# BIOMETRIC ATTENDANCE SYSTEM


*A Report Submitted*
*as Requirements for the Mini Project 1A Course of*
**Semester IV, AY 2022-2023**

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April, 2023


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# Certificate

This is to certify that the Mini project entitled **Biometric Attendance System** is a work of

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submitted as fulfilment of the requirement for the Mini Project1B of **"Semester IV"** in **"Second Year of Engineering AY 2022-2023"**.

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HOD, EXTC


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## Mini Project 1B Report Approval

This Mini project report entitled **'Biometric Attendnace System'** by **Diya Rai, Kshitija Zodge , Ibrah Kazi , Vighnesh Pai** is approved for the completion of Mini Project 1B course **of Sem IV of AY 2022-2023 in Dept. of Electronics & Telecommunication Engineering.**

### Examiners

1. _____

2. _____

Date : / /

Place : **Kurla, Mumbai**

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# Acknowledgement

The satisfaction that accompanies the successful completion of the task would be incomplete without the mention of the people who made it possible , whose constant guidance and encouragement crown all the success.

It is our greatest pleasure to thank Ms.Namita Agarwal(HOD of Electronics & Telecommunication Department), Don Bosco Institute of Technology for providing us heart full encouragement support and allowing us to work in such a resourceful lab of this esteemed institute.

We show our gratitude to our Honourable Principal Dr.Prasanna Nambiar for having provided all facilities & Support.

We very much thankful to our laboratory assistants and all faculty members who helped us in the completion of our project.

**Abstract**

Attendance System is used to detect the user identification and time management. Attendance system is required in many different places such as offices, companies, schools, organization and institution etc. Attendance system enables the user to track the working hours and late arrivals, early departures, time taken on breaks and absentees. The main aim of the report is to construct the attendance system using Fingerprint module and RTC module. In this system Arduino Uno and Parallax Data acquisition tool (PLX-DAQ) are the main components to display record in Excel.

# Chapter 1

# Introduction

## 1.1 Problem Statement

To develop a low-cost and easy-to-use biometric attendance system using Arduino that provides accurate and efficient attendance records while preventing fraudulent activities such as buddy punching.

## 1.2 Project Motivation

In our Education system, we are using the same old methods of taking attendance like teachers call out the name of the student and attendance is marked on a sheet of paper. This causes a lot of time wastage. The other method is that the teacher can pass a sheet of paper in the class, but it also leads to a major drawback that the student tend to sign the attendance for his friends. So to remove this drawback we are using a new attendance system based on biometric.

### 1.2.1 Applications

The applications of a biometric attendance system are numerous and can be implemented in various industries, including:-

1. **Corporate Offices**: To ensure timely reporting and higher productivity, biometric attendance systems can be used in corporate offices to automate the attendance tracking process.

2. **Schools and Universities**: Biometric attendance systems can be used in schools and universities to track student attendance and monitor attendance patterns. This can help educational institutions identify students who are frequently absent, and take appropriate measures to ensure they do not fall behind in their studies.

3. **Hospitals and clinics:**Biometric attendance systems can be used in healthcare facilities to track employee attendance, ensure timely reporting of staff, and maintain patient care standards.

4. **Government organizations:** Biometric attendance systems can be used in government organizations to monitor employee attendance and prevent fraudulent activities. This technology can be used to track attendance at government offices, government-run programs, and other similar initiatives.

## 1.3 Project Objectives & Outcomes

**Objectives:**

The main objective of this project is to construct attendance system that captures unique biological feature like fingerprint using optical fingerprint sensor module and the overall result of the fingerprints captured will be displayed in excel sheet.

**Outcomes:**

The outcome is a system that accurately records attendance using biometric fingerprint verification. It saves time, reduces manual work, enhances security, maintains digital attendance records, provides a user-friendly interface, enables real-time tracking, and facilitates efficient attendance management.

