

# Smart Class Room with Wireless Finger Print Attendance

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**Abstract**— Fingerprint Attendance system is one of the most important things in which it is required in some of the important places schools, colleges, and many corporate industries. This fingerprint attendance system is required for marking their attendance, and we can reduce the time wastage. This paper describes all about the smart classroom with a wireless fingerprint attendance system. The main aim of this paper is that we need to get perfect attendance without manipulation. The fingerprint sensor, RTC Module, and Arduino Uno are the components in which we are using in this project.

**Index Terms**— Arduino UNO, RTC module, LCD,

## I. INTRODUCTION

In the present world, we can see that the marking of attendance for students in a class is taking through pen and paper by calling their roll number and students' name, this wastes a lot of time, and we can also see the manipulation of attendance. Another way of doing this is that just passing the sheet to every student and asks them to sign on it and also waste a huge amount of time. If there are a large number of students in a class, the whole time wastes due to only attendance, and this effects the lecture, and the faculty is unable to deliver the complete things, or he is unable to complete the syllabus in an expected time. In order to avoid this, we are using fingerprint attendance. The fingerprint attendance system is all about marking the attendance of the students through their fingerprints templates.

### A. Background Study

In present attendance systems, we can see a large number of mistakes like manipulation of attendance and time buddy punching. In this system, the student's registration number and name-calling waste a lot of time. For example, in a class, there are more than 100 students and marking their attendance on the sheet by calling their roll number, and their name will waste a lot of time. But in some of the institutions and many engineering colleges still, it is using for marking the attendance. The disadvantage of using manual attendance is that calling the students registration number and his/her name wastes a large amount of time.

## II. SYSTEM MODEL AND PROBLEM DESCRIPTION

This paper represents the smart classroom with a wireless fingerprint attendance system. The fingerprint module and Arduino Uno are the main components in this project, and Arduino can take the overall attendance through the EEPROM module. We use the EEPROM module for storing the data of attendance.



