PROGRAM 4

Write a program for congestion control using Leaky Bucket Algorithm
(c++)

```c
#include<stdio.h>
#include<stdlib.h>
#include<unistd.h>

#define NOF_PACKETS 10

int rand(int a)
{
    int rn = (random() % 10) % a;
    return  rn == 0 ? 1 : rn;
}

int main()
{
    int packet_sz[NOF_PACKETS], i, clk, b_size, o_rate, p_sz_rm=0, p_sz, p_time, op;
    for(i = 0; i<NOF_PACKETS; ++i)
        packet_sz[i] = rand(6) * 10;
    for(i = 0; i<NOF_PACKETS; ++i)
        printf("\npacket[%d]:%d bytes\t", i, packet_sz[i]);
    printf("\nEnter the Output rate:");
    scanf("%d", &o_rate);
    printf("Enter the Bucket Size:");
    scanf("%d", &b_size);
    for(i = 0; i<NOF_PACKETS; ++i)
    {
        if( (packet_sz[i] + p_sz_rm) > b_size)
            if(packet_sz[i] > b_size)/*compare the packet siz with bucket size*/
                printf("\n\nIncoming packet size (%dbytes) is Greater than bucket capacity (%dbytes)-
PACKET REJECTED", packet_sz[i], b_size);
            else
                printf("\n\nBucket capacity exceeded-PACKETS REJECTED!!");
        else
        {
            p_sz_rm += packet_sz[i];
            printf("\n\nIncoming Packet size: %d", packet_sz[i]);
            printf("\nBytes remaining to Transmit: %d", p_sz_rm);
            p_time = rand(4) * 10;
            printf("\nTime left for transmission: %d units", p_time);
            for(clk = 10; clk <= p_time; clk += 10)
            {
                sleep(1);
                if(p_sz_rm)
                {
```

```c
        if(p_sz_rm <= o_rate)/*packet size remaining comparing with output rate*/
            op = p_sz_rm, p_sz_rm = 0;
        else
            op = o_rate, p_sz_rm -= o_rate;
        printf("\nPacket of size %d Transmitted", op);
        printf("----Bytes Remaining to Transmit: %d", p_sz_rm);
        }
        else
        {
            printf("\nTime left for transmission: %d units", p_time-clk);
            printf("\nNo packets to transmit!!");
        }
            }
        }
    }
}
```

OUTPUT

```
packet[0]:30 bytes
packet[1]:10 bytes
packet[2]:10 bytes
packet[3]:50 bytes
packet[4]:30 bytes
packet[5]:50 bytes
packet[6]:10 bytes
packet[7]:20 bytes
packet[8]:30 bytes
packet[9]:10 bytes
Enter the Output rate:10
Enter the Bucket Size:15

Incoming packet size (30bytes) is Greater than bucket capacity (15bytes)-PACKET REJECTED

Incoming Packet size: 10
Bytes remaining to Transmit: 10
Time left for transmission: 20 units
Packet of size 10 Transmitted----Bytes Remaining to Transmit: 0
Time left for transmission: 0 units
No packets to transmit!!

Incoming Packet size: 10
Bytes remaining to Transmit: 10
Time left for transmission: 30 units
Packet of size 10 Transmitted----Bytes Remaining to Transmit: 0
Time left for transmission: 10 units
No packets to transmit!!
Time left for transmission: 0 units
No packets to transmit!!

Incoming packet size (50bytes) is Greater than bucket capacity (15bytes)-PACKET REJECTED

Incoming packet size (30bytes) is Greater than bucket capacity (15bytes)-PACKET REJECTED

Incoming packet size (50bytes) is Greater than bucket capacity (15bytes)-PACKET REJECTED

Incoming Packet size: 10
Bytes remaining to Transmit: 10
```

```
Incoming Packet size: 10
Bytes remaining to Transmit: 10
Time left for transmission: 30 units
Packet of size 10 Transmitted----Bytes Remaining to Transmit: 0
Time left for transmission: 10 units
No packets to transmit!!
Time left for transmission: 0 units
No packets to transmit!!

Incoming packet size (50bytes) is Greater than bucket capacity (15bytes)-PACKET REJECTED

Incoming packet size (30bytes) is Greater than bucket capacity (15bytes)-PACKET REJECTED

Incoming packet size (50bytes) is Greater than bucket capacity (15bytes)-PACKET REJECTED

Incoming Packet size: 10
Bytes remaining to Transmit: 10
Time left for transmission: 10 units
Packet of size 10 Transmitted----Bytes Remaining to Transmit: 0

Incoming packet size (20bytes) is Greater than bucket capacity (15bytes)-PACKET REJECTED

Incoming packet size (30bytes) is Greater than bucket capacity (15bytes)-PACKET REJECTED

Incoming Packet size: 10
Bytes remaining to Transmit: 10
Time left for transmission: 10 units
Packet of size 10 Transmitted----Bytes Remaining to Transmit: 0

...Program finished with exit code 0
Press ENTER to exit console.
```