AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH

408/1, Kuratoli, Khilkhet, Dhaka 1229,
Bangladesh

Title: Familiarization with microcontroller, study of blink test using and implementation of a traffic control system using microcontrollers

Lab report no: 01 **Date of Submission:** 25-09-2023

Course Title: Microprocessor & Embedded System

Course Code: **Section:** L

Semester: 09 2023-24 **Course Teacher:** PROTIK PARVEZ SHEIKH

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	Total Marks	

Title: Familiarization with microcontroller, study of blink test using and implementation of a traffic control system using microcontrollers

Introduction:

The objectives of this experiment are to-
1. Get familiar with Arduino microcontrollers.
2. Use an Arduino and delay functions to make an LED blink.
3. Implement an LED traffic control system using Arduino.
4. Simulate the microcontroller-based systems using proteus.

Equipment List:

1. Arduino IDE (2.0.1 or any recent version)
2. Arduino Microcontroller board
3. Bread board
4. LED lights (Red, Green, and Yellow)
5. Three 200 Ω resistors
6. Jumper wires

Circuit diagram:

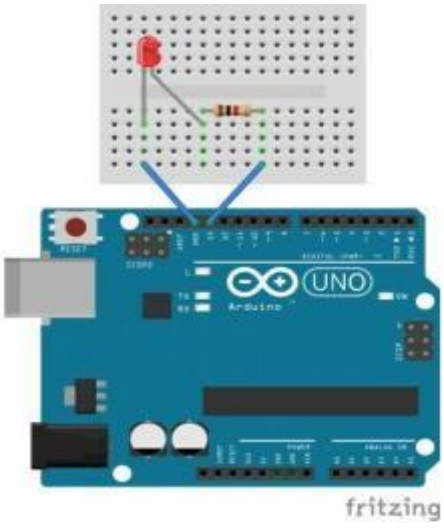


Fig-1: *LED Blink Test using an Arduino Microcontroller Board*

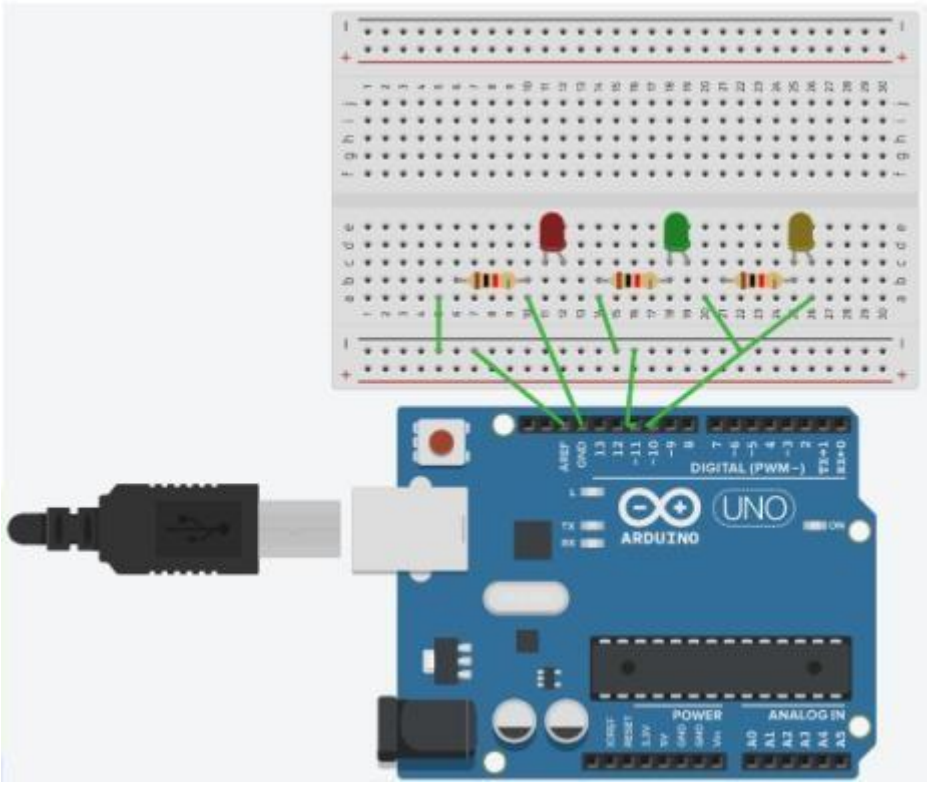


Fig-2: *Traffic Control System using an Arduino Microcontroller Board*

Code/program:

LED Blink

```
int led=13;
void setup () {
  pinMode(led, OUTPUT);
  }

  void loop () {
    digitalWrite (led, HIGH);
    delay (1000);
    digitalWrite (led, LOW);
    delay (1000);
  }
```

