Task & Work Time Documentation for OpenGL Project:

Estimated Total Time: 23-25h

OpenGL Tutorial - TheCherno Videos (Time Spent: 6h)

- Invested time in watching TheCherno's OpenGL tutorial videos.
- Gained insights into best practices, common pitfalls, and advanced techniques in OpenGL development and used some of them in the project.

ImGui Integration (Time Spent: 4h)

- Integrated ImGui into the OpenGL project for a user-friendly graphical interface.
- Implemented ImGui widgets for various functionalities such as tweaking parameters, enabling/disabling features, and displaying debug information.

Error Handling (Time Spent: 2h)

- Implemented robust error handling mechanisms to detect and handle runtime errors.
- Included informative error messages and logging to aid in debugging.

Model-View-Transformation Matrices (Time Spent: 2h)

- Finished implemented the concept of Model-View-Projection matrices.
- Applied transformations to objects in the scene using these matrices to control their position, rotation, and scaling.

Rendering Multiple Objects (Time Spent: 3h)

- Enhanced the rendering pipeline to support multiple objects in the scene: 1 spaceship, 8 aliens(cats) and 3 bullets(fish)
- Ensured proper management of vertex data, shaders, and rendering calls for each object.

Fixing Code for Object Visibility (Time Spent: 1h)

- Addressed issues related to object visibility.
- Debugged and modified code to ensure correct rendering and visibility of all objects in the scene.

Animation for Spaceship and Aliens (Time Spent: 2h)

- Implemented animation features for the spaceship and alien objects.
- Aliens move horizontally within the window and the spaceship can be moved by pressing A/D or right/left arrow key.

Adding Background with Normal Map (Time Spent: 1h)

- Incorporated a background with a normal map to enhance the visual appeal of the OpenGL window.
- Ensured proper mapping and rendering of the background.

Making the Background Scrollable (Time Spent: 2h)

- Implemented a scrollable feature for the OpenGL window.
- Provided automatic scrolling for a dynamic viewing experience.

Overall Reflection:

- The project successfully incorporated various OpenGL features and concepts.
- Challenges were encountered and overcome during debugging and code optimization.
    - Light source could not be fixed timely
- The addition of animations and visual enhancements improved the overall user experience.