# Chapter 2

# Project Implementation

## 2.1 Block diagram

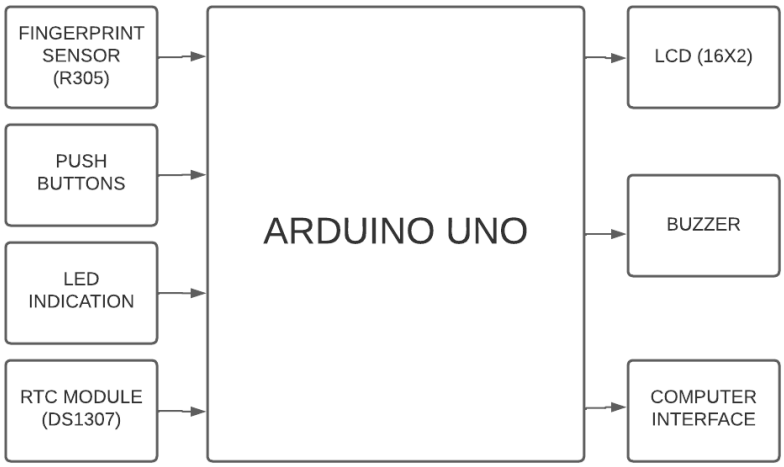


Figure 2.1: The block diagram of Biometric Attendance System

In this Fingerprint Sensor Based Biometric Attendance System using Arduino, we used a Fingerprint Sensor module to authenticate a true person or employee by taking their finger input in

the system. Here we are using 4 push buttons to register new fingerprint or delete stored fingerprint or match stored fingerprint. The 4 push buttons are used as an input unit for these tasks. Similarly, RTC Module DS1307 is used for registering scanning/entering/existing time of the user.

The LCD displays the time record and every function happening via push button. Buzzer indicates different functions and happening whenever an interrupt is detected. The LED is used for power indication.

## 2.2 Flowchart

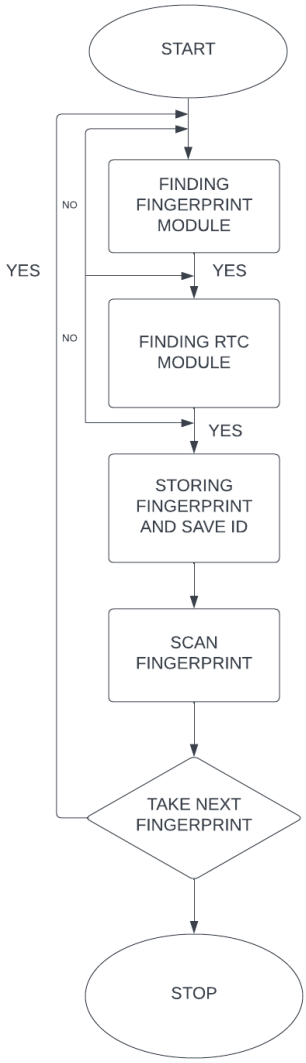


Figure 2.2: Flowchart for Registering fingerprint

## 2.3 Circuit Diagram

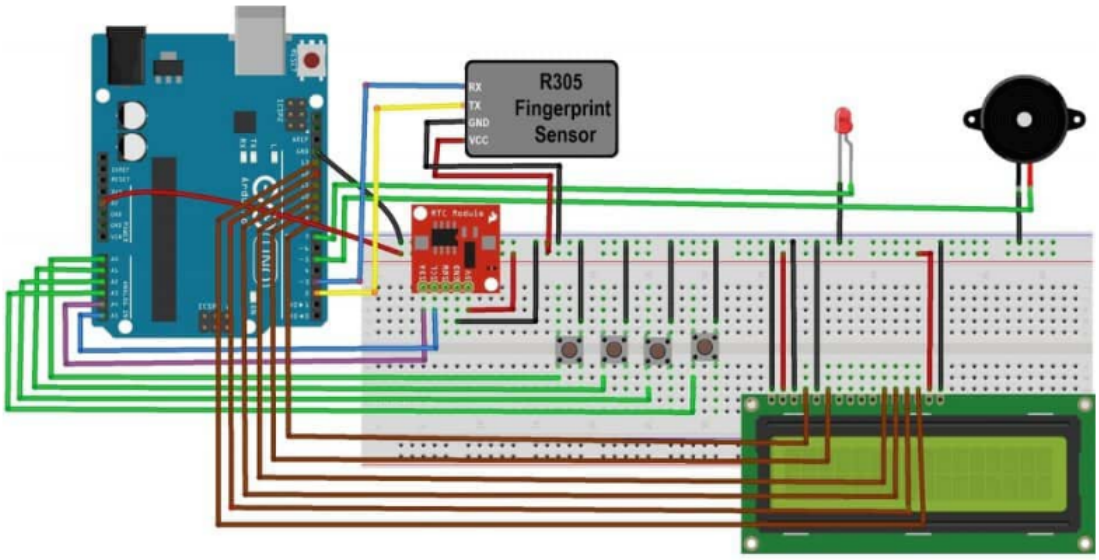


Figure 2.3: Circuit Diagram

The circuit diagram showcases the components and their connections in the attendance biometric system using Arduino. The Arduino board acts as the main controller, receiving inputs and controlling various modules. The RTC Module DS1307 is connected through I2C communication to provide accurate timekeeping for attendance records. The Fingerprint Sensor R307 is linked to the Arduino via the RX and TX pins, enabling fingerprint capture and verification. The LCD 16x2 display serves as the visual interface, displaying attendance details and prompts. The push buttons allow user interaction and input. The buzzer provides audible feedback for actions or events, while the LED indicates system status or specific conditions.

