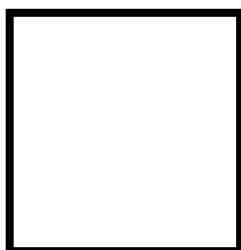**PAMANTASAN NG LUNGSOD NG MAYNILA**

(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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S 10:00am-1:00pm / CPE 0412.1-1

Date Submitted
11-11-2023

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 displays 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.
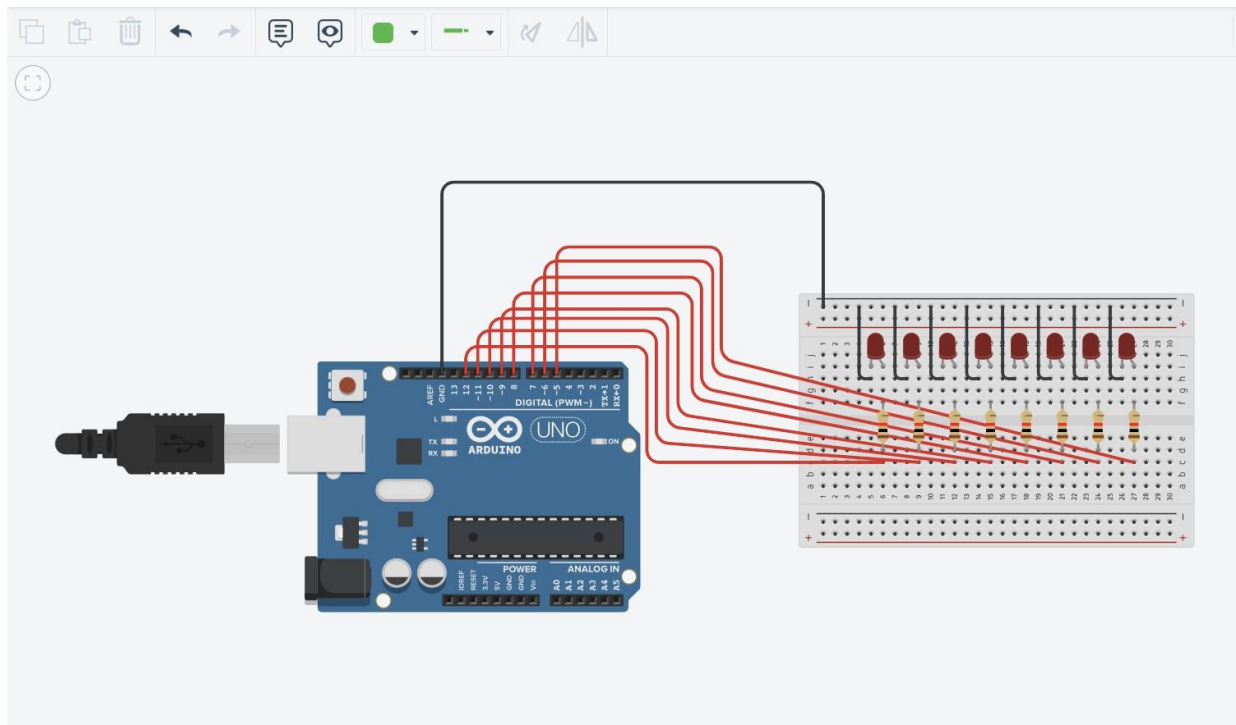

Figure No.1 Ring Counter Display Circuit Diagram

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);
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");
67    digitalWrite(6, LOW);
68    delay(500);
69    Serial.println("The LED7 is LOW");
70
71    digitalWrite(5, HIGH);
72    delay(500);
73    Serial.println("The LED8 is HIGH");
74    digitalWrite(5, LOW);
75    delay(500);
76    Serial.println("The LED8 is LOW");
77
78  }
```
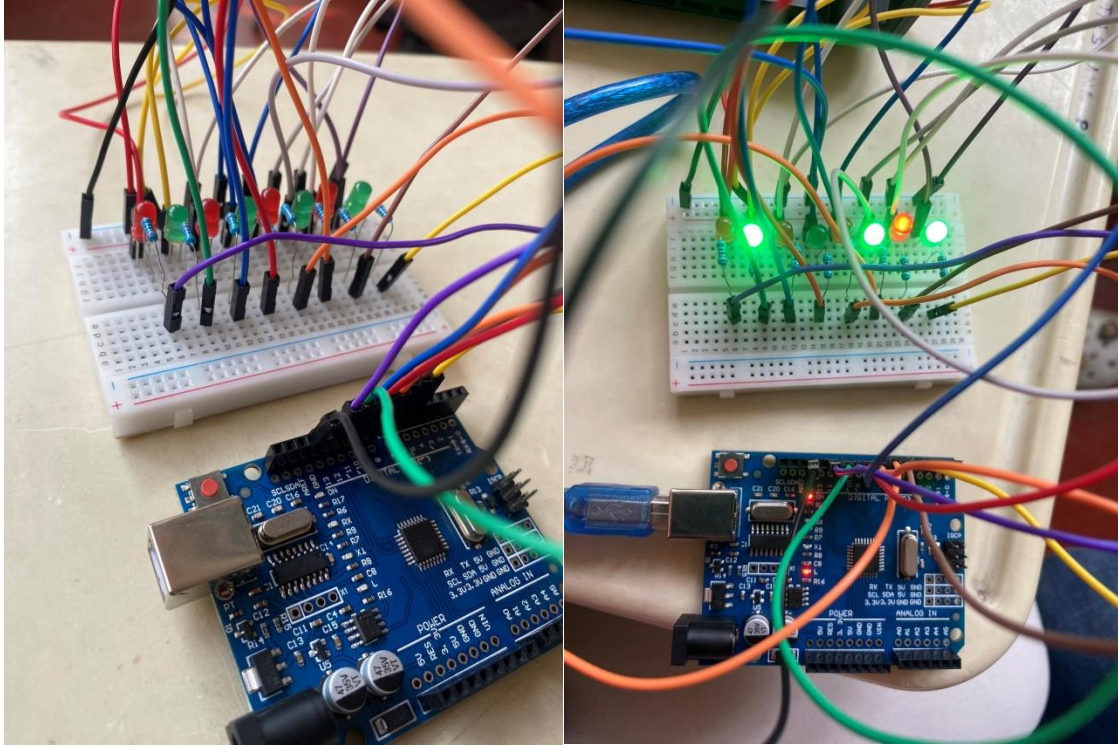
Actual Implementation:

Figure No.2 Actual Ring Counter Display

IV. Conclusion

Using the Tinkercad interface, I recreated a ring counter display of 8 LEDs, provided in the circuit diagram and given code on the laboratory paper. I learned how to build and simulate the circuit in Tinkercad before programming using a virtual Arduino. The ring counter display functioned properly. The LEDs were turned on one at a time, starting from the left and ending on the right. The LEDs were then turned off in reverse order, beginning on the left and ending on the right. I also learned how to use Arduino functions like digitalWrite() and delay() to control the LEDs. I also learned how to iterate over the LEDs and switch them on and off in sequence using a for loop. Overall, this laboratory activity was a great way to learn. I learned how to build, simulate, and program a ring counter display using Arduino and Tinkercad. I also learned how to control LEDs using a variety of Arduino functions.

References

[1] Marian, P. (2022). Arduino 8 bit Binary LED Counter. Electro Schematics. https://www.electroschematics.com/arduino-8-bit-binary-led/

[2] Sanhkla, M. (2022). Basics of Arduino Tinkercad. Studocu. https://www.studocu.com/ph/document/new-era-university/computer-systemsengineering/basics-of-arduino-tinkercad/54731034