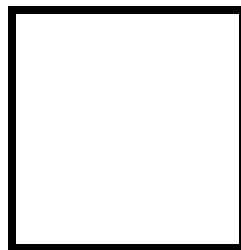




PAMANTASAN NG LUNGSOD NG MAYNILA
(University of the City of Manila)
Intramuros, Manila

Microprocessor Lab

Laboratory Activity No. 2
Arduino and Tinkercad Interface



Score

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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.

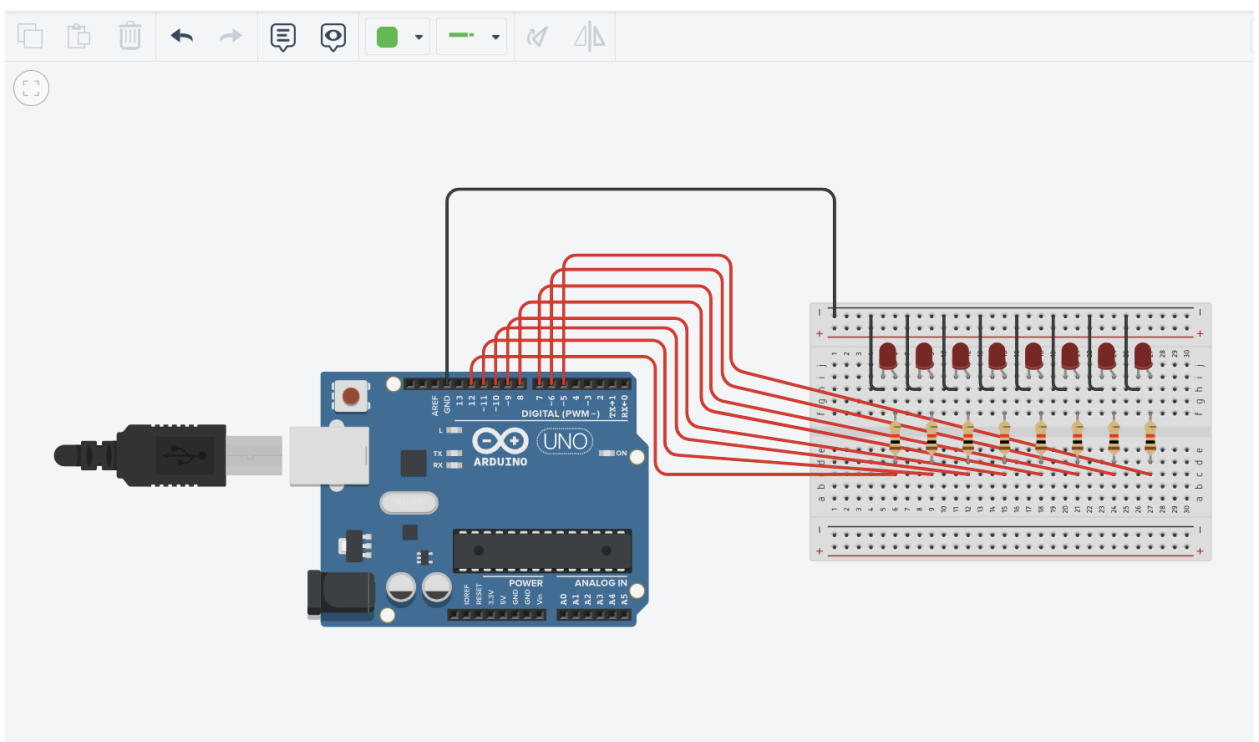


Figure No.1 Ring Counter Display Circuit Diagram

Components Used

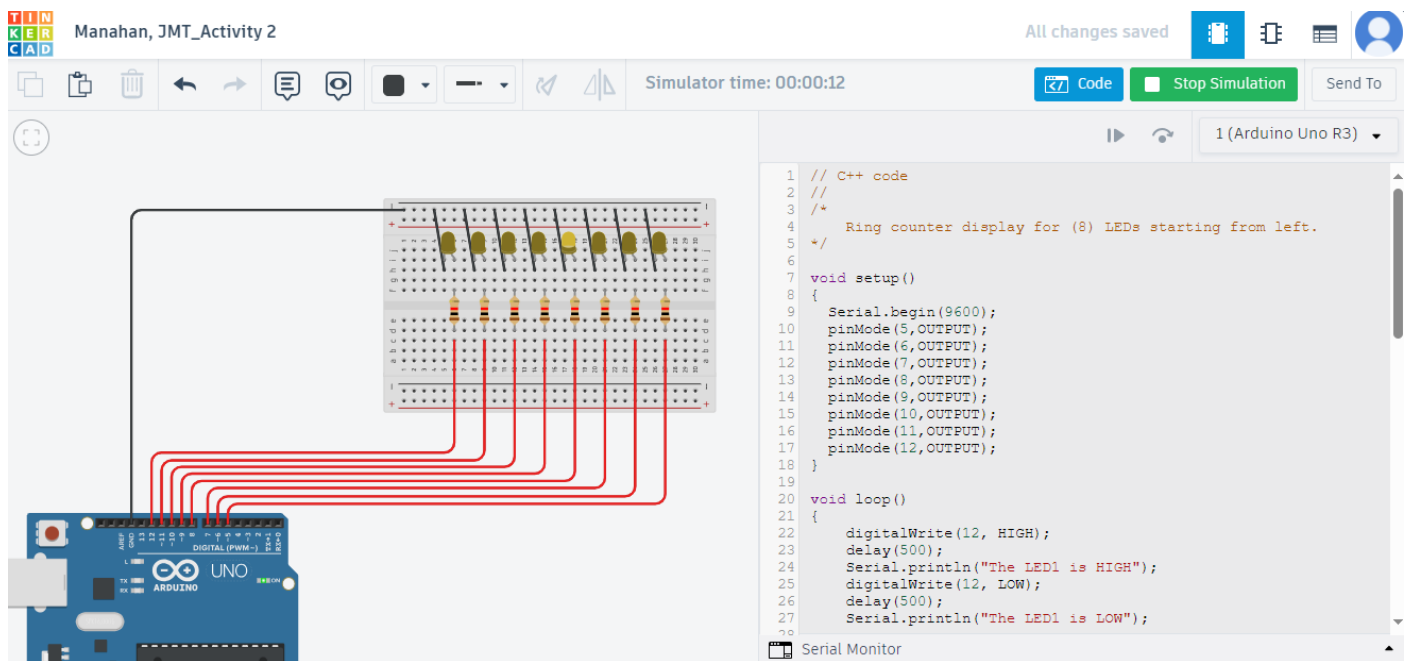
1. 8 LEDs
2. Resistor
3. Breadboard

CODE:

```
1 // C++ code
2 //
3 /*
4  * Ring counter display for eight (8) LEDs starting from left.
5  */
6
7 void setup()
8 {
9     Serial.begin(9600);
10    pinMode(5, OUTPUT);
11    pinMode(6, OUTPUT);
12    pinMode(7, OUTPUT);
13    pinMode(8, OUTPUT);
14    pinMode(9, OUTPUT);
15    pinMode(10, OUTPUT);
16    pinMode(11, OUTPUT);
17    pinMode(12, OUTPUT);
18 }
19
20 void loop()
21 {
22     digitalWrite(12, HIGH);
23     delay(500);
24     Serial.println("The LED1 is HIGH");
25     digitalWrite(12, LOW);
26     delay(500);
27     Serial.println("The LED1 is LOW");
28
29     digitalWrite(11, HIGH);
30     delay(500);
31     Serial.println("The LED2 is HIGH");
32     digitalWrite(11, LOW);
33     delay(500);
34     Serial.println("The LED2 is LOW");
35
36     digitalWrite(10, HIGH);
37     delay(500);
38     Serial.println("The LED3 is HIGH");
39     digitalWrite(10, LOW);
40     delay(500);
41     Serial.println("The LED3 is LOW");
42
43     digitalWrite(9, HIGH);
44     delay(500);
45     Serial.println("The LED4 is HIGH");
46     digitalWrite(9, LOW);
47     delay(500);
48     Serial.println("The LED4 is LOW");
49
50     digitalWrite(8, HIGH);
51     delay(500);
52     Serial.println("The LED5 is HIGH");
53     digitalWrite(8, LOW);
54     delay(500);
55     Serial.println("The LED5 is LOW");
56
57     digitalWrite(7, HIGH);
58     delay(500);
59     Serial.println("The LED6 is HIGH");
60     digitalWrite(7, LOW);
61     delay(500);
62     Serial.println("The LED6 is LOW");
63
64     digitalWrite(6, HIGH);
65     delay(500);
66     Serial.println("The LED7 is HIGH");
