EXP 2 ***STUDY OF PROPERTIES OF SIGNALS***

14/7/14

AIM:

To study the basic properties of signals.

PROGRAM:

TIME REVERSAL

clc;

clear all;

close all;

n1=input('ENTER THE VALUE FOR n1 ');

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

n=n1:n2;

m=numel(n);

e=n1;

disp(' ');

disp('ENTER THE SEQUENCE');

for i=1:1:m

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

x(i)=input('');

e=e+1;

end

n=n1:n2;

stem(n,x);

title('THE ORIGINAL SIGNAL');

axis([n1-3 n2+3 min(x)-5 max(x)+5]);

fprintf('TIME REVERSED SIGNAL');

i=1;

for z=0:m-1

y(i)=x(m-z);

i=i+1;

end

n=-n2:-n1;

figure;

stem(n,y);

axis([-n2-3 -n1+3 min(y)-5 max(y)+5]);

title('TIME REVERSED SIGNAL');

OUTPUT:

Enter the value for n1 0

Enter the value for n2 3

Enter the sequence

x[0] 1

x[1] 2

x[2] 3

x[3] 4





TIME SHIFTING

%To read input signal

clc;

clear all;

close all;

n1=input('ENTER THE VALUE FOR n1 ');

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

n=n1:1:n2;

m=numel(n);

e=n1;

disp(' ');

disp('ENTER THE SEQUENCE');

for i=1:1:m

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

x(i)=input('');

e=e+1;

end

figure

n=n1:n2;

stem(n,x);

title('THE ORIGINAL SIGNAL');

axis([n1-3 n2+3 min(x)-5 max(x)+5]);

k=input('enter the value by which the signa should be shifted ');

fprintf('The time shifted signal is');

figure;

n=n1-k:n2-k;stem(n,x);

axis([n1-k-3 n2-k+3 min(x)-5 max(x)+5]);

title('TIME SHIFTED SIGNAL ');

OUTPUT:

ENTER THE VALUE FOR n1 0

ENTER THE VALUE FOR n2 6

ENTER THE SEQUENCE

x[0] 1

x[1] 2

x[2] 3

x[3] 4

x[4] 3

x[5] 2

x[6] 1

enter the value by which the signal should be shifted 3

The time shifted signal is>>





TIME SCALING

*TIME COMPRESSION*

clc;

clear all;

close all;

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

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

n=n1:1:n2;

m=numel(n);

e=n1;

disp(' ');

disp('ENTER THE SEQUENCE');

for i=1:1:m

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

x(i)=input('');

e=e+1;

end

figure

n=n1:n2;

stem(n,x);

title('THE ORIGINAL SIGNAL');

axis([n1-3 n2+3 min(x)-5 max(x)+5]);

a=input('ENTER THE SCALING FACTOR ');

z=1;

s=n1\*abs(a);

for i=1:m

if((s>=n1) && (s<=n2))

y(i)=x(z);

z=z+abs(a);

else

y(i)=0;

end

s=s+abs(a);

end

if(a>0)

figure

n=n1:n2;

stem(n,y);

title('TIME SCALED SIGNAL');

axis([n1-3 n2+3 min(y)-5 max(y)+5]);

else

i=1;

for z=0:m-1

h(i)=y(m-z);

i=i+1;

end

figure

n=-n2:-n1;

stem(n,h);

axis([-n2-3 -n1+3 min(h)-5 max(h)+5]);

title('TIME SCALED SIGNAL');end

OUTPUT:

ENTER THE VALUE FOR n1 -4

ENTER THE VALUE FOR n2 4

ENTER THE SEQUENCE

x[-4] 1

x[-3] 2

x[-2] 3

x[-1] 4

x[0] 5

x[1] 4

x[2] 3

x[3] 2

x[4] 1

ENTER THE SCALING FACTOR 2

>>





*TIME EXPANSION*

clc;

clear all;

close all;

n1=input('ENTER THE VALUE FOR n1 ');

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

n=n1:1:n2;

m=numel(n);

e=n1;

disp(' ');

disp('\nENTER THE SEQUENCE');

for i=1:1:m

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

x(i)=input('');

e=e+1;

end

figure

n=n1:n2;

stem(n,x);

title('THE ORIGINAL SIGNAL');

axis([n1-3 n2+3 min(x)-5 max(x)+5]);

a=input('ENTER THE FRACTIONAL SCALING FACTOR ');

h=1;

for i=1:m

y(h)=x(i);

h=h+abs(a);

end

j=m+((abs(a)-1)\*(m-1));

k=j-m;

n1=n1-(k/2);

n2=n2+(k/2);

if(a>0)

figure

n=n1:n2;

stem(n,y);

axis([n1-3 n2+3 min(y)-5 max(y)+5]);

title('TIME SCALED SIGNAL');

else

i=1;

for z=0:j-1

h(i)=y(j-z);

i=i+1;

end

subplot(1,2,2);

n=-n2:-n1;

stem(n,h);

axis([-n2-3 -n1+3 min(h)-5 max(h)+5]);

title('TIME SCALED SIGNAL');

end

OUTPUT:

ENTER THE VALUE FOR n1 -4

ENTER THE VALUE FOR n2 4

ENTER THE SEQUENCE

x[-4] 1

x[-3] 2

x[-2] 3

x[-1] 4

x[0] 5

x[1] 4

x[2] 3

x[3] 2

x[4] 1

ENTER THE FRACTIONAL SCALING FACTOR 2





RESULT:

Thus the basic properties of signals have been studied and the required result is obtained.