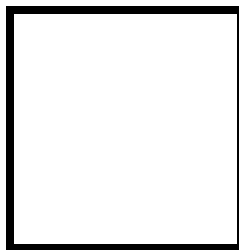




PAMANTASAN NG LUNGSOD NG MAYNILA
(University of the City of Manila)
Intramuros, Manila

Microprocessor Lab

Laboratory Activity No. 2
Arduino and Tinkercad Interface



Score

Submitted by:
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Saturday 10:00 AM to 1:00 PM / CPE 0412.1-1

Date Submitted
30-09-2023

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

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

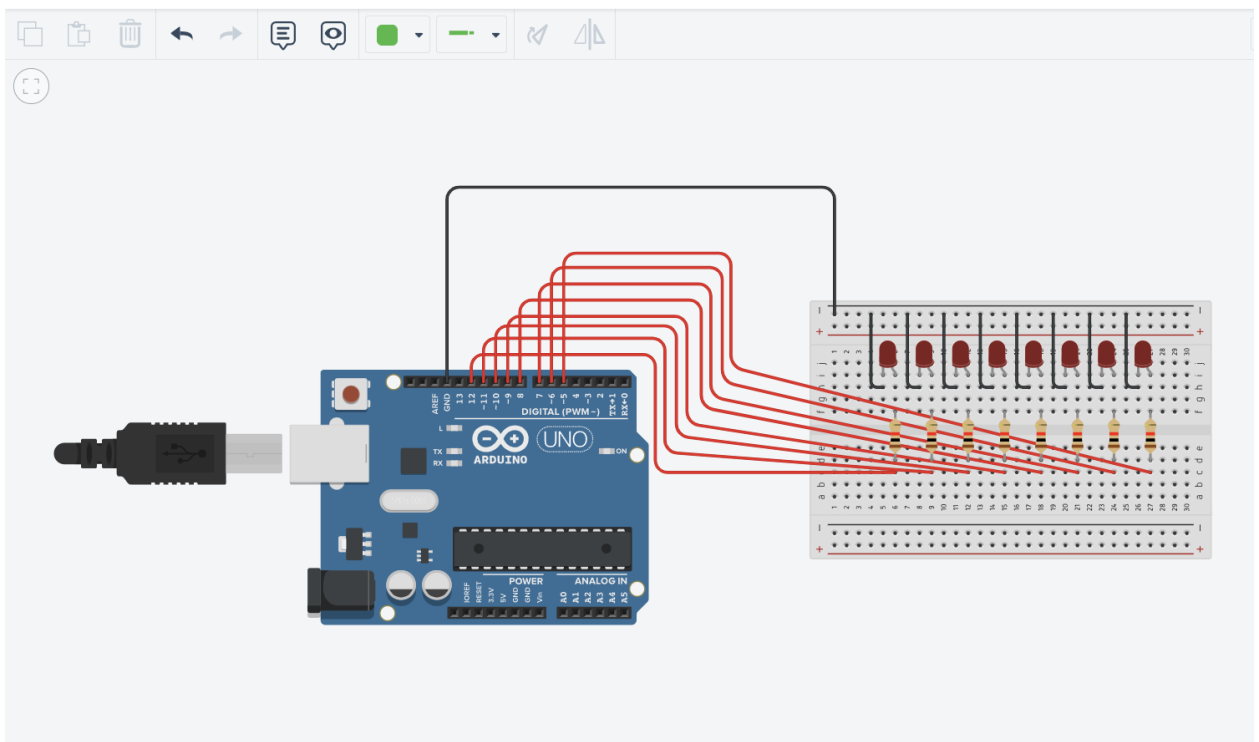


Figure No.1 Ring Counter Display Circuit Diagram

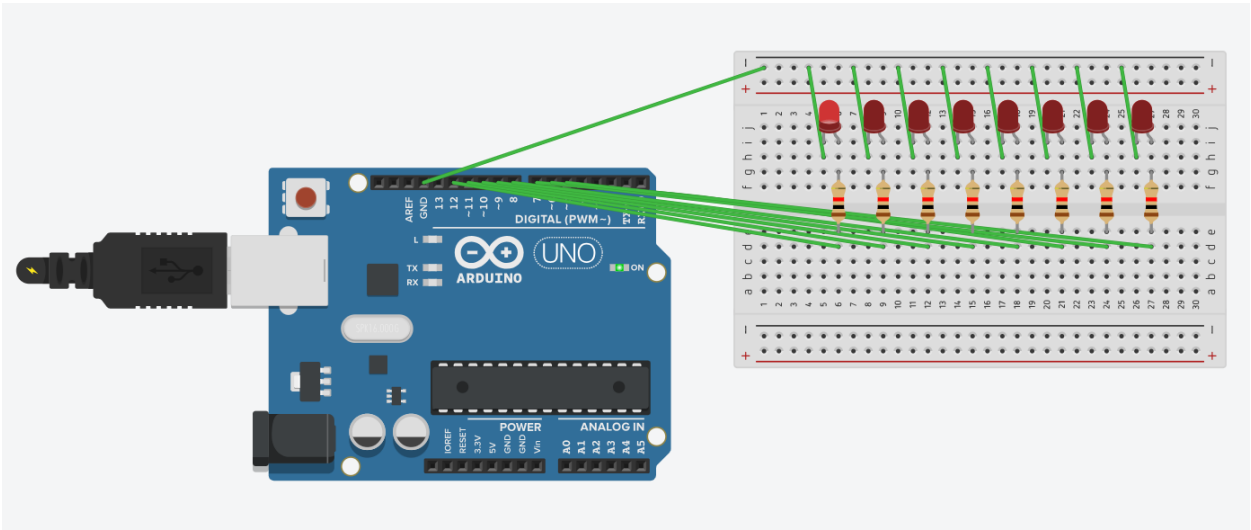
Components Used

1. 8 LEDs
2. Resistor
3. Breadboard

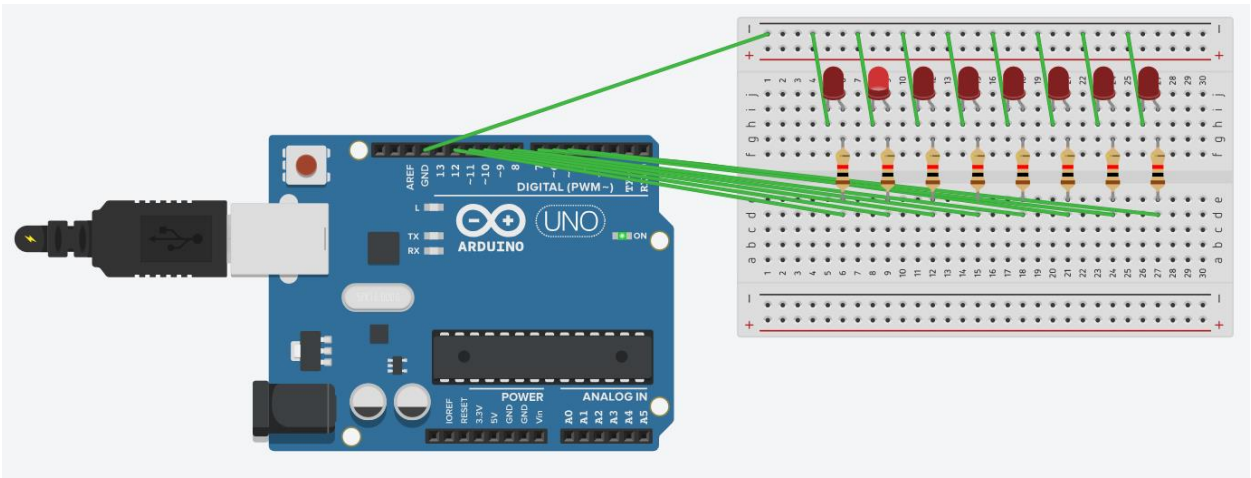
CODE:

```
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 }
```

