B

Project 1: RGB LED Cycler

Overview

In this project, you will use the RGB LED within your Arduino kit to learn the basics of digital inputs, PWM output, switch-case statements, functions, and various loops. The goal of this project will be to activate different modes on the RGB LED using a button to cycle through them and a switch-case statement to execute the appropriate functions. Since this is a beginning project, there is some psuedocode below to give you an idea of how the code should be structured. It will be up to you to determine what specific functions you want your LED to perform.

Requirements

For this project, you must successfully hook up a button, an RGB LED, and any supporting passive components your Arduino and breadboard. You must also have at least three different functions that your LED performs - one of which must include loop. A great example would be the rainbow loop or the breathe loop.

Reminder: The LED *must* be connected to the Arduino pins with resistors in series in order to protect the diodes. Please consult your Arduino kit manual for specific resistor values

Submission

You will be required to submit the following on Canvas:

1. a well-organized and documented schematic of the project setup
2. the source code file

Please package all of these items into a compressed (zipped) folder and upload them to Canvas.

Grading

You will be graded along the following criteria:

Criterion	Points
Efficacy	60
Schematic neatness	20
Code neatness	20
Mystery extra credit	10

Extra Credit

Hint: Research the problem with button inputs

If you are willing to dig in a little bit more, this project has a couple of opportunities to earn extra credit points at the discretion of the instructor. Implementing something unique with the RGB LED or the button input will warrant the extra credit points. If you want to try and get the extra credit points, please let the instructor know in the submission and detail why you believe you earn the points.

Psuedocode

```
Program: RGB LED Cycler

Define an input button pin as some Arduino pin
Define the red LED pin as some Arduino pin
Define the green LED pin as some Arduino pin
Define the blue LED pin as some Arduino pin
Define the number of LED functions as the number of modes you want

Initialize the current LED mode as 0

Function: Setup
    Initialize Serial communication for debugging
    Initialize input pins
    Initialize output pins

Function: Loop
    Check for button pressed
    If button is pressed then
        If the current LED mode is the last LED mode
            Reset the current LED mode to the first one
        Else
            Increment the LED mode by 1
    Switch the current LED mode
        Case the current LED mode is set to 0
            Execute first LED function
        Case the current LED mode is set to 1
            Execute second LED function
        Case the current LED mode is set to 2
            Execute third LED function
        ...

Function: First LED Function
    [YOUR CODE HERE]
...
```