ESE-2014 LAB 4

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Using the evenodd function, decompose the following sequences into their even and odd components. Plot these components using the stem function.

1. x1(n)= {0,1,2,3,4,5,6,7,8,9}

SOLUTION:

Creating even-odd function

Editor - C:\Users\Sruthi\Documents\MATLAB\evenodd.m

evenodd.m

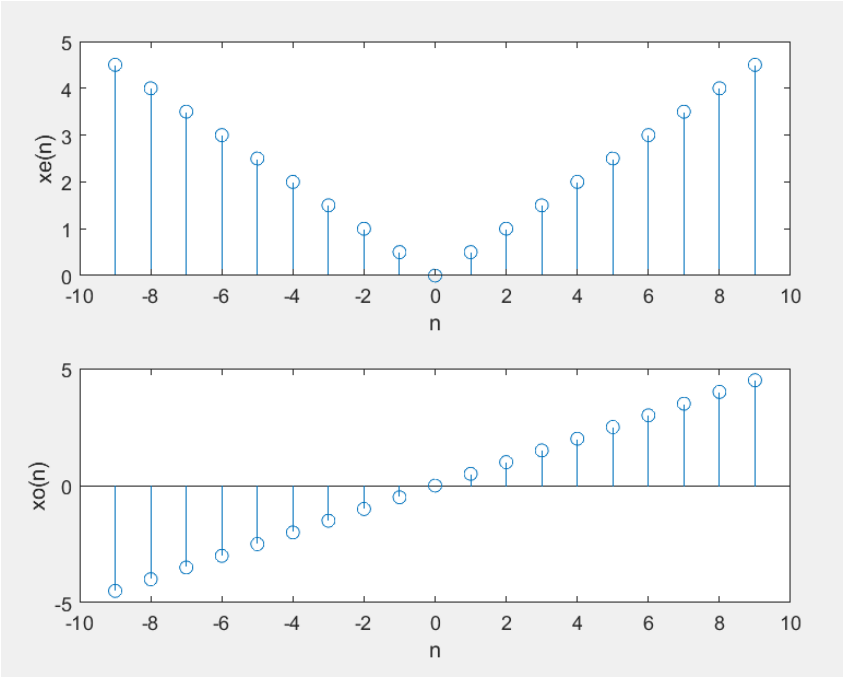
```
function [xe, xo, m] = evenodd(x,n)
if any(imag(x)~=0)
    error("x is not a real sequence")
end
m = -fliplr (n); m1 = min([m,n]); m2 = max([m,n]); m = m1:m2;
nm = n(1)-m(1); n1 = 1:length(n); x1 = zeros(1,length(m));
x1(n1+nm)=x;
x = x1;
xe = 0.5*(x+fliplr(x));
xo = 0.5*(x-fliplr(x));
subplot(2,1,1);
stem(m,xe); xlabel('n'); ylabel('xe(n)');
subplot(2,1,2);
stem(m,xo); xlabel('n'); ylabel('xo(n)');
```

Operation on sequence

Command Window

```
>> n1=[0:9]; x1=[0 1 2 3 4 5 6 7 8 9];
>> [xe1,xo1,m1]=evenodd(x1,n1);
```

OUTPUT:



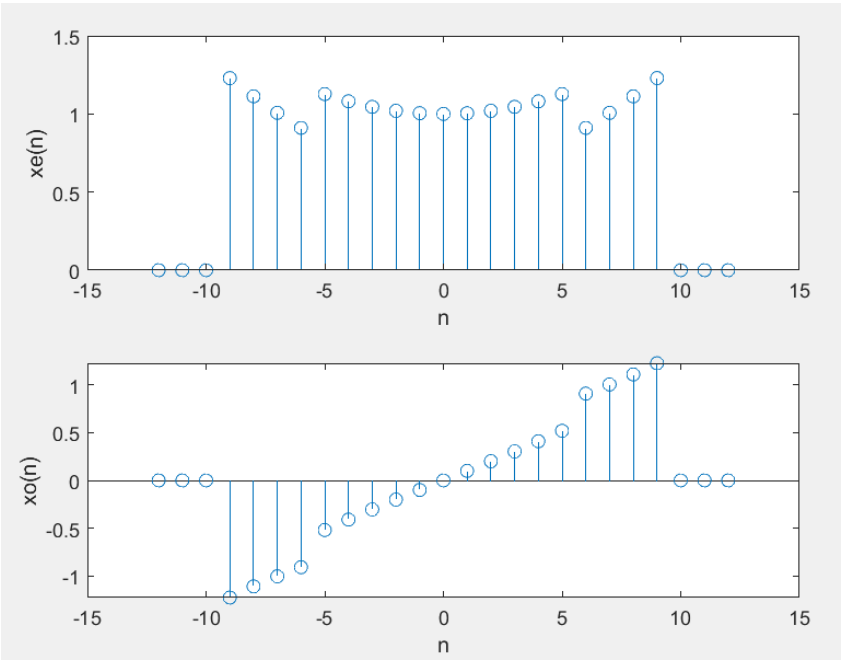
2. x2(n)= e^(0.1n)[u(n+5)-u(n-10)]

