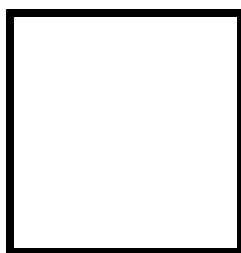




PAMANTASAN NG LUNGSOD NG MAYNILA
(University of the City of Manila)
Intramuros, Manila

Microprocessor Lab

Laboratory Activity No. 2
Arduino and Tinkercad Interface



Score

Submitted by:
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<Saturday 1:00 – 7:00pm> / <CPE 0412 & CPE 0412.1>

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

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

Components Used

1. 8 LEDs
2. Resistor
3. Breadboard

Microcontroller Used

1. Arduino Uno

CODE

```
1 // C++ code
2 //
3 void setup()
4 {
5     Serial.begin(9600);
6     pinMode(6, OUTPUT);
7     pinMode(7, OUTPUT);
8     pinMode(8, OUTPUT);
9     pinMode(9, OUTPUT);
10    pinMode(10, OUTPUT);
11    pinMode(11, OUTPUT);
12    pinMode(12, OUTPUT);
13    pinMode(13, OUTPUT);
14 }
15
16 void loop()
17 {
18     digitalWrite(6,HIGH);
19     delay(500);
20     Serial.println("The LED1 is HIGH");
21     digitalWrite(6, LOW);
22     Serial.println("The LED1 is LOW");
23     delay(500);
24     digitalWrite(7,HIGH);
25     delay(500);
26     Serial.println("The LED2 is HIGH");
27     digitalWrite(7, LOW);
28     delay(500);
29     Serial.println("The LED2 is LOW");
30     digitalWrite(8,HIGH);
31     delay(500);
32     Serial.println("The LED3 is HIGH");
33     digitalWrite(8, LOW);
34     delay(500);
35     Serial.println("The LED3 is LOW");
```

```

36  digitalWrite(9,HIGH);
37  delay(500);
38  Serial.println("The LED4 is HIGH");
39  digitalWrite(9, LOW);
40  delay(500);
41  Serial.println("The LED4 is LOW");
42  digitalWrite(10,HIGH);
43  delay(500);
44  Serial.println("The LED5 is HIGH");
45  digitalWrite(10, LOW);
46  delay(500);
47  Serial.println("The LED5 is LOW");
48  digitalWrite(11,HIGH);
49  delay(500);
50  Serial.println("The LED6 is HIGH");
51  digitalWrite(11, LOW);
52  delay(500);
53  Serial.println("The LED6 is LOW");
54  digitalWrite(12,HIGH);
55  delay(500);
56  Serial.println("The LED7 is HIGH");
57  digitalWrite(12, LOW);
58  delay(500);
59  Serial.println("The LED7 is LOW");
60  digitalWrite(13,HIGH);
61  delay(500);
62  Serial.println("The LED8 is HIGH");
63  digitalWrite(13, LOW);
64  delay(500);
65  Serial.println("The LED8 is LOW");
66  }

