

This supplementary file is the code that runs in MATLAB. These codes are mainly used to analyze the influence of changes of relevant factors on each participant. The pictures in the paper are obtained by running the code. You need to run duli.m file first and then technologypork.m file.

Code:

File 1: duli.m

```
function dydt=duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q);
dydt=zeros(3,1);
dydt(1)=y(1)*(1-y(1))*(-C1+G+y(2)*s*G+y(3)*k*G-y(2)*p*C2-
y(3)*q*C3+(1-y(2))*f*R2+(1-y(3))*g*R3-G-y(2)*m*G-y(3)*n*G);
dydt(2)=y(2)*(1-y(2))*(-C2+a*R2+y(1)*p*C2-(1-
y(3))*v*a*R2+u+y(1)*f*R2-y(3)*v*b*R3);
dydt(3)=y(3)*(1-y(3))*(-C3+b*R3+y(1)*q*C3-(1-
y(2))*v*b*R3+u+y(1)*g*R3-y(2)*v*a*R2);
end
```

File 2: technologypark.m

```
#####figure 1 #####
figure(1)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2],[0.2 0.2
0.2]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
```

```

[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,2], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cs-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gs-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bs-', 'linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,2], [0.8 0.8
0.8]);
plot(t,y(:,1), 'cp-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gp-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bp-', 'linewidth',1);
hold on
legend('MC:x=0.2', 'HE:y=0.2', 'GE:z=0.2', 'MC:x=0.5', 'HE:y=0.5', 'GE:z=0
.5', 'MC:x=0.8', 'HE:y=0.8', 'GE:z=0.8')
axis([0 2 0 1])

#####figure 2-a #####
figure(2)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,2], [0.2 0.5
0.5]);
plot(t,y(:,1), 'cx-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gx-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bx-', 'linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;

```

```

[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,2], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cs-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gs-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bs-', 'linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,2], [0.8 0.5
0.5]);
plot(t,y(:,1), 'cp-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gp-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bp-', 'linewidth',1);
hold on
legend('MC:x=0.2', 'HE:y=0.5', 'GE:z=0.5', 'MC:x=0.5', 'HE:y=0.5', 'GE:z=0
.5', 'MC:x=0.8', 'HE:y=0.5', 'GE:z=0.5')
axis([0 2 0 1])

#####figure 2-b #####
figure(3)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,0.8], [0.5 0.2
0.5]);
plot(t,y(:,1), 'cx-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gx-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bx-', 'linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;

```

```

[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,0.8], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cs-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gs-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bs-', 'linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,0.8], [0.5 0.8
0.5]);
plot(t,y(:,1), 'cp-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gp-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bp-', 'linewidth',1);
hold on
legend('MC:x=0.5', 'HE:y=0.2', 'GE:z=0.5', 'MC:x=0.5', 'HE:y=0.5', 'GE:z=0
.5', 'MC:x=0.5', 'HE:y=0.8', 'GE:z=0.5')
axis([0 0.8 0 1])

#####figure 2-c #####
figure(4)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,0.8], [0.5 0.5
0.2]);
plot(t,y(:,1), 'cx-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gx-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bx-', 'linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;

```

```

[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,0.8], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cs-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gs-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bs-', 'linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,0.8], [0.5 0.5
0.8]);
plot(t,y(:,1), 'cp-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gp-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bp-', 'linewidth',1);
hold on
legend('MC:x=0.5', 'HE:y=0.5', 'GE:z=0.2', 'MC:x=0.5', 'HE:y=0.5', 'GE:z=0
.5', 'MC:x=0.5', 'HE:y=0.5', 'GE:z=0.8')
axis([0 0.8 0 1])

#####figure 3 #####
figure(5)
C1=1,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,2.5], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cx-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gx-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bx-', 'linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;

```

```

[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,2.5], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cs-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gs-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bs-', 'linewidth',1);
hold on

C1=3,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,2.5], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cp-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gp-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bp-', 'linewidth',1);
hold on

C1=4,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,2.5], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cp-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gp-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bp-', 'linewidth',1);
hold on
legend('MC:C1=1', 'HE:C1=1', 'GE:C1=1', 'MC:C1=2', 'HE:C1=2', 'GE:C1=2', 'M
C:C1=3', 'HE:C1=3', 'GE:C1=3', 'MC:C1=4', 'HE:C1=4', 'GE:C1=4')
axis([0 2.5 0 1])

#####figure 4-a #####
figure(6)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;