67     digitalWrite(6, LOW);
68     delay(500);
69     Serial.println("The LED7 is LOW");
70
71     digitalWrite(5, HIGH);
72     delay(500);
73     Serial.println("The LED8 is HIGH");
74     digitalWrite(5, LOW);
75     delay(500);
76     Serial.println("The LED8 is LOW");
77
78 }
```

IV. Conclusion

Making a dynamic light show with just eight LEDs in a ring counter display starting from the left is a straightforward but effective method. This activity's code is rather simple, and it may be implemented on a variety of hardware platforms and in a number of computer languages. This Arduino code is a simple ring counter display for eight LEDs starting from the left. It works by turning on each LED in turn for 500 milliseconds, and then turning it off again. The code also prints a message to the serial monitor each time an LED is turned on or off. The setup() function is called once when the Arduino starts up. It initializes the serial monitor and sets all of the LED pins to output mode. The loop() function is called repeatedly, over and over again. It is responsible for turning on the LEDs in sequence and printing messages to the serial monitor. The digitalWrite() function is used to set a digital pin to either HIGH or LOW. The delay() function is used to pause the program for a specified number of milliseconds. The Serial.println() function is used to print a message to the serial monitor. To use this code, you would connect the eight LEDs to the Arduino pins 5, 6, 7, 8, 9, 10, 11, and 12. You would also need to connect the Arduino to a computer using a USB cable. Once the code is uploaded to the Arduino and the LEDs are connected, you can open the serial monitor to see the messages that are printed. You should see a message for each LED that is turned on and off. You can also modify the code to change the speed of the ring counter display or to add additional features. For example, you could add a button that allows you to start and stop the ring counter display.



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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