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

Microprocessor Lab

Laboratory Activity No. 3

Binary Representation of 8 LEDs in TinkerCad and Arduino Programming

Score

Submitted by:
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Submitted to:

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I. Objectives

To create Arduino circuit of Binary representation (decimal 0-255 using 8 LEDs)

II. Method/s

- Perform a task problem given in the presentation.
- Write a code and perform an Arduino circuit diagram of a binary representation of 0 – 255 decimal using 8 LED

III. Results

-This link below is directed to the simulation that was done in the TinkerCad

https://www.tinkercad.com/things/eWu3KDkJkG7-swanky-borwo/editel?sharecode=xJ75gj-b0sDY_bOIfAtimYJAR1mnY4HI_Ro7t5AgMlU

TinkerCad

Exercise 1: Write a code that does a binary representation of 0 -255 using 8 LED that will represent as the 8 bits.

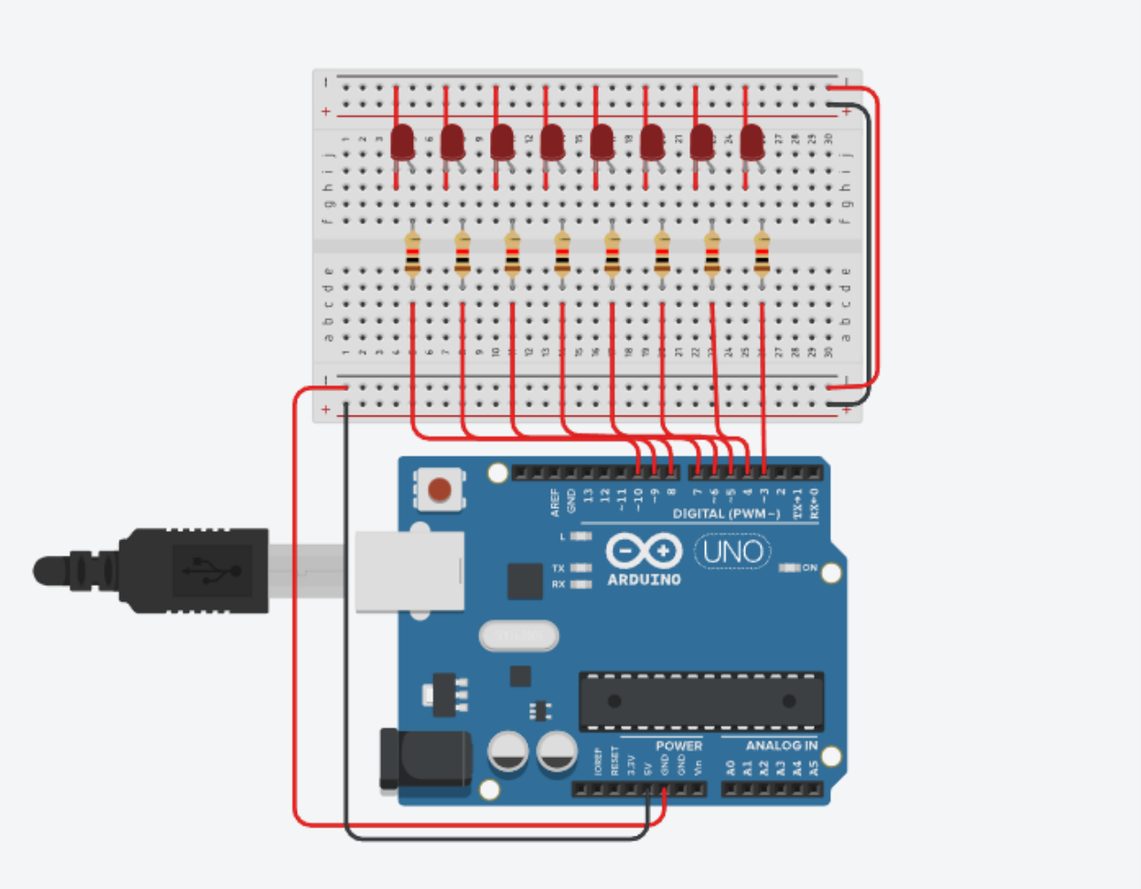

Figure No.1 Ring Counter Display Circuit Diagram

Components Used

1. 8 LEDs

2. 8 pcs. of 1k Ω Resistor
3. Breadboard
4. Jumper wires

CODE:

```
//number of LEDs used
#define num_led 8

// led pin numbers
const int pin_led[] = {2, 3, 4, 5, 6, 7, 8, 9};

//  serial monitor
void setup() {
  Serial.begin(9600);
}

// Loop
void loop() {
  // Count values from 0 to 255
  for (int count = 0; count < 256; count++) {
    // Display the binary representation on the LEDs/ display
    for (int i = 0; i < num_led; i++) {
      digitalWrite(pin_led[i], (count >> i) & 1);
    }

  // the value count will be printed in the serial monitor
    Serial.println(count);


    delay(500);
  }
}
```

IV. Conclusion

In this lab report we were tasked to create to create an Arduino circuit of Binary representation (decimal 0-256 using 8 LEDs). Case to case basis a binary representation is an essential aspect in the field of electronics wherein devices such as microcontrollers and computers to represent and manipulate data showing the on and off states. The lab exercise was completed with the use of tinkercad (materials includes: jumper wires, 8 LEDs, 8 resistors, arduino uno and a breadboard). In this the concept, the binary numbers was visually displayed throught a set of eight Light Emitting Diodes. As each LED is set, each one of them represents a binary bit of either 0 or 1. The arduino programmign code used counts from 0 to 255 which displays the binary presentation using for loops. This all in all made us understood a step closer to the concept and further visualization of binary representation through 8 LED lights.

References

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

[2]“Creating an 8-Bit Binary Counter using an Arduino,” *www.youtube.com*. https://youtu.be/gOpdbPHs92s (accessed Oct. 14, 2023).

[3]“Binary Representations in Digital Logic,” *GeeksforGeeks*, Sep. 14, 2018. https://www.geeksforgeeks.org/binary-representations-in-digital-logic/