Crystal Berkhan

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CS 330

Design Decisions

The items I selected for my 3D scene include cookie dough pieces on a white sheet of paper, a phone stand, a candle, a music box, a spoon, an ice cream cone, and a coaster. I used cubes, cylinders, planes, a sphere, and a cone to recreate these objects. In my original scene, I was lacking a fourth primitive shape to represent an object; however, in my completed scene, I incorporated two additional shapes with the use of the cone and sphere. The table and placemat were created using two planes with two different textures, one a wood texture and the other a flower texture. It was difficult to find exact textures to match the objects in my original scene, but I improvised. I created the paper the cookie dough pieces sit on and the pieces of cookie dough using planes and cubes. A simple white texture and cookie dough texture allowed me to properly portray these items. I am not fully satisfied with the creation of the candle using a cylinder and cube. I believe it looks too choppy to look realistic, but I used an off-white texture and a “sun” texture to make it appear as if it was lit. The music box and phone stand were both made using cubes and two different textures. The phone stand was something I dreaded creating the most, but I enjoyed making it and loved how the textures made the objects look realistic. I also switched out the spoon in my scene for a measuring cup. I, for some reason, could not get my sphere to compress into a spoon-like shape and opted for an object made of two primitive shapes instead. Lastly, the coaster was created with a compressed cube and a texture that matches exactly what the real-life coaster says! I also used Phong lighting in my scene to recreate the harsh lighting of the hanging light in my dining room. The way the lighting is positioned does not allow for many shadows or dark areas in my program.

To navigate through my scene, the user can use the WASD keys to move forward, backward, left, and right. I also incorporated the Q and E keys to allow for up and down movement. I struggled with setting up the mouse movement for this scene throughout the entire development process; however, during review and clean-up, I realized I was missing two simple lines of code to allow the user to fully look around the scene using the mouse and the scroll wheel to adjust camera speed. The P key also switches the view from perspective or orthographic.

Many of the functions used to create my program I obtained from other sources, such as the tutorials provided from GitHub, and they can be reused. For example, the UCreateTexture and UDestroy texture were extremely useful to have on hand and a complete timesaver. Other functions that are reusable are the functions for mouse movement and input keys. I utilized the camera header files from the tutorials and copied the functions for camera movements as well.

The only function I could consider “custom” would be the Urender function. This function creates all the shapes and binds the textures to the shapes in the scene. I utilized a mesh header and cpp file that made the creation of my shapes simple. These files, as well as my Urender function, can be reused. The Urender function can be easily adjusted to create a completely new 3D scene.