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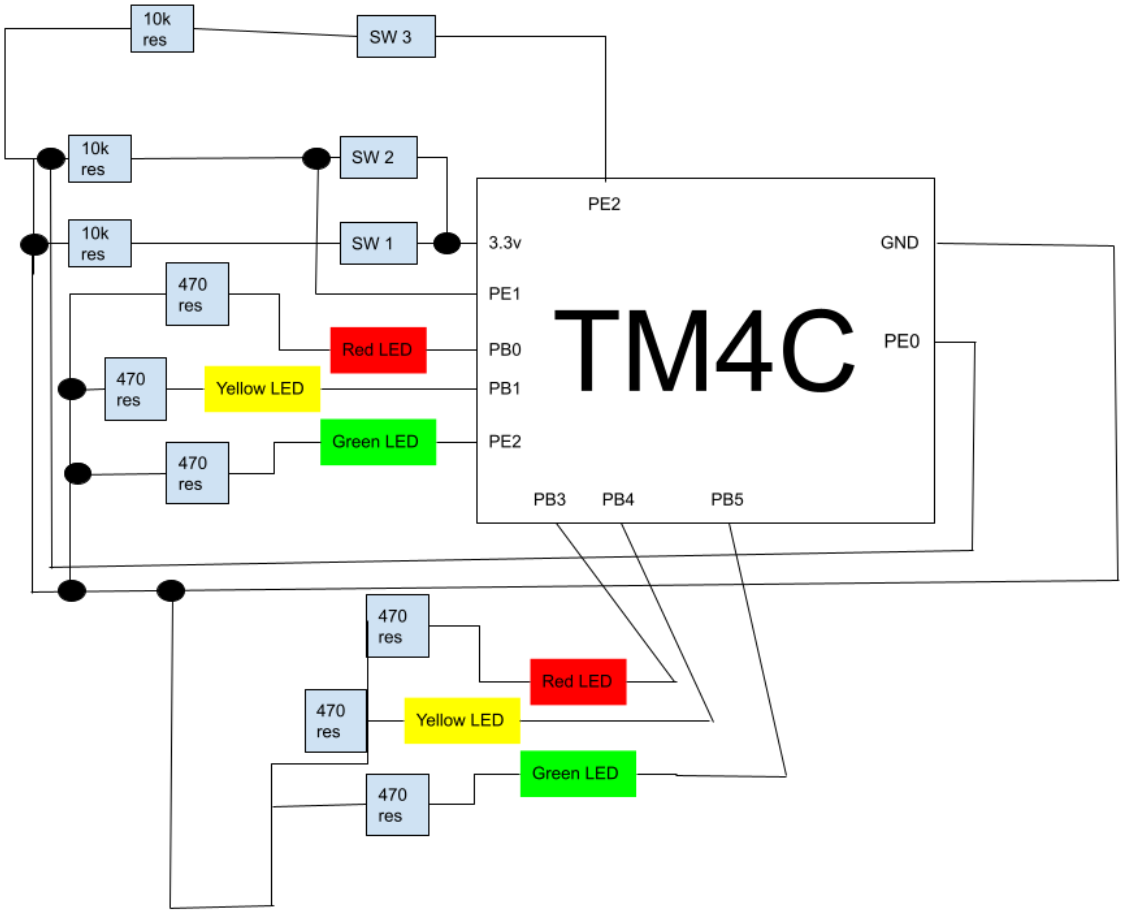
Project 3 Report
10/8/21

1) Overview
    a) The goal of this project was to implement a traffic light system based on the interest of Main and Spring in Pullman WA. This intersection also included a pedestrian walk light, which could override the traffic lights.
    b) First the circuits on the bread had to be made to run the starter code. Once that was set up the implementation of the light system could start. The functionality of each part was finished before adding new components. After all the parts were on the board, a final polish was done to make sure each part worked propber in conjunction with the others.
    c) I was responsible for both the code and the hardware.
2) Function Description
    a) Two sets of traffic lights representing the intersection of two one way streets must work properly with each other. Switches function as indicators for oncoming traffic. If one light is red and has oncoming traffic the lights will switch in the proper order. If the other switch is pressed the lights will switch back. If both switches are pressed then the two lights will cycle through their states letting both lanes flow in an orderly manner. There is a third switch and set of lights to represent a pedestrian crossing. This light is red when there is a green traffic light on. If the third switch is pressed, both traffic lights turn red and the pedestrian light turns green allowing a pedestrian to cross.
    b) Software and documentation will be turned in all at once.
    c) Launchpad electronic, breadboard
    d) Two sets of traffic lights representing the intersection of two one way streets must work properly with each other. Switches function as indicators for oncoming traffic. If one light is red and has oncoming traffic the lights will switch in the proper order. If the other switch is pressed the lights will switch back. If both switches are pressed then the two lights will cycle through their states letting both lanes flow in an orderly manner. There is a third switch and set of lights to represent a pedestrian crossing. This light is red when there is a green traffic light on. If the third switch is pressed, both traffic lights turn red and the pedestrian light turns green allowing a pedestrian to cross.
    e) There are three switches. One for each street and one for the pedestrian crossing.
    f) Electronic maintenance
3) Deliverables
    a)
    b)
    c) Traffic light system based on the TM4C and electronics.

Data Flow Graph



Input table for FSM

	000	001	010	011	100	101	110	111
GoN	GoN	WaitN	GoN	WaitN	WaitN	WaitN	GoP	WaitN
WaitN	GoE	GoE	GoE	GoE	GoP	GoP	GoP	GoE
GoE	GoE	GoE	WaitE	WaitE	WaitE	WaitE	WaitE	WaitE
WaitE	GoN	GoN	GoN	GoN	GoP	GoP	GoP	GoP
GoP	GoP	SlowP	SlowP	WaitN	GoP	SlowP	SlowP	SlowP
SlowP	SlowP	GoE	GoN	WaitN	SlowP	GoE	GoN	GoN

My delay was done using the given SysTick_Wait10ms(int) function. I used this to create the delay needed for the yellow lights and the flashing pedestrian light. My largest difficulty was correctly turning on the PE2 for input. It was my final issue and took me the longest to solve. I found that having to hold pedestrian switches did not exactly emulate real light traffic lights. If there were a way around this using my six state FSM I would have liked to have found it.