
3
4
1

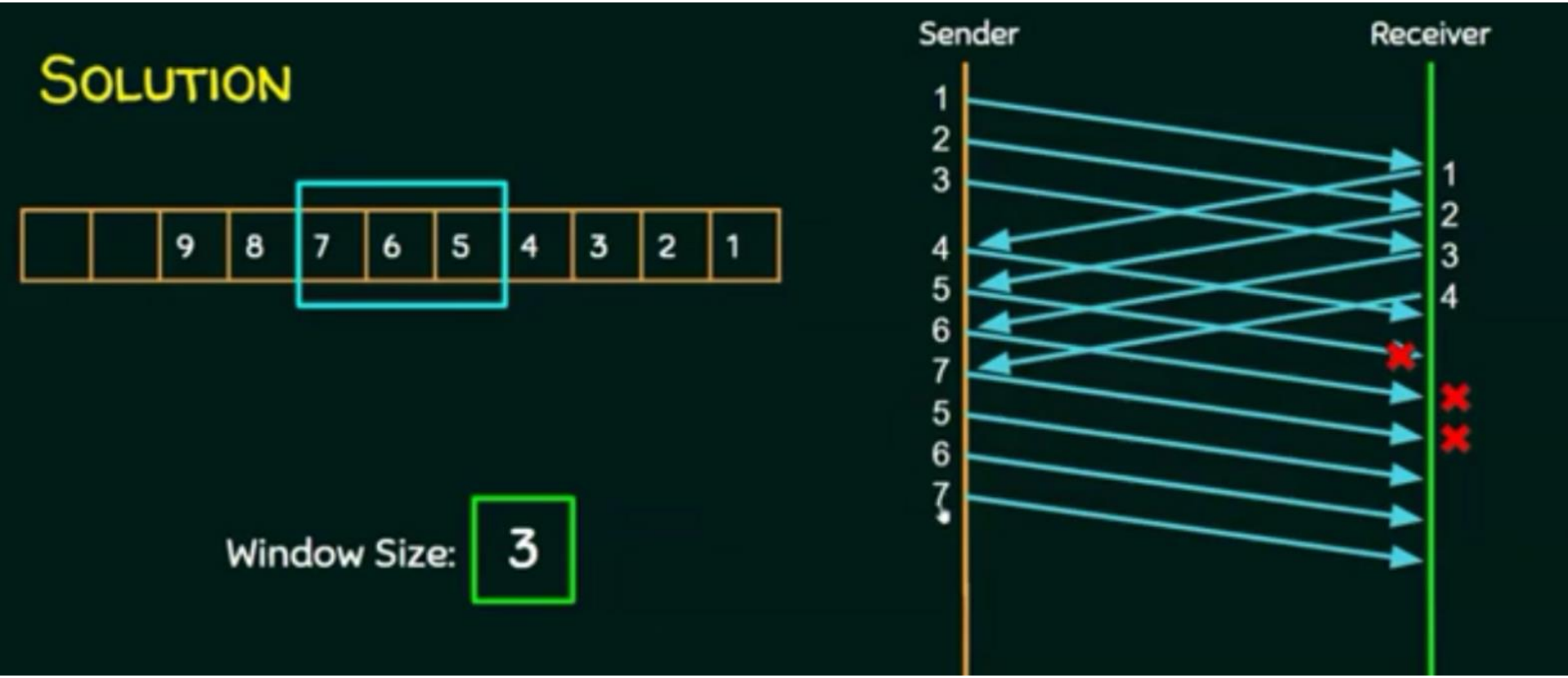

SOLUTION
9
8
7
6
5
4
3
2
1
Window Size:
3
Sender
Receiver
1
2
3
4
5
1
2


SOLUTION
9
8
7
6
5
4
3
2
1
Window Size:
3
Sender
Receiver
1
2
3
4
5
6
1
2
3

