clc

clear all

close all

%Define input signal

x1=ones(1,100)

n=linspace(0,1,100)

x2=sin(2\*pi/2\*n)

h1=[0.5,0.5] %LPF

h2=[0.5,-0.5] %HPF

h=conv(h1,h2) %BPF

y1=conv(x1, h)

y2=conv(x2,h)

subplot(2,2,1),stem(x1,'filled'),title('Input1')

subplot(2,2,2),stem(x2,'filled'),title('Input2')

subplot(2,2,3),stem(y1(1:length(x1)),'filled'),title('First output')

subplot(2,2,4),stem(y2(1:length(x2)),'filled'),title('Second output')

clc

clear all

close all

%Define input signal

x1=ones(1,100)

n=0:100

x2=(-1).\*n

h1=[0.5,0.5] %LPF

h2=[0.5,-0.5] %HPF

y1=conv(x1, h1)

y2=conv(x2,h2)

subplot(2,2,1),stem(x1,'filled'),title('Input1')

subplot(2,2,2),stem(x2,'filled'),title('Input 2')

subplot(2,2,3),stem(y1(1:length(x1)),'filled'),title('output1')

subplot(2,2,4),stem(y2(1:length(x2)),'filled'),title('output2')

clc

clear all

close all

%Define input signal

x1=ones(1,100)

n=linspace(0,1,100)

x2=sin(2\*pi/2\*n)

h1=[0.5,0.5] %LPF

h2=[0.5,-0.5] %HPF

h=conv(h1,h2) %BPF

y1=conv(x1, h)

y2=conv(x2,h)

subplot(2,2,1),stem(x1,'filled'),title('Input1')

subplot(2,2,2),stem(x2,'filled'),title('Input2')

subplot(2,2,3),stem(y1(1:length(x1)),'filled'),title('First output')

subplot(2,2,4),stem(y2(1:length(x2)),'filled'),title('Second output')

clc

close all

clear all

%Generation of unit ramp signal

n=-5:5

x=n.\*(n>=0)

y=stem(n,x,'filled')

xlabel('n'),ylabel('Amplitude')

title('Unit Ramp signal')

%Generation of sine wave

clc

close all

clear all

t=linspace(0,1,100)

a=5

f=10

x=a\*sin(2\*pi\*f\*t)

subplot(2,1,1)

xlabel('frequency'),ylabel('amplitude'),title('Sinewave ')

plot(t,x)

N=256

fs=100

f=fs/2\*linspace(0,1,N/2)

x=fft(x,N)/N

subplot(2,1,2)

plot(f,abs(x(1:length(f))))

xlabel('time'),ylabel('amplitude'),title('Spectrum')

clc

close all

clear all

%Generate sine wave

t=linspace(0,1,100)

f=6

x=sin(2\*pi\*f\*t)

y1=xcorr(x,x)

subplot(2,1,1),plot(y1)

xlabel('t'),ylabel('Amplitude'),title('Correlation with sine wave')

n1=rand(1,length(x))

x1=x+n1

y2=xcorr(x,x1)

subplot(2,1,2),plot(y2)

xlabel('t'),ylabel('Amplitude'),title('Correlation with corrupted wave')