

# EEN - 521 Digital Signal and Image Processing

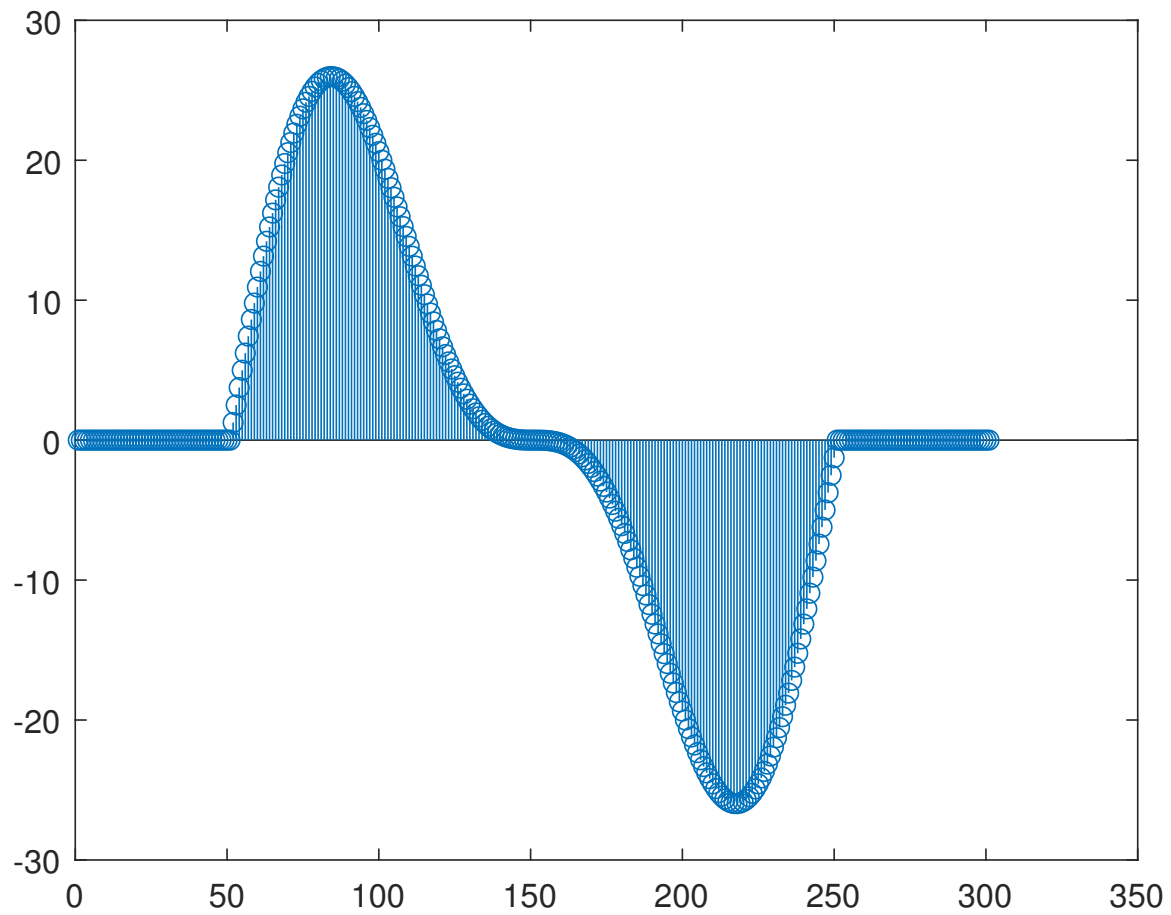
## Lab Report 2

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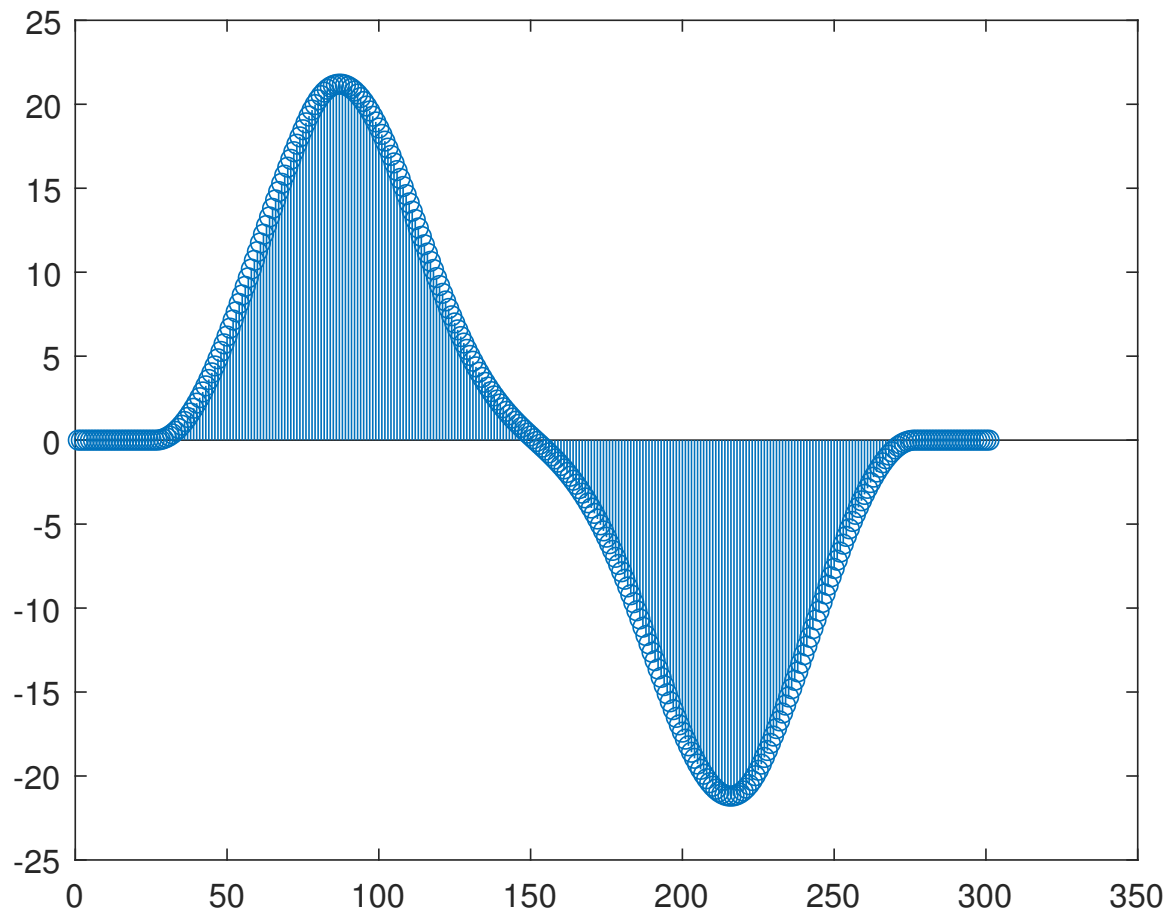
```
clc  
clear all  
close all
```

Solution 1:

```
%1  
n=0:200;  
y=10*sin(n*pi/50)+20*sin(n*pi/100);  
y1=[zeros(1,50) y zeros(1,50)];  
yf=movmean(y1,50);  
figure;  
stem(y1);
```

