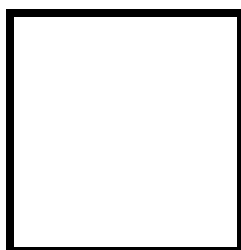




PAMANTASAN NG LUNGSOD NG MAYNILA
(University of the City of Manila)
Intramuros, Manila

Microprocessor Lab

Laboratory Activity No. 2
Arduino and Tinkercad Interface



Score

Submitted by:
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Sat 10:00 AM – 1:00PM / CPE 0412.1

Date Submitted
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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.

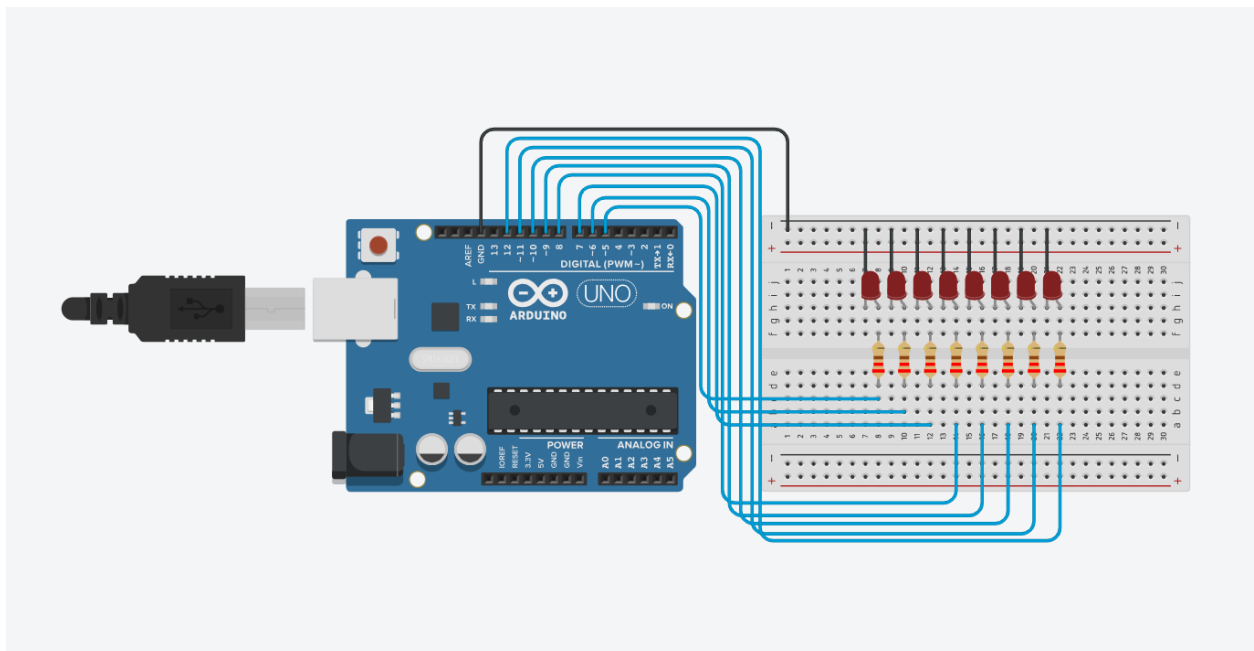


Figure No.1 Ring Counter Display Circuit Diagram

Components Used

1. 8 LEDs
2. Resistor
3. Breadboard

CODE:

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

IV. Conclusion

To summarize, the primary objective of this laboratory exercise was to demonstrate the application and construction of a ring counter utilizing an Arduino Uno and 8 LEDs through the online simulation provided by tinkercard. In this laboratory, each of the LEDs was connected to the digital pins on the Arduino from five to twelve pin, as well as the ground pin.

Within the source code, the initial step involved setting the serial baud rate and pinMode for each of the LEDs within the void setup. Subsequently, within the void loop, the "digitalWrite" function was utilized to control the output of the LEDs, with the options being either "High" for the on state or "Low" for the off state. The intended outcome of this laboratory exercise was to sequentially illuminate the LEDs from left to right simultaneously.

All in all, this laboratory activity effectively implemented a principle and technique of hardware programming using the Arduino Uno, specifically by employing a ring counter through the tinkercard simulation platform.

References

[1] Valnaut, “Building a LED binary counter,” Hackster.io, <https://www.hackster.io/valnaut/building-a-led-binary-counter-bb3c63> (accessed Sep. 30, 2023).

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