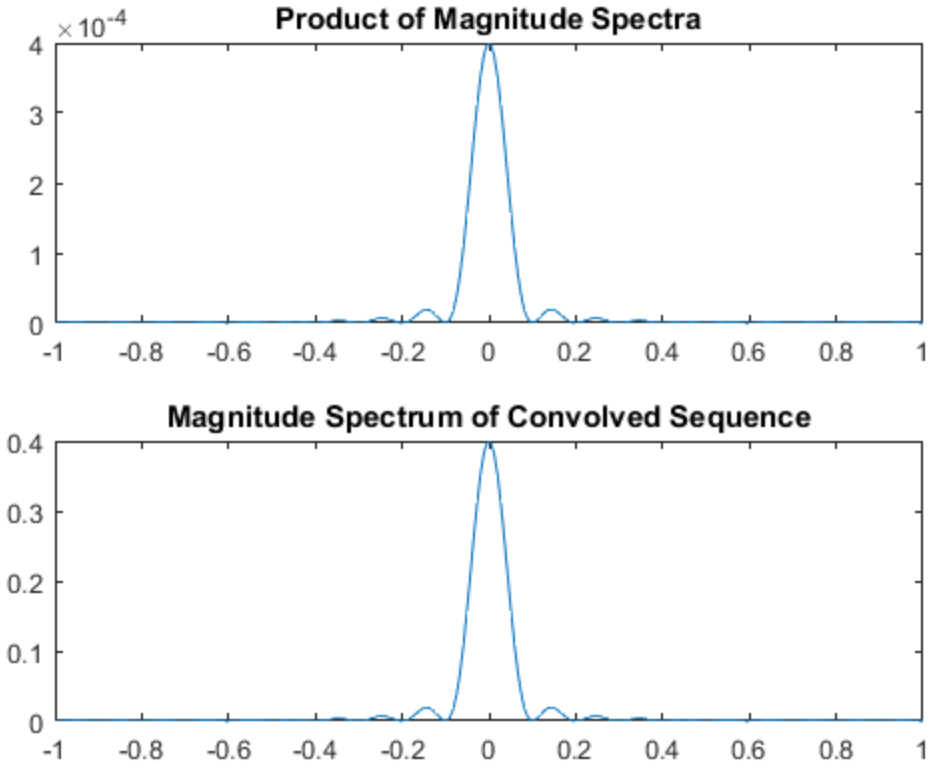
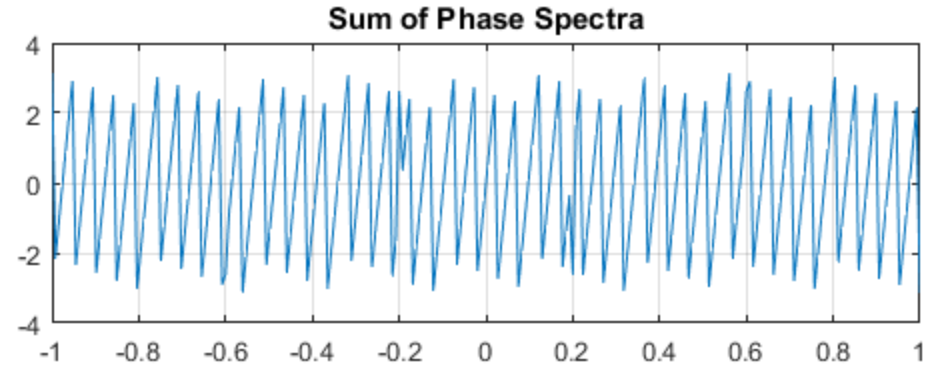
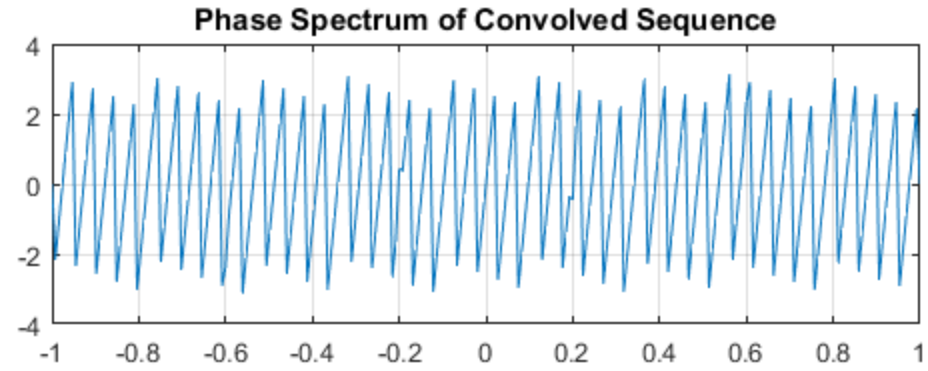
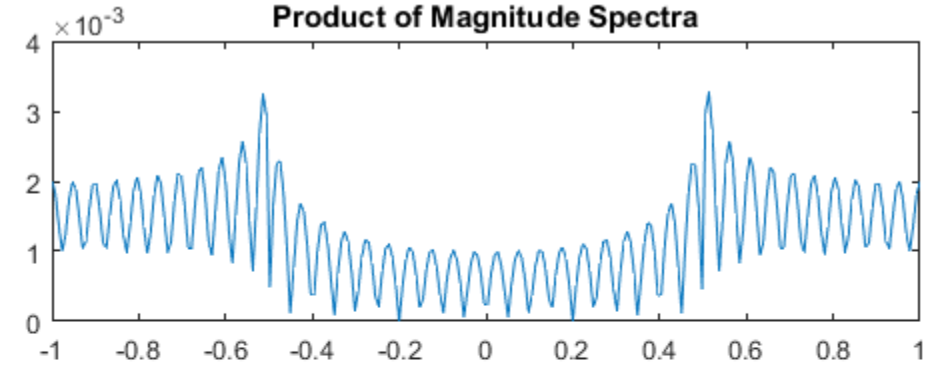
```
%   Joseph R. Palicke
%   ECE 44800
%   LAB 3
%   Pt 2
clc
close all
clear all


precede = zeros(1,500);
trail = zeros(1,500);
signal_x = ones(1,1000);

dt = 1e-3;
x = [precede signal_x trail];   % Signal x(t)
w = -pi:2*pi/255:pi;            % Designated frequencies (rad/sample)
y = conv(x,x);

Xf = freqz(x,1,w).*dt;
Mult = Xf.*Xf;

figure
subplot(2,1,1)
plot(w/pi,abs(Mult));
title('Product of Magnitude Spectra')
Convol = freqz(y,1,w).*dt;
subplot(2,1,2)
plot(w/pi,abs(Convol));
title('Magnitude Spectrum of Convolved Sequence')

figure
subplot(2,1,1)
plot(w/pi,angle(Mult));grid
title('Sum of Phase Spectra')
subplot(2,1,2)
plot(w/pi,angle(Convol));grid
title('Phase Spectrum of Convolved Sequence')

% Modulation Property

Mult_x = fft(x.*x).*dt;
y = freqz(Mult_x,1,w).*dt;
z = conv(Xf,Xf);
Convol_2 = freqz(z,1,w).*dt;

figure(3)
subplot(2,1,1)
plot(w/pi,abs(y));
title('Product of Magnitude Spectra')
subplot(2,1,2)
plot(w/pi,abs(Convol_2));
title('Magnitude Spectrum of Convolved Sequence')
```

