Final Project – Solar System Model

by

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1. Test from my proposal

I am planning to design the Solar System for the Final project. Therefore, my design would have 8 Planets revolving around the Sun. All planets would be positioned in its own orbits. The planetary motion would be made according to the Kepler's third law. I would exaggerate the Planet's diameter and the Planet's orbital radius so that the difference between them is visible. The Sun would be the biggest in the Solar system and therefore, its diameter would be scaled. I am also planning to include lighting source for the Sun and to add textures for the planets. It would also include scaling with respect to the orbit proportion, like If Planet A's orbital period is twice as long as Planet B's in real life, it will be twice as long in the scaled-life as well.

2. What you actually did for your project, with images

I have designed the solar system as per the actual model by taking relative measures of certain parameters. The orbits of the planets were modeled as per Kepler's third law. The diameter of the planet as well was taken from the relative value. The following table shows the data used in the project

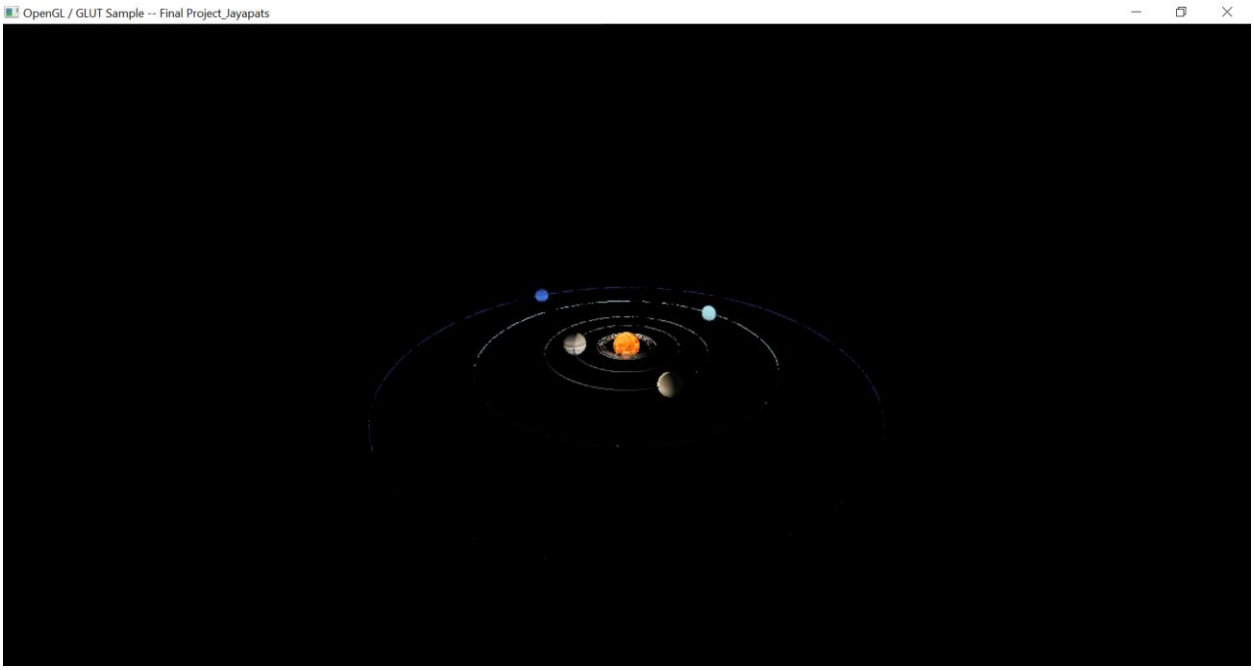
Planet	Relative Radius of Orbit	Relative Length of Year	Relative Orbital Velocity used in Project	Relative Diameter	Relative Radius	Radius used in Project
Mercury	0.387	0.2409	1.607	3032	1516	0.1516
Venus	0.723	0.616	1.174	7521	3760.5	0.37605
Earth	1	1	1	7,917	3958.5	0.39585
Mars	1.524	1.9	0.802	4212	2106	0.2106
Jupiter	5.203	12	0.434	86881	43440.5	4.34405
Saturn	9.539	29.5	0.323	72367	36183.5	3.61835
Uranus	19.18	84	0.228	31518	15759	1.5759
Neptune	30.06	165	0.182	30599	15299.5	1.52995

