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## Soru 1-a-----

```
clc,clear;
```

```
%-----Soru-1
```

```
n=-100:100; %% n aralık
```

```
w= linspace(-pi,pi); %% w aralığı
```

```
[step1,n1]=stepseq(0,-100,100); %%Birim fonksiyon işlemi
```

```
[step2,n2]=stepseq(21,-100,100);    %%Birim fonksiyon işlemi
```

```
x=((0.9).^n).*n.*(step1-step2);    %% SİNYAL
```

```
X=dtft(x,n,w);    %% dtft fonksiyonu
```

```
subplot(2,1,1)    %% Grafik işlemleri
```

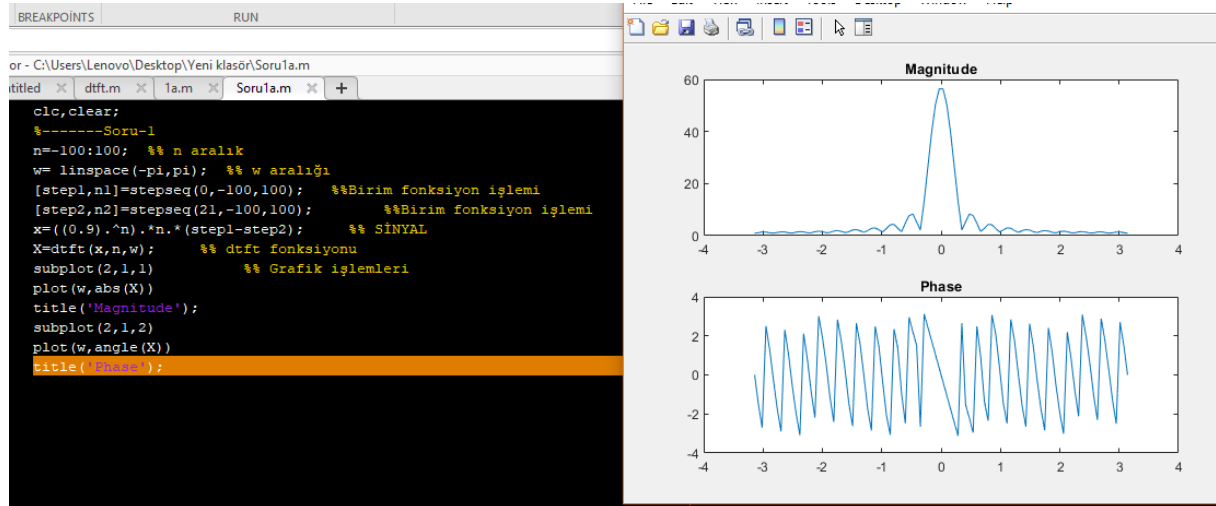
```
plot(w,abs(X))
```

```
title('Magnitude');
```

```
subplot(2,1,2)
```

```
plot(w,angle(X))
```

```
title('Phase');
```



# Soru1b-----

clc; close all;

%-----Soru-2

n=-100:100; %% n değeri aralığı

w= linspace(-pi,pi); %% w değeri aralığı

[k1,n1]=stepseq(0,-100,100); %% Birim fonksiyon işlemi

[k2,n2]=stepseq(51,-100,100); %% Birim fonksiyon işlemi

x=(cos(0.5\*pi\*n)+1i\*sin(0.5\*pi\*n)).\*(k1-k2); %% Sinyal

X=dtft(x,n,w); %% dtft fonksiyonu

subplot(2,1,1) %% Grafik İşlemleri .....

