**Microprocessor Lab**

Laboratory Activity No. 2

**Arduino and Tinkercad Interface**

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Score

*Submitted by:*

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**Sat 10:00-1:00 / CPE 0412.1-1**

*Date Submitted*

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*Submitted to:*

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I. Objectives

This laboratory activity aims to implement the principles and techniques of hardware programming using Arduino through:

- creating an Arduino programming and circuit diagram.

II. Method/s

- Perform a task problem given in the presentation.

- Write a code and perform an Arduino circuit diagram of a ring counter that display

eight (8) LEDs starting from left.

**Exercise 1: Write a code that does a ring counter display for eight (8) LEDs starting from left.**

**A computer screen shot of a circuit board

Description automatically generated**

Figure No.1 Ring Counter Display Circuit Diagram

**Components Used**

1. 8 LEDs
2. Resistor
3. Breadboard

**CODE:**

A screenshot of a computer program

Description automatically generated

A screenshot of a computer program

Description automatically generatedA screenshot of a computer

Description automatically generated

III. Results

**Tinker Cad Link:**

<https://www.tinkercad.com/things/dplz8dNzVEn-super-hango/editel?sharecode=FAuqxZtjjBMeFbcaoW6-ytw3_Nf5xJJzTuAO5NbXy0U>

A circuit board with wires connected to it

Description automatically generated

**Type Written Code:**

// C++ code

// Ring counter display for eight (8) LEDs

void setup() {

Serial.begin(9600);

pinMode(5,OUTPUT);

pinMode(6,OUTPUT);

pinMode(7,OUTPUT);

pinMode(8,OUTPUT);

pinMode(9,OUTPUT);

pinMode(10,OUTPUT);

pinMode(11,OUTPUT);

pinMode(12,OUTPUT);

}

void loop() {

digitalWrite(12,HIGH);

delay(500);

Serial.println("The LED1 is HIGH");

digitalWrite(12,LOW);

delay(500);

Serial.println("The LED1 is LOW");

digitalWrite(11,HIGH);

delay(500);

Serial.println("The LED1 is HIGH");

digitalWrite(11,LOW);

delay(500);

Serial.println("The LED1 is LOW");

digitalWrite(10,HIGH);

delay(500);

Serial.println("The LED1 is HIGH");

digitalWrite(10,LOW);

delay(500);

Serial.println("The LED1 is LOW");

digitalWrite(9,HIGH);

delay(500);

Serial.println("The LED1 is HIGH");

digitalWrite(9,LOW);

delay(500);

Serial.println("The LED1 is LOW");

digitalWrite(8,HIGH);

delay(500);

Serial.println("The LED1 is HIGH");

digitalWrite(8,LOW);

delay(500);

Serial.println("The LED1 is LOW");

digitalWrite(7,HIGH);

delay(500);

Serial.println("The LED1 is HIGH");

digitalWrite(7,LOW);

delay(500);

Serial.println("The LED1 is LOW");

digitalWrite(6,HIGH);

delay(500);

Serial.println("The LED1 is HIGH");

digitalWrite(6,LOW);

delay(500);

Serial.println("The LED1 is LOW");

digitalWrite(5,HIGH);

delay(500);

Serial.println("The LED1 is HIGH");

digitalWrite(5,LOW);

delay(500);

Serial.println("The LED1 is LOW");

}

IV. Conclusion

*When the provided C++ program is executed, it will create a visually appealing and interactive LED display. The code sets up eight LEDs, and they will light up one after the other in sequence with a half-second interval, creating a clockwise "ring" effect. As each LED turns on, the program will print a message to the Serial monitor indicating that the LED is "HIGH," and when the LED turns off, it will print that it is "LOW." This sequence will continue indefinitely, giving the impression of a rotating light pattern, with each LED briefly illuminating before passing the "light" to the next one. Overall, this code produces a simple yet visually engaging LED ring counter display that can be observed both through the LEDs themselves and in the Serial monitor.*

*In conclusion, the provided C++ code demonstrates a ring counter display for eight LEDs. The program sets up the pins for the LEDs and then repeatedly cycles through them, turning each LED on and off in sequence with a 500-millisecond delay while also printing the LED state to the Serial monitor. This code creates a simple visual and serial output pattern for controlling the LEDs in a ring counter fashion.*

**References**

[1] C. Isidro. ‘Arduino and Tinkercad Interface,’ Pamantasan Lungsod ng Maynila, 2023

[2] “Ring Counter in Digital Logic,” *GeeksforGeeks*, Jun. 26, 2018. https://www.geeksforgeeks.org/ring-counter-in-digital-logic/

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