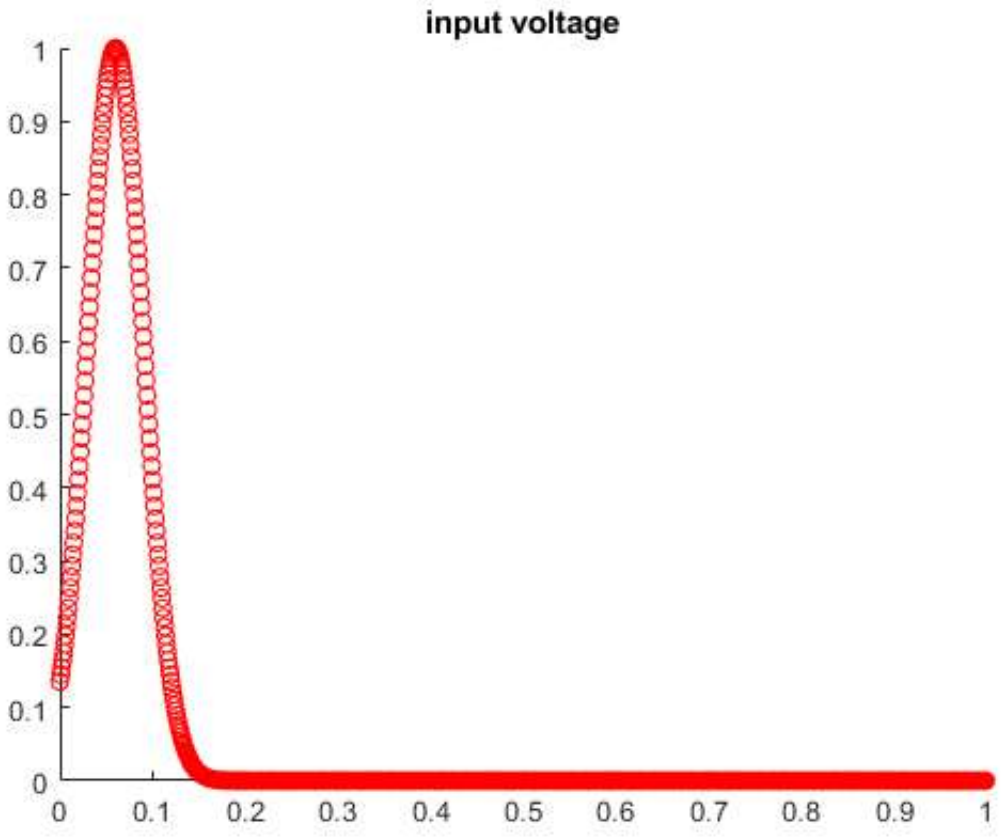
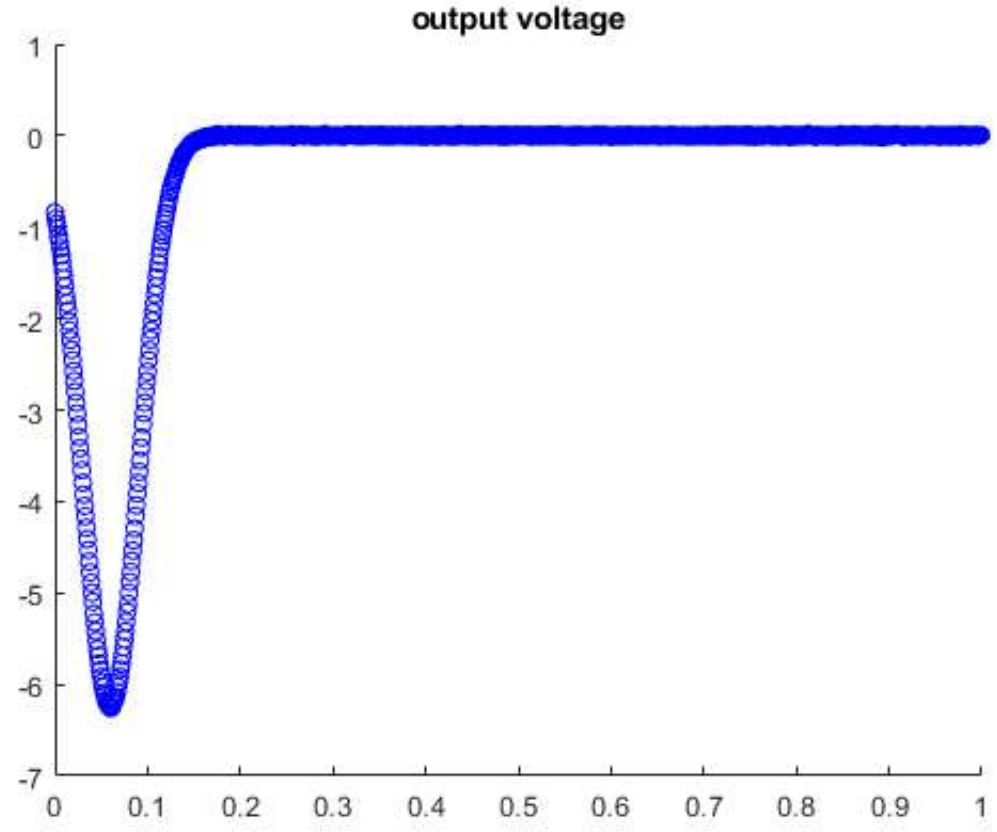
```
clear all
close all

R1 = 1;
C = 0.25;
R2 = 2;
L = 0.2;
R3 = 10;
a = 100;
R4 = 0.1;
Ro = 1000;
Cn = 0.00001;
Y1 = 1/R1;
Y2 = 1/R2;
Y3 = 1/R3;
Y4 = 1/R4;

% V = [V1    V2            V3   V4     V5           i1  iL  i3];
G = [-1/R1  1/R1           0     0      0            1   0   0;
    1/R1 (-1/R1)-(1/R2)  0     0      0            0  -1   0;
    0      0            -1/R3  0      0            0   1   0;
    0      0            0   -1/R4  1/R4            0   0   1;
    0      0            0    1/R4 (-1/R4)-(1/Ro)   0   0   0;
    1      0            0      0      0            0   0   0;
    0      1            -1     0      0            0   0   0;
    0      0            a/R3   1      0            0   0   0]
%%%% I think I need to make in a variable rather than a constant

% V = [V1  V2  V3   V4  V5 i1  iL i3];
Cm =   [-C  C   0   0   0   0   0  0;
    C  -C   0   0   0   0   0  0;
    0   0  -Cn  0   0   0   0  0;
    0   0   0   0   0   0   0  0;
    0   0   0   0   0   0   0  0;
    0   0   0   0   0   0   0  0;
    0   0   0   0   0   0  -L  0;
    0   0   0   0   0   0   0  0]

%%%%%%%%%%%%%%%% Remember to output the matrices above %%%%%%%%%%%%%%

n = 0;
tstep = 0.001;
time =0;


for m = 1:1000
    n = n + 1;

    In = randn*0.001;
    Vin = exp(-(time-0.06).^2/(2*(0.03)^2));

    F = [0 0 In 0 0 Vin 0 0];
    V = G\F';
    V3(n) = V(3);
    Vo(n) = V(5);
```