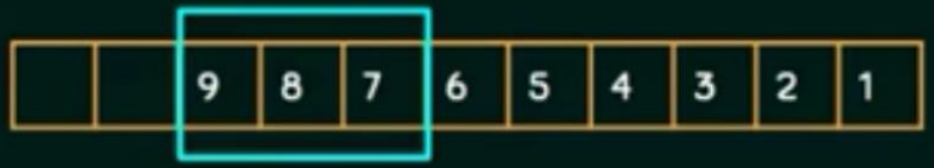

SOLUTION
9
8
7
6
5
4
3
2
1
Window Size:
3
Sender
Receiver
1
2
3
4
5
6
7
1
2
3
4


SOLUTION
9
8
7
6
5
4
3
2
1
Window Size:
3
Sender
Receiver
1
2
3
4
5
6
7
1
2
3
4

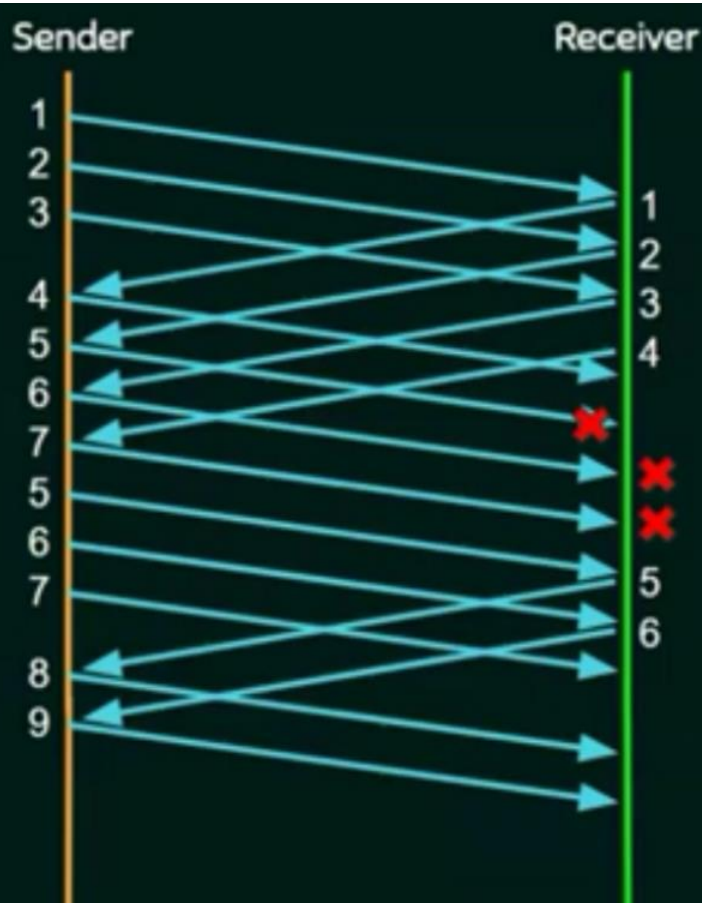