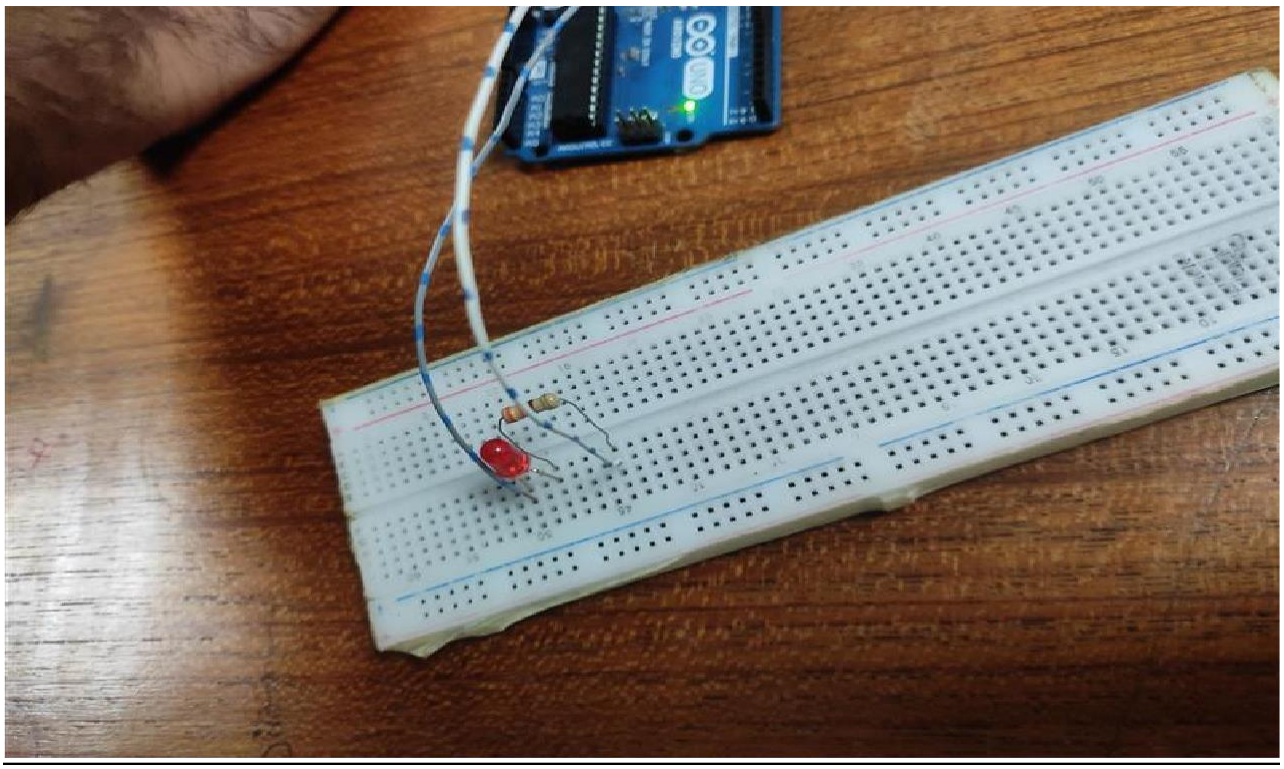
Traffic Control System

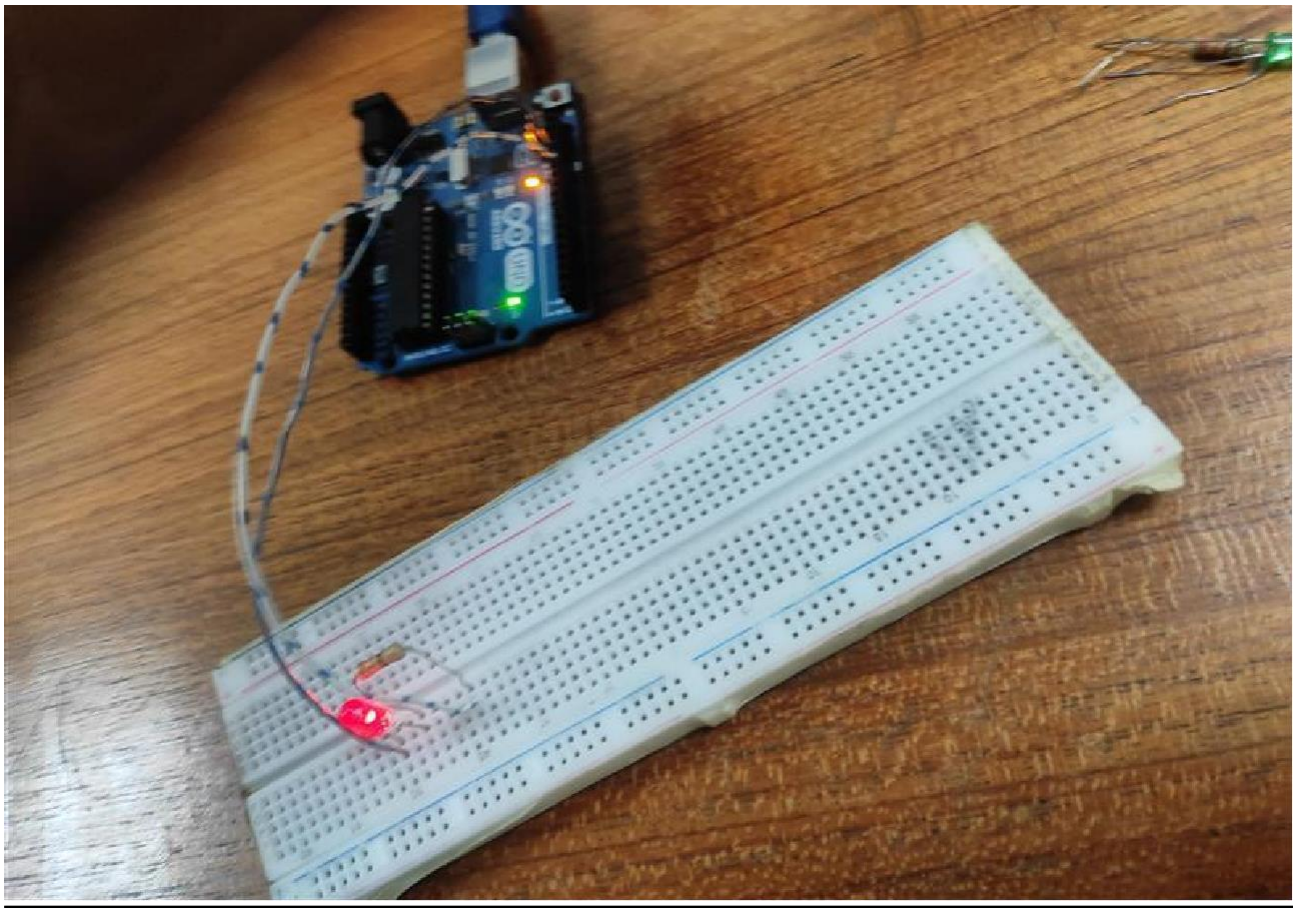
```
#define RED_PIN 8
#define YELLOW_PIN 10
#define GREEN_PIN 12
int red_on = 3000;
int red_yellow_on = 1000;
int green_on = 3000;
int green_blink = 500;
int yellow_on = 1000;
```

```
void setup() {
pinMode(RED_PIN, OUTPUT);
pinMode(YELLOW_PIN, OUTPUT);
pinMode(GREEN_PIN, OUTPUT);
}
void loop() {
digitalWrite(RED_PIN, HIGH);
delay(red_on);
digitalWrite(YELLOW_PIN, HIGH);
delay(red_yellow_on);



digitalWrite(RED_PIN, LOW);
digitalWrite(YELLOW_PIN, LOW);
digitalWrite(GREEN_PIN, HIGH);
delay(green_on);
digitalWrite(GREEN_PIN, LOW);


for(int i = 0; i < 3; i = i+1)
{
delay(green_blink);
digitalWrite(GREEN_PIN, HIGH);
delay(green_blink);
digitalWrite(GREEN_PIN, LOW);
}
digitalWrite(YELLOW_PIN, HIGH);
delay(yellow_on);
digitalWrite(YELLOW_PIN, LOW);
}
```

