https://github.com/RyuKaSa/GL_UGE_Project

The report is located in the markdown.MD file on GitHub.

The final project is on the optimization branch, and the executable is ./APP3_executable. The APP1 and APP2 versions are earlier builds and should be ignored.

The project was developed on macOS during the holidays, which made it impossible to use Valgrind, as it is not yet reliably supported on ARM architecture.

I attempted to check for memory leaks using macOS's built-in Leaks tool, but I suspect it wasn’t functioning correctly. The results were inconsistent, with the number of reported leaks varying between runs even when no code changes were made. Consequently, I couldn't confidently address or fix these potential issues.

I did not have time to clean up main.cpp, which ended up being excessively long. However, the majority of this length comes from the creation of objects (cubes, spheres, etc.), despite having dedicated creation functions to streamline this process.

Additionally, there are many rendering passes (-> each rendering loop in the game engine's while loop). I didn't have time to factorize uniforms or optimize this aspect of the rendering pipeline. Even though I started the project three months ago and had implemented shadows, lighting, normal maps, and models two months ago, I was caught off guard by the sheer amount of remaining work.

I believe the distinction between the two rooms—where the key difference lies in whether photons have mass or not—is significant enough to serve as a meaningful contrast. This seemingly simple difference has profound consequences, and I attempted to represent one possible outcome in Room 2: light sources, requiring an infinite amount of energy to maintain their speed due to their mass, collapse into black holes, pulling in surrounding energy and matter.