Assignment 1

Introduction to OpenGL: Drawing a Colorful Hexagon

Introduction:

In **OpenGL Tutorial 1**, we have modeled a square from two equilateral triangles. In this assignment, you are given a half hexagon, which is comprised of three triangles. You need to model a full hexagon by adding triangles to it. A hexagon is made of six triangles. You will also color each triangle of the hexagon.

Assignment Specification:

Unzip the attached file. It has three files: **Hexagon.cpp**, **hexagon.vs**, and **hexagon.fs**. When you compile and run the program, the following output as demonstrated in **Figure 1a** will be generated. **Figure 1b** shows the triangles in the half hexagon as you switch to the wireframe mode by pressing '**s**'/ '**S**' from the keyboard.

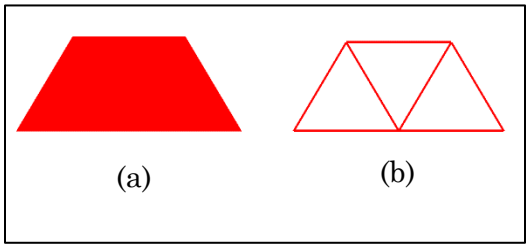

Figure 1: (a) A half hexagon and (b) its wireframe-based representation.

To do lists:

Complete the hexagon: **3 points**

- Find out the additional vertices E and F (as demonstrated in Figure 2) to complete the hexagon by mirror-reflecting C and B respectively around the X-axis. (Hints: Keeping the X coordinate unchanged, just negate the Y-coordinate of C to get E. Do the same for B to get F.)
- Complete the hexagon by adding triangles DOE, EOF, and AOF to the half hexagon. We added a triangle in OpenGL Tutorial 1 with GL_TRIANGLES to model a square. You need to follow a very similar approach. Uploaded example **SquareSingleAttribute.zip** will be helpful.

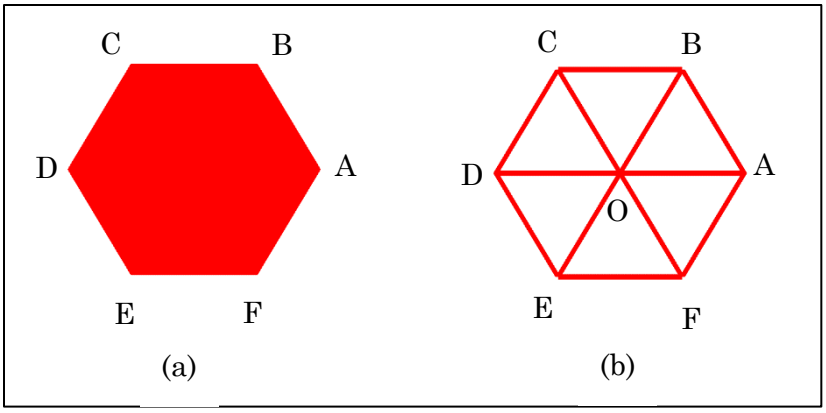

Figure 2: (a) A hexagon and (b) its wireframe-based representation.

Add color as an attribute: **4 points**

You have modeled a hexagon with vertices as its only attribute. **Now, add color as another attribute**. Your hexagon is made of six triangles; each triangle has three vertices. Give each triangle a different color as demonstrated in Figure 3. I'll talk about adding color as an attribute in the class shortly.

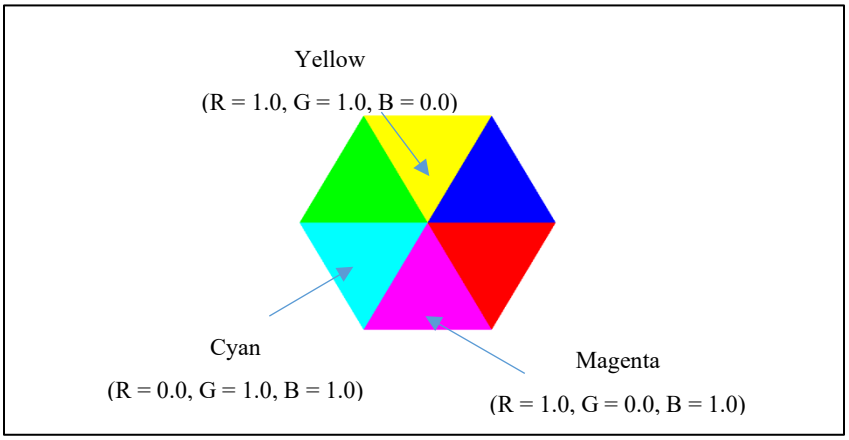

Figure 3: (a) A colorful hexagon with each triangle colored different.

Change the window title: **0.5 points**

After you complete the above steps, change the window title to "A Colorful Hexagon".

Submission:

Thus, your submission should include the following files:

HexagonColored.cpp, **hexagonColored.vs,** and **hexagonColored.fs**

- Place your solution in a zipped file named with your last name followed by the first initial of your first name followed by '1' (ex: **CSCD377YasminS1.zip**) and submit the solution via canvas.

Submission deadline is **Thursday, January 20, 11:59 pm**.

This assignment weighs **7.5%** of the course.