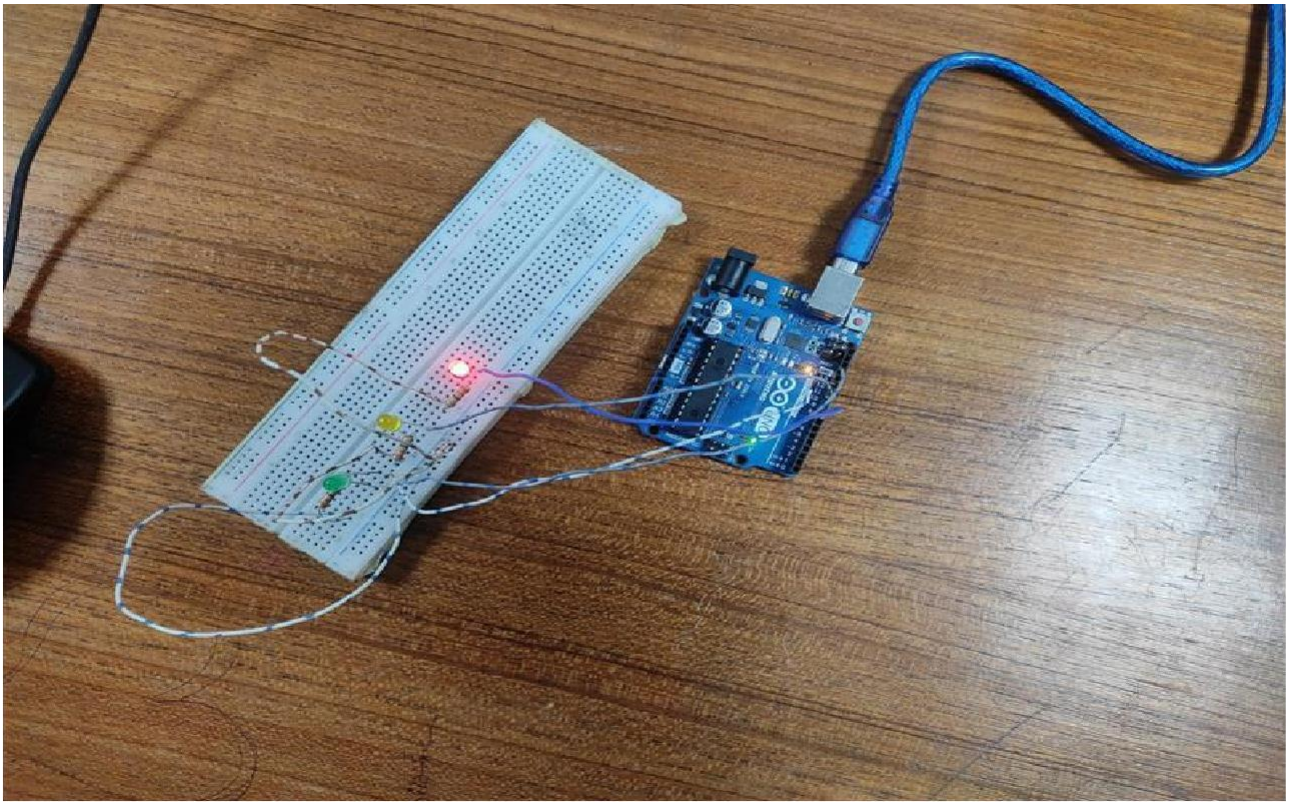
Hardware Implementation:

