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**AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)**

**FACULTY OF ENGINEERING**

**MICROPROCESSOR AND EMBEDDED SYSTEMS**

**Fall 2021-2022**

**Section: M**

**Group: B**

**Lab Report No: 02**

## Title:

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

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## Abstract:

From this experiment, our main goal is to make LED blink and traffic control system using Arduino. At first, we have to know about Arduino. Arduino is an open-source platform where can perform different type interactive electronic projects. Here we will make a traffic control system. We will make LED blink using Animated LED model. There will be three types of LED model. They are- red, yellow and green. We will also make a delay function which help to blink the lights after certain times. After performing this experiment through Arduino, it will become a traffic control system.

## Objective:

Our main objective from this experiment is to familiarize with Microcontroller. We need microcontroller because if we give any input using keyboard, microcontroller is required. Here we will be using two approaches to perform this experiment. One is using the Proteus software only and the other is using Proteus and Arduino IDE both. Through these approaches we will know how to perform the traffic control system. We will also gather knowledge how to connect the animated LED model lights, the ground and the default input terminal together and make a traffic control system.

## 4. Results:

### 4.1. Simulation Environment:

Graphical user interface

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Here we have click to New Project.

Graphical user interface

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We have to click next again.

Graphical user interface, application

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After that we have to select Create a schematic from the selected template and click next.

Graphical user interface, application

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Then select Do not create a PCB layout and click next.

Graphical user interface

Description automatically generated

From the three option we have select the Create Firmware Project and Family will be ARDUINO and click next.

Graphical user interface, application

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Then we have to click Finish.

Table

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After that window will appear. It is for the simulation.

Graphical user interface, text, application

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And this window is for the code writing.

### 4.2. Simulation Results:

Chart

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Figure 1: Traffic Control System Circuit Design

This above picture shows the traffic control system using the microcontroller.

Figure 2: Red and green lights are on, yellow light is off

Chart

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Figure 3: Yellow light is on, red and green lights are off

Diagram

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Chart, scatter chart

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Figure 4: Red light is, yellow and green lights are off

Figure 5: Red light is On

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The above simulation is done by using the Arduino IDE and the Proteus Software.

A screenshot of a computer

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Figure 6: Green light is on

Chart

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Figure 7: Red and yellow lights are on

Figure 8: Source code for the simulation

Graphical user interface, text, application

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### 4.3 Discussion:

We have used pin number 12 for green, pin number 10 for yellow and pin number 8 for red, respectively, for led lights. All of them are connected with the ground. As you can see from the pictures above, all the lights turn on and off after certain period of time.

## Lab Task:

#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() {

//ports for connecting LEDs

pinMode(RED\_PIN, OUTPUT);

pinMode(YELLOW\_PIN, OUTPUT);

pinMode(GREEN\_PIN, OUTPUT);

}

void loop() {

//turning on voltage at output red LED

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);

}

## Conclusion:

In this experiment we worked with traffic control system. We have used Proteus 8.12 application as tools. We designed the circuit with the help of and after designing we were able to implement it. We have learned many things from this experiment such as what Arduino is and how it works. How to code in Arduino, designing a circuit that will be helpful for the future.

## 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