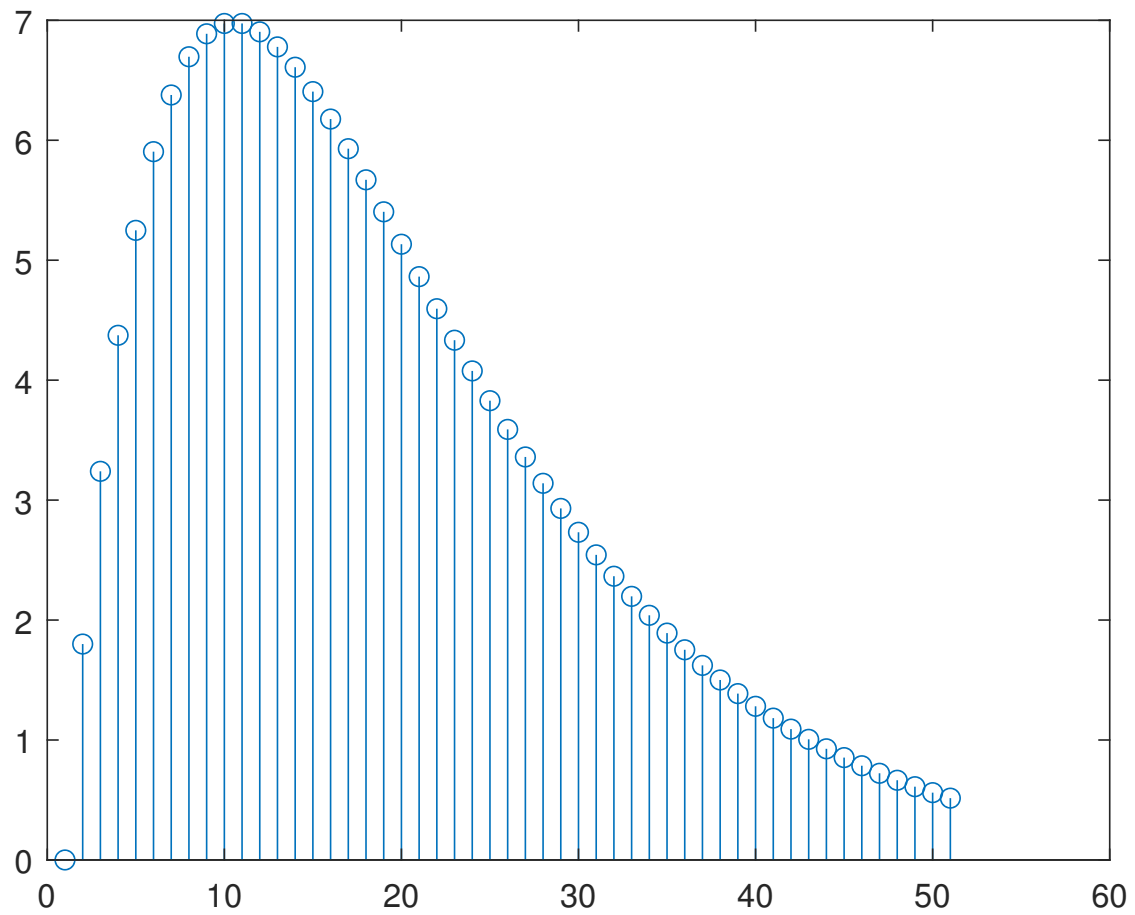


```
figure;  
stem(yf);
```

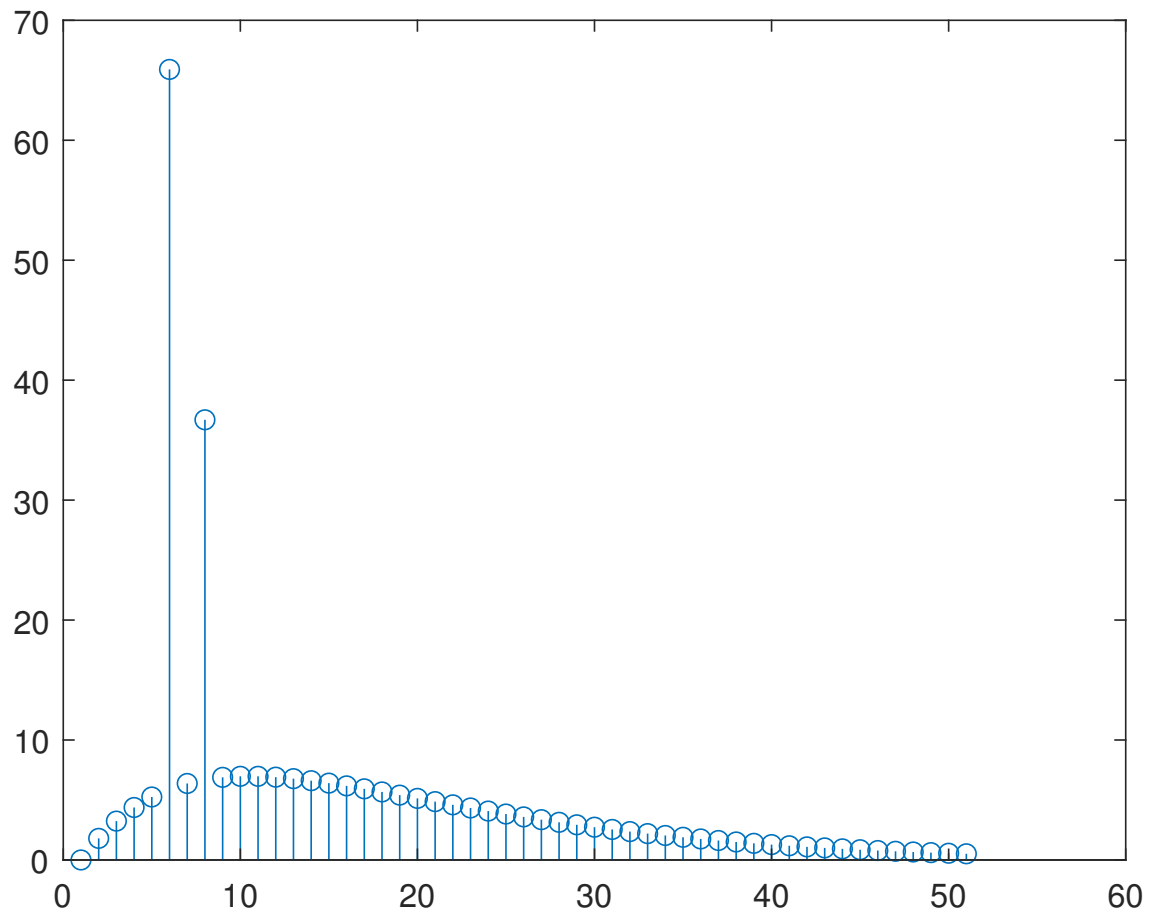


Solution 2:

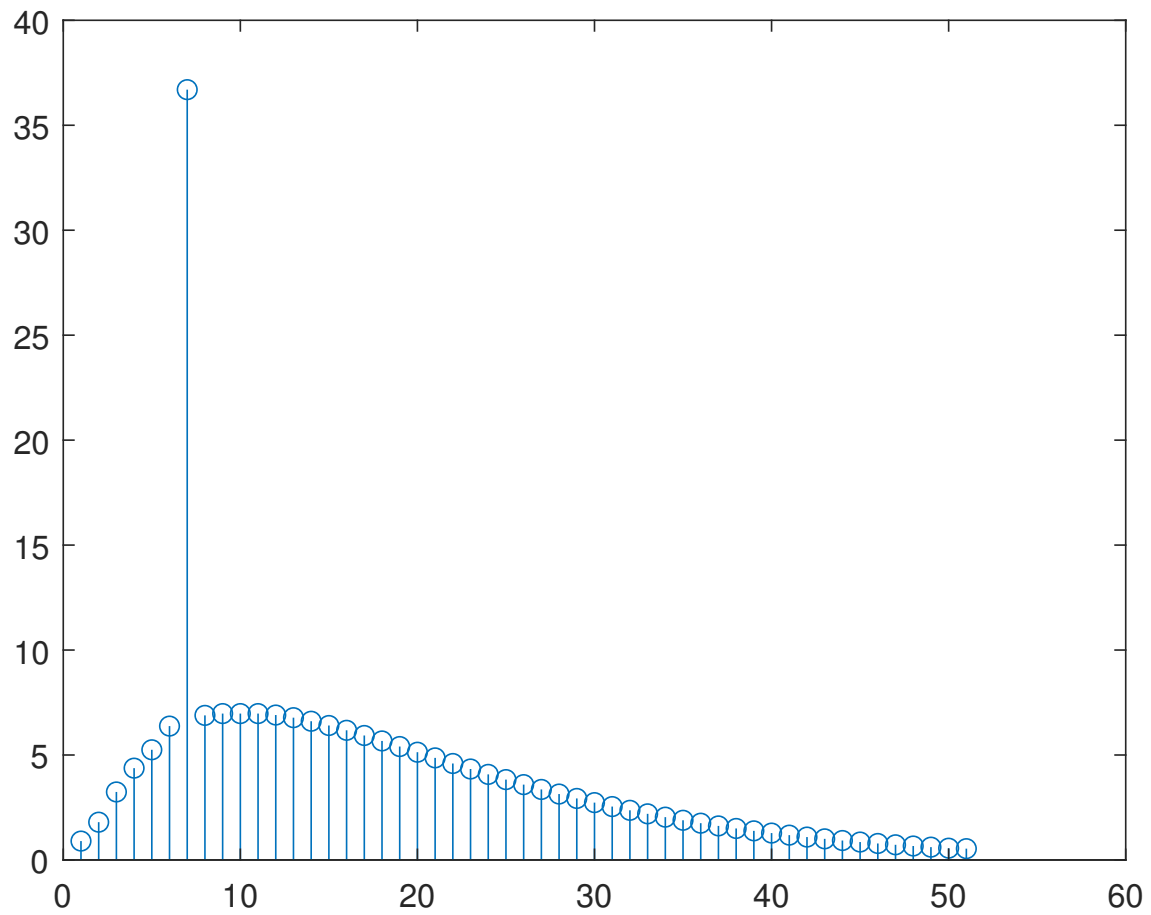
```
%2  
n=0:50;  
s=2*(n.*(0.9).^n);  
figure  
stem(s)
```