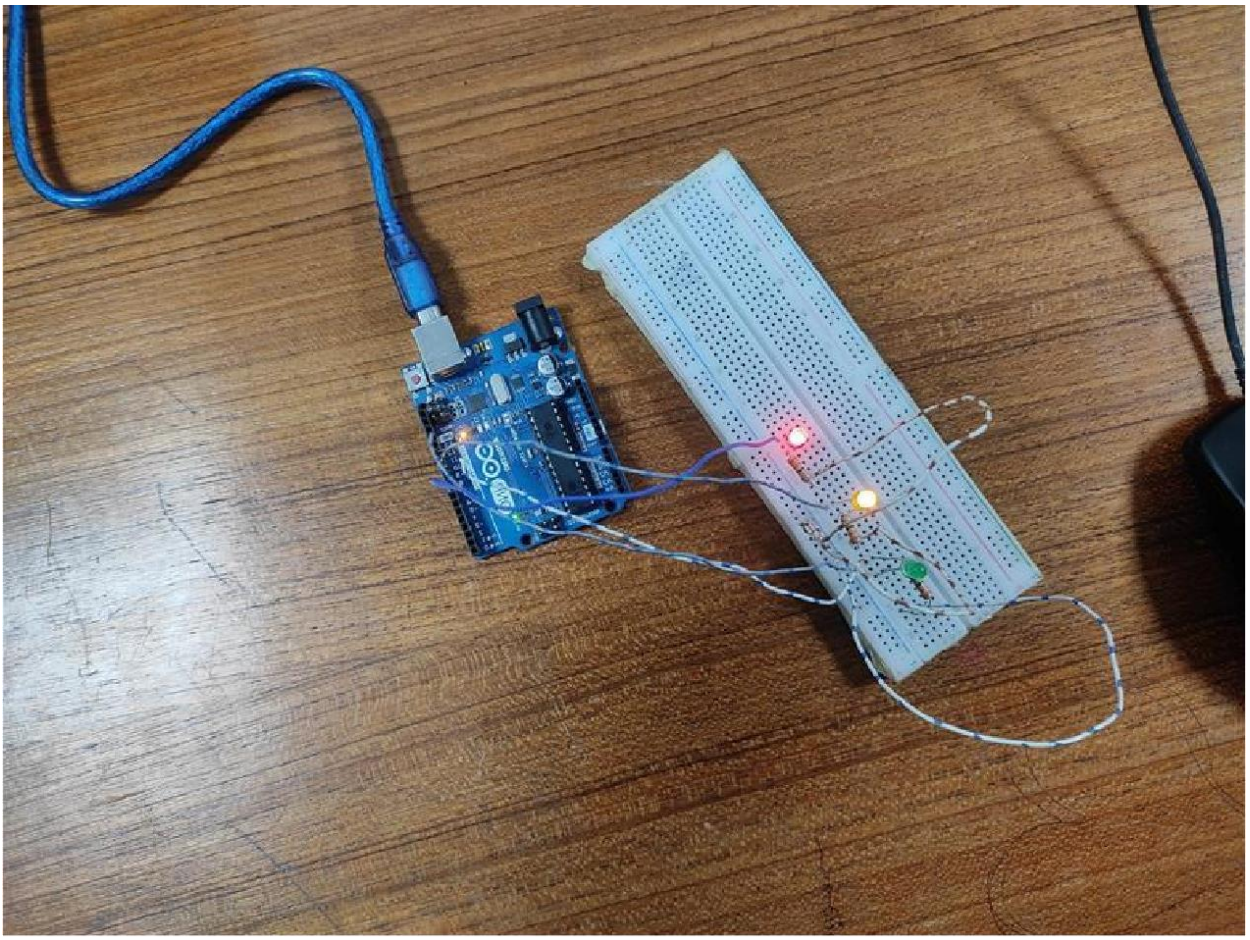
LED Blink Test

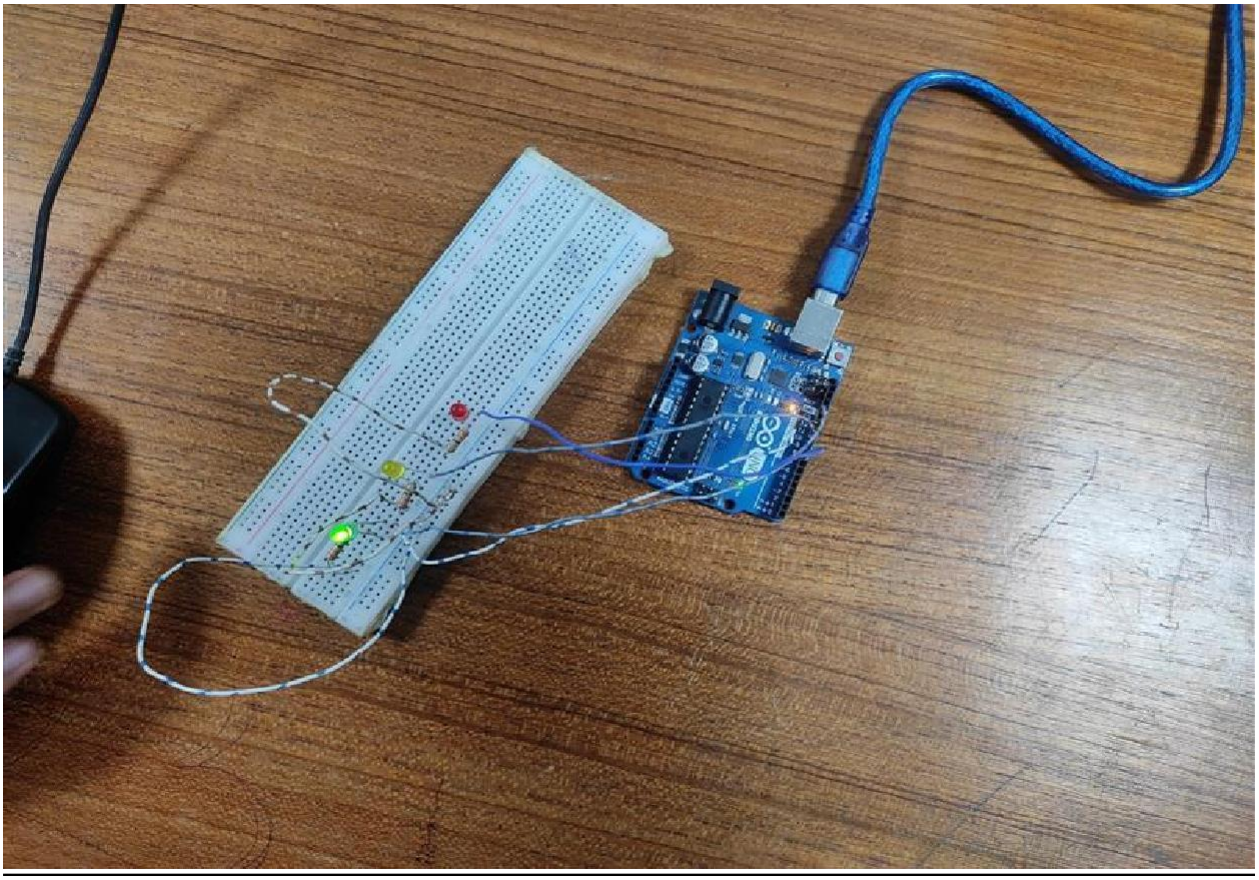