Figure1(a) Interfacing of Controller with Figure print module and computer

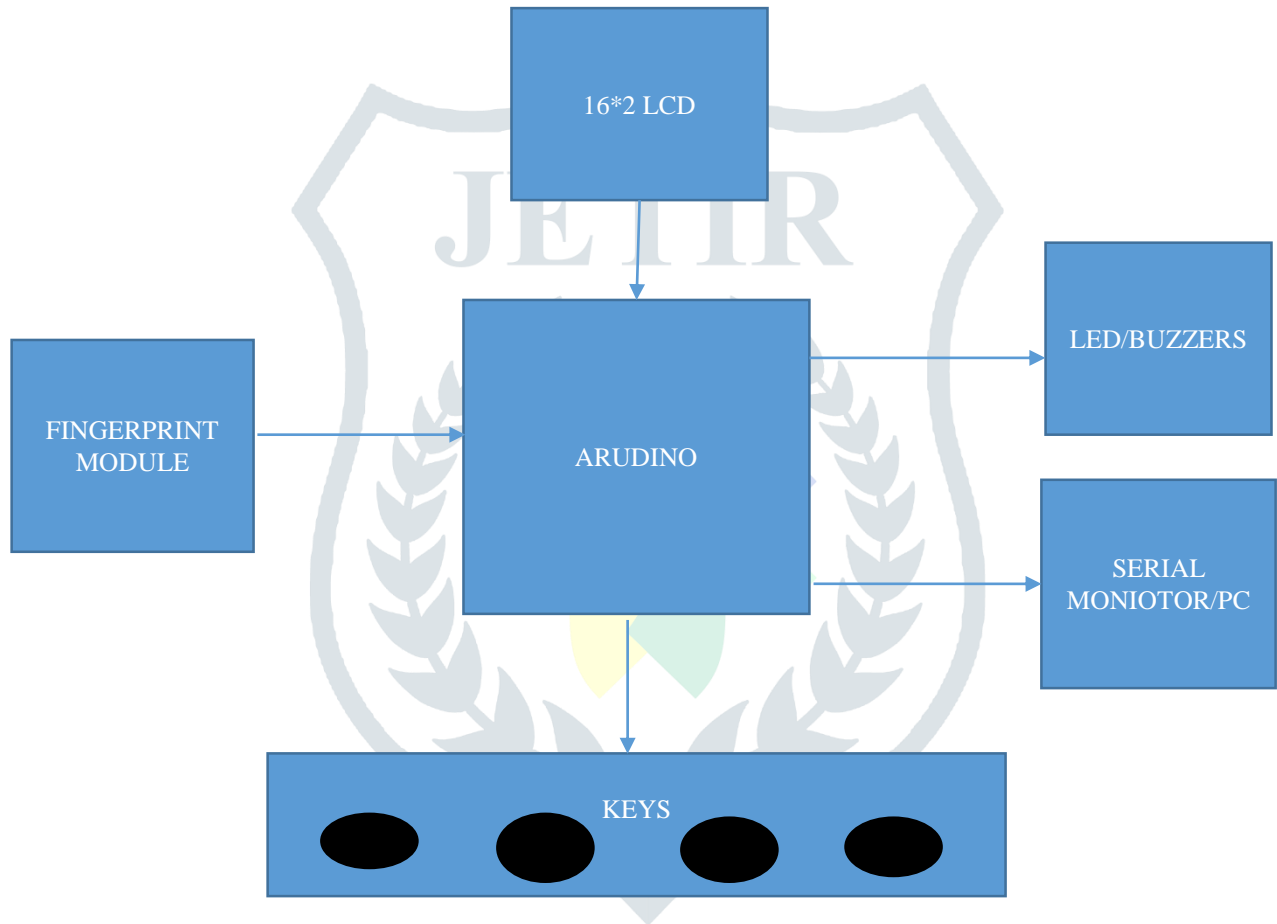


Fig. 1(b) Block Diagram of the system model

### Fig. 1(a&b) Block Diagram Explanation:

In figure1(a) block diagram, we are using three components namely they are fingerprint module, controller and computer. In the initial stage, the fingerprint module is connected to the controller and then after the controller is connected to the computer. The function of the fingerprint module is to take the templates through the controller, and it is sending to the computer, finally the computer stores all the templates of the students, and it is stored in the excel sheet with the help of EEPROM module.

In this block diagram, we are using four push buttons(keys), and they are enrolled, delete, up, and down. The enroll key is used to enroll the person of a fingerprint in to the system and the enroll key is also used for downloading the attendance of the students, Now delete key is used to reset or delete the user from a system and if the user wants to enroll the fingerprint of the new person then we use both up and down keys. In this paper, LCD is used for when a person is enrolled or deleted from a system. It can be known from the LCD. All the scanned data can be shown on the 16\*2 LCD. In this paper, Arudino is the main component, and without Arudino, the project would not work, and it is just like a heart in the human body.

## A. System Requirements

### 4. RTC module

Arudino uno microcontroller

#### 1) Arduino Uno microcontroller

The main aim of the microcontroller in the Arduino is to enroll and search the fingerprint of a person. Arduino, shown in Fig2(a), is the main component that can be interfaced with all other components which are present in the paper. By enrolling the fingerprint of a person, the controller can scan the template from the fingerprint sensor shown in Fig2(b), enroll the id number of a student. Both transmitter and receiver are connected to the digital pins of 4 and 5 of the Arduino Uno. The ground and VCC are also connected to the arduino, and this was the interfacing for the fingerprint module to the Arduino. The fingerprint enrolling can be done through the transmitters as well as through the enroll button; also, this is all about the Arudino Uno in this project.

