**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 10:00 am - 1:00 pm / CPE 0412.1-1**

*Date Submitted*
**29-09-2023**

*Submitted to:*

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I. Objectives

This laboratory activity aims to implement the principles and techniques of hardware programming using Arduino through:

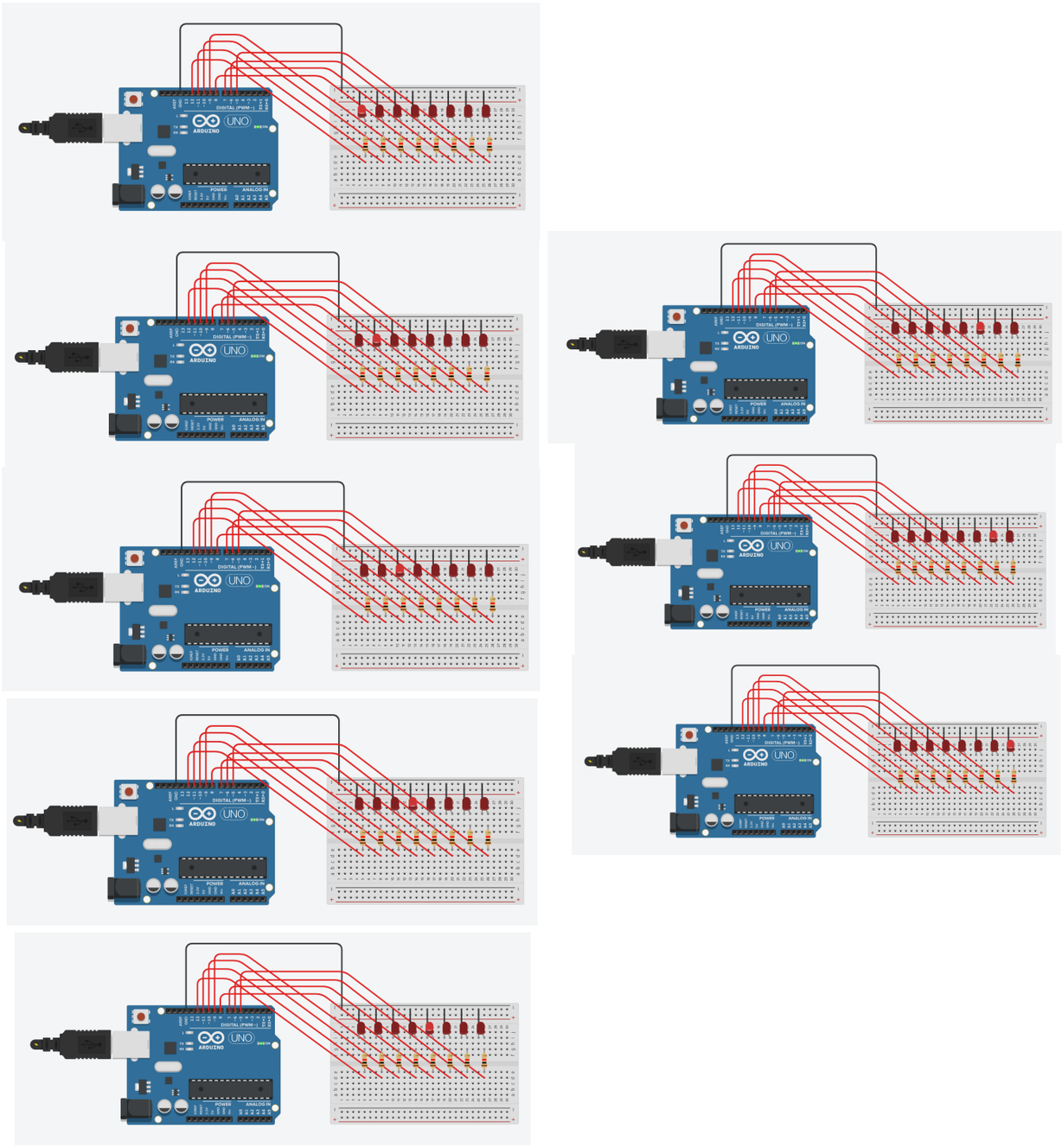
- creating an Arduino programming and circuit diagram.

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 the left.

