This project focused on developing a 3D office environment for Triangle and Cube Studios that could serve as a prototype for 3D printing and digital visualization. My goal was to design a realistic and cohesive scene while keeping the code modular, efficient, and adaptable for future projects. I selected five main objects for the environment: a desk, lamp, speakers, monitor, and cup. Each item was chosen to create balance, realism, and functionality within the space. The desk serves as the foundation for the scene, the lamp, constructed from seven primitives, adds technical depth, the speakers provide symmetry, the monitor offers vertical focus, and the cup gives a natural, lived-in detail. These objects were programmed to be modular and reusable so they can easily be modified or rearranged in other projects. Together, they create a professional, believable workspace aligned with Triangle and Cube Studios’ goal of producing flexible prototypes for clients in different industries.

The navigation system was designed to feel intuitive and professional, allowing users to explore the environment freely. The W, A, S, and D keys move the camera forward, left, backward, and right, while Q and E control vertical movement. Mouse movement adjusts the camera’s rotation for smooth viewing, and the scroll wheel zooms in or out for different perspectives. I also added the P and O keys to toggle between perspective and orthographic projection modes, letting users choose between realistic or measurement-friendly views. These controls mirror those used in professional 3D design software, making the environment easy and natural to navigate.

To keep the program organized and efficient, I built custom functions within two main classes: ViewManager and SceneManager. The ViewManager handles camera movement, delta time calculations, and projection switching to ensure smooth, consistent navigation across different frame rates. The SceneManager manages object creation, rendering, and a four-light setup with realistic color temperatures that bring depth and realism to the scene. Separating these responsibilities makes the program modular, easier to maintain, and reusable for future development.

Overall, this project helped me strengthen my understanding of 3D modeling, lighting, camera control, and clean programming design. Each choice was made to balance realism, usability, and flexibility while meeting professional industry standards. The final result is a functional, well-organized 3D environment that represents the level of quality expected at Triangle and Cube Studios and demonstrates practical skills applicable to game design, visualization, and 3D printing projects.