```
% Main simulation code
pars.G=10;
pars.C=2;
pars.A=[pars.G - pars.C /2  pars.G
    0 pars.G/2]; % Fill in here
pars.x0=0.1; % Initial fraction of hawks
pars.tmax=4;
[t,x]=ode45(@hd_model,[0 pars.tmax],pars.x0,[],pars);
% Plot the results
hold on
tmph=plot(t,x,'k-');
set(tmph,'linewidth',3);
xlabel('Time, t');
ylabel('Hawk fraction, x');
title('three curves of Hawk-Dove gain and loss');
```

```
% Main simulation code
pars.G=10;
pars.C=7;
pars.A=[pars.G - pars.C /2  pars.G
    0 pars.G/2]; % Fill in here
pars.x0=0.1; % Initial fraction of hawks
pars.tmax=4;
[t,x]=ode45(@hd_model,[0 pars.tmax],pars.x0,[],pars);
% Plot the results
```

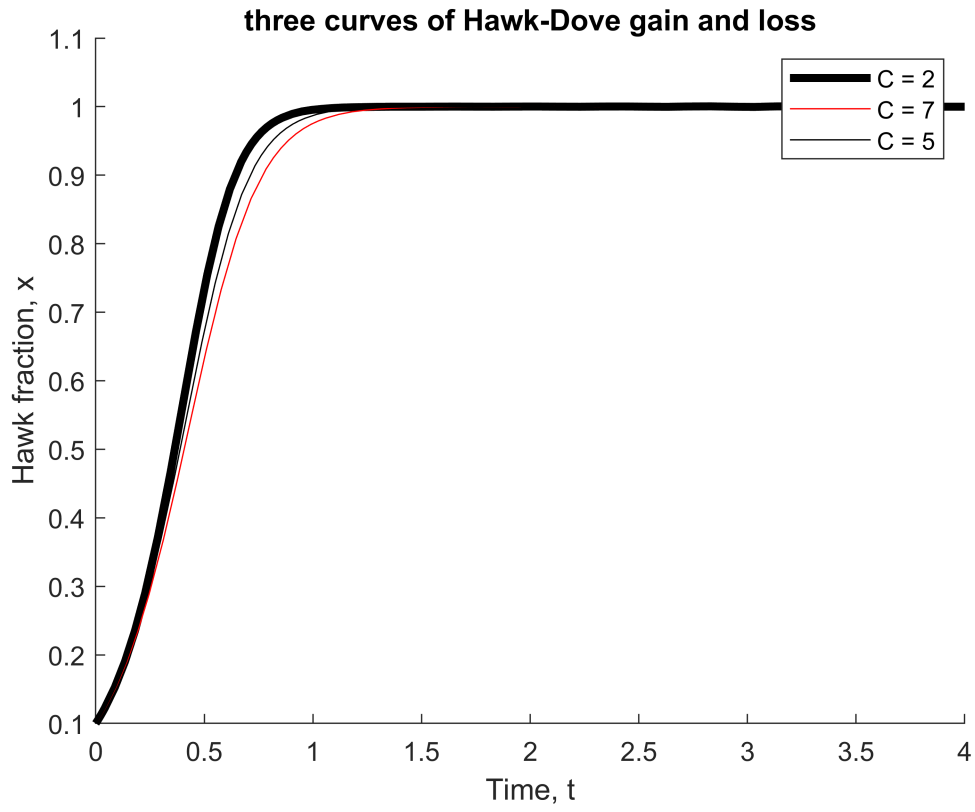
```
hold on
tmph=plot(t,x,'r-');
hold on
```

```

```

```
% Main simulation code
pars.G=10;
pars.C=5;
pars.A=[pars.G - pars.C /2  pars.G
    0 pars.G/2]; % Fill in here
pars.x0=0.1; % Initial fraction of hawks
pars.tmax=4;
[t,x]=ode45(@hd_model,[0 pars.tmax],pars.x0,[],pars);
% Plot the results
hold on
tmph2=plot(t,x,'k-');
hold on
legend('C = 2', 'C = 7', 'C = 5');
```

