

Content

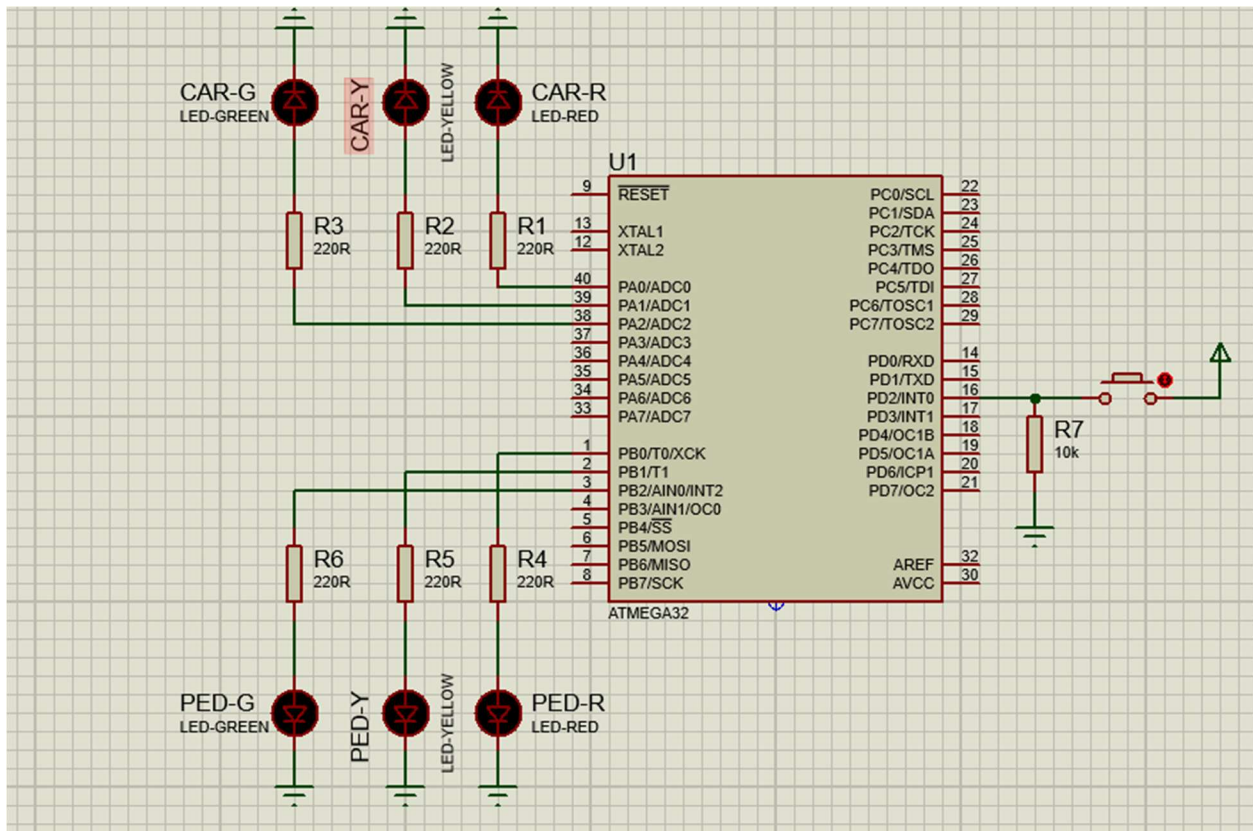
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1- System Description:

The traffic light control system is designed to control the flow of traffic at an intersection. It has two modes of operation: a normal mode for car traffic and a pedestrian mode. In normal mode, the traffic lights follow a pattern of red for 5 seconds, yellow for 5 seconds (blinking), green for 5 seconds, and yellow for 5 seconds (blinking). In pedestrian mode, the traffic lights are opposite of the normal mode, with red for pedestrians corresponding to green for cars and vice versa. Yellow lights blink for both modes.

2- System Design:

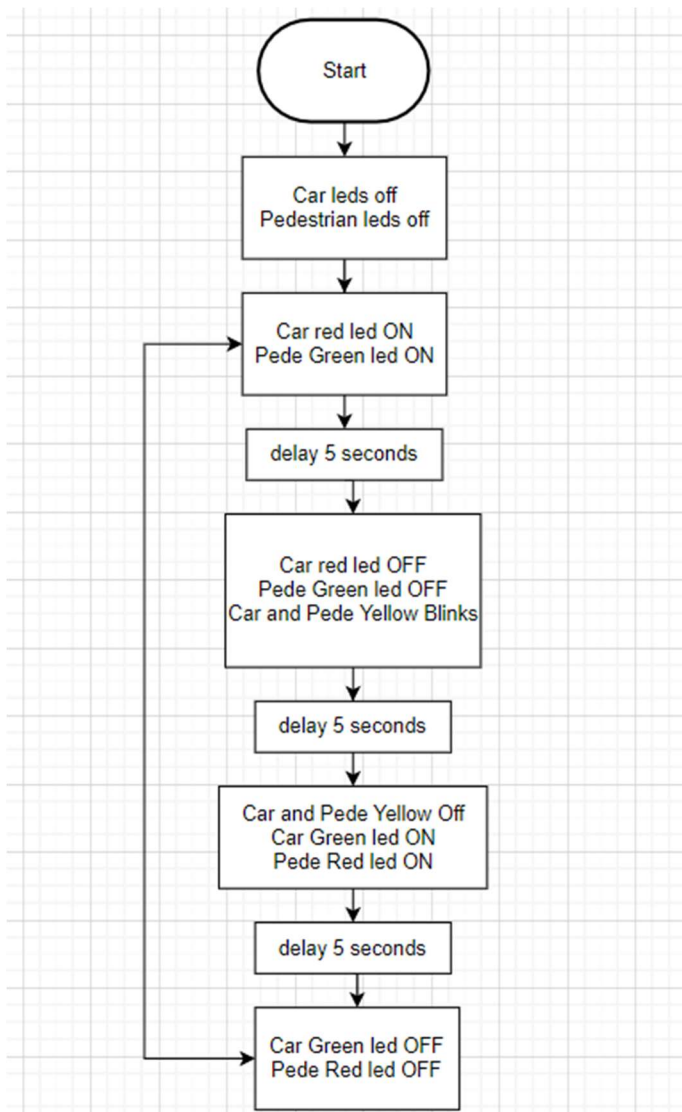
The system uses three LEDs for each mode (car and pedestrian) on two different ports (A and B). Push buttons are used to switch between the two modes and to trigger the pedestrian mode. The system uses interrupts to detect when the push buttons are pressed.



