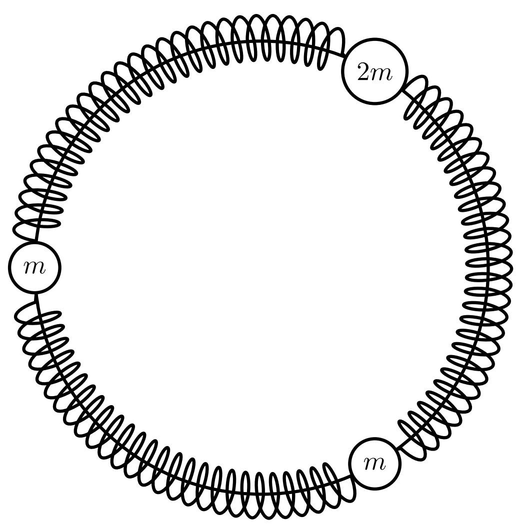
All questions from Taylor, Chapter 11. Please show all your work and write legibly for full credit!

- **11.10**: Looking at coupled oscillators with dissipative forces. Only *need* the computer for plotting at the end, though you of course can use it for whatever you want.
- **11.14**: Coupling pendulums with springs! **In addition to the book problem, do the following:**
  i) Use the normal modes to write out the full generalized solutions for the system.
  ii) Solve these solutions when

$$\begin{aligned} \phi_1 &= 5^\circ \\ \dot{\phi}_1 &= 0\,\mathrm{rad/s} \\ \phi_2 &= 10^\circ \\ \dot{\phi}_2 &= 0\,\mathrm{rad/s} \\ \\ g &= 9.8\,\mathrm{m/s^2} \\ k &= 10\,\mathrm{N/m} \\ m &= 1\,\mathrm{kg} \end{aligned}$$

  over the first 20 seconds. You can let the two pendula be separated by a distance of half their length, with their length equal to 10 m.
  iii) Visualize the resulting solutions using an animation in Matplotlib.
- **11.31**: The description of this problem leaves a little much to the imagination in my opinion, so allow me to clarify some aspects and provide you a picture. There are *three* springs, one connecting each mass to the other two along the edge of the loop. And you can envision this as a top down view, so you don't need to account for gravity, just the potential of the springs. At equilibrium, things would look something like:



  You will probably get a normal frequency that seems a little strange. This isn't cause to panic, but think about it what it would mean in the context of the problem. Looking at 11.27 might help understand it better as well.