THADOMAL SHAHANI TSEC ENGINEERING COLLEGE

EXPERIMENT NO. 4

Aim :- To simulate the Go Back N flow control algorithm.

Theory :-

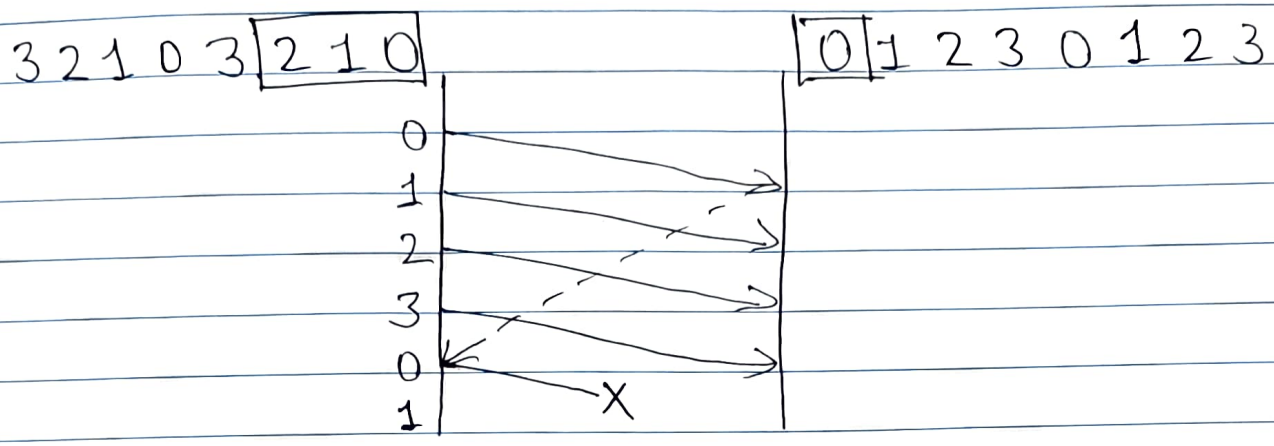
Go Back N is a type of a sliding window protocol. In this protocol, the sender can send the frames in window without receiving the acknowledgement of previously sent frame.

In the Go Back N, the window size of sender is N bits, and it means N bits can be sent without receiving acknowledgement of first frame. The receiver's window size is of 1 bit.

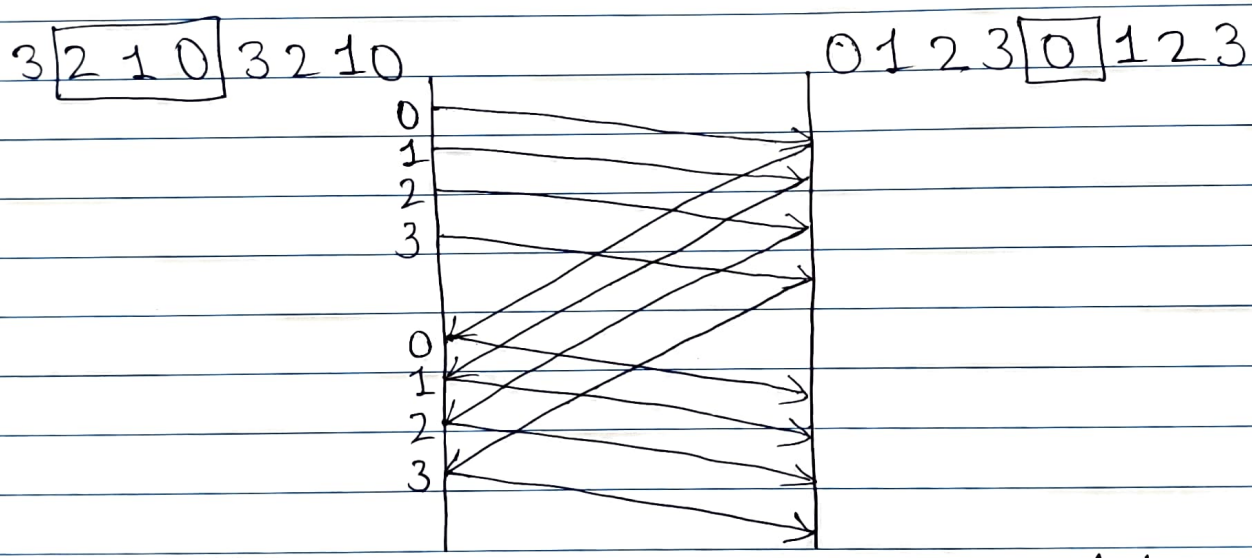
For Go Back N protocol, if there are k bits in sequence numbers, the sender's window size is of $2^k - 1$ bits. If sender does not receive the acknowledgement, it leads to retransmission of all the current window frames.

If the window size of sender is set to 2^k bits, then data loss can occur if the first bit of sequence gets lost, then the sequence on the receiver's end gets ahead of the data from sender's side.

Example :- k=2, data = 01230123
Window size of sender = $2^k - 1 = 3$



Frame 0 was lost, so the entire window consisting of 0, 1 and 2 will be retransmitted.



The window was resent and the complete data got transmitted successfully.

Conclusion :- Implemented the Go Back N ARQ flow control algorithm.

```
import random
import time

total_frames = int(input("Enter the total number of frames: "))
window_size = int(input("Enter the Window Size: "))
total_transmissions = 0
random.seed(time.time())

current_frame = 1
while current_frame <= total_frames:
    transmitted_frames = 0
    for frame in range(current_frame, min(current_frame +
window_size, total_frames + 1)):
        print("Frames sent", frame)
        total_transmissions += 1

    for frame in range(current_frame, min(current_frame +
window_size, total_frames + 1)):
        flag = random.randint(0, 1)
        if not flag:
            print("Acknowledgment for Frame", frame)
            transmitted_frames += 1
        else:
            print("Frame", frame, "Not Received")
            print("Retransmitting Window")
            break

    print()
    current_frame += transmitted_frames

print("Total number of transmissions:", total_transmissions)

'''
python -u "C:/Users/Rishab/OneDrive/Desktop/CN Experiments/import
random.py"
Enter the total number of frames: 4
Enter the Window Size: 3
Frames sent 1
Frames sent 2
Frames sent 3
Acknowledgment for Frame 1
Frame 2 Not Received
Retransmitting Window
Frames sent 2
Frames sent 3
Frames sent 4
Frame 2 Not Received
Retransmitting Window
Frames sent 2
Frames sent 3
Frames sent 4
Acknowledgment for Frame 2
Frame 3 Not Received
Retransmitting Window
Frames sent 3
Frames sent 4
Frame 3 Not Received
Retransmitting Window
```

```
Frames sent 3
Frames sent 4
Frame 3 Not Received
Retransmitting Window
Frames sent 3
Frames sent 4
Acknowledgment for Frame 3
Acknowledgment for Frame 4
Total number of transmissions: 15
'''
```