

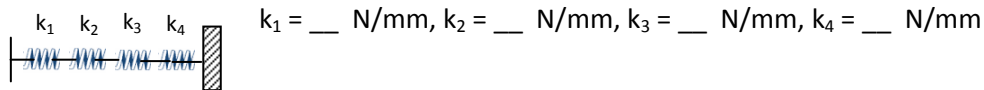
Linear Mechanical Spring Simulation with Haptic Paddle

Name: _____ MAE 101B Section: _____

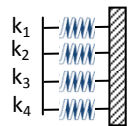
Answer the following questions **before** starting the simulation

1.1 Write down the Hooke's law equation for linear mechanical springs. What does the equation describe?

1.2 Given a set of springs in series below, compute the equivalent stiffness coefficient, k_{eq} , of the system.



1.3 Given a set of springs in parallel below, compute the equivalent stiffness coefficient, k_{eq} , of the system.



1.4 Given two sets of four identical springs. In one set, the springs are connected in series and the other set are in parallel. To deflect the two sets of springs to the same distance, which set (series or parallel) will require a higher force? Try to answer this question intuitively without deriving the equations.

Answer the following questions **using** the simulation

2.1 Set the stiffness coefficients to the values described in Question 1.2, what is the k_{eq} ? _____

2.2 Set the stiffness coefficients to the values described in Question 1.3, what is the k_{eq} ? _____

2.3 Set all of the stiffness coefficients to $\underline{\hspace{1cm}} \text{ N/mm}$

2.3.1 Select Series connection. What is the equivalent stiffness coefficient? Now, try moving the virtual springs using the Haptic Paddle. _____

2.3.2 Select Parallel connection. What is the equivalent stiffness coefficient? Now, try moving the virtual springs using the Haptic Paddle. _____

2.3.3 Which set feel stiffer? _____

Does this agree with your intuition of how the systems should behave? _____

Evaluation of the simulation: Provide rating from a scale of 5 (Strongly agree) to 1 (Strongly disagree)

The simulation is easy to use:	5	4	3	2	1
The visualization helps me understand the concept:	5	4	3	2	1
The force feedback helps me understand the concept:	5	4	3	2	1
The overall Haptic Paddle system helps me understand the concept:	5	4	3	2	1
I would like to see more simulation like this in the class:	5	4	3	2	1
Other comments/suggestions:					