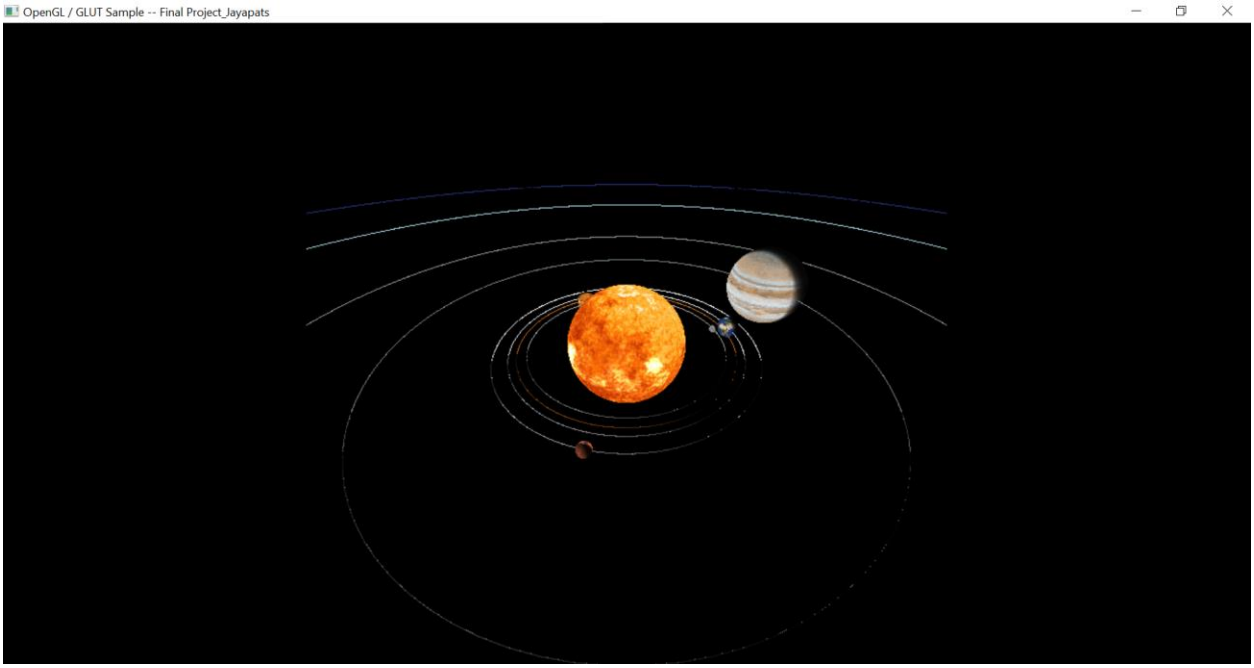
The planets rotation around itself was calculated as per the relative length of year in the above table. The rotation around the sun, that is the orbital velocity is also calculated as per Kepler's law and is mentioned in the table above. Sun's diameter is designed to be the biggest of all and other planets sizes were calculated from its relative sizes.