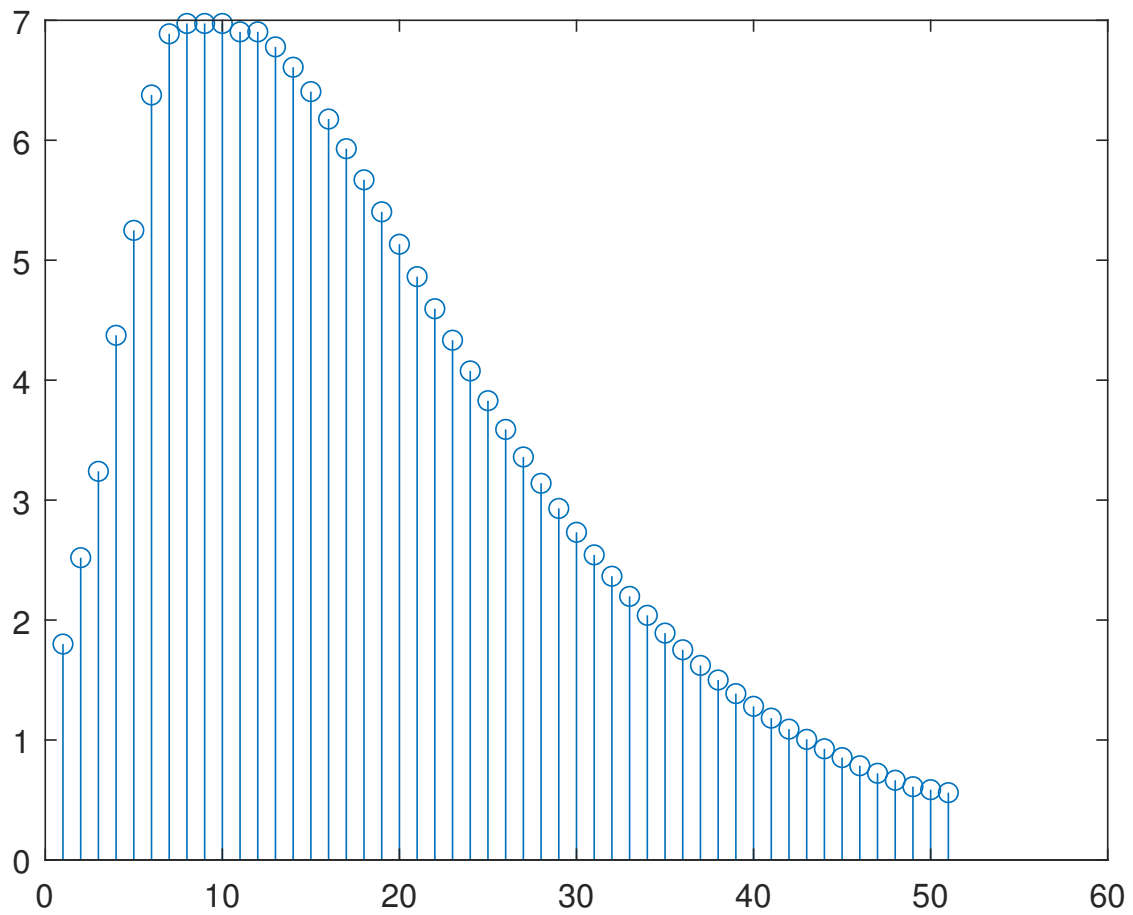
```
noise=60*[n-5==0]+30*[n-7==0];  
noisy=s+noise;  
figure  
stem(noisy)
```



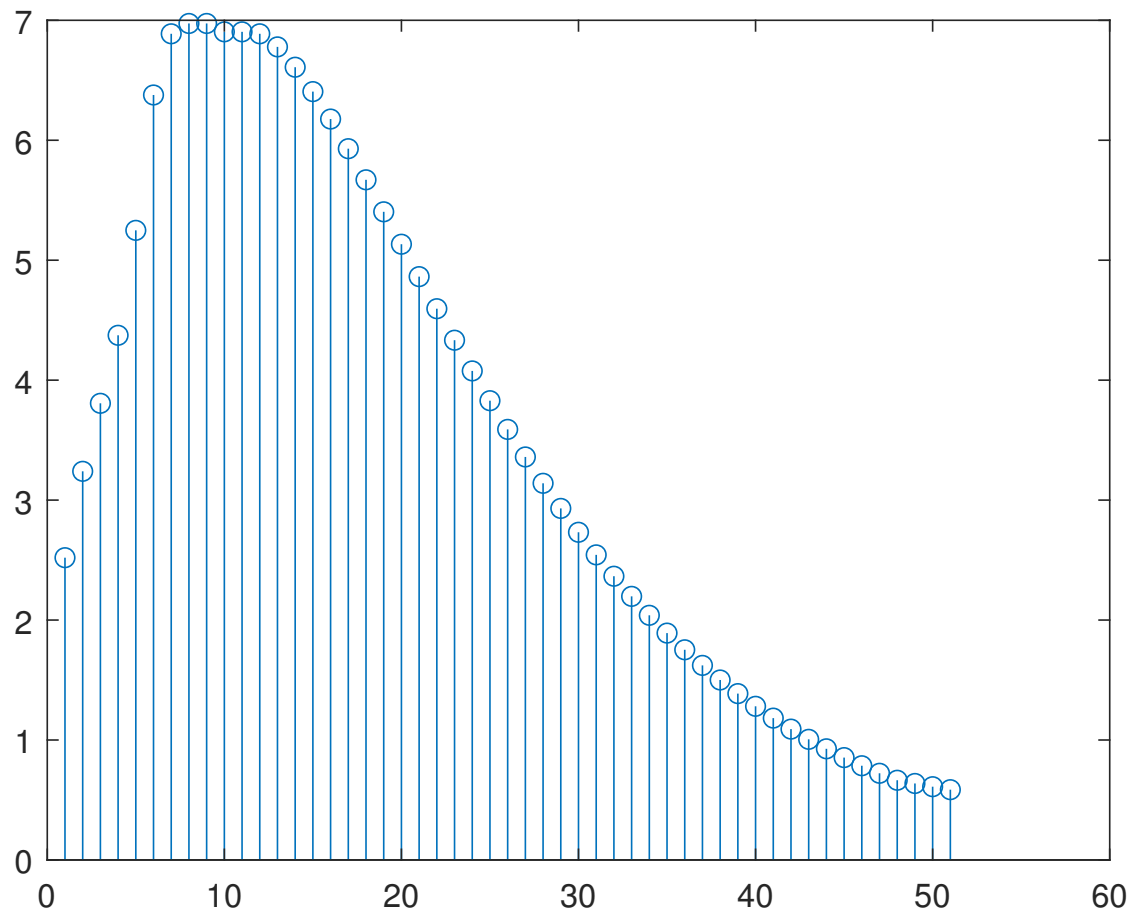
```
A1=movmedian(noisy,3);  
figure  
stem(A1)
```



```
A2=movmedian(noisy,5);  
figure  
stem(A2)
```



