**Write-Up**

**Justify development choices for your 3D scene. As you write, think about why you chose your selected objects. Also consider how you were able to program for the required functionality.**

For the scene I created four different objects that are all composed of primitive shapes. Each object is a rough estimation of its real-life counterpart. The first object is the mouse. The mouse uses two primitive shapes: a partial sphere and a cylinder. A mouse is a simple object that is well represented by these two shapes. The second object in the scene is a tablet. The tablet is represented by a plane and an elongated box. The tablet also represents an object that is easy to represent with minimal shapes. The third object is the keyboard. The keyboard only utilizes different sizes of boxes. The keyboard is more complex and uses a for loop to generate the individual keys. The general shape is fairly easy to create with a few creative rotations. The final object of the scene is a marker holder. The object is a cylinder shape with plane dividers and cylinder markers. This object is much more complex to create and requires the use of alpha values for the texture to render correctly. The scene also includes a simple plane to represent the table that holds all of the objects. There are two lights in this scene that made sense to create. The first light is a lamp which exists in the rear right corner of the scene. This lamp is best represented as a point light and the scattered light is represented well with a higher ambient value. The second light in the scene originates from the tablet. This light is subtle but adds a nice ambiance to the scene.

**Explain how a user can navigate your 3D scene. As you compose your thoughts, discuss how you set up to control the virtual camera for your 3D scene using different input devices.**

The user is able to navigate the scene using both the keyboard and the mouse. Movement of the mouse changes the pitch and yaw of the camera. The WASD keys on the keyboard direct the camera forward left back and right respectively. The movements of the camera is based on the current forward vector of the camera which is changed by the mouse. The QE keys on the keyboard increase and decrease the height of the camera respectively. The scroll wheel has two available inputs. Scrolling the wheel forward increases the movement speed of the camera. Scrolling the wheel backwards decreases the movement speed. There are maximum and minimum values that the camera speed can be increased and decreased to. Pressing the P key switches the view of the scene between perspective and orthographic. The perspective view allows the viewport to display the scene in a manner that is similar to real life. The orthographic view preserves the relative sizes of all the objects in the scene for an objective view of everything.

**Explain the custom functions in your program that you are using to make your code more modular and organized. Ask yourself, what does the function you developed do and how is it reusable?**

The code separates many aspects of the functionality into their own functions. This allows the purpose of the code to be easily recognized from the main function. Aspects of the code including initialization, rendering, input processing, shader creation, texture creation, and mesh creation are separated into either different functions or another translation unit. All of these functions can be taken from this code and used in another project with minimal tweaking. The only section of the code that is unique to this project is the rendering function. The rendering function covers the creation of all the unique objects in this project.