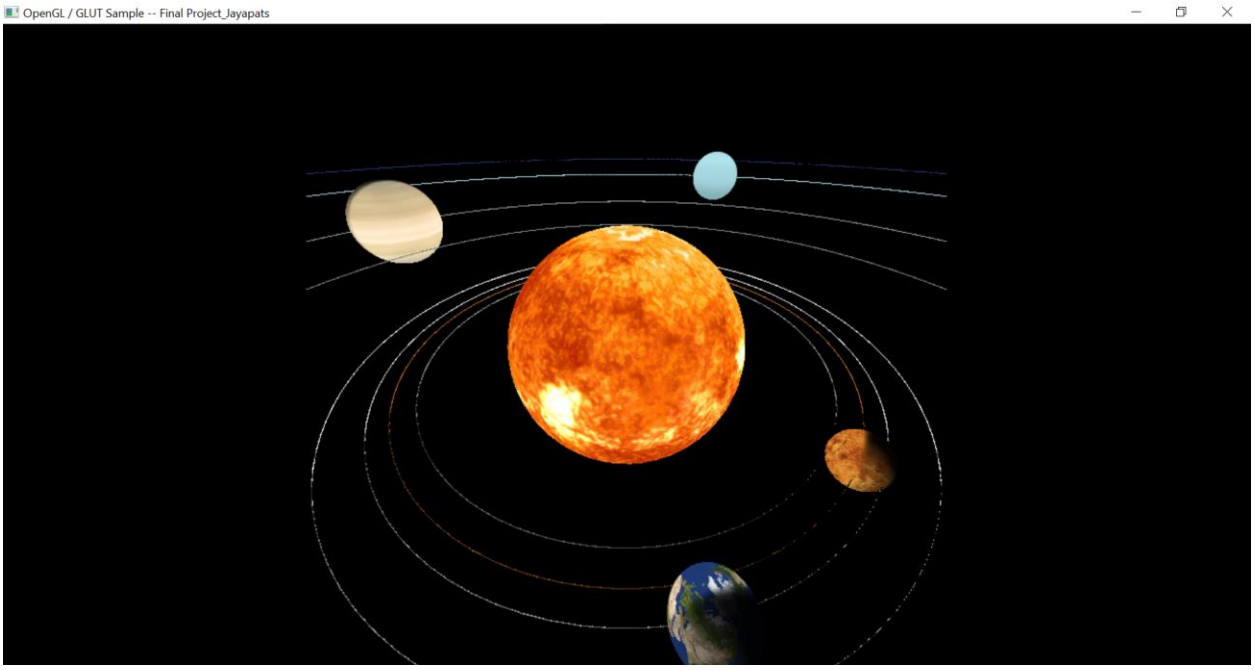
I have placed a source light at the center. Also, there are few point lights placed at certain distances to get a good view at the solar system.

Keyboard Keys to toggle:

Keys	View
o or O	Outside View
e or E	View close to Earth
c OR C	View close to Sun
i or I	View inside Sun
f or F	To Freeze the scene




