```
% Name (first and last)
% CSC 2262
% cs2262xx
% Sample 7
m1 = .8;
m2 = .6;
m3 = .5;
k1 = 4.3;
k2 = 5.1;
k3 = 4.6;
k4 = 5.4;
c1 = .024;
c2 = .012;
c3 = .020;
c4 = .016;

A11 = [          0          0          0
                 0          0          0
                 0          0          0 ];

A12 = [          1          0          0
                 0          1          0
                 0          0          1 ];

A21 = [ -(k1+k2)/m1          k2/m1            0
              k2/m2   -(k2+k3)/m2          k3/m2
                 0          k3/m3   -(k3+k4)/m3 ];

A22 = [ -(c1+c2)/m1          c2/m1            0
              c2/m2   -(c2+c3)/m2          c3/m2
                 0          c3/m3   -(c3+c4)/m3 ];
A = [A11  A12
     A21  A22];

[eigvec  eigval] = eig(A);
t = 0:.001:12;
line1x = [0  12];
line1y = [0  0];
titles(1,:) = 'Sample 7, Figure 1';
titles(2,:) = 'Sample 7, Figure 2';
titles(3,:) = 'Sample 7, Figure 3';
```

```
n = 0;
for(k = 5 : -2 : 1)
    n = n + 1;
    alpha = real( eigval(k,k) );
    beta =  imag( eigval(k,k) );
    omega = sqrt( alpha^2 + beta^2 );
    zeta = -alpha/omega;
    w = omega * sqrt( 1 - zeta^2 );
    a1 = real( eigvec(1,k) );
    b1 = imag( eigvec(1,k) );
    a2 = real( eigvec(2,k) );
    b2 = imag( eigvec(2,k) );
    a3 = real( eigvec(3,k) );
    b3 = imag( eigvec(3,k) );
    x1 = 2 * exp(alpha*t) .* ( a1*cos(w*t) + b1*sin(w*t) );
    x2 = 2 * exp(alpha*t) .* ( a2*cos(w*t) + b2*sin(w*t) );
    x3 = 2 * exp(alpha*t) .* ( a3*cos(w*t) + b3*sin(w*t) );

    figure(n);
    plot(t,x1,'b',t,x2,'r',t,x3,'g',line1x,line1y,'k');
    axis([0  12  -.6  .6]);
    set(gca,'xtick',0:2:12);
    set(gca,'ytick',-.6:.2:.6);
    xlabel('t');
    ylabel('x1(blue), x2(red), x3(green)');
    title(titles(n,:));
end
```