CS 405 Project 1 Report

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Methodology

Task 1

In the beginning, we asked ChatGPT to apply some transformations given in "transformation-prompt.txt" file on a cube. The answer that ChatGPT returned to us was a 4x4 matrix namely transformationMatrix. After pasting the matrix into our code, Task 1 in "index.html" file was run. The output can be found in Figure 1.

The link to the chat for Task 1:
https://chat.openai.com/share/8ade26c4-b70e-49b5-b2d1-17cc214ab0e5

Task 2

For the second task, we were asked to apply the transformations by ourselves. To do so, the functions provided at the beginning of utils.js file are used. Coming to calculations, firstly the angles in degrees were converted into radians since createRotationMatrix functions take radian parameters. Then, matrices for each operation are created to perform

multiplication. In the end, transformations are combined by using multiplyMatrices function in following order: Scale, rotateX, rotateY, rotateZ, translate. The following output can be found in Figure 2. One of the reasons of the differences between the figures could be that ChatGPT might have used another matrix as a basis in the beginning, whereas we used an identity matrix.

Task 3

In task 3, were were asked to animate the transformations infinitely in periods of ten seconds. In the first five seconds, the cube goes from its initial state to final state. In the remaining five seconds, the cube goes from its final state to its first state. In order to do so, we asked ChatGPT for the animation process. Firstly, GPT defined two variables which hold the total duration of the animation in milliseconds and the time elapsed since the animation started. Then, it calculated the progress of the animation as a value between 0 and 1. In the chat, GPT used different matrices for initial and final matrices. In the code, they are defined using createIdentityMatrix() and getModelViewMatrix() for the initial and final matrices respectively by myself. Lastly, GPT used a function called lerpMatrices() for displaying the correct animation in the right time.

The link to the chat for Task 3:
https://chat.openai.com/share/3495569a-927f-4c5d-a03c-16532daa3863

GitHub Link: https://github.com/Exion007/CS405/tree/main/Project1

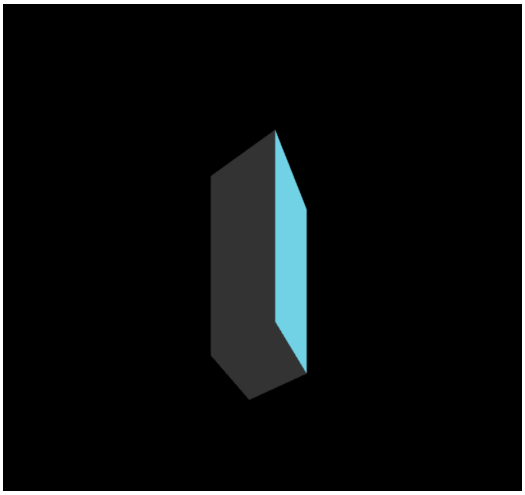

Figure 1: Task 1 Result

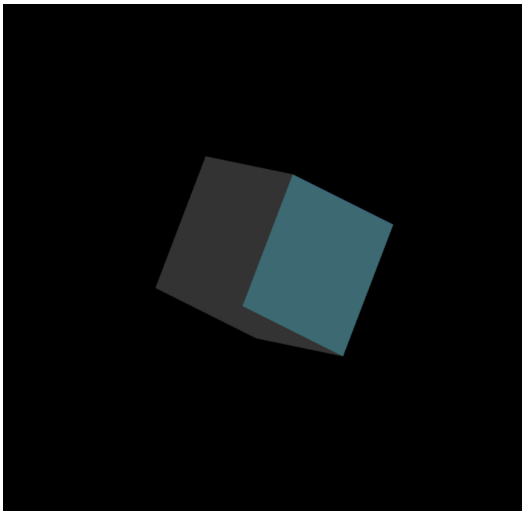

Figure 2: Task 2 Result