

PROJECT REPORT

Topic – Traffic Signal Operated using Arduino

Aim – To create and operate traffic signal using Arduino Uno

Need of this Project –

The traffic signal is already used in various cities and towns. It is used to control and regulate traffic. It is used to maintain order.

I always wondered how the layover time between the traffic lights is adjusted and could we control it through a simple microcontroller. Through Arduino I was able to adjust the time duration as well as do some more minor changes like blinking of green light for the drivers to know that signal is about to turn red.

Components Used –

1. Three LEDs – Red , Yellow and Green
2. Three 10K Ohm resistors
3. Jumper Wires
4. Breadboard
5. Arduino Uno

Component description –

1. LED –

A **light-emitting diode (LED)** is a [semiconductor light source](#) that emits light when [current](#) flows through it. [Electrons](#) in the semiconductor recombine with [electron holes](#), releasing energy in the form of [photons](#).

2. Resistor –

A **resistor** is a [passive two-terminal electrical component](#) that implements [electrical resistance](#) as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to [divide voltages](#), [bias](#) active elements, and terminate [transmission lines](#), among other uses.

3. Jumper wires –

A **jump wire** (also known as jumper, jumper wire, jumper cable, DuPont wire or cable) is an [electrical wire](#), or group of them in a cable, with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the

components of a [breadboard](#) or other prototype or test circuit, internally or with other equipment or components, without soldering.

4. Breadboard –

A **breadboard** is a solderless device for temporary prototype with electronics and test circuit designs.

5. Arduino Uno –

The **Arduino Uno** is an [open-source microcontroller board](#) based on the [Microchip ATmega328P](#) microcontroller and developed by [Arduino.cc](#). The board is equipped with sets of digital and analog [input/output](#) (I/O) pins that may be interfaced to various [expansion boards](#) (shields) and other circuits. The board has 14 digital I/O pins (six capable of [PWM](#) output), 6 analog I/O pins, and is programmable with the [Arduino IDE](#) (Integrated Development Environment), via a type B [USB cable](#). It can be powered by the USB cable or by an external [9-volt battery](#), though it accepts voltages between 7 and 20 volts.

Steps –

Three simple steps

1. Assembly of the circuit.
2. Writing the code.
3. Upload and Run.

Input and Output –

The input is given through the commands from Arduino and output is observed through the LEDs.

Code –

```
#define RED_PIN 8
#define YELLOW_PIN 10
#define GREEN_PIN 12

void setup() {
  // put your setup code here, to run once:
  pinMode(RED_PIN,OUTPUT);
  pinMode(YELLOW_PIN,OUTPUT);
  pinMode(GREEN_PIN,OUTPUT);
}
```

```

void loop() {
  // put your main code here, to run repeatedly:
  digitalWrite(RED_PIN,HIGH);
  delay(3000);
  digitalWrite(YELLOW_PIN,HIGH);
  delay(1000);
  digitalWrite(RED_PIN,LOW);
  digitalWrite(YELLOW_PIN,LOW);
  digitalWrite(GREEN_PIN,HIGH);
  delay(3000);
  digitalWrite(GREEN_PIN,LOW);
  for(int i=0;i<3;i=i+1)
  {
    delay(500);
    digitalWrite(GREEN_PIN,HIGH);
    delay(500);
    digitalWrite(GREEN_PIN,LOW);

  }
  digitalWrite(YELLOW_PIN,HIGH);
  delay(1000);
  digitalWrite(YELLOW_PIN,LOW);

}

```

Future Scope –

The traffic signals are already used in cities and town but sometimes it is difficult to change the layover duration but with the help of Arduino it becomes easy. Also many more changes such blinking of green signal can be implemented for the drivers to know that signal is about to turn red.

Bill of materials –

Resister	x 3	=	30 Rs.
LED	x 3	=	30 Rs.

Jumper wires	x 7	=	35 Rs.
Arduino uno	x 1	=	350 Rs.
Breadboard	x 1	=	90 Rs.
Total		=	535 Rs.

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