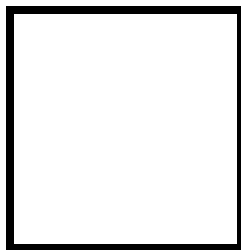




PAMANTASAN NG LUNGSOD NG MAYNILA
(University of the City of Manila)
Intramuros, Manila

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
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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.

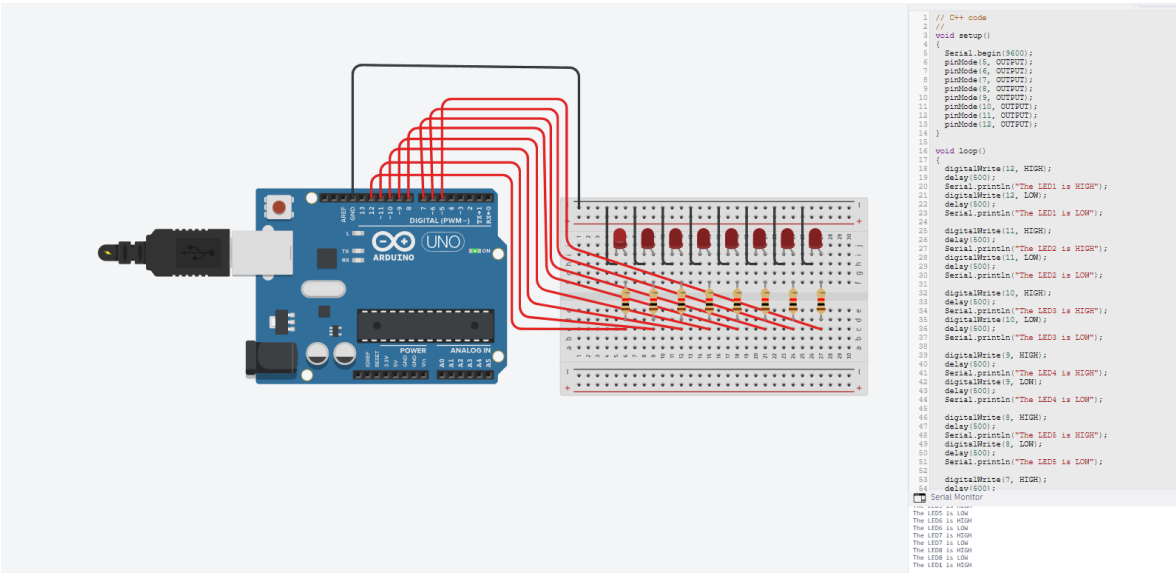


Figure No.1 Ring Counter Display Circuit Diagram

Components Used

1. 8 LEDs
2. Resistor
3. Breadboard

CODE:

```
/ C++ code
//
void setup()
{
  Serial.begin(9600);
  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);
  Serial.println("The LED1 is HIGH");
  digitalWrite(12, LOW);
  delay(500);
  Serial.println("The LED1 is LOW");

  digitalWrite(11, HIGH);
  delay(500);
  Serial.println("The LED2 is HIGH");
  digitalWrite(11, LOW);
  delay(500);
  Serial.println("The LED2 is LOW");

  digitalWrite(10, HIGH);
  delay(500);
  Serial.println("The LED3 is HIGH");
  digitalWrite(10, LOW);
  delay(500);
  Serial.println("The LED3 is LOW");

  digitalWrite(9, HIGH);
  delay(500);
  Serial.println("The LED4 is HIGH");
```

```
digitalWrite(9, LOW);  
delay(500);  
Serial.println("The LED4 is LOW");
```

```
digitalWrite(8, HIGH);  
delay(500);  
Serial.println("The LED5 is HIGH");  
digitalWrite(8, LOW);  
delay(500);  
Serial.println("The LED5 is LOW");
```

```
digitalWrite(7, HIGH);  
delay(500);  
Serial.println("The LED6 is HIGH");  
digitalWrite(7, LOW);  
delay(500);  
Serial.println("The LED6 is LOW");
```

```
digitalWrite(6, HIGH);  
delay(500);  
Serial.println("The LED7 is HIGH");  
digitalWrite(6, LOW);  
delay(500);  
Serial.println("The LED7 is LOW");
```

```
digitalWrite(5, HIGH);  
delay(500);  
Serial.println("The LED8 is HIGH");  
digitalWrite(5, LOW);  
delay(500);  
Serial.println("The LED8 is LOW");
```

```
}
```

Tinker Cad Link:

https://www.tinkercad.com/things/kspkDq9L5HY?sharecode=0m3RpVlRXYe4mItEyQEfjA-g-M--oCkKvz0f_hkaXsY

IV. Conclusion

To sum it up, the primary objective of the laboratory exercise was to put into practice hardware programming principles and techniques using Arduino. Specifically, the goal was to create an eight-LED ring counter display that would sequentially illuminate the LEDs. We can confidently affirm that this objective was successfully achieved.

I witnessed the LEDs lighting up in a perfect sequence after generating and running the Arduino code and configuring the associated circuit, beginning with LED 1 and going to LED 8. Each LED lit up at a predetermined period, effectively displaying how a ring counter works. This not only proved our understanding of hardware programming principles, but also demonstrated how a ring counter works in practice.

This laboratory activity helped us better understand programming for Arduino and hardware design ideas. It taught us the critical skill of coding to control many LEDs in sequence, which is essential in the field of embedded technology development. The task additionally introduced us to the idea of a ring counter, which can be found in a variety of digital electronics circuits.

Lastly, this activity provided a valuable hands-on learning experience by allowing us to put our conceptual understanding to a practical project. It emphasized Arduino's adaptability and potential in delivering hardware solutions while also providing useful insights into the realm of electronic design and microcontroller programming.

References

- [1] GeeksforGeeks. "Ring counter in digital logic," GeeksforGeeks, 2023. [Online]. Available: <https://www.geeksforgeeks.org/ring-counter-in-digital-logic/>.
- [2] "Arduino - Home," Arduino, [Online]. Available: <https://www.arduino.cc/>.
- [3] "Tinkercad - From mind to design in minutes," Tinkercad, [Online]. Available: https://www.tinkercad.com/things/kspkDq9L5HY?sharecode=0m3RpVlrXye4mItEyQEfjA-g-M--oCkKvz0f_hkaXsY