CS3388B, Winter 2023

Problem Set 2

Due: January 20, 2023

Exercise 1. Any RGBA32 color can be encoded as 4 byte unsigned integer. Give the binary number for the color `#8CE4FA`

Exercise 2. How many colors are possible in the RGB16 color space?

Consider a hypothetical color space with 4 color channels CMKY, where C is encoded using 6 bits, M encoded with 10 bits, Y encoded with 12 bits, and K encoded with 4 bits. How many colors are possible in this color space?

Exercise 3. Consider the following code segment. How many triangles are drawn?

```
glBegin(GL_TRIANGLE_FAN);
glVertex2f(0., 0.5);
glVertex2f(0.2, 0.5);
glVertex2f(0.4, 0.5);
glVertex2f(0.6, 0.9);
glVertex2f(0.7, 0.2);
glVertex2f(0, -0.2);
glVertex2f(-0.2, 0.0);
glEnd();

glBegin(GL_TRIANGLES);
for (int i = 1; i < 10; ++i) {
    glVertex2f(0.09*i, -0.7);
    glVertex2f(-0.09*i, -0.3);
}
glEnd();
```

Exercise 4. Assume a clockwise winding order. Calculate the normalized normal vector for the triangle rendered by the following code segment, assuming that OpenGL uses a left-hand coordinate system where the x-axis extends to the right and the y-axis extends upward.

```
glBegin(GL_TRIANGLE_FAN);
glVertex2f(0.4, 0.4);
glVertex2f(-0.3, 0.2);
glVertex2f(0.2, -0.3);
glEnd();
```