```
% Fall 2018
% Lab #2, "Introduction to Matlab - II"
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clc close
all clear
all %
Exercises:

% (A) % step
initialization t=-
pi:pi/100:pi; % function
initialization
f=cos(10*t); g=exp(-
0.5*t).*cos(10*t); %
generate plot
subplot(4,1,4)
plot(t,f,'r',t,g,'b')

% (B) % step
initialization t=-
pi:pi/100:pi; % function
initialization f=sinh(t);
g=f.*sin(10*t); %generate
plots subplot(4,1,3);
plot(t,f,'gx')
subplot(4,1,2);
plot(t,g,'ro')

% (C)
% polynomial coeeficients for all equations
A=[2 3 2 1; 5 1 -3 2; 7 -5 -2 -1; 6 4 3 -5];
% y values for all equations
B=[3; 7; -5; -10]; % backslash operator to find system of
equation solutions xy=A\B; % print solutions disp("xy= ")
disp(xy)

% (D) % define coefficients of characteristic equation & generate find
roots r=roots([1 5 7 5 -6 -10]); % print roots disp("roots are: ")
disp(r)
% (E) % define roots & generate find polynomial p=poly([-2 -3 5
-1+1i -1-1i]); % the us of "1i" was suggested by  matlab instead
of using i or j % print polynomial disp("polynomial is: ")
disp(p)

%(F) % defining differential eq. & using dsolve to
solve y=dsolve('D4y + 10*D3y + 35*D2y + 50*Dy + 24*y =
0', 'y(0)=2', 'Dy(0)=1', 'D2y(0)=0', 'D3y(0)=0', 't');
% print solution disp("y= ") disp(y)
```

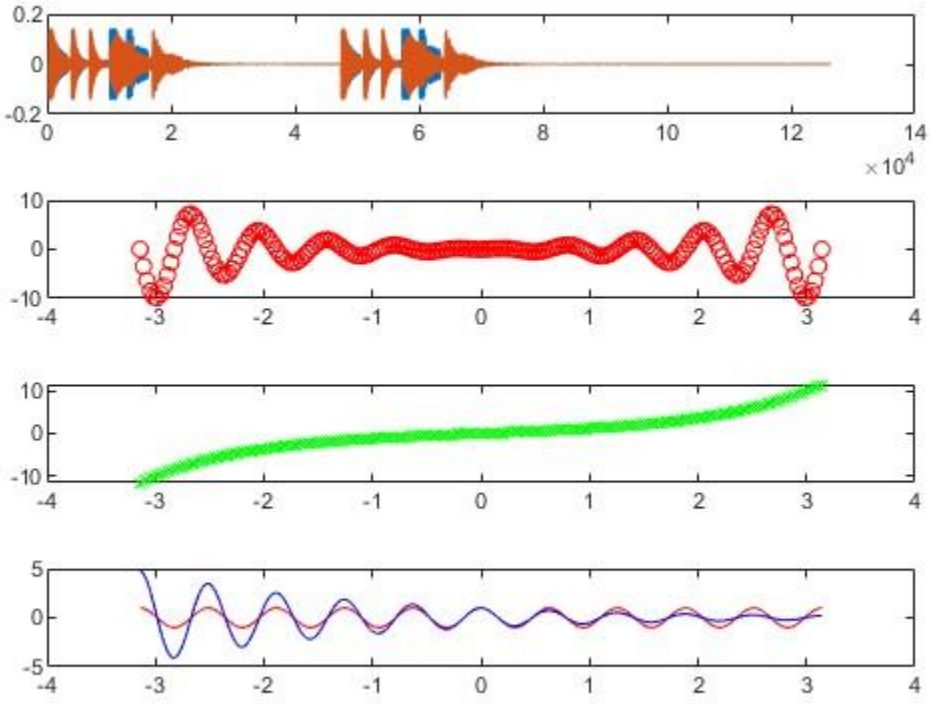
```
% (G) % audioread function targeting
audio file m=audioread('Alarm08.wav'); %
plotting audiowave subplot(4, 1, 1)
plot(m)

xy=     -
0.0464
    0.7912
   -0.7146
2.1485

roots are:    -
3.4737 + 0.0000i
   0.9577 + 0.0000i
  -0.6497 + 1.4545i
  -0.6497 - 1.4545i
-1.1845 + 0.0000i

polynomial is:       1     2    -17
-68    -98    -60

y= (37*exp(-t))/3 - (43*exp(-2*t))/2 + 15*exp(-3*t) - (23*exp(-
4*t))/6
```



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