**Solar System Report**

for

CS 450/550 Fall Quarter 2015

Final Project

by

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**I. The Proposal of Final Project**

In the final project, I will draw a solar system with nine planets. As I know how to involve textures, lighting, and animate. I will let every planet go around with sun and every planet has rotation of itself.

**Details:**

1. Every planet has texture

2. Sun will give the white light

3. Every planet has its own track

4. Every planet rotates of itself

5. Every planet will go around with sun

6. Give a good eye position to look at the whole project

7. 3D rotation and scaling from the sample program could still be working

**II. The Function Using in Final Project**

**1. BmpToTexture**

This function is given by professor Bailey. I use this function to open the picture which type is bmp and convert it into texture in the final project. In this final project, I use nine bmp pictures to represent Sun, Mercury, Venus, Earth, Moon, Mars, Saturn, Uranus, and Neptune.

**2. glBindTexture and glGenTextures**

I use glGenTextures function to set the handles of texture binding. In this way, I can use glBindTexture to set different texture object to be the current texture object that I want to create, change, or use.

**3. SetPointLight**

This function is given by professor Bailey. I use this function to set the point light in the middle of Sun. The only light in the solar system is Sun. To set light, I also need to use glEnable( GL\_LIGHTING ).

**4. glPushMatrix and glPopMatrix**

These two functions are used to save and restore the current transformation. In the final project, I need to make Moon go around Earth. Other planets go around Sun. Every planet also have self-rotation. So I need to use the combination of glPushMatrix and glPopMatrix.

**5. MjbSphere**

This function is given by professor Bailey. The usage of this function is draw a sphere which can use texture on if. As every planet will have texture on it, I need to use MjbSphere.

**III. The Difference Between Proposal and Project**

First of all, I want to make every planet has the size according to the proportion. However, Sun is too big. If using the proportion of true size, other planets except Sun are too small to see.

Second, self-rotation cannot be represented according to its real cycle. This is because some planets’ self-rotation cycles are too short. If using its real cycle for every planet, it is hard to see whether it has self-rotation.

At last, I didn’t use shader in the final project. The side, which is facing to Sun of every planet, will be lighted due to openGL lighting.

**IV. The Impressive Cleverness**

I set the different animate speed. In lower speed, it is easily to see the planets, which is near the Sun, rotation because it rotates too fast. In higher speed, it is easily to see the planets, which is far from Sun, rotation because it rotates too slowly.

**V. What I Learned from This Project**

First of all, I can handle different planets self-rotation and revolution by using glPushMatrix and glPopMatrix. Second, I can easily tell when to use glRotatef and glTranslatef due to this project. Third, it’s really hard to deal with light in openGL. Point light is not bright enough in a big space.

**VI. The Outcome of Final Project**



