**<TRAFFIC LIGHT CONTROLLER USING ARDUINO UNO>  
A MINI PROJECT REPORT**

*Submitted by*

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*In partial fulfillment of the Requirements for the Degree*

*of*

**BACHELOR OF TECHNOLOGY**

## COMPUTER SCIENCE AND ENGINEERING



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**BONAFIDE CERTIFICATE**

Certified that this Project Report titled “**Traffic Light Controller Using Arduino Uno**“is the bonafide work done by **Anish Pranav(RA2211003011624**) & **Yogesh .V (RA2211003011672) and Srinivas G (RA2211003011687)**, who completed the project under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other work.

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**Traffic Light Controller Using Arduino Uno**

**OBJECTIVE:**

The objective of this project, "Traffic Light Controller Using Arduino Uno," is to design an effective and intuitive traffic control system leveraging Arduino Uno technology. The focus is to simulate and manage traffic flow, ensuring safety and efficient movement within a controlled environment. This system aims to mimic real-world traffic light behaviour, enhancing its scalability, robustness, and adherence to traffic regulatory standards.

**ABSTRACT:**

The "Traffic Light Controller Using Arduino Uno" project concentrates on constructing an Arduino Uno-based traffic control system. It simulates traffic lights, managing the flow of vehicles in a controlled setting. By replicating real-world traffic light behaviour, it addresses safety concerns and aligns with traffic regulations, emphasizing robustness and scalability.

**CHALLENGES ADDRESSED:**

The traffic light controller addresses the following challenges:

* Simulating Real-World Traffic Lights: The system replicates the behaviour of traffic lights to regulate vehicular movement.
* Ensuring Safe Traffic Flow: Emphasizing safety measures to govern the flow of vehicles within the controlled environment.
* Adhering to Traffic Regulatory Standards: Following predefined traffic regulations in the operation of the simulated traffic lights.

**HIGHLIGHTS:**

The traffic light controller project emphasizes:

* Functional Simulation: Accurately simulate the behaviour of real traffic lights in a controlled environment.
* Safety Measures: Implementing features to ensure safe vehicular movement within the simulated scenario.
* Scalability: Designing a system that can be expanded and adjusted to simulate varying traffic scenarios.
* Regulatory Compliance: Adherence to traffic rules and standards governing traffic light operations.

**HARDWARE REQUIREMENTS**

Arduino Uno: Utilized as the microcontroller to orchestrate the traffic light sequences.

* LEDs (Red, Yellow, Green): To simulate the different states of traffic lights.
* Resistors: For regulating the current in the LED circuits.
* Breadboard: To create a prototype for the traffic light circuitry.
* Jumper Wires: To establish connections between the components.

**SOFTWARE USED:**

* Arduino IDE: The Integrated Development Environment to write, compile, and upload code to the Arduino Uno.

**WORKING PRINCIPLE:**

1. Initialization: The system initializes when powered up, configuring the Arduino Uno and the connected components.

2. Traffic Light Simulation: The system simulates the sequence of traffic lights – red, yellow, and green – to manage vehicle flow.

3. Timing Mechanism: Timers control the duration of each light phase, replicating real-world traffic light behavior.

4. Transition Control: Smooth transitions between different light phases for safe traffic management.

5. End of Cycle: The cycle repeats, emulating a continuous traffic control sequence.

**PROGRAM:**

The program code is written in the Arduino IDE, detailing the logic for controlling the traffic light sequences.

/

This program blinks pin 13 of the Arduino (the

built-in LED)

/

void setup()

{

pinMode(0, OUTPUT);//initiates pin 0 as output

pinMode(1, OUTPUT);//initiates pin 1 as output

pinMode(2, OUTPUT);//initiates pin 2 as output

}

void loop()

{

for (int i = 0 ; i < 10 ; i += 1) //this will flash advanced green 10

{

digitalWrite(2, HIGH); //turns on the green led, pin 2 is turned on

delay(100); //100 millisecond delay

digitalWrite(2, LOW); //turns off the green led, pin 2 is turned off

delay(100); //100 millisecond

}

digitalWrite(2, HIGH);//turns on the green led, pin 2 is turned on

delay(15000); // 15000 millisecond delay

digitalWrite(2, LOW); // turns off the green led, pin 2 is turned off

digitalWrite(1, HIGH);// turns on the yellow led, pin 1 is turned on

delay(5000);//5000 millisecond delay

digitalWrite(1, LOW);//turns off the yellow led, pin 1 is turned off

digitalWrite(0, HIGH);//turns on the red led, pin 0 is turned on

delay(15000);//15000 millisecond delay

digitalWrite(0, LOW);//turns off the red led, pin 0 is turned off

}

**FLOWCHART:**

Illustrates the logical flow and sequence of operations in controlling the traffic light system.

A diagram of a traffic light

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**HARDWARE:**

Visual representations showcasing the implemented traffic light controller, including the setup, circuit diagram, and code execution on the Arduino IDE.

A circuit board with wires

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**CONCLUSION:**

The Traffic Light Controller project demonstrates an effective and scalable simulation of traffic lights, ensuring safe and regulated vehicular movement in a controlled environment. It emphasizes adherence to traffic regulations and the significance of scalability and safety measures in such systems.

**REFERENCES:**

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