Essential:

1. Based on the value of k you computed in the prelab, how much force should be required to displace the tip of the cantilever 2.5 cm? Does this feel about right?

2. Adjust the damping by rotating the knob at the back of the air pot so that it takes the spring roughly 1 second to return "most of the way" to its initial position after being released. Using the digital camera, Matlab, and the methods you developed in the prelab, take data for this setting. From this data determine the time constant based on your best curve fit. Attach a print-out of your plots.

3. From your data, determine a value (or values) for the damping coefficient c associated with the air pot. Repeat for at least one other significantly different air pot setting.

Extra Credit:

4. Does the time constant change if you vary the amplitude or direction of the initial displacement? Attach a print-out which adresses this question. How do you explain the observed data?

5. Adjust the air pot and observe the response to various initial conditions or disturbances. Is our first-order model a "good" model of the system? Does it completely describe the dynamics of the system?

6. Is the digital camera a "good" way to measure the response of the system? Can you use it to accurately measure all of the responses you've seen?