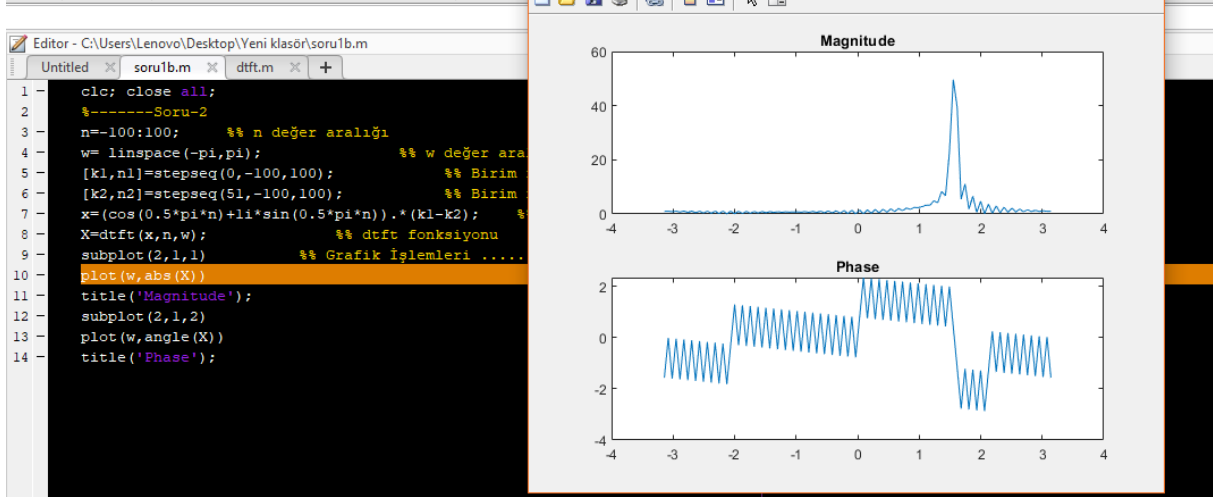
plot(w,abs(X))

title('Magnitude');

subplot(2,1,2)

plot(w,angle(X))

title('Phase');



# Soru1c-----

```
clc,clear; %% Soru-3333
```

```
n=0:7;    %% n aralığı
```

```
w= linspace(-pi,pi);    %% Phase aralığı
```

```
x=[4 3 2 1 1 2 3 4];    %% Soruda verilmiş
```

```
X=dtft(x,n,w);    %% dtft
```

```
subplot(2,1,1) %% Grafik işlemleri...
```

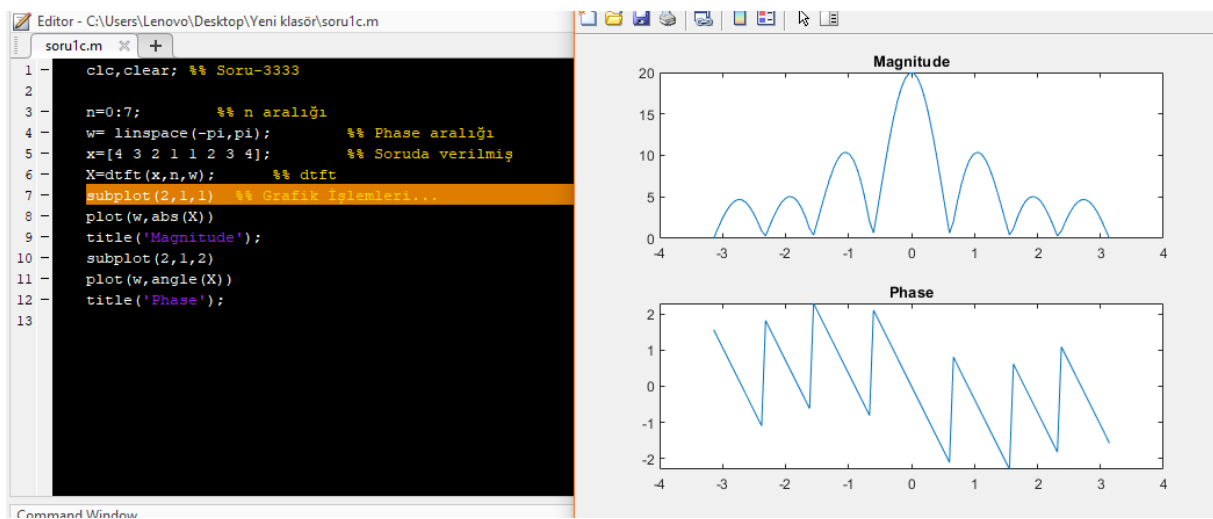
```
plot(w,abs(X))
```

```
title('Magnitude');
```

```
subplot(2,1,2)
```

```
plot(w,angle(X))
```

```
title('Phase');
```



