



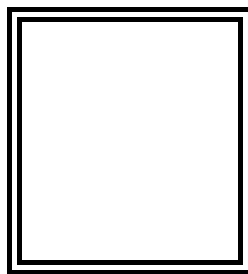
**PAMANTASAN NG LUNGSOD NG MAYNILA**  
(University of the City of Manila)  
Intramuros, Manila

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**Microprocessor Lab**

Laboratory Activity No. 3

**Binary Representation of 8 LEDs in TinkerCad and Arduino Programming**



Score

*Submitted by:*

**Manalansan, Coleen D.**

**<Saturday 1:00-7:00pm> / <CpE 412-2>**

*Date Submitted*

**10-13-2023**

*Submitted to:*

**Engr. Maria Rizette H. Sayo**

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## Objective

- To create Arduino circuit of Binary representation (decimal 0-256 using 8 LEDs)

## CODE:

```
const int LED_PINS[] = {13, 12, 11, 10, 7, 6, 5, 4};

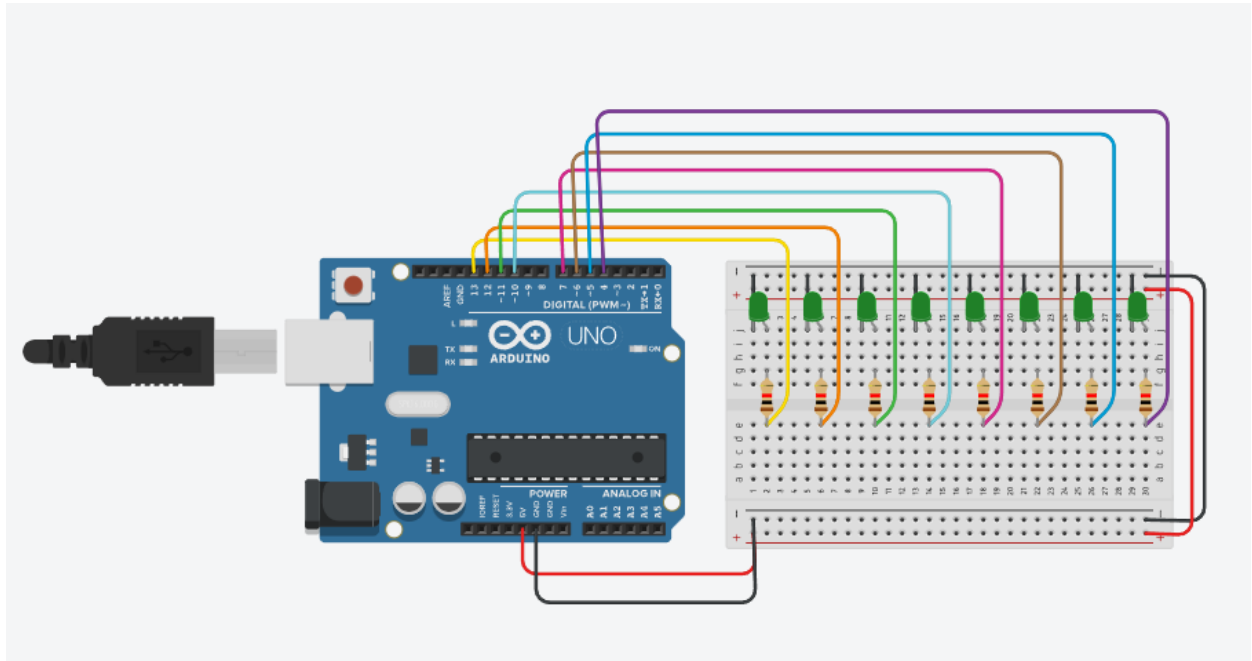
void setup() {
  Serial.begin(9600); // Initialize the serial monitor
  for (int i = 0; i < 8; i++) {
    pinMode(LED_PINS[i], OUTPUT);
  }
}

void loop() {
  for (int decimal = 0; decimal <= 256; decimal++) {
    displayBinary(decimal);
    Serial.println(decimal);
    delay(300);
  }

  // Turn off all LEDs and stop
  turnOffAllLEDs();
  while (true) {
    // Infinite loop to stop the program
  }
}

void displayBinary(int decimal) {
  for (int i = 0; i < 8; i++) {
    int bitValue = (decimal >> i) & 0x01;
    digitalWrite(LED_PINS[i], bitValue);
  }
}

void turnOffAllLEDs() {
  for (int i = 0; i < 8; i++) {
    digitalWrite(LED_PINS[i], LOW); // Turn off all LEDs
  }
}
```



### TINKERCAD Simulation Link:

<https://www.tinkercad.com/things/8XeYXxyMvc6-lab-3/editel?sharecode=pAD3X-zihYS-dJbFBasmakvmHlo3kJB898AnyAQeYU0>

### Conclusion

In conclusion, this code is designed for an Arduino microcontroller. Its primary purpose is to demonstrate the binary representation of numbers from 0 to 256 by lighting up a set of eight LEDs connected to digital pins 4 to 13. The code configures the LED pins, uses bitwise operations to convert the decimal count to binary, and displays the count on the LEDs. Additionally, it sends the current decimal value to the Arduino's serial monitor. The count speed is controlled by a delay between updates. Once the count is complete, all LEDs are turned off, and the program enters an infinite loop to stop further execution. This code provides an introduction to binary representation and demonstrates how to manipulate LEDs using an Arduino.