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Com S/ME 557
Homework 3

Problem 2

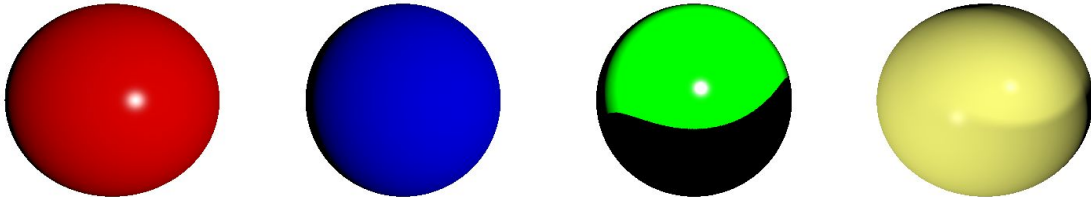


Figure 1: 3D models for the four spheres. Camera position is in the z-direction

Red Sphere: Highlight on the surface of a diffuse object

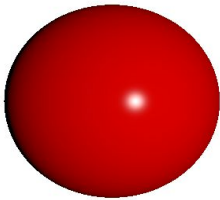


Figure 2: Rendering of the red sphere

To make the spotlight on the center of the red sphere, direct light was used.. The ambient intensity was set to 0.0, since it was not needed. The red coloring of the sphere came from the diffuse and specular intensities.

Blue Sphere: Diffuse surface, no highlights are visible

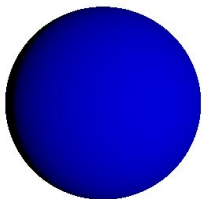


Figure 3 :Rendering of the blue sphere

For the blue sphere, direct light was the main function used to create this look. The specular and ambient intensities were both set to 0.0 so that no highlights were visible on the sphere. The diffuse intensity was set at 1.0 in order to generate this “dull” effect.

.Green Sphere: Spotlight with small highlight and sharp cutoff angle

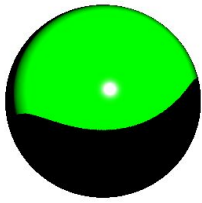


Figure 4: Rendering of the green sphere

For the green sphere, the spotlight was used and the ambient intensity was set to 0.0. The diffuse intensity was set to 1.0. The shininess of material was placed at 150 for the small specular highlight. The cone angle was set to 30 degrees, however the cone angle was not set to align with the light position as that didn't give the correct figure. Instead the cone direction was aligned only with the -z direction to correctly render the sphere as given in the assignment

Yellow Sphere: Little highlight and smooth cutoff angle

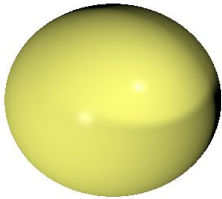


Figure 5: Rendering of the yellow sphere

To gain the yellow color of this sphere, the material color was set to 0.5,0.5,0.1. The material shininess was set to 150 again to get the small specular highlight. Two light sources were used to render this sphere. One spotlight was used to create the smooth cutoff light, through using the smoothstep function, which performs Hermite interpolation between two values. The second specular highlight, which can be seen outside of the spotlight, was achieved through the use of a single direct light, with the light position in the -x direction.