GAM 51

Assignment 2

Due 3/12

**Gravity**

For this assignment you will be applying gravitational forces to rigid bodies. You will build a simulation that introduces a given number of objects in to a space with a random mass and random starting velocity. Each body should be represented by a sphere. The scale of the sphere should be multiplied by the sphere’s mass. When a sphere is in contact with another sphere, the larger of the two objects should begin to consume the other’s mass. The simulation must contain a GUI to allow for user input to determine the upper and lower bounds of the randomized values for the objects. The GUI should also take input for the number of objects to be created and the rate that objects consume mass.

**Requirements and restrictions**

This project should contain no colliders. To determine collision, use the distance between two spheres and subtract the sum of the two radiuses.

**Equations that you will need**

Newton's law of universal gravitation states that a particle attracts every other particle in the universe with a force which is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centers.

**Newton's universal law of gravitation**: F = Gm1m2/r2, where F is the force due to gravity, between two masses (m1 and m2), which are a distance r apart; G is the gravitational constant (approximately 6.674×10−11 N⋅m2/kg2).

**in code**

G = 6.674f \* (10 ^ 11)

force = ((float)G \* A.mass \* B.mass) / (r \* r)