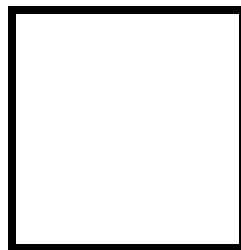




PAMANTASAN NG LUNGSOD NG MAYNILA
(University of the City of Manila)
Intramuros, Manila

Microprocessor Lab

Laboratory Activity No. 2
Arduino and Tinkercad Interface



Score

Submitted by:
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Saturday, 1-4 PM/ CPE 0412. 1-2

Date Submitted
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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.

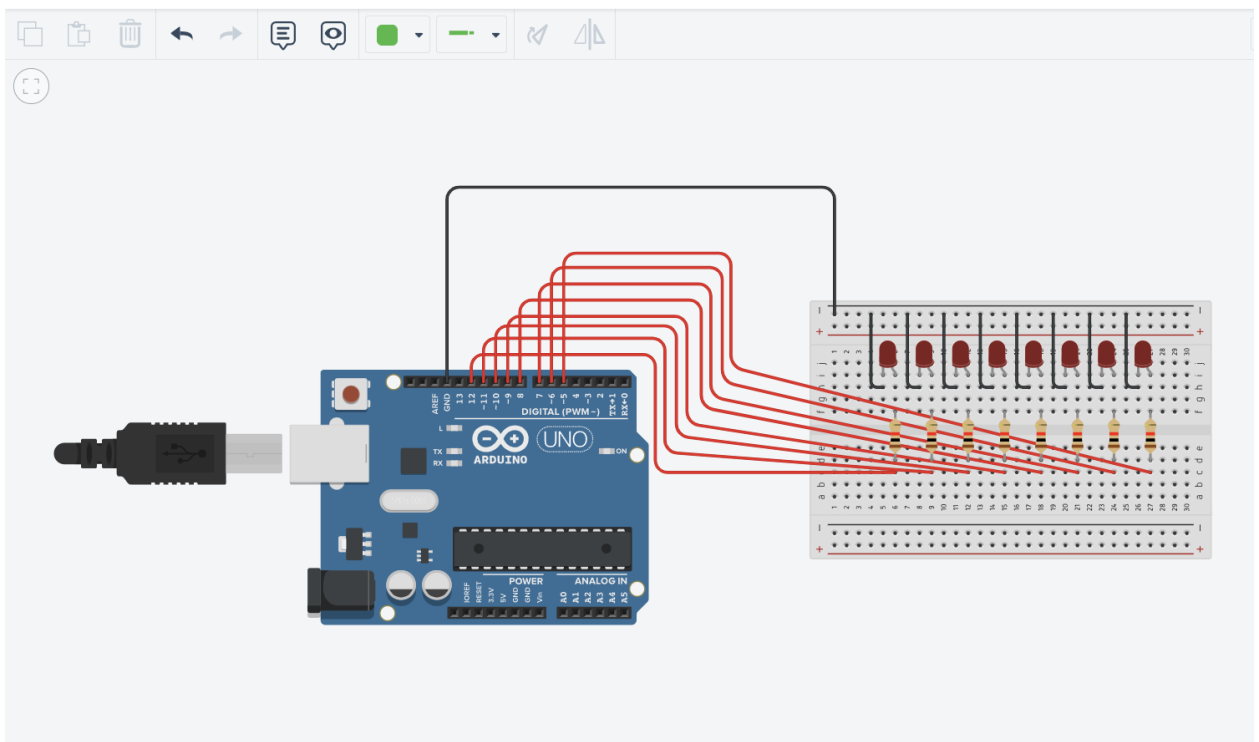


Figure No.1 Ring Counter Display Circuit Diagram

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     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 }
```

RESULT:

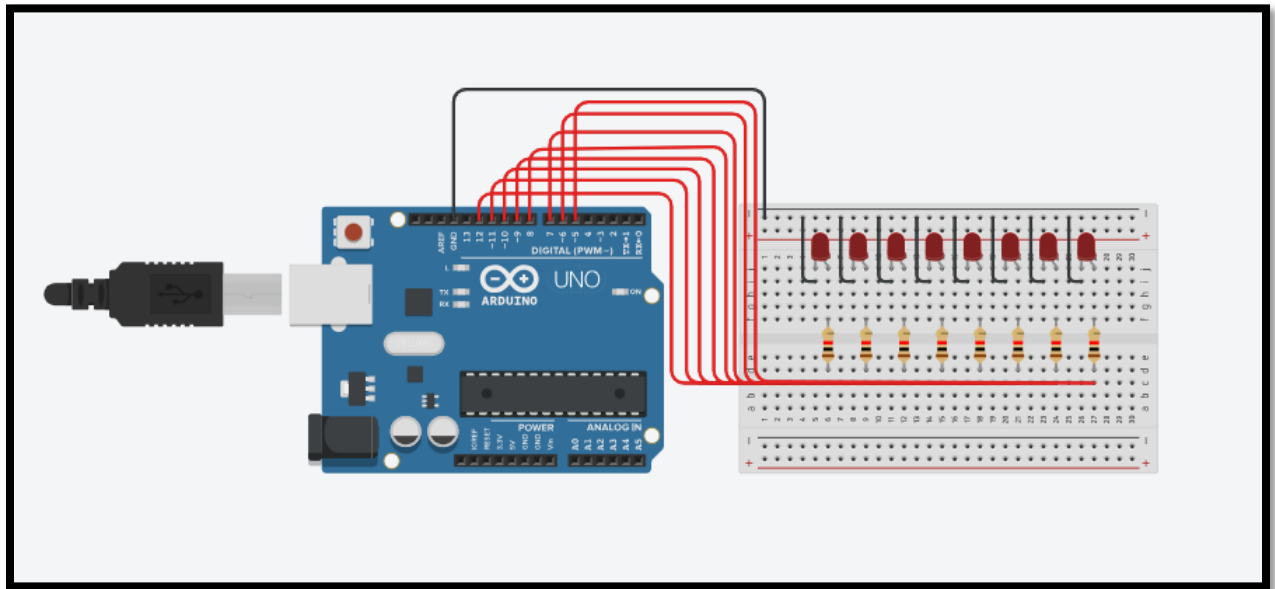


Figure 2. Ring Counter Display Circuit Diagram

CODE:

```
// Marquez, Kert Justine D.
// CPE 0412. 1-2
// LABORATORY 2: Arduino Tinkercad Interface

void setup()
{
  // To start the bit funtion of the arduino at rate of 9600
  Serial.begin(9600);
  // To Initialize the pin numbers of the led
  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 1000 millisecond(s)
  Serial.println("The LED1 is HIGH");
  digitalWrite(12, LOW);
  Serial.println("The LED1 is LOW");
}
```

```
delay(500); // Wait for 1000 millisecond(s)
```

```
digitalWrite(11, HIGH);  
delay(500); // Wait for 1000 millisecond(s)  
Serial.println("The LED2 is HIGH");  
digitalWrite(11, LOW);  
Serial.println("The LED2 is LOW");  
delay(500); // Wait for 1000 millisecond(s)
```

```
digitalWrite(10, HIGH);  
delay(500); // Wait for 1000 millisecond(s)  
Serial.println("The LED3 is HIGH");  
digitalWrite(10, LOW);  
Serial.println("The LED3 is LOW");  
delay(500); // Wait for 1000 millisecond(s)
