**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

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| **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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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.

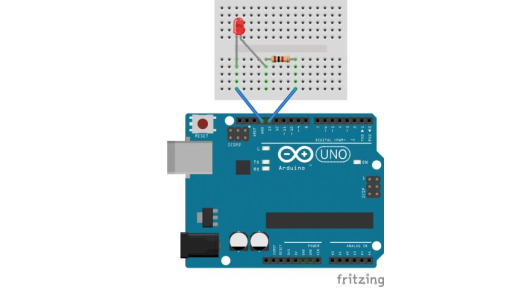
3. Implement an LED traffic control system using Arduino.

4. Simulate the microcontroller-based systems using proteus.

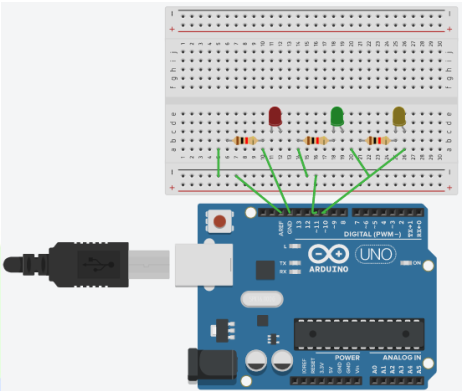
**Equipment List:**

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*

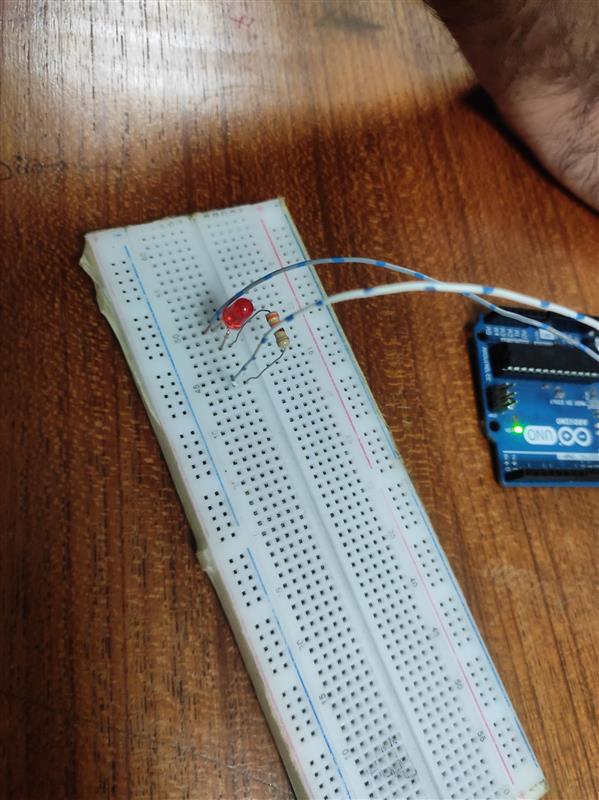
**Code/program:**

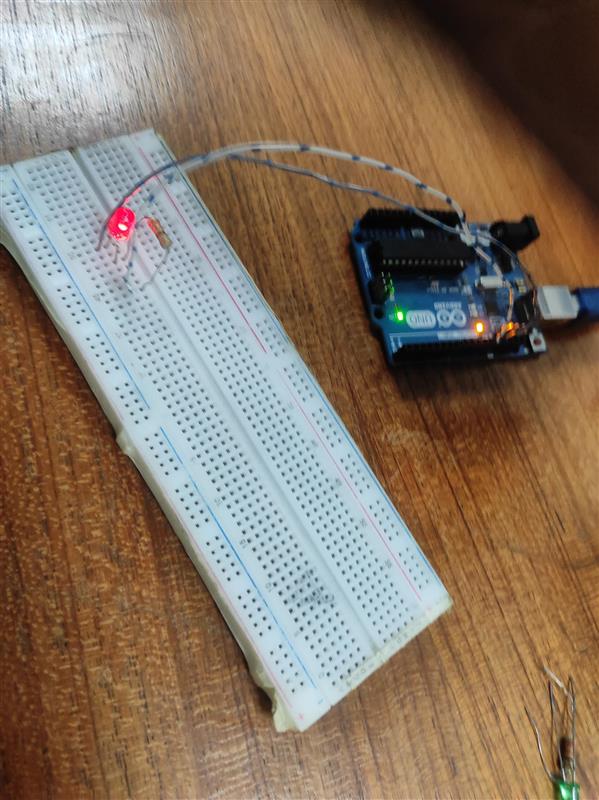
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| **LED Blink** |
| int led=13; void setup () {   pinMode(led, OUTPUT);   }    void loop () {     digitalWrite (led, HIGH);     delay (1000);     digitalWrite (led, LOW);     delay (1000);   } |