#### 2) Fingerprint Module

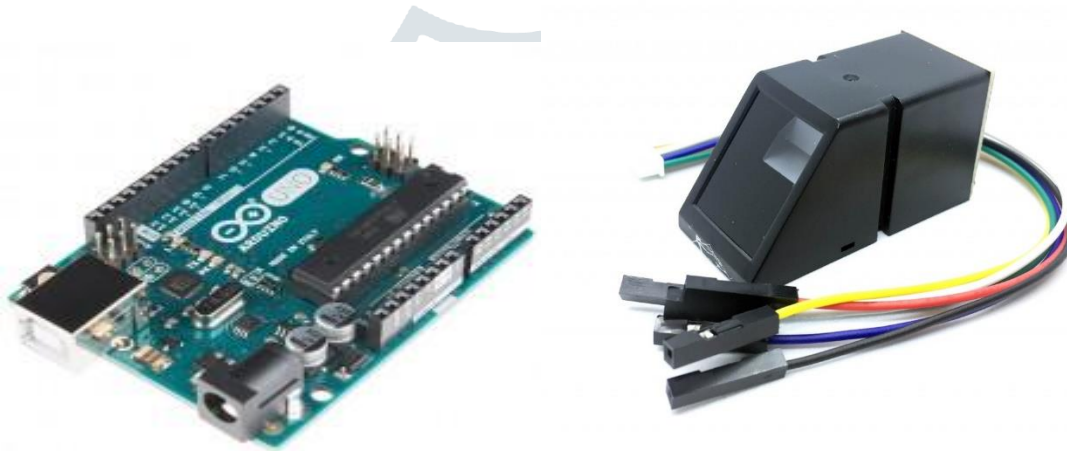


Fig. 2(a) Arudino Uno

Fig.2(b) Finger print sensor

In the present scenario, we can see different types of fingerprint modules in the market. Among them, some of the modules are capacitive, piezoelectric, and resistive. In this paper, we have used the optical fingerprint sensor. The scanned image can be converted in the form of template, and it is saved in memory, which is in the EEPROM module.

#### 3) 16\*2 LCD Display:

The LCD shown in Fig3 is an electronic component in which we used to display the characters on the top of the screen of the display. In 16\*2 LCD Display, we can see the 16 characters in 2 columns, and each character can be displayed by using a 5\*7 pixel matrix. The main advantage of using 16\*2 Lcd is that it displays the data on the screen.

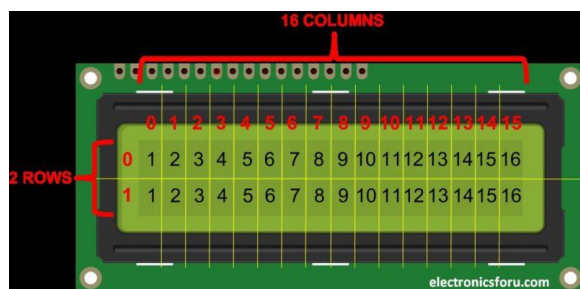


Fig.3 LCD Display

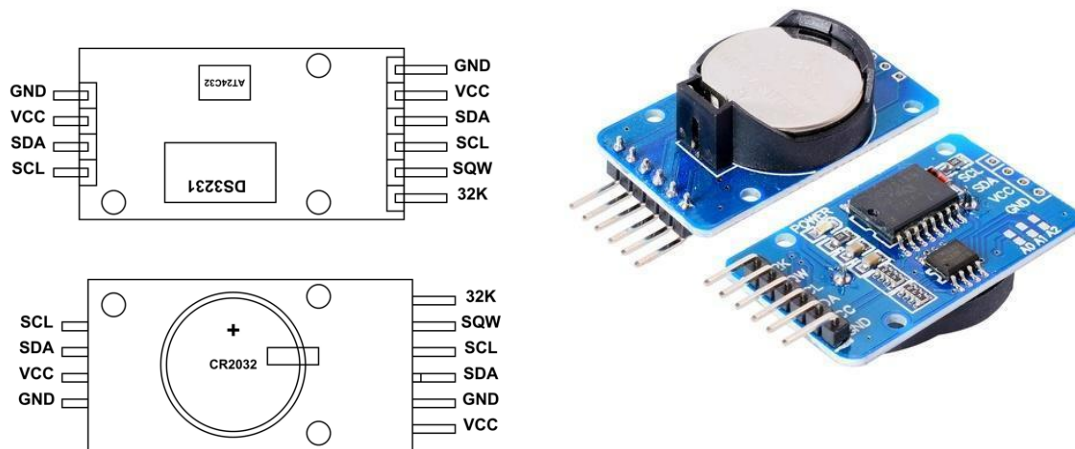


Fig.4 RTC module

#### 4) RTC Module

The RTC module shown in Fig. 4 is used, indicating the time and date on display; DS3231 RTC is a precise real-time clock module with 32k bit EEPROM with a built-in 10-bit temperature sensor having a resolution of 0.25 c. The full form of it was Real-Time Clock, and generally, it is used for displaying the time and date at a particular instance of time. The RTC module is a low cost, and it is extremely accurate with the i2c protocol. The ds3231 Arudino is available in both commercial and industrial temperatures ranges, and it is offered in a 16 pin,300-mi SO package.