## Soru 2a-----

```
clc,clear;

w= linspace(-pi,pi); %% w aralığı belirledik
m1=stepanddtft(0,10,100,100,w); %M=10
subplot(4,2,1) ; %% Subplot yaptık
plot(w/pi,abs(m1)) ; %% Çizdirdik
title('Magnitude M=10'); %% Garfik işlemleri
subplot(4,2,2)
plot(w/pi,angle(m1))
title('Phase M=10');

m2=stepanddtft(0,25,100,100,w); %M=25
subplot(4,2,3); %% Grafik işlemleri.....
plot(w/pi,abs(m2));
title('Magnitude M=25');
subplot(4,2,4)
plot(w/pi,angle(m2))
title('Phase M=25');

m3=stepanddtft(0,50,100,100,w); %M=50
subplot(4,2,5); %% Grafik işlemleri.....
plot(w/pi,abs(m3));
title('Magnitude M=50');
subplot(4,2,6)
plot(w/pi,angle(m3))
title('Phase M=50');

m4=stepanddtft(0,101,150,150,w); %M=101
subplot(4,2,7); %% Grafik işlemleri.....
plot(w/pi,abs(m4));
```

```
title('Magnitude M=101');
```

```
subplot(4,2,8);
```

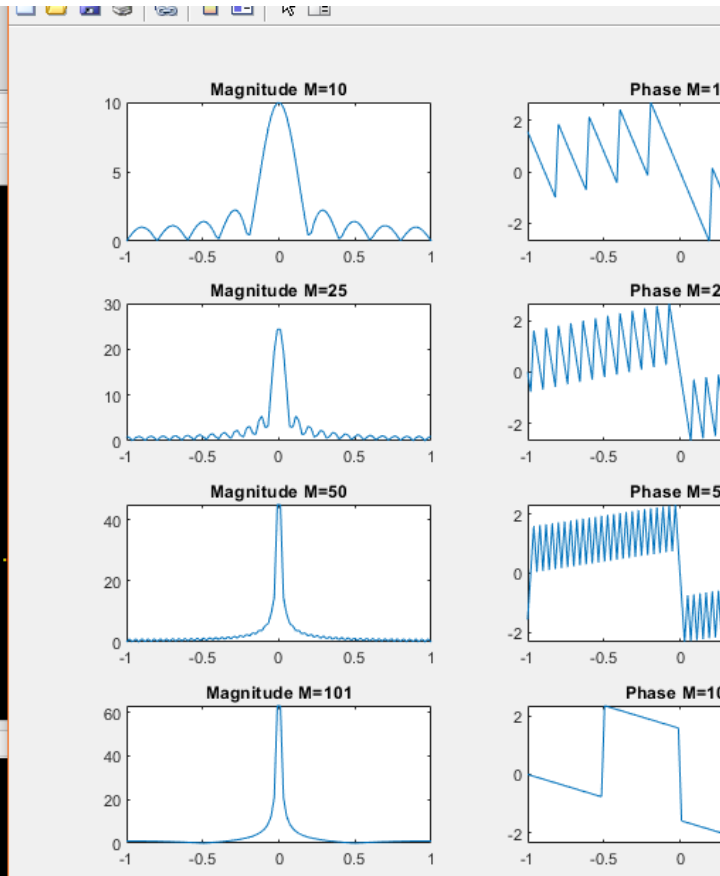
```
plot(w/pi,angle(m4));
```

```
title('Phase M=101');
```

```
Breakpoints Run Run and Advance Advance Run and Time
BREAKPOINTS RUN

Editor - C:\Users\Lenovo\Desktop\Yeni klasör\soru2a.m
soru2a.m stepanddtft.m +
6 title('Magnitude M=10'); %% Grafik işlemleri
7 subplot(4,2,2);
8 plot(w/pi,angle(m1));
9 title('Phase M=10');
10
11 m2=stepanddtft(0,25,100,100,w); %M=25
12 subplot(4,2,3); %% Grafik işlemleri.....
13 plot(w/pi,abs(m2));
14 title('Magnitude M=25');
15 subplot(4,2,4);
16 plot(w/pi,angle(m2));
17 title('Phase M=25');
18
19 m3=stepanddtft(0,50,100,100,w); %M=50
20 subplot(4,2,5); %% Grafik işlemleri.....
21 plot(w/pi,abs(m3));
22 title('Magnitude M=50');
23 subplot(4,2,6);
24 plot(w/pi,angle(m3));
25 title('Phase M=50');
26

Command Window
fx >>
```