SOLUTION:

Operation on Sequence

```
Command Window
  >> n2 = [-8:12]; x2 = exp(0.1*n2).*(stepseq(-5,-8,12) - stepseq(10,-8,12));
  >> [xe2,xo2,m2] = evenodd(x2,n2);
```

OUTPUT:



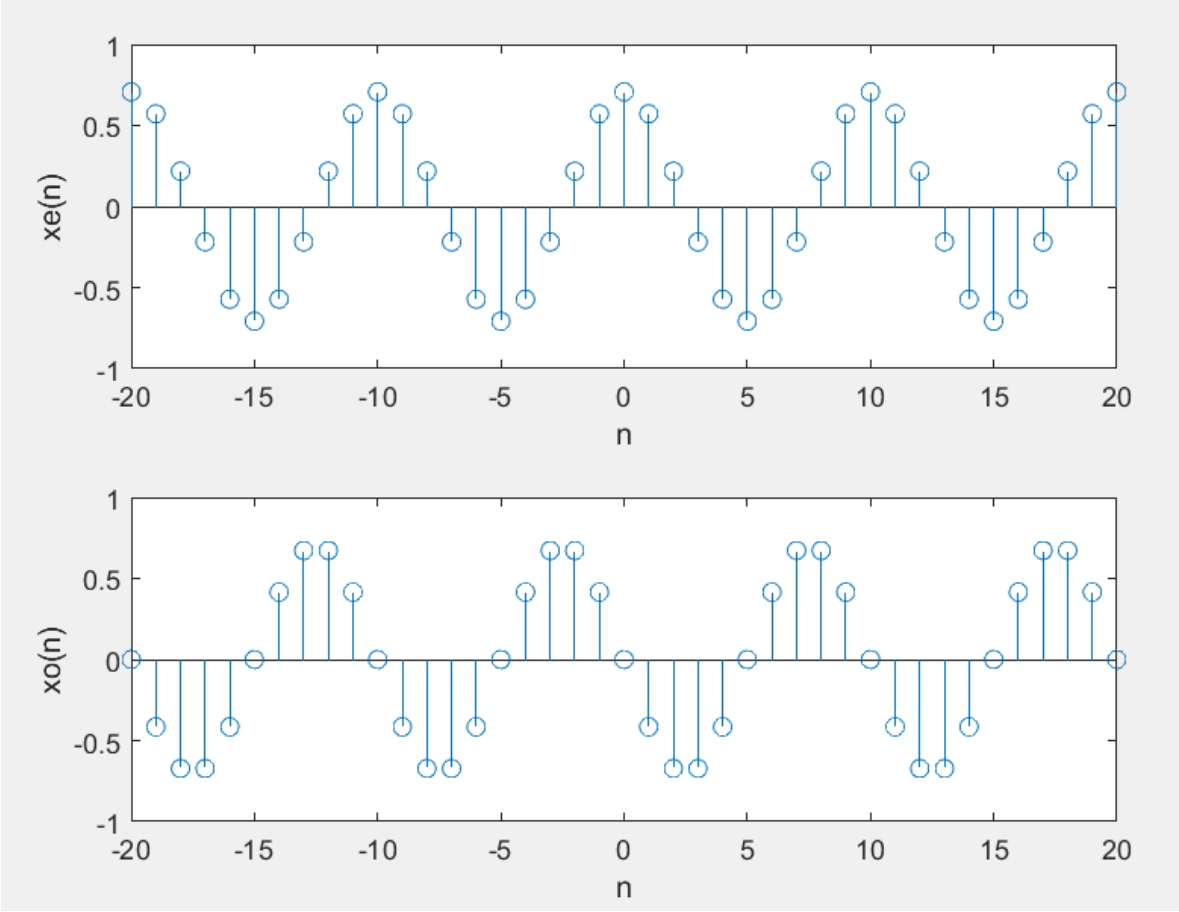
3. x3(n)=cos(0.2*pi*n+(pi/4)), -20<=n<=20

SOLUTION:

