

Project

This is a project about 2 mass objects, 2 spring and 2 damper .

```
% stating the variables
% mass 1 object properties
k1 = 1;
b1 = 1;
m1 = 1;

%second mass object properties
k2 = 1;
b2 = 2;
m2 = 1.5;

F = 1;
sim("Mass2_sim.slx");
```

Now we declared the variable this is how we solved the second equation as in the paper and simulink

2 Masses, 2 Spring, 2 dampers.

b_1 : damping coefficient damper 1

b_2 : damping coefficient damper 2

m_1 : mass of block 1

m_2 : mass of block 2

k_1 : coeff spring constant (stiffness) Spring 1

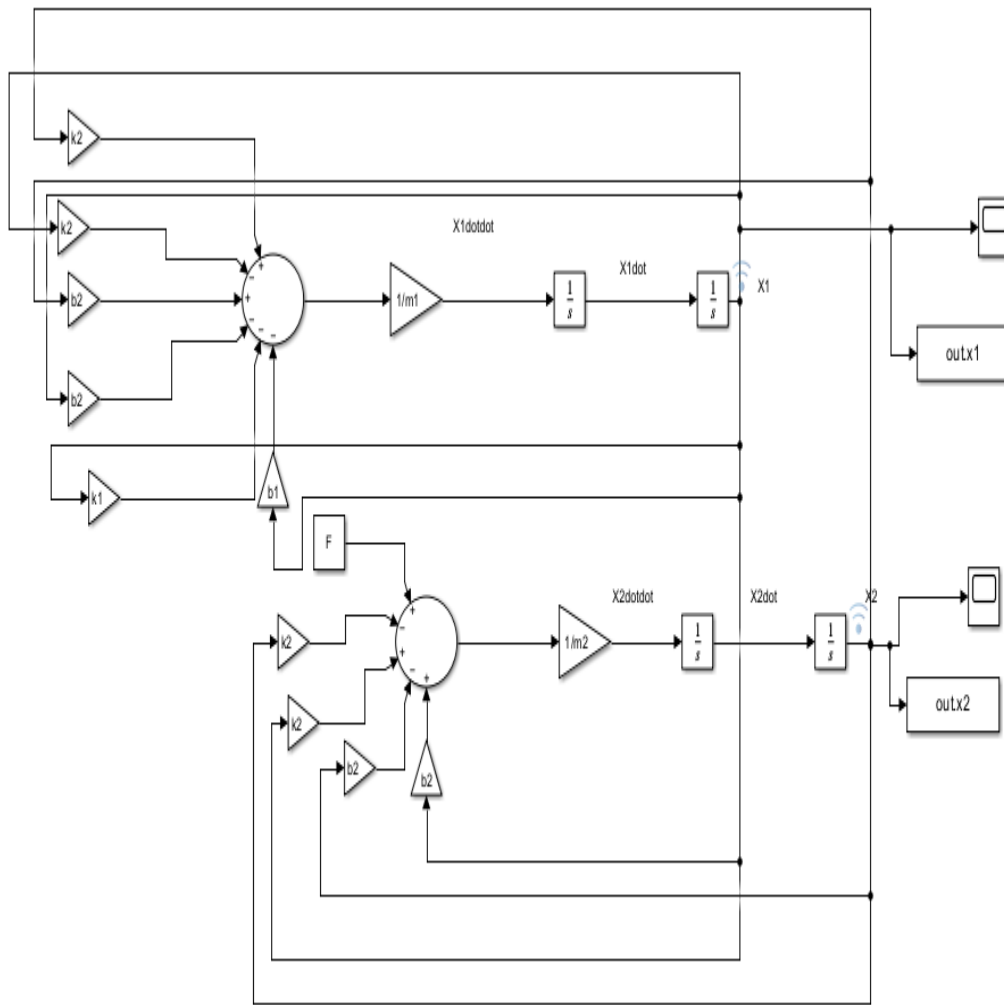
k_2 : " " " " Spring 2

x_1 : distance between from 0 to m_1

x_2 : distance from 0 to m_2

$$m_1 \ddot{x}_1 = k_2(x_2 - x_1) + b_2(\dot{x}_2 - \dot{x}_1) - k_1 x_1 - b_1 \dot{x}_1$$

