COL781 Computer Graphics

Assignment 1: Ray Tracing Part 2

Due Date : 17.2.2019

This part of the assignment involves implementation of some additional features of ray tracing as discussed in the class and simulation of the process of ray tracing in OpenGL. These are outlined as follows

a. Augment the objects using transformation. An affine transformation M be appplied to a simple primitive of the type earlier implemented (e.g., sphere) and is ray traced by appropriately finding the ray for the intersection with the simple primitive. The normal would also required to be transformed by an appropriate transform obtained from M.
b. Texture mapping
c. Process simulation: The process of ray tracing for a given pixel on the viewing/image plane should be simulated. That is if a probe is done for a pixel (i, j) on the ray traced image, the simulation should show in 3D the primary ray from the eye, the point(s) of hit and the seconadry rays from the hit-point, the shadow ray(s). The simulation should be done using OpenGL. The scene should be displayed in an OpenGL viewer where the view point can be changed interactively.The scene would typically have all the objects defined for the scene, the light source(s), the camera (position be rendered as some object e.g., a sphere or an object model of a camera), the viewing plane, which may be translucent, the rays -- primary ray, secondary rays for reflections, refractions, and shadow -- as lines.

Note:

- The assignment can be done in any programming language, however it is recommended that C/C++ be used as it will be simpler to embed OpenGL in the subsequent assignments.
- The submission will happen through moodle and exact instruction will be given soon for how to submit.
- The assignment can be done in a group of size 2 max. It is assumed that both partners will participate in the assignment and accordingly evaluation will be done. Once the partners are formed they can not change for susequent assignments.