## 2.4 Components & Their Description

The following components are used in the designing of attendance monitoring system:-

1) Arduino UNO
2) Fingerprint Module
3) RTC Module
4) Parallax Data Acquisition tool (PLX-DAQ)
5) Microsoft Excel

a) **Arduino Uno:**

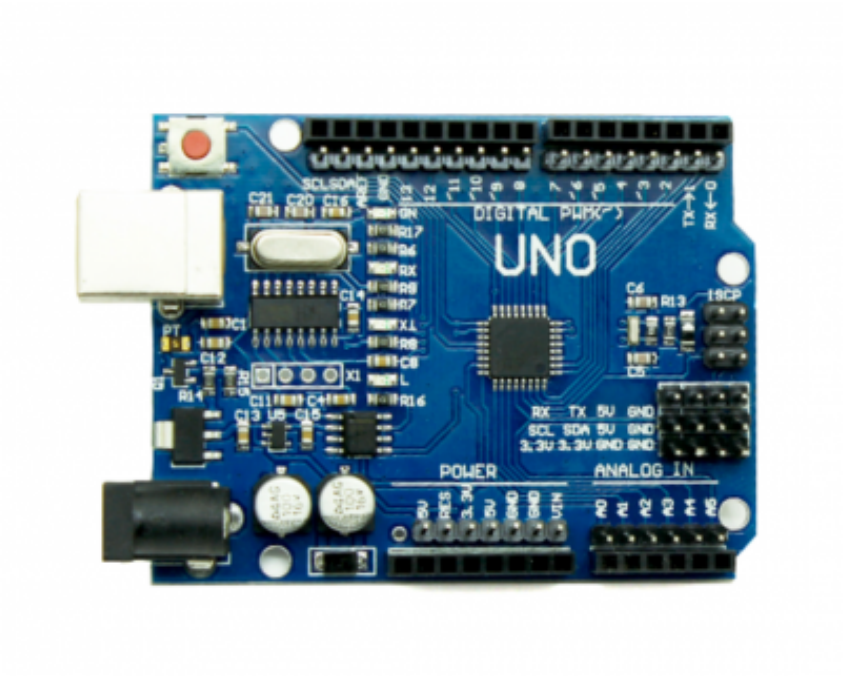


Figure 2.4: Arduino Uno Board

It is basically a microcontroller which is based on both hardware and software. The main purpose of this microcontroller is to store, register and display the data. In Storing, the microcontroller stores the fingerprint of the user with a particular ID Number. When the fingerprint of the user is stored then the user will register himself. In Registering, the will be checked with the stored fingerprint and if both the fingerprints match then the ID Number of that fingerprint is displayed on the Serial Monitor and further the data is displayed on Excel.

b) **Fingerprint Sensor:**

Figure 2.5: Fingerprint Sensor

There are different types of fingerprint Sensors like Optical, Capacitive, Ultrasonic, thermal etc. In this project, we are using Optical Fingerprint Sensor Module. It is used to scan the fingerprint of the user and save the image of the fingerprint in the memory (EEPROM).

c) **DS1307 RTC Module:**

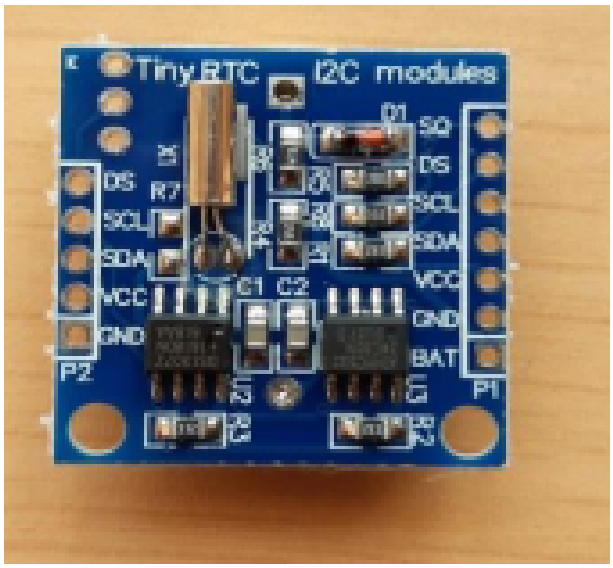


Figure 2.6: RTC Module

RTC module also Known as Real Time Clock Module is used as a Time and Date Remembering System. This Module is used to display the Date and Time at which the User scans his fingerprint and the result is saved in the memory.