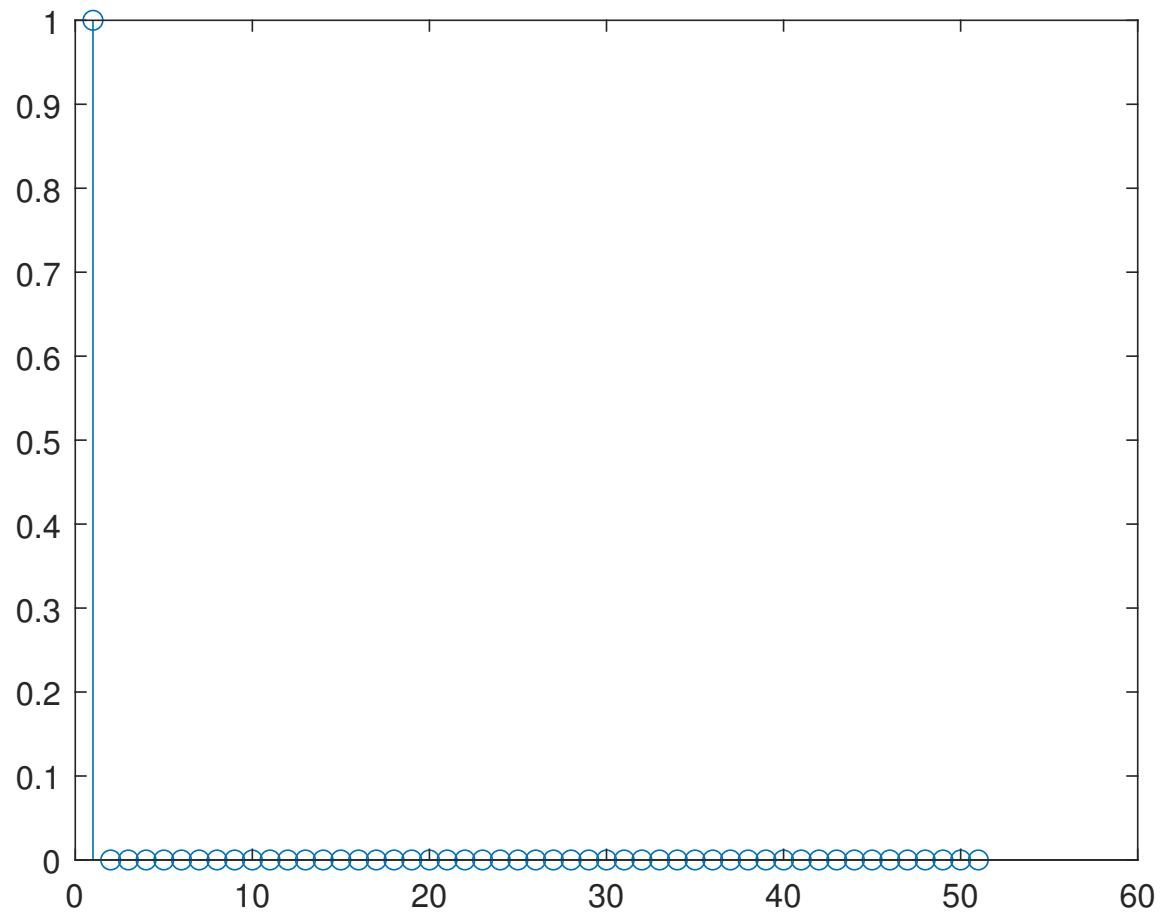
```
A3=movmedian(noisy,7);  
figure  
stem(A3)
```



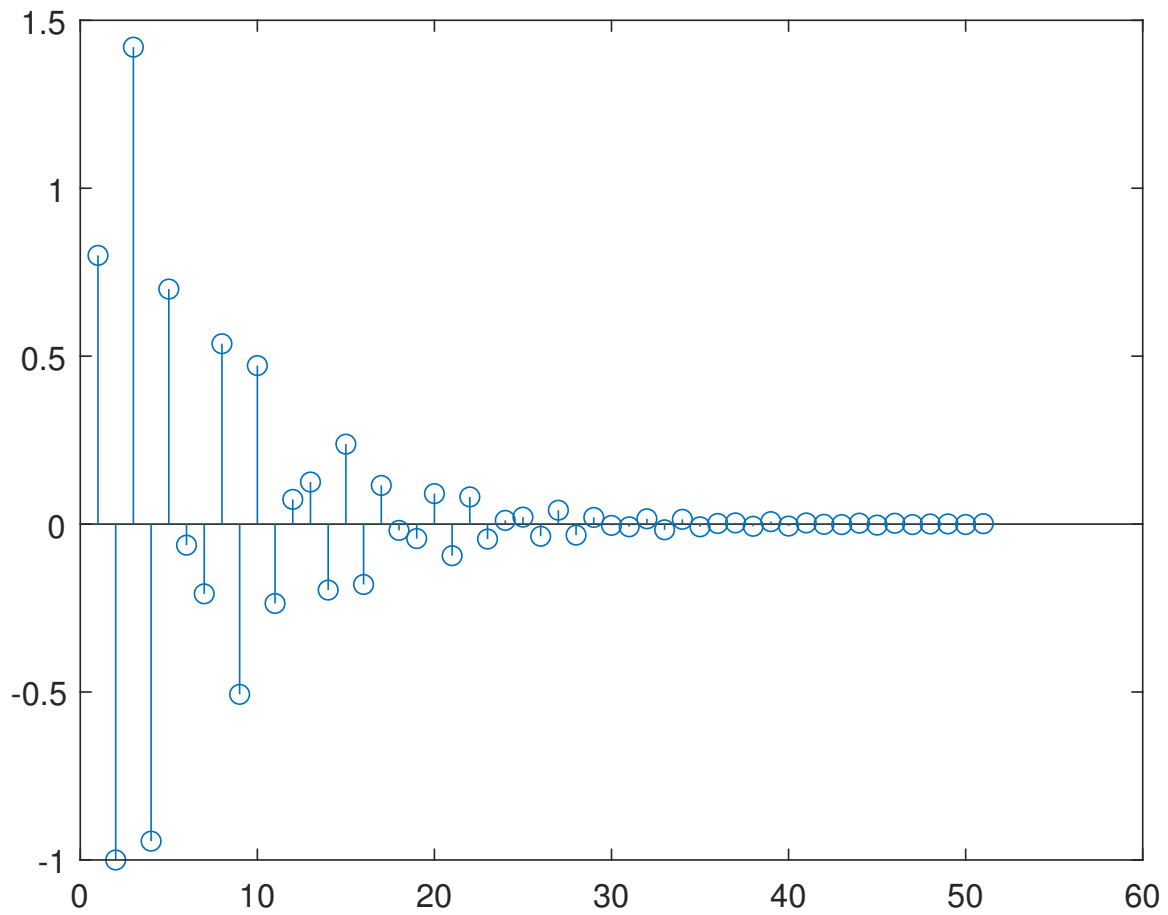
Solution 3:

```
%3
n=0:50; % Indices
b=[0.8,-0.44,0.36,0.02];
a=[1,0.7,-0.45,-0.6];
delta=[n==0];
Iresp=filter(b,a,delta);
units = [n>=0];
Sresp=filter(b,a,units);
figure;
stem(delta);
```

