

# Online Attendance System Using Arduino and Fingerprint Sensor

CSE-367 (Microprocessor Project)

Assigned Group No: 02

Project Title

Biometric Attendance Monitoring System

(Virtual Attendance App)

---

## Team Members

1. Anindya Mazumder - 2020331026
2. Purbasha Moni - 2020331073
3. Monira Afroz Ane – 2020331081
4. Rajib Robidas - 2020331099
5. Pradip Pashi - 2020331105

Department of Computer Science and Engineering, Shahjalal University of Science and Technology, Sylhet-3114, Bangladesh.



## **Abstract**

This project focuses on developing an online attendance system utilizing an Arduino microcontroller and an R305 fingerprint sensor. The system is designed to record attendance by verifying fingerprints and displaying the status on an LCD screen. This report provides comprehensive instructions for assembling the hardware, wiring the components, and programming the Arduino.

## **Keywords**

- Attendance System
- Arduino
- Fingerprint Sensor
- Automation
- Microcontroller
- Real-Time Clock

## **Introduction**

The modern educational and corporate environments require efficient attendance tracking systems. Traditional methods are time-consuming and prone to errors. This project aims to create an automated attendance system using an Arduino microcontroller and a fingerprint sensor to ensure accuracy and reliability.

## Objectives

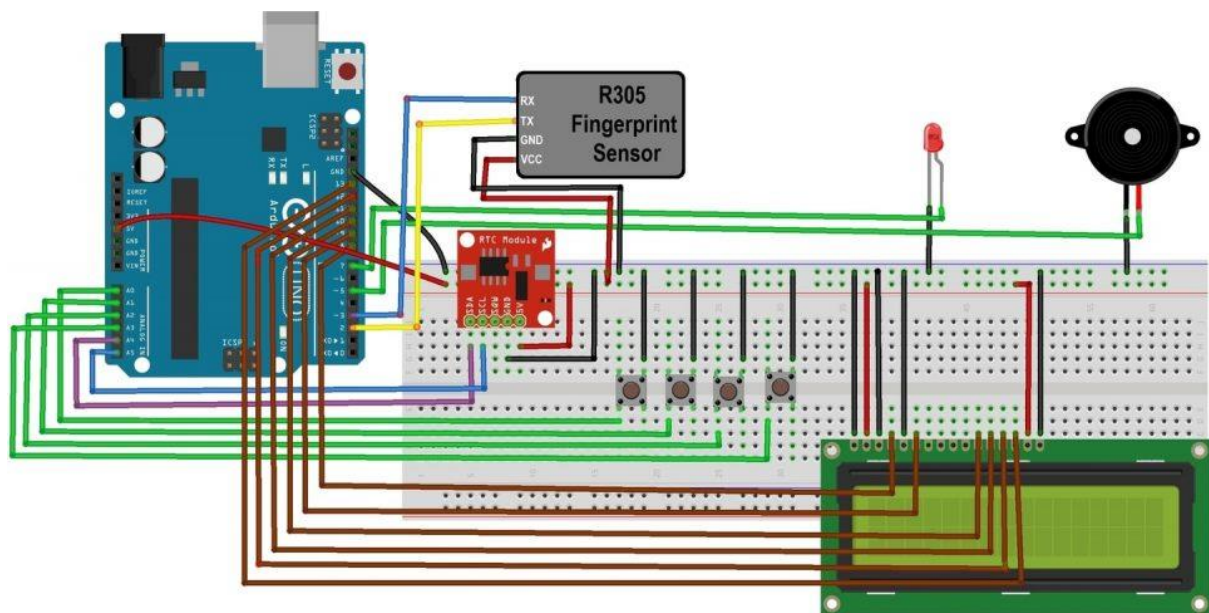
1. To design a hardware architecture incorporating an Arduino microcontroller and R305 fingerprint sensor.
2. To develop software for recording and displaying attendance.
3. To integrate the system components into a cohesive unit.
4. To provide detailed instructions to facilitate replication of the project by new users.

## Components Required

- Arduino Uno
- R305 Fingerprint Sensor
- RTC Module (Real-Time Clock)
- 16x2 LCD Display
- Push Buttons (4 pieces)
- Breadboard
- Jumper Wires
- Resistors (220 ohms)
- LED
- Buzzer

## Circuit Diagram

Below is the circuit diagram for the project. Follow the diagram to connect all the components correctly.



## Step-by-Step Instructions

### 1. Connect the Fingerprint Sensor:

- **VCC** to **5V** on Arduino
- **GND** to **GND** on Arduino
- **RX** to **D2** on Arduino
- **TX** to **D3** on Arduino

### 2. Connect the RTC Module:

- **VCC** to **5V** on Arduino
- **GND** to **GND** on Arduino
- **SDA** to **A4** on Arduino
- **SCL** to **A5** on Arduino

### 3. Connect the LCD Display:

- **VSS** to **GND**
- **VDD** to **5V**
- **V0** to the middle pin of the potentiometer
- **RS** to **D7** on Arduino
- **RW** to **GND**
- **E** to **D6** on Arduino
- **D4** to **D5** on Arduino
- **D5** to **D4** on Arduino
- **D6** to **D3** on Arduino
- **D7** to **D2** on Arduino
- **A** to **5V**
- **K** to **GND**