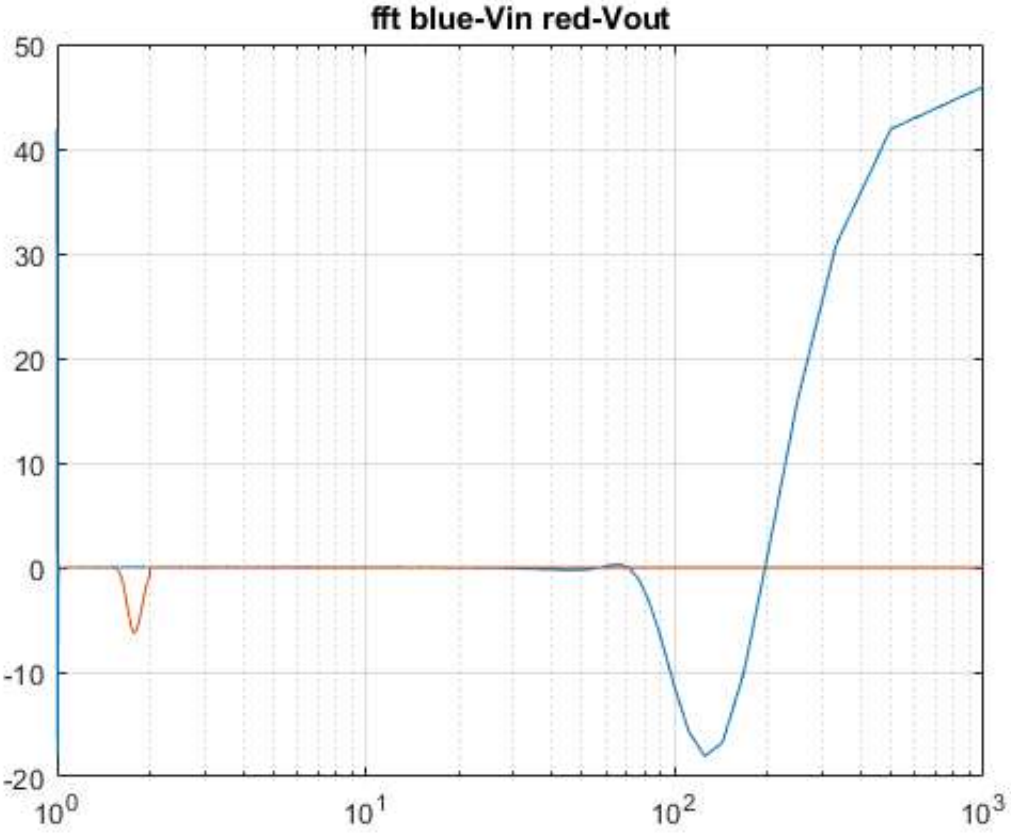
```
    figure(10);
    hold on
    scatter(time,Vin,'r')
    title('input voltage')
    figure(11)
    hold on
    scatter(time,V(5),'b')
    title('output voltage')

    time = tstep*n;
end

freq = 1./(tstep:tstep:time);
Xin = fft(V3);
Xout = fftshift(Vo);

figure(12)
semilogx(freq,Xin,freq,Xout)
title('fft blue-Vin red-Vout')
grid on

figure(13)
Xshiftin = fftshift(Xin);
Xshiftout = fftshift(Xout);
semilogx(freq,Xshiftin,freq,Xshiftout)
grid on
title('fftshift red-vin blue-vout')
```

