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 7-10:00 am> / <CPE 0412-1>

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.

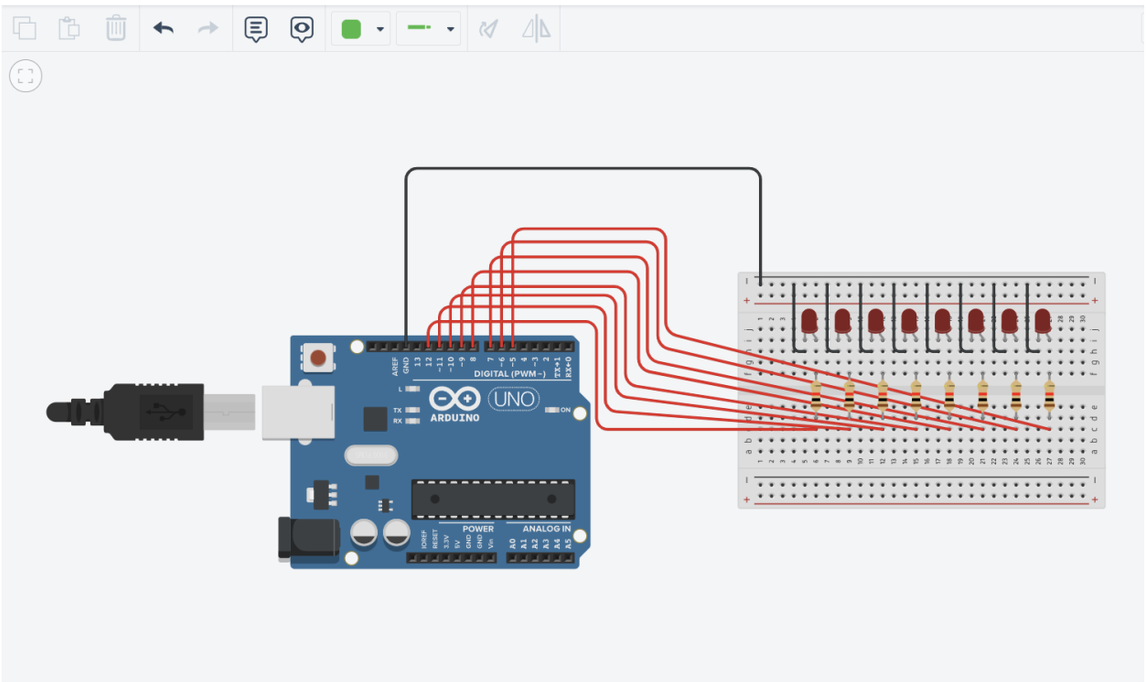


Figure No.1 Ring Counter Display Circuit Diagram

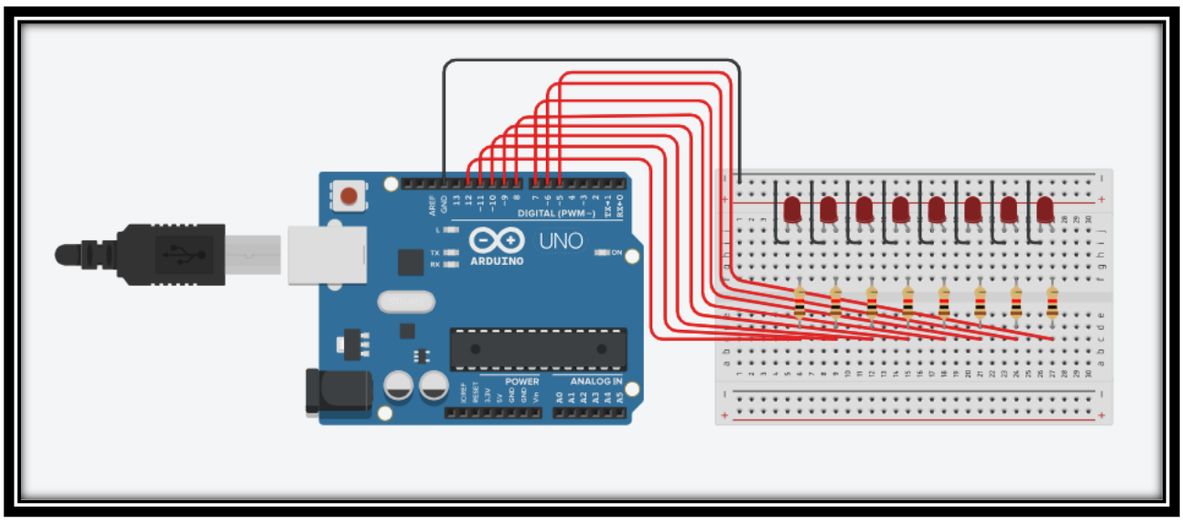
Components Used

1. 8 LEDs
2. Resistor
3. Breadboard

CODE:

```
// C++ code
//
/*
  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");
```

Result:



IV. Conclusion

The experiment's primary focus was on exploring the interplay between Arduino programming and the creation of a ring counter display graphic. This experiment served as a practical demonstration of how Arduino technology can be applied to construct a functional ring counter display using eight red LEDs, each accompanied by a 1k resistor. The core objective of this experiment was to showcase the practical application of Arduino technology in a hands-on manner. The chosen setup, featuring a ring counter display, provided a tangible example of how hardware components (the LEDs and resistors) could be coordinated with software components (the Arduino code) to achieve a specific functionality – in this case, counting and displaying numbers.

The success of the experiment hinged on the effectiveness of the constructed Arduino code. This code was responsible for orchestrating the entire system, ensuring that the LEDs illuminated in the correct sequence to represent the counting process. In essence, the experiment underscored the crucial connection between the hardware components (the LEDs and resistors) and the software components (the Arduino code), demonstrating how they collaborated to deliver the desired display and counting capabilities.

In conclusion, Laboratory Experiment 2 provided a practical and instructive example of the synergy between hardware and software in the realm of Arduino technology, showcasing how these elements could be integrated to create functional and interactive systems. This type of hands-on experience is valuable for individuals seeking to understand and apply the principles of electronics and programming in a real-world context.

References

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