Project 10: Advanced Shaders

CST-310

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**Background**

The main idea of Advanced Shaders 2 is to add textures using GLUT and SOIL into the scene created in the previous project. It’s important to understand shaders and textures in this context because it can be useful in many areas of computer science. In the context of simulation or gaming, the shaders and textures add a more lifelike interaction with the scene. In this project, we have a cylinder, ball, and cube. Each object has received texturing and lighting effects. The textures added were “Bump-Picture.jpg” and “Bump-Map.jpg.” Each image is used by SOIL to be imported into the scene and implemented by GLUT using different vertexes. The first step in this process is texture mapping. Texture mapping implements images and patterns to be formed onto a specified object. To complete this, the image is loaded, and each corner is given a point on the object to be formed around. Bump mapping uses the imported image mixed with a texturing effect to create a more textured surface on an object. Each of these aspects of texture are added to the program to create a more realistic look.

**Mathematical Functions**

In this program, there are mathematical functions included in the camera function. In this function, trigonometric functions are utilized to move around each x, y, and z axis. This allows for three-dimensional implementation in the scene. Furthermore, there is a lighting function in the scene that allows for dimension. The dimension is created by the shadows casted by objects and the uneven lighting on different sides of the objects. The mathematical model in the lighting includes coordinates for placement on the x, y, and z axes.