## B. Experiment setup

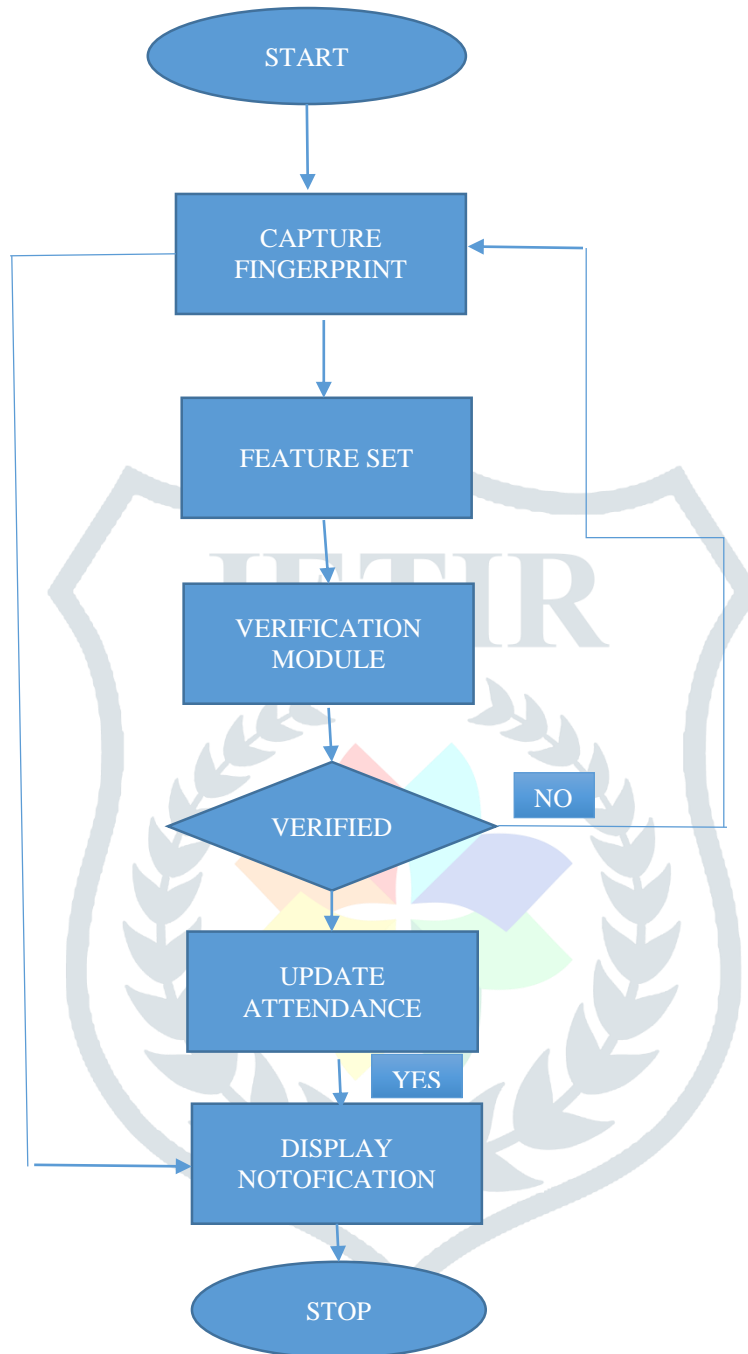


Fig.5 Flow chart for enrolling the fingerprint

Firstly, the fingerprint module is connected with Arduino. The fingerprint can be scanned through the fingerprint sensor, and if it is ok then it is enrolled or otherwise, it will display on the LCD that your template was not scanned. If the enrolling is ok, then it is converted into the EEPROM module. After that, another fingerprint is taken and saved as another ID number.

