

Mini Project

Electronic Circuits and Devices

EC4050



**BIOMETRIC FINGERPRINT
ATTENDANCE SYSTEM**

By:-

2021/E/053 : I.G.P.T.SEWWANDI

2021/E/082 : L.M.N.H.DE MEL

2021/E/171 : W.D.A.DULANYA

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1. Introduction

Implementing a biometric fingerprint attendance system is a significant step toward enhancing the efficiency and accuracy of attendance tracking in various settings, including educational institutions, businesses, and organizations. This advanced technology leverages the uniqueness of each individual's fingerprint to automate the process of recording attendance, offering numerous benefits such as increased accuracy, security, and streamlined administrative tasks.

In this project, we are going to design a Fingerprint Sensor Based Biometric Attendance System using Arduino. Simply we will be interfacing fingerprint sensor with Arduino, LCD Display & RTC Module to design the desired project. In this project, we used the fingerprint Module and Arduino to take and keep attendance data and records.

The system switches on the device for a particular user automatically on sensing him through his fingerprint scan. For this, we use a fingerprint scanner interfaced with a microcontroller-based circuit. As soon as a person enters he/she is allowed to scan his/her finger on the scanner.

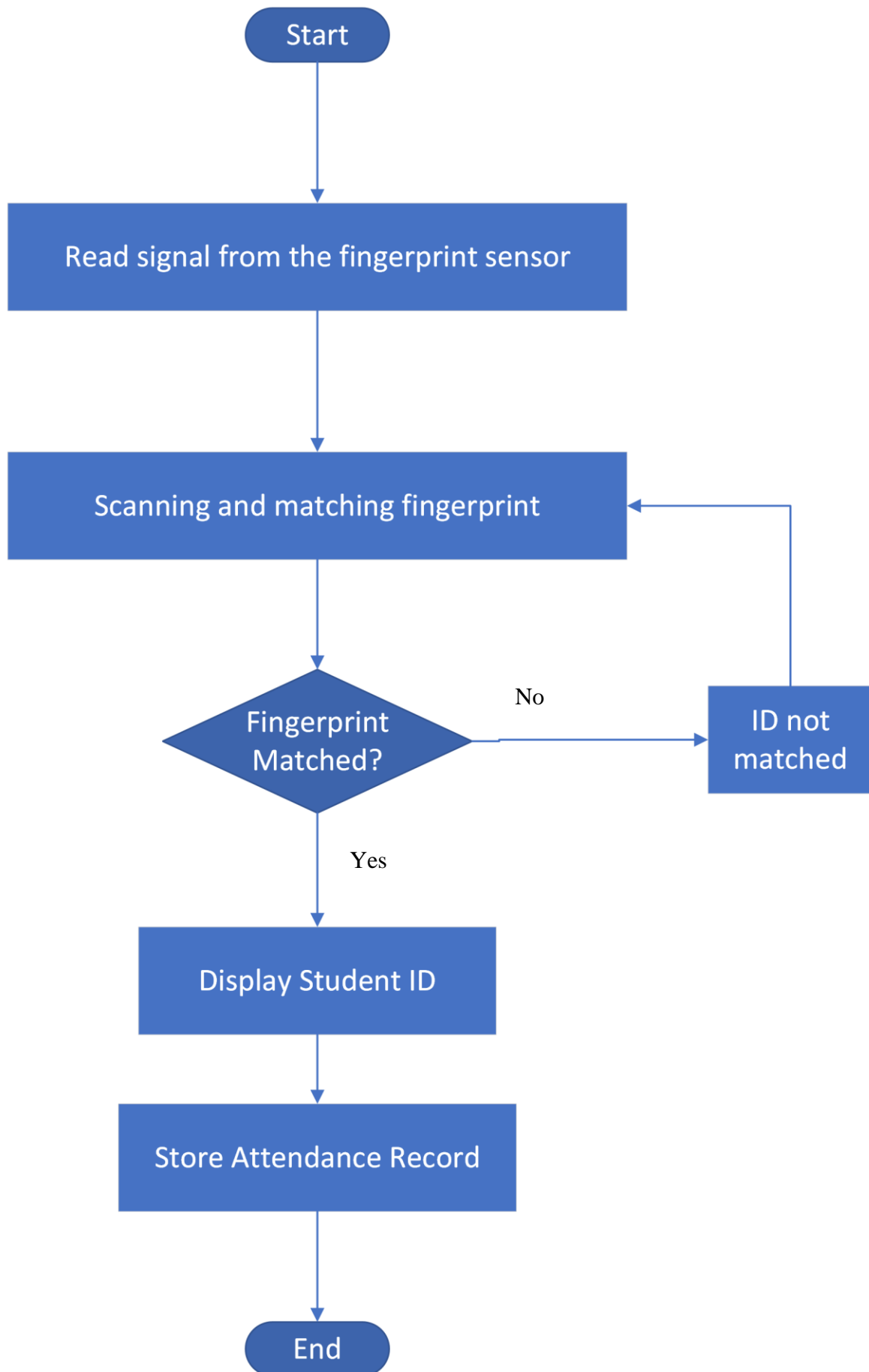
On scanning the data is sent to the microcontroller, based on this data the scanned copy is now verified for authentication. If the user is verified the microcontroller switches on a device (light) to indicate the user's verification.