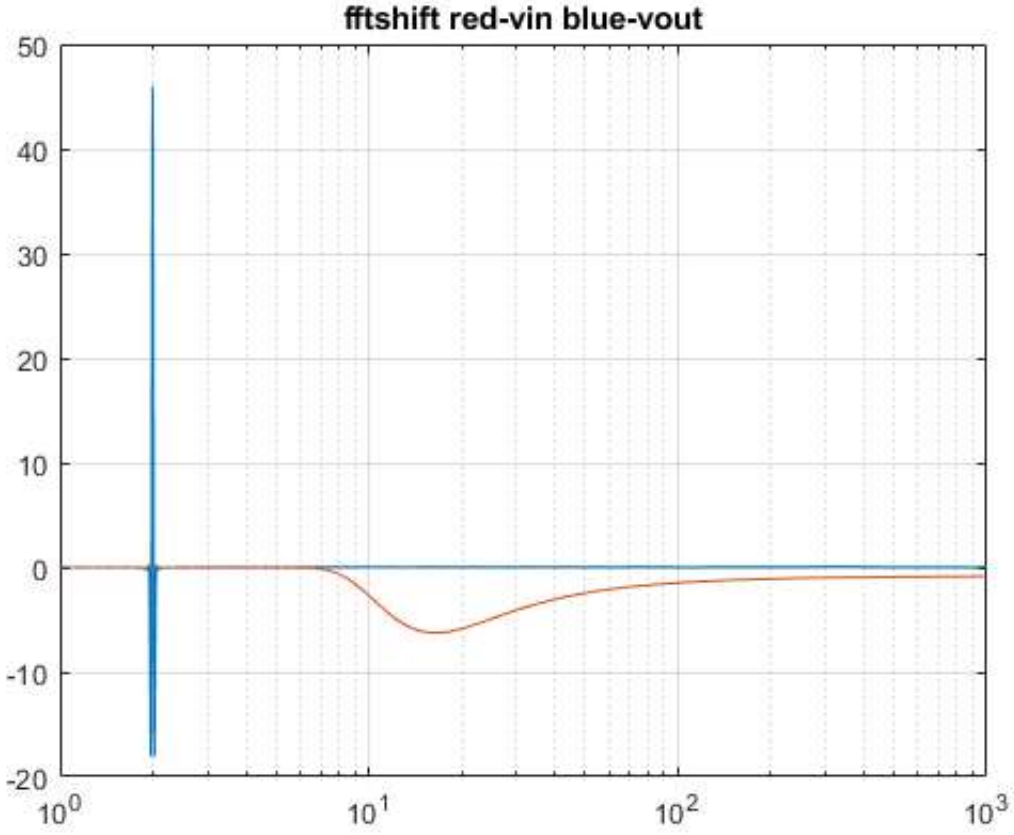
```
G =

  Columns 1 through 7

   -1.0000    1.0000         0         0         0    1.0000         0
    1.0000   -1.5000         0         0         0         0   -1.0000
         0         0   -0.1000         0         0         0    1.0000
         0         0         0  -10.0000   10.0000         0         0
         0         0         0   10.0000  -10.0010         0         0
    1.0000         0         0         0         0         0         0
         0    1.0000   -1.0000         0         0         0         0
         0         0   10.0000    1.0000         0         0         0

  Column 8

         0
         0
         0
    1.0000
         0
         0
         0
         0


Cm =
```

```
  Columns 1 through 7

   -0.2500    0.2500         0         0         0         0         0
    0.2500   -0.2500         0         0         0         0         0
         0         0   -0.0000         0         0         0         0
         0         0         0         0         0         0         0
         0         0         0         0         0         0         0
         0         0         0         0         0         0         0
         0         0         0         0         0         0   -0.2000
         0         0         0         0         0         0         0

  Column 8

         0
         0
         0
         0
         0
         0
         0
         0

Warning: Imaginary parts of complex X and/or Y arguments ignored
Warning: Imaginary parts of complex X and/or Y arguments ignored
```




output voltage
1
0
-1
-2
-3
-4
-5
-6
-7
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


fft blue-Vin red-Vout
50
40
30
20
10
0
-10
-20
10^0
10^1
10^2
10^3



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