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HW1B Writeup

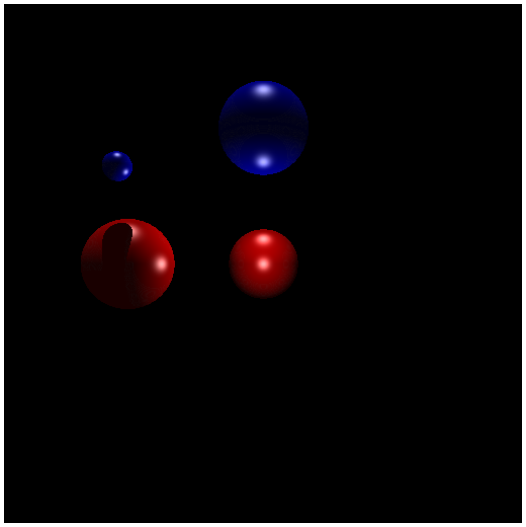

Figure 1. Example image with a directional light shining downwards
and a point light in the middle of the three larger spheres.

ka defines the base brightness of an object regardless of light. kd defines how much color is applied to the object from diffuse lighting. ks defines how much color is applied to the object from specular lighting. For all the k's, the higher the value, the more that aspect of lighting affects the final color. n is how shiny the object is, with higher values resulting in more of a chrome look. Od is the intrinsic color of the object. Os is the color of the highlights that appear from specular light.

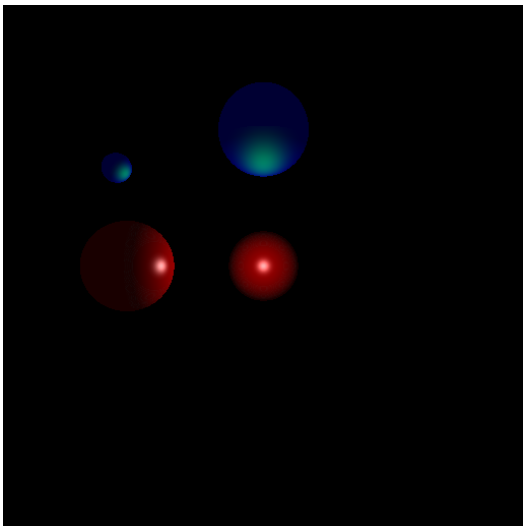

Figure 2. Red balls have ka = 0.1, kd = 0.5, ks = 0.7, n = 50, Od = (1,0,0), Os = (1,1,1)
Blue balls have ka = 0.2, kd = 0.3, ks = 0.5, n = 5, Od = (0,0,1), Os = (0,1,0)

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Directional light sources are similar to the sun. Light from them will effectively come from one direction for all objects, regardless of where those objects are. Point light sources are positionally dependent, like a lamp in a living room. If an object is to the left of the light, then it's right side is lit up. If an object is to the right of the light, then it's left side is lit up.

