**ABSTRACT:**

This project presents the design and implementation of a traffic light control system using Arduino microcontroller, Red, Yellow, and Green LED lights, along with an integrated buzzer for auditory signals. The system is designed to simulate a basic traffic signal, providing a cost-effective and versatile solution for educational purposes, small-scale intersections, or pedestrian crossings.

The core of the system is an Arduino microcontroller, programmed to manage the sequential operation of the traffic lights. The traffic light sequence includes the standard Red, Yellow, and Green lights, with predefined time intervals to simulate real-world traffic control scenarios. The modular design allows for easy customization of timing parameters to suit specific requirements.

The Red, Yellow, and Green LED lights serve as visual indicators for the respective traffic signal phases. The use of LEDs provides energy efficiency, durability, and clear visibility even in varying ambient lighting conditions. The inclusion of a buzzer enhances safety by providing an audible signal, aiding individuals with visual impairments or alerting pedestrians and drivers to impending phase changes.

The power supply for the system is a standard 5V source, ensuring compatibility with commonly available USB power adapters or portable power banks. This low-voltage requirement enhances safety and simplifies integration with other electronic components.

**INTRODUTION:**

Traffic lights play a crucial role in regulating vehicular and pedestrian movement at intersections, ensuring orderly and safe traffic flow. In this project, we will explore the implementation of a simple traffic light system using Arduino, along with red, yellow, and green LED lights, and an audible alert through a buzzer. The Arduino microcontroller will serve as the brain of the system, controlling the sequence of lights based on a predefined traffic signal pattern.

The primary components include three LEDs representing red, yellow, and green signals, each corresponding to the standard traffic light colours. Additionally, a buzzer is integrated to provide an audible indication of the traffic light status. The entire system operates on a 5V power supply, making it suitable for various applications and easy to interface with Arduino microcontrollers.

Throughout this project, we will delve into the programming logic required to create a functional traffic light simulation. By combining hardware and software elements, we aim to replicate the familiar traffic light sequence that ensures smooth traffic management in urban environments. This project serves as an educational and hands-on exploration of basic electronic components, Arduino programming, and their application in real-world scenarios.

**Keywords:**  IoT, Traffic signalling