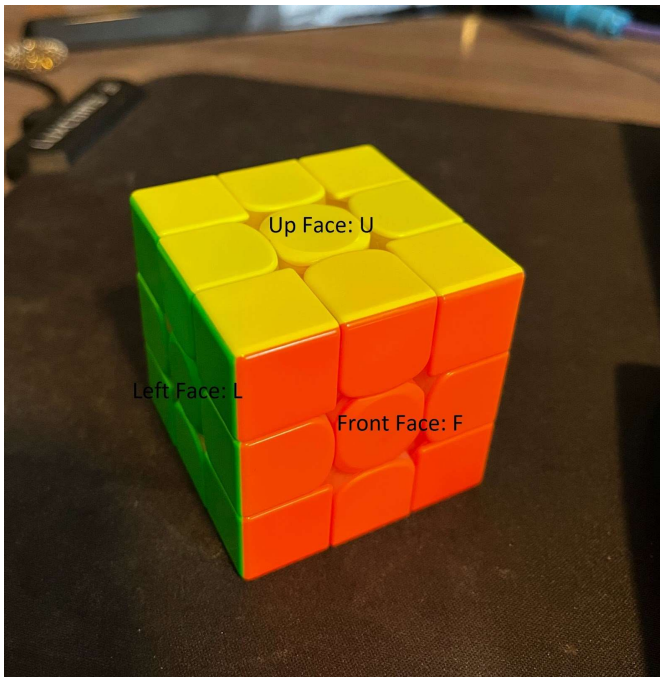
Project Proposal:

For my final project, I think that I would like to do a virtual 3d representation of a rubik's cube. I would have it so that face rotations are bound to keyboard interactions and you can rotate the cube in the scene as well. A key press should rotate the face of the cube clockwise and when a key is pressed with the shift modifier, the face should be rotated counter-clockwise. The face turns should be animated rotations and the colors of the sub-cube faces should be persistent throughout the animation. The scene should have the main Rubik's cube and it should be composed of the 26 sub-cubes. A secondary function could be having a keypress scramble cube. There should be faces labeled with the correct label that moves around with the correct



face of the cube. So the front face of the cube should have a tracking label that says something like, "Front face, F"

The key binds should be as follows:

R: Turns the right face clockwise
L: Turns the left face clockwise
U: Turns the up face clockwise
D: Turns the bottom face clockwise
B: Turns the back face clockwise
F: Turns the front face clockwise
M: Turns the middle slice clockwise in relation to the right face
E: Turns the equator slice clockwise in relation to the up face
S: Turns the remaining middle slice clockwise in relation to the front face
[: Scrambles the cube
] : Resets the cube to a solved state

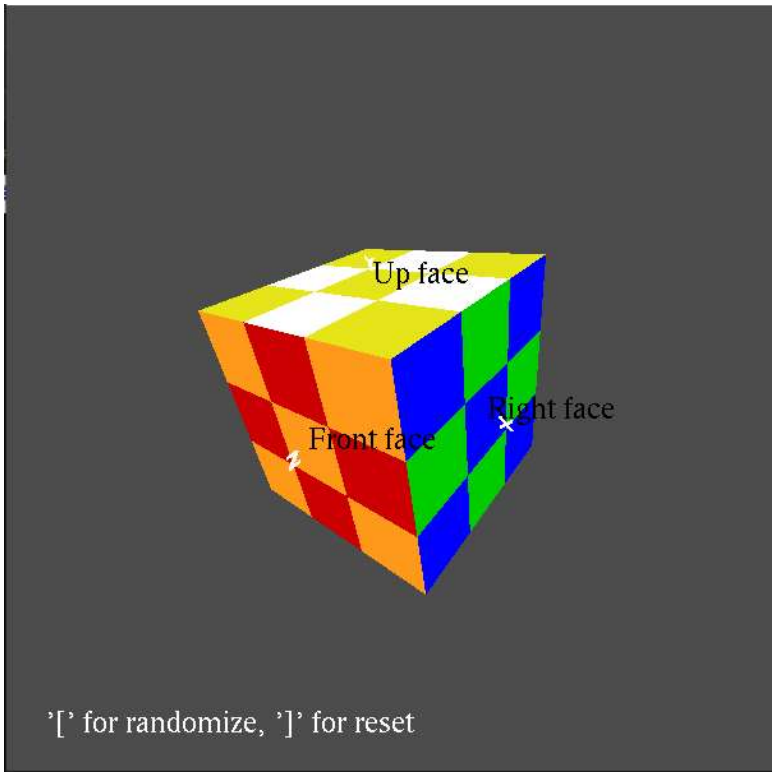
I think this project has some personal significance to me because I have been solving Rubik's cubes for over 12 years. I have reached a fairly advanced level with being able to solve the classic 3x3x3 Rubik's cube in around 11 seconds on average with a personal best of 6.78.

