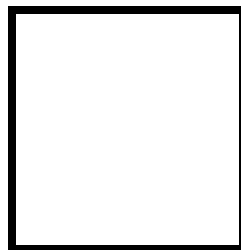**PAMANTASAN NG LUNGSOD NG MAYNILA**

(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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<Saturday 10:00a-1:00p > / <CPE 0412.1-1>

Date Submitted
30-09-2023

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.

III. Results

TinkerCad

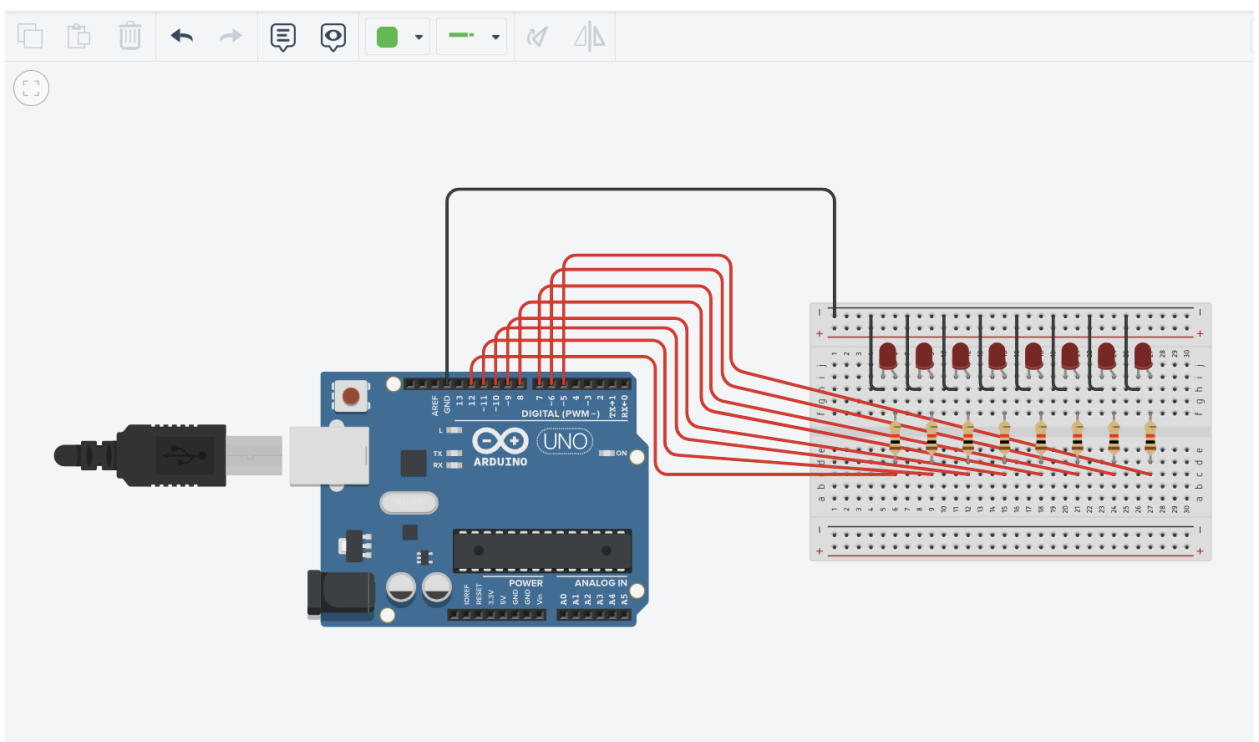**Exercise 1: Write a code that does a ring counter display for eight (8) LEDs starting from left.**

