Final Project For N-Body

Make a 2-D nbody code that calculates the forces by computing the potential, where the potential is found by convolving the density with the (softened) potential from a single particle.

Part 1: Using this code, show that a single particle at rest remains motionless.

Part 2: Next, show that a pair of particles placed in a circular orbit continue to orbit each other.

Part 3: Set up both periodic and non-periodic boundary conditions. Set up a problem where hundreds of thousands of particles are initially scattered randomly throughout the domain. Show the evolution with time for both periodic and non-periodic boundary conditions. Track the total energy - how well is it conserved?