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| **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); //to make red LED on delay(red\_on); //to turn yellow LED on digitalWrite(YELLOW\_PIN, HIGH); delay(red\_yellow\_on);    //turning off RED\_PIN and YELLOW\_PIN, and turrning on greenLEd digitalWrite(RED\_PIN, LOW); digitalWrite(YELLOW\_PIN, LOW); digitalWrite(GREEN\_PIN, HIGH); delay(green\_on); digitalWrite(GREEN\_PIN, LOW);    //for turning green Led on and off for 3 times for(int i = 0; i < 3; i = i+1) { delay(green\_blink); digitalWrite(GREEN\_PIN, HIGH); delay(green\_blink); digitalWrite(GREEN\_PIN, LOW); } //for turning on yellow LED digitalWrite(YELLOW\_PIN, HIGH); delay(yellow\_on); digitalWrite(YELLOW\_PIN, LOW); } |

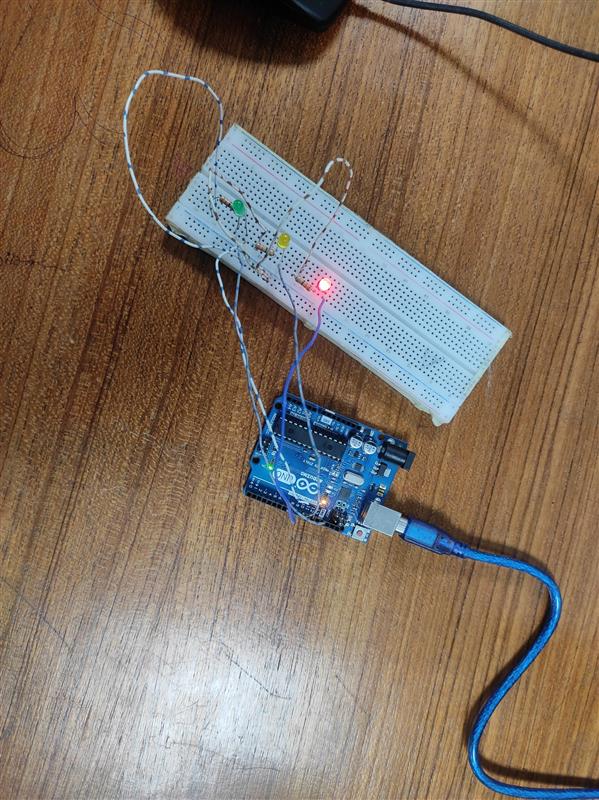
**Hardware Implementation:**

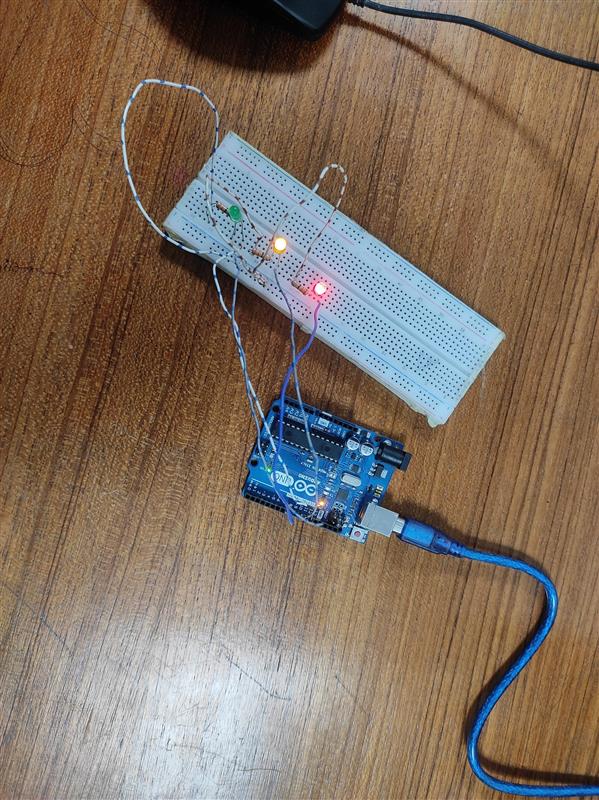
**LED Blink Test**

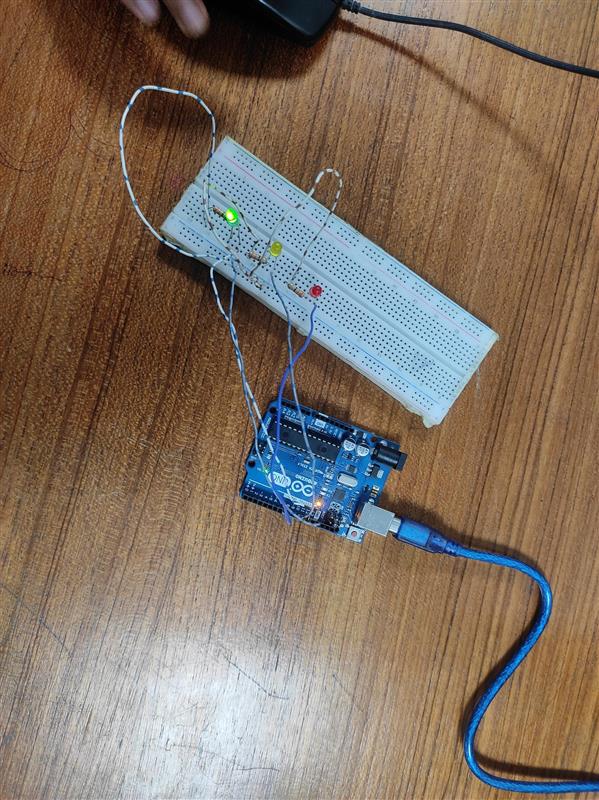
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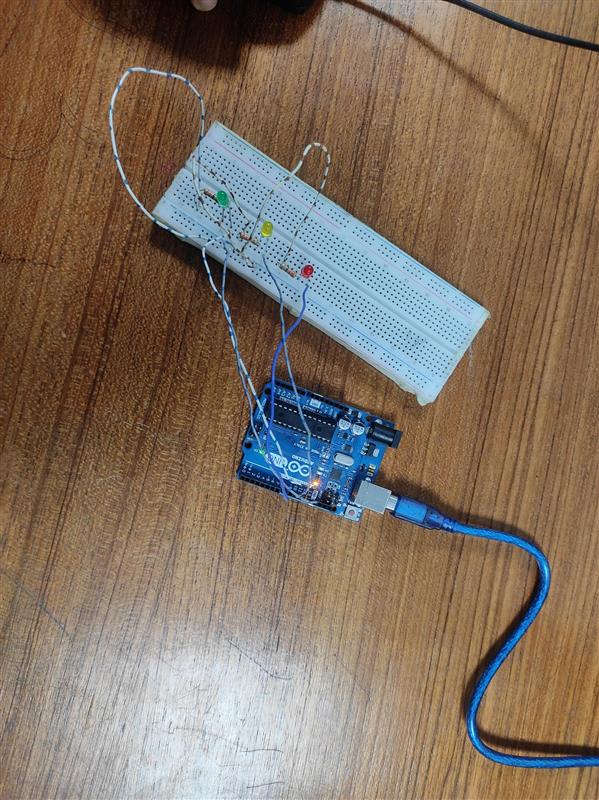
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**Traffic Control System**

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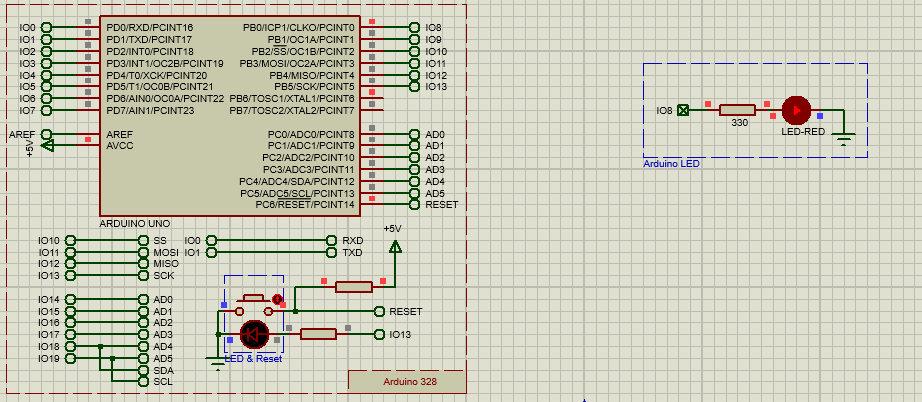
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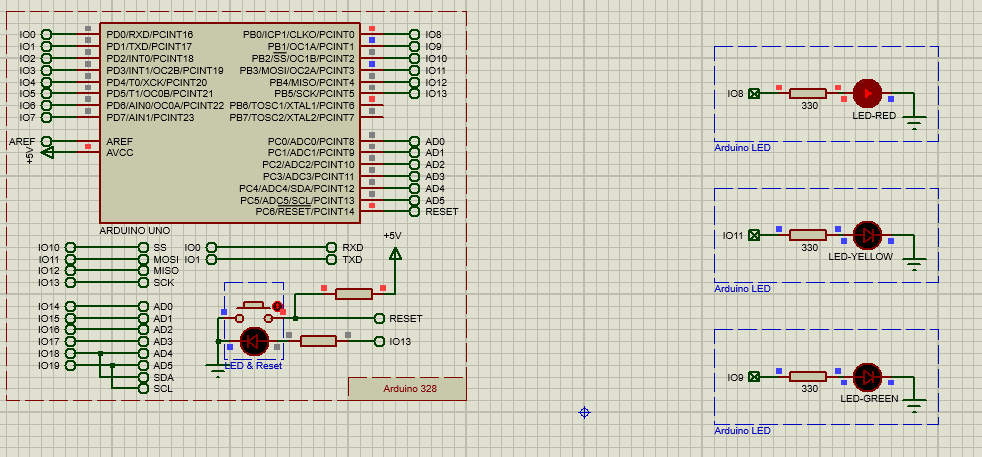
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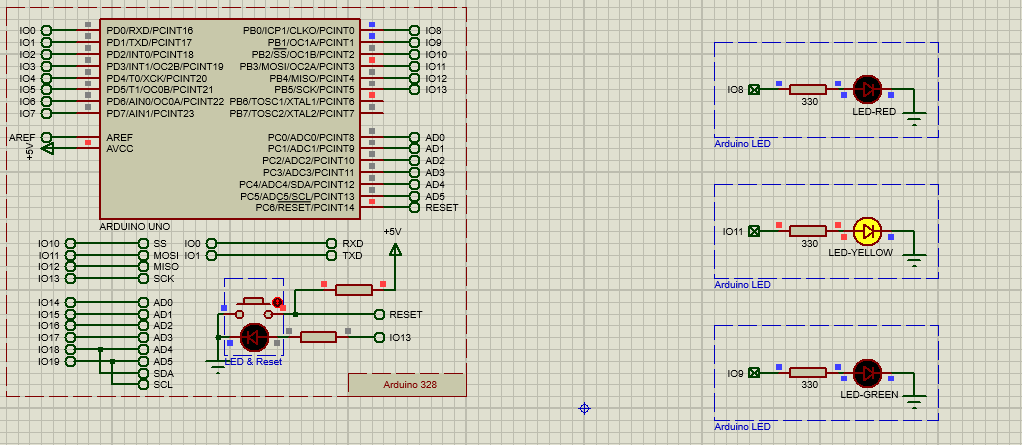
**Simulation:**

