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Department of Electronics Engineering

Traffic Signal

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Abstract:

Traffic light control systems are widely used to monitor and control the flow of automobiles through the junction of many roads. They aim to realize smooth motion of cars in the transportation routesTraffic signal abstraction refers to the process of simplifying or generalizing the concept of a traffic signal system to its essential components and functionalities. It involves representing the traffic signal system in a more abstract or high-level manner, focusing on its core features and principles.

In traffic engineering, traffic signals are an essential part of managing and controlling the flow of vehicles and pedestrians at intersections. However, a traffic signal system can be quite complex, involving various components such as traffic lights, controllers, sensors, and communication systems. Abstraction allows us to understand and analyze the traffic signal system at a higher level of abstraction, without delving into the intricate technical details.

Circuit and Working :-
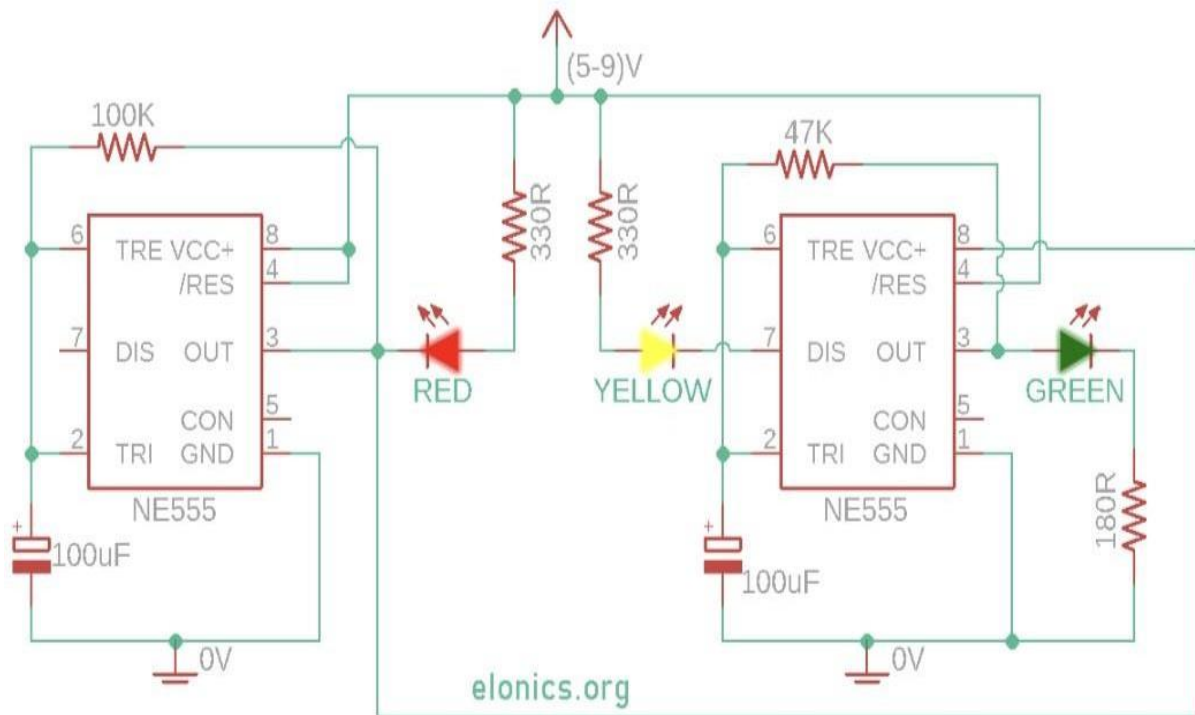
Fig. 1: project circuit diagram

Working :-

 Two such a stable circuits with the first astable circuit powering the other. So the second 555 timer IC will be powered only if the output of first 555 timer IC is ON.

The red LED is connected such that it turns ON only if the output of first 555 timer IC is at 0V. This is because the other terminal of red LED is connected to positive voltage. Yellow LED turns ON during discharge mode of second 555 IC, and the green LED turns ON whenever the output of second 555 timer IC is at positive voltage.

Immediately after we power ON this circuit, output of the first 555 timer IC will be in ON state because the voltage at PIN-3 (Trigger Pin) is less than $1/3^{rd}$ of the supply voltage. The red LED cannot turn ON yet, but the second 555 IC is powered and so the green light turns ON.

The capacitor of 2nd 555 timer IC slowly charges and as soon as it charges to $2/3^{rd}$ of the supply voltage (Threshold Voltage), the output of 2nd 555 IC turns OFF and the yellow LED glows because the discharge pin is activated.

