CSE4204 | Computer Graphics Lab | Assignment – 3

Part A [5 marks]:

Create a 3D cube using an index buffer. The color of a vertex is the absolute value of its coordinates, i.e., absolute values of X, Y and Z coordinates will be treated as the R, G and B values respectively of its color attribute. In addition to that, you must introduce a border for the object as shown in the diagrams below.

For pressing the LEFT and RIGHT arrow keys, the cube will rotate (+ve) along the Y and X-axis respectively. For pressing the UP and DOWN arrow keys, the border will increase and decrease respectively. [See the lower right image of the diagram below.]

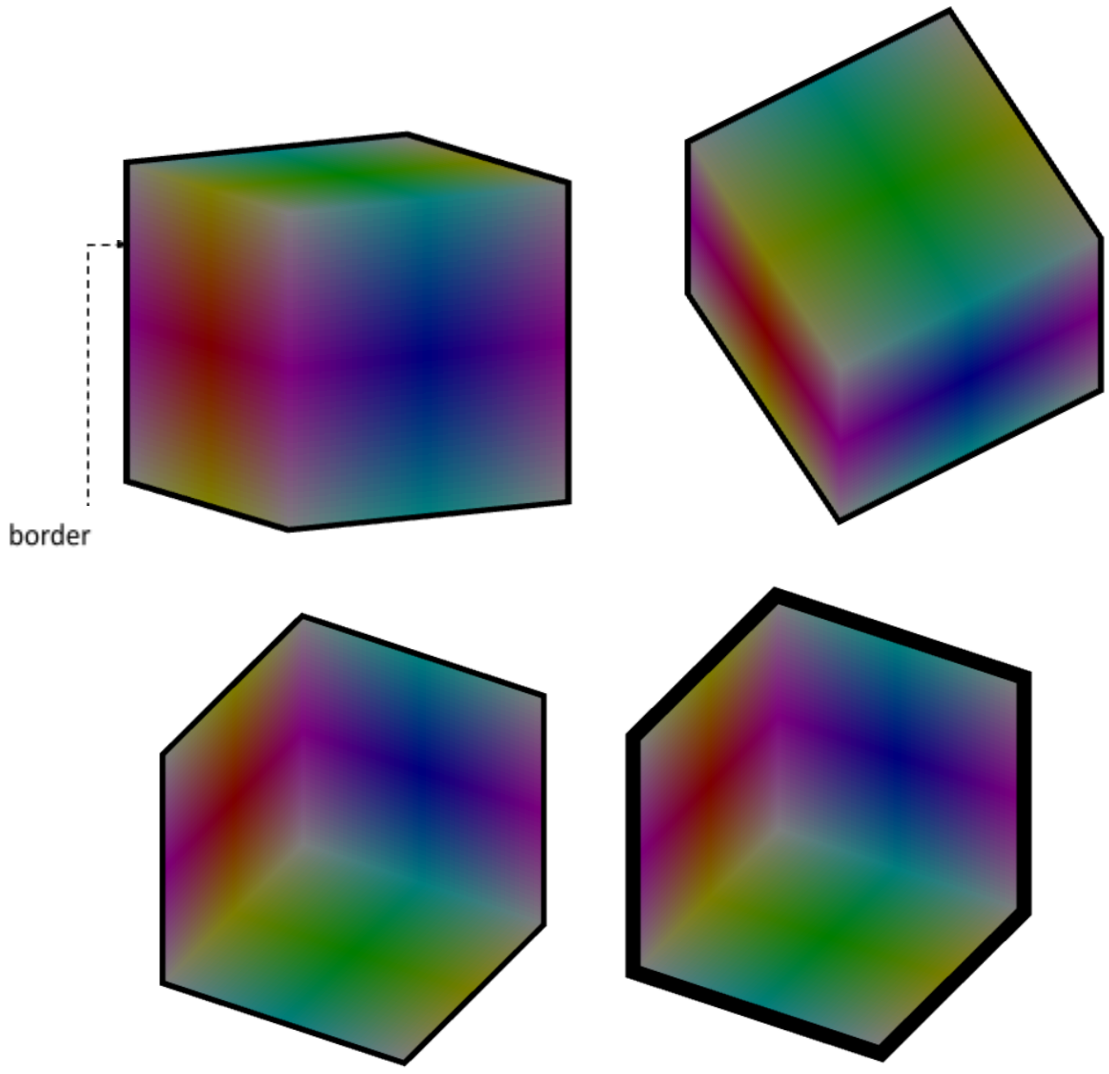

Figure: Different Example States of the 3D Cube.

Hints:

- Do not define color information outside the shader specifically, rather reuse the coordinate information inside the shaders.
- To draw the border, you can call the draw functions two times. One will draw the cube with black color, but being slightly scaled up. For the next call, the cube will be drawn with faces' colors, but not being scaled. This difference between scaling factors will be appeared as a border in the canvas.
- To handle the colors for two different draw calls, you can use control statements inside shaders that will switch between different `gl_FragColor`.
- Be careful while using `gl.COLOR_BUFFER_BIT` for the second draw call.

Evaluation: Coding + Viva