Operation on Sequence

```
Command Window
>> n3 = [-20:20]; x3 = cos(0.2*pi*n3 + pi/4);
>> [xe3,xo3,m3] = evenodd(x3,n3);
```

OUTPUT:



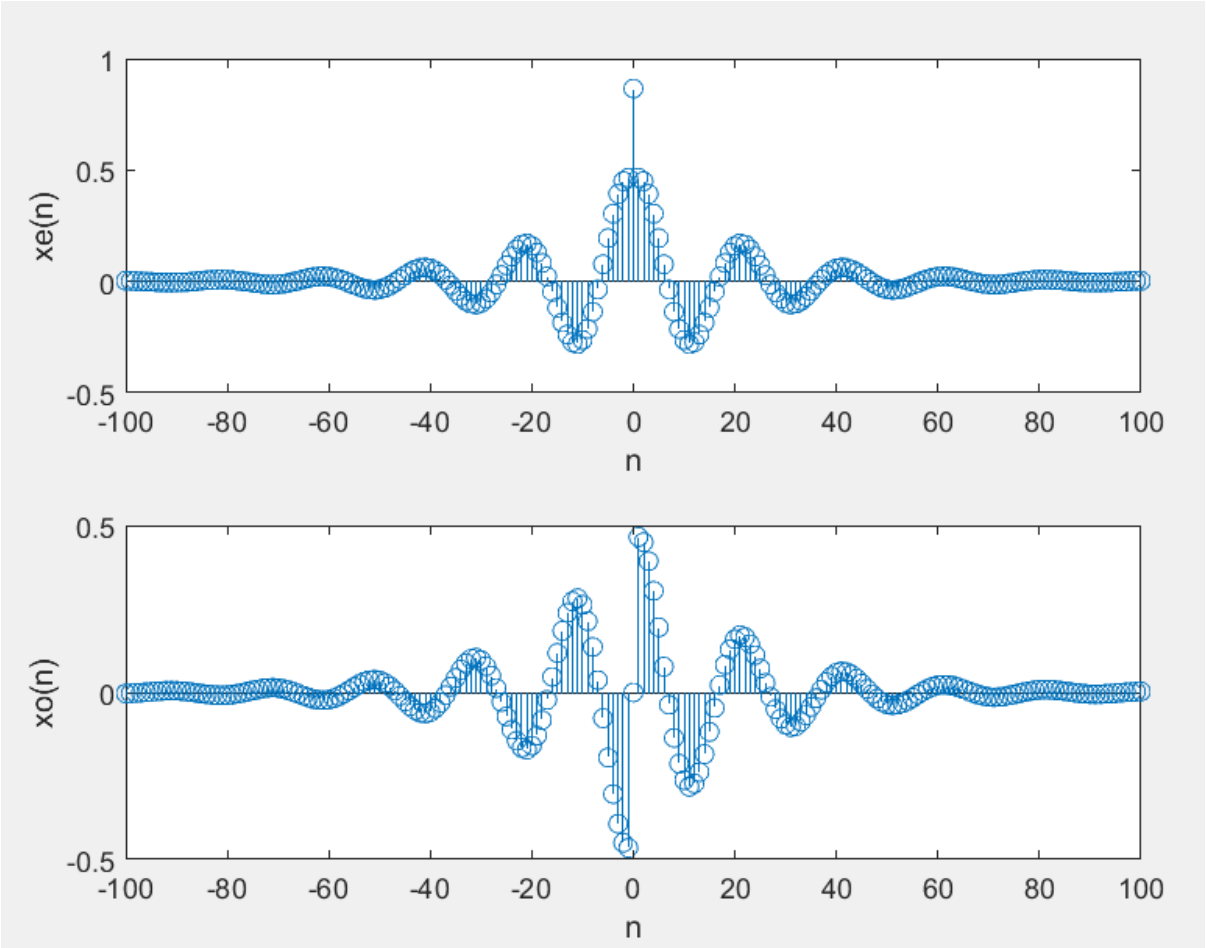
4. x4(n)=e^(-0.05n)sin(0.1*pi*n+(pi/3)), 0<=n<=100

SOLUTION:

Operation on Sequence

```
Command Window
>> n4 = [0:100]; x4 = exp(-0.05*n4).*sin(0.1*pi*n4 + pi/3);
>> [xe4,xo4,m4] = evenodd(x4,n4);
```

OUTPUT:


xe(n)
1
0.5
0
-0.5
-100
-80
-60
-40
-20
0
20
40
60
80
100
n
xo(n)
0.5
0
-0.5
-100
-80
-60
-40
-20
0
20
40
60
80
100
n