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CS – 450

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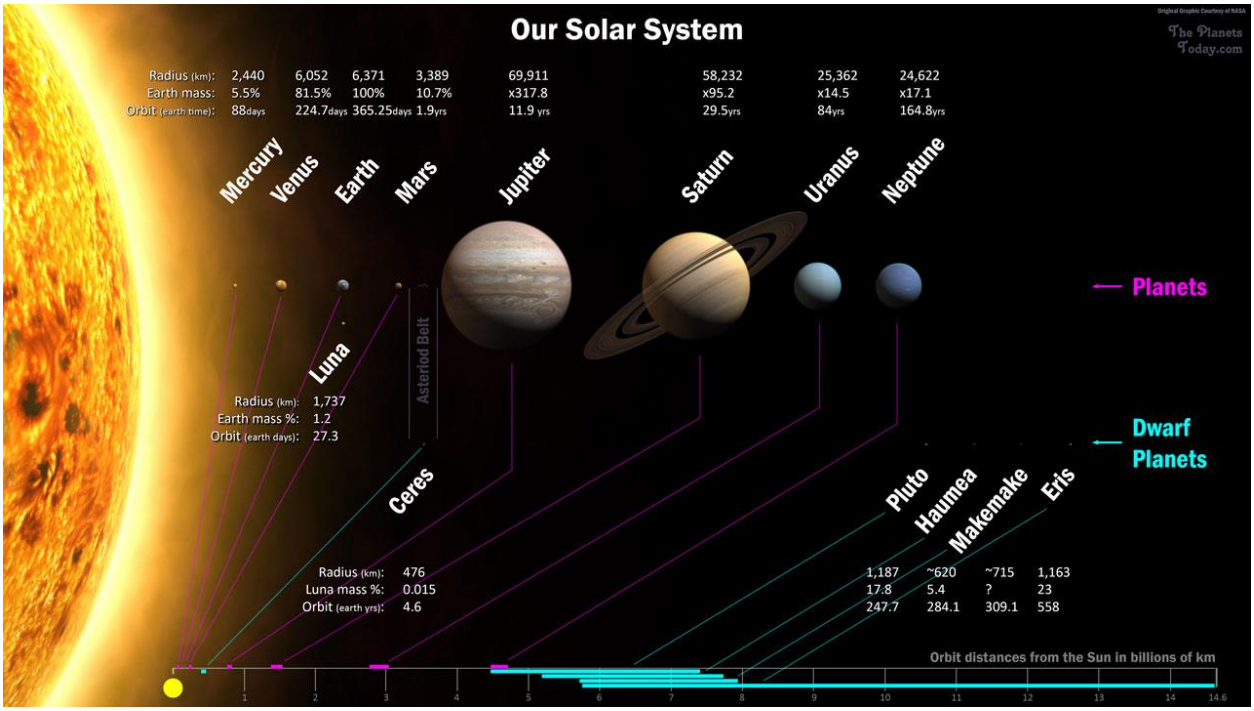
Final Project Proposal

I would like to recreate our Solar System for the final project. I have reviewed the Final Project Proposal Comments *(Links 1)*, on the class website *(Links 2)*, and I have thought of some ways to implement these ideas. I wanted to implement the planets diameter and planet orbital radius by changing the exact size and putting it into my own size type *(Math 1)*. For the distance in between each planet *(Math 2)*. In terms or rotation around the sun I was planning on having each rotation being equal to one Earth year *(Math 3)*. I will be using the textures from *(Link 3)*. I will make the Sun a point light and will have RGB: (255,228,132) = (1.0, 0.89, .52).



Math

1. Planet Size Calculating:
   Since the sizes of the actual planets wont really work in openGL I wanted to make each 20,000 km = 1.0 in xyz coordinates, except for the sun otherwise it would be to big, the sun will be set to 10 xyz.
   Diameter:
   a. **Sun**: 10 xyz
   b. **Mercury**: 2,440 km = .122 xyz
   c. **Venus**: 6,052 km = .3026 xyz
   d. **Earth**: 6,371 km = .31855 xyz
   e. **Mars**: 3,390 km = .1695 xyz
   f. **Jupitar**: 69,911 km = 3.49555 xyz
   g. **Saturn**: 58,232 km = 2.9116 xyz
   h. **Uranus**: 25,362 km = 1.2681 xyz
   i. **Neptune**: 24,622 km = 1.2311 xyz

2. Distance between each planet will be 1 xyz for simplicity

3. Planet Rotation:
   Using the Time mechanic

```
float Time;

#define MS_IN_THE_ANIMATION_CYCLE  10000

. . .

int ms = glutGet( GLUT_ELAPSED_TIME );      // milliseconds

ms  %=  MS_IN_THE_ANIMATION_CYCLE;

Time = (float)ms  /  (float)MS_IN_THE_ANIMATION_CYCLE;        // [ 0., 1. )
```

   I will make each second be equal to an Earth year, subject to change if its too fast or too slow will notify in the final paper.
   a. **Mercury**: 88 days = .24110 seconds
   b. **Venus**: 224.7 days = .61562 seconds
   c. **Earth**: 365 days = 1 second
   d. **Mars**: 1.9 years = 1.9 seconds
   e. **Jupitar**: 11.9 years = 11.9 seconds
   f. **Saturn**: 29.5 years = 29.5 seconds
   g. **Uranus**: 84 years = 84 seconds
   h. **Neptune**: 164.8 years = 164.8 years

Links

1. Final Project Proposal Comments:
   http://web.engr.oregonstate.edu/~mjb/cs550/Projects/fpcomments.html
2. Class Website:
   http://web.engr.oregonstate.edu/~mjb/cs550/
3. NASA Textures:
   https://nasa3d.arc.nasa.gov/images