**Reflection for Creating a 3D Scene in OpenGL**

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**Design Decisions: Justification of the 3D Scene Development**

In the process of developing a 3D scene, it is essential to make thoughtful design choices that serve both aesthetic and functional purposes. My primary inspiration for the scene was to create a workspace – a desk, to be precise. This choice was deliberate, reflecting a space of creativity, hard work, mistakes, and growth.

The lamp on the desk stands as more than just an object; it embodies functionality. By incorporating the ability to adjust the lamp's intensity and color, users have the power to interact with the environment, bringing to life the idea that we can control our environment to an extent, much like in real life. The lamp's design, constructed from two cones, a sphere, and various cylinders, was chosen to showcase complexity in shape formation, challenging me to build something intricate from simple forms.

Next, the post-it note was an intuitive choice, offering users a guide on how to interact with the scene, especially the lamp controls. The Rubik's cube on the desk stands as a metaphor for problem-solving and the complexities of the challenges we face in coding and life.

The pile of garbage, my original failed attempt at creating a sphere, was intentionally retained in the scene. It serves as a poignant reminder that in the process of creation, failures are stepping stones. Every error teaches us something, making us better equipped for future endeavors.

Lastly, the Pokémon ball has a touch of nostalgia, a homage to the late '90s and a nod to my fondness for the iconic series.

**Navigation: User Experience and Camera Control**

To create an immersive experience, users can navigate the scene using a combination of keyboard and mouse controls. The [] keys control the lamp, offering an on/off toggle, whereas the 1, 2, and 3 keys manipulate the lamp's color intensity, granting users an intuitive control mechanism that most will be familiar with.

The virtual camera setup has been designed to be controlled via different input devices. Mouse movements allow users to pan around the scene, while the W, A, S, and D keys provide the capability to move forward, left, backward, and right, respectively. This combination creates a user-friendly navigation experience, reminiscent of many 3D computer games, ensuring even those new to such interfaces can explore with ease.

**Custom Functions: Modular and Organized Code**

One of the pillars of good coding practice is modularity – the ability to break down complex operations into manageable, reusable chunks. Custom functions in the program were crafted with this in mind.

For instance, the class to build shapes is modular and reusable. Should the scene expand to include other shapes, this class can be employed without reinventing the wheel. By keeping functions and classes generic, the codebase remains clean, organized, and primed for scalability.

Reflecting on the development process, some segments of code, while not currently encapsulated within a function, have potential for such encapsulation. This ongoing reflection ensures that as the scene evolves, the code remains streamlined and efficient.

Each element and function in the 3D scene has been chosen with purpose and intent. From design to navigation, and to code organization, the goal has been to create a cohesive, interactive, and meaningful digital environment.