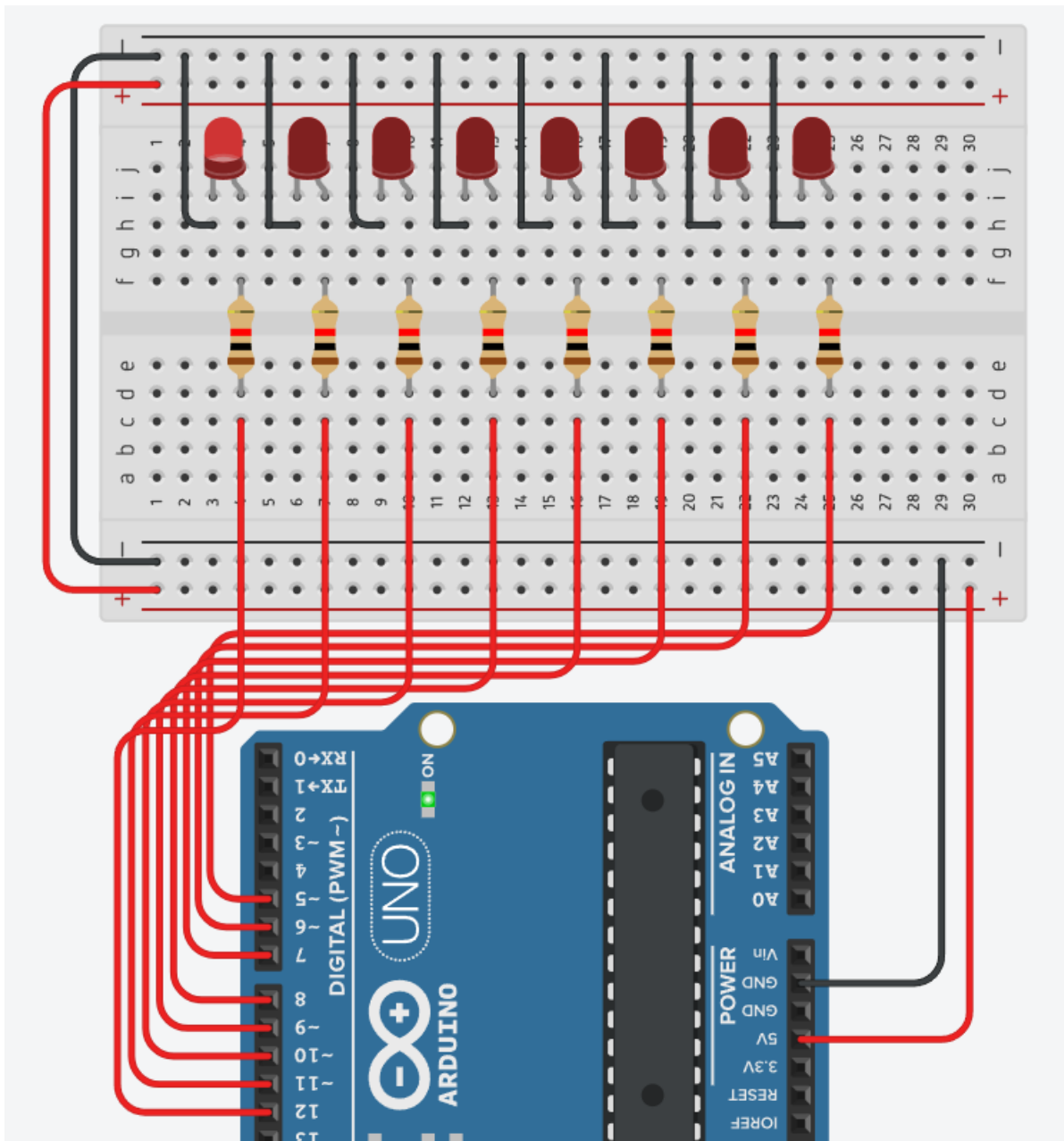Figure No.1 Ring Counter Display Circuit Diagram

Figure No.2 Own simulation in TinkerCad

Components Used

1. 8 LEDs
2. Resistor
3. Breadboard

CODE:

```
//Ring counter display for eight
(LEDs starting from left.
/

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); // Wait for 500 millisecond(s)
  digitalWrite(12, LOW);
  delay(500); // Wait for 500 millisecond(s)

  digitalWrite(11, HIGH);
  delay(500); // Wait for 500 millisecond(s)
  digitalWrite(11, LOW);
  delay(500); // Wait for 500 millisecond(s)

  digitalWrite(10, HIGH);
  delay(500); // Wait for 500 millisecond(s)
  digitalWrite(10, LOW);
  delay(500); // Wait for 500 millisecond(s)

  digitalWrite(9, HIGH);
  delay(500); // Wait for 500 millisecond(s)
  digitalWrite(9, LOW);
  delay(500); // Wait for 500 millisecond(s)

  digitalWrite(8, HIGH);
  delay(500); // Wait for 500 millisecond(s)
  digitalWrite(8, LOW);
  delay(500); // Wait for 500 millisecond(s)

  digitalWrite(7, HIGH);
  delay(500); // Wait for 500 millisecond(s)
  digitalWrite(7, LOW);
  delay(500); // Wait for 500 millisecond(s)
```

digitalWrite(6, HIGH);

delay(500); // Wait for 500 millisecond(s)

digitalWrite(6, LOW);

delay(500); // Wait for 500 millisecond(s)

digitalWrite(5, HIGH);

delay(500); // Wait for 500 millisecond(s)

digitalWrite(5, LOW);

delay(500); // Wait for 500 millisecond(s)

}

```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);
```

```
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. Conclusion

Eight LEDs are used by the Arduino code to create a ring counter display. The required pins are initialized as OUTPUT, and after that, the loop() code begins an indefinite loop. Starting with the leftmost LED (attached to pin 5) and going towards the right (up to pin 12), each LED inside the loop is turned on one at a time. Each LED is illuminated for 500 ms before going out. The LEDs appear to move in a circular pattern as a result of the endless repetition of this sequence.

References

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