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Project 1 Reflection

**Justification for Development Choices**

The objects used in this code are a plane, a cube, a cylinder, and a half sphere. These objects were chosen to create a visually interesting scene with varied shapes and textures. The plane represents the ground, the cube object represents a toaster, and the cylinder and half sphere create a wine glass. The textures used for each object were selected to provide contrast and visual interest. For example, the brushed metal texture on the mixing provides a reflective surface that contrasts with the wood texture on the ground. Using these primitive objects made it easier to create more complex objects in 3D space. Instead of trying to create a mesh specifically for a wine glass (which would be incredibly difficult) a cylinder and a halfsphere were generated and repositioned instead.

**Navigation in the 3D Scene**

The user can navigate the 3D scene using keyboard and mouse inputs. The mouse is used to change the direction of the view, and the keyboard is used to move the camera forward, backward, left, and right. The camera movement speed can be adjusted using the mouse’s scroll wheel. Most of this functionality is thanks to the `processInput` function which is used to handle keyboard inputs and update the camera's position and direction accordingly. Similarly, the mouse callback function is used to handle mouse inputs and calculate the camera's new direction.

**Custom Functions**

The code includes several custom functions to make it more modular and organized. These functions include `processInput`, which handles keyboard inputs and updates the camera's position and direction, `framebuffer\_size\_callback`, which is a callback function used to update the viewport size when the window is resized, `mouse\_callback`, which handles mouse inputs and calculates the camera's new direction, and `scroll\_callback`, which handles mouse scroll inputs and adjusts the camera's zoom level. Also a lot of the ShapeGenerator functions such as the makeHalfSphere and makCube were created so that we could make many of these shapes quickly and easily. These functions are reusable and help to keep the code organized and easy to read.