**Final Project Submission 7-1: Reflection**

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**Design Choices**

Developing the scene required careful consideration of each object within the image. First, objects were broken down into simpler shapes. Then color and texture were determined for each object and created as needed. Finally, the overall lighting of the scene was established, along with the way different materials would react to it.

The scene featured a single die, a miniature traffic cone, a rubber ball, a donut-shaped dog toy, and a coffee mug. Of these objects, the die, ball, and donut were simple shapes on their own: a cube, a sphere, and a torus, respectively. The mug consisted of a cylindrical cup and a toroidal handle. The traffic cone was composed of three parts: a tapered cylindrical body, a spherical top, and a plane. A cube was placed around the scene to mimic walls.

Before determining the color and texture of the objects, a decision was made on whether to maintain their realism. Given the cartoonish and vibrant appearance of some objects, a non-realistic approach was chosen. Images hand-drawn in paint were used for the textures of the table plane, die cube, donut torus, and mug cylinder. The traffic cone, mug handle, and walls being solid colors required only a single color for each. While a free, open-source image was applied to the ball, it was ultimately unnecessary and only retained for convenience.

To illuminate the scene, an attempt was made to replicate the lighting of the original image. The original scene was lit by a single ceiling fan and an open window. Two light sources were created to mimic these original sources. While applying lighting to the objects, additional materials were developed beyond those provided by the course. In particular, a custom material was created for the ball to achieve a glowing effect. This material employed a bright pink color for strong diffuse and specular highlights, contrasted with a dark blue for a subtle ambient light.

**Navigation**

A simple navigation system was implemented. Users can move forward, backward, left, and right using the WASD keys. The Q and E keys control vertical movement. The mouse is used to adjust the camera's orientation, and the mouse scroll wheel controls the camera's movement speed when using WASD and QE. Users can switch between perspective and orthographic views by pressing P or O, respectively.

**Custom functions**

No custom functions were implemented. However, careful attention was paid to accurately mapping texture coordinates to correctly replicate the die's texture. Unfortunately, the texture mapping for the torus was out of the scope of the developer. As mentioned earlier, new materials were created using the same format as previous materials, but with adjusted vec3 values to simulate real-world materials.