BACKGROUND

There are many celestial objects in the universe, all obeying Newton’s law of gravity. Many of those celestial bodies could be on their very way to disrupt the current motions of the planets in our solar system. It is possible such disruptions could have drastic effects on the orbits of the planets in our solar system. However, the most drastic effects will result from the disruptions of Jupiter since it is has the most mass compared to other planets in our solar system. The goal of project is to determine, through simulation, how the behavior of the planets, mostly their trajectories, will change if Jupiter collides with a celestial object of considerable size and mass while being governed by the gravitational law. The collision are treated as a perfectly inelastic collision.

METHOD FOR CODE

The base of the code was used from Project 2 where Velocity Verlet is used to set up the orbits. The base code also uses Newton’s Universal Law of Gravitation to calculate the positions and velocities at each time step. The collisions of the celestial object and Jupiter are modeled through perfectly inelastic collisions. The path of the celestial object is a straight line to Jupiter instead of a more realistic model where the path is more elliptical. Many attempts were made to make the orbit of the celestial object an elliptical one but due to time constraints, that task could not be achieved.