Sampling Therom

```
t=-10:01:10;
T=4;
fm=1/T;
x=cos(2*pi*fm*t);
subplot(2,2,1);
plot(t,x);
xlabel('time');
ylabel('x(t)')
title('continuous time signal')
grid;
n1=-4:1:4
fs1=1.6*fm;
fs2=2*fm;
fs3=8*fm;
x1=cos(2*pi*fm/fs1*n1);
subplot(2,2,2);
stem(n1,x1);
xlabel('time');
ylabel('x(n)')
title('discrete time signal with fs<2fm')
hold on
subplot(2,2,2);
plot(n1,x1)
grid;
n2=-5:1:5;
x2=cos(2*pi*fm/fs2*n2);
subplot(2,2,3);
stem(n2,x2);
xlabel('time');
ylabel('x(n)')
title('discrete time signal with fs=2fm')
hold on
subplot(2,2,3);
plot(n2,x2)
grid;
n3=-20:1:20;
x3=cos(2*pi*fm/fs3*n3);
subplot(2,2,4);
stem(n3,x3);
xlabel('time');
ylabel('x(n)')
title('discrete time signal with fs>2fm')
hold on
subplot(2,2,4);
plot(n3,x3)
grid;
```

Linear Convolution Given Two Sequence

```
x=[1 0 1 1]
a=0:length(x)-1;
subplot(2,2,1);
stem(a,x);
xlabel('n');
 ylabel('x(n)');
title('sequence x(n)');
grid on;
h=[5 6 7 8]
b=0:length(h)-1;
subplot(2,2,2);
stem(b,h);
xlabel('n');
ylabel('h(n)');
title('sequence h(n)');
grid on;
y=conv(x,h)
c=0:length(y)-1;
subplot(2,2,3);
stem(c,y);
xlabel('n');
ylabel('y(n)');
title('sequence y(n)');
grid on;
```

COMMUTATIVE PROPERTY

```
clear all;
clc;
x=[1 2 3 4]
h=[2 4 6 8]
y1=conv(x,h)
y2=conv(h,x)
if(y1==y2)
      disp('commutative property proved')
else
      disp('commutative property not proved')
end
```

Circular Convolution Given Two Sequnce

```
x=[1 1 1 1]
a=0:length(x)-1;
subplot(2,2,1);
stem(a,x);
xlabel('n');
ylabel('x(n)');
title('sequence x(n)');
grid on;
h=[1 2 3 4]
b=0:length(h)-1;
subplot(2,2,2);
stem(b,h);
xlabel('n');
ylabel('h(n)');
title('sequence h(n)');
grid on;
l=max(length(x),length(h));
disp('circular convolution of the given two sequence');
y=cconv(x,h,l)
c=0:length(y)-1;
subplot(2,2,3);
stem(c,y);
xlabel('n');
ylabel('y(n)');
title('circular convolution of the given two sequence');
grid on;
clear all;
clc;
x=[1 2 3 4]
h1=[2 3 4 5]
h2=[1 2 3 8]

h3=[h1+h2]
c1=conv(x,h1)
c2=conv(x,h2)
y1=conv(x,h3)
y2=(c1+c2)
if(y1==y2)
    disp('distributive property proved')
else
     disp('distributive property not proved')
end
```

ASSOCIATIVE PROPERTY

```
clear all;
clc;
x=[1 1 1 1]
h1=[5 6 7 8]
h2=[2 4 6 8]
c1=conv(x,h1)
y1=conv(c1,h2)
c2=conv(h1,h2)
y2=conv(x,c2)
if(y1==y2)
   disp('associtative property proved')
else
  disp('associtative property not proved')
end
```

DISTRIBUTIVE PROPERTY

```
clear all;
clc;
x=[1 2 3 4]
h1=[2 3 4 5]
h2=[1 2 3 8]
h3=[h1+h2]
c1=conv(x,h1)
c2=conv(x,h2)
y1=conv(x,h3)
y2=(c1+c2)
if(y1==y2)
   disp('distributive property proved')
 else
 disp('distributive property not proved')
 end
```

N POINT DFT

```
clc;
close all;
clear all;
x=[0 1 2 3];
N=4;
n=0:N-1;
X=fft(x,N)
Xmag=abs(X)
Xp=phase(X)
xm=abs(x)
xp=phase(x)
subplot(2,2,1);
stem(n,xm,'*');
xlabel('time');
ylabel('magnitude');
title('input magnitude plot');
subplot(2,2,2);
stem(n,xp,'*');
xlabel('time');
ylabel('phase angel');
title('input phase plot');
subplot(2,2,3);
stem(n,Xmag,'*');
xlabel('time');
ylabel('magnitude');
title('output magnitude plot');
subplot(2,2,4);
stem(n,Xp,'*');
xlabel('time');
ylabel('phase angel');
title('output phase plot');
disply('using inbuilt function');
```