System Description:

Traffic lights are a lighting system that controls cars and pedestrians flow on streets.

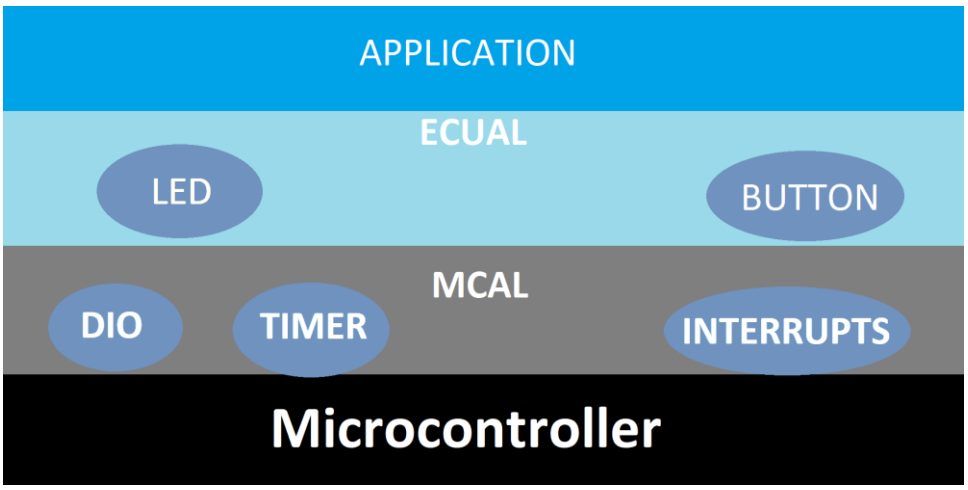
Red: Stop **Yellow: Get ready or Slow down** **Green: Go**

Our system is on-demand traffic lights which have a separated lights for pedestrians and cars. When cars Red LED is on, the pedestrians Green LED is on and vice versa. The system also has a button for pedestrians to cross the street by making cars stop by making cars Red LED on, and pedestrians Green LED on.

System Design:

1) System Layers:

1. **Microcontroller: physical controller of the system.**
2. **Microcontroller Abstraction Layer (MCAL): microcontroller dependent drivers.**
3. **Electronic Unit Abstraction Layer (ECUAL): input / output units' drivers.**
4. **Application Layer: software logic that controls the system.**



2) System Drivers:

1. LED Driver: Initializes LED for a specific pin within specific a port. Controls the LED (ON, OFF, Toggle).

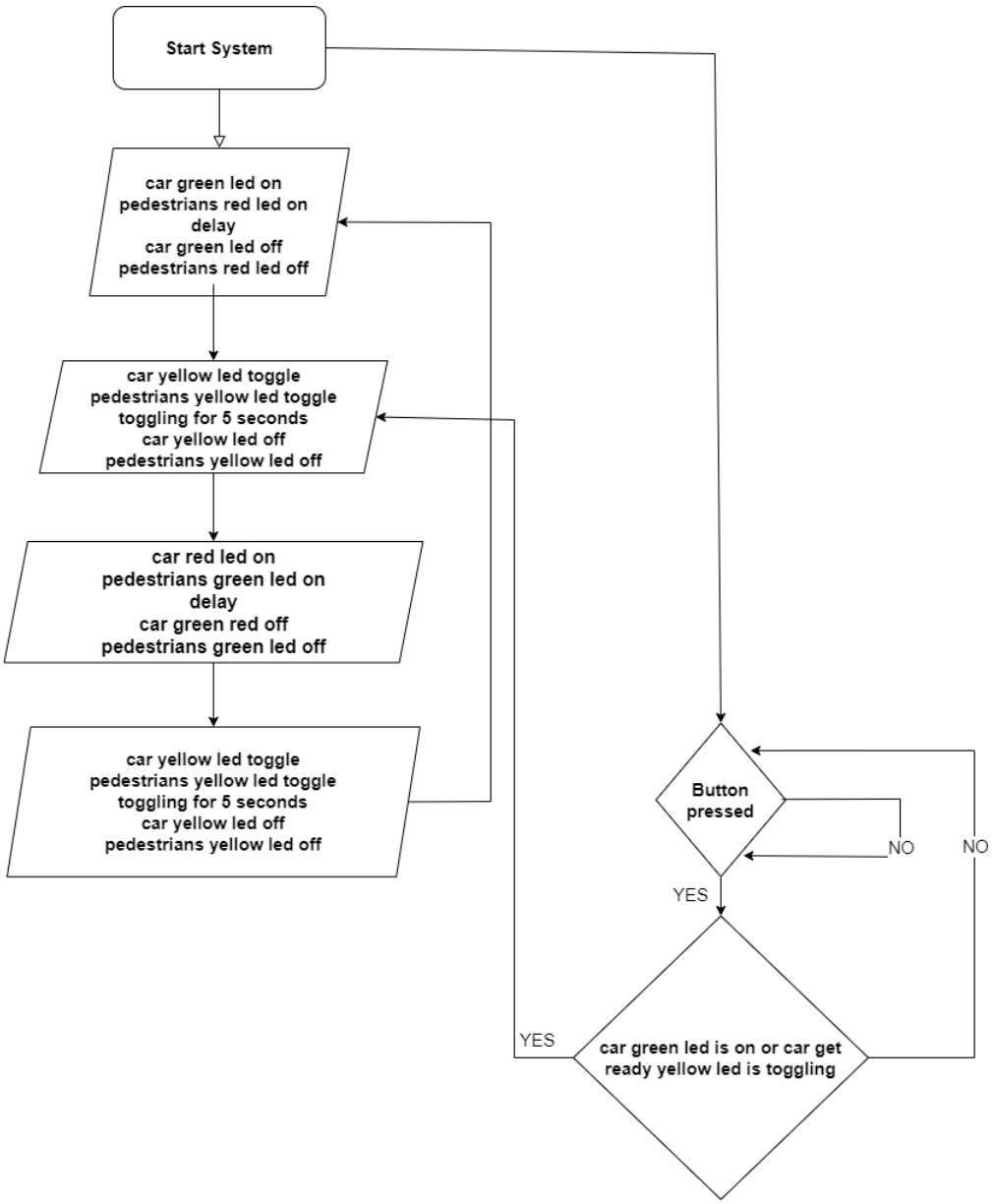
2. Button Driver: Initializes BUTTON for a specific pin within a specific port.

3. Digital Input/Output Driver (DIO Driver): Initializes any pin in each port to be INPUT or OUTPUT pin. Controls pins in each port to be HIGH, LOW.

4. Interrupts Driver: Defines the External Interrupt vector and Defines the Interrupt Service Routine (ISR) function prototype.

5. Timer Driver: Defines delay for 5 second and delay for .25 second function.

System Flow Chart



System Constraints

There are no special constraints in this system, all you want is to make sure that your pins are correctly connected.