

Computer Graphics

Assignment 4

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Question 1)

To render a triangle in the ray tracer. I made files triangle.h and triangle.cpp.

The only difference between sphere and triangle was the intersection function.

In the triangle.cpp file the intersection of the ray with the triangle was determined using the barycenter coordinates. Solved equations for the coordinates using cramer's rule of matrices.

A final check was made to ensure that the intersection point lied inside the triangle only.

Question 2)

For shading, normal were needed at the point of intersection.

So, when the ray intersected some object, I calculated the normal at that point and then passed this value to the normal variable in the ray object.

Then in the world.cpp file in the shade function, I traversed over all the light sources and added their contribution through diffusion and spectrum lighting and then returned the final colour after mixing the light and the object colour.

Question 3)

For simulation shadows, while traversing over all the light sources, I made another shadow ray and then called firstIntersection function on it.

If this ray hits some object then this means there the path of light is obstructed and there will be no contributions of diffusion and spectral light from this light source so I skipped this source.