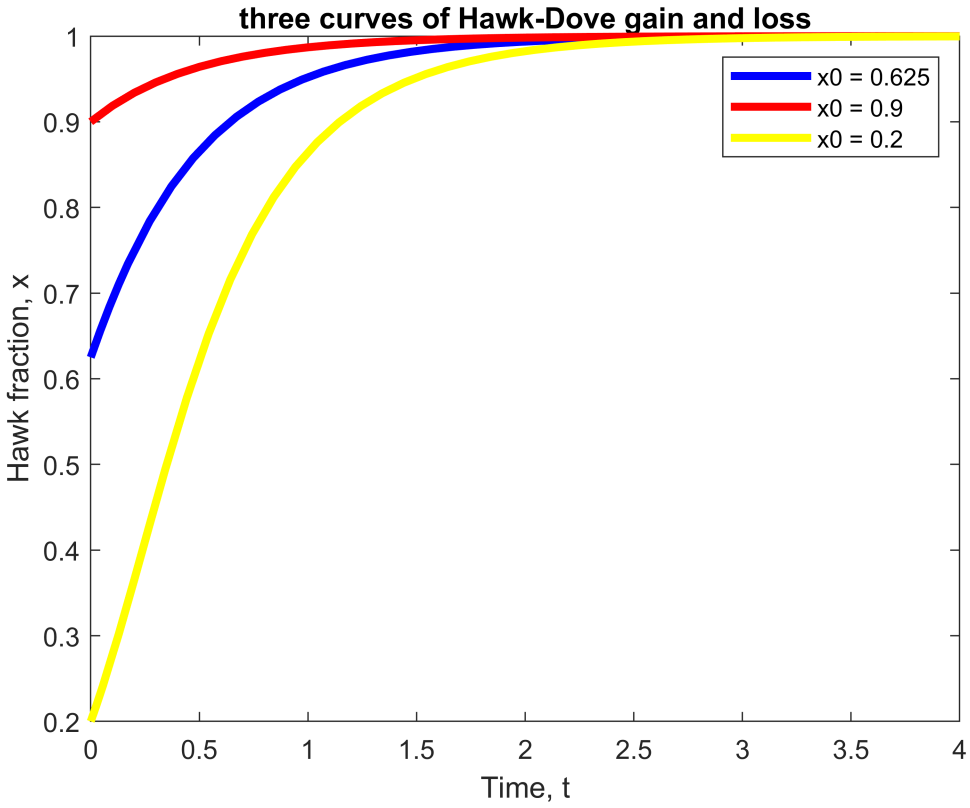
```
% Exercise 2
% The equilibrium is G/C, or x = 5/8
pars.G=10;
pars.C=16;
pars.A=[pars.G - pars.C /2  pars.G
    0 pars.G/2]; % Fill in here
pars.x0=0.625; % equilibrium
pars.tmax=4;
[t,x]=ode45(@hd_model,[0 pars.tmax],pars.x0,[],pars);
% Plot the results
hold off
```




```
tmph=plot(t,x,'b-');
set(tmph,'linewidth',3);
xlabel('Time, t');
ylabel('Hawk fraction, x');
title('three curves of Hawk-Dove gain and loss');
```

```
pars.G=10;
pars.C=16;
pars.A=[pars.G - pars.C /2  pars.G
    0 pars.G/2]; % Fill in here
pars.x0=0.9; % Initial fraction of hawks higher
pars.tmax=4;
[t,x]=ode45(@hd_model,[0 pars.tmax],pars.x0,[],pars);
% Plot the results
hold on
tmph=plot(t,x,'r-');
set(tmph,'linewidth',3);
xlabel('Time, t');
ylabel('Hawk fraction, x');
title('three curves of Hawk-Dove gain and loss');
legend('x0 = 0.9', 'x0 = 0.625', 'x0 = 0.2');
```

```
% Exercise 2
% The equilibrium is G/C, or x = 5/8
pars.G=10;
pars.C=16;
pars.A=[pars.G - pars.C /2  pars.G
    0 pars.G/2]; % Fill in here
pars.x0=0.2; % Initial fraction of hawks lower
pars.tmax=4;
[t,x]=ode45(@hd_model,[0 pars.tmax],pars.x0,[],pars);
% Plot the results
hold on
tmph=plot(t,x,'y-');
set(tmph,'linewidth',3);
xlabel('Time, t');
ylabel('Hawk fraction, x');
title('three curves of Hawk-Dove gain and loss');
legend('x0 = 0.625', 'x0 = 0.9', 'x0 = 0.2');
```




```
function dxdt = hd_model(t,x,pars)
r1=x*pars.A(1,1)+(1-x)*pars.A(1,2);
r2=x*pars.A(2,1)+(1-x)*pars.A(2,2);
r_avg = r1*x+r2*(1-x);
dxdt = r1*x-r_avg*x;
end
```