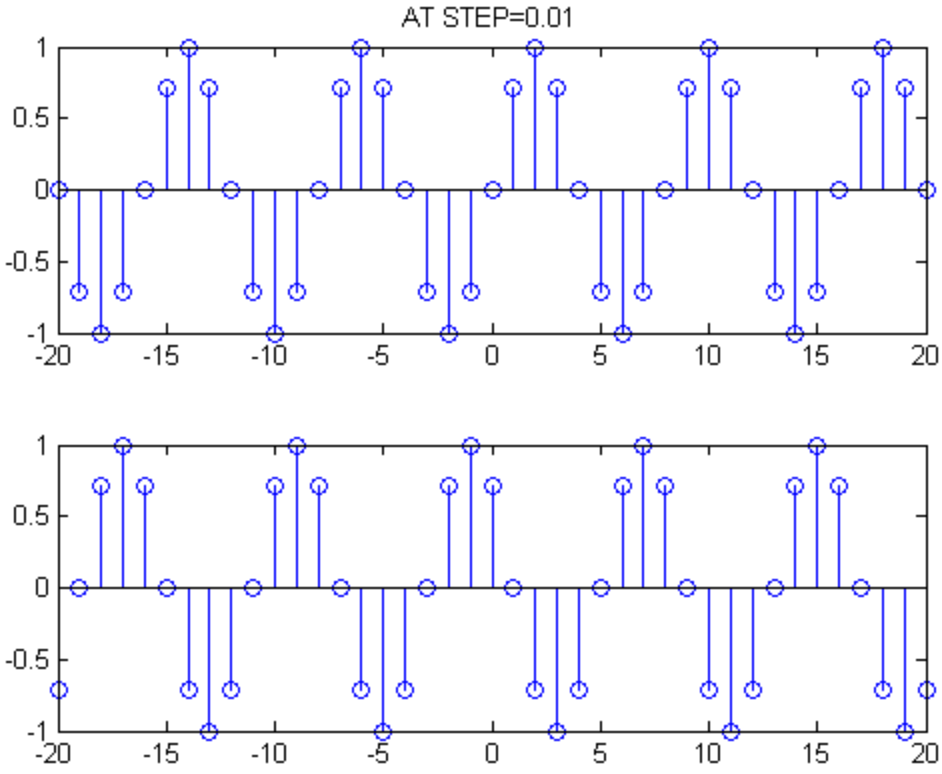
DSP LAB1

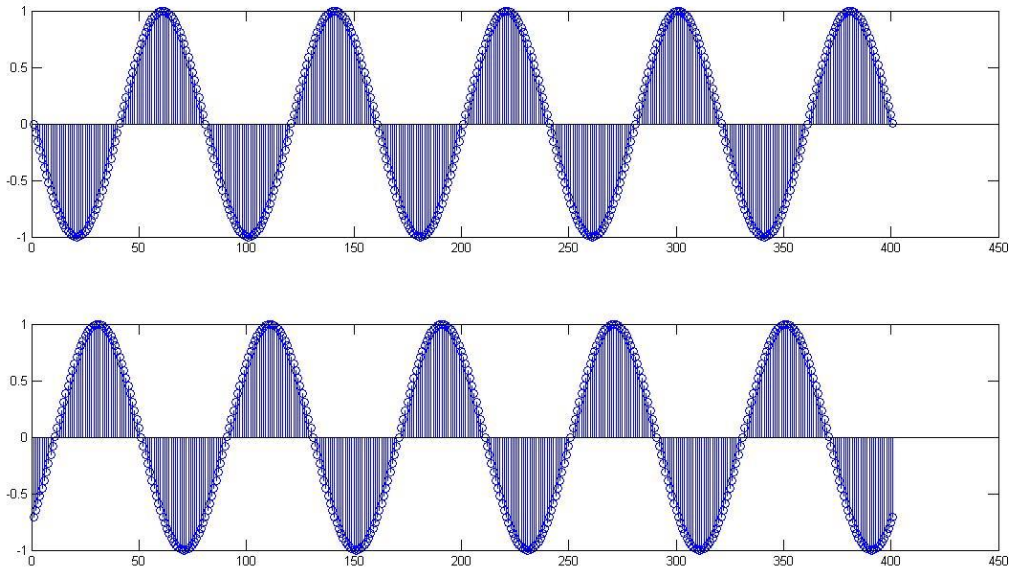
Q1:

```
rand('seed',72);
n=-20:1:20;
x_n=sin(n*(pi/4));
x2=sin((n-5)*(pi/4));

subplot(2,1,1)
stem(n,x_n)
title('AT STEP=0.01')
subplot(2,1,2)
stem(n,x2)
```