### 4. Connect the Push Buttons:

- One side of each button to **GND**
- The other side to digital pins (e.g., **D8**, **D9**, **D10**, **D11**) with pull-up resistors

### 5. Connect the LED and Buzzer:

- **LED** positive leg to **D12** through a 220-ohm resistor
- **LED** negative leg to **GND**
- **Buzzer** positive leg to **D13**
- **Buzzer** negative leg to **GND**

## Operation Mechanism

1. The real-time date is displayed continuously when attendance is not being registered or checked.
2. When a user places a finger on the fingerprint sensor, the system checks if the fingerprint is registered and, if so, records the attendance.
3. To register a new fingerprint, press the first button from the left (Button A).
4. The fingerprint number will be displayed, and you can select the desired number by pressing the third button (Button C) to increase or the fourth button (Button D) to decrease the number.
5. Once the required number is selected, press the second button (Button B).
6. Place the finger on the fingerprint sensor.
7. Place the same finger again to confirm the registration. The fingerprint will then be successfully registered.
8. The system is now ready to check and store fingerprint attendance.

## Arduino Code

The code for this project is available on GitHub. You can download or clone the repository to get the latest version of the code. [GitHub Repository link: Online Attendance System](https://github.com/RajibRobidas/Biometric-Attendance-System)

(<https://github.com/RajibRobidas/Biometric-Attendance-System>)

## Cost Estimation

The project's cost is primarily driven by the hardware components, with open-source software being utilized to avoid additional costs. The estimated hardware cost is as follows:

Materials	Quantity	Cost (BDT)
Arduino UNO	1	1050.00
R305 Fingerprint Sensor	1	800.00
RTC Module	1	200.00
16x2 LCD i2c Display	1	115.00
Push Buttons	4	40.00
Breadboard	1 (Big size)	300.00
Jumper Wires	50 pcs	50.00
Resistors (220 ohms)	10	10.00
LED	1	5.00
Buzzer	1	10.00
Others		620.00
<b>Total</b>		<b>3200.00</b>

## Troubleshooting

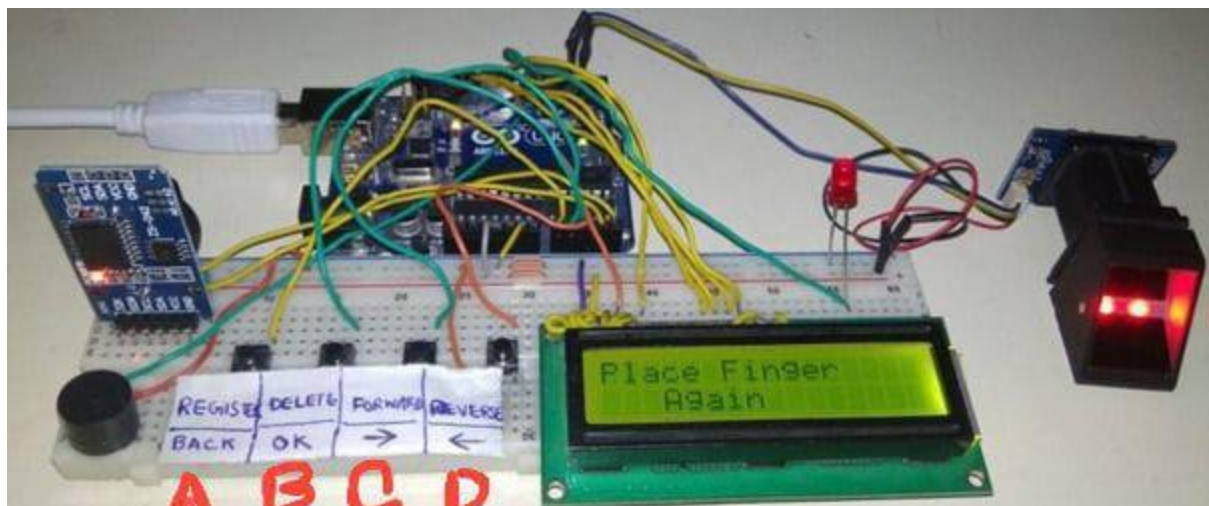
- **Fingerprint Sensor Not Found:** Ensure that the sensor is correctly wired and that the connections are secure.
- **LCD Display Issues:** Check the connections and ensure that the contrast is set correctly using the potentiometer.
- **RTC Module Not Working:** Verify the wiring and ensure the module has a battery inserted.

## Conclusion

By following the steps outlined in this report, you can successfully build an online attendance system using an Arduino and a fingerprint sensor. This project is an excellent way to learn about integrating various components and modules with Arduino, providing a practical application for real-world use.

## References

- Arduino Official Documentation: [Arduino](https://www.arduino.cc/) (<https://www.arduino.cc/>)
- R305 Fingerprint Sensor Datasheet
- RTC Module Documentation
- LCD Display Tutorials



This report provides all necessary instructions and detailed explanations to ensure that a new student can replicate the project from scratch. The step-by-step guide, coupled with the circuit diagram and troubleshooting tips, makes it an ideal resource for beginners.