## Soru 2b-----

```
clc,clear; %% Soru 2b-----
```

```
w= linspace(-pi,pi); %% w aralığı
```

```
%n=-150:150
```

```
M1=stepanddtft2(10,150,150,w); %M=10
```

```
subplot(4,2,1); %% Grafik işlemleri.....
```

```
plot(w/pi,abs(M1));
```

```
title('Magnitude M=10');
```

```
subplot(4,2,2)
```

```
plot(w/pi,angle(M1));
```

```
title('Phase M=10');
```

```
M2=stepanddtft2(25,150,150,w); %M=25
```

```
subplot(4,2,3); %% Grafik işlemleri.....
```

```
plot(w/pi,abs(M2));
```

```
title('Magnitude M=25');
```

```
subplot(4,2,4);
```

```
plot(w/pi,angle(M2));
```

```
title('Phase M=25');
```

```
M3=stepanddtft2(50,150,150,w); %M=50
```

```
subplot(4,2,5); %% Grafik işlemleri.....
```

```
plot(w/pi,abs(M3));
```

```
title('Magnitude M=50');
```

```
subplot(4,2,6)
```

```
plot(w/pi,angle(M3))
```

```
title('Phase M=50');
```

```
M4=stepanddtft2(101,150,150,w); %M=101
```

```
subplot(4,2,7); %% Grafik işlemleri.....
```

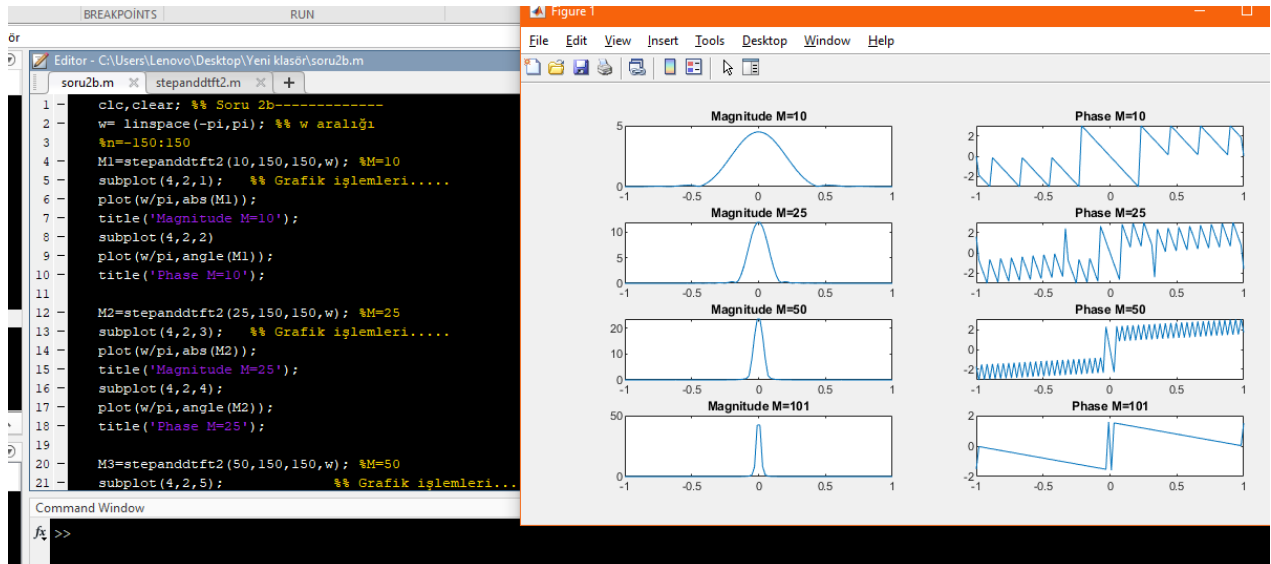
```
plot(w/pi,abs(M4));
```

```
title('Magnitude M=101');
```

```
subplot(4,2,8);
```

```
plot(w/pi,angle(M4));
```

```
title('Phase M=101');
```



## Soru 2c-----

```
clc,clear; %%
```

```
w= linspace(-pi,pi);
```

```
%n=-150:150
```

```
m1=stepanddttf3(10,150,150,w); %m=10
```

```
subplot(8,1,1)
```

```
plot(w/pi,abs(m1))
```

```
title('Magnitude M=10');
```

```
subplot(8,1,2)
```

```
plot(w/pi,angle(m1))
```

```
title('Phase M=10');
```

```
m2=stepanddttf3(25,150,150,w); %m=25
```

```
subplot(8,1,3)
```

```
plot(w/pi,abs(m2))
```

```
title('Magnitude M=25');
```

```
subplot(8,1,4)
```

```
plot(w/pi,angle(m2))
```

```
title('Phase M=25');
```

```
m3=stepanddtft3(50,150,150,w); %m=50
```

```
subplot(8,1,5)
```

```
plot(w/pi,abs(m3))
```

```
title('Magnitude M=50');
```

```
subplot(8,1,6)
```

```
plot(w/pi,angle(m3))
```

```
title('Phase M=50');
```

```
m4=stepanddtft3(101,150,150,w); %m=101
```

```
subplot(8,1,7)
```

```
plot(w/pi,abs(m4))
```

```
title('Magnitude M=101');
```

```
subplot(8,1,8)
```

```
plot(w/pi,angle(m4))
```