Normally the yellow LED would turn ON for the same time as the green LED. But even before the capacitor of 2nd 555 timer IC reaches $1/3^{rd}$ of supply voltage, the voltage across capacitor of 1st 555 timer IC reaches 2/3rds of the supply voltage and so the output of 1st 555 IC turns OFF, resulting in yellow LED turning OFF and the red LED turning ON.

This cycle repeats again and again

Part List:

Table 1: Components

Semiconductors	Part Number	Unit Price	Quantity	Total Price
IC1	555 timer IC	10	2	20
D1(diodes)	-	-	-	-
Resistors				
R1	100K	3	1	3
R2	47K	3	1	3
R3	330 Ohm	3	2	6
R4	180K	3	1	3
Capacitors				
C1	100 uF	5	2	10
Miscellaneous				
IC holder		5	2	10
Connecting wires		2	2	4
LED lights (R,B,G)		2	3 (each)	6
Battery	9V	40	1	40
Breadboard		90	1	90
Total			18	195

Construction :
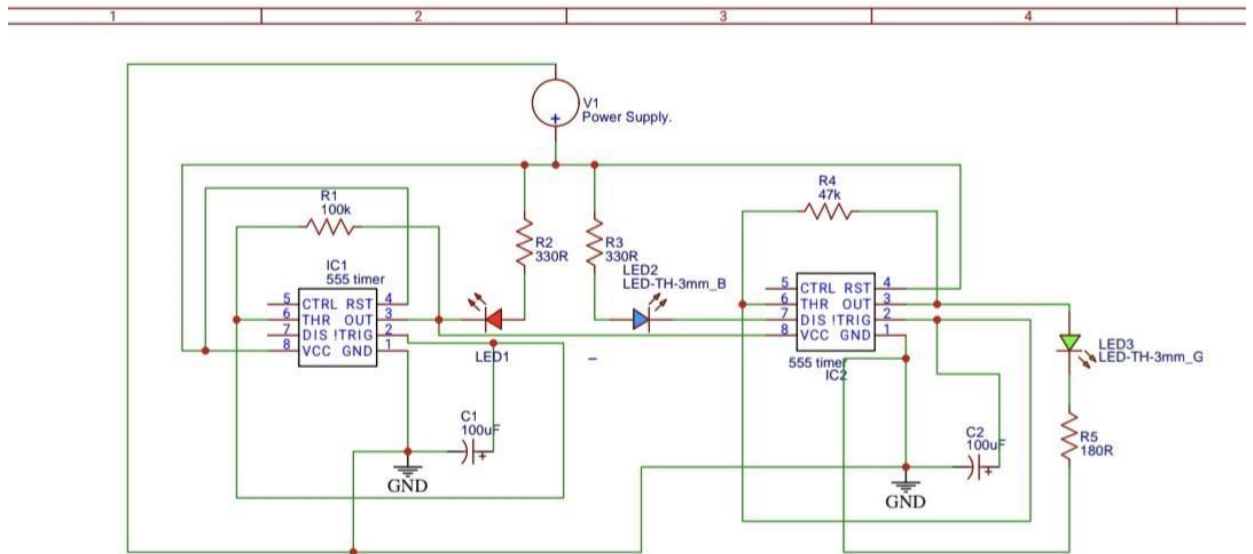
Fig. 2: Schematic
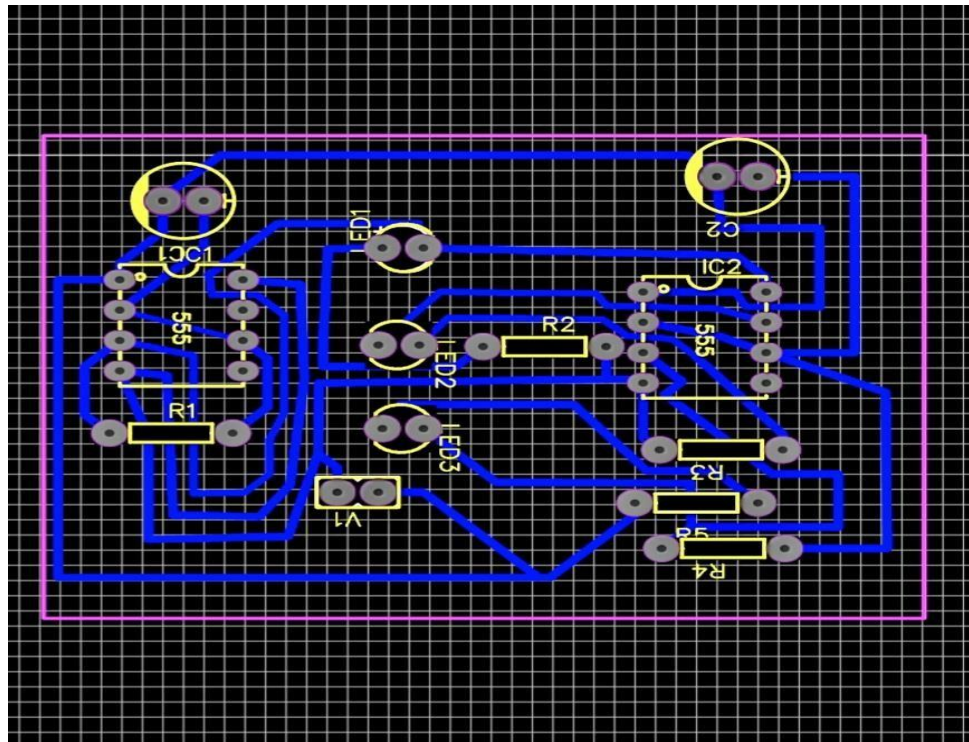
Table 2: footprints

