**DENNIS SELFINGER**

**Design Decisions Document**

**Project Overview**

**For my 3D scene project, I designed a virtual environment depicting a fish tank located in a basement, complete with a mounted fish above it and a nearby coffee table. This setting was chosen to allow for a gradual increase in complexity, starting with simple shapes and progressively adding more sophisticated features.**

**Technology Choices**

* **OpenGL: This was the primary technology used for the project, as it is well-suited for creating and managing 3D content. OpenGL's extensive functionality and widespread industry support made it the ideal choice for rendering the detailed components of my scene.**

**Development Strategies**

* **Collaboration: Working on this project felt akin to being part of a team. Collaborating with fellow students on certain parts of the code and reviewing each other's work helped refine the final product.**
* **Debugging and Comments: I incorporated systematic debugging to identify and resolve issues as they arose. Additionally, I added comprehensive comments throughout the code to clarify the purpose and functionality of various segments, which was crucial for both my understanding and for potential future reviews by others.**

**Chosen Scene Components**

* **Fish Tank and Coffee Table: The choice of a fish tank and coffee table was driven by their geometric simplicity, which allowed me to focus on refining my skills in creating and manipulating basic 3D shapes. Adding a mounted fish introduced a creative element that enhanced the scene's overall aesthetic.**
* **Lighting: Achieving the desired lighting effects posed significant challenges, requiring extensive experimentation with light positioning and properties to capture the right ambiance.**

**Learning Outcomes**

* **C++ and OOP Mastery: This project significantly boosted my comfort and proficiency with C++ and object-oriented programming. The hands-on experience allowed me to better understand and apply complex concepts in a practical setting.**
* **Matrix and Linear Algebra Application: The project provided a practical application of matrix operations and linear algebra, essential for manipulating 3D object transformations and camera movements.**

**Future Plans**

* **Continued Development: I plan to continue developing this project, aiming to enhance its complexity and realism. The next steps include improving the lighting dynamics and introducing additional interactive elements to make the scene more engaging.**

**Conclusion**

**This project not only helped me solidify my understanding of fundamental graphics programming concepts but also prepared me for more advanced studies and projects in 3D graphics. The iterative development process, from initial concept to final implementation, was invaluable in deepening my software development skills.**