Assignment 3

In this assignment, you are required to render a scene using ray casting. For details about ray casting, refer to theory class lectures and corresponding slides.

The number and location of different objects in the scene will be input from a file named “description.txt”. The scene must contain a black and white tiled checkerboard. The width of each tile of the checkerboard will be 30. In addition to that, you are required to render two different types of objects: sphere and pyramid. There can be an arbitrary number of spheres and pyramids in the scene. There will also be an arbitrary number of light sources in the scene. You are required to calculate the diffuse and specular light components based on those light sources. The particular format of the “description.txt” file is provided in the sample file provided to you as a part of the assignment. Note that, description of the checkerboard is not present in the description file.

At first, you will have to create an OpenGL program that demonstrates the scene provided in the input file “description.txt”. The OpenGL program must have camera operations. You can reuse the code related to camera operations done in the earlier assignments. Those who have not done the camera related parts or have done so with errors can collect code of this portion only from others. A sample output of the OpenGL program can be found by running the provided .exe file (OpenGL.exe). After moving the camera to a certain position, pressing ‘0’ will render the scene with respect to that particular camera location and produce an image “out.bmp” generated by ray casting. Please note that the generated output image file must be consistent with the view obtained in the OpenGL window for which it is rendered.

A header file for creating bmp images along with a sample code segment demonstrating how to use that header file are available in the folder “bmp_demo”.

For any further query, feel free to discuss in theory classes next week.

Special Notes

1. The field of view should be 90 degrees.