Coms 331 **Assignment 3** **Fall 2019**

Introduction

In this assignment you will add a key callback function and a mouse button callback function to the `PlusSign.cpp` program (renamed `ColorWheel.cpp`).

User Interface

When the user clicks the mouse button, the color of the plus sign will advance to the next color in a sequence red, orange, yellow, green, blue, purple. After reaching purple, then next color will cycle back to red.

When the user presses the escape key, the graphics window will close.

Program Description

Copy `PlusSign.cpp` and its shader programs to a folder `Assignment 3` and rename them `ColorWheel`.

Add a `typedef` statement that defines `Color` to be a `vec3` object. Then define an array of `Color` objects, initialized to the colors red, orange, yellow, green, blue, and purple, in that order. For example, define red as `vec3(1.0f, 0.0f, 0.0f)`. (You choose the RGB values that make those colors.) Also define a variable `numColors` equal to the number of colors and a variable `currColor` representing the index of the current color, initialized to `0` (red).

Use the function `glVertexAttrib1fv()` to set the color attribute. The first parameter is `vColor` and the second parameter is the color from the array of colors, as a `vec3` object.

Add a mouse button callback function `mouseButtonCB()`. This function should respond to mouse clicks. When the user left-clicks, the `mouseButtonCB()` function should increment `currColor`, with "wraparound" back to `0`, and make it the current color of the plus sign.

Add a key callback function `keyCB()`. This function should respond to the escape key. When the user presses the escape key, the graphics window should close.

The two callback functions must be registered in `main()` by using the functions `glfwSetMouseButtonCallback()` and `glfwSetKeyCallback()`.

In the `init()` function, replace the statement that prints "Welcome to Color Wheel" with a call to a function `printInstructions()`. Now that we have a user interface, we need to tell the user how to use it. Create the function `printInstructions()` and have it display the following:

```
Welcome to Color Wheel

Left-click to advance to the next color

Press the escape key to quit the program
```

Every program that we write should display a full set of instructions describing the user interface.