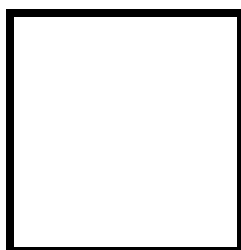# PAMANTASAN NG LUNGSOD NG MAYNILA
(University of the City of Manila)
Intramuros, Manila

Microprocessor Lab

Laboratory Activity No. 2
Arduino and Tinkercad Interface

Score

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Saturday 4-7PM / CpE 0412-2

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.
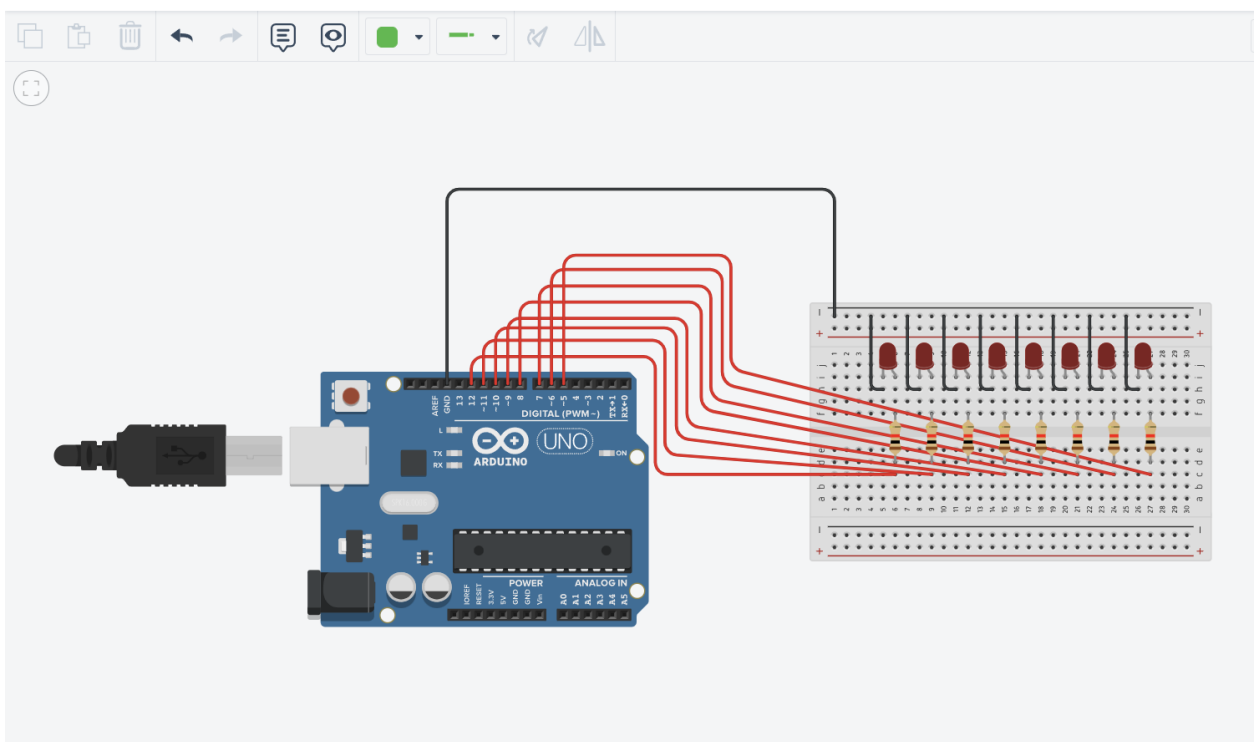

Figure No.1 Ring Counter Display Circuit Diagram

Components Used

1. 8 LEDs
2. Resistor
3. Breadboard

CODE:

```cpp
// C++ code
//
/*
  Ring counter display for eight (8) LEDs starting from 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);
  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");
}
```

IV. Conclusion

In this lab activity, we created an Arduino program and circuit diagram through the use of TinkerCAD. Specifically, we built a ring counter display for eight (8) LEDs starting from the left. The components that were used are 8 LEDs, 8 resistors, breadboard, and the Arduino Uno R3 itself. We also used programming principles to code the circuit so that it will be functional and woking. The result showed a working ring counter display which displayed eight (8) LEDs lighting up one-by-one starting from the left direction. Overall, this laboratory activity exercised the concept of Arduino programming and circuit composition through the interface of TinkerCAD. This proved helpful for us to really understand the workings of the circuit and also to know what code is needed to run the simulation perfectly.

References

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