EXP 5 ***DICRETE FOURIER TRANSFORM AND***

28/7/14 ***INVERSE DICRETE FOURIER TRANSFORM***

AIM:

To perform discrete fourier transform and inverse discrete fourier transform of a given sequence in Matlab.

PROGRAM:

*DISCRETE FOURIER TRANSFORM*

clc;

clear all;

close all;

n1=0;

n2=input('ENTER THE VALUE FOR n2 ');

n=n1:n2;

L=numel(n);

e=n1;

disp(' ');

disp('ENTER THE SEQUENCE');

for i=1:L

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

x(i)=input('');

e=e+1;

end

figure

n=n1:n2;

stem(n,x);

axis([n1-1 n2+1 min(x)-1 max(x)+1]);

title('THE INPUT SEQUENCE');

N=input('Enter the value of N ');

if L<N

x=[x,zeros(1,N-L)];

end

p=1;

y=zeros(1,N);

for k=0:N-1

for n=0:N-1

format short;

b=x(n+1)\*exp(-(1i\*(2\*pi\*k\*n)/N));

y(p)=y(p)+b;

g(p)=abs(y(p));

ph(p)=angle(y(p));

end

p=p+1;

if p>N

p=p-1;

end

end

fprintf('\nTHE %d POINT DFT OF THE INPUT IS',N);

fprintf('\n');

for i=1:p

disp(y(i))

end

fprintf('\nMAGNITUDE RESPONSE');

disp(g);

fprintf('\nPHASE RESPONSE');

disp(ph);

figure

n=0:N-1;

stem(n,g);

title('MAGNITUDE RESPONSE');

axis([-1 N min(g)-1 max(g)+1]);

figure

n=0:N-1;

stem(n,ph);

title('PHASE RESPONSE');

axis([-1 N min(ph)-1 max(ph)+1]);

OUTPUT:

ENTER THE VALUE FOR n2 2

ENTER THE SEQUENCE

x[0] 1

x[1] 1

x[2] 1

Enter the value of N 4

THE 4 POINT DFT OF THE INPUT IS

3

0 - 1.0000i

1.0000 + 0.0000i

-0.0000 + 1.0000i







*INVERSE DISCRETE FOURIER TRANSFORM*

clc;

clear all;

close all;

n1=0;

n2=input('ENTER THE VALUE FOR n2 ');

n=n1:n2;

m=numel(n);

e=n1;

disp(' ');

c=0;

disp('ENTER THE SEQUENCE X[K]');

for i=1:m

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

x(i)=input('');

e=e+1;

end

N=input('Enter the value of N ');

p=1;

y=zeros(1,N);

for k=0:N-1

for n=0:N-1

b=(1/N)\*(x(n+1)\*exp((1i\*(2\*pi\*k\*n)/N)));

y(p)=y(p)+b;

if imag(y(p))==0

format bank;

y(p)=real(y(p));

end

g(p)=abs(y(p));

ph(p)=angle(y(p));

end

p=p+1;

if p>N

P=P-1;

end

end

fprintf('\nTHE OUTPUT x[n] IS');

fprintf('\n');

disp(y);

n=0:N-1;

stem(n,g);

title('MAGNITUDE RESPONSE');

axis([-1 N min(g)-1 max(g)+1]);

OUTPUT:

ENTER THE VALUE FOR n2 7

ENTER THE SEQUENCE X[K]

x[0] 5

x[1] 0

x[2] 1-j

x[3] 0

x[4] 1

x[5] 0

x[6] 1+j

x[7] 0

Enter the value of N 8

THE OUTPUT x[n] IS

1.00 0.75 0.50 0.25 1.00 0.75 0.50 0.25



RESULT:

Thus DFT and IDFT has been performed on the sequences and the desired result is obtained.