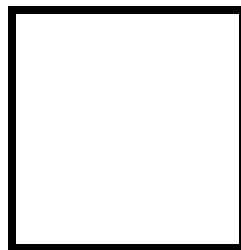**PAMANTASAN NG LUNGSOD NG MAYNILA**

(University of the City of Manila)

Intramuros, Manila

Microprocessor Lab

Laboratory Activity No. 2
Arduino and Tinkercad Interface

Score

Submitted by:
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Sat 10:00AM – 1:00PM / CPE 0412 – 1.1

Date Submitted
DD-MM-YYYY

Submitted to:

Engr. Maria Rizette H. Sayo

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.

III. Results

TinkerCad

https://www.tinkercad.com/things/bXkbUaIcW24-dazzling-amberis/editel?sharecode=rQ_3GXxsU0G7Jg9k5oUfbLqn9SipscXK_bweBBw2_Kg

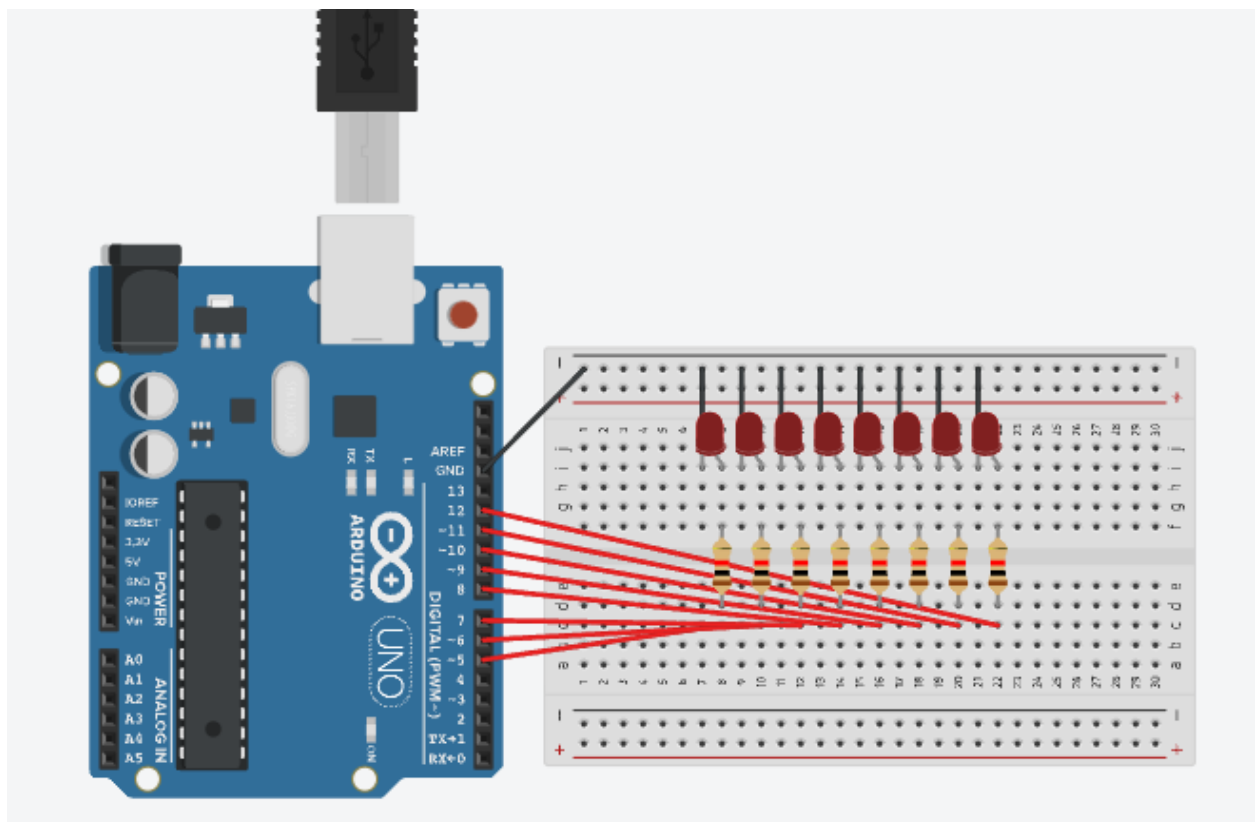**Exercise 1: Write a code that does a ring counter display for eight (8) LEDs starting from left.**

