In this assignment, you are going to create a simulation of the Solar system.

1. Each planet will rotate on its axis at an appropriate speed and orbit the Sun at an appropriate speed.
2. The size of the planets and their distance from the Sun should be approximately relative to each other, but it will not be possible to simulate their real sizes or distances (the Sun is ~100x bigger than the Earth).
3. Each planet should have an appropriate texture.
4. Your project should have an appropriate sky-box.
5. Your camera should be positioned in such a way that we can see most, if not all, of the planets when we enter VR mode (without needing to press the AWSD keys to move).

* Extra credit if you can add the Earth’s moon.
* Extra credit if you can add Saturn’s rings.

Make sure you cite your sources for your textures.

Upload your completed solar system to github into a repository called A-Frame-Nine-Planets.

Here is the planetary data you will need to create the orbits and rotational speeds

|  |  |  |
| --- | --- | --- |
| **Name of Celestial Body** | **Time to Spin on Axis (days)** | **Time to Orbit Sun (years)** |
| Sun | 27 | - |
| Mercury | 59 | 0.241 |
| Venus | 243 | 0.845 |
| Earth | 1 | 1 |
| Mars | 1.020 | 1.882 |
| Jupiter | 0.417 | 11.860 |
| Saturn | 0.444 | 29 |
| Uranus | 0.719 | 84 |
| Neptune | 0.671 | 165 |
| Pluto | 6.375 | 248 |

(source: <https://www.bobthealien.co.uk/solarsystem/table.htm> )

*“Such are the distances, in fact, that it isn’t possible, in any practical terms, to draw the solar system to scale. Even if you added lots of fold-out pages to your textbooks or used a really long sheet of poster paper, you wouldn’t come close. On a diagram of the solar system to scale, with Earth reduced to about the diameter of a pea, Jupiter would be over a thousand feet away and Pluto would be a mile and a half distant (and about the size of a bacterium, so you wouldn’t be able to see it anyway). On the same scale, Proxima Centauri, our nearest star, would be almost ten thousand miles away. Even if you shrank down everything so that Jupiter was as small as the period at the end of this sentence, and Pluto was no bigger than a molecule, Pluto would still be over thirty-five feet away.”*

(Source: A Short History of Nearly Everything, Bill Bryson, 2004)

Here is the planetary data you will need to approximate the size and distances:

|  |  |  |
| --- | --- | --- |
| **Name of Celestial Body** | **Average Distance from Sun (km)** | **Diameter (km)** |
| Sun | - | 1,392,700 |
| Mercury | 57,900,000 | 4,878 |
| Venus | 108,160,000 | 12,104 |
| Earth | 149,600,000 | 12,756 |
| Mars | 227,936,640 | 6,794 |
| Jupiter | 778,369,000 | 142,984 |
| Saturn | 1,427,034,000 | 120,536 |
| Uranus | 2,870,658,186 | 51,118 |
| Neptune | 4,496,976,000 | 49,532 |
| Pluto | 5,906,375,000 | 2,370 |

(source: <https://www.bobthealien.co.uk/solarsystem/table.htm> )