EXP 3 ***CONVOLUTION***

14/7/14

AIM:

To linearly convolute and circularly convolute two sequence.

PROGRAM:

*LINEAR CONVOLUTION*

clc;

clear all;

close all;

fprintf('\nTHE SEQUENCE h[n]');

disp(' ');

n11=input('\nENTER THE VALUE FOR n1 ');

n12=input('\nENTER THE VALUE FOR n2 ');

n=n11:1:n12;

m1=numel(n);

e=n11;

disp(' ');

disp('ENTER THE SEQUENCE');

for i=1:1:m1

fprintf('h[%d] ',e);

h(i)=input('');

e=e+1;

end

figure

n=n11:n12;

stem(n,h);

title('h[n]');

axis([n11-3 n12+3 min(h)-5 max(h)+5]);

fprintf('\nTHE SEQUENCE x[n]');

disp(' ')

n21=input('\nENTER THE VALUE FOR n1 ');

n22=input('\nENTER THE VALUE FOR n2 ');

n=n21:1:n22;

m2=numel(n);

e=n21;

disp(' ');

disp('ENTER THE SEQUENCE');

for i=1:1:m2

fprintf('x[%d] ',e);

x(i)=input('');

e=e+1;

end

figure

n=n21:n22;

stem(n,x);

title('x[n]');

axis([n21-3 n22+3 min(x)-5 max(x)+5]);

x1=zeros(numel(x),m1+m2-1);

x=[x,zeros(1,m1+m2-1-numel(x))];

for i=1:4

x1(i,:)=x;

x=circshift(x,[0 1]);

end

g=x1'\*h';

fprintf('\nTHE OUTPUT IS ');

disp(g');

n1=n11+n21;

figure

n2=m1+m2+n1-2;

n3=n1:n2;

stem(n3,g);

title('y[n]=x[n]\*h[n]');

axis([n1-2 n2+2 min(g)-2 max(g)+2]);

OUTPUT:

THE SEQUENCE h[n]

ENTER THE VALUE FOR n1 0

ENTER THE VALUE FOR n2 3

ENTER THE SEQUENCE

h[0] 1

h[1] -1

h[2] 1

h[3] -1

THE SEQUENCE x[n]

ENTER THE VALUE FOR n1 -2

ENTER THE VALUE FOR n2 1

ENTER THE SEQUENCE

x[-2] 1

x[-1] 2

x[0] 1

x[1] 1

THE OUTPUT IS 1 1 0 1 -2 0 -1







*CIRCULAR CONVVOLUTION*

clc;

clear all;

close all;

fprintf('\nTHE SEQUENCE h[n]');

disp(' ');

n11=input('\nENTER THE VALUE FOR n1 ');

n12=input('\nENTER THE VALUE FOR n2 ');

n=n11:1:n12;

m1=numel(n);

e=n11;

disp(' ');

disp('ENTER THE SEQUENCE');

for i=1:1:m1

fprintf('h[%d] ',e);

h(i)=input('');

e=e+1;

end

figure;

n=n11:n12;

stem(n,h);

title('h[n]');

axis([n11-3 n12+3 min(h)-5 max(h)+5]);

fprintf('\nTHE SEQUENCE x[n]');

disp(' ')

n21=input('\nENTER THE VALUE FOR n1 ');

n22=input('\nENTER THE VALUE FOR n2 ');

n=n21:1:n22;

m2=numel(n);

e=n21;

disp(' ');

disp('ENTER THE SEQUENCE');

for i=1:1:m2

fprintf('x[%d] ',e);

x(i)=input('');

e=e+1;

end

figure

n=n21:n22;

stem(n,x);

title('x[n]');

axis([n21-3 n22+3 min(x)-5 max(x)+5]);

%

m=max(m1,m2);

if m1>m2

x=[x,zeros(1,m-m2)];

else

h=[h,zeros(1,m-m1)];

end

%conv

h1=zeros(numel(h),m);

for i=1:numel(h)

h1(i,:)=h;

h=circshift(h,[0 1]);

end

g=h1'\*x';

fprintf('\nTHE OUTPUT IS ');

disp(g');

n1=n11+n21;

figure

n2=m+n1-1;

n3=n1:n2;

stem(n3,g);

title('CIRCULAR CONVOLVED OUTPUT');

axis([n1-2 n2+2 min(g)-2 max(g)+2]);

OUTPUT

THE SEQUENCE h[n]

ENTER THE VALUE FOR n1 0

ENTER THE VALUE FOR n2 4

ENTER THE SEQUENCE

h[0] 0

h[1] 1

h[2] 0

h[3] 0

h[4] 0

THE SEQUENCE x[n]

ENTER THE VALUE FOR n1 0

ENTER THE VALUE FOR n2 4

ENTER THE SEQUENCE

x[0] 0

x[1] 1

x[2] 2

x[3] 3

x[4] 4

THE OUTPUT IS 4 0 1 2 3



RESULT

Thus linear and circular convolution has been performed on two sequences and the desired output is obtained.