% SDSMT EE311 Lab 1 — Fall 2009
% By Charles R. Tolle
% Prob. 1 ex 1

format compact %optional command to print without spaces

r1=50;
r2=20;
r3=20;
r4=10;
r5=15;

a=[r1+r2+r3 -r2 -r3;
   -r2 r2+r4 -r4;
   -r3 -r4 r5+r3+r4]; %notice similarity in equations

b=[12;-5;0]; %order must match the a matrix

x=inv(a)*b

i1=x(1)
i2=x(2)
i3=x(3)

ir4=x(3)-x(2) %solving for a branch current

Vr4=r4*ir4 %solving for a voltage drop
New to MATLAB? Watch this Video, see Demos, or read Getting Started.

```matlab
% Clear all variables
clear all

% Change current directory to the lab directory
home('~/Users/l_tolle/SDMT/ECE/classes/Fall2009/EE311/labs/lab1/lab_1_sol')

% Run the script file pl_ex1.m
run('~/Users/l_tolle/SDMT/ECE/classes/Fall2009/EE311/labs/lab1/lab_1_sol/pl_ex1.m')
```

```matlab
>> x = 
  0.1275 
  -0.0678 
  0.0416 

i1 = 0.1275 
i2 = -0.0678 
i3 = 0.0416 
i4 = 0.1094 
```

```matlab
>> vr4 = 1.0940
```

```
% Write output variables to a file
```

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SMT MS EE311 Lab 1 Fall 2009
% SDSMT EE311 Lab 1 - Fall 2009
% By Charles R. Tolto
% Prob. 1 ex 2

t=[0:0.01:2]; % first number is starting point, second is increment, third is ending point
y=3*sin(2*pi*t +(pi/2));
plot(t,y) % These functions can also be done by double clicking axis
xlabel('Time (sec)')
title('My Favorite Sine Function')
ylabel('Amplitude (volts)') % can be used to rescale - format is [xmin xmax ymin ymax]
axis([0 2 -4 4])
Problem 2:  

a.) \( x = -11 \)  
\( y = 9 \)

b.) \( x = -10.4615 \)  
\( y = 7.4923 \)  
\( z = 4.8615 \)

c.) No answer. - matrix not full rank.  
2 indeqns.

d.) \( x = 7.7273 \)  
\( y = -8.1818 \)  
\( z = -0.2727 \)

e.) No answer, not a square matrix.  
3 eqns. 2 unknowns.

f.) Not a square matrix.  
3 eqns. 3 unknowns.
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t=[0:0.01:6];
y=4*sin(pi*t + (pi/4));
plot(t,y) %first number is starting point, second is increment, third is ending point
title('My Favorite Sine Function') %These functions can also be done by double clicking axis
xlabel('Time [sec]')
ylabel('Amplitude [volts]') %can be used to rescale - format is [xmin xmax ymin ymax]
axis([0 6 -4 4])
% SDSMT EE311 Lab 1 — Fall 2009
% By Charles R. Tolle
% Prob. 4

freq=[100 1000 2500 5000 10000 25000 50000];
amp=[1 0.707 0.5 0.26 0.1 0.05 0.005];
ampdb=20*log10(amp);
semilogx(freq,ampdb)
grid
title('Low Pass Filter') % These functions can also be done by double clicking axis
xlabel('Freq (Hz)')
ylabel('Amplitude (dB)') % can be used to rescale — format is [xmin xmax ymin ymax]
Figure 1

Low Pass Filter

Amplitude (dB)

Freq (Hz)

-50

-45

-40

-35

-30

-25

-20

-15

-10

-5

0
PLOT(X,Y) plots vector Y versus vector X. If X or Y is a matrix, then the vectors are plotted versus the rows or columns of the matrix, whichever line up. If X is a scalar and Y is a vector, disconnected line objects are created and plotted as discrete points vertically at X.

PLOT(Y) plots the columns of Y versus their index. If Y is complex, PLOT(Y) is equivalent to PLOT(REAL(Y), IMAG(Y)). In all other uses of PLOT, the imaginary part is ignored.

Various line types, plot symbols and colors may be obtained with PLOT(X,Y,S) where S is a character string made from one element from any or all of the following 3 columns:

b   blue    . point    solid
k   black   s square  none
r   red     x x-mark  dashdot
y   yellow  * star    dash
g   green   + plus    dotted
m   magenta           (none) no line
c   cyan     v triangle (down)
w   white    < triangle (left)
p   pentagram     > triangle (right)
h   hexagon

For example, PLOT(X,Y,'c:.JMenuItem 1') plots a cyan dotted line with a plus at each data point; PLOT(X,Y,'bo ') plots blue diamond at each data point but does not draw any line.

PLOT(X1,Y1,S1,X2,Y2,S2,X3,Y3,S3,..) combines the plots defined by the (X,Y,S) triples, where the X's and Y's are vectors or matrices and the S's are strings.

For example, PLOT(X,Y,'-x',X,Y,'o') plots the data twice, with a solid yellow line interpolating green circles at the data points.

The PLOT command, if no color is specified, makes automatic use of the colors specified by the axes ColorOrder property. By default, PLOT cycles through the colors in the ColorOrder property. For monochrome systems, PLOT cycles over the axes LineStyleOrder property.

Note that RGB colors in the ColorOrder property may differ from similarly-named colors in the (X,Y,S) triples. For example, the second axes ColorOrder property is medium green with RGB [0 0.5 0], while PLOT(X,Y,'g') plots a green line with RGB [0 1 0].

If you do not specify a marker type, PLOT uses no marker.
If you do not specify a line style, PLOT uses a solid line.

PLOT(AX,...) plots into the axes with handle AX.

PLOT returns a column vector of handles to line series objects, one handle per plotted line.

The X,Y pairs, or X,Y,S triples, can be followed by parameter/value pairs to specify additional properties of the lines. For example, PLOT(X,Y,'LineWidth',2,'Color',[.6 0 0]) will create a plot with a dark red line width of 2 points.

Example

x = linspace(0,2*pi,100); y = tan(x)/sin(x); plot(x,y,'-r');

See also plot tools, semilogy, semilogx, loglog, plotyy, plot3, grid, title, xlabel, ylabel, axis, hold, legend, subplot, scatter.

Overloaded methods:

- timeseries/plot
- iddata/plot
- idfrd/plot
- idnlhw/plot
- idnlx/plot
- ampc/plot
- frd/plot
- dsdata/plot
- wdec/plot
- dptree/plot
- wrtree/plot
- ewtree/plot
- rmtree/plot
- comtree/plot

Reference page in Help browser: doc plot