#### 1) Explanation of flowchart of Fingerprint of a student

For searching and finding of a fingerprint of a student can be shown in the flowchart in which first we need to scan the fingerprint and then there are four keys among them enroll is one of the keys which functions after doing it, it then converted to the controller. The main function of controller is that it controls all the templates of students, and then it is converted on to its originals; if it is right, it again follows the further steps as mentioned in the flowchart.

The basic step in the first flowchart is that, first we need to capture the finger of a student, after capturing if the captured image was correct then we move to the feature set otherwise we need to display that the finger has not captured in the module and further we have to move the verification module after it is verifying we have to update the attendance. If it is not shown, then we move to capture the fingerprint again. This is all about the first flowchart. In the second flowchart also it is similar but a slight difference

between the first flowchart and the second flowchart, in the second flowchart we are taking the fingerprint of the students directly by the fingerprint module, if the scanning of the fingerprint module is correct then we move according to the further steps what we are drawn in the flowchart.

The com4 and com7 are the serial monitors in which we have used in the Arduino. The final result also depends on this serial monitor, because the serial monitors are the device in which it is going to execute the entire program of the project. After writing all the codes into the Arduino integrated development kit, first, we need to select the type of the board and ports, whether it has connected or not, and then we have to run the code further to check any errors. After successfully executing the program, the following results are displayed in such a way that your fingerprint was found or not. Initially, we have scanned the four users, and it also tells the which user's finger was scanned at that time, and it also shows the ids of students who have enrolled the fingerprint in the fingerprint sensor module.

The excel sheet shows that the result of the students who have scanned through their fingers, and all this data can be saved into the module called EEPROM. The exact date and time can be displayed with the use of rtc module; Here, the RTC module plays an important role in which it plays displaying the exact time and exact date whenever we are taking the attendance for the students in a class.