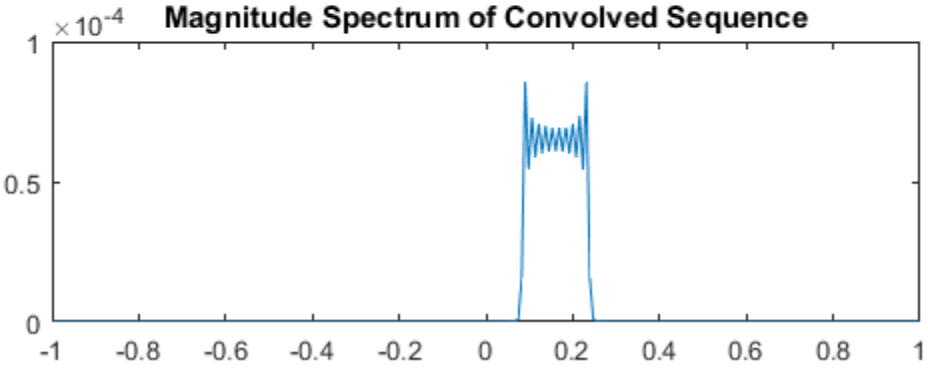
```
figure
subplot(2,1,1)
plot(w/pi,angle(y));grid
title('Sum of Phase Spectra')
subplot(2,1,2)
plot(w/pi,angle(Convol_2));grid
title('Phase Spectrum of Convolved Sequence')
```