```

```

[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,3], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cx-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gx-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bx-', 'linewidth',1);
hold on

C1=2,C2=6,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,3], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cs-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gs-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bs-', 'linewidth',1);
hold on

C1=2,C2=7,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,3], [0.5 0.5
0.5]);
plot(t,y(:,1), 'cp-', 'linewidth',1);
grid on
hold on
plot(t,y(:,2), 'gp-', 'linewidth',1);
hold on
plot(t,y(:,3), 'bp-', 'linewidth',1);
hold on

C1=2,C2=8,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@ (t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q), [0,3], [0.5 0.5
0.5]);
plot(t,y(:,1), 'co-', 'linewidth',1);
grid on

```

```

hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);
hold on
legend('MC:C2=5','HE:C2=5','GE:C2=5','MC:C2=6','HE:C2=6','GE:C2=6','M
C:C2=7','HE:C2=7','GE:C2=7','MC:C2=8','HE:C2=8','GE:C2=8')
axis([0 3 0.5 1])

```

```

#####figure 4-b #####

```

```

figure(7)
C1=2,C2=11,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,
k=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,15],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

```

```

C1=2,C2=12,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,
k=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,15],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on
plot(t,y(:,3),'bs-','linewidth',1);
hold on

```

```

C1=2,C2=13,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,
k=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,15],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on

```



```

hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

C1=2,C2=14,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,
k=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,15],[0.5 0.5
0.5]);
plot(t,y(:,1),'co-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);
hold on
legend('MC:C2=11','HE:C2=11','GE:C2=11','MC:C2=12','HE:C2=12','GE:C2=
12','MC:C2=13','HE:C2=13','GE:C2=13','MC:C2=14','HE:C2=14','GE:C2=14'
)
axis([0 15 0 1])

#####figure 5 #####
figure(8)
C1=2,C2=5,C3=8,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

C1=2,C2=5,C3=9,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);

```

```

grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on
plot(t,y(:,3),'bs-','linewidth',1);
hold on

C1=2,C2=5,C3=10,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,
k=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

C1=2,C2=5,C3=11,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,
k=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,5],[0.5 0.5
0.5]);
plot(t,y(:,1),'co-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);
hold on
legend('MC:C3=8','HE:C3=8','GE:C3=8','MC:C3=9','HE:C3=9','GE:C3=9','M
C:C3=10','HE:C3=10','GE:C3=10','MC:C3=11','HE:C3=11','GE:C3=11')
axis([0 5 0.5 1])

#####figure 6 #####
figure(9)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.1,s=0.8,k=
0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);

```

```

grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.3,s=0.8,k=
0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on
plot(t,y(:,3),'bs-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.4,s=0.8,k=
0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.5,s=0.8,k=
0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'co-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);

```

```

hold on
legend('MC:v=0.1','HE:v=0.1','GE:v=0.1','MC:v=0.3','HE:v=0.3','GE:v=0.3',
'MC:v=0.4','HE:v=0.4','GE:v=0.4','MC:v=0.5','HE:v=0.5','GE:v=0.5'
)
axis([0 2.5 0.5 1])

#####figure 7-a #####
figure(10)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=2,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on
plot(t,y(:,3),'bs-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=4,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on

```

```

plot(t,y(:,3),'bp-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=5,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'co-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);
hold on
legend('MC:u=2','HE:u=2','GE:u=2','MC:u=3','HE:u=3','GE:u=3','MC:u=4'
,'HE:u=4','GE:u=4','MC:u=5','HE:u=5','GE:u=5')
axis([0 1 0.5 1])

```

```

%#####figure 7-b #####

```

```

figure(11)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=6,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

```

```

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=7,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on

```

```

plot(t,y(:,3),'bs-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=8,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=9,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'co-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);
hold on
legend('MC:u=6','HE:u=6','GE:u=6','MC:u=7','HE:u=7','GE:u=7','MC:u=8'
,'HE:u=8','GE:u=8','MC:u=9','HE:u=9','GE:u=9')
axis([0 1 0.5 1])

#####figure 8-a #####
figure(12)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0.1,q=0.1;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on

```

```

plot(t,y(:,3),'bx-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0.15,q=0.15;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on
plot(t,y(:,3),'bs-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0.2,q=0.2;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

plot(t,y(:,3),'bp-','linewidth',1);
hold on
legend('MC:f=0,g=0,p=0.1,q=0.1','HE:f=0,g=0,p=0.1,q=0.1','GE:f=0,g=0,
p=0.1,q=0.1','MC:f=0,g=0,p=0.15,q=0.15','HE:f=0,g=0,p=0.15,q=0.15','G
E:f=0,g=0,p=0.15,q=0.15','MC:f=0,g=0,p=0.2,q=0.2','HE:f=0,g=0,p=0.2,q
=0.2','GE:f=0,g=0,p=0.2,q=0.2')
axis([0 2 0.3 1])

#####figure 8-b #####
figure(13)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0.3,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2.5],[0.5 0.5
0.5]);

