```
clear

r = 1;     % initialize constants
m = 0.2;
k = 500;
c = 5;

dt = 0.001;
n=10000;

p(1) = 2;   % initialize
v(1) = 0;

t(1) = 0;

for i=2:n+1
 t(i) = t(i - 1) + dt;

  if (p(i-1) < 0) break; endif  % check for ball under ground

  if (p(i - 1) > r)  % ball in contact with ground ?
    a = -10;      % no, accel = -10
  else
    a = -10 - c*v(i - 1) + k*(r - p(i - 1)); % yes
  endif

  p(i) = p(i - 1) + v(i - 1)*dt;  % project ball position
  v(i) = v(i - 1) + a*dt;         % and velocity

end

plot(t, p)
```