Computer Graphics Assignment#1

Draw my name's initial in WebGL

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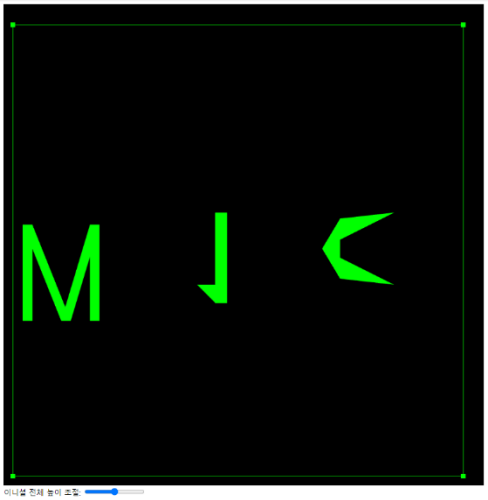
Implement each initial separately (각각의 이니셜을 따로 구현)



I first drew the initials of my name in 1024px * 1024px using the gl.drawArrays function. For 'M', since it's entirely made up of straight lines, I could have used LINE_STRIP, but in my case, I implemented it with TRIANGLES. I created one right-angled triangle, and by rotating another one 180 degrees to have their hypotenuses touching, a rectangle was formed. However, for 'J', along with the straight lines represented using TRIANGLES, I used TRIANGLE_FAN to depict the bottom part of 'J'.

For 'C', it seemed like grouping three TRIANGLES together could approximate the letter 'C', and doing so resulted in a somewhat sharp-edged 'C' that was a bit disappointing.

Place each of the already created initials on the same canvas. (이미 만들어놓은 각각의 이니셜을 동일한 캔버스에 배치)

I succeeded in drawing 'M', 'J', and 'C' on their respective canvases with floating-point numbers, but then I realized they should be displayed together on the same canvas. It seemed difficult to modify the drawn initials made of floating-point numbers, so I converted the already created initials into coordinates of a 1024*1024 coordinate system, and then converted those 1024*1024 format coordinates into floating numbers suitable for WebGL to insert into vertices. By dividing each coordinate of the 1024*1024 format by 512, half of 1024, and subtracting 1, I converted them into floating numbers between -1 and 1 suitable for WebGL. However, if I simply converted and inserted each initial as is, they would overlap with each other. Since I drew them myself, the size of 'M' appeared somewhat larger. Thus, I added an offset to each initial, adding to the original coordinate system's x-coordinate to adjust so that the initials would not overlap. Also, because I had drawn the initials large on a 1024*1024 canvas, I multiplied the coordinates of 'J' and 'C' by 0.5 to reduce their size by half, and for the larger 'M', I specially reduced its size further by multiplying by 0.4.

Adjusting the height using a slider. (슬라이더를 활용하여 높이 조절하기.)

I used the slider input tag in HTML to allow for the adjustment of the initials' height. I spent a lot of time on a problem where the letters kept shrinking and disappearing during implementation. To solve this, I wanted to store the 1024*1024 coordinate data containing the initials' information in another variable, so that whenever the slider value changed, I could fetch the original data and modify it from there for updates. However, due to JavaScript's characteristic where initializing an object with "=" assigns a reference, the problem arose because it modified and updated based on the modified initials' coordinate data, not the original initials' coordinate data. Using `var displayed_coordinates = JSON.parse(JSON.stringify(coordinates));` copies not just the reference address but all the contained values as well. Height adjustment was implemented by modifying the y-coordinates of the data. Afterwards, re-rendering is necessary to update the changes on the canvas.

Demonstration(시연):

Adjusting the slider below moves the initials up and down. Resizing has been excluded due to issues.