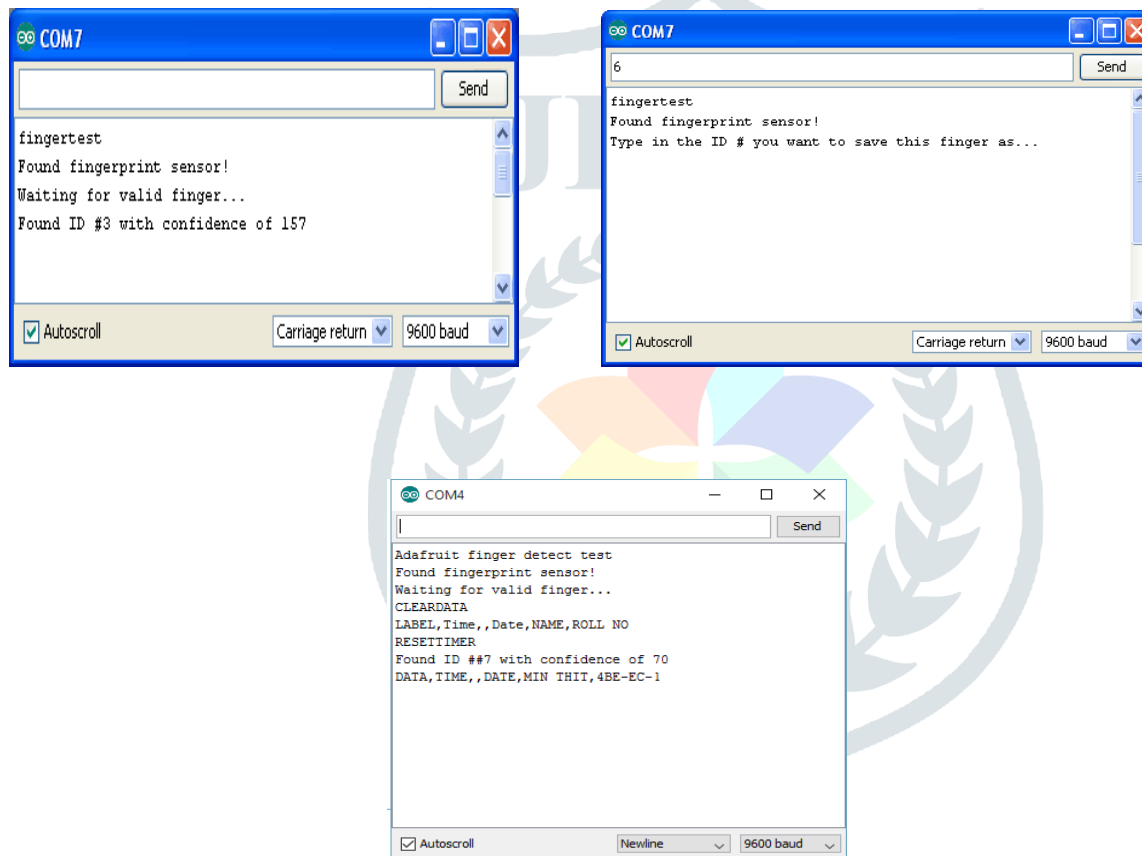


Fig.6 Testing the Fingerprint

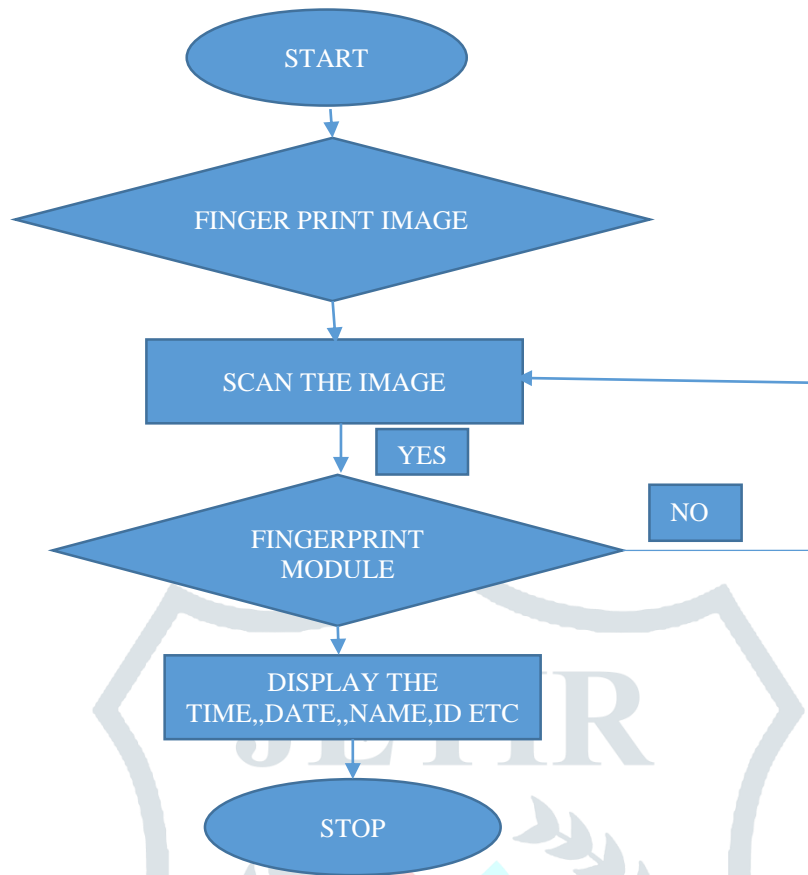


Fig.7 Flow chart for scanning the fingerprint

	A	B	C	D	E
1	Time	Date	NAME	ROLL NO	
2	9:10:25	25-11-19	Bala	6	
3	9:10:35	25-11-19	krishna	8	
4	9:10:45	25-11-19	siva	10	
5	9:11:00	25-11-19	usha	11	
6	9:11:12	25-11-19	sushmitha	20	
7	9:11:25	25-11-19	indra	22	
8	9:11:30	25-11-19	sreekanth	25	
9	9:11:55	25-11-19	pranavi	28	
10	9:12:00	25-11-19	yogesh	30	

Fig.7 The final result obtained in the excel sheet

### III. CONCLUSION

Nowadays, we can see that as information technology and communication technology is growing on, but still, we are facing a lot of errors or mistakes in attendance systems. So to avoid such kind of mistakes, we are using this fingerprint wireless attendance system. By using this project, we can able to mark the perfect attendance system in any corporate industry or offices, schools, and colleges. We are adding one additional feature of this project is that we can display the attendance of students data on an excel datasheet.

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