2. Circuit Components

- Arduino UNO Board
- R305/R307 Fingerprint Sensor
- DS3231/DS1307 RTC Module
- 16x2 LCD Display
- Potentiometer 10K
- Push Buttons
- Buzzer 5V
- LED 5mm Any Color
- Connecting Wires 40
- Breadboard
- Resistors (1k, 1k, 2.2k)

3. The Process of System Designing and Implementation

- First, the components which are needed were found by browsing the internet.
- The components were collected from the shops outside.
- The circuit design was implemented and tested on a breadboard.
- The EasyEDA software was used to design the circuit.
- The circuit was thoroughly checked, and the results were observed.

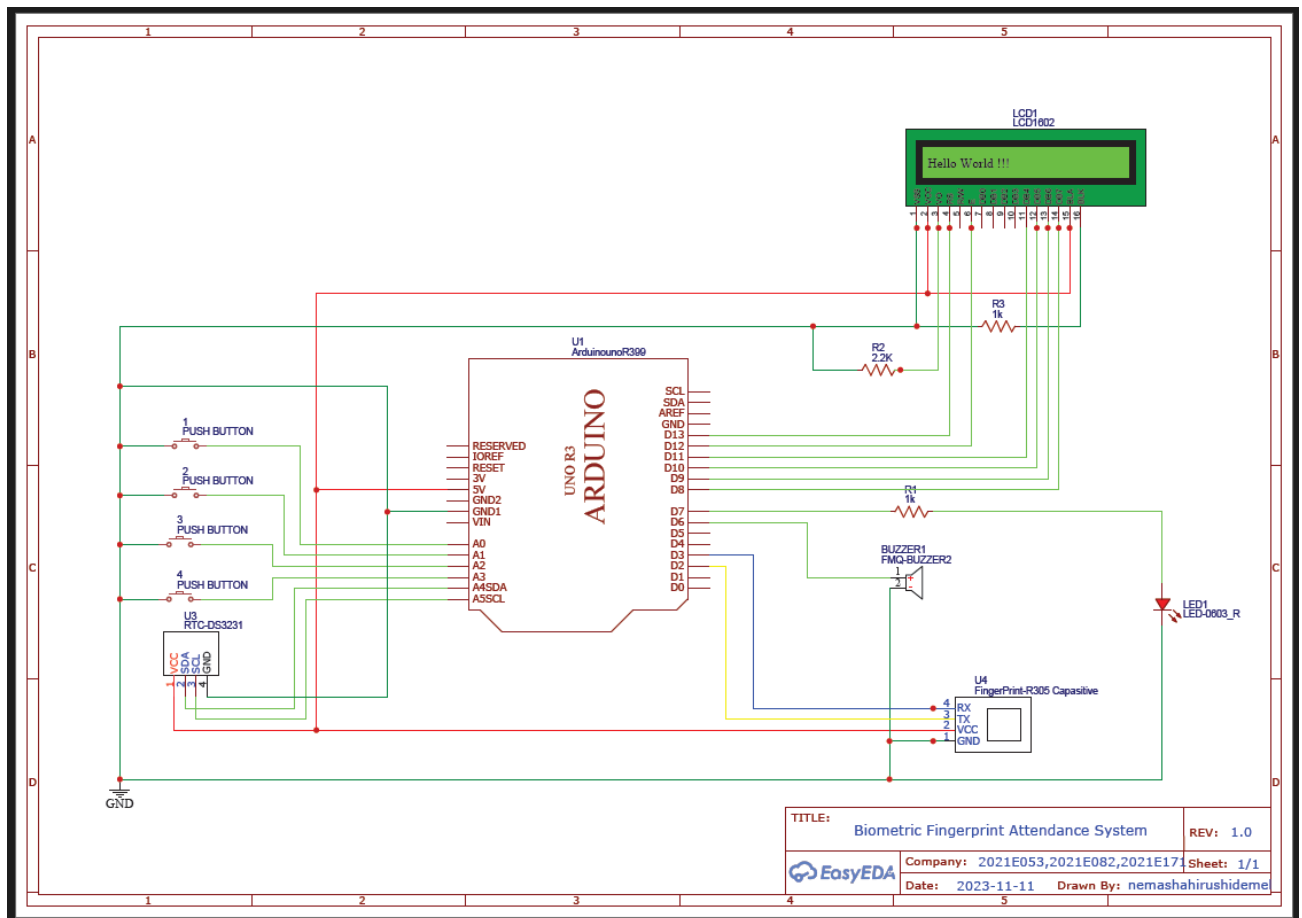


4. Analysis of Circuit Design

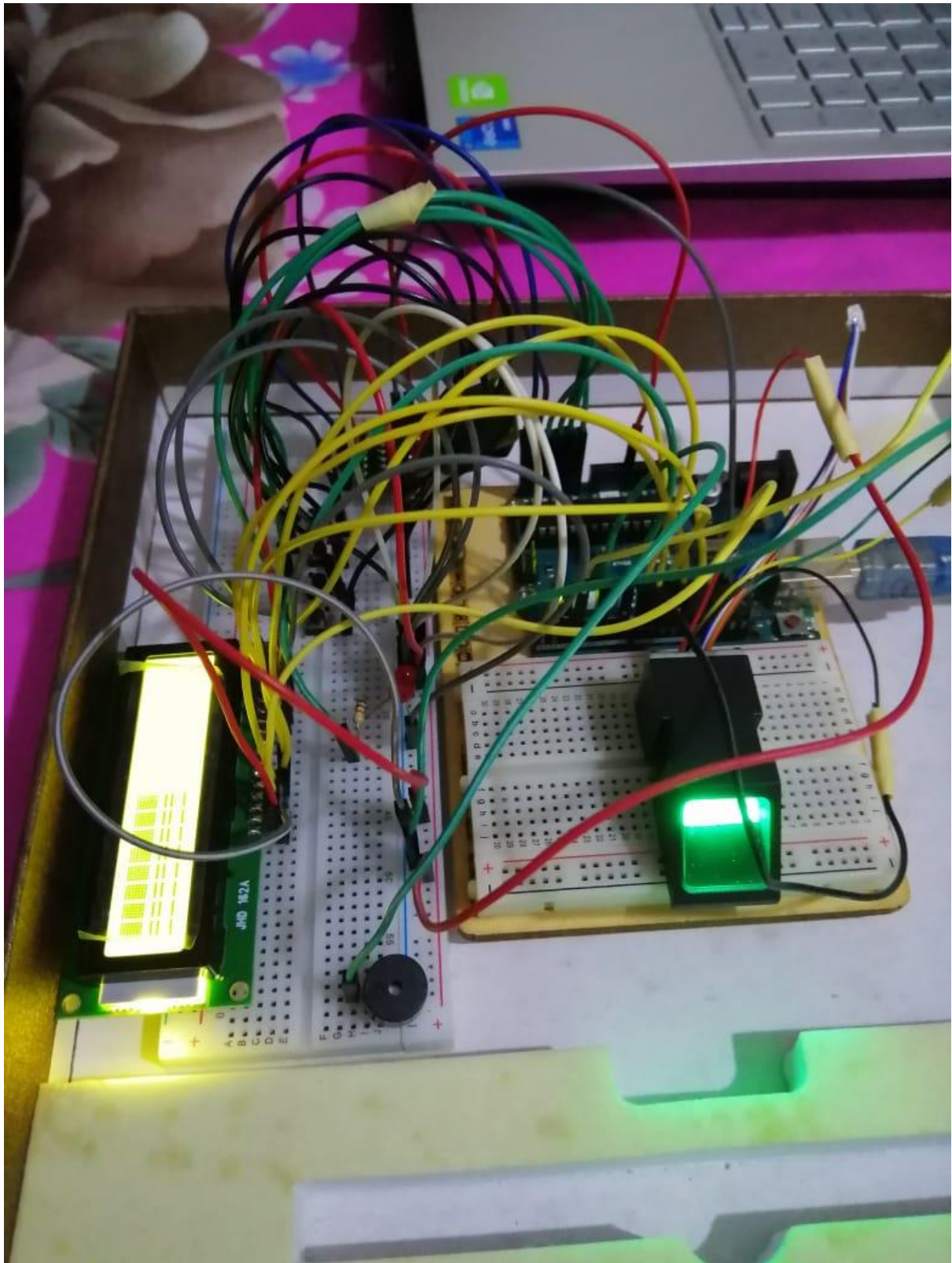
The circuit was designed to track attendance by using Arduino Uno.

5. Drafts of the Project

Circuit Simulation using Circuit Wizard



Breadboard Implementation



6. Challenges

- We were unable to find the proper components in EasyEDA software.
- Using the laboratories to do the work was difficult as there were many groups to work on this project.
- Also, it was a challenge to print the circuit pathway on the copper plate without flaws.
- The last challenge will be soldering. We will have to face some difficulties due to the lack of practice to solder.

7. Reflection

- We learned about how to use EasyEDA simulation software.
- We got to know how to design circuits in practice.
- We were familiar with soldering.
- We had to face various obstacles and we were able to study them.

8. Conclusion

In conclusion, the design and implementation of a biometric fingerprint attendance system circuit presented certain challenges. However, through careful planning, budgeting, task allocation, designing, and iterative testing these challenges were overcome.

Implementing a biometric fingerprint attendance system is a significant step toward enhancing the efficiency and accuracy of attendance tracking in various settings.