```

```
digitalWrite(9, HIGH);  
delay(500); // Wait for 1000 millisecond(s)  
Serial.println("The LED4 is HIGH");  
digitalWrite(9, LOW);  
Serial.println("The LED4 is LOW");  
delay(500); // Wait for 1000 millisecond(s)
```

```
digitalWrite(8, HIGH);  
delay(500); // Wait for 1000 millisecond(s)  
Serial.println("The LED5 is HIGH");  
digitalWrite(8, LOW);  
Serial.println("The LED5 is LOW");  
delay(500); // Wait for 1000 millisecond(s)
```

```
digitalWrite(7, HIGH);  
delay(500); // Wait for 1000 millisecond(s)  
Serial.println("The LED6 is HIGH");  
digitalWrite(7, LOW);  
Serial.println("The LED6 is LOW");  
delay(500); // Wait for 1000 millisecond(s)
```

```
digitalWrite(6, HIGH);  
delay(500); // Wait for 1000 millisecond(s)  
Serial.println("The LED7 is HIGH");  
digitalWrite(6, LOW);  
Serial.println("The LED7 is LOW");  
delay(500); // Wait for 1000 millisecond(s)
```

```
digitalWrite(5, HIGH);  
delay(500); // Wait for 1000 millisecond(s)  
Serial.println("The LED8 is HIGH");  
digitalWrite(5, LOW);  
delay(500); // Wait for 1000 millisecond(s)  
Serial.println("The LED8 is LOW");  
}
```

IV. Conclusion

The laboratory Experiment 2 concentrated on the relationship between Arduino programming and the construction of a ring counter display graphic. This demonstration demonstrates the practical use of Arduino technology and eight red LEDs, each with a 1k resistor, to make a simple counter. The entire system was effectively managed by constructed code, demonstrating the connection between hardware and software components in delivering the necessary display and counting capability.

References

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