

Fall 2009
22C:151 Introduction to Computer Graphics
Assignment 7

Due: Wednesday October 28th at 11:59pm

Warning: Start early! Prof. Wyman will be out of town with intermittent e-mail from October 25th to 30th.

Goal: Understand how to load textures from a file, and use OpenGL to apply them to simple objects.

Problem 1 (5 points): Load a texture from a PPM file. This will involve reading a PPM file into memory in a format OpenGL can understand. If you're still having trouble understanding PPM files, please come talk to me, as the rest of this assignment depends on successful completion of this part.

Problem 2 (5 points): Add a textured "infinite plane" to your program from Homework 6. This should act as a "floor" in your scene, so it should be behind the lit object, but you should be able to see the horizon (where the black background and the floor meet) from your viewpoint.

- Use a checker pattern to texture the floor.
- The complex object (bunny, cow, etc.) still needs to be lit using OpenGL lighting, but you should turn off lighting when texturing the floor.
- Infinite planes cannot be specified in OpenGL, so just use a very, very large quad.

Problem 3 (5 points): Add the ability (via menu or keystroke) to replace the illuminated object with a textured cube. Put a different texture on each face of the cube. Allow the cube to be rotated via a trackball. Once again, illumination should be turned off for this object.

Problem 4 (5 points): Add the ability (via menu or keystroke) to replace the illuminated object with a textured cone. Specify texture coordinates for all triangles in the cone. Make sure to specify intelligent texture coordinates so that we can clearly see the cone is textured. Allow the cone to be rotated via a trackball. Again, illumination should be turned off for this object.

Extra Credit A (2 points): Come up with a technique to texture all the complex objects used in Assignment 6. This should be at least a semi-intelligent approach that gives reasonable results. This should be selectable using a menu option or keystroke, and we should be able to rotate the object via the trackball. Once again, illumination may be turned off for this.

Extra Credit B (2 points): *Only available in conjunction with Extra Credit A!* For the complex objects used in Assignment 6, allow both texturing and lighting to be applied at the same time. You should use your texturing technique from Extra Credit A, yet still be able to see both specular highlights and the texture color.

NOTE: A "README" file is required in order to get full credit! It is worth the 2 or 3 minutes it takes to write such a file, as it guarantees we know how to compile and run your program, and you can make note of any odd behavior or strange bugs (which may mask required functionality).