```

```

plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0.4,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on
plot(t,y(:,3),'bs-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0.5,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

plot(t,y(:,3),'bp-','linewidth',1);
hold on
legend('MC:f=0,g=0,p=0.3,q=0','HE:f=0,g=0,p=0.3,q=0','GE:f=0,g=0,p=0.
3,q=0','MC:f=0,g=0,p=0.4,q=0','HE:f=0,g=0,p=0.4,q=0','GE:f=0,g=0,p=0.
4,q=0','MC:f=0,g=0,p=0.5,q=0','HE:f=0,g=0,p=0.5,q=0','GE:f=0,g=0,p=0.
5,q=0')
axis([0 2.5 0 1])

#####figure 8-c #####
figure(14)

```



```

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0,q=0.2;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

```

```

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0,q=0.3;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on
plot(t,y(:,3),'bs-','linewidth',1);
hold on

```

```

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0,q=0.4;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,2.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

```

```

plot(t,y(:,3),'bp-','linewidth',1);
hold on
legend('MC:f=0,g=0,p=0,q=0.2','HE:f=0,g=0,p=0,q=0.2','GE:f=0,g=0,p=0,
q=0.2','MC:f=0,g=0,p=0,q=0.3','HE:f=0,g=0,p=0,q=0.3','GE:f=0,g=0,p=0,
q=0.3','MC:f=0,g=0,p=0,q=0.4','HE:f=0,g=0,p=0,q=0.4','GE:f=0,g=0,p=0,

```

```

q=0.4')
axis([0 2.5 0 1])

#####figure 8-d #####
figure(15)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0.1,q=0.2;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0.2,q=0.1;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on
plot(t,y(:,3),'bs-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0.2,q=0.3;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

```

```

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0.8
,m=0.5,n=0.5,u=3,p=0.3,q=0.2;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'co-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);
hold on
legend('MC:f=0,g=0,p=0.1,q=0.2','HE:f=0,g=0,p=0.1,q=0.2','GE:f=0,g=0,
p=0.1,q=0.2','MC:f=0,g=0,p=0.2,q=0.1','HE:f=0,g=0,p=0.2,q=0.1','GE:f=
0,g=0,p=0.2,q=0.1','MC:f=0,g=0,p=0.2,q=0.3','HE:f=0,g=0,p=0.2,q=0.3',
'GE:f=0,g=0,p=0.2,q=0.3','MC:f=0,g=0,p=0.3,q=0.2','HE:f=0,g=0,p=0.3,q
=0.2','GE:f=0,g=0,p=0.3,q=0.2')
axis([0 0.5 0.3 1])

```

```

#####figure 9-a #####

```

```

figure(16)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.1,g=0.1,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

```

```

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.2,g=0.2,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on

```

```

plot(t,y(:,3),'bs-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

```

```

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.4,g=0.4,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'co-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);
hold on
legend('MC:f=0.1,g=0.1,p=0,q=0','HE:f=0.1,g=0.1,p=0,q=0','GE:f=0.1,g=
0.1,p=0,q=0','MC:f=0.2,g=0.2,p=0,q=0','HE:f=0.2,g=0.2,p=0,q=0','GE:f=
0.2,g=0.2,p=0,q=0','MC:f=0.3,g=0.3,p=0,q=0','HE:f=0.3,g=0.3,p=0,q=0',
'GE:f=0.3,g=0.3,p=0,q=0','MC:f=0.4,g=0.4,p=0,q=0','HE:f=0.4,g=0.4,p=0
,q=0','GE:f=0.5,g=0.5,p=0,q=0')
axis([0 1 0.5 1])

```

```

#####figure 9-b #####
figure(17)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.2,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0
.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on

```

```

hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0
.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on
plot(t,y(:,3),'bs-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.4,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0
.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.5,g=0,a=0.8,b=0.6,v=0.15,s=0.8,k=0
.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'co-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);
hold on

```

```

legend('MC: f=0.2, g=0, p=0, q=0', 'HE: f=0.2, g=0, p=0, q=0', 'GE: f=0.2, g=0, p=
0, q=0', 'MC: f=0.3, g=0, p=0, q=0', 'HE: f=0.3, g=0, p=0, q=0', 'GE: f=0.3, g=0, p=
0, q=0', 'MC: f=0.4, g=0, p=0, q=0', 'HE: f=0.4, g=0, p=0, q=0', 'GE: f=0.4, g=0, p=
0, q=0', 'MC: f=0.5, g=0, p=0, q=0', 'HE: f=0.5, g=0, p=0, q=0', 'GE: f=0.5, g=0, p=
0, q=0')
axis([0 0.5 0.5 1])

