Appendix B:

This code illustrates the simulation of AVQ using different values of Bandwidth and fixed number of packets.

```
%? 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

prompt = ('Please Enter arrival rate at the link\n'); % set arrival rate
arrival_rate = input(prompt); % wait for user entry



%B=1000;
x=0;

for B=100:100:5000
   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 accourding 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('Packets');
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

%AVQ_Comp(C);
BS=100:100:5000;

figure (3)
plot (BS,drops,'color','r','marker','.','Linewidth',0.5);
title('Packet Drop with Diffrent Bandwidth Configuration');
xlabel('Bandwidth');
ylabel('No. of Packet Droped');

legend('AVQ Packet Droped');
```