**Project Goals:**

1. To create a very simple 3D modelling program where cubes can be added and different transformations can be applied on them, as well as full control over their colors.
2. To be able to import 3D models using a nice GUI such that the imported models can also be positioned, scaled, and rotated under the control of the user.

**Features Implemented:**

1. **Modelling**: whether by importing 3D models to the program, or using primitives, different models can be created based on the user’s interaction.
2. **Interaction**: Users can use the UI to interact with the different objects/models in the scene, including the lighting color and position.
3. **Rendering**: The cube primitives are rendered by using OpenGL’s “**glDrawArrays()**” function, also lighting has been added to the program and can be controlled by the user.

**Instructions & Controls:**

1. WASD to move around the scene
2. EQ to go up and down in the scene
3. Right-Mouse-Button to rotate the scene with the mouse movement.
4. LCTRL + Scroll to change the FOV.
5. A demo video has been added to the project folder to show the major functionalities.

**Technical Details:**

Mouse Picking was attempted to be implemented as a feature, however due to the lack of time, it is unfinished. However, the function that retrieves the mouse position in world coordinates using Ray Casting exists in the mainProject.cpp file under the name: “**getMouseRay()**”. And it can be tested by uncommenting line 484 in the “**update()**” function.

**Challenges Faced:**

1. It was of an extreme difficulty to get the file browser to work with ImGui as it does not natively support it. A lot of code had to be modified, some of the code from the library ImGuiFileDialog was also deprecated and required a lot of back-tracing and fixing.
2. Implementing Mouse Picking using Ray Casting was also a challenge, and due to the lack of time it was left unfinished.

**Citations:**

1. Model by Berk Gedik, from: <https://sketchfab.com/3d-models/survival-guitar-backpack-low-poly-799f8c4511f84fab8c3f12887f7e6b36>
2. Assimp Library, from: <https://github.com/assimp/assimp>
3. Dear ImGui Library, from: <https://github.com/ocornut/imgui>
4. ImGuiFileDialog, from: <https://github.com/aiekick/ImGuiFileDialog>