Flow Control at Data Link layer

Aim:

Write a program to implement flow control at a data link layer using sliding window protocol. Stimulate the flow of frames from one node to another.

Create a sender program with following features:

1. Input window size from the user
2. Input 1 character per frame
3. Consider 1 character per frame
4. Create a frame with following field [frame no, Data].
5. Send the frames. [print the output on screen and save it in a file called sender buffer]
6. Wait for the acknowledgment from receiver [Introduce delay in the program].

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7. Read a file called Receiver buffer
8. Check ACK field for Acknowledgment number
9. If the Ack number is expected,
Send new set of frames accordingly to the sender, buffer file [Overwrite the sender buffer file with new from] Else NACK is received, resend the frames accordingly.

Create a receiver file with following features

1. Reader a file called Sender-buffer
2. Check the frame no
3. If the frame no are as expected, write the appropriate ACK no. in the Receiver buffer file Else write NACK no in the Receiver file.

Student observation

```python
import math
import time

def sender (message, window_size):
    num_frames = math.ceil(len(message)/
                window_size)
    sent_frame = 0.
    while sent_frame < window_size:
        start = sent_frame * window_size
        end = min (start + window_size,
                   len(message))
        Print f(f "\n sender: Sending
                frames from position
                {start + 1} to {end}")
        for i in range (start, end):
            Print f(f" frame {i+1} : message
                     [i]} sent.")
        if random.choice ([true, false]):
            Print (f" Receiver : Acknowledgment received
                    for frames from {start + 1} to {end}
```

```python
            sent_frame += 1
        else:
            Print (f" receiver : Ack NOT received
                    frames {} start to {} of end
            Resending    frames")
            time.sleep (2)
    Print ("\n All frames sent successful
    receiver (message, window_size)

def receiver (message, window_size):
    pass

if __name__ == "__main__":
    message = input ("Enter message
                     send: ")
    window_size = int (input ("Enter
                    window size : "))

    sender (message, window_size)
    receiver (message, window_size)
```

output:

Enter the message to send: helo
Enter the window size: 2
sender: sending frames from

frame 1: 'h' sent

frame 2: 'e' sent

Receiver: Acknowledgement Receiving
frame 1 to 2

Sender: sending frame from 3 to,

frame 3: 'l' sent

frame 4: 'o' sent

Receiver: Acknowledgement Not
Received for frames
from 3 to 4. Resending
frames

Sender: sending frames from 3?
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frame 3: 'l' sent

frame 4: 'o' sent

Receiver: Acknowledgement Received
from 3 to 4

Result:
Thus Program is executed
and output is verifying successfully