ConvolutionOfDiscreteSequence.m

clc;

clear all;

close all;

x=input('Enter the first sequence x =');

nx=input('Enter the index of the first sequence nx=');

h=input('Enter the impulse response of the system,second sequence h=');

nh=input('Enter the index of the second sequence nh=');

% Index of the convolved signal

n=min(nx)+min(nh):max(nx)+max(nh);

y=conv(x,h);

disp('The convolved signal is:');

y

disp('The index of convolved sequence is:');

n

subplot(311);

stem(nx,x);

subplot(312);

stem(nh,h);

subplot(313);

stem(n,y);

Enter the first sequence x =[1 2 3 -1 1]

Enter the index of the first sequence nx=[-1 0 1 2 3]

Enter the impulse response of the system,second sequence h=[1 -1 2 -1 1]

Enter the index of the second sequence nh=[-2 -1 0 1 2]

The convolved signal is:

y =

1 1 3 -1 7 -4 6 -2 1

The index of convolved sequence is:

n =

-3 -2 -1 0 1 2 3 4 5

>>



Assignment 1:

clc;

clear all;

close all;

x=[1 2 3 1];

nx=[0 1 2 3];

h=[1 2 1 -1];

nh=[0 1 2 3];

% Index of the convolved signal

n=min(nx)+min(nh):max(nx)+max(nh);

y=conv(x,h);

disp('The convolved signal is:');

y

disp('The index of convolved sequence is:');

n

subplot(311);

stem(nx,x);

subplot(312);

stem(nh,h);

subplot(313);

stem(n,y);

The convolved signal is:

y =

1 4 8 8 3 -2 -1

The index of convolved sequence is:

n =

0 1 2 3 4 5 6

>>



Assignment 2:

clc;

clear all;

close all;

% a is a constant , |a|<1

a=input(' Enter the value of a (constant) , |a|<1 ');

n=0:1:5;

y=exp(a\*n);

u=(n-0)>=0;

h=y.\*u;

% Index of the convolved signal

nout=min(n)+min(n):max(n)+max(n);

output=conv(u,h);

disp('The convolved signal is:');

output

disp('The index of convolved sequence is:');

nout

subplot(311);

stem(n,y);

subplot(312);

stem(n,u);

subplot(313);

stem(nout,output);

Enter the value of a (constant) , |a|<1 0.5

The convolved signal is:

output =

Columns 1 through 10

1.0000 2.6487 5.3670 9.8487 17.2377 29.4202 28.4202 26.7715 24.0532 19.5716

Column 11

12.1825

The index of convolved sequence is:

nout =

0 1 2 3 4 5 6 7 8 9 10

>>



2.

clc;

clear all;

close all;

t=-3:0.01:8;

x=(t>=-1 & t<=1);

subplot(311);

plot(t,x);

h1=(t>=1 & t<=3);

h2=(t>3 & t<=4);

h=h1+(2\*h2);

subplot(312);

plot(t,h);

y=convn(x,h);

y=y/100;

t1=2\*min(t):0.01:2\*max(t);

subplot(313);

plot(t1,y);



3.

clc;

close all;

clear all;

t=-2:0.01:4;

h=(t==2); % impulse at t=2

x=(t>=0 & t<=3); % pulse of duration 3 seconds

y=convn(x,h);

t1=2\*min(t):0.01:2\*max(t);

subplot(311);

plot(t,h);

subplot(312);

plot(t,x);

subplot(313);

plot(t1,y);



Assignment 3:

clc;

close all;

clear all;

t=-2:0.01:4;

x=(t>=0 & t<=1); % pulse of duration 1 second

h1=(t>=0 & t<=1);

h2=(t>1 & t<=2);

h=h1+(-1\*h2);

y=convn(x,h);

t1=2\*min(t):0.01:2\*max(t);

subplot(311);

plot(t,h);

subplot(312);

plot(t,x);

subplot(313);

plot(t1,y);



Assignment 4:

clc;

close all;

clear all;

t=-4:0.01:4;

x=(t>=0 & t<=2); % pulse of duration 2 seconds

x1=4\*x;

h=(t>=-2 & t<=2); % pulse of duration 4 seconds

h1=2\*h;

y=convn(x1,h1);

y=y/1000;

t1=2\*min(t):0.01:2\*max(t);

subplot(311);

plot(t,h1);

subplot(312);

plot(t,x1);

subplot(313);

plot(t1,y);



Assignment 5:

clc;clear all;close all;

th=-2:0.01:2;

h=(th>=-2);

tx=0:0.01:5;

x=tx+1;

t=min(tx)+min(th):0.01:max(tx)+max(th);

y=conv(x,h);

subplot(221);

plot(tx,x);

subplot(222);

plot(th,h);

subplot(223);

plot(t,y);

z=deconv(y,h);

subplot(224);

tz=(min(t)-min(th)):0.01:(max(t)-max(th));

plot(tz,z);

