

Appendix C:

This code illustrates a fixed bandwidth and a variety of packet number stated from 100 packets to 5000 packet with 500 gaps in each loop.

```
%? is the arrival rate at the link
%C is virtual queue whose capacity
% ? > 0 is the smoothing parameter
%B = buffer size
% s = arrival time of previous packet
%t = Current time
%b = number of bytes in current packet
%VQ = No of bytes currently in virtual queue  %virtual queue capacity C
=?(?C ? ?)
%? Desired utilization <1

clc, close all, clear all;

%prompt =('Please Enter Number of Total Packets\n');%set total packet
number
%number_packets = input(prompt); % wait for user entry
x=0;
for B=100:500:5000;
for (number_packets=100:500:5000)
prompt = ('Please Enter arrival rate at the link\n'); % set arrival rate
arrival_rate = 4; %input(prompt); % wait for user entry
    x=x+1;
    b = randi(1000,1,number_packets); % generate random size of each
packet random_packet_size
    time=0:number_packets-1; % set over all time of simulation according
to the processing items
    s=randi(440,1,number_packets); %s packet_arrive_time
t=time;
figure(1) % view the bytes of each packet during time
plot(time,b,'color','r','marker','.', 'Linewidth',0.5);
title('Bytes in each packet');
xlabel('Time in seconds');
ylabel('Packets in Bytes');
legend('Bytes');
```

```

figure(2) % view the number of packets du
bar(1:1:number_packets);
title('Number of packets');
xlabel('Time in seconds');
ylabel('No. of Packet');
legend('Number of Packets');
alpha=0.8;
gamma=4;
C=20;
C = alpha*(0.98*C - gamma);
VQ=b;
drop=0;
for i=1:number_packets
    VQ(i)=VQ(i)-gamma*b(i);
    VQ(i)=VQ(i)*-1;
    VQ_max=max(VQ(i),0);
    if (VQ_max+b(i)>B)
        drop=drop+1;
    else
        VQ(i)=VQ_max+b(i);
    end
    C = max(min(C + 0.98 * 0.8 * 100 * (t - s), C) - alpha * b, 0);
end
drops(x)=drop;
end
end
%AVQ_Comp(C);
figure (3)

```

```

=[0,150,266.666700000000,375,480,583.333300000000,685.714300000000
0,787.500000000000,888.888900000000,990,1090.909000000000,1191.667
0000000,1292.308000000000,1392.857000000000,1493.333000000000,1593.
750000000000,1694.118000000000,1794.444000000000,1894.737000000000,1
995,2095.238000000000,2195.455000000000,2295.652000000000,2395.83300
000000,2496,2596.154000000000,2696.296000000000,2796.429000000000,28
96.552000000000,2996.667000000000,3096.774000000000,3196.8750000000
0,3296.970000000000,3397.059000000000,3497.143000000000,3597.2220000
000,3697.297000000000,3797.368000000000,3897.436000000000,3997.5000
000000];

```

```

y=[100,200,300,400,500,600,700,800,900,1000,1100,1200,1300,1400,1500
,1600,1700,1800,1900,2000,2100,2200,2300,2400,2500,2600,2700,2800,29
00,3000,3100,3200,3300,3400,3500,3600,3700,3800,3900,4000];
plot (x,y,'color','r','marker','.', 'Linewidth',0.5);
title('Fixed Bandwidth Diffrent Packets');
xlabel('Number of Packets');
ylabel('Packet Drop');
legend('AVQ Packet Dropped');

```