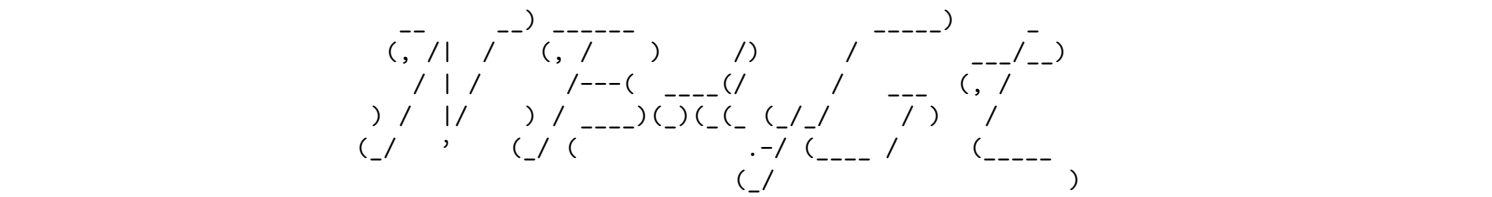

==========

Nick Walker

27 February 2013

V 1.3

This program creates a solar system and uses Newton's Law of gravitation to animate motion. It allows the user to manipulate and explore the system at will.

Requires:

```
*   OpenGL - a graphics library
    -   http://pyopengl.sourceforge.net/

*   numpy - a math library
    -   http://www.numpy.org/
```

Usage:

```
*   Run the NBodyV_1_3.py file

*   The extra folders allow for people without Python to run the program
    on a Windows machine by running the executable in the \dist folder

*   Collisions with debris are still very unstable, but they are relatively
    easy to disable. You can disable collisions by commenting out the line
    with updateCollisions(); also, if you just want to remove debris, comment
    out the if block in the updateCollsions() function and the else: line in
    the NewtonV_1_3.py file, then tab over everything that was in the else block
```

Features:

```
*   Gravitation between multiple Astronomical objects
```

* Adding and subtracting objects from the system
* Camera rotation about the center of the system with keyboard input
* Scene traversal with keyboard input
* Scene traversal with mouse input
* Collisions with debris

Future Features:

* More variation in mass and density
* Better collisions (fix bugs with debris and conservation of energy)
* Larger systems
* Generation of high speed, high mass external Astronomical objects
* N number of stars
* Lighting control
* Bugfixes for movement

Controls:

* w: move forward
* s: move backward
* a: turn left
* d: turn right
* e: turn up
* q: turn down
* i: rotate camera up
* k: rotate camera down

* j: rotate camera left

* l: rotate camera right

*]: add Astronomical object

* [: remove Astronomical object

* mouse: changes camera facing

* left click: move forward

* right click: move backward

* middle click: stop moving forward or backward

Credits:

* Nick Walker