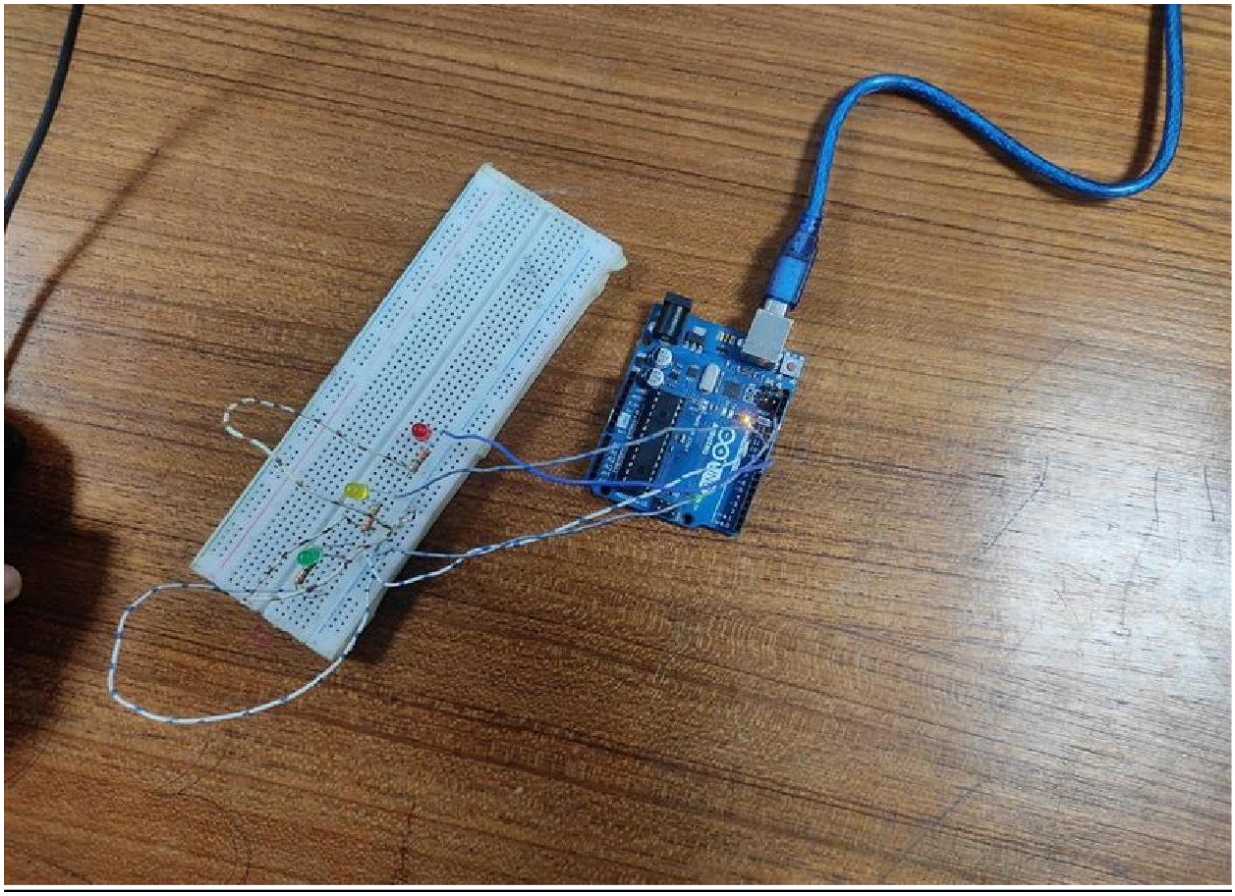


Traffic Control System