SOLUTION
9
8
7
6
5
4
3
2
1
Window Size:
3
Sender
Receiver
1
2
3
4
5
6
7
1
2
3
4

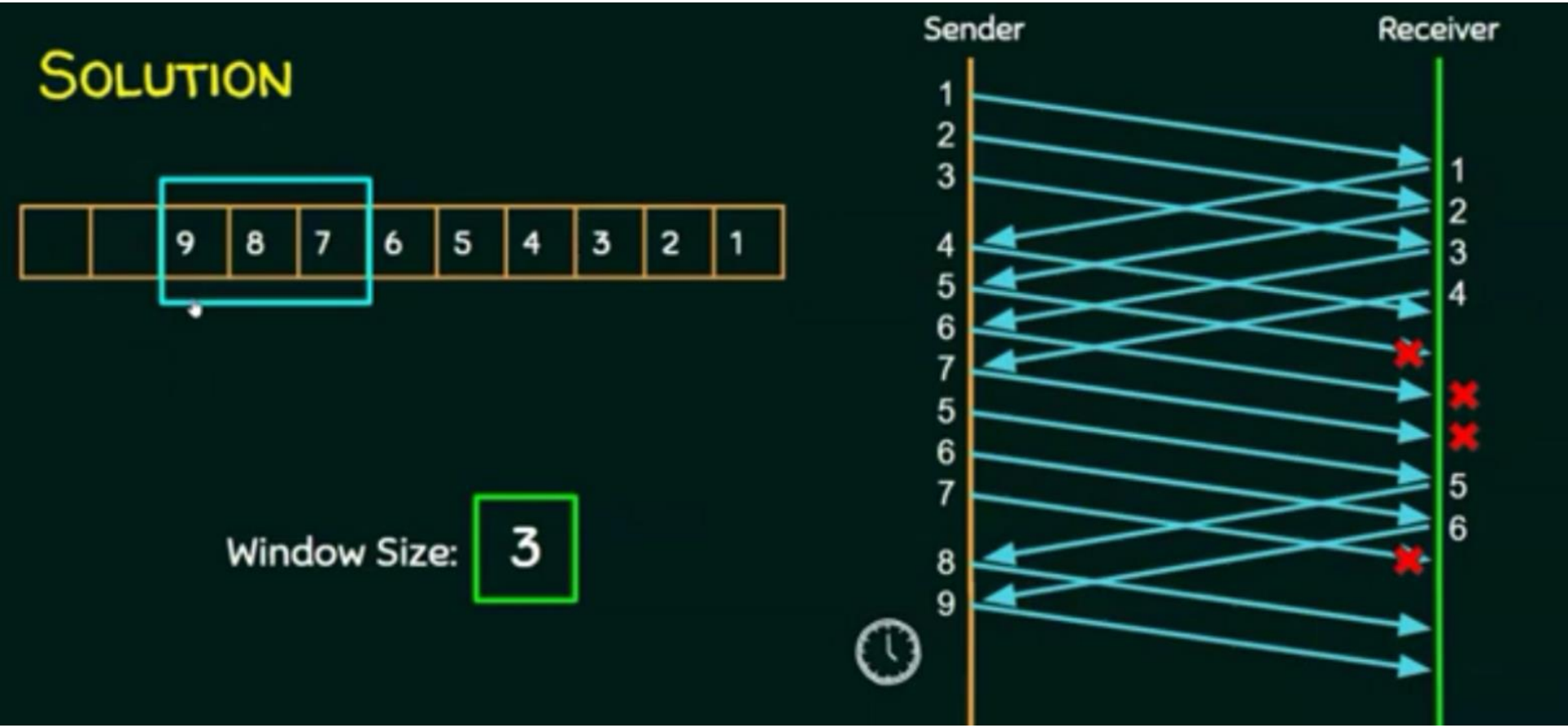

SOLUTION
9
8
7
6
5
4
3
2
1
Window Size:
3
Sender
Receiver
1
2
3
4
5
6
7
5
6
7
1
2
3
4

