4-Way Traffic Light using RGB LEDs

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RBT211 – Arduino Embedded Programming

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Final Project

I started out with 4 RGB LEDs and my breadboard. I need three resistors for each LED for a total of 12 resistors. The resistors are 1k resistors. I am also using Tinkercad to make sure I am not blowing up any LEDs and it helps to make sure the circuit is complete and that all lights work.

My first screenshot is Tinkercad and the lights blink. A simple circuit to make sure everything will turn on and off. My second screenshot is also Tinkercad linking the middle two LEDs and linking the outer two LEDS. You can notice that the lights are on in the screenshot. I am using the simple code that Tinkercad starts out with because it just blinks the light on and off every second.

I have made a replica in the real world of my breadboard in Tinkercad. Both blink as they should. I have initialized the ports and set a couple ports as outputs for now. The idea is to use PB1 and PD3 because I can do interrupts with those ports. I want to try and get a "don't walk" LED to blink and the "walk" LED to stay on for a certain amount of time. My priority is getting the lights to work correctly.

The idea of the lights to work is that two will remain red for a certain amount of time while the counterparts are green for a certain amount of time. Since I don't have yellow, I'm going to try and make purple the middle color for this experiment. I tried to make it brown but that did not work. Red would take over. I did, however, manage to make it purple. I now have my three colors.

Now I have to figure out the timing of the lights and the code that goes with that. I found yellow for the lights. I came by it by accident. I didn't know that red and green made yellow but it kind of does. I'm rolling with it for now. I just need to find the timing for the rest of the lights. I think I may be going about it the long way but as long as I can get it to work, I'll be happy. I'll figure out the short version later.

After as short break, I am going to try and create an interrupt that will blink for a few seconds. I have placed a red LED on the board and I will attempt to make it blink for 2 seconds before going solid for 5 seconds.

My efforts to create an interrupt have failed. I still do not understand them enough. I gave it a try using past projects as examples but I couldn't decipher it correctly. I know I'm missing something simple, but I don't know what it is. I tried reading the chapter on interrupts again and it still didn't click for me. What I think I need to understand them more is to do more interrupts. The repetition would help me understand better but time constraints have forbidden the repetition I need. Maybe in some other classes I will have a chance to do more interrupts. I'll even look online on https://www.udemy.com/.

With my luck, in my first job I will have to make several interrupts and my anxiety will spike. I'll probably have more help than here. I know there is only so much instructors can do. And the fact that it is all online is sometimes a downfall for me. I learn by doing and instruction at the same time. I enjoyed this class although I think it beat me. I wanted to do so much more, but time and my lack of understanding got in the way.

I have tried to document as much as possible. This is also something I need to work on but I am getting better. Documenting things is beginning to be second nature to me. That I find is a good thing. I hope I have gone somewhat above and beyond, but I don't really know.

All of the pictures are in the PowerPoint Presentation. I didn't feel the need to attach them to this document since the presentation is an extension of this whole document.

Here is the link to the final video:

https://youtu.be/vdahyDVnfvU - Final Presentation