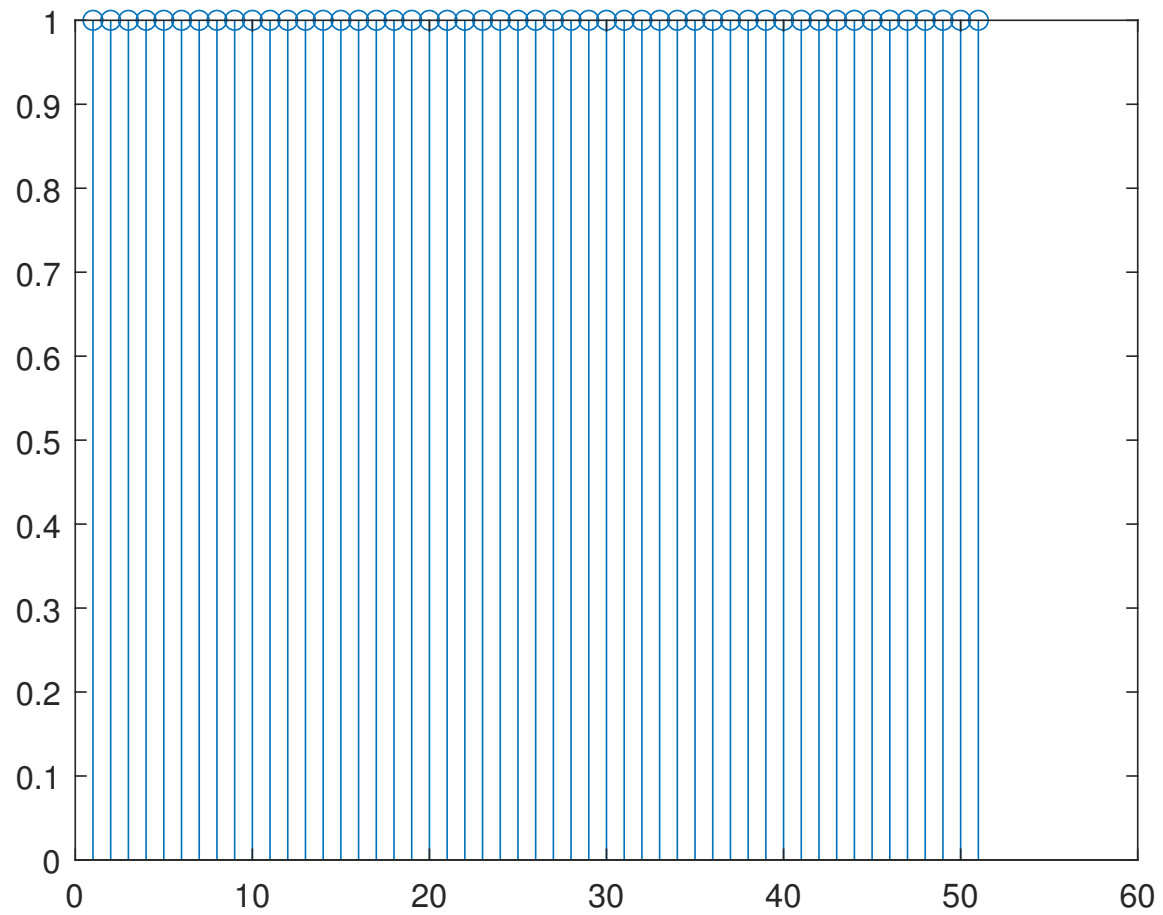




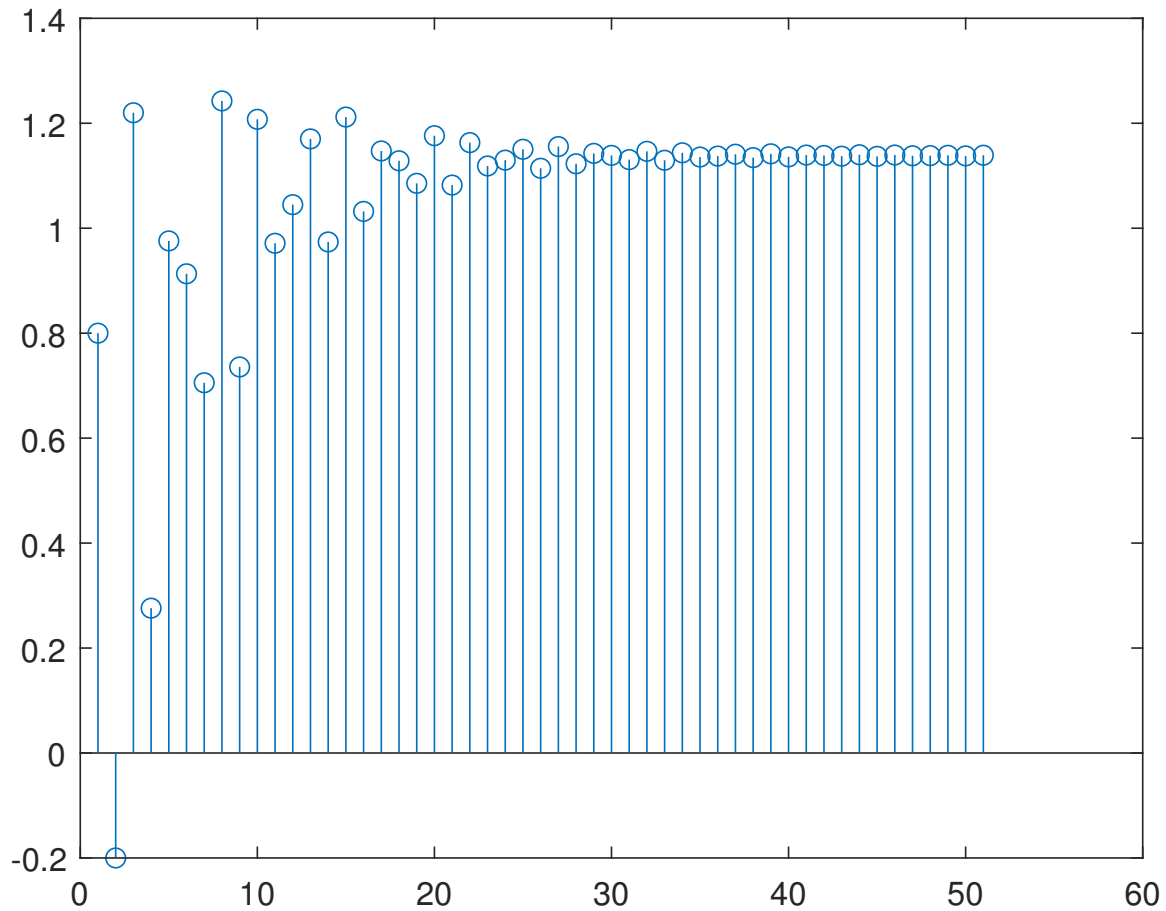
```
figure;  
stem(Iresp);
```



```
figure;  
stem(units);
```