```

TinkerCad

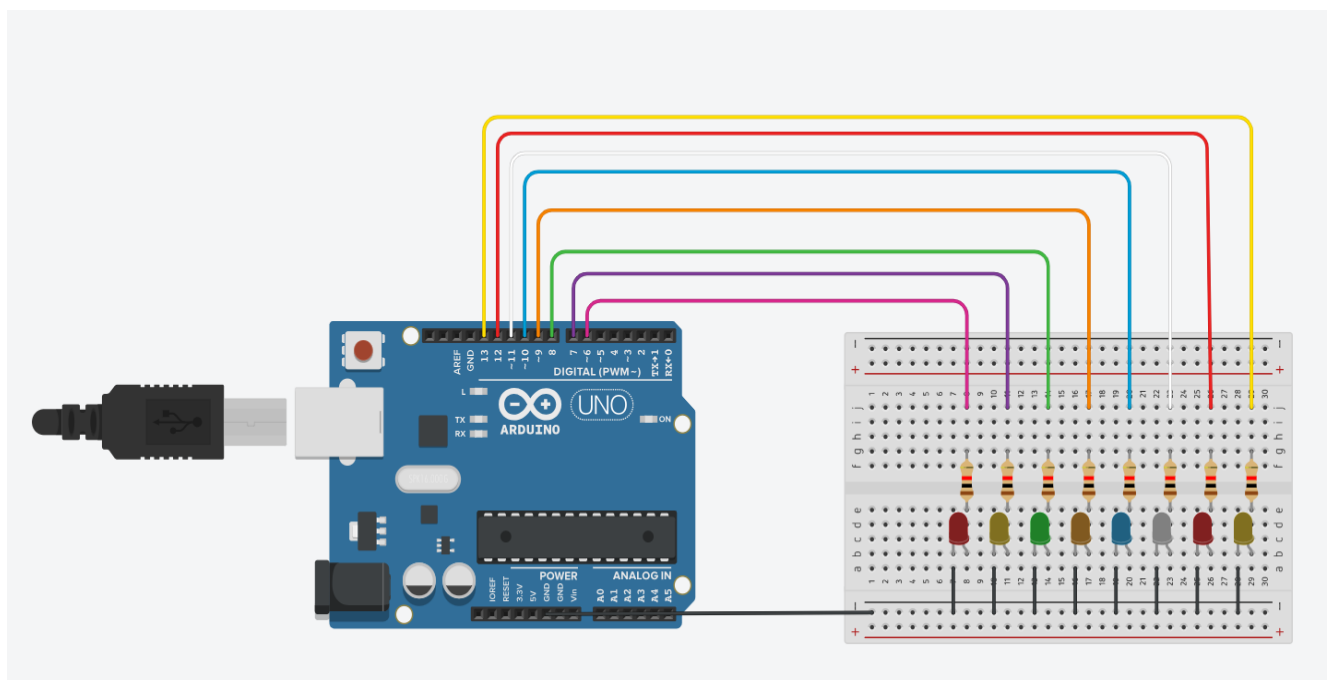
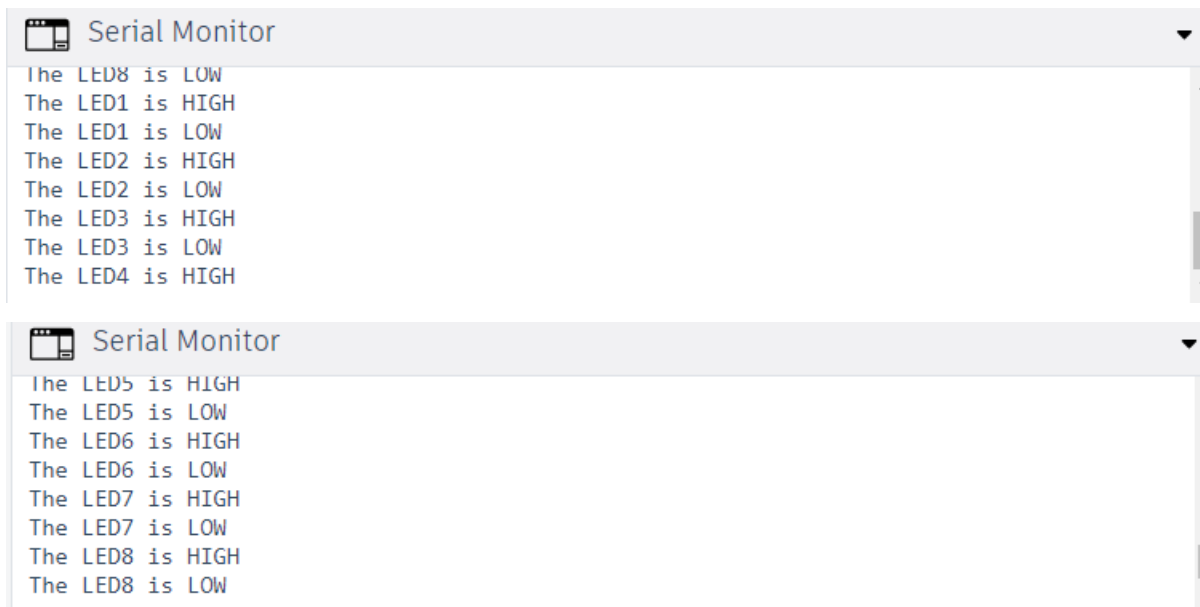


Figure 1 Ring Counter Display Circuit Diagram

TinkerCad Link

<https://www.tinkercad.com/things/f01DqLL4EGv?sharecode=RzkXe9607YWmP-AAWPVNAJAxQNksmm9S4KMPsUoHLbA>



IV. Conclusion

In this laboratory, I used tinkercad to create the circuit diagram and did some basic coding to display a Ring counter display circuit. Tinkercad is a free web tool used by over 50 million people worldwide for 3D design, electronics, and coding. It quickly became a popular platform for developing models for 3D printing, as well as an introductory course in constructive design and engineering. Tinkercad is intended to assist users, particularly the next generation of designers and engineers, in developing fundamental abilities for innovation and a lot more.

This laboratory also includes a breadboard, resistors, LED components, and an Arduino Uno R3 microcontroller. There are also several functions utilized in this laboratory code, such as the `setup ()` function, which initializes the variable, pin modes, and much more. It also used the `loop ()` function to set the values that would alter, reply, and control the Arduino board. A variety of other functions and syntax have been employed in order for the program to function. The high and low constants, which indicate the level of the pins where the LEDs are linked, are the most crucial commands in this laboratory. The LED will be ON if the voltage is 5 volts or more, and OFF if the voltage is 0 volts or lower.

With this, the challenge of performing an Arduino circuit diagram of a ring counter that shows eight (8) LEDs starting from the left has been satisfied.

References

- [1] D.J.D. Sayo. "University of the City of Manila Computer Engineering Department Honor Code," PLM-CpE Departmental Policies, 2020.
- [2] Tinkercad, "Tinkercad | From mind to design in minutes," Tinkercad, 2019. <https://www.tinkercad.com/>
- [3] "The Full Arduino Uno Pinout Guide [including diagram]," circuito.io blog, Nov. 18, 2018. <https://www.circuito.io/blog/arduino-uno-pinout/>
- [4] "Arduino - Delay," www.arduino.cc. <https://www.arduino.cc/en/reference/delay>
- [5] "Arduino Void Setup and Void Loop Functions [Explained]," The Robotics Back-End, Dec. 28, 2020. <https://roboticsbackend.com/arduino-setup-loop-functions-explained/>