# *SOLAR SYSTEM*      NANDA KISHORE KALIDINDI, nkk263, N16138926

This project tries to mimic our **Solar system** with **9** Planets(well, pluto!), **1** Sun, **1** Moon.

## Assignment Requirements

- 4 - Positional Lights ✔
- Normal and Specular maps for all 9 planets, 2 rings and 1 sun ✔ (Moon has no normal/specular)
- All spherical objects are rendered using Geometrymaker, Planet rings and orbit traces are achieved using loadObj method ✔

## Additional implementations

- Arc ball implementation (quite buggy)
- Hierarchical entities, planet rings being children of planets and Moon is a child of Earth

Planet rings(**planet_ring.obj**) and orbital rings(**torus_final.obj**) are rendered using OBJ files which are created with the help of **Blender**. Both are created from a **TORUS** mesh.
**Orbit obj** - Major radius 7.0, Minor radius 0.01. **Planet ring** - Scale torus to zero along Y axis

**Arc ball** only works on the **LEFT** half of the screen, did not concentrate much to get it working as it is not a requirement. A more concrete and fully working implementation will be pushed soon.

## BUILD INSTRUCTIONS:

**>** All the files in the **executable files** folder should be moved in to the executable directory
**>** Once the program is built an running arc ball is to be tried **ONLY** on the left half of the frame
**>** If the program exits while trying to pan the scene, please rebuilt the project

|  | Revolution | Renderer | Diffuse map | Specular map | Normal map |
|---|---|---|---|---|---|
| **SUN** | 0.0 | makeSphere | ✔ | ✔ | ✔ |
| **MERCURY** | 47.89 | makeSphere | ✔ | ✔ | ✔ |
| **VENUS** | 35.03 | makeSphere | ✔ | ✔ | ✔ |
| **EARTH** | 29.79 | makeSphere | ✔ | ✔ | ✔ |
| **MARS** | 24.14 | makeSphere | ✔ | ✔ | ✔ |
| **JUPITER** | 13.06 | makeSphere | ✔ | ✔ | ✔ |
| **SATURN** | 9.64 | makeSphere | ✔ | ✔ | ✔ |
| **URANUS** | 6.81 | makeSphere | ✔ | ✔ | ✔ |
| **NEPTUNE** | 5.43 | makeSphere | ✔ | ✔ | ✔ |
| **PLUTO** | 4.00 | makeSphere | ✔ | ✔ | ✔ |
| **MOON** | 25.00 | makeSphere | ✔ | ✘ | ✘ |
| **SATURN RING** | 0.0 | loadObj | ✔ | ✘ | ✘ |
| **URANUS RING** | 0.0 | loadObj | ✔ | ✘ | ✘ |
| **ORBITAL RINGS** | 0.0 | loadObj | ✔ | ✘ | ✘ |

**Light Positions** (W.R.T world)
(-8.0, 0.0, 8.0), (8.0, 0.0, 8.0), (8.0, 0.0, -8.0),
(-8.0, 0.0, -8.0), (0.0, 8.0, 0.0)

**SCREEN SHOTS**