Figure No.1 Ring Counter Display Circuit Diagram

Components Used

1. 8 LEDs
2. Resistor
3. Breadboard

CODE:

```cpp
1  // C++ code
2  //
3  /*
4    Ring counter display for eight (8) LEDs starting from left.
5  */
6
7  void setup()
8  {
9    Serial.begin(9600);
10   pinMode(5, OUTPUT);
11   pinMode(6, OUTPUT);
12   pinMode(7, OUTPUT);
13   pinMode(8, OUTPUT);
14   pinMode(9, OUTPUT);
15   pinMode(10, OUTPUT);
16   pinMode(11, OUTPUT);
17   pinMode(12, OUTPUT);
18 }
19
20 void loop()
21 {
22   digitalWrite(12, HIGH);
23   delay(500);
24   Serial.println("The LED1 is HIGH");
25   digitalWrite(12, LOW);
26   delay(500);
27   Serial.println("The LED1 is LOW");
28
29   digitalWrite(11, HIGH);
30   delay(500);
31   Serial.println("The LED2 is HIGH");
32   digitalWrite(11, LOW);
33   delay(500);
```

```cpp
34   Serial.println("The LED2 is LOW");
35
36   digitalWrite(10, HIGH);
37   delay(500);
38   Serial.println("The LED3 is HIGH");
39   digitalWrite(10, LOW);
40   delay(500);
41   Serial.println("The LED3 is LOW");
42
43   digitalWrite(9, HIGH);
44   delay(500);
45   Serial.println("The LED4 is HIGH");
46   digitalWrite(9, LOW);
47   delay(500);
48   Serial.println("The LED4 is LOW");
49
50   digitalWrite(8, HIGH);
51   delay(500);
52   Serial.println("The LED5 is HIGH");
53   digitalWrite(8, LOW);
54   delay(500);
55   Serial.println("The LED5 is LOW");
56
57   digitalWrite(7, HIGH);
58   delay(500);
59   Serial.println("The LED6 is HIGH");
60   digitalWrite(7, LOW);
61   delay(500);
62   Serial.println("The LED6 is LOW");
63
64   digitalWrite(6, HIGH);
65   delay(500);
66   Serial.println("The LED7 is HIGH");
```