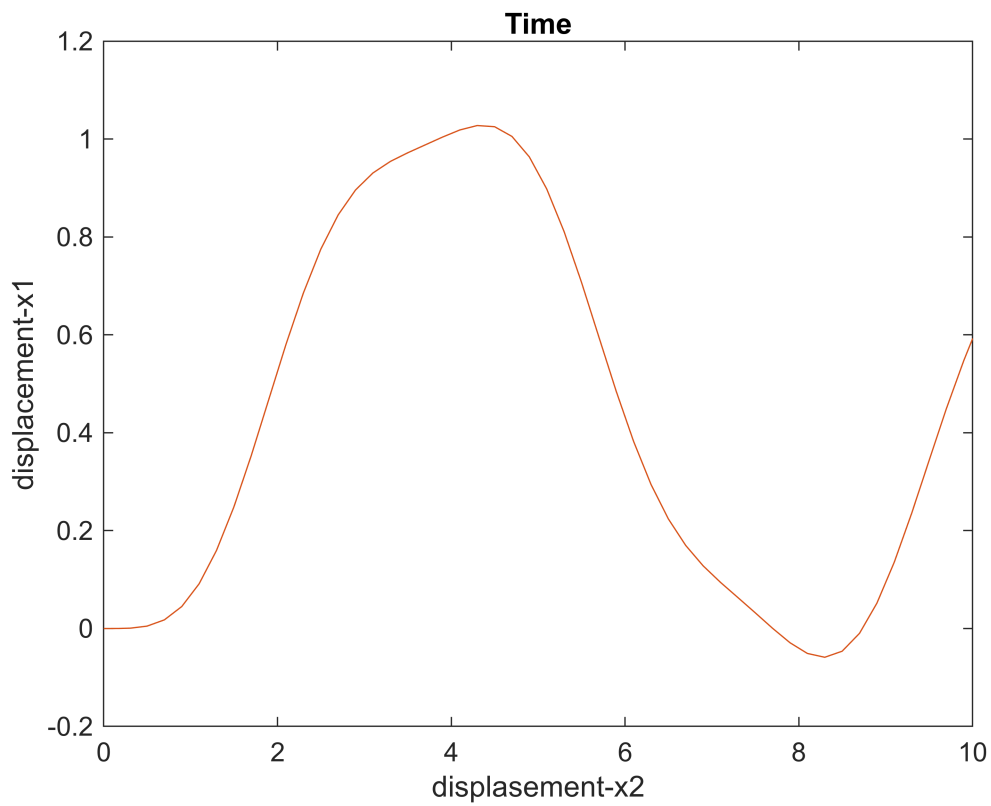
$$m_2 \ddot{x}_2 = \underbrace{F}_{\text{force on } m_2} - k_2(x_2 - x_1) - b_2(\dot{x}_2 - \dot{x}_1)$$



This is the problem

solved lets simulate and plot and compare

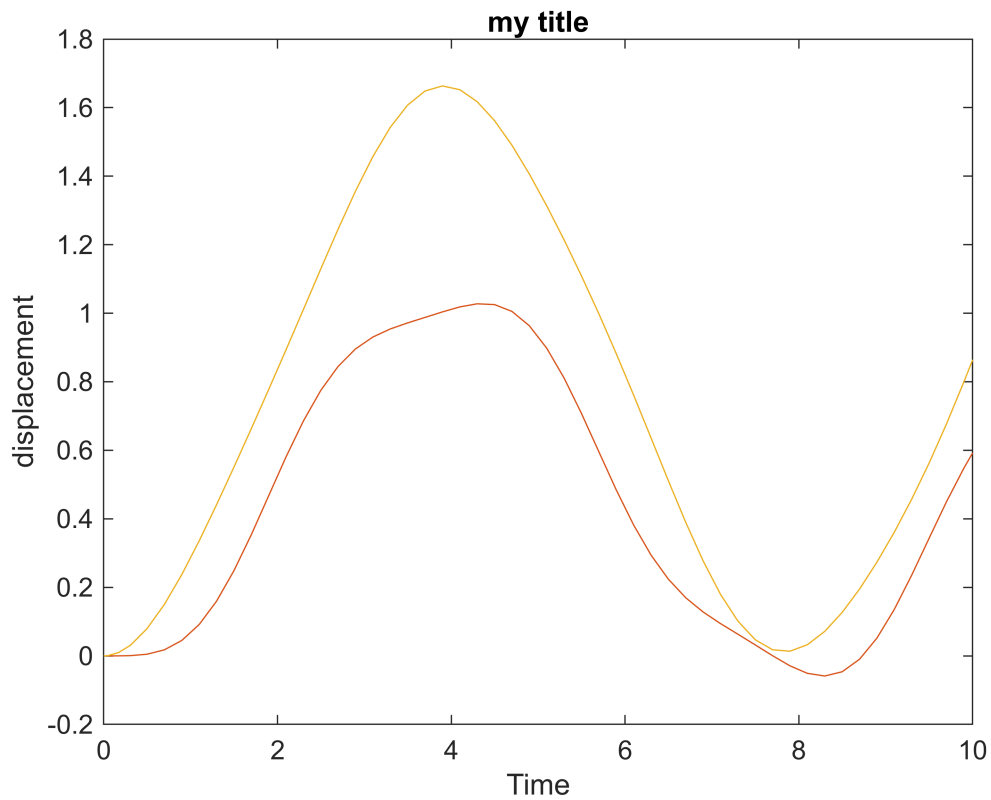
```
figure
plot(ans.F)
hold on
plot(ans.x1)
ylabel("displacement-x1")
xlabel("displacement-x2")
title("Time")
```



```
% plotting mass 2
figure
plot(ans.F)
hold on
plot(ans.x2)
ylabel("displacement-x2")
xlabel("Time")
title("my title-2-2")
```



```
% lets compare
figure
plot(ans.F)
hold on
plot(ans.x1)
hold on
plot(ans.x2)
ylabel("displacement")
xlabel("Time")
title("my title")
```



Comparing the Results we can see that mass2 has displaced more than mass1 and that is due to the force by m1 because not just the force 1 is applied but the mass of the object 1 and its force so that is the reason for m2 to displace much more than m1

To be Continued...