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Sliding Window

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Aim: Write a program to implement flow control at data link layer using sliding window Protocol. Simulate 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 a text Message from the user.
3. Consider 1 frame with following fields [Frame no, DATA]
4. Send the frame (Print the output on screen and save it in a file called Sender - Buffer]
5. wait for the acknowledge from the Receiver.
6. Reader a file called Receiver-Buffer.
7. Check Ack field for the Acknowledge number.
8. If the acknowledgement number is as expected, send new set of frames accordingly. Else if NAck is received, resend the frames accordingly

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Create a receiver file with following feature.

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, Buffer file.

Student observation

1) Sender

```
import time
import os
def Sender(window_size, message):
    Sender_buffer = "Sender_Buffer.txt"
    Receiver_buffer = "Receiver_Buffer.txt"
    frame_no = 0

frames = [[i, message[i]] for i in
                range(len(message))]
while frame_no < (frames):
    for i in range(window_size),
    if frame_no + i < len(frames),
print("Sending frame: {frame_no+i}
```

```
with open (sender_ buffer.txt')
f.write(f"{frame [frame_no + i][0]}
        {frame [frame_no + i][1]} \n")
time.sleep (1)

while True:
    if os.path.exists (receiver_buffer)
        with open ((receiver_buffer.'r') as f:
            ack_no = int (f.read().strip())
        os.remove (receiver_buffer)
        break
    if ack_no >= frame_no:
        print (f"ACK received for frame:
                                {ack_no}")
        frame_no = ack_no + 1
    else:
        print (f"NACK received for frame:
                                {frame_no}")

if __name__ == "__main__":
    window_size = int (input ("Enter window
                                size:"))
    message = input ("Enter a message:")
    sender (window_size, message)
```

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ii) Receiver

```
import time
import os
def receiver():
    sender_buffer = "sender_Buffer.txt"
    receiver_buffer = "Receiver_Buffer.txt"
    expected_frame_no = 0
    while True:
        if os.path.exists(sender_buffer):
            with open(sender_buffer, 'r') as f:
                lines = f.readlines()
            os.remove(sender_buffer)

        for line in lines:
            frame = line.strip().split()
            frame_no = int(frame[0])
            data = frame[1]
        if frame_no == expected_frame_no:
            print(f"Received frame: {frame_no}
                  data: {data}")
            with open(receiver_buffer, 'w') as f:
                expected_frame_no = 1
        else:
            print(f"Unexpected frame: {frame_no}")
            with open(receiver_buffer, 'w') as f:
                f.write(str(expected_frame_no))
```

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```
if __name__ == "__main__":
    receiver()
```

O/P:

```
Enter window size : 5
Enter message : hellow
Sending frame : [0, 'h']
Sending frame : [1, 'e']
Sending frame : [2, 'l']
Sending frame : [3, 'l']
Sending frame : [4, 'o']
```

Result)

Thus the flow control at data link layer using sliding window is implemented successfully.

Done
9/10/24