CS 405 Project #1 Report

Task 1
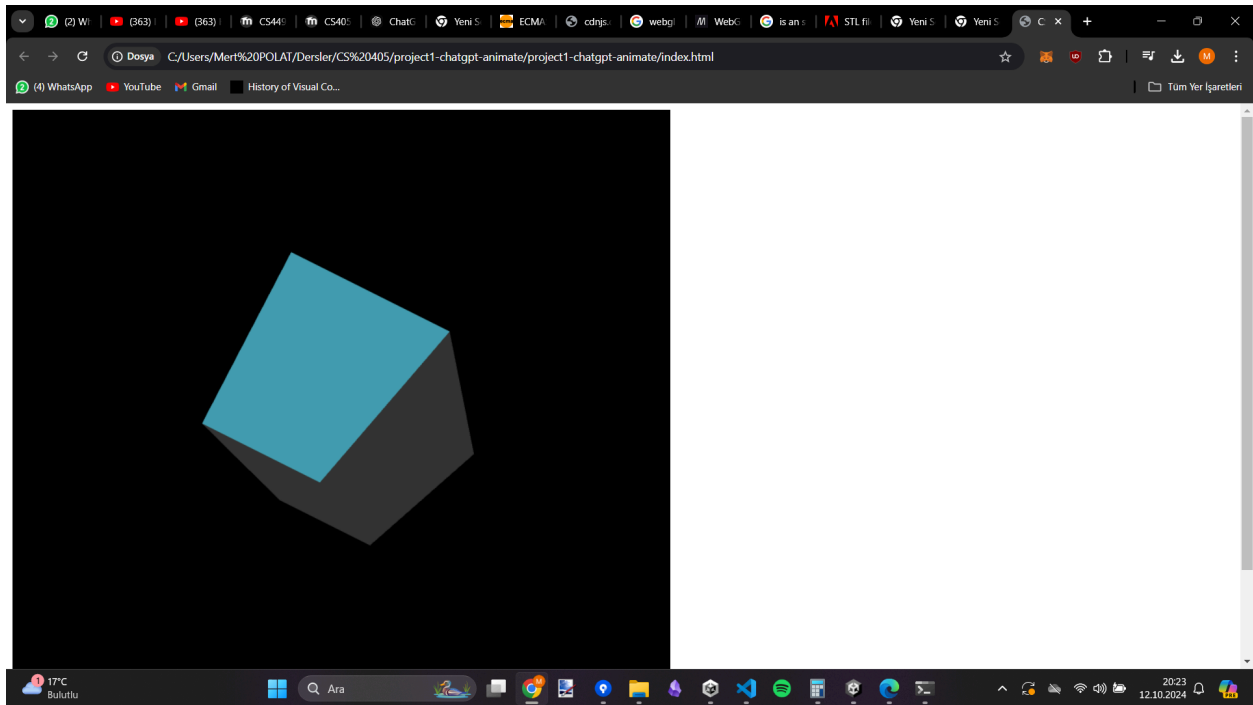
Here is a link to my chat logs with Chat-GPT.

