COMPUTER GRAPHICS ASSIGNMENT #2
SIMPLE SOLID RENDERER

August 5, 2018

Introduction

In this assignment you will continue to develop your modeling software. The goal of this assignment is to render solid, shaded objects.

REQUIREMENTS

As in the previous assignment, some of the requirements involve developing a user interface. Design it however you like, using the mouse and menu, or just the keyboard, as long as you can manipulate the scene in a reasonable amount of effort. The assignment is to add the following elements to your program.

1. Geometry:
   - Allow specifying a uniform material for each model. The material should consist of emissive, diffuse and specular colors. Allow the user to change the different colors.
   - Procedurally generate one non-uniform material (i.e. a material that is different on different vertices). Use the slides on texture generation for inspiration. There are many different options here, and no incorrect answer, so be creative!
2. The scene:
   - Allow the user to add several light sources to the scene. The user should be able to transform the light sources in the same way models are transformed, and also to change their colors. Implement at least point light sources and parallel light sources.
   - Add an ambient light to the scene, and allow the user to control it.
3. The renderer:
   - Implement a scan conversion algorithm to draw solid triangles.
   - Implement the z-buffer algorithm to allow hidden surface removal.
   - Implement flat, Gouraud and Phong shading (only if normal-per-vertex are available) and allow the user to switch between them.

   In addition, add two of the following:

   (a) Enable fog effect and supersampling anti-aliasing.

   (b) Enable full screen blur and light bloom.