ELEN 50 - Lab 1 - Daren Liu

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Matrix multiplication

```
a = [2,1; 3,2];
b = [3,1;2,2];
a1 = a * b;
disp(a1)
a2 = b * a;
disp(a2)
a3 = (a' * b')';
disp(a3)
a4 = (b' * a')';
disp(a4)
% a1 and a4 are the same, and a2 and a3 are the same
```

```
 8     4
13     7

 9     5
10     6

 9     5
10     6

 8     4
13     7
```

Matrix inverses

```
a1 = inv(a * b);
disp(a1);
a2 = inv(a) * inv(b);
disp(a2)
a3 = inv(b*a);
disp(a3)
a4 = inv(b) * inv(a);
disp(a4)
ans1 = a1*(a*b);
disp(ans1)
```

```
ans2 = (a*b)*a1;
disp(ans2)
% the product for both ans1 and ans2 is
% 1 0
% 0 1
```

```
 1.7500   -1.0000
-3.2500    2.0000

 1.5000   -1.2500
-2.5000    2.2500

 1.5000   -1.2500
-2.5000    2.2500

 1.7500   -1.0000
-3.2500    2.0000

  1     0
  0     1

 1.0000   -0.0000
 0.0000    1.0000
```

Solving circuits with MATLAB

```
c = [1,0,1; 3,3,4; 2,2,3];
s = [10;12;5];
v = inv(c) * s;
disp(v)
compare = c*v;
disp(compare)
%s is the same as compare
```

```
19.0000
-3.0000
-9.0000

10.0000
12.0000
 5.0000
```

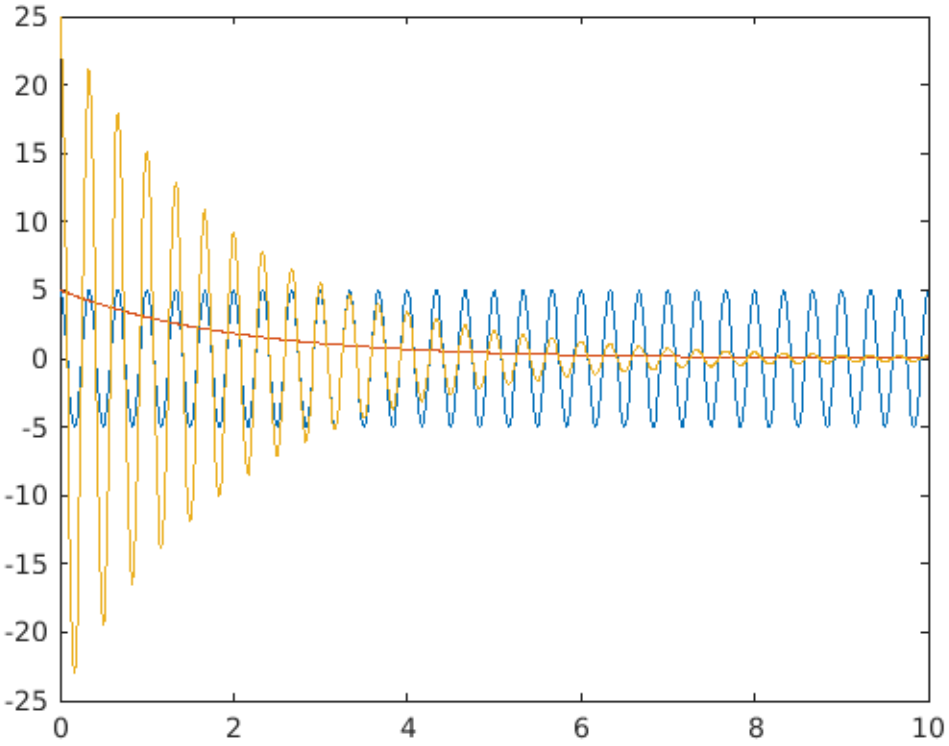
More about matrix inverses

```
d = [2,4;1,2];
inverse = inv(d);
disp(inverse)
% a. Apparently, there is no inverse for d
% b. According to the error message, the maxtrix is
%    singular to working precision, which means that
%    an inverse does not exist for this matrix
```

```
Warning: Matrix is singular to working precision.
   Inf   Inf
   Inf   Inf
```

Products of Time Functions

```
t = [0:0.01:10];
p = 5*cos(2*pi*3*t);
v = 5*exp(-0.5*t);
b = p.*v;
plot(t, p, t, v, t, b);
```



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