IE2070 - Assignment (Individual)

Year 2 Semester 2 – 2024

Project Specifications

Students are expected to develop an LED lamp that can be remotely operated using an IR remote controller used at home (example: TV Remote Controller).

Development Requirements:

1. The power for the LED lamp should be provided using batteries.
2. The controller for the LED lamp should be an Arduino UNO.
3. The LED lamp has 4 white colored LEDs and 1 multi-color LED.
4. Use the volume up/down button or channel up/down button to operate the lamp.

The remote-controlled LED lamp should operate in the following sequence:

1. Initially the LED lamp should be turned off.
2. Upon pressing the volume up/channel up button, the 1st LED should be turned on. Pressing the volume up/channel up button again will turn on the 2nd LED. Similarly, the sequence should continue till all the colors of the multi-color LED are turned on.
3. If the volume up/channel up button is repeatedly pressed, the LED lamp will toggle between the available number of colors of the multi-color LED.

The following sequence should be demonstrated:

1. Off -> Up -> 1st LED -> Up -> 2nd LED -> Up -> 3rd LED -> Up -> 4th LED -> Up -> 1st color of multi-color LED -> Up -> 2nd color of multi-color LED -> Up -> 3rd color of multi-color LED -> Up -> 1st color of multi-color LED -> Up -> 2nd color of multi-color LED -> Up -> 3rd color of multi-color LED
2. Upon pressing the volume down/channel down button will first turn off the final color of the multi-color LED. Similarly, the sequence should continue till all the LEDs are turned off.
3. Use the volume down/channel down button to reduce the brightness of the LED.

Students are required to create a comprehensive report detailing the design process, circuit diagram, testing results and a discussion. The report should adhere to the IEEE format.

A structured outline for the report should include sections covering the following topics.

1. Title page
2. Introduction
3. Design methodology
4. Code implementation
5. Circuit diagram

6. Testing and validation
7. Discussion
8. References

The deadline for submitting the report is **28th of April 2024**. Following the deadline, a viva session will be conducted. Please note that the students who fail to participate in the viva session will be awarded zero marks for this individual assignment.

Marking Criteria

Project report (Design Decisions, Implementation and Testing)	30%
Software implementation (Use Microchip Studio: Assembly/C language can be used.)	40%
Demonstration the product with Q/A session	30%