Final Project:

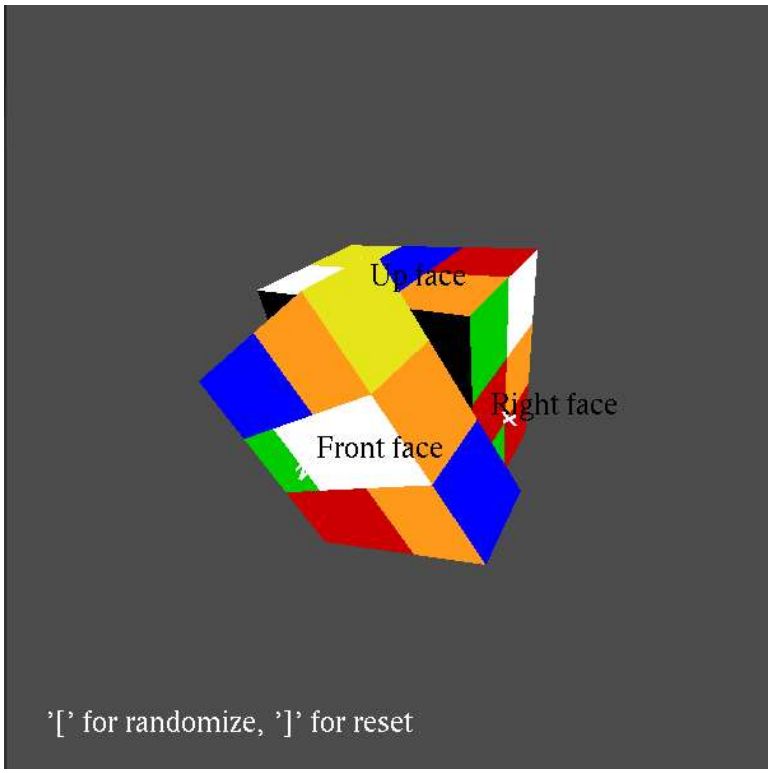
Video Demonstration:

https://media.oregonstate.edu/media/t/1_dskc8qqy

For my final project I created a virtual Rubik's cube with animated turning on all possible layers and faces. The program starts with the cube in a solved state. The cube is composed of 26 subcubes that move and once one animation for a turn ends, another one can begin.



I also added a randomization feature where 20 random moves are performed on the cube. The cube can also be reset back to a solved state.



The key turns are locked to the initial orientation of the cube, so changing the orientation of the cube does not change the keybind. So turning the “Front face” to the back will not change the keybind for the cube.

Changes to the Proposal:

None, I think what I set out to do was fairly vague and I accomplished what I set out to do.

What I Learned:

For this project, I heavily relied on using arrays and structs to store settings and information about each subcube. I used arrays of structs to hold information about rotation, position, and face colors of each subcube which made referencing the subcubes very easy. I also used switch statements to select the color changing function and animation.