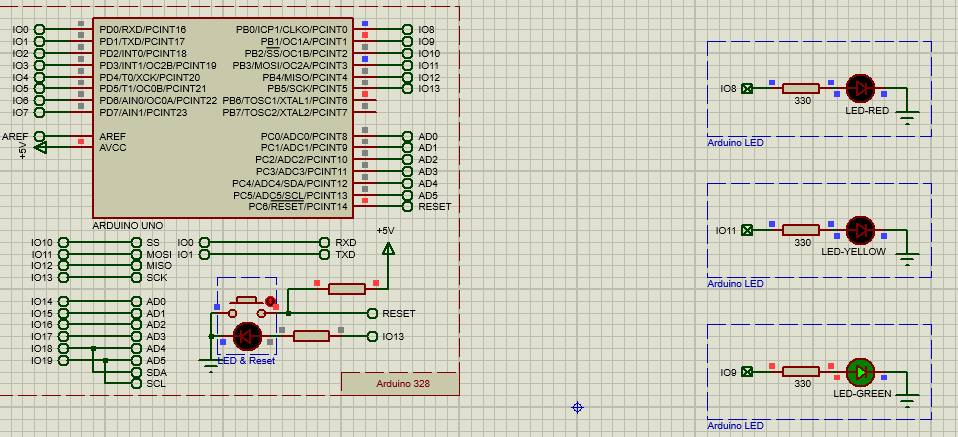
**LED blink**

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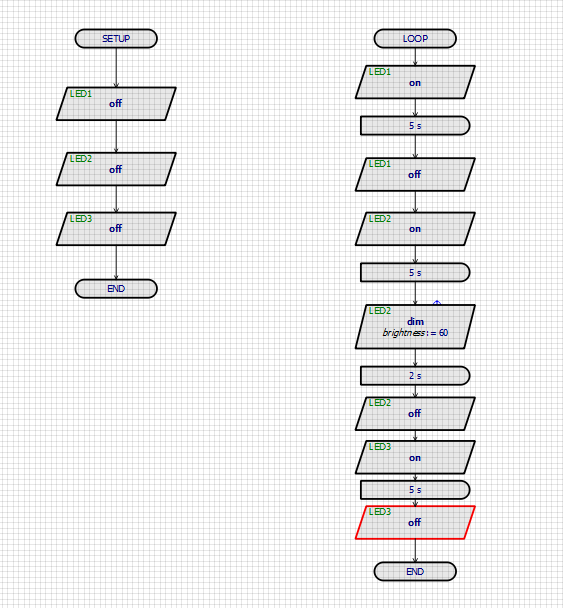
**Traffic Light**

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**Flowchart**

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**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