Embedded Systems Project

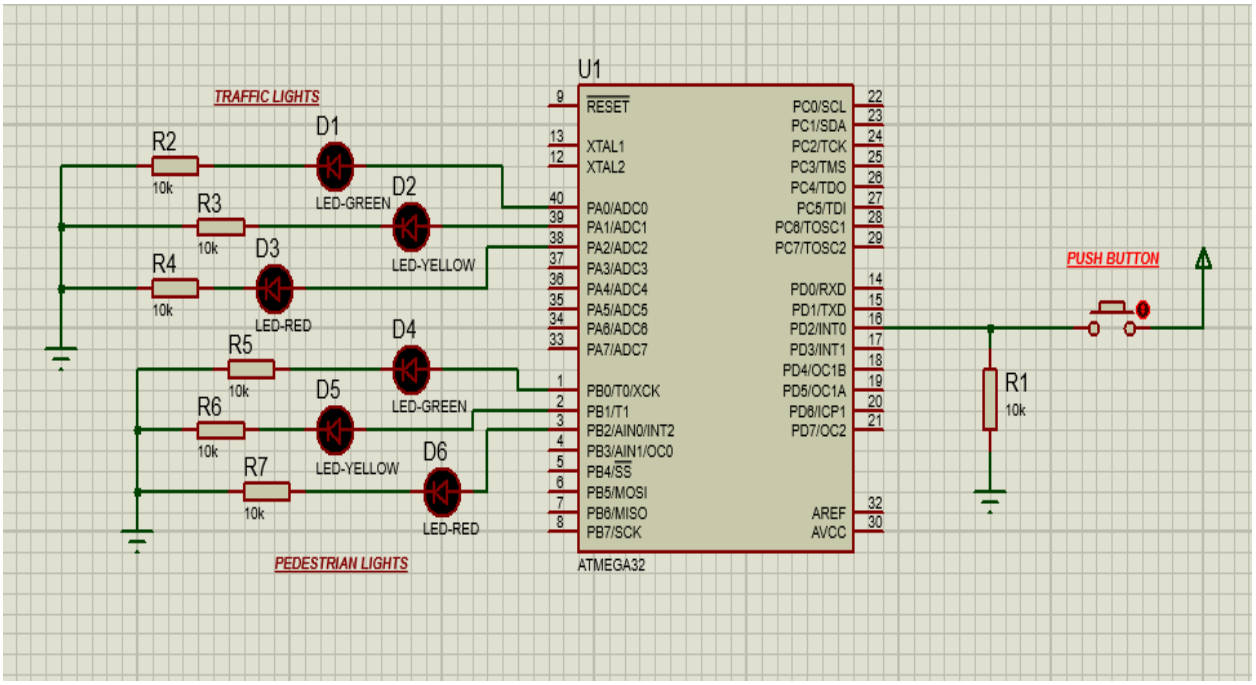
On-demand Traffic Light Control

1. System Description

On-demand Traffic Light Control is a project the consists of two modes that helps the pedestrians control the traffic to pass the road safely when demanded. The first mode controls the traffic light, while the second mode guide the pedestrian to pass the road. When, the pedestrian pushes the button as a request to pass the street. The systems stop the cars and guide the pedestrian to pass within the time limits, after that the cars will start to move again according to the traffic lights.