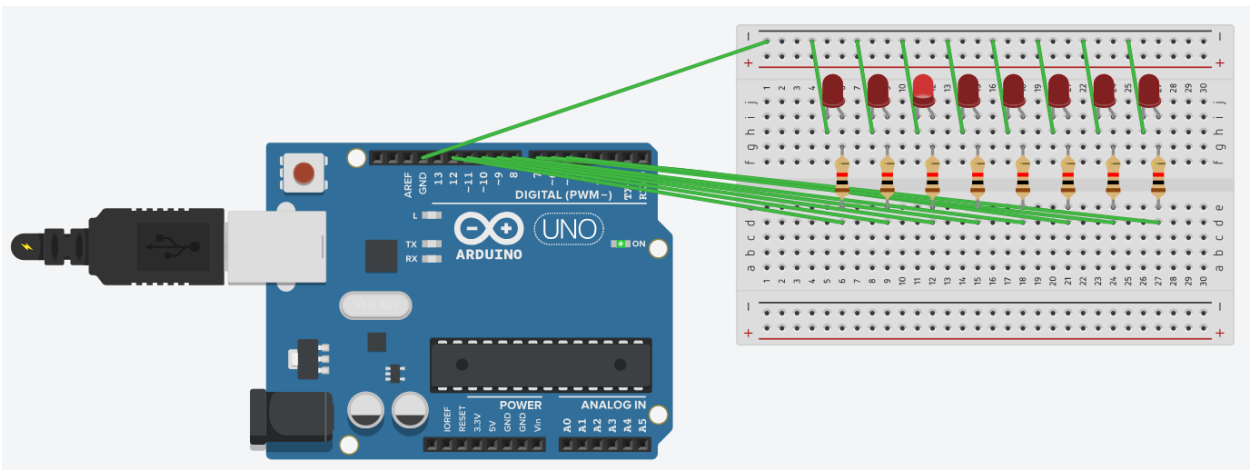
IV. Output



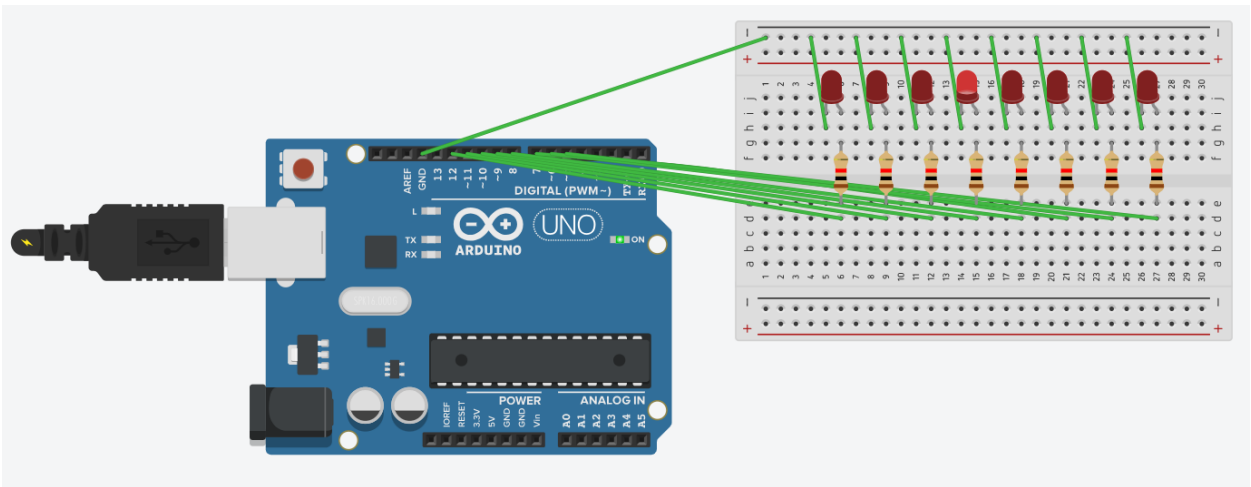
First LED Blinking



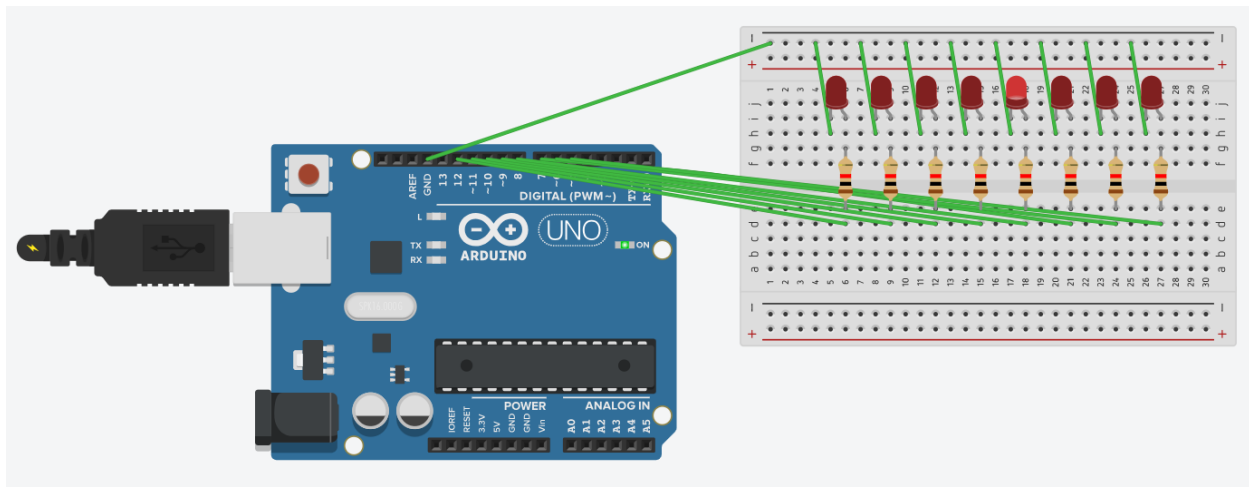
Second LED Blinking



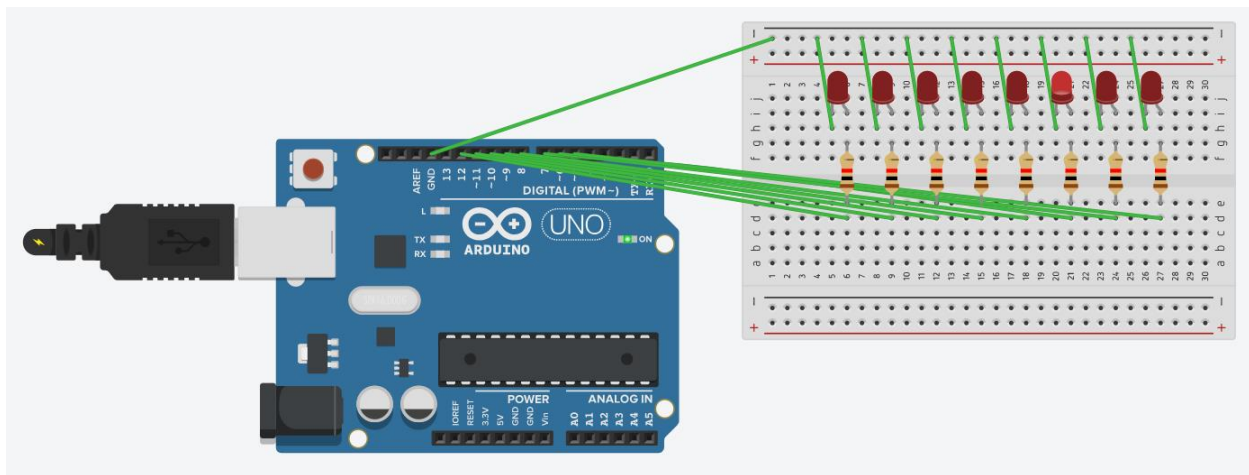
Third LED Blinking



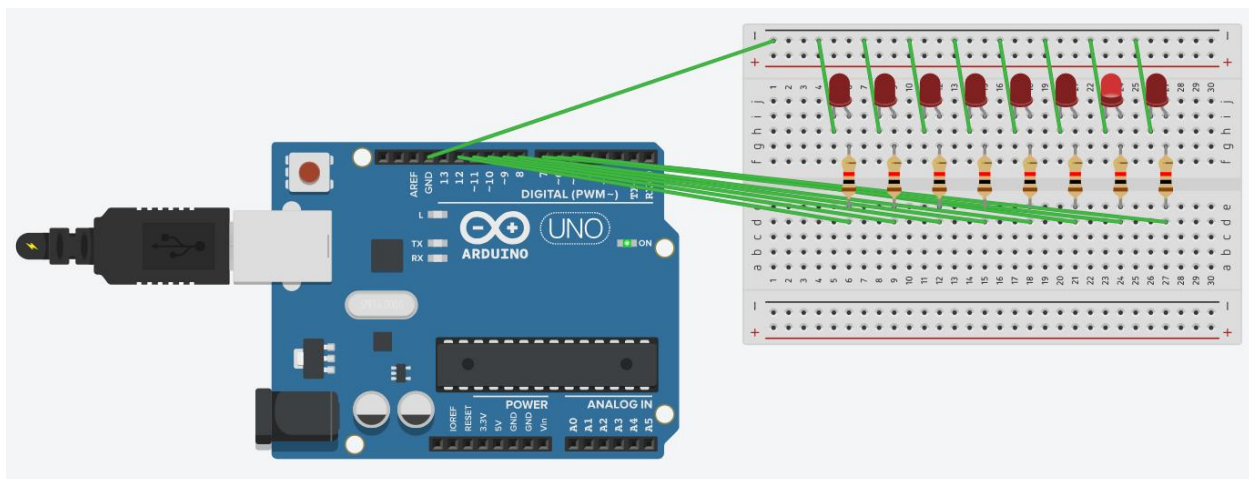
Fourth LED Blinking



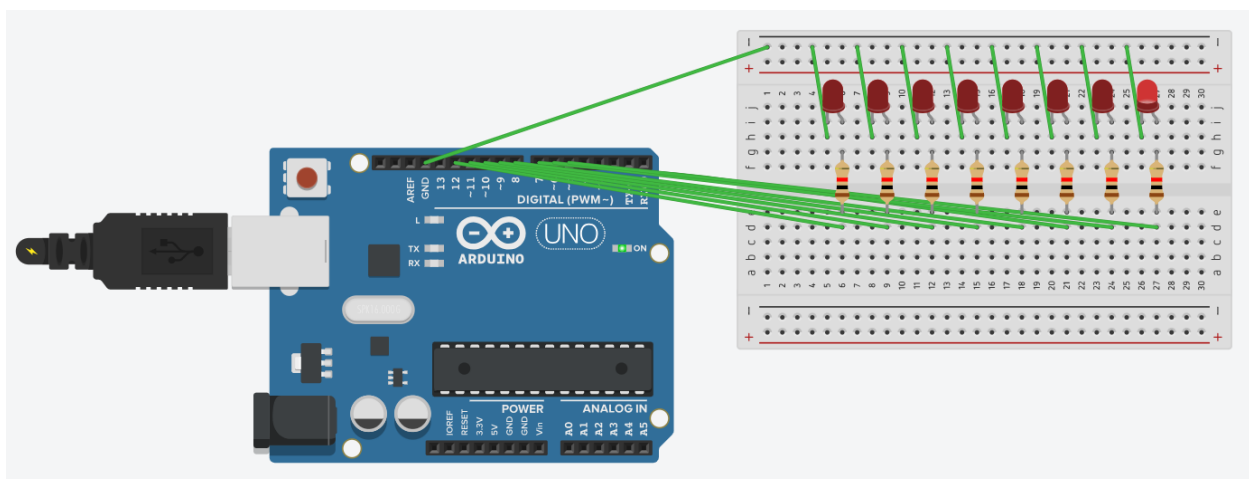
Fifth LED Blinking



Sixth LED Blinking



Seventh LED Blinking



Eighth LED Blinking

IV. Conclusion

For the Lab Activity No. 2 of the Microprocessors Lab, I write a code that does a ring counter display for eight (8) LEDs starting from left using tinkercad. For the definition of ring counter, the Shift register is frequently used in ring counters. Nearly identical to the shift counter is the ring counter. The only difference is that whereas in the case of the ring counter, the output of the last flip-flop is connected to the input of the first flip-flop, in the case of the shift register, it is taken as output. Everything else is the same aside from this. [1]

Through the use of the Autodesk Tinkercad, we can see that the output for this lab activity was successful because we can see in the screenshots that all of the LEDs were blinking from left to right one by one. We can also see that the purpose of this activity is to use Arduino programming and circuit design to implement the ideas and methods of hardware programming.

References

[1] GeeksforGeeks. (2023, January 19). *Ring Counter in digital logic*. GeeksforGeeks. <https://www.geeksforgeeks.org/ring-counter-in-digital-logic/>