III. Results



**TinkerCad**

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

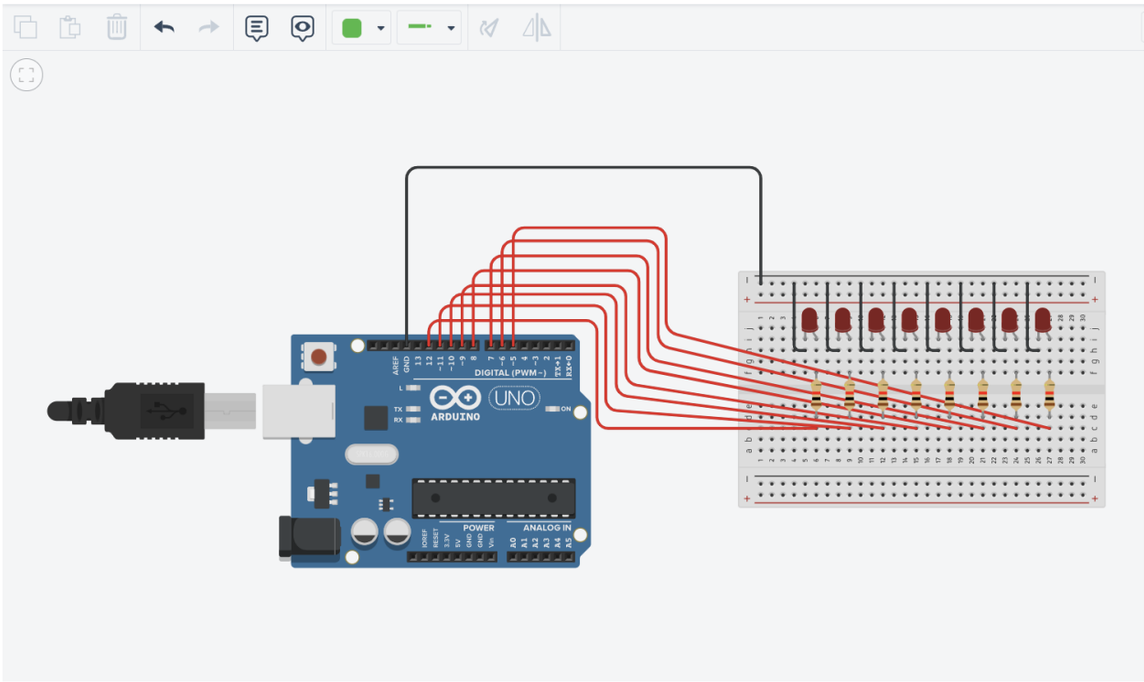



Figure No.1 Ring Counter Display Circuit Diagram

**Components Used**

1. 8 LEDs
2. Resistor
3. Breadboard

**CODE:**

```
// C++ code
//Palacio, Leticia Mae
// Ring counter display for eight (8) LEDs starting from the left.

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);
```

```
  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");
```

```
  digitalWrite(4, HIGH);
  delay(500);
  Serial.println("The LED9 is HIGH");
  digitalWrite(4, LOW);
  delay(500);
  Serial.println("The LED9 is LOW");

  digitalWrite(3, HIGH);
  delay(500);
  Serial.println("The LED10 is HIGH");
  digitalWrite(3, LOW);
  delay(500);
  Serial.println("The LED10 is LOW");

  digitalWrite(2, HIGH);
  delay(500);
  Serial.println("The LED11 is HIGH");
  digitalWrite(2, LOW);
  delay(500);
  Serial.println("The LED11 is LOW");

  digitalWrite(1, HIGH);
  delay(500);
  Serial.println("The LED12 is HIGH");
  digitalWrite(1, LOW);
  delay(500);
  Serial.println("The LED12 is LOW");
}
```

## IV. Conclusion

*In summary, this laboratory activity aimed to familiarize participants with the essential aspects of hardware programming using Arduino. Through the task of designing a ring counter circuit that illuminates eight LEDs from left to right, students were not only able to practice coding but also gain practical experience in creating circuit diagrams. This exercise not only enhanced their understanding of Arduino but also helped them develop valuable skills in embedded systems and microcontroller programming, setting a solid foundation for future hardware-related projects and applications.*

## 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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