

Season based traffic light using audrino

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Abstract: Due to rapid rise in automobiles & because of large time delays between traffic light. Controlling the traffic becomes a major task. This becomes a severe problem in many cities across the world. So in order to rectify this problem, we go for “Season Based Traffic Light”. Normally, a conventional traffic light works on a fixed time concept allotted to each side of the junction which can't be varied & junction timings allotted are fixed. Higher traffic density occurs at one side of the junction which demands longer green time as compared to standard allocated time. This system is done using a ARDUINO UNO interfaced with sensor at the junctions. The IR sensors are used to detect the density at the traffic signal.

Keywords: Arduino based Traffic Light Controller,

I. INTRODUCTION:

The use of personal vehicles is very common now a days and a result, the number of vehicles on the roads are exponentially increasing. Roads without any supervision or guidance can lead in to traffic congestions and accidents. Traffic Lights or Traffic Signals are signalling devices that are used to control the flow of traffic. Generally, they are positioned at junctions, intersections, 'X' roads, pedestrian crossings etc. and alternate the priority of who has to wait and who has to go [1-3]. The traffic lights will provide instructions to the users (drivers and pedestrians) by displaying lights of standard colour. The three colours used in traffic lights are Red, Yellow and Green. The system must be used to control the traffic lights for smooth and safe movement of traffic. These control systems consists of electro mechanical controllers with clockwork mechanisms or modern solid state computerised systems with easy setup and maintenance. In this work, an Arduino based Traffic Light Controller system is designed. It is a simple implementation of traffic lights system but can be extended to a real time system with programmable timings, pedestrian lighting etc [4,5].

II. PROPOSED WORK

Arduino UNO: The main part of the Traffic Light Controller is the controller itself. Arduino UNO will serve the purpose in this project to handle all the switching of the LEDs and controlling their timings. **LEDs:** The LEDs used in the project are basic 5mm LEDs of Red, Yellow and Green colors. The maximum current that can be allowed through these LEDs (Red, Yellow and Green in particular) is 20mA. (For Blue LED, the maximum current can be up to 30mA) shown in fig 1.

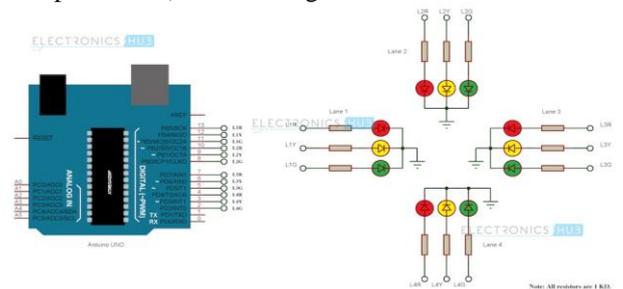


FIG 1: Season Based Traffic Light Using Audrino

III. Circuit Design:

Since the work is a traffic light controller, the circuit consists of many LEDs (12 as a matter of fact) as we are implementing traffic lights at a 4 way intersection. The project is a simple representation of traffic light controller and hence no other extra components are used. We need three LEDs of Red, Yellow and Green colors at each intersection. The intersection is divided in to four lanes: Lane1, Lane 2 Lane 3 and Lane 4. All the LEDs are connected to the Arduino UNO's digital I/O pins through respective current limiting resistors of 1KΩ. All the connections are made as per the circuit diagram. The complete wiring diagram of the circuit is shown below.

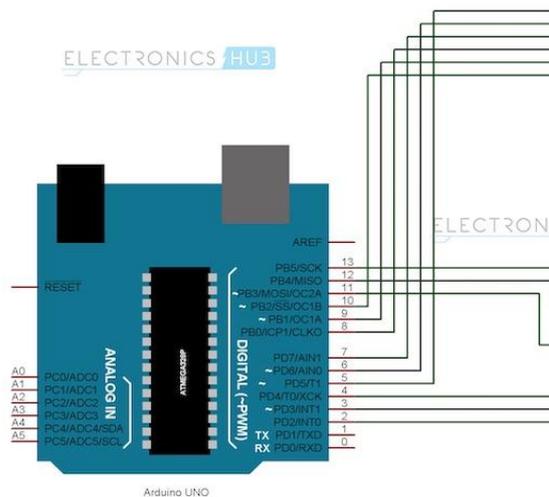


Fig 2: Wiring Diagram of Circuit

The real time traffic light controller is a complex piece of equipment which consists of power cabinet, main controller or processor, relays, control panel with switches or keys, communication ports etc. In this project, a simple traffic light system for a 4 way intersection is implemented using Arduino UNO. Although it is not the ideal implementation for real life scenarios, it gives an idea of the process behind the traffic light control system. The aim of the project is to implement a simple traffic light controller using Arduino UNO, where the traffic is controlled in a pre-defined timing system. The working of the project is very simple and is explained below. Consider the following gif image showing a loop of traffic light operations. The project is also implemented in the same manner shown in fig 2.

In that, first the Lane 1 gets its Green light turned. Hence, in all the other Lanes, their corresponding Red lights are turned on. After a time delay of predefined time say 5 seconds, the Green light in the Lane 3 must be turned on and the Green light in the Lane 1 must be turned off. As a warning indicator, the Yellow light in Lane 1 is turned on indicating that the red light is about to light up. Similarly, the yellow light in the Lane 3 is also turned as an indication that the green light about to be turned on. The yellow lights in Lanes 1 and 3 are turned for a small duration say 2 seconds after with the red light in the Lane 1 is turned on and green light in Lane 3 is also turned on. The green light in Lane 3 is also turned on for a predefined time and the process moves forward to Lane 4 and finally Lane 2. The system then loops back to Lane 1 where the process mentioned above will be repeated all over again shown in fig 3.

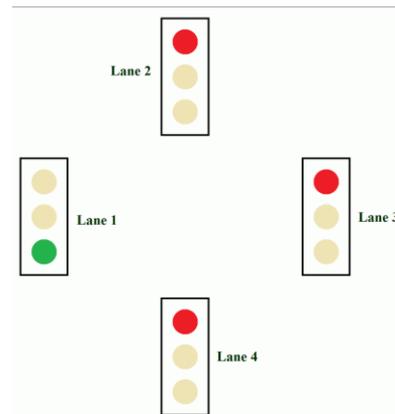


Fig 3: Lane Diagram

IV. Conclusion:

This paper may help in the future to be free from traffic problems. The components are used in this system less cost & efficiency is more because of the IR sensors are used for counting the no of vehicles in each way of the junction. The ARDUINO UNO used is a simple prototype model which works more efficiently. As the IR sensor emits the IR radiations, when an object crosses this sensor will start to count the no of vehicles in each way & proportional output is given by the ARDUINO UNO board.

V. REFERENCES:

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