STEP : n =-20:0.1:20;



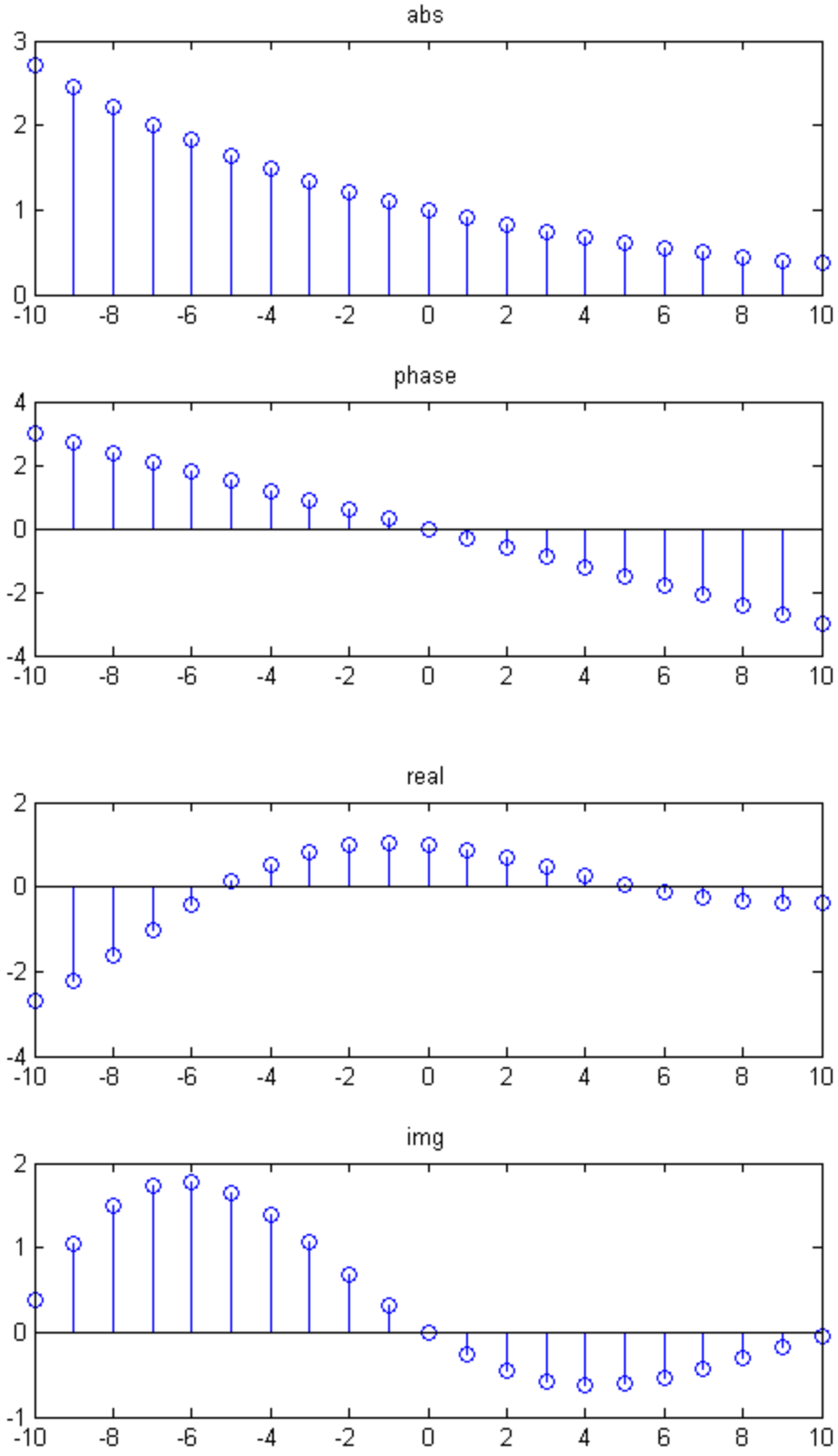
Q2:

```
rand('seed',72);
n=-10:1:10;
X_N=exp(-1*(0.1+i*0.3)*n);
x_abs= abs(X_N);
x_phase=angle(X_N);

x_real=real(X_N);
x_imag=imag(X_N);


subplot(2,1,1)
stem(n,x_abs)
title('abs')
subplot(2,1,2)
stem(n,x_phase)
title('phase')

figure
subplot(2,1,1)
stem(n,x_real)
title('real')
subplot(2,1,2)
stem(n,x_imag)
title('img')
```


abs
3
2
1
0
-10
-8
-6
-4
-2
0
2
4
6
8
10
phase
4
2
0
-2
-4
-10
-8
-6
-4
-2
0
2
4
6
8
10
real
2
0
-2
-4
-10
-8
-6
-4
-2
0
2
4
6
8
10
img
2
1
0
-1
-10
-8
-6
-4
-2
0
2
4
6
8
10