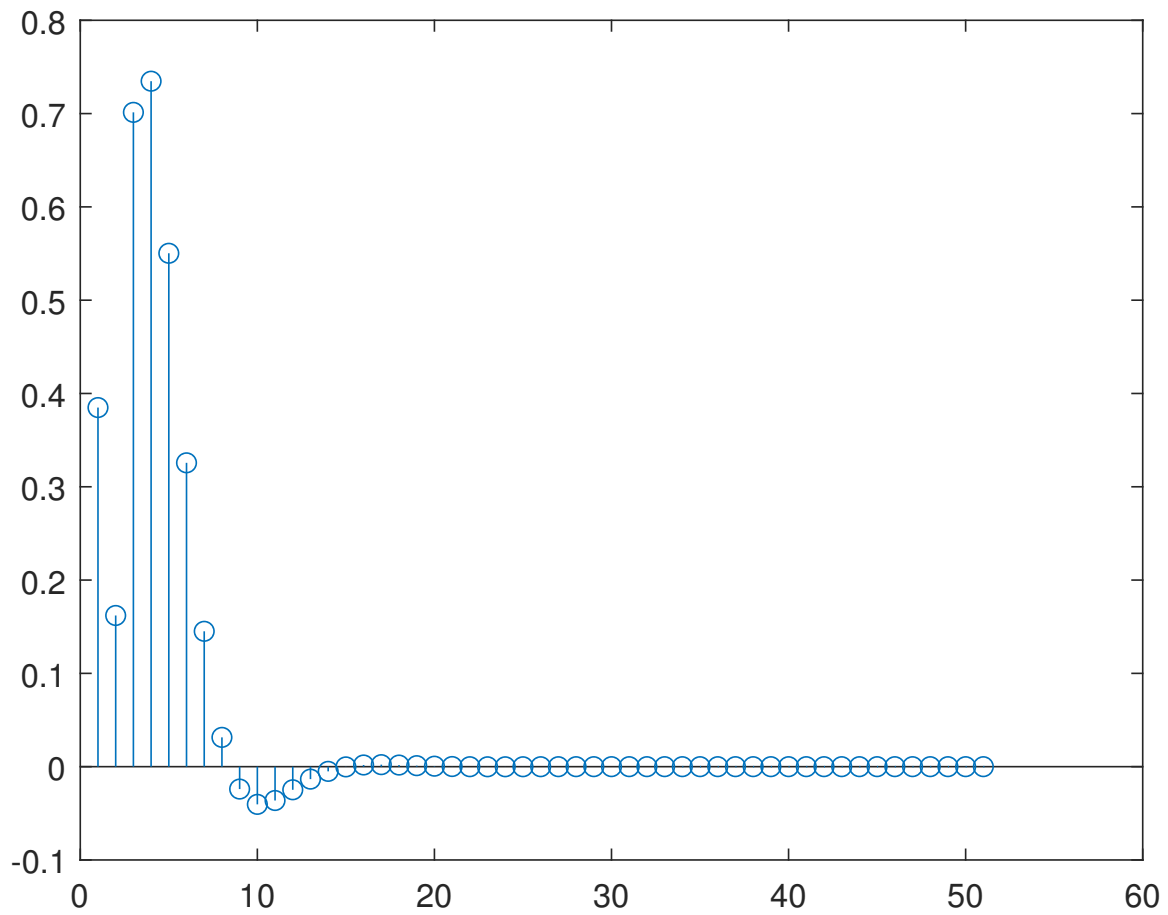


```
figure;  
stem(Sresp);
```

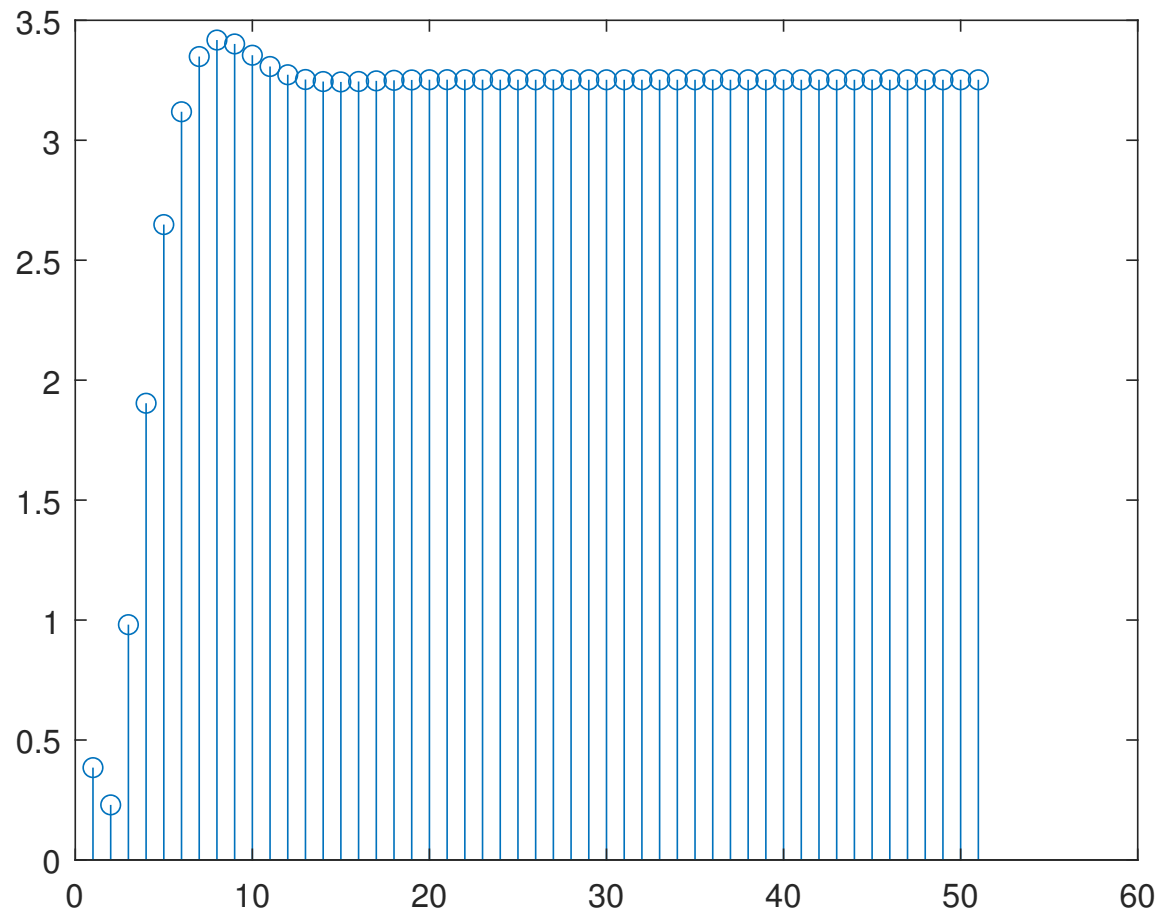


Solution 4:

```
%4
b=[0.0675, 0.1349, 0.675];
a=[1,-1.143, 0.4128];
y=[1,2];
inicias = filtic(b,a,y);
delta=[n==0];
Iresp = filter(b,a,delta,inicias) ;
units = [n>=0];
Sresp = filter(b,a,double(units),inicias);
figure;
stem(Iresp);
```



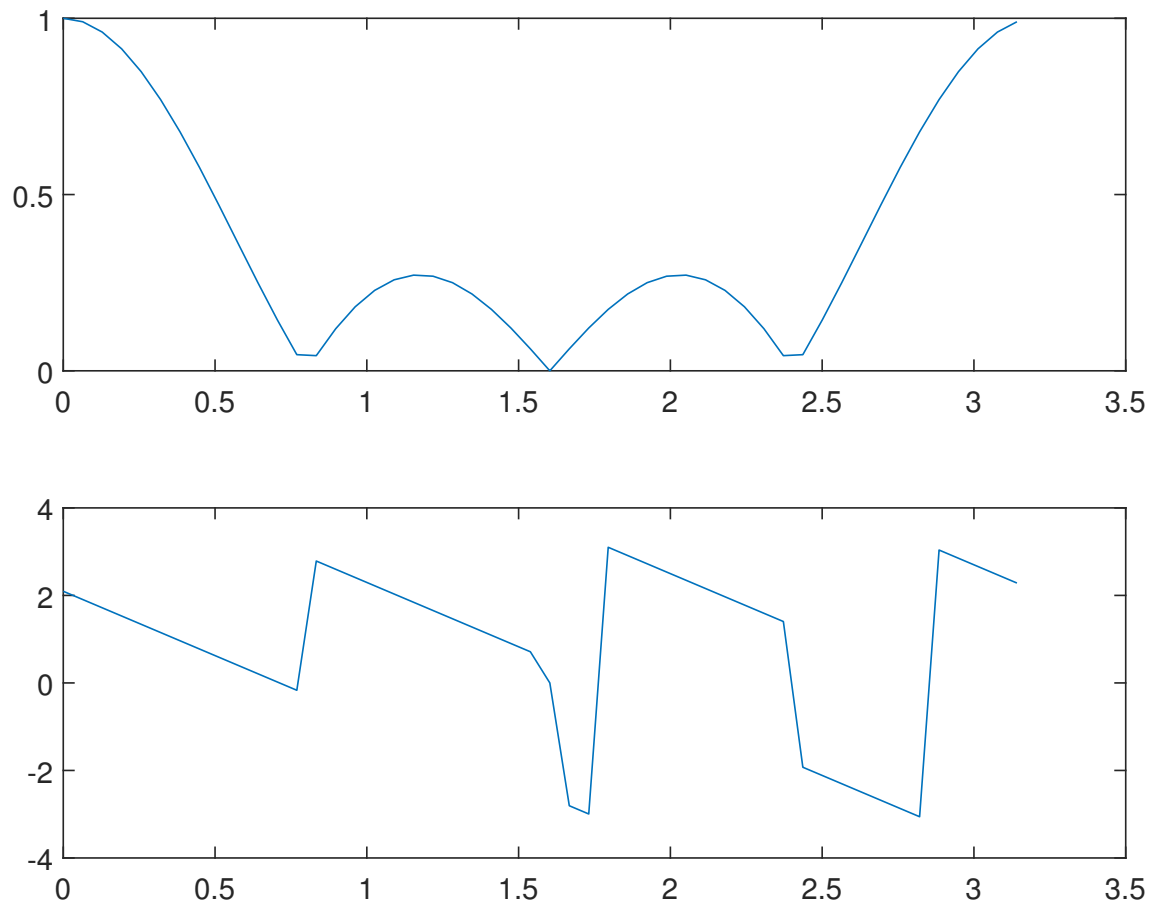
```
figure;  
stem(Sresp);
```



Solution 5:

```
%5
n=0:49;
omega=0:pi/49:pi;
h=[ones(1,4)/4 zeros(1,46)];
noisy=exp(j*50*pi/3);
y=conv(noisy,h);
Yw=fft(y);

subplot(2,1,1);
plot(omega,abs(Yw));
subplot(2,1,2);
plot(omega,angle(Yw));
```