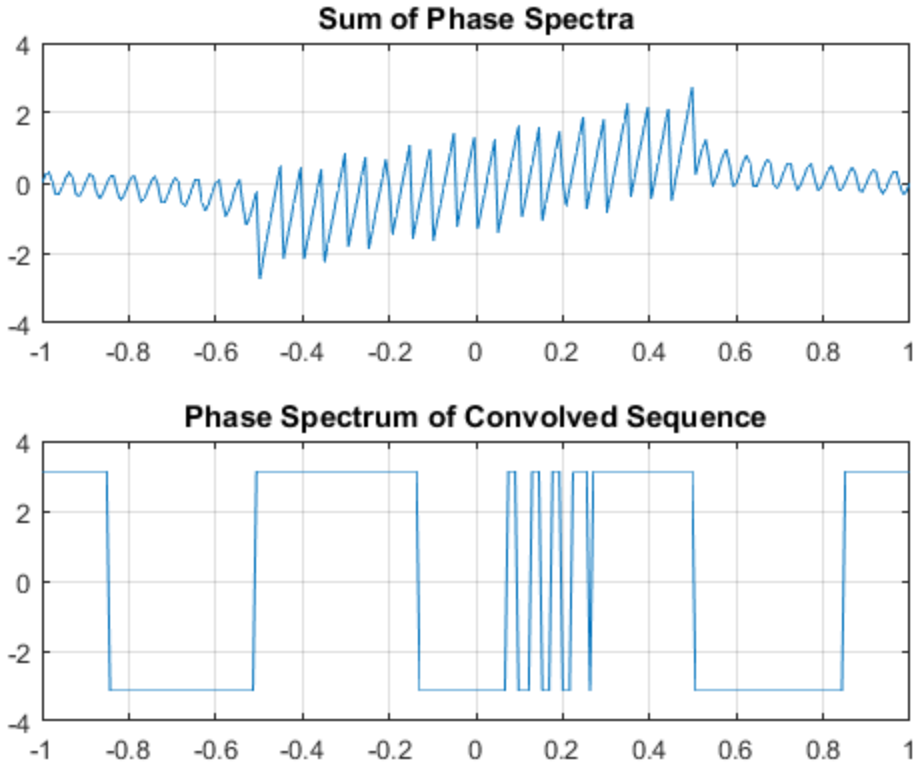



Sum of Phase Spectra
4
2
0
-2
-4
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1


Phase Spectrum of Convolved Sequence
4
2
0
-2
-4
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1


Product of Magnitude Spectra
×10-3
4
3
2
1
0
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1


Magnitude Spectrum of Convolved Sequence
×10-4
1
0.5
0
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1



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