Solution

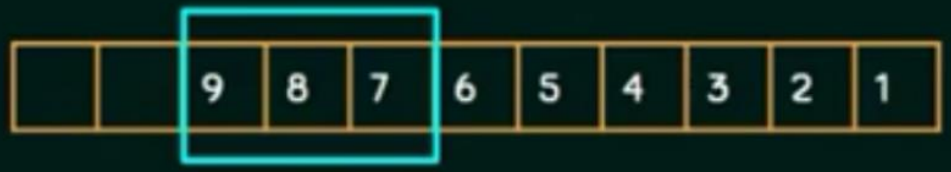


Window Size: 3

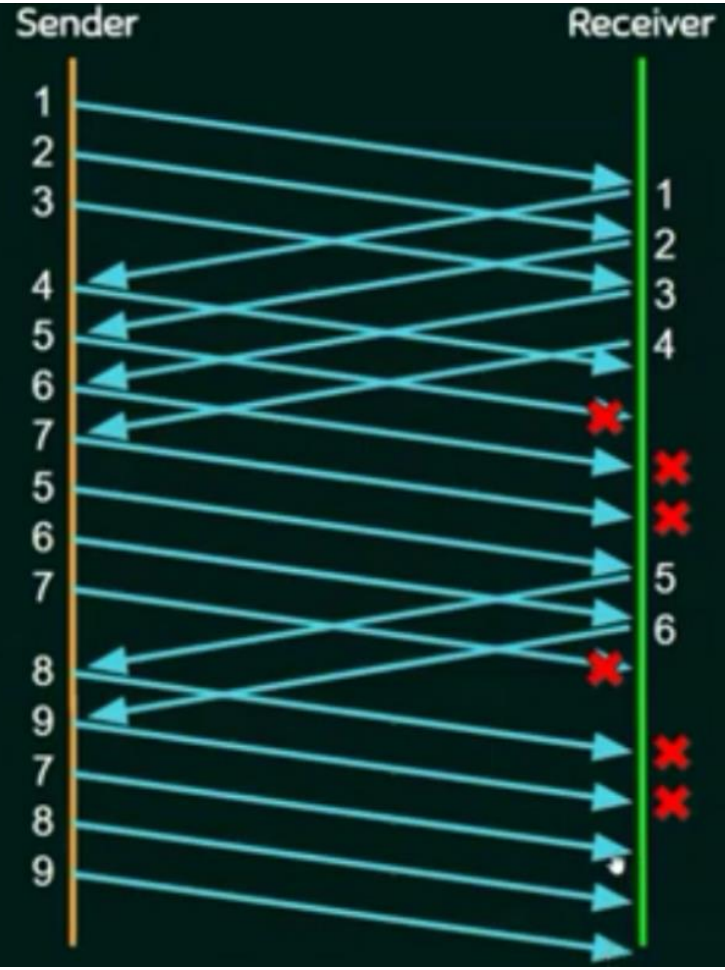



SOLUTION
9
8
7
6
5
4
3
2
1
Window Size:
3
Sender
Receiver
1
2
3
4
5
6
7
5
6
7
8
9
1
2
3
4
5
6

