Light up Solar System

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1 Introduction

This program improves the implementation of the solar system, adding lighting and reflection, which makes the spheres look more three-dimensional and realistic.

2 Implementation

For the planets and moons, they are diffuse models. The sun hits these spheres as a parallel light source. When the sphere is illuminated by the parallel light, the color value is obtained according to the clip between the light and the normal of the tangent plane. The formula is as follows:

$$v\_color = color_{sphere} * color_{light}(white)* < color_{sphere}, color_{light} >$$

In order to ovserve the sun, the program regards it as a specular model. Parallel light enters in a direction towards the inside of the screen. The surface of the sphere is specularly reflected, and the observed color is the projection of the color of the reflected light on the z axis. The formula is as follows:

$$v\_color = color_{sphere} * color_{light}(white)* < color_{sphere}, (0.0, 0.0, 1.0) >$$

3 Result