```

```

#####figure 9-c #####

```

```

figure(18)
C1=2, C2=5, C3=7, R2=14, R3=12, G=7, f=0, g=0.1, a=0.8, b=0.6, v=0.15, s=0.8, k=0
.8, m=0.5, n=0.5, u=3, p=0, q=0;
[t, y]=ode45(@(t, y)
duli(t, y, C1, C2, C3, R2, R3, G, f, g, a, b, v, s, k, m, n, u, p, q), [0, 1], [0.5 0.5
0.5]);
plot(t, y(:, 1), 'cx-', 'linewidth', 1);
grid on
hold on
plot(t, y(:, 2), 'gx-', 'linewidth', 1);
hold on
plot(t, y(:, 3), 'bx-', 'linewidth', 1);
hold on

```

```

C1=2, C2=5, C3=7, R2=14, R3=12, G=7, f=0, g=0.2, a=0.8, b=0.6, v=0.15, s=0.8, k=0
.8, m=0.5, n=0.5, u=3, p=0, q=0;
[t, y]=ode45(@(t, y)
duli(t, y, C1, C2, C3, R2, R3, G, f, g, a, b, v, s, k, m, n, u, p, q), [0, 1], [0.5 0.5
0.5]);
plot(t, y(:, 1), 'cs-', 'linewidth', 1);
grid on
hold on
plot(t, y(:, 2), 'gs-', 'linewidth', 1);
hold on
plot(t, y(:, 3), 'bs-', 'linewidth', 1);
hold on

```

```

C1=2, C2=5, C3=7, R2=14, R3=12, G=7, f=0, g=0.3, a=0.8, b=0.6, v=0.15, s=0.8, k=0
.8, m=0.5, n=0.5, u=3, p=0, q=0;
[t, y]=ode45(@(t, y)
duli(t, y, C1, C2, C3, R2, R3, G, f, g, a, b, v, s, k, m, n, u, p, q), [0, 1], [0.5 0.5
0.5]);
plot(t, y(:, 1), 'cp-', 'linewidth', 1);
grid on
hold on
plot(t, y(:, 2), 'gp-', 'linewidth', 1);

```

```

hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0,g=0.4,a=0.8,b=0.6,v=0.15,s=0.8,k=0
.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,1],[0.5 0.5
0.5]);
plot(t,y(:,1),'co-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);
hold on
legend('MC:f=0,g=0.1,p=0,q=0','HE:f=0,g=0.1,p=0,q=0','GE:f=0,g=0.1,p=
0,q=0','MC:f=0,g=0.2,p=0,q=0','HE:f=0,g=0.2,p=0,q=0','GE:f=0,g=0.2,p=
0,q=0','MC:f=0,g=0.3,p=0,q=0','HE:f=0,g=0.3,p=0,q=0','GE:f=0,g=0.3,p=
0,q=0','MC:f=0,g=0.4,p=0,q=0','HE:f=0,g=0.4,p=0,q=0','GE:f=0,g=0.4,p=
0,q=0')
axis([0 1 0.5 1])

#####figure 9-d #####
figure(19)
C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.1,g=0.2,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cx-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gx-','linewidth',1);
hold on
plot(t,y(:,3),'bx-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.2,g=0.1,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cs-','linewidth',1);

```

```

grid on
hold on
plot(t,y(:,2),'gs-','linewidth',1);
hold on
plot(t,y(:,3),'bs-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.2,g=0.3,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'cp-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'gp-','linewidth',1);
hold on
plot(t,y(:,3),'bp-','linewidth',1);
hold on

C1=2,C2=5,C3=7,R2=14,R3=12,G=7,f=0.3,g=0.2,a=0.8,b=0.6,v=0.15,s=0.8,k
=0.8,m=0.5,n=0.5,u=3,p=0,q=0;
[t,y]=ode45(@(t,y)
duli(t,y,C1,C2,C3,R2,R3,G,f,g,a,b,v,s,k,m,n,u,p,q),[0,0.5],[0.5 0.5
0.5]);
plot(t,y(:,1),'co-','linewidth',1);
grid on
hold on
plot(t,y(:,2),'go-','linewidth',1);
hold on
plot(t,y(:,3),'bo-','linewidth',1);
hold on
legend('MC:f=0.1,g=0.2,p=0,q=0','HE:f=0.1,g=0.2,p=0,q=0','GE:f=0.1,g=
0.2,p=0,q=0','MC:f=0.2,g=0.1,p=0,q=0','HE:f=0.2,g=0.1,p=0,q=0','GE:f=
0.2,g=0.1,p=0,q=0','MC:f=0.2,g=0.3,p=0,q=0','HE:f=0.2,g=0.3,p=0,q=0',
'GE:f=0.2,g=0.3,p=0,q=0','MC:f=0.3,g=0.2,p=0,q=0','HE:f=0.3,g=0.2,p=0
,q=0','GE:f=0.3,g=0.2,p=0,q=0')
axis([0 0.5 0.5 1])

```