Solution

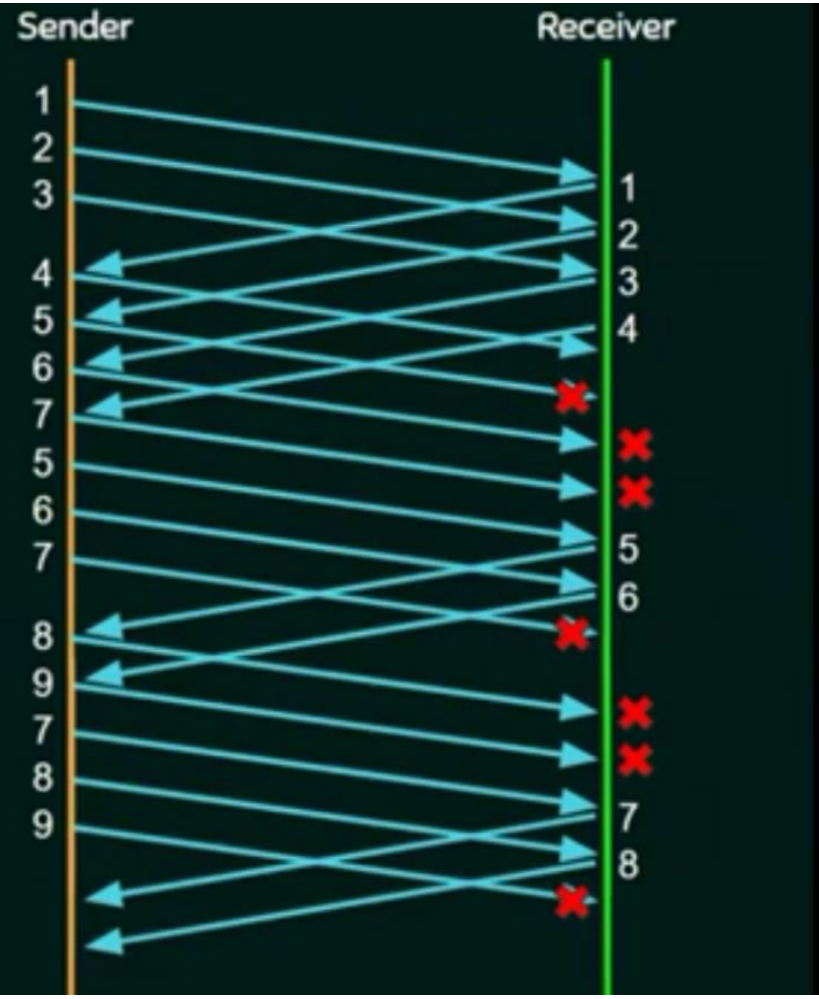


Window Size: 3



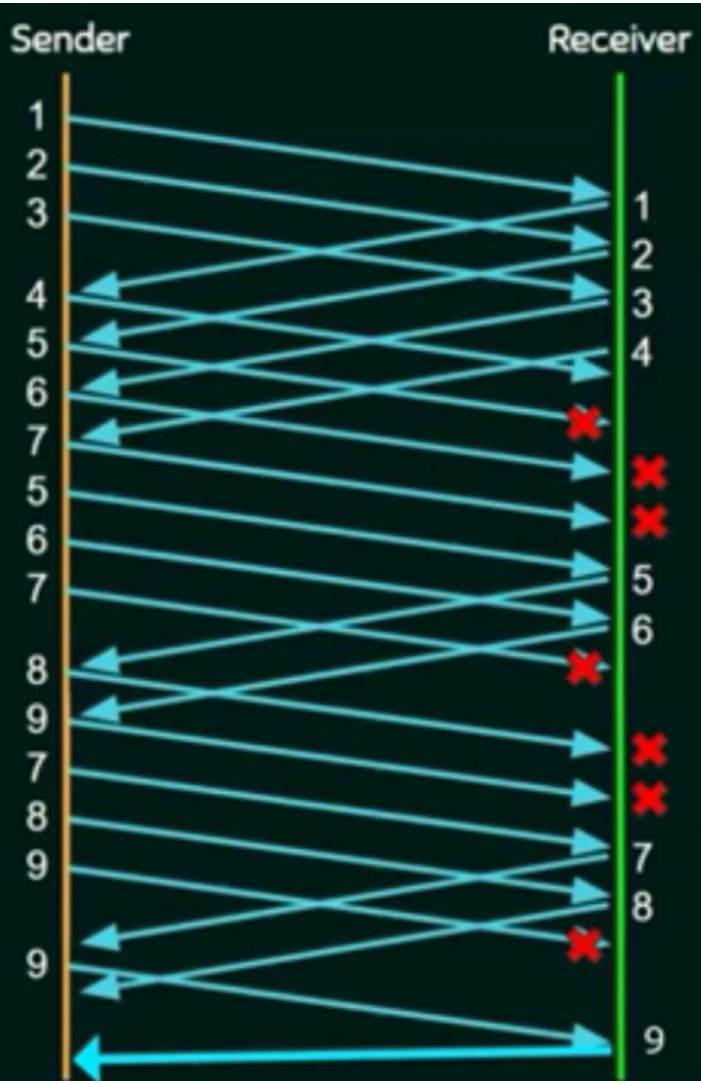
Solution

Window Size: 3

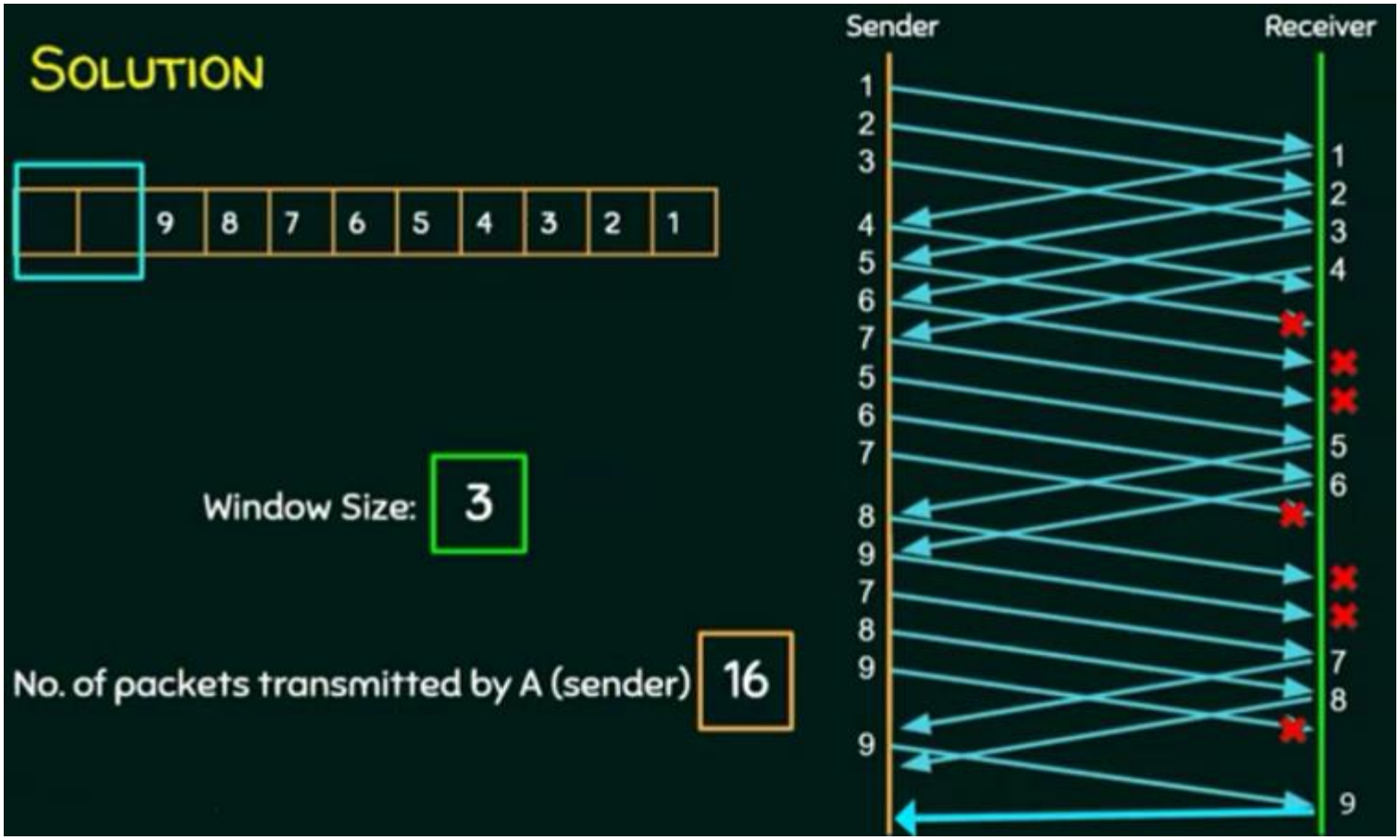


Solution

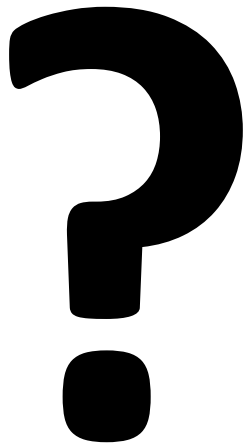
Window Size: 3



NESO ACADEMY


SOLUTION
9 8 7 6 5 4 3 2 1
Window Size: 3
No. of packets transmitted by A (sender) 16
Sender
Receiver
1 2 3 4 5 6 7 5 6 7 8 9 7 8 9 9
1 2 3 4 5 6 7 8 9

Questions




THANK YOU!