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:
Sison, Dan Jedrick S.
<Saturday 1pm-4pm> / <CPE 0412.1-2>

Date Submitted
20-09-2023

Submitted to:

Engr. Maria Rizette H. Sayo

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.

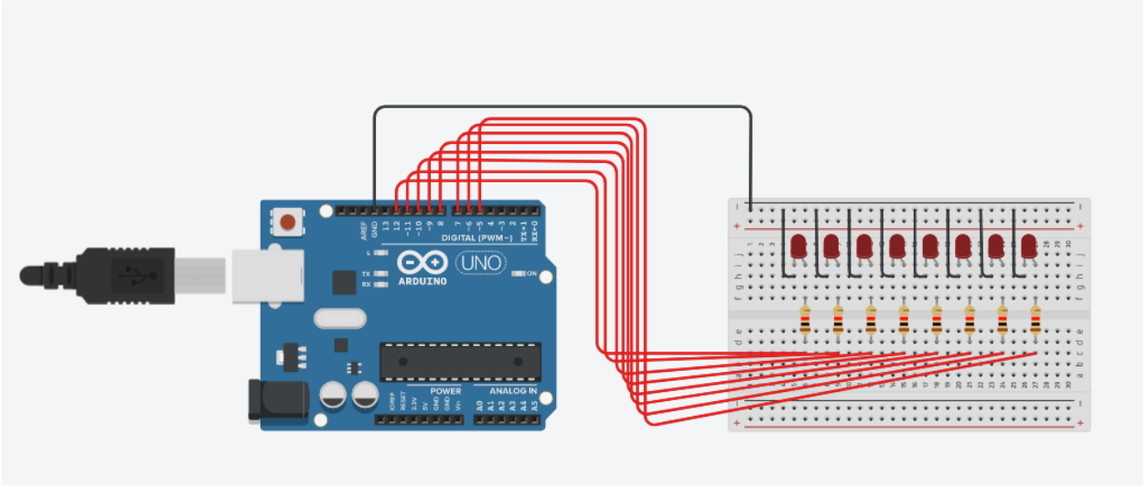

Figure No.1 Ring Counter Display Circuit Diagram

Components Used

1. 8 LEDs
2. Resistors
3. Breadboard
4. Arduino Uno R3

CODE:

```
// C++ code
//
/*
    Sison-DJS BSCPE 4-2
    Ring counter display for eight (8) LEDs starting from left to right.
*/

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(450); // Wait for 450 millisecond(s)
  Serial.println("LED1 is HIGH");
  digitalWrite(12, LOW);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED1 is LOW");

  digitalWrite(11, HIGH);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED2 is HIGH");
  digitalWrite(11, LOW);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED2 is LOW");

  digitalWrite(10, HIGH);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED3 is HIGH");
  digitalWrite(10, LOW);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED3 is LOW");

  digitalWrite(9, HIGH);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED4 is HIGH");
  digitalWrite(9, LOW);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED4 is LOW");

  digitalWrite(8, HIGH);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED5 is HIGH");
  digitalWrite(8, LOW);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED5 is LOW");

  digitalWrite(7, HIGH);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED6 is HIGH");
  digitalWrite(7, LOW);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED6 is LOW");

  digitalWrite(6, HIGH);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED7 is HIGH");
  digitalWrite(6, LOW);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED7 is LOW");

  digitalWrite(5, HIGH);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED8 is HIGH");
  digitalWrite(5, LOW);
  delay(450); // Wait for 450 millisecond(s)
  Serial.println("LED8 is LOW");
}
```

IV. Conclusion

This laboratory activity aimed to implement the principles and techniques of hardware programming using Arduino by creating an Arduino programming and circuit diagram. The objective was successfully achieved by performing the given task problem and writing a code to create a ring counter display for eight LEDs starting from the left. The Tinkercad simulation was utilized for this experiment, and the circuit diagram (Figure No.1) depicted the components used, including eight LEDs, resistors, a breadboard, and an Arduino Uno R3.

Through the implementation of the code and circuit diagram, the ring counter successfully displayed the desired sequence of LED illumination, demonstrating the proper functioning of the programmed Arduino hardware. This laboratory activity provided hands-on experience in hardware programming with Arduino, allowing for a better understanding of circuit design, code implementation, and the interaction between software and hardware components.

Overall, the objectives of the laboratory activity were met, and the successful implementation of the ring counter display using Arduino showcased the practical application of hardware programming principles and techniques. It is important to note that further experimentation and exploration could be conducted to expand upon this foundation and delve into more complex hardware programming concepts.