clc;

clear all;

close all;

a = 2;

t = 0:2\*pi/50:2\*pi;

x = a \* sin(t); % Fixed syntax here

subplot(3,1,1)

plot(x, 'r');

xlabel('time(s)');

ylabel('Amplitude(v)');

title('Message signal');

delta = 0.2;

xn = zeros(1, length(x)); % Initialize xn with zeros

% Delta modulation

for i = 1:length(x)

if x(i) > xn(i)

d(i) = 1;

xn(i + 1) = xn(i) + delta; % Fixed syntax here

else

d(i) = 0;

xn(i + 1) = xn(i) - delta; % Fixed syntax here

end

end

subplot(3,1,2)

stairs(xn)

xlabel('time(s)');

ylabel('Amplitude (v)');

title('Delta modulated signal');

% Delta demodulation

xn = zeros(1, length(x)); % Reset xn

for i = 1:length(d)

if d(i) > xn(i)

d(i) = 0;

else

d(i) = 1;

end

xn(i + 1) = xn(i) + (2 \* d(i) - 1) \* delta; % Fixed syntax here

end

subplot(3,1,3)

plot(xn, 'c');

xlabel('time(s)');

ylabel('Amplitude(v)');

title('Delta demodulated signal');