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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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.

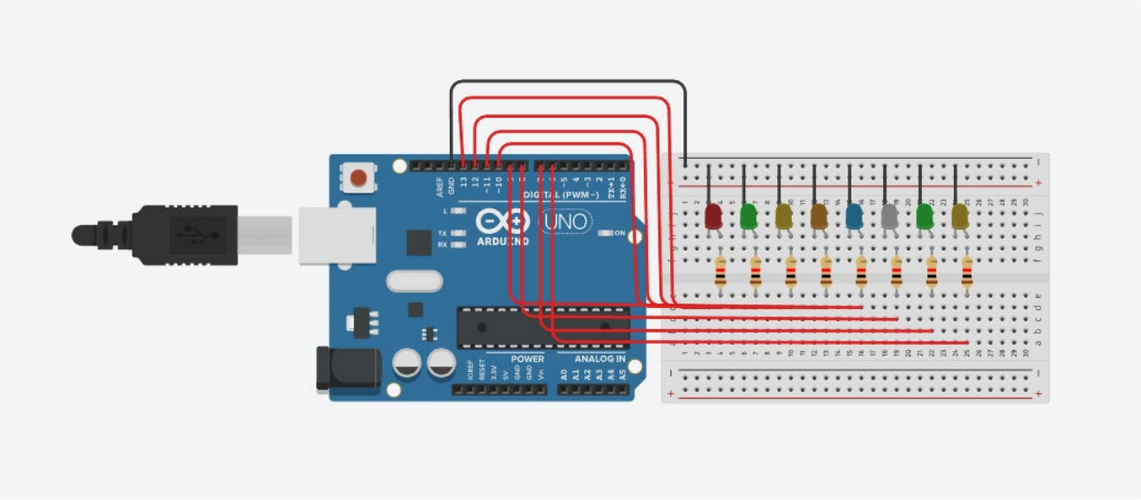

Figure No.1 Ring Counter Display Circuit Diagram

Components Used

1. 8 LEDs
2. Resistor
3. Breadboard

TinkerCad Link

https://www.tinkercad.com/things/lFCWk2rrO6X?sharecode=_IdoaiI3_W1WWVcdvGchitrOlsb-BLLn7aHPovo5o7Y

CODE:

```
//
void setup()
{
  Serial.begin(9600);
  pinMode(13, OUTPUT);
  pinMode(12, OUTPUT);
  pinMode(11, OUTPUT);
  pinMode(10, OUTPUT);
  pinMode(9, OUTPUT);
  pinMode(8, OUTPUT);
  pinMode(7, OUTPUT);
  pinMode(6, OUTPUT);
}

void loop()
{
  digitalWrite(13, HIGH);
  delay(350);
  Serial.println("The LED1 is HIGH");
  digitalWrite(13, LOW);
  delay(350);
  Serial.println("The LED1 is LOW");

  digitalWrite(12, HIGH);
  delay(350);
  Serial.println("The LED2 is HIGH");
  digitalWrite(12, LOW);
  delay(350);
  Serial.println("The LED2 is LOW");

  digitalWrite(11, HIGH);
  delay(350);
  Serial.println("The LED3 is HIGH");
  digitalWrite(11, LOW);
  delay(350);
  Serial.println("The LED3 is LOW");

  digitalWrite(10, HIGH);
  delay(350);
  Serial.println("The LED4 is HIGH");
  digitalWrite(10, LOW);
  delay(350);
  Serial.println("The LED4 is LOW");

  digitalWrite(9, HIGH);
  delay(350);
  Serial.println("The LED5 is HIGH");
  digitalWrite(9, LOW);
  delay(350);
  Serial.println("The LED5 is LOW");

  digitalWrite(8, HIGH);
  delay(350);
  Serial.println("The LED6 is HIGH");
  digitalWrite(8, LOW);
  delay(350);
  Serial.println("The LED6 is LOW");

  digitalWrite(7, HIGH);
  delay(350);
  Serial.println("The LED7 is HIGH");
  digitalWrite(7, LOW);
  delay(350);
  Serial.println("The LED7 is LOW");

  digitalWrite(6, HIGH);
  delay(350);
  Serial.println("The LED8 is HIGH");
  digitalWrite(6, LOW);
  delay(350);
  Serial.println("The LED8 is LOW");
}
```

IV. Conclusion

In summary, the lab report demonstrates the successful creation and execution of a ring counter concept using an Arduino microcontroller and eight LEDs. The primary goal of this experiment was to establish a circuit and develop code to progressively illuminate eight LEDs from left to right, resulting in a continuous LED ring effect characteristic of a ring counter.

The provided code effectively accomplishes this objective by configuring the required pin settings and utilizing a loop within the loop() function. This loop sequentially activates and deactivates each LED, creating the desired ring counter effect, with a 350-millisecond delay between each transition.

Additionally, the code generates serial monitor output to indicate the status of each LED, whether it is in the high (ON) or low (OFF) state, allowing for real-time monitoring and verification of the ring counter's operation.

In conclusion, the Arduino-based ring counter concept successfully illuminates eight LEDs in a continuous loop, exemplifying the fundamental principles and functionality of a digital circuit known as a ring counter.

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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