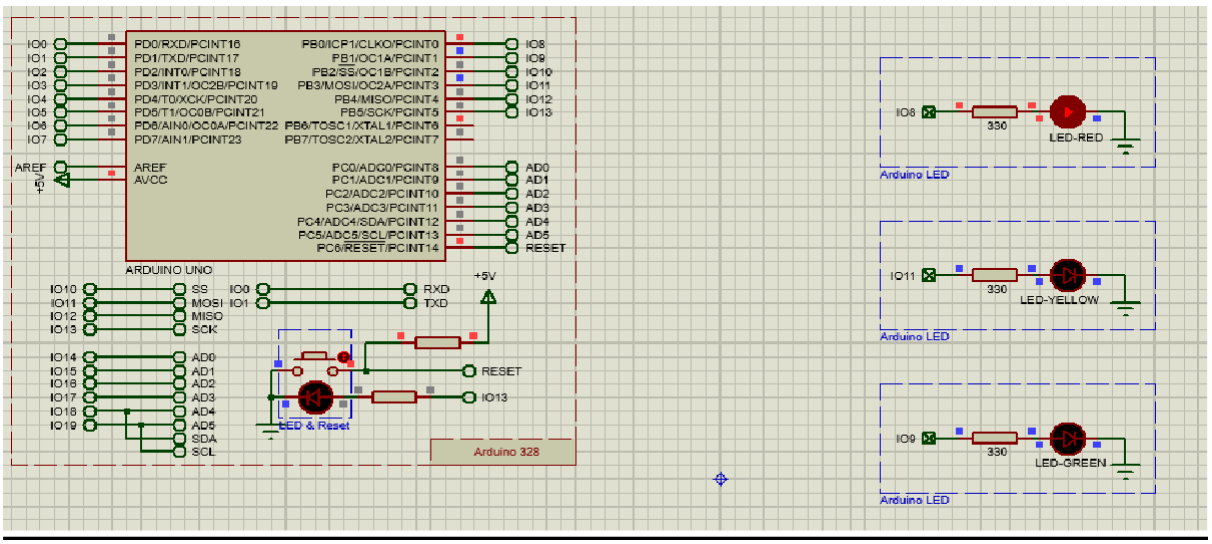


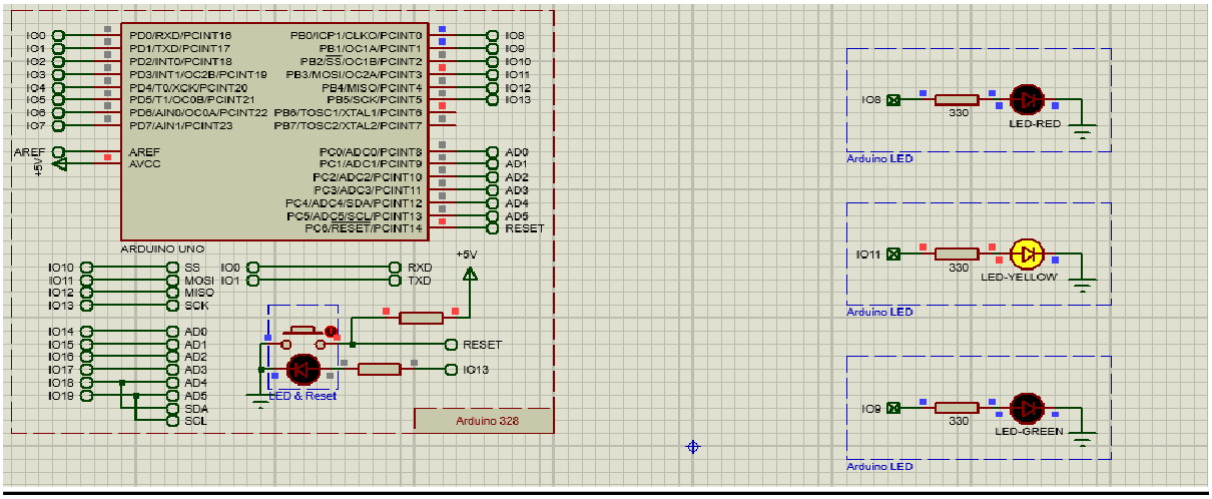






Simulation:


