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Project 3 Design Document

1. Requirements Document.
2. Overview

We will learn how to interface switches, LED components to our hardware and a finite state machine in our software to operate a 4-way intersection. We will need to build circuits (using switches, LEDs, resistors) on the breadboard and connect them to the launchpad.

1. Function description

The 4-way intersection will have two stoplights (main st and spring st) and a pedestrian crossing. When main st is green cars can drive on main st and when spring st is green cars can drive on spring st. The main st light will be told there is a car by sensor 1 (PE0), the spring st light will be told there is a car by sensor 2 (PE1) and both lights will turn red when notified by sensor 3 that there is a pedestrian. These are all controlled by a FSM which is described in diagrams below.

1. Deliverables

There will be a working launchpad with 6 LEDs and 3 switches which operate a 4-way intersection along with code to that runs it. There will be this document as well.

1. Design Document.

*Diagram A:*

Diagram, schematic

Description automatically generated

*Diagram B:*

Diagram

Description automatically generated

1. Discussions.

I implemented my delay using SysTick shown in the demo code for this project, specifically the 50ms function. This project I was able to set up the hardware at ease because of the previous project. The most difficult thing for me was bit specific addressing and understanding how the finite state machine works. I think a limiting factor is just using the switches to emulate a car coming, this could be improved by somehow using motion sensors.