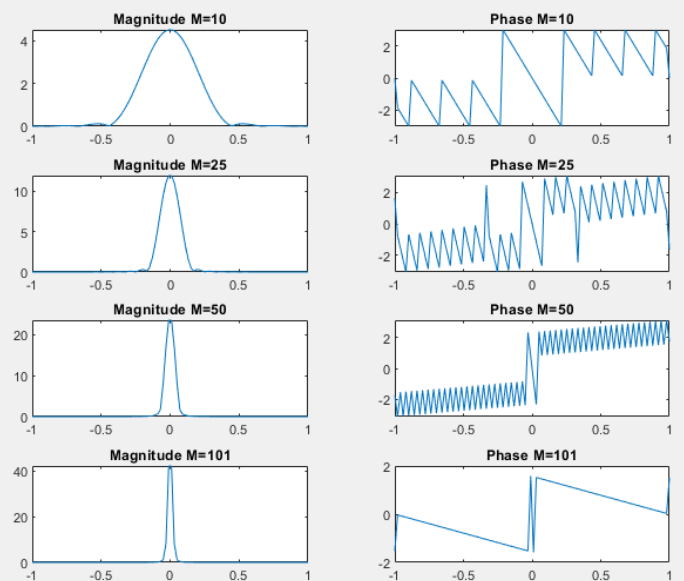
```
title('Phase M=101');
```

```
editor - C:\Users\Lenovo\Desktop\Yeni klasör\Soru2c.m
Soru2c.m  x  +
clc,clear; %% Soru 2c-----
w= linspace(-pi,pi); %% w aralığı
% n=-150:150
m1=stepanddtft2(10,150,150,w); %M=10
subplot(4,2,1); %% Grafik işlemleri.....
plot(w/pi,abs(m1));
title('Magnitude M=10');
subplot(4,2,2);
plot(w/pi,angle(m1));
title('Phase M=10');

m2=stepanddtft2(25,150,150,w); %M=25
subplot(4,2,3); %% Grafik işlemleri.....
plot(w/pi,abs(m2));
title('Magnitude M=25');
subplot(4,2,4);
plot(w/pi,angle(m2));
title('Phase M=25');

m3=stepanddtft2(50,150,150,w); %M=50
subplot(4,2,5); %% Grafik işlemleri.....
plot(w/pi,abs(m3));
title('Magnitude M=50');
subplot(4,2,6);
plot(w/pi,angle(m3));
title('Phase M=50');

m4=stepanddtft2(101,150,150,w); %M=101
subplot(4,2,7); %% Grafik işlemleri.....
plot(w/pi,abs(m4));
title('Magnitude M=101');
subplot(4,2,8);
plot(w/pi,angle(m4));
title('Phase M=101');
```





# Soru 2d-----

```
clc,clear; %% Soru 2d-----
```

```
w= linspace(-pi,pi);    %% w aralığı
```

```
%n=-150:150
```

```
m1=stepanddtft3(10,150,150,w); %M=10
```

```
subplot(4,2,1);    %% Grafik işlemleri.....
```

```
plot(w/pi,abs(m1));
```

```
title('Magnitude M=10');
```

```
subplot(4,2,2);
```

```
plot(w/pi,angle(m1));
```

```
title('Phase M=10');
```

```
m2=stepanddtft3(25,150,150,w); %M=25
```

```
subplot(4,2,3);    %% Grafik işlemleri.....
```

```
plot(w/pi,abs(m2));
```

```
title('Magnitude M=25');
```

```
subplot(4,2,4);
```

```
plot(w/pi,angle(m2));
```

```
title('Phase M=25');
```

```
m3=stepanddtft3(50,150,150,w); %M=50
```

```
subplot(4,2,5);    %% Grafik işlemleri.....
```

```
plot(w/pi,abs(m3));
```

```
title('Magnitude M=50');
```

```
subplot(4,2,6);
```

```
plot(w/pi,angle(m3));
```

```
title('Phase M=50');
```

```
m4=stepanddtft3(101,150,150,w); %M=101
```

```
subplot(4,2,7);    %% Grafik işlemleri.....
```

