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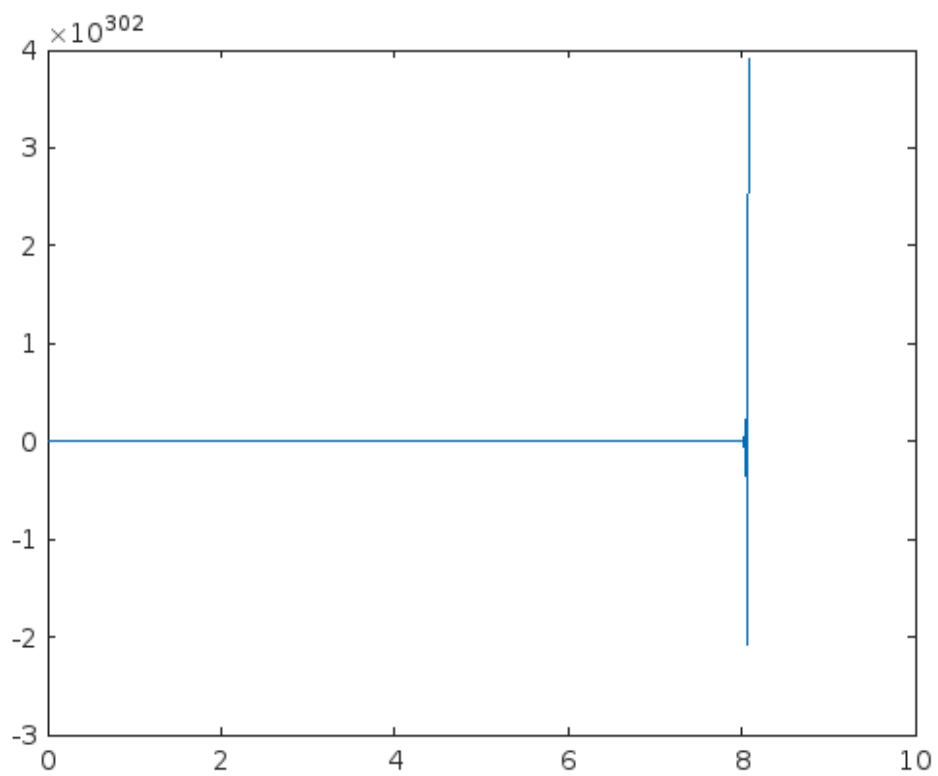
```
M=1;
K=1000;
C=0.3;
f_amp=5;
freq=8;
time=100;
dt=.125/20;
time_vec=0:dt:time;
F=f_amp*sin(2*pi*freq*time_vec);
X0=0;
V0=0;
[x xd xdd]=betanemark3(M,K,C,time,X0,V0,dt,F);
plot(time_vec,x)
```

```
function [x xd xdd]=betanemark3(M,K,C,time,X0,V0,dt,F)
a=1/6;b=1/2;
x=X0;
xd=V0;
xdd(:,1)=inv(M)*(F(:,1)-C*xd(:,1)-K*x(:,1));

i=1;
for m1=dt:dt:time
x(:,i+1)=inv((1/(a*dt^2))*M+(b/(a*dt))*C+K)*(F(i+1)+M*((1/(a*dt^2))*x(:,i)+(1/(a*dt))*xd(:,1)+(1/(2*a)-1)*xdd(:,i))+C*((b/(a*dt))*x(:,i)+(b/a-1)*xd(:,i) +
(b/a-2)*dt*0.5*xdd(:,i)));

xdd(:,i+1)=(1/(a*dt^2))*(x(:,i+1)-x(:,i))-(1/(a*dt))*xd(:,i)-(1/(2*a)-1)*xdd(:,i);
xd(:,i+1)=xd(:,i)+(1-b)*dt*xdd(:,i) +b*dt*xdd(:,i+1);
time(1,i+1)=m1;
i=i+1;
end

end
```



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