```matlab
clear all;
M = 0.815;
m = 0.210;
Ip = 0.305;
g = 9.8;
a = 1.719;
b = 7.682;
e = 2;

A32 = -(3/4 * m*g) / (M+ (1/4)*m);
A33 = -(e+b) / (M + (1/4)*m);
A42 = (3/4)*(g/Ip)*(1+(3/4)*(m/(M+ (1/4)*m)));
A43 = (3/4)*((e+b)/Ip)/(M + (1/4)*m);

A = [0 0 1 0; 0 0 0 1; 0 A32 A33 0; 0 A42 A43 0];

B31 = a / (M+ (1/4)*m);
B41 = -(3/4)*(a/Ip)/(M+(1/4)*m);

B = [0; 0; B31; B41];
C = [1 0 0 0; 0 1 0 0];

rank(ctrb(A,B));
Observe = [C; C*A; C*A*A; C*A*A*A];
rank(Observe);


eigs = [-60 -90 -120 -150];
L = place(A', C', eigs).'


% R = 1;
% Q1 = diag([5000 3000 20 20]);
% [X1,L1,K3] = care(A,B,Q1,R)
%
% x0 = [0; 0.06; 0; 0];
%
% A3 = A-B*K3;
% B3 = [0; 0; 0; 0];
% sys3 = ss(A3,B3, C, 0);
% t = 0:0.05:5;
% u = zeros(length(t),1);
% lsim(sys3,u,t,x0)
% grid on
```