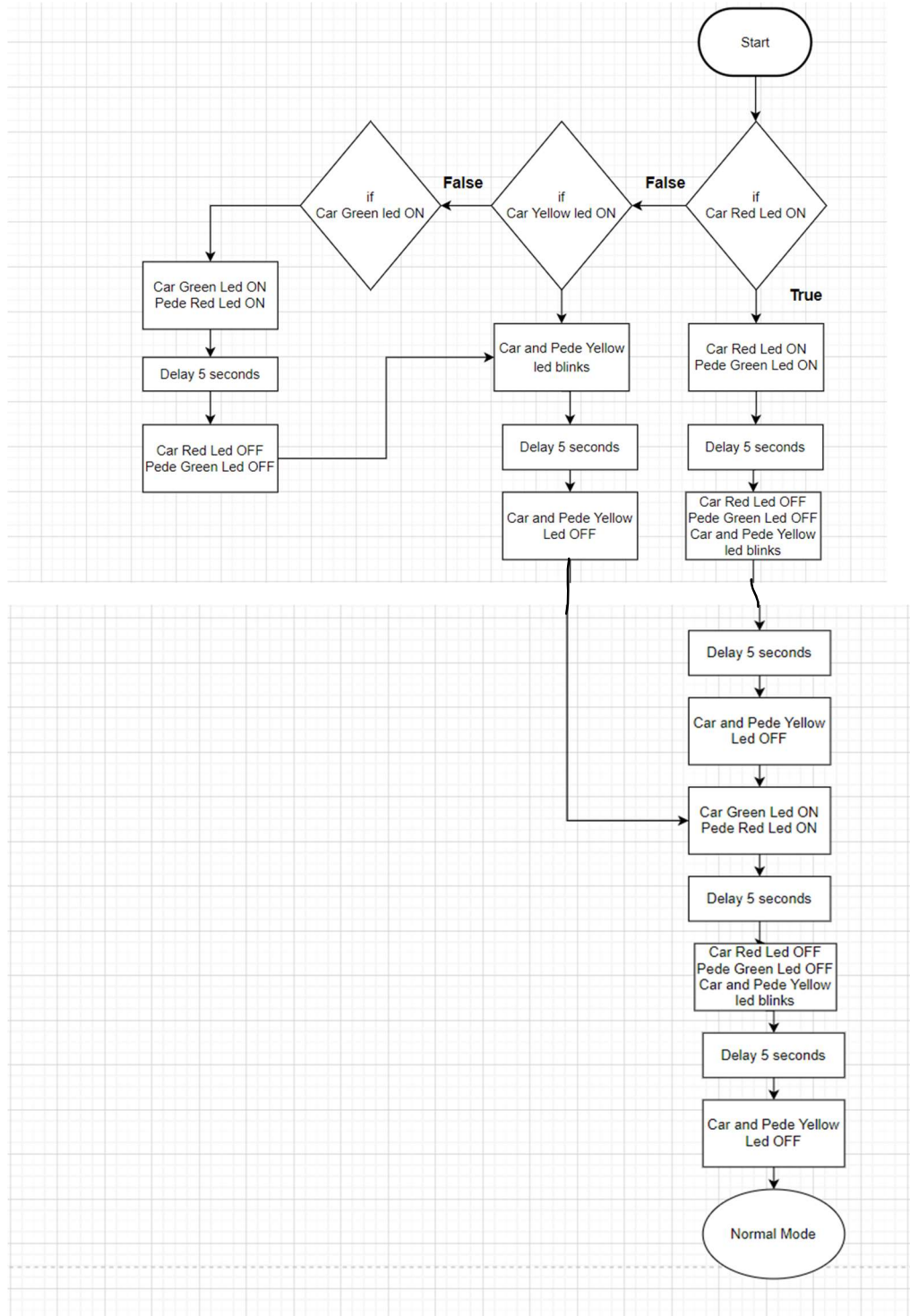
3- State Machine and Flow chart:

The system starts in normal mode and remains in this mode until the mode switch push button is pressed, at which point it switches to pedestrian mode. In pedestrian mode, the system remains in this mode until the mode switch push button is pressed again, at which point it switches back to normal mode.

3.1 Normal Mode:



3.2 Pedestrian Mode:



4- System Constraints:

There are several constraints that the system must adhere to. One constraint is the debounce feature, which prevents the system from responding to multiple or long button presses. Another constraint is the timer function, which determines the duration that the LEDs remain on or off. The system also has a constraint on the number of times the yellow LED blinks in each mode.