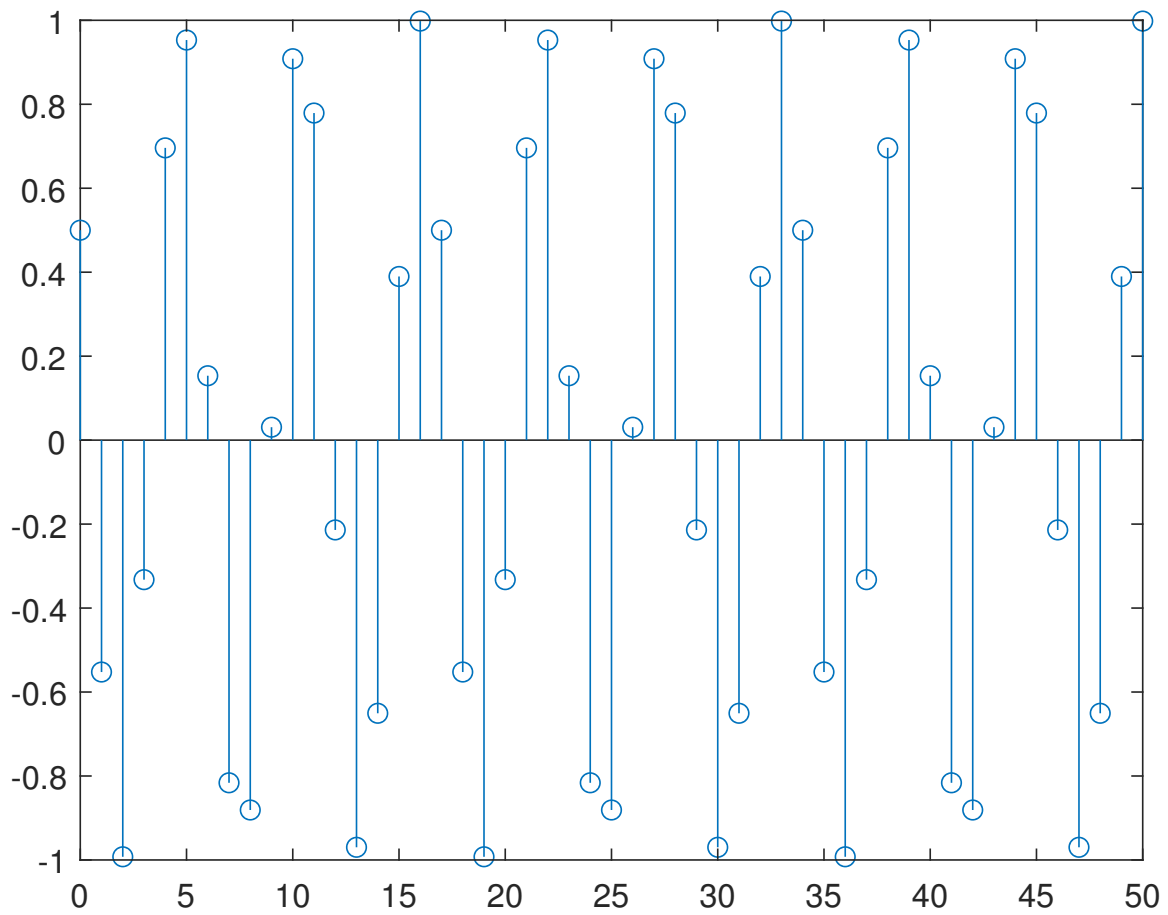


Solution 6:

```
%6
```

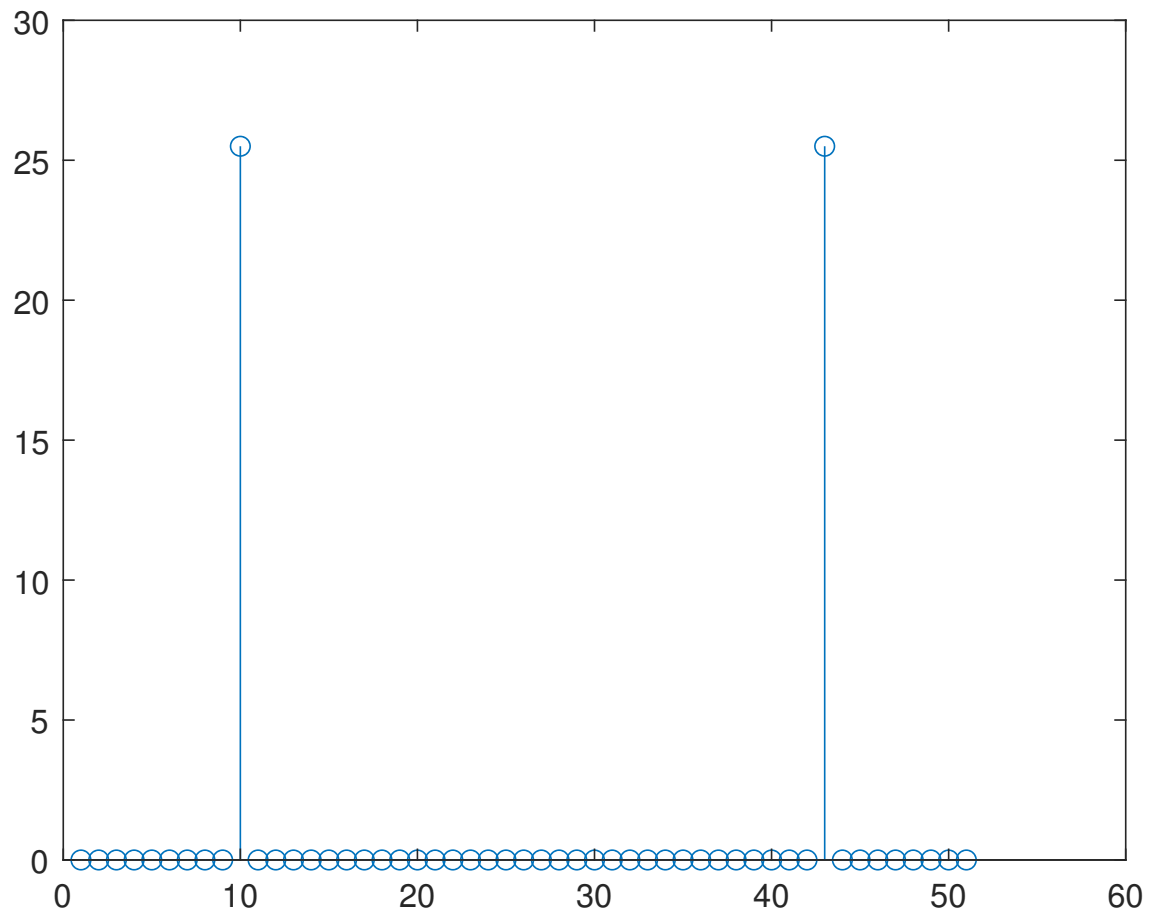
Solution 7:

```
%7
n=0:50;
noisy=cos(6*pi*n/17+pi/3);
FT=fft(noisy);
xn1=ifft(FT);
figure;
stem(n,noisy);
```