Q3:

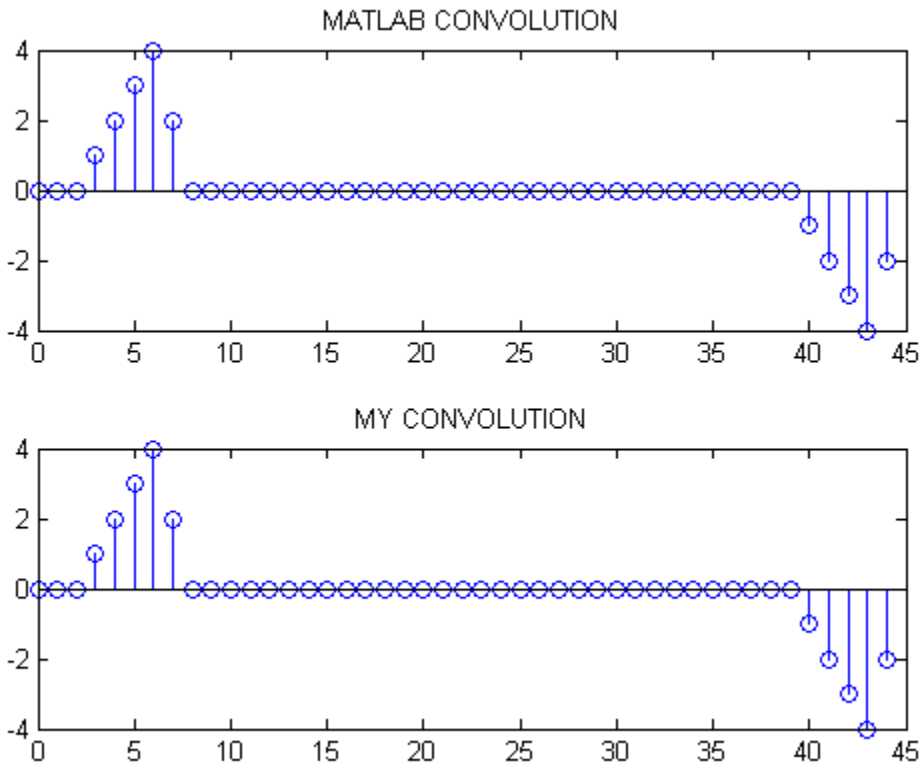
```
rand('seed',72);
n=4:1:40;
X_N=ones(size(n));

H_N=[0 0 0 1 1 1 1 -2 -2]


 subplot(2,1,1)
Y2=conv(X_N,H_N);
M= 0:length(Y2)-1;
stem(M,Y2)
title('MATLAB CONVOLUTION')


Y=MY_CONV(X_N,H_N);

M2= 0:length(Y)-1;
subplot(2,1,2)
stem(M2,Y)
title('MY CONVOLUTION')
```



The function of convolution

```
function [y] = MY_CONV( X , H )

N = length(X);
M = length(H);

Ny = N + M -1;

y = zeros(1,Ny);

for i = 1:N
      for k = 1:M
       y(i+k-1) = y(i+k-1) + H(k)*X(i);
      end
end

end
```

Q4 :

```
rand('seed',72);

[y,Fs]=audioread('C:\Users\SOUQ COMPUTER\Downloads\Zahb_Elleil.mp3');
FS2=22000*4;
%  sound(y,Fs)
 sound(y,FS2)
```

*When we increase the fs the speed on the voice increase

Q5:

```
rand('seed',72);
n=0:1:10;
X=4*cos((pi/8)*n);
yn=[1 1 0 0 0 0 0 0 0 0];
input=1;


for index=3:10

    yn(index)=yn(index-1)+2*yn(index-2)+X(index-2);
end
```

```
subplot(2,1,1)
stem(yn)

h=conv(input,yn);
subplot(2,1,2)
stem(h)
```