**Microprocessor Lab**

Laboratory Activity No. 2

**Arduino and Tinkercad Interface**

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Score

*Submitted by:*

**Lapid, Henderson Eiann C.**

**<Saturday – 1:00 pm – 4:00 pm> / <Section | Block 2>**

*Date Submitted*

**30-09-2023**

*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**

A computer screen shot of a circuit board

Description automatically generated

*Figure No.1 Ring Counter Display Circuit Diagram*

A computer screen shot of a circuit board

Description automatically generated

*Figure No.2 – In Simulation, LED is lit up in succession.*

A screenshot of a computer

Description automatically generated

*Figure No.3 – Serial Monitor Output while in simulation*

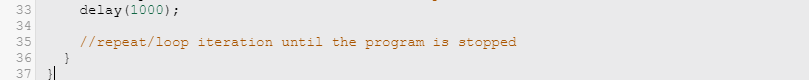
**Components Used**

1. 8 LEDs
2. 8 Resistors
3. Breadboard

**CODE:**

A screenshot of a computer code

Description automatically generated



IV. Conclusion

A ring counter is an application of the shift register, the difference is, in a ring counter, the output of the last flip-flop is connected to the input of the first flip-flop [2].

As observed during the simulation of the circuit, it indeed functions like a ring counter, looping and proceeding to the next LED from left to right. The circuit design is as given from this laboratory activity, with little modifications such as the wiring to make the circuit neater.

The program is just a simplified code of the given program codes in this activity, no such references can be cited as it is just programming experience of similar circuits in our subject, CPE 0411.1 – Embedded Systems (LAB). Using a for loop statement, iterating continuously from 0 to 7. Each LED is lit up from left to right, connected pins 12 to 5 respectively, with a delay for each HIGH and LOW state of 1000ms.

**References**

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

[2] SUDIPTADANDAPAT, “Ring Counter in Digital Logic,” GeeksforGeeks, https://www.geeksforgeeks.org/ring-counter-in-digital-logic/ (accessed Sep. 30, 2023).