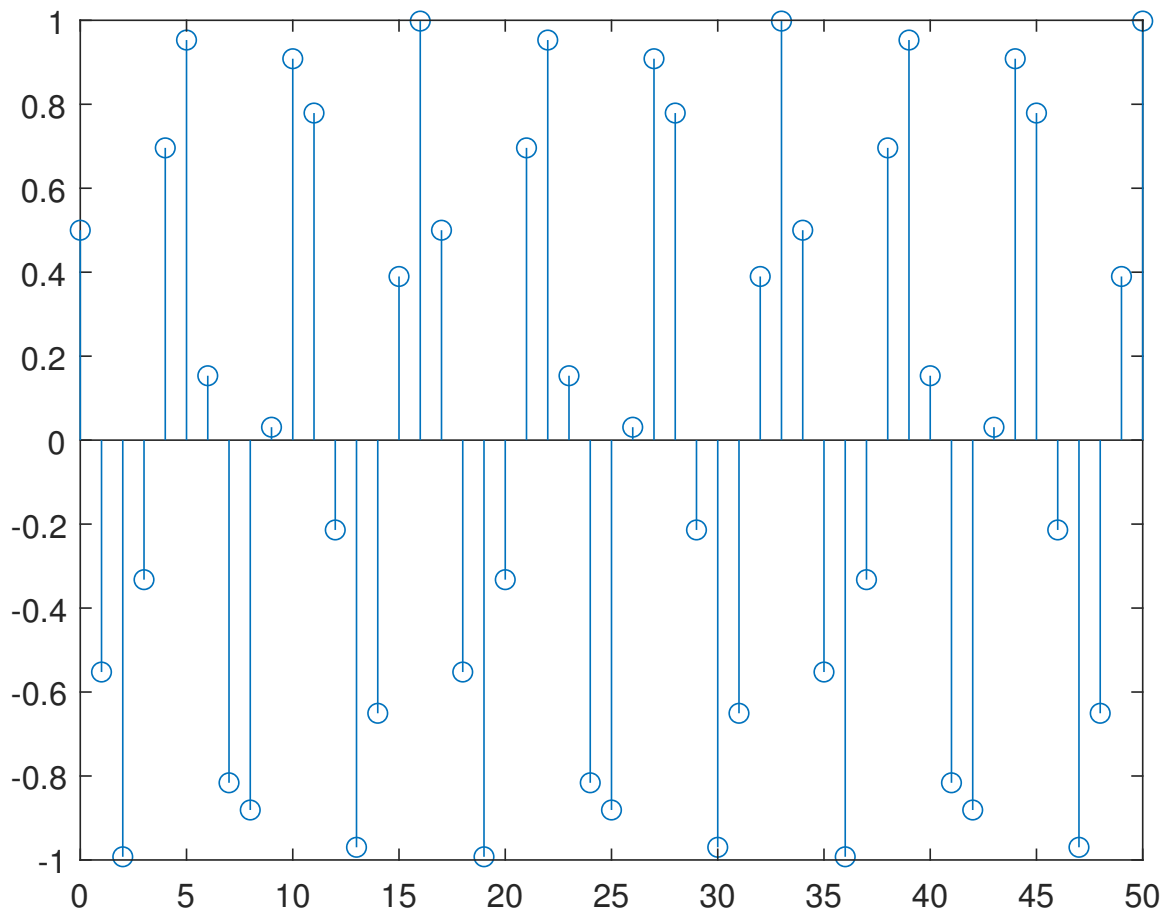


```
figure;  
stem(abs(FT));
```



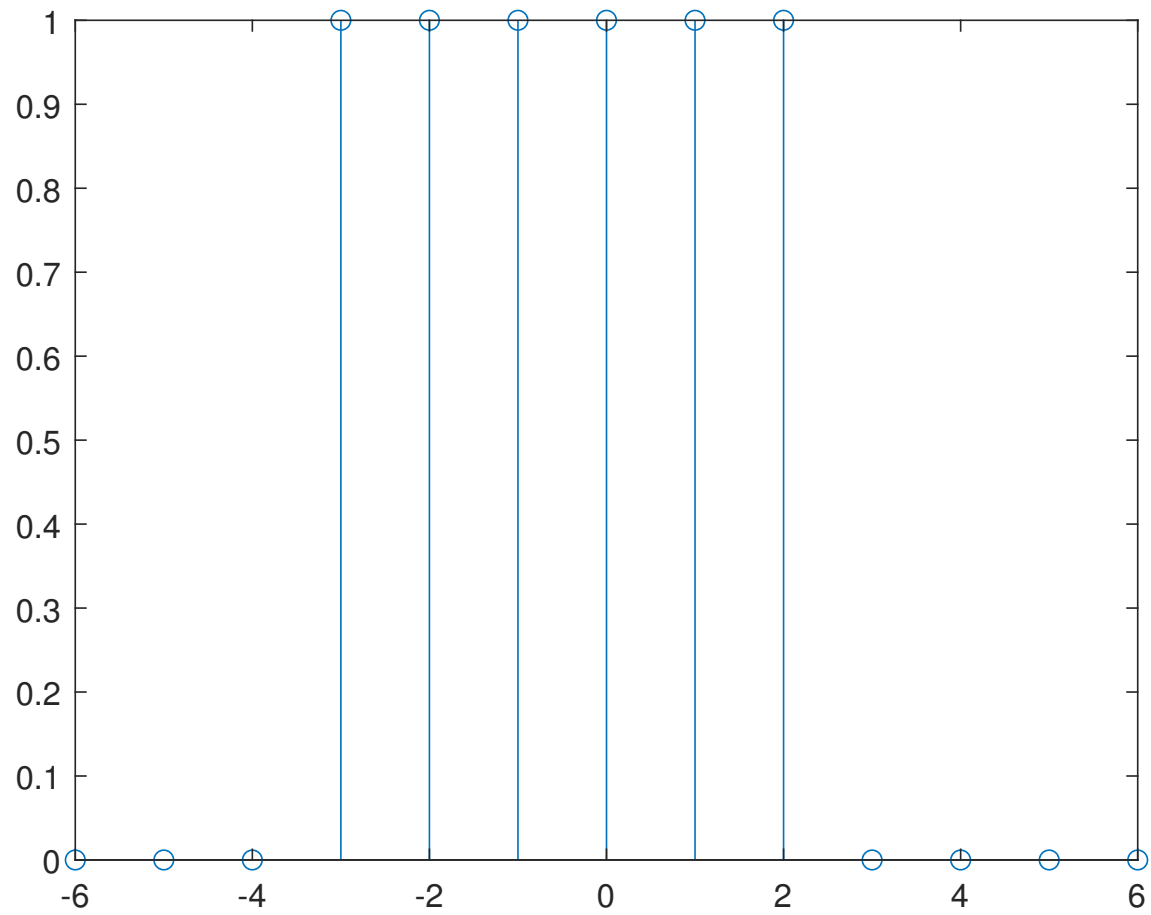


```
figure;  
stem(n,xn1);
```

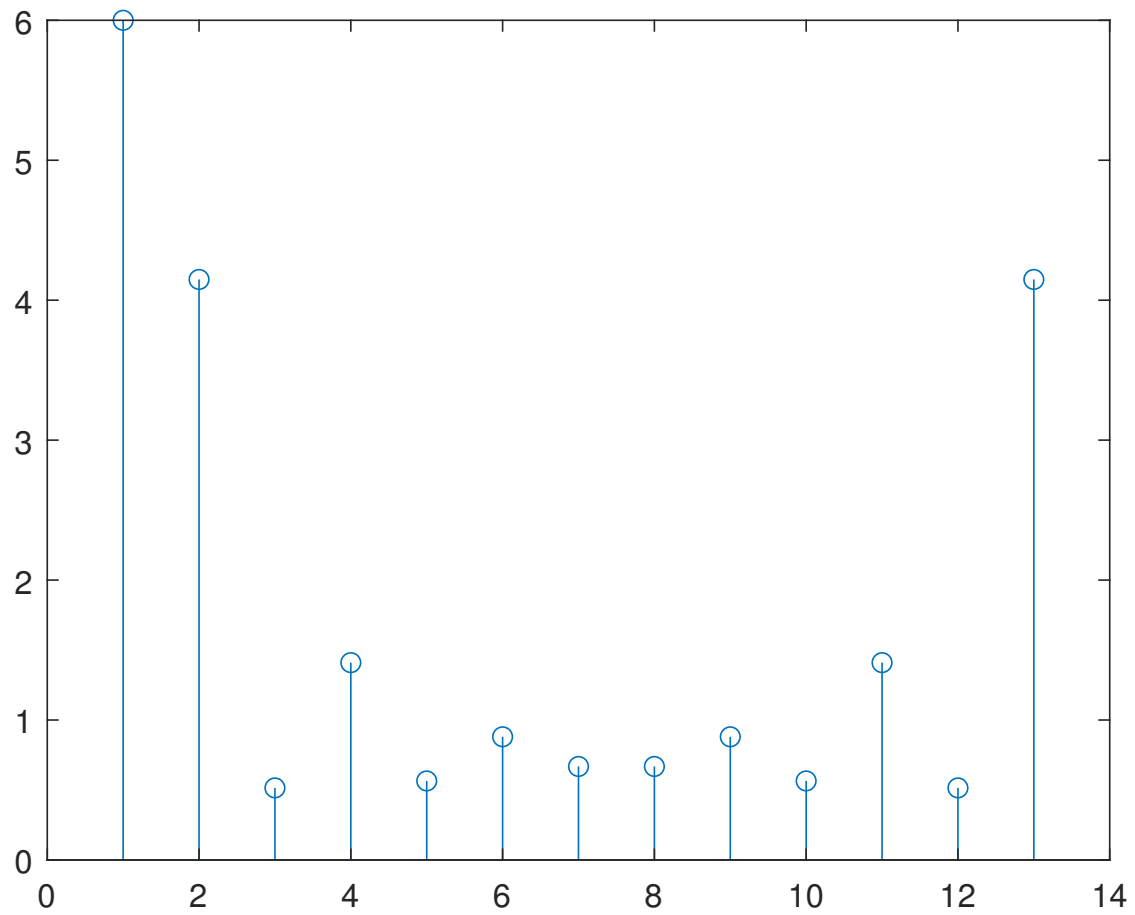


Solution 8:

```
%8
n=-6:6; % Indices
x5= [(n+3) >= 0]-[(n-3) >= 0]; % Sequence
D=fft(x5);
figure;
stem(n,x5);
```



```
figure;  
stem(abs(D));
```



```
figure;  
stem(angle(D));
```