ARDUINO UNO
LED & Reset
Arduino 328
LED-RED
LED-YELLOW
LED-GREEN
330
Arduino LED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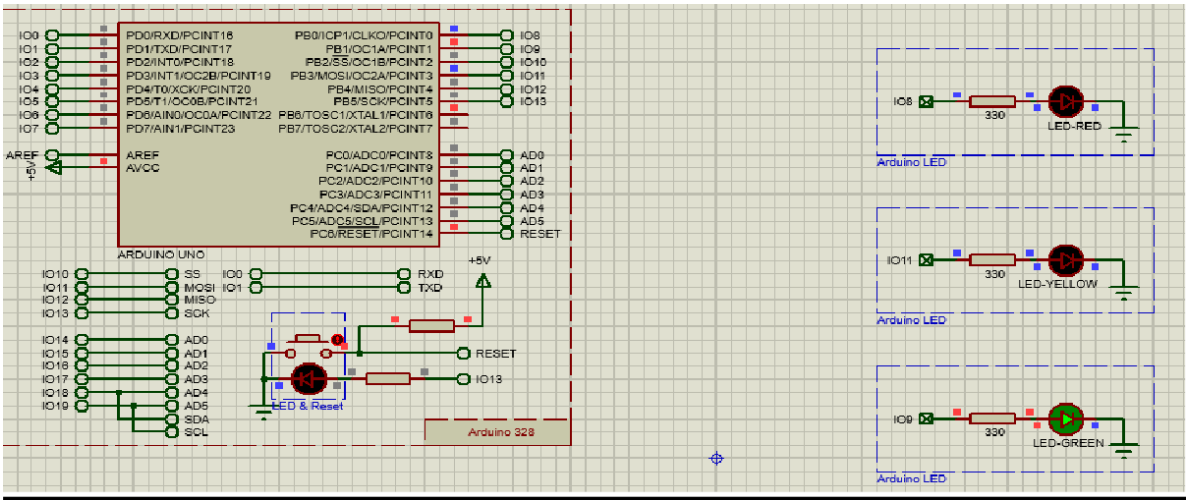
ARDUINO UNO
LED & Reset
Arduino 328
LED-RED
LED-YELLOW
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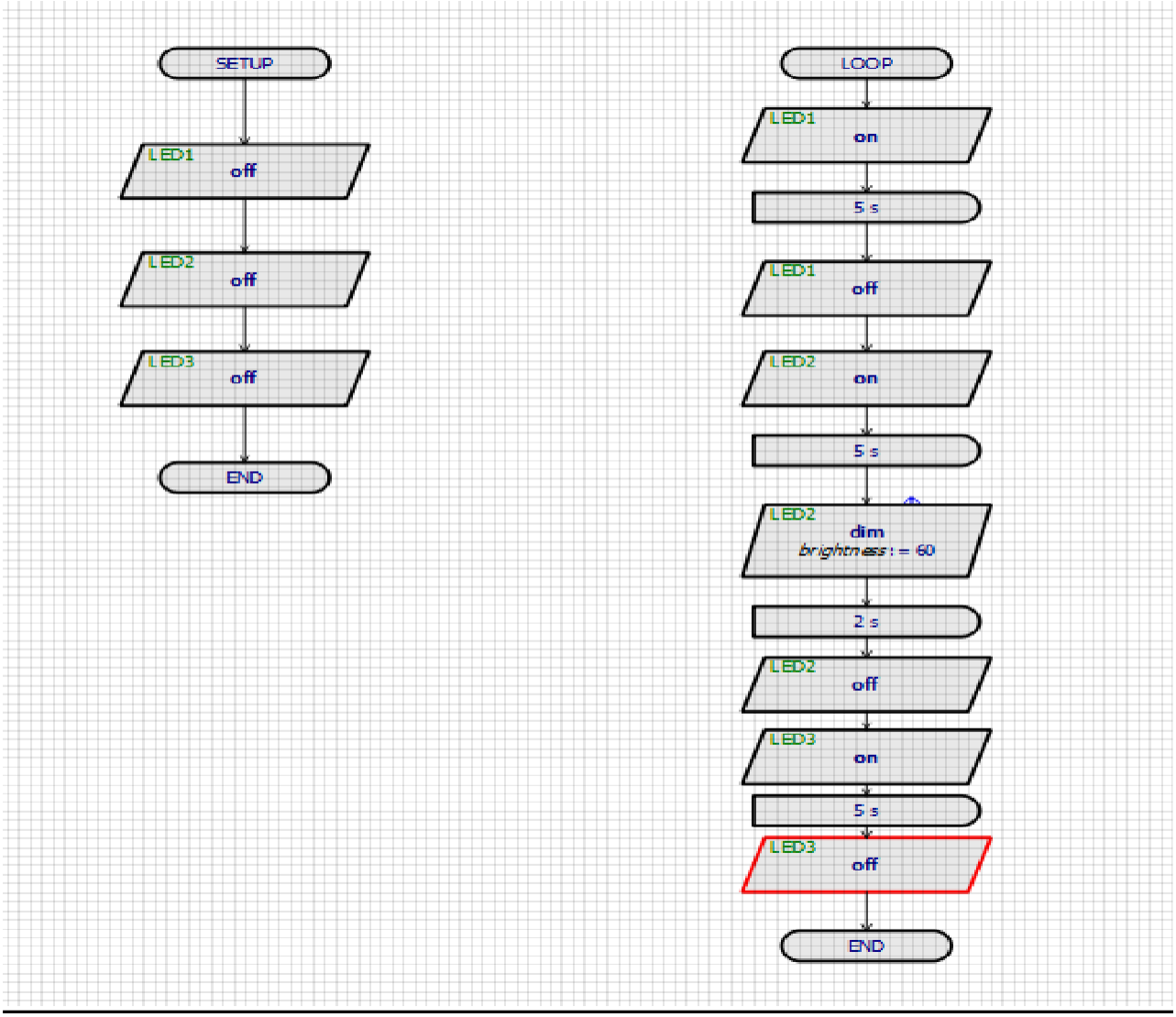
330
Arduino LED

Flowchart



Discussion: The purpose of the experiment was to gain experience with the Arduino IDE software and to create an LED blink using the Arduino platform and its delay functions. Additionally, a traffic control system was built using the Arduino microcontroller. To begin, the code was written in the IDE software and tested on a breadboard circuit. Once confirmed, the code was then transferred to the Arduino board. The experiment was successfully completed without any hardware or code-related issues and produced similar results both in simulation and in real-life testing.

Reference(s):

1) https://www.arduino.cc/.
2) https://www.coursera.org/learn/arduino/lecture/ei4ni/1-10-first-glance-at-a-program
3) Jeremy Blue; Exploring Arduino: Tools and Techniques for Engineering Wizardry