https://chatgpt.com/share/670ab2c8-007c-8002-92bb-1a3793623556

Below is the what chat-gpt says to be to the right matrix for the prompt.

```
const transformationMatrix = new Float32Array([
    0.1767767, -0.28661165, 0.36959946, 0.3,
    0.30618622, 0.36959946, 0.14016504, -0.25,
    -0.35355339, 0.1767767, 0.30618622, 0.0,
    0.0, 0.0, 0.0, 1.0
]);
```
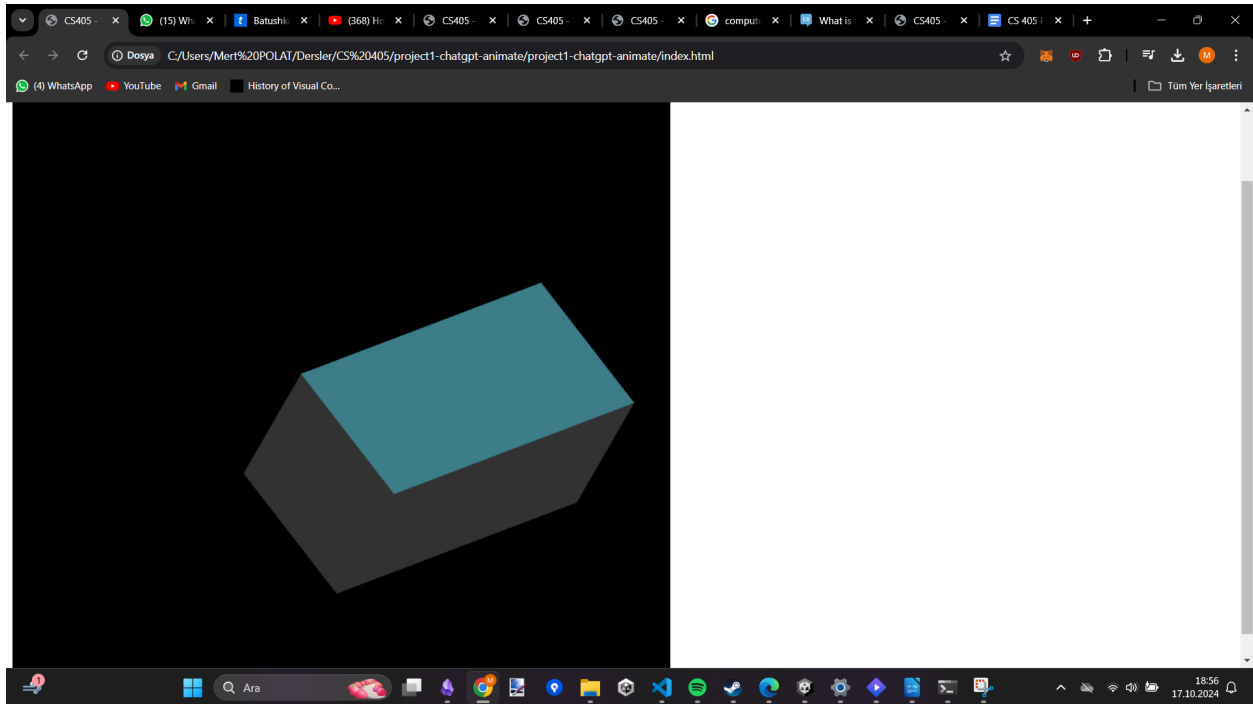
Here is what this matrix actually does.

Task 2

Here is the modified function that uses the given functions in utils.js to calculate the given transform.

```javascript
function getModelViewMatrix() {
    // calculate the model view matrix by using the transformation
    // methods and return the modelView matrix in this method


    const translationMatrix = createTranslationMatrix(0.3, -0.25, 0);
    const scalingMatrix = createScaleMatrix(0.5, 0.5, 1);
    const rotationMatrixX = createRotationMatrix_X(30 * Math.PI / 180);
    const rotationMatrixY = createRotationMatrix_Y(45 * Math.PI / 180);
    const rotationMatrixZ = createRotationMatrix_Z(60 * Math.PI / 180);

    let modelViewMatrix = multiplyMatrices(scalingMatrix,
createIdentityMatrix());
    modelViewMatrix = multiplyMatrices(rotationMatrixX,modelViewMatrix);
    modelViewMatrix = multiplyMatrices(rotationMatrixY,modelViewMatrix);
    modelViewMatrix = multiplyMatrices(rotationMatrixZ,modelViewMatrix);
    modelViewMatrix = multiplyMatrices(translationMatrix,modelViewMatrix);

    return modelViewMatrix;
}
```

Here is the the matrix values that this function calculates. I got these values from outputting it through the console and using google dev tools console to read it. Note that this is different from what Chat-GPT calculated. The reason for this might be because Chat-GPT is a generalized LLM and LLM's are generally really bad at doing math. They were designed for predicting text ,not doing linear algebra calculations.

```
[0.1767766922712326, -0.2866116404032102, 0.7391989012326494,
0.30000001192092896, 0.3061862071122423, 0.3695994506163247,
0.28033005777672404, -0.25, -0.3535533845424652, 0.1767766922712326,
0.6123724142244846, 0, 0, 0, 0, 1]
```

Here is what the model looks like:

Task 3

Here is a link to my Chat-GPT logs.
https://chatgpt.com/share/670ab2c8-007c-8002-92bb-1a3793623556

The output given by Chat-GPT calculates the animations by linearly interpolating the two matrices (the identity matrix and the target model view matrix) in the given time frame using a function called lerpMatrix. The prompt it gave me had a mistake. Instead of using Date.now for doing time calculations it used performance.now which led to weird stuff happening during the interpolation because of the weird t value.