



**Course Name:** Internet Of Things Lab

**Course code:** 21CSP-344

**Date of Performance** 24/08/2023

## **Experiment 1.4**

**Aim:** Develop a smart traffic light management system with the help of IoT.

### **Objectives:**

1. Learn about interfacing.
2. Learn about IoT programming.

### **Components Used:**

1 × Breadboard, 1 × Arduino Uno R3, 3 × LEDs (Red, Yellow, Green), 3 × 220Ω Resistor

### **Description:**

Nowadays, everyone prefers a personal vehicle. Hence, the number of vehicles on the road is increasing continuously, which results in traffic jams. Traffic light controller helps to manage the traffic and to maintain proper traffic management. These systems are placed at the intersections of the road or at the crossings to avoid congestions and accidents. The systems indicate to the driver by using different colors of light. Therefore it is simple to avoid congestion at the intersections.

### **Procedure**

- Step 1: Gather Components: Get Arduino board, traffic light LEDs, sensors, IoT module, wires, and power supply. DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
- Step 2: Design Circuit: Connect LEDs, sensors, and IoT module to the Arduino following a wiring diagram.
- Step 3: Write Arduino Code: Use Arduino IDE to program the board for controlling lights based on sensor input. Step 4: Implement IoT: Add IoT module to Arduino code for remote connectivity.
- Step 5: Update Arduino Code: Integrate code with chosen platform for data transmission and control.
- Step 6: Run the System: Run the code by compiling and updating in Arduino uno board.
- Step 7: Optimize and Refine: Adjust timing and logic, optimize code, and test under different scenarios.
- Step 8: Deploy and Monitor: Install the system, ensure power and connectivity, and monitor performance. Remember that while these steps are summarized, each step might require more detailed actions and configurations. Always refer to the documentation of your hardware components, sensors, and chosen



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IoT platform for specific guidance.

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**CODE:**

```
int red = 1;
int yellow = 3;
int green = 5;
void setup()
{
    Serial.begin(9600);
    pinMode(red, OUTPUT);
    pinMode(yellow, OUTPUT);
    pinMode(green, OUTPUT);
}
void loop(){
    changeLights();
    delay(5000);
}

void changeLights()
{
    // green off, yellow on for 3 seconds
    digitalWrite(green, LOW);
    digitalWrite(yellow, HIGH);
    delay(1000);

    // turn off yellow, then turn red on for 5 seconds
    digitalWrite(yellow, LOW);
    digitalWrite(red, HIGH);
    delay(2000);

    // red and yellow on for 2 seconds (red is already on though)
    digitalWrite(yellow, HIGH);
    delay(3000);

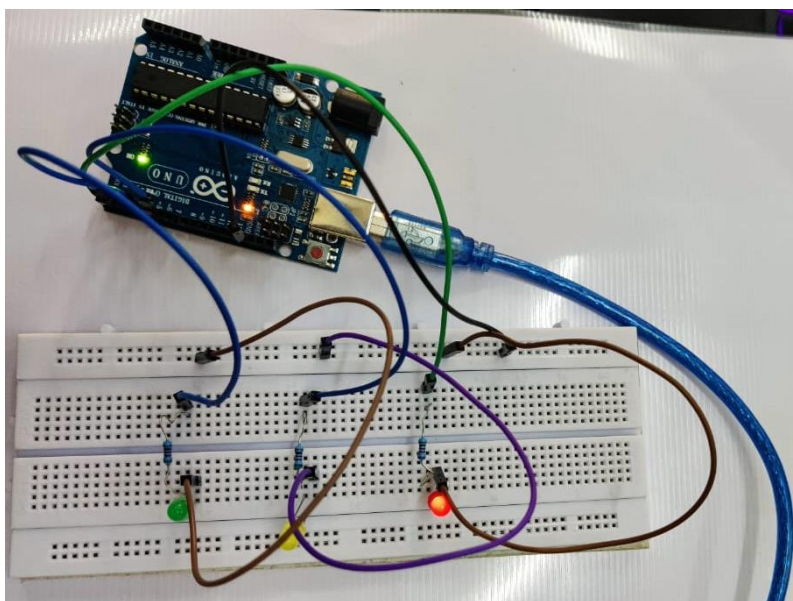
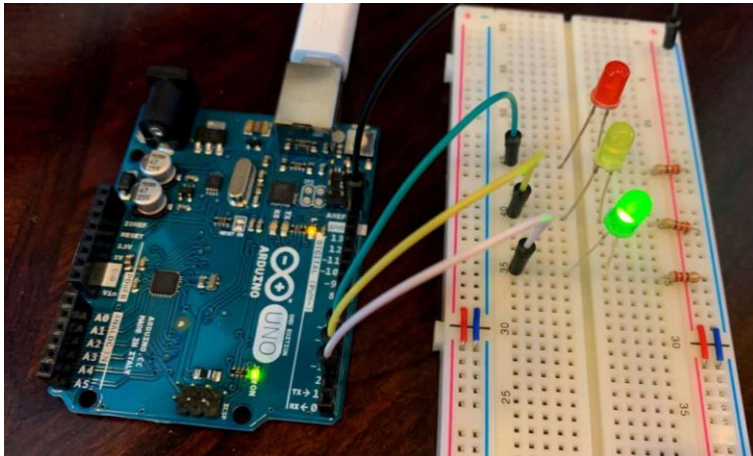
    // turn off red and yellow, then turn on green
    digitalWrite(yellow, LOW);
    digitalWrite(red, LOW);
    digitalWrite(green, HIGH);
    delay(3000);
}
```

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**Output :**

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**Result:**

You should see your LED turn on and off. If the required output is not seen, make sure you have assembled the circuit correctly, and verified and uploaded the code to your board. This traffic light controller includes a crosswalk signaling system. The traffic light controller in this system can be implemented practically, and it could be expanded.



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**Learning Outcomes :**

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- Learning About IoT: You'll understand how everyday things can be connected to the internet to make them smarter and more useful.
- Using Sensors: You'll play with special devices that can sense cars and changes in the environment.
- Collecting and Studying Data: You'll gather information from the sensors to figure out what's happening on the road.