S.No.	Componets	Footprint Name
1	IC	555 timer IC
2	Capacitor	Electrolyte capacitor 100 uF 50V
3	LED	LED-TH_BD3.0_RED
		LED-TH_BD3.0_YELLOW
		LED-TH_BD3.0_GREEN
4	Power supply	HDR-TH_2P-P2.54-V
5	Register	R_AXIAL-0.3

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Photo Of Your Project:-
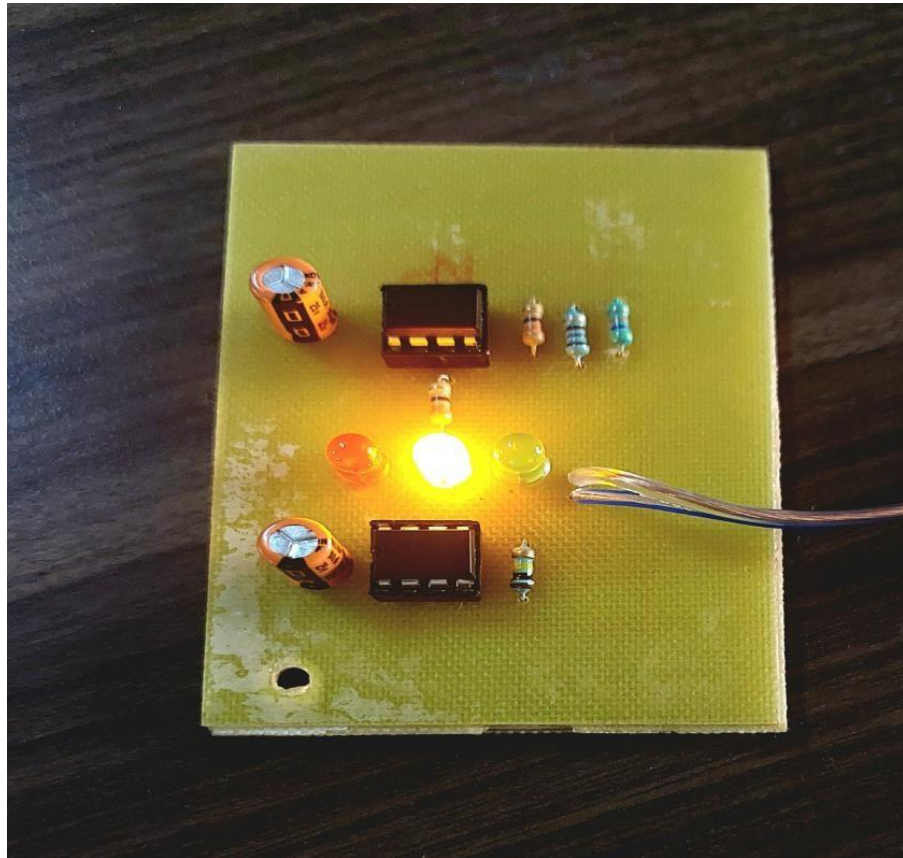
Applications:

- Smart traffic lights use data from sensors, cameras, GPS, vehicles, cell phones and other devices to detect patterns of traffic and the volume of vehicles, pedestrians andbicyclists approaching an intersection.

- When properly timed, traffic signals increase the traffic handling capacity of an intersection, and when installed under conditions that justify its use, it is a valuabledevice for improving the safety and efficiency of both pedestrian and vehicular traffic:
- . Traffic Signal Control: The primary function of a traffic signal application is to control the timing and sequencing of traffic signals at intersections. The application determines when each signal should turn green, yellow, or red based on predefined algorithms, traffic conditions, and input from various sensors.
- Traffic Monitoring: Traffic signal applications often include monitoring capabilities to collect real-time data about traffic conditions. This data can be gathered through sensors, cameras, or other detection devices installed at intersections. It helps in assessing traffic volume, congestion levels, and detecting unusual events such as accidents or road blockages.