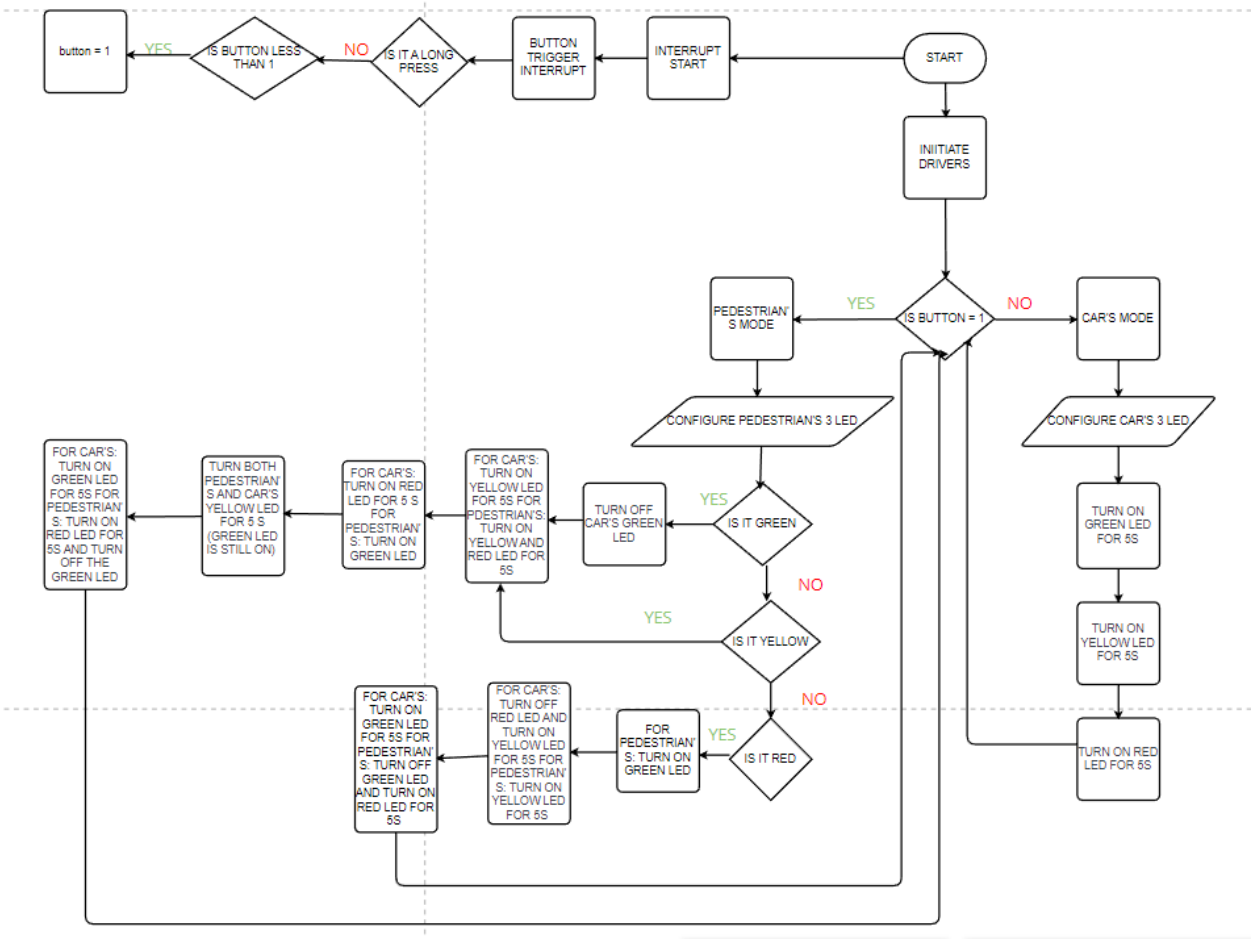
2. System Design

The system consists of 6 LEDS, one push button and an AVR CHIP (ATMEGA32). To represent the car's mode that control the traffic we have 3 LEDs (RED, GREEN, YELLOW). We also have the push button that is used by the pedestrian to help them pass the street by stopping the cars and going to the pedestrian's mode. Finally, we have the last 3 LEDS (RED, GREEN, YELLOW) to represent the pedestrian's traffic lights. The system is working at 1MHZ.



The system will consist mainly of three layers: Application, ECUAL, MCAL. The ECUAL will contain the LED and the button drivers. The MCAL will be composed of the following: DIO, timers, and interrupt drivers. In addition, there will be another layer that will store the AVR registers.

3. System Flow Chart



4. System Constraints

- Pedestrian can cross the road for only 10 second every time they push the button.
- According to the software, cars will be stopped every 10 seconds.