Expt. No: 7

Date: 4/9

SLIDING WINDOW

AIM: Write a program to implement flow control at data link layer using sliding window protocol

1. Input window size and message from user
2. Divide message → 1 character = 1 frame with [frame no., DATA]
3. sender writes frames to sender_Buffer.txt
4. sender waits for ACK by reading Receiver_Buffer.txt
5. If correct ACK → send next window, else if NACK → resend same window
6. Receiver reads frames from sender_Buffer.txt
7. If frame numbers are correct → write ACK to Receiver_Buffer.txt
8. If error → write NACK to Receiver_Buffer.txt
9. Repeat until all frames are sent successfully
10. Errors can be tested by manually editing frame no. / ACK in the files

Code : sender.py

```
import time
msg = input ("Enter message: ")
win = int (input ("Enter window size: "))
frames = [[i, ch] for i, ch in enumerate(msg)]
ptr = 0
while ptr < len (frames):
    window = frames [ptr: ptr + win]
    with open ("sender_Buffer.txt", "w") as f:
        for fr in window:
            f.write (f"{fr[0]} {fr[1]}\n")
    print ("Sent:", window)
    time.sleep (2)
    try:
        with open ("Receiver_Buffer.txt") as f:
            ack, no = f.read().split()
            no = int (no)
    except:
        continue
    if ack == "ACK" and no == ptr + len(window):
        print ("ACK received")
        ptr += win
    else:
        print ("NACK received → Resending...")
```

receiver.py

```
import time
expected=0
while True:
    try:
        with open("sender_Buffer.txt") as f:
            lines = f.readlines()
    except:
        time.sleep(1); continue
    if not lines:
        time.sleep(1); continue
    ok = True
    for line in lines:
        no, data = line.strip().split()
        if int(no) != expected:
            ok = False; break
        expected += 1
    with open("Receiver_Buffer.txt", "w") as f:
        if ok:
            f.write(f"ACK {expected}")
            print("ACK", expected)
        else:
            f.write(f"NACK {expected}")
            print("NACK", expected)
    time.sleep(2)
```

Output:

sender output :

Enter message : HELLO

Enter window size : 3

sent : [[0, 'H'], [1, 'E'], [2, 'L']]

ACK received

sent [[3, 'L'], [4, 'O']]

ACK received

Receiver output:

ACK 3

ACK 5

Result:

Program to implement flow control using sliding window Protocol was successfully executed.

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