OpenGL / GLUT Sample -- Final Project_Jayapats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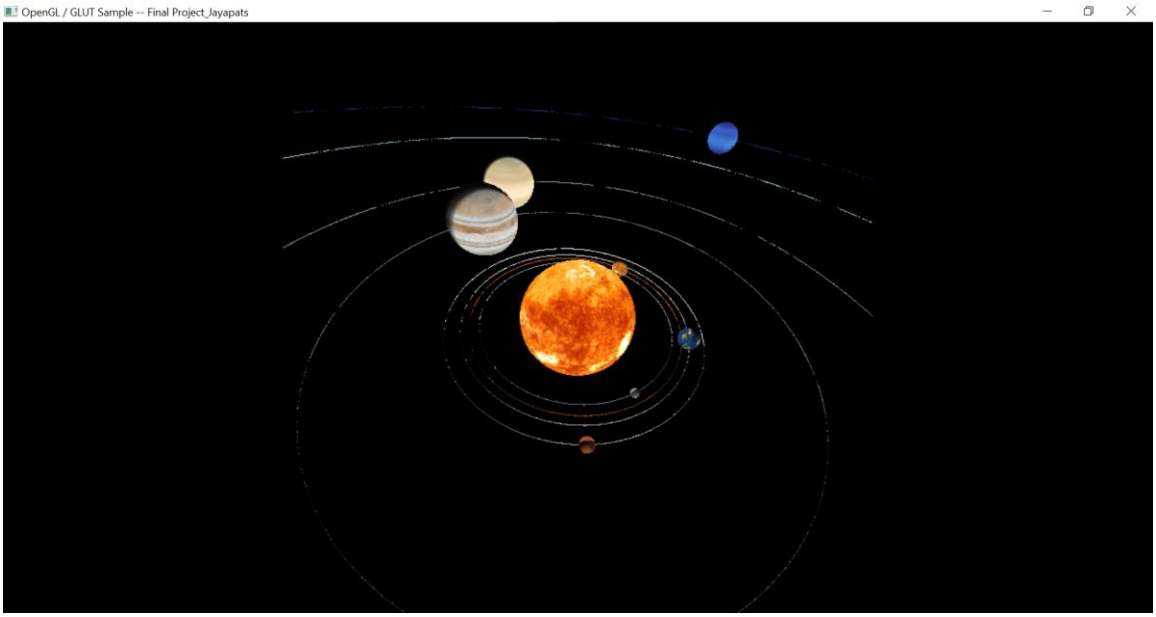
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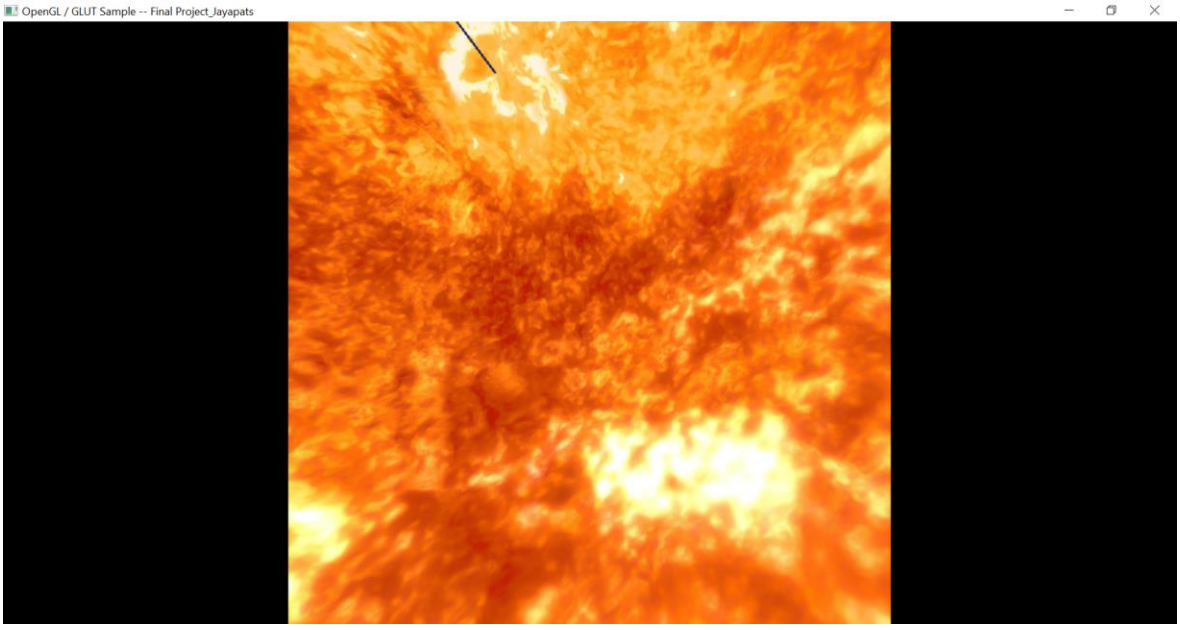
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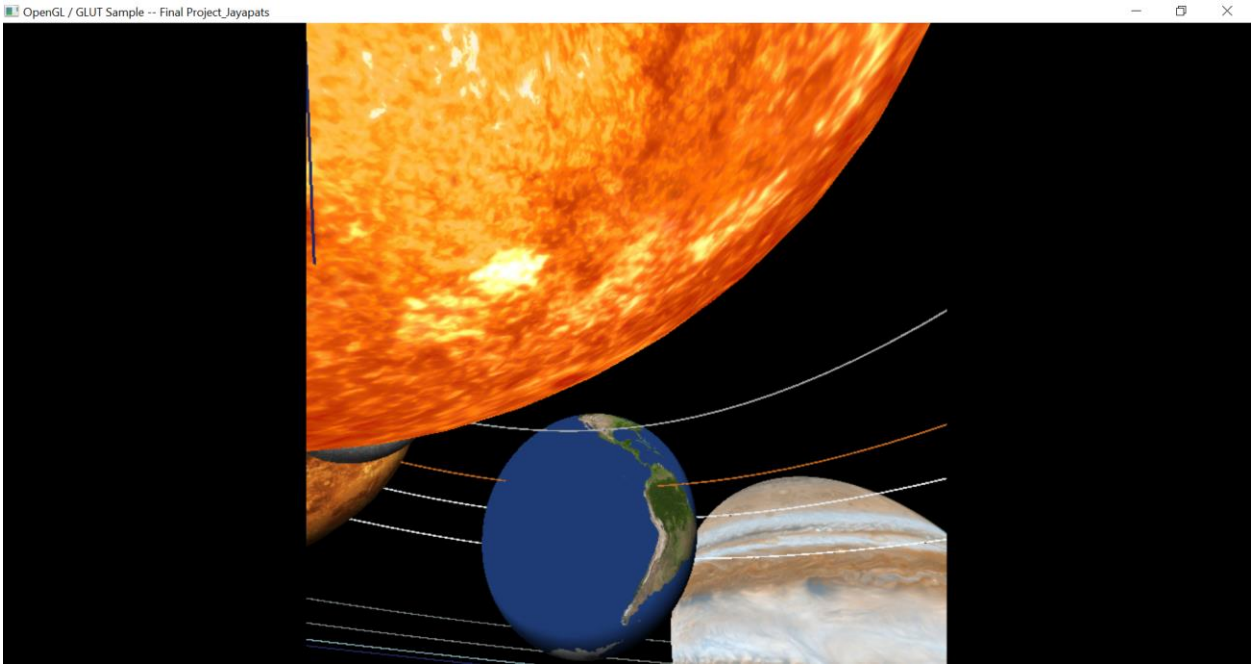
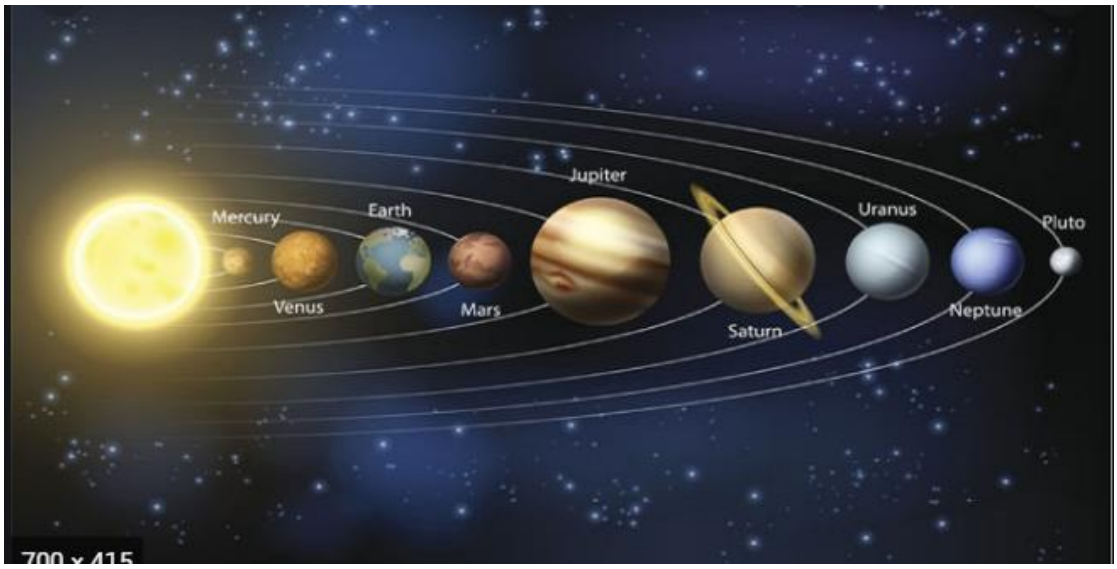


3. How your project differs from what you proposed, and why
   The project output is similar to that in the proposal.

4. What you learned from doing this project (i.e., what you know now that you didn't know when you started)
   I learnt how to do the lighting well. The most important part of this project is to ensure the texture mapping and orbital distances according to keppler's law. From this project, I learnt to map the textures and do the relative rotation of the planet around the sun and rotation by itself.

5. Any images that are especially representative of what you did

   The following is a representative image from the web:



6. A link to the video showing off your project - be sure it is **unlisted**.

https://media.oregonstate.edu/media/t/1_tl1416hz