IV. Results
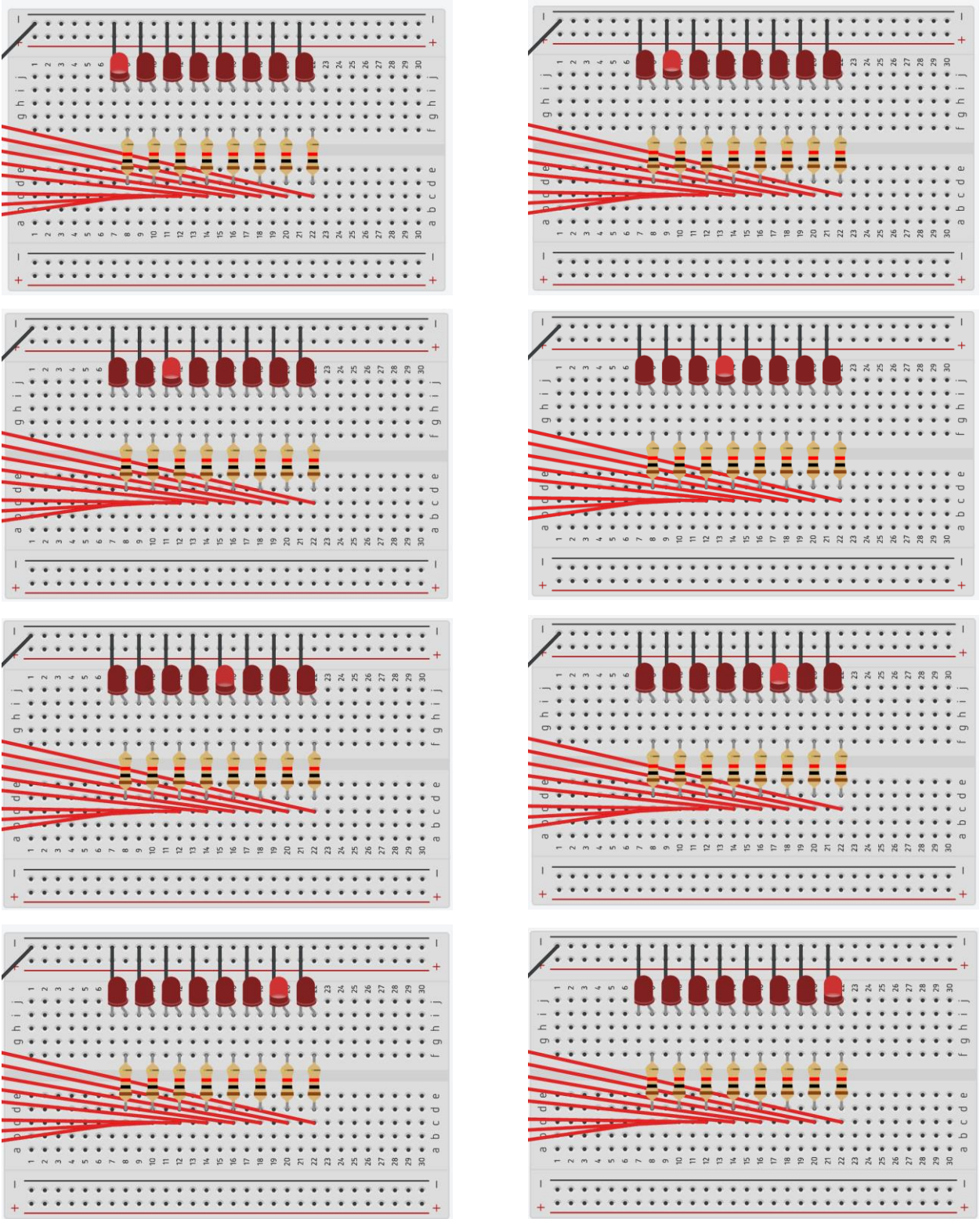
V. Conclusion

In conclusion, this laboratory experiment successfully achieved its objectives of implementing hardware programming principles and techniques using Arduino. The experiment involved the creation of an Arduino programming code and a corresponding circuit diagram. Specifically, the experiment focused on designing a ring counter circuit that displayed eight LEDs starting from the left. Through the defined methods, participants were able to perform the required task problem presented in the instructions.

This hands-on experience provided valuable insights into the practical application of Arduino in hardware programming, allowing participants to gain proficiency in coding and circuit design. By successfully creating a functional ring counter circuit, participants not only demonstrated their understanding of Arduino programming but also developed essential skills for future electronics and microcontroller-based projects. Overall, this experiment served as an effective learning tool, enabling students to bridge the gap between theoretical knowledge and practical implementation in the field of hardware programming with Arduino.

References

[1] D.J.D. Sayo. "University of the City of Manila Computer Engineering Department Honor Code," PLM-CpE Departmental Policies, 2020.

[2] Ring counter in digital logic. (2023) Retrieved from: https://www.geeksforgeeks.org/ring-counter-in-digital-logic/