# Project 2

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Due: 9/24/2021

## Requirements

### Overview

The purpose of this project is to construct a stop light model system on the LaunchPad. The system will contain three LEDs that represent an actual stoplight, and two buttons representing a pedestrian switch and a vehicle sensor to trigger the stoplight changes. These will run off of the LaunchPad device, connecting to PORT\_E.

### Function Description

The system will follow the state machine below. When the device is started, it will initially be in the green state. When the pedestrian button is pressed, it will delay 0.1 seconds before transitioning to a yellow light. After one second, the light will turn red indefinitely. Then once the car sensor button is pressed, it will transition back to green and repeat.

Diagram

Description automatically generated

### Deliverables

A breadboard traffic light system will be created, connected to the LaunchPad. It will have the three green, yellow, and red LEDs with two switches and appropriate resistors.

## Design

The schematic of the LEDs, buttons, and microcontroller is shown below.

Diagram, schematic

Description automatically generated

The data flow is shown below:

Graphical user interface, diagram

Description automatically generated with medium confidence

### Discussion

The delay was implemented using a for-loop and estimating the delay based on the clock frequency of the chip. A simple state machine was sufficient, where the nextState is determined by the current state and the switch inputs. It is expected that the delay will deviate from exactly 100 ms, and it would be necessary to use the hardware timer for more accurate and precise timing.