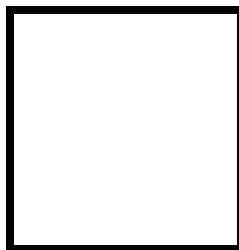




PAMANTASAN NG LUNGSOD NG MAYNILA
(University of the City of Manila)
Intramuros, Manila

Microprocessor Lab

Laboratory Activity No. 2
Arduino and Tinkercad Interface



Score

Submitted by:
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Sat 1:00 PM-4:00 PM / CPE 0412-1.2

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.

III. Results

TinkerCad

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

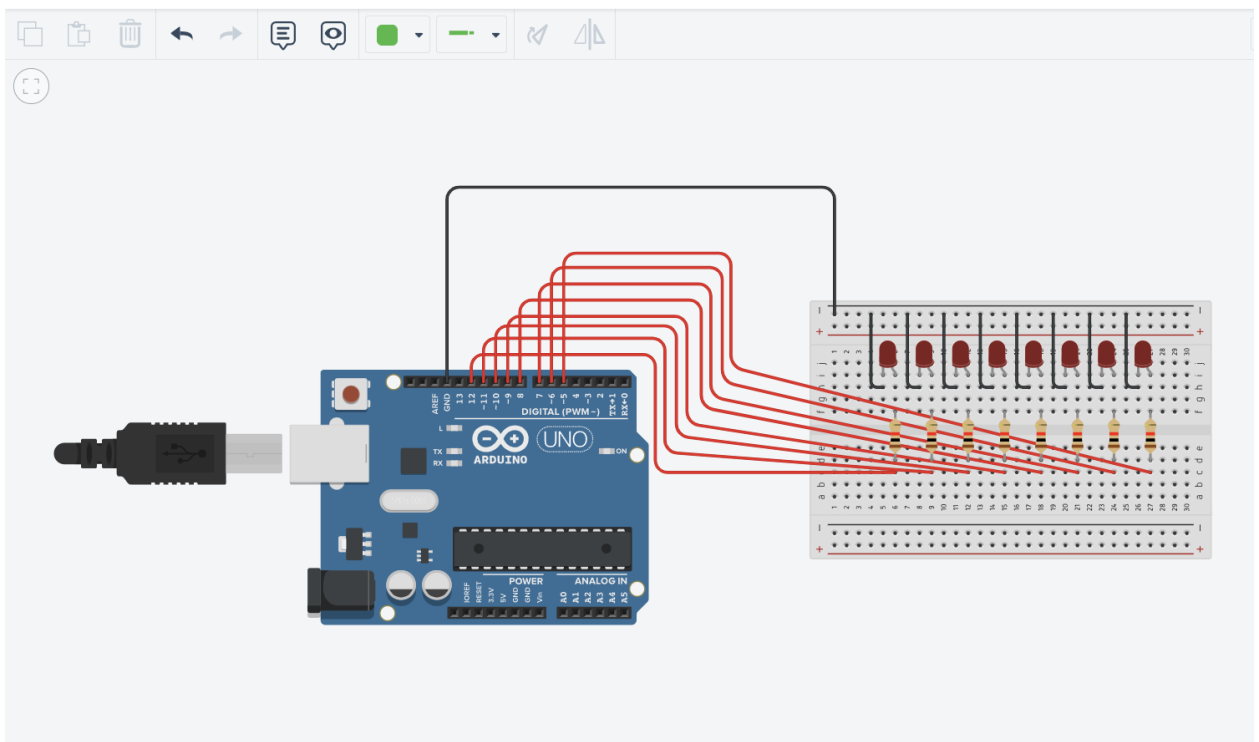


Figure No.1 Ring Counter Display Circuit Diagram

Components Used

1. 8 LEDs
2. Resistor
3. Breadboard

CODE:

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

```

IV. Conclusion

In conclusion, the main focus of the lab activity is building an eight-LED ring counter display using Tinkercad. In order to create a cyclic sequence, this involves using a digital counter called a ring counter. With each clock pulse in a ring counter, the output state changes to the following bit position. A digital circuit containing an eight-LED ring counter, a breadboard, an Arduino, and resistors was built using Tinkercad. The LEDs were showcased and switched between their on and off states using programming codes. In addition to introducing students to the idea of ring counters, this hands-on exercise also gives them experience creating and simulating digital circuits. Anyone interested in digital electronics must comprehend how ring counters work and how they are used because they are a crucial component of many different digital systems.

References

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

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