System Description:

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

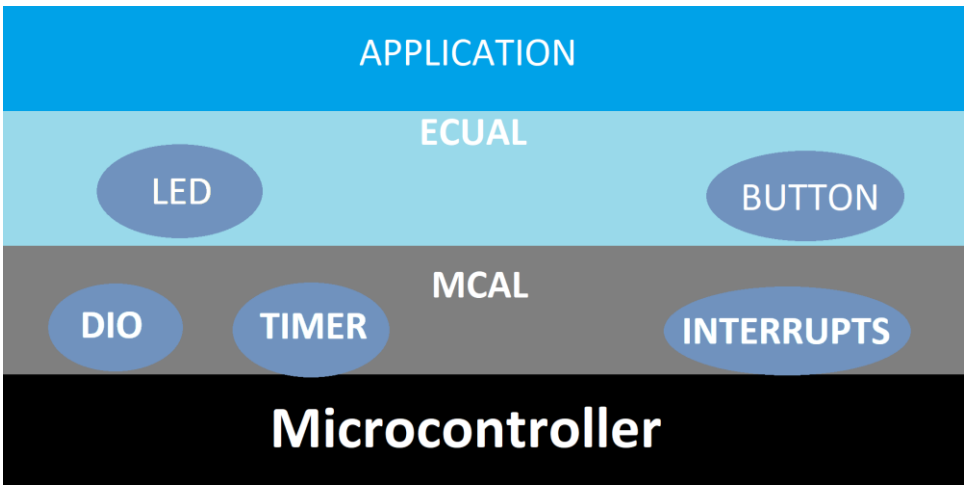
Red: Stop **Yellow: Get ready or Slow down** **Green: Go**

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).

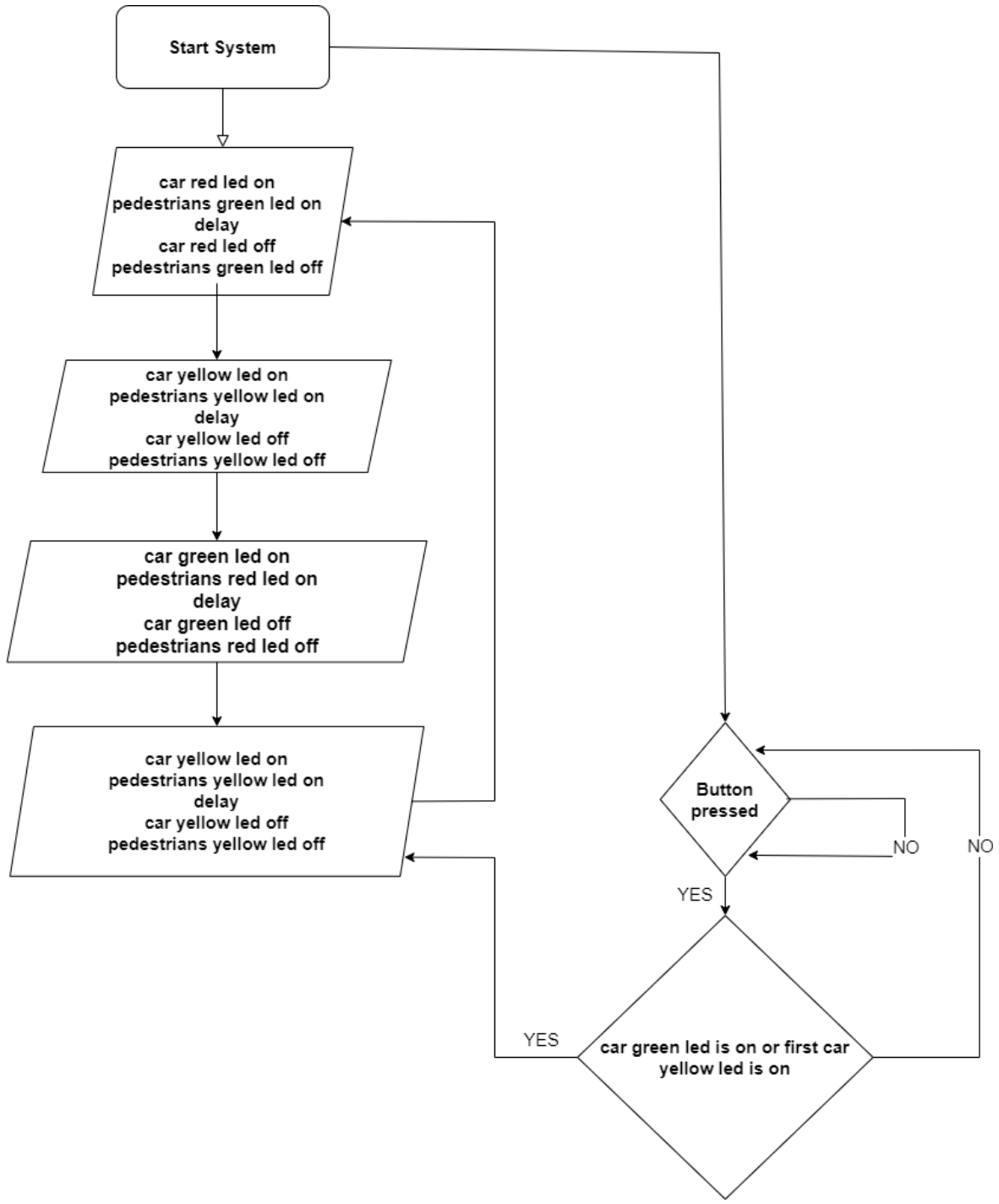
2. Button Driver: Initializes BUTTON for a specific pin within a specific port.

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 function.

System Flow Chart



System Constraints

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