CMPE360

Project 2

Transformations

Section 02

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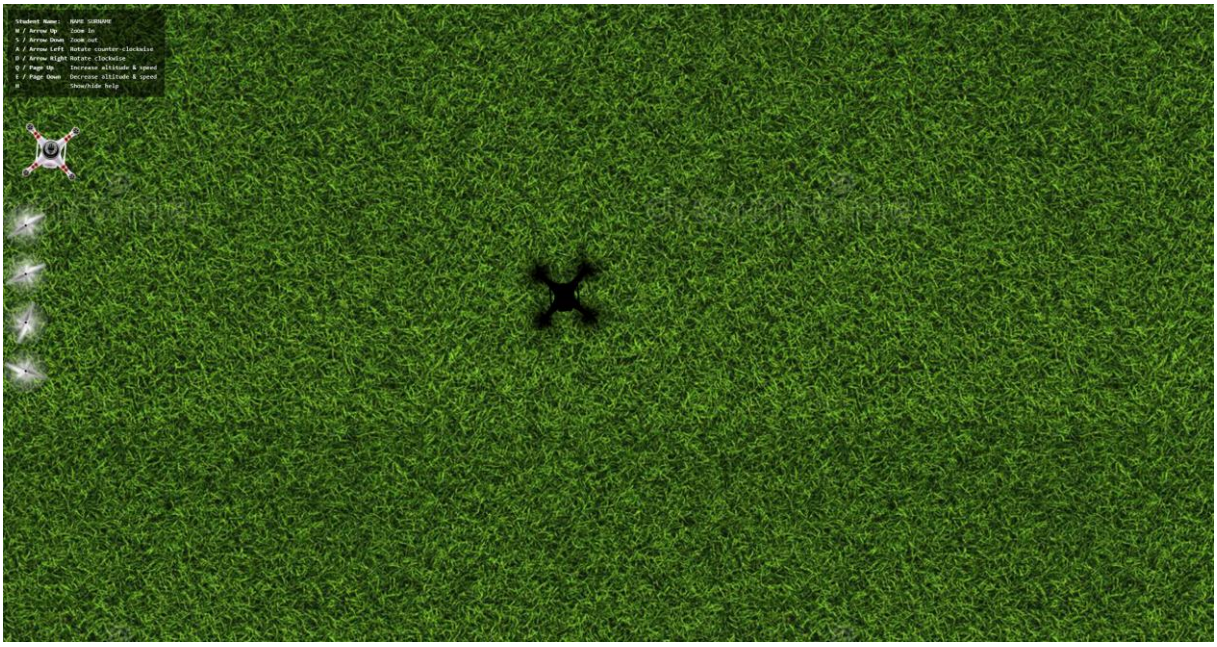
Part 1



https://drive.google.com/file/d/1FNij6C_1HymDt4FfuUvY0mO7ZTbiCeJG/view?usp=sharing

Part 2 – Explaining of The Functions

```
function GetTransform(positionX, positionY, rotation, scale) {

    const transformMatrix = [1, 0, 0, 0, 1, 0, 0, 0, 1];

    transformMatrix[0] = scale;
    transformMatrix[4] = scale;

    const radianRotation = (rotation * Math.PI) / 180;
    const cos = Math.cos(radianRotation);
    const sin = Math.sin(radianRotation);

    const rotationMatrix = [cos, -sin, 0, sin, cos, 0, 0, 0, 1];
    transformMatrix[2] = positionX;
    transformMatrix[5] = positionY;

    const resultMatrix = [];
    for (let i = 0; i < 3; i++) {
        for (let j = 0; j < 3; j++) {
            let sum = 0;
            for (let k = 0; k < 3; k++) {
                sum += transformMatrix[i * 3 + k] * rotationMatrix[k * 3 + j];
            }
            resultMatrix.push(sum);
        }
    }

    return resultMatrix;
}
```

GetTransform

- GetTransform uses *positionX,positionY,rotation and scale* with initiliazing 3x3 matrix that is called *transformMatrix[].*
- Calculates the rotation in radians by converting the rotation parameter from degrees to radians.
- Applies scaling by *transformMatrix[0]* and *transformMatrix[4].*
- Applies translation by *transformMatrix[2]* and *transformMatrix[5].*
- Return results in *resultMatrix[]* by multiplying rotation and transform

```
function ApplyTransform(trans1, trans2) {

    const resultMatrix = [];

    for (let i = 0; i < 3; i++) {
        for (let j = 0; j < 3; j++) {
            let sum = 0;
            for (let k = 0; k < 3; k++) {
                sum += trans1[i * 3 + k] * trans2[k * 3 + j];
            }
            resultMatrix.push(sum);
        }
    }

    return resultMatrix;
}
```

ApplyTransform

- Combines two transformation matrices.
- Loops performs matrix mult. between trans1 and trans2.
- Return results in *resultMatrix[]* by multiplying trans1 and trans2.