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

# Microprocessor Lab

Laboratory Activity No. 3
**Arduino and Tinkercad Interface**

Score

*Submitted by:*
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**7 AM – 10AM/ Saturday**

*Date Submitted*
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*Submitted to:*

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I. Results

**LINK:** https://www.tinkercad.com/things/hSQ5puWUOI1

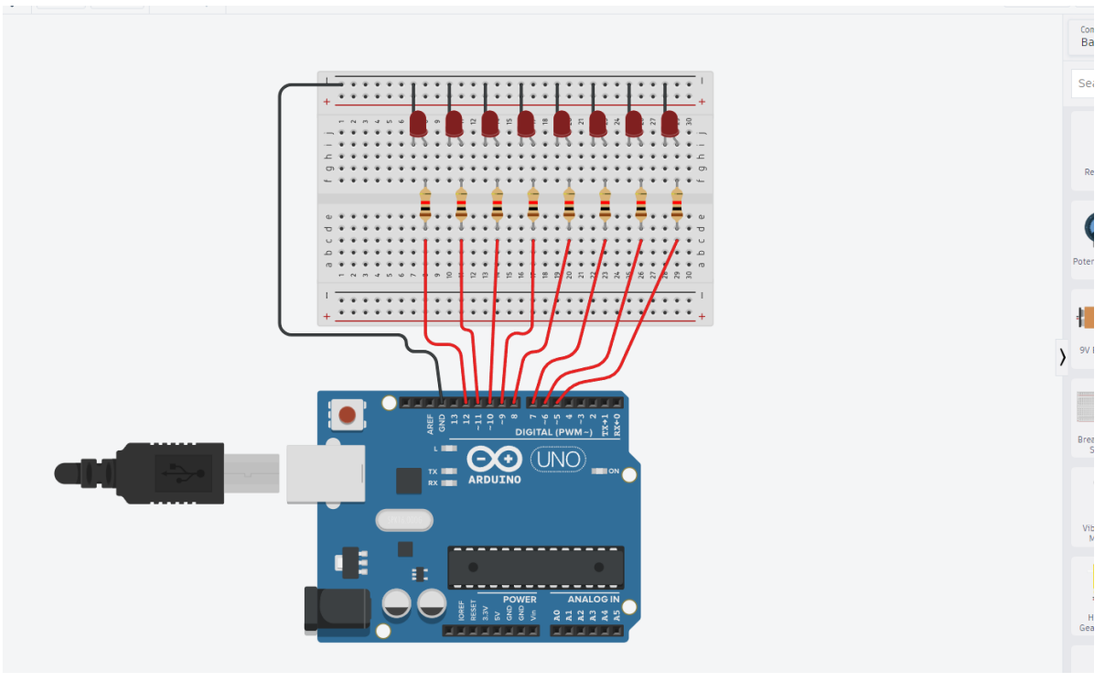

Figure No.1

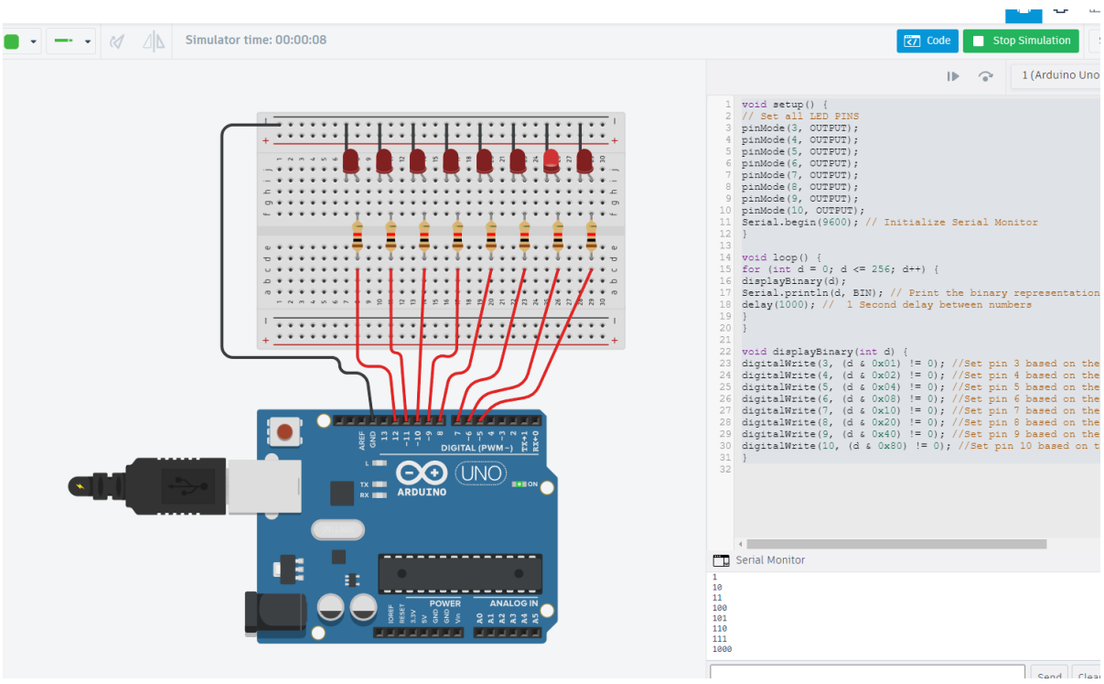


Figure No.2

**Components Used**

1. 8 LEDs
2. Resistor

3. Breadboard
4. Arduino Uno

**CODE:**

```
        void setup() {
// Set all LED PINS
pinMode(3, OUTPUT);
pinMode(4, OUTPUT);
pinMode(5, OUTPUT);
pinMode(6, OUTPUT);
pinMode(7, OUTPUT);
pinMode(8, OUTPUT);
pinMode(9, OUTPUT);
pinMode(10, OUTPUT);
Serial.begin(9600); // Initialize Serial Monitor
}

void loop() {
for (int d = 0; d <= 256; d++) {
displayBinary(d);
Serial.println(d, BIN); // Print the binary representation to Serial Monitor
delay(1000); //  1 Second delay between numbers
}
}

void displayBinary(int d) {
digitalWrite(3, (d & 0x01) != 0); //Set pin 3 based on the least significant bit
digitalWrite(4, (d & 0x02) != 0); //Set pin 4 based on the second least significant bit
digitalWrite(5, (d & 0x04) != 0); //Set pin 5 based on the third least significant bit
digitalWrite(6, (d & 0x08) != 0); //Set pin 6 based on the fourth least significant bit
digitalWrite(7, (d & 0x10) != 0); //Set pin 7 based on the fifth least significant bit
digitalWrite(8, (d & 0x20) != 0); //Set pin 8 based on the sixth least significant bit
digitalWrite(9, (d & 0x40) != 0); //Set pin 9 based on the seventh least significant bit
digitalWrite(10, (d & 0x80) != 0); //Set pin 10 based on the most significant bit
}
```

IV. Conclusion

This Arduino code serves the purpose of creating a binary number display using a set of LEDs connected to digital pins on an Arduino board. During the initialization in the setup() function, eight digital pins (3 to 10) are set as OUTPUT pins. Each of these pins corresponds to a specific bit in the binary representation of the numbers that will be displayed.

Serial communication is also established in the setup, running at a baud rate of 9600. This enables communication with the Arduino through the Serial Monitor, facilitating debugging and providing a way to monitor the program's execution.

The core of the code lies within the loop() function, where a for loop iterates from 0 to 256. For each value of 'd' within this range, the code invokes the displayBinary() function. This function's role is to control the LEDs' states based on the binary representation of 'd,' with each LED corresponding to a specific bit.

This code creates an engaging visual display of binary numbers on the LEDs, incrementing through the range from 0 to 256 and providing a tangible way to observe binary representations in action. It's a valuable learning tool for those looking to understand binary numbering systems and Arduino programming.

**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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