e) **LCD:**

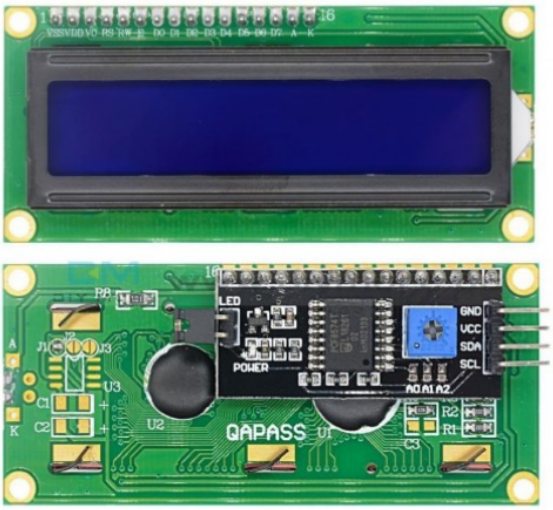


Figure 2.7: 16X2 LCD Display with I2C interface

The 16x2 LCD display with I2C interface can be used in a biometric attendance system to provide a clear and easy-to-read display of attendance-related information. The LCD display can show important details such as the date, time, student fingerprint ID , and attendance status. It allows users to quickly check their attendance records and provides real-time feedback. The I2C interface simplifies the wiring and communication between the LCD display and the main controller, reducing the number of pins required

e) **Parallax Data Acquisition Tool (PLX-DAQ):**

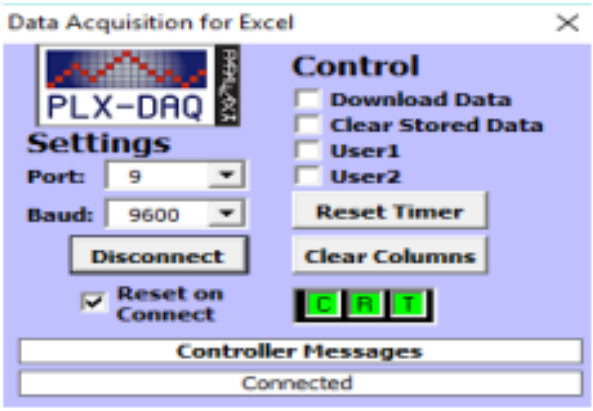


Figure 2.8: PLX-DAQ Tool

Parallax Data Acquisition Tool or PLX-DAQ is a add-on tool for Microsoft Excel. It is basically used to display the data of the Serial Monitor in Excel spread sheet. The Arduino Uno Microcontroller is simply Connected to a Computer via USB cable. When we open the PLX-DAQ tool, then Excel sheet opens automatically. After that, we need to connect the PLX-DAQ by simply providing the port to which the controller is connected at 9600bps. The Microcontroller will now send the data directly to Excel spread sheet.

## 2.5 Output


Figure 2.9: Displaying Date & Time of Registration


Figure 2.10: Id matched


Figure 2.11: Attendance Registered Successfully

## 2.6 Expense

For the list of components, see table 2.1

Table 2.1: List of components

| **COMPONENT** | **QUANTITY** | **COST** |
|---|---|---|
| Arduino Uno | 1 | 385 |
| R305 Fingerprint Sensor | 1 | 975 |
| DS1307 RTC Module | 1 | 50 |
| Push Buttons | 4 | 30 |
| LCD Display 16*2 | 1 | 60 |
| Buzzer | 1 | 10 |
| Total | - | 1500/- |

# Chapter 3

# Conclusion

Biometric systems have replaced the manual and unreliable systems by presenting reliable, secured, fast and efficient system. This paper consists of one of those systems. Fingerprint based attendance system will help to detect the presence of student and employees in schools, colleges and offices etc. It is user friendly and reliable and most of all it displays the time and date to check whether the user is on time or late. It also displays ID numbers on excel sheet. This Excel sheet can be saved and is used to calculate the attendance of the User. Hence, a system with expected results has been developed but there is still need for improvement.

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# Appendix A

# Datasheets