MA/CSSE Homework 7
Due 5/8

Directions
The goal of this project is to create a working parallel n-body solver using domain decomposition.

You may use my code posted on Moodle to help you. Posted are

- `nbody_solver_stripped.c` – A working nbody solver stripped of its core functionality, but demonstrating how to use the helper functions I have written for you.
- `nbodyutils.h` – A collection of helper functions to load initial data from a file, write properly formatted output data, parse command line options, etc.
- `results_to_gif.c` – A program to take the output written by the nbody solver and convert it to an animated gif.

Your program should support the options found in my `nbodyutils.h` file. In particular, it should read initial data from any given file, and be able to take a combination of stepsize, number of steps, and end time to determine its parameters. It should use a simple Euler's method to solve the corresponding system of differential equations.

Your program should generate an output file in the same format as the one generated by my `nbodyutils.h` file (in case you don't want to use my code for some reason).

In the interest of giving proper credit, the `results_to_gif.c` file relies on the `gifsave89.c` suite found at `http://www.forkosh.com/gifsave89.html`

Animated gifs do not utilize a large number of frames well. By default, `results_to_gif` will only output 200 evenly spaced simulation times as frames of the gif. You may change this option to a larger number for a more detailed movie. If you do so, you may want to convert the animated gif to an `.avi` file for viewing. An example of doing so is:
`ffmpeg -i animation.gif -s 256x256 animation.avi`
`ffmeg` is installed on all cluster machines.