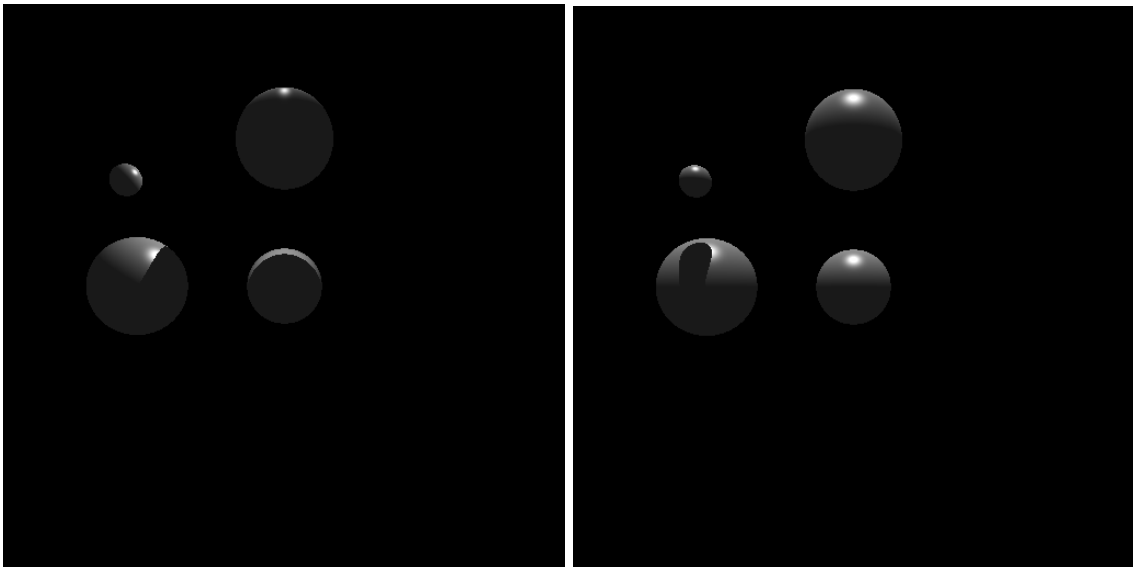

Figure 3. Point light source above the top sphere (left) vs. directional light source coming from above (right)

Multiple light sources can create a different look than a single light would. This is because light is additive. With that in mind, light intensity needs to be managed well with multiple lights or they will max out colors.

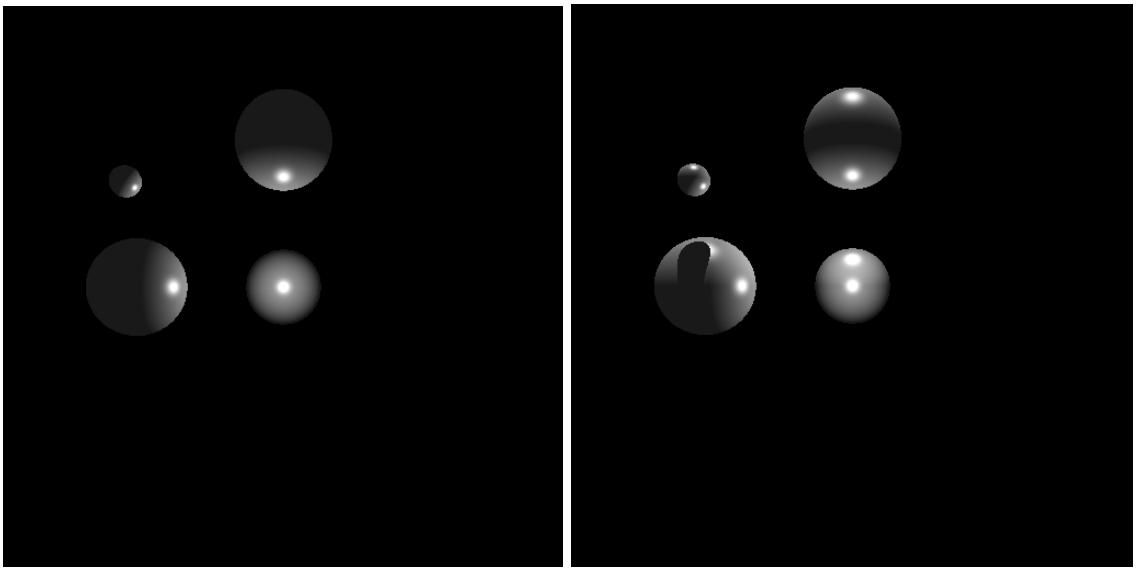

Figure 4. Single point light source (left) vs. same point light source plus a directional light from above (right). In both cases, the light sources each have a light intensity of (0.5, 0.5, 0.5).

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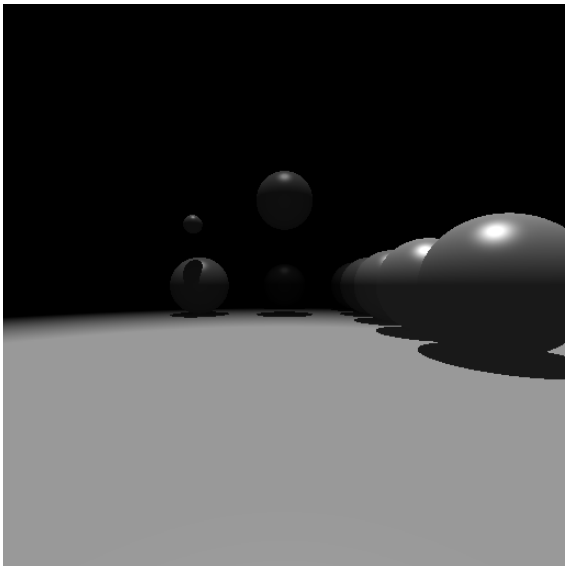

Figure 5. Depth cueing