In-class assignment # 4

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Instructions: We're going to use the code for your pre-class assignment, where you modeled the behavior of a mass on a spring over some interval of time. You've already implemented Euler method and a simple predictor-corrector method. Now, implement (1) either the Euler-Cromer method or the midpoint method and (2) the 4th order Runge-Kutta method, and answer the following questions:

- For given timestep sizes, $\Delta t = 0.1\pi, 0.01\pi$, and 0.001π, what is the difference in the relative change in energy between the Euler methods and these two methods?
- Assume you wish to maintain energy to a given level of accuracy - say 0.01% between $t = 0$ and $t = 4\pi$. How many time steps of each of your methods do you need to reach that level of accuracy? How many total floating-point operations is that for each method for the entire integration?

Make some notes in `ANSWERS.md`, and we'll also discuss it in class.

What to turn in: Turn in `ANSWERS.md`, any source code you wrote, any plots you created (and the scripts you used to create them). **Do not** turn in object files or executables!