CSE4204 | Computer Graphics Lab | Assignment – 3

Part A [5 marks]:

Create a 3D octahedron using index buffer. The color of each side of the octahedron should be different. You have the freedom to choose any color you want.

For pressing LEFT and RIGHT arrow keys, the octahedron will rotate (-ve) and (+ve) along the Y-axis. For pressing the Up and Down arrow keys, the octahedron will rotate (-ve) and (+ve) along the X-axis. Also, the octahedron will scale up and down for pressing the A and S buttons.

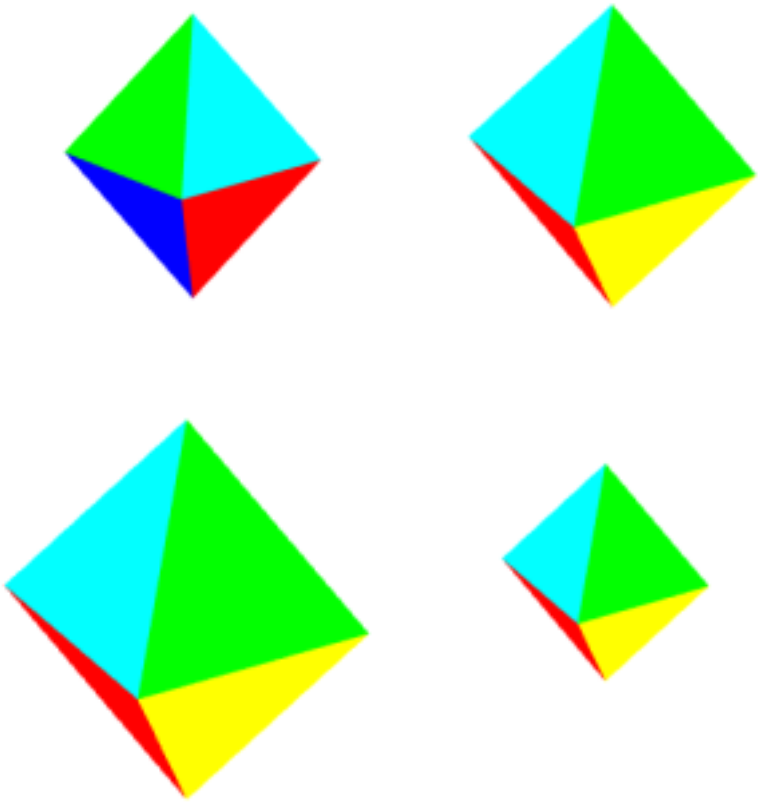


Figure: Different Example States of the 3D Octahedron.

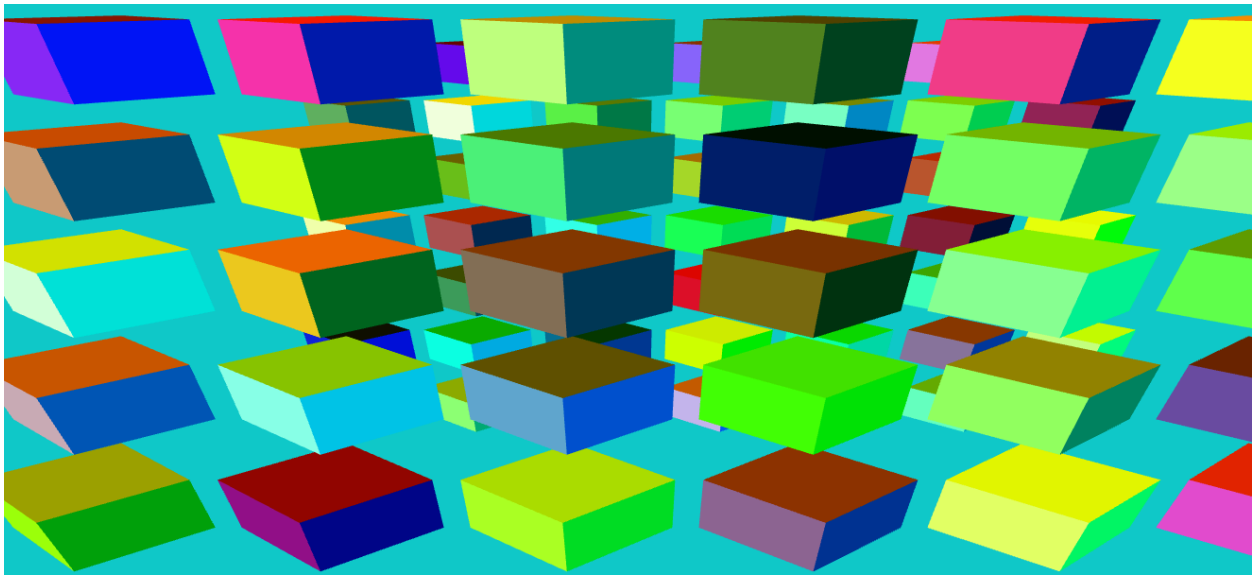
Hints:

- You must carefully define the order of the vertices. For front-facing triangles, the order of the vertices should be counterclockwise and vice-versa

Part B [5 marks] :

Create multiple cubes from the geometry of a single cube. You need to create at least 30 cubes in all directions with arbitrary colors. You must apply perspective projection and camera transformation to it.

Your program can only have the coordinate and color information of a single cube. You need to apply appropriate transformations on that particular cube to generate other cubes with arbitrary colors. With each mouse click, the color of the cubes will be changed. Also, you should be able to change the camera position by key pressing. For the Up and Down arrow key pressing, the camera will move towards the viewing direction and away from the viewing direction respectively.



Video Demo Available Here: https://rb.gy/k0t1s6

Hints:

- For generating multiple cubes, you can write a recursive function to generate new cubes around each cube.
- For arbitrary color, you can use Math.random() function in Javascript
- For changing the camera position, you need to change the factors of the Eye Matrix

Evaluation: Coding + Viva