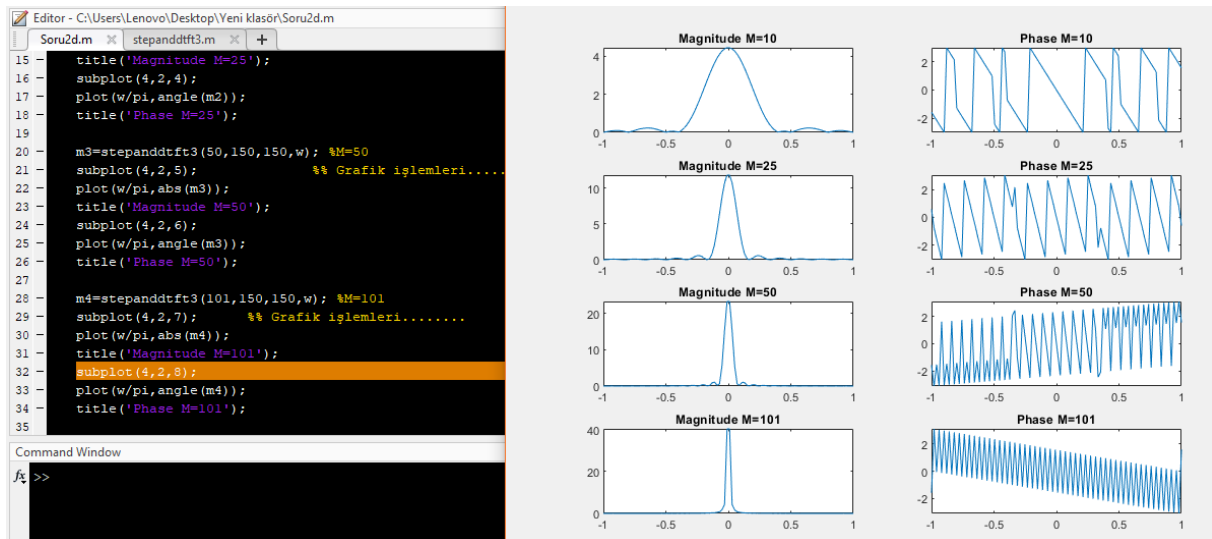
```
plot(w/pi,abs(m4));
```

```
title('Magnitude M=101');
```

```
subplot(4,2,8);
```

```
plot(w/pi,angle(m4));
```

```
title('Phase M=101');
```



## Fonksiyonlar-----

### DTFT----

```
function [X] = dtft(x,n,w)
```

```
    X = exp(-1j*w'*n) * x.';
```

```
End
```

### SİGADD----

```
function [y,n] = sigadd(x1,n1,x2,n2)
```

```
n = min(min(n1),min(n2)):max(max(n1),max(n2)); % duration of y(n)
```

```
y1 = zeros(1,length(n)); y2 = y1; % initialization
```

```
y1(find((n>=min(n1))&(n<=max(n1))==1))=x1; % x1 with duration of y
```

```
y2(find((n>=min(n2))&(n<=max(n2))==1))=x2; % x2 with duration of y
```

```
y = y1+y2;
```

## STEPANDDTFT-----

```
function [X]=stepanddtft(n1,n2,n3,n4,w)

n=-n3:n4;

[step1,n11]=stepseq(n1,-n3,n4);
[step2,n21]=stepseq(n2,-n3,n4);

step=(step1-step2);

X=dtft(step,n,w);

End
```

## STEPANDDTFT2-----

```
function X=stepanddtft2(m,n1,n2,w)

n=-n1:n2;

[step1,n11]=stepseq(0,-n1,n2);
[step2,n21]=stepseq(m,-n1,n2);

step=(step1-step2);

x=(0.5-0.5*cos((2*pi*n)/(m-1))).*step;

X=dtft(x,n,w);
```

## STEPANDDTFT3-----

```
function X=stepanddtft3(m,n1,n2,w)

n=-n1:n2;

[step1,n11]=stepseq(0,-n1,n2);
[step2,n21]=stepseq(m,-n1,n2);

step=(step1-step2);

a=abs(m-1-(2.*n));

x=(1-(a/(m-1))).*step;

X=dtft(x,n,w);
```

# STEPSEQ-----

```
function [x,n] = stepseq(n0,n1,n2)
if ((n0 < n1) | (n0 > n2) | (n1 > n2))
    error('arguments must satisfy n1 <= n0 <= n2')
end
n = [n1:n2];
x = [(n-n0) >= 0];
end
```