Ex: NO: 7
Date: 12/9/24

Practical - 7.

Aim:

Program should achieve at least below given requirements. you can make it a bidirectional program wherein receiver is sending its data frames with acknowledgement.

Program: ~~Receiver~~ Sender.py

```
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 < len(frames):
    for i in range(window_size):
        if frame_no + i < len(frames):
            print(f'Sending frame: {frames[frame_no + i]}')
```

```
with open(sender_buffer, 'a') as f:
    f.write(f'{frames[frame_no + i][0]}
    {frames[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},
resending...")

if __name__ == "__main__".
    window_size = int(input("Enter window size"))
    message = input("Enter message")
    Sender(window_size, message).
```

Receiver.py.

```
import os.

def receiver():
    Sender_buffer = "Sender_Buffer.txt"
    receiver_buffer = "Receiver_Buffer.txt"
    expected_frame_no = 0.

while true:
    if os.path.exist (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:
            f.write (str (frame_no))
        expected_frame_no += 1.
    else:
```

```
print(f"Unexpected frame: {frame_no}, data: {data}")
with open(receiver_buffer, 'w') as f:
    f.write(str(frame_no))
    f.write(str(expected_frame_no+1))
    f.write(str(expected_frame_no-1))
if __name__ == "__main__":
    receiver()
```

Output: python Sender.py

```
Enter window size: 5
Enter message: hello
Sending frame: [0, 'h']
Sending frame: [1, 'e']
Sending frame: [2, 'l']
Sending frame: [3, 'l']
Sending frame: [4, 'o']
NACK received for frame: 0, resending...
Sending frame: [0, 'h']
Sending frame: [1, 'e']
Sending frame: [2, 'l']
```

Sending frame : [3, '1']

Sending frame : [4, '0']

NACK received for frame : 0, resending...

Sending frame : [0, 'h']

Sending frame : [1, 'e']

Sending frame : [2, 'l']

Sending frame : [3, 'l']

Sending frame : [4, 'o']

ACK received for frame : 4.

python receiver.py-

unexpected frame : 2, expected : 0

unexpected frame : 2, expected : 0.

unexpected frame : 3, expected : 0.

Result:

Thus, the program was successfully executed & the output is verified.

13/9/24