Course Name: Internet of Things Lab **Course code:** 21CSP-344

Experiment 1.4

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Subject Name: Internet of Things Lab **Subject Code:** 21CSP-344

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

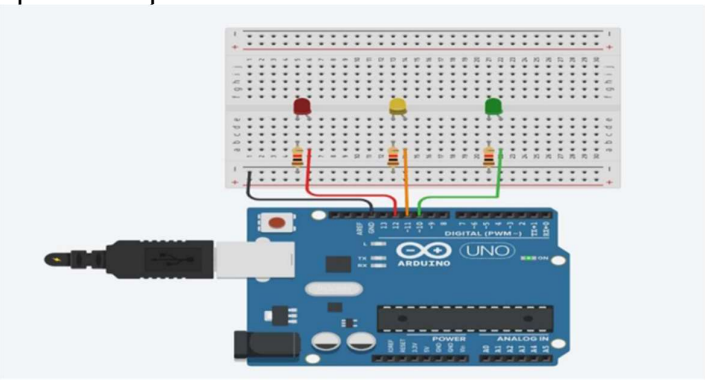
Objectives:
- Learn about interfacing.
- Learn about IoT programming

Software used: Arduino UNO

Hardware used:
- 1 × Breadboard
- 1 × Arduino Uno R3
- 3 × LEDs (Red, Yellow, Green)
- 3 × Jumper

Problem:
Nowadays, everyone prefers a personal vehicle. Hence, the number of vehicles on the roads 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: LEDs are small, powerful lights that are used in many different applications. To start, we will work on blinking an LED, the Hello World of microcontrollers. It is as simple as turning a light on and off. Establishing this important baseline will give you a solid foundation as we work towards experiments that are more complex. Follow the circuit diagram and hook up the components on the breadboard as shown in the image given below:



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Code:

```
int red1 = 10;
int yellow1 = 9;
int green1 = 8;

// Traffic light two
int red2 = 13;
int yellow2 = 12;
int green2 = 11;

void setup () {
// Traffic light one
pinMode (red1, OUTPUT);
pinMode (yellow1, OUTPUT);
pinMode (green1, OUTPUT);

// Traffic light two
pinMode (red2, OUTPUT);
pinMode (yellow2, OUTPUT);
pinMode (green2, OUTPUT);
}
void loop () {
changeLights ();
delay(10000);
}

void changeLights () {
// Both yellow lights turns on
digitalWrite(green1, LOW);
digitalWrite(yellow1, HIGH);
digitalWrite(yellow2, HIGH);
delay (7000);

// turns off both yellow and turns on red1 and green2
digitalWrite(yellow1, LOW);
digitalWrite(red1, HIGH);
digitalWrite(yellow2, LOW);
digitalWrite(red2, LOW);
digitalWrite(green2, HIGH);
```

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```
 delay(7000);

 // both of the yellow lights turns on
 digitalWrite(yellow1, HIGH);
 digitalWrite(yellow2, HIGH);
 digitalWrite(green2, LOW);
 delay(3000);

 // turns off both yellow light and turns on grren1 and red2
 digitalWrite(green1, HIGH);
 digitalWrite(yellow1, LOW);
 digitalWrite(red1, LOW);
 digitalWrite(yellow2, LOW);
 digitalWrite(red2, HIGH);
 delay(7000);
}
```

Result: