**Objectives:**

* Introducing a new system to the educational era.
* To design fingerprint based biometric attendance system.
* To enroll fingers of the students for the system.
* To take attendance of the students.
* To calculate average attendance of a student from the attendance sheet at the end of the semester.

**Introduction:**

In every educational institutions, the authority keeps track of the attendance of all students. But the attendance system is poor. The system can easily be manipulated. For example, a teacher has to pass a printed sheet to record the attendance of the students. A student needs to fill the sheet with his/her signature. In this case, some of the students can imitate their friends' signatures even though they are absent. To avoid this issue, many teachers are to call out the students' name or roll. But this approach is very time consuming. Most of the universities in Bangladesh have a procedure to exclude their students from taking examination if their attendance is less than 60 percentange.

To solve these issues, we are going to introduce a new system that is **Fingerprint based Biometric Attendance System**. The fingerprints are one of the main forms in biometric field which are used to identify the individuals and their uniqueness. Above all the mentioned problems will be solved by using this system.

**Project Description:**

In this fingerprint attendance system circuit, we used Fingerprint Sensor module to authenticate a true person or employee by taking their finger input in the system. Here we are using a keypad. We used “A” for enrollment. “B” for Attendance. And “C” and “D” for controlling ID no. “A” key is used for enrollment of a new person into the system. So when the user wants to enroll new finger then he/she need to press “A” key then LCD asks for the ID, where user want to be store the finger print image. Now if at this time user does not want to proceed further then he/she can press the key again to go back. When user enrolls new finger, then he/she need to select finger ID by using two key “C” and “D” and then press “#” to proceed with selected ID. User needs to press “B” for attendance. As all the students id are enrolled, when a student place his/her finger on the sensor,if the id saved against his finger matches his given finger he will be considered present. The fingers which will not be placed on the sensor will be considered absent. **SD Card Module** has been used for moving data from the arduino memory to a datasheet.

**Required Apparatus:**

* Arduino Mega
* R307 Fingerprint Module
* DS3231 Real Time Clock (RTC) Module
* SD Card Module
* 4\*4 Keypad
* 16\*2 LCD Display
* Micro SD Card
* Potentiometer
* Bread Board
* Connecting wires
* Power supply

**Block Diagram:**

**Circuit Diagram:**

**Working Procedure:**

Working of this fingerprint attendance system project is fairly simple. First of all, the user needs to enroll fingerprints of the user with the help of key “A” of the keypad. To do this, user need to press “A” and then LCD asks for entering ID for the fingerprint to save it in memory by ID number. So now user needs to enter ID by using “C” and “D” keys. After selecting ID, user needs to press “#” key to select the ID. Now LCD will ask to place finger over the fingerprint module. Now user needs to place his finger over finger print module and then the module takes finger image. Now the LCD will say to remove finger from fingerprint module, and again ask to place finger again. Now user needs to put his finger again and module takes an image and convert it into templates and stores it by selected ID into the finger print module’s memory.  Now the user will be registered and he/she can feed attendance by putting their finger over fingerprint module.By the same method, all the users will be registered into the system.

Now if the user wants to remove or delete any of the stored ID or fingerprint, then he/she need to go to “file” then “examples” then “Adafruit Fingerprint Sensor Library” and then choose the respected file and run it to delete or remove any template. SD Card Module has been used to transfer data from the memory of Arduino to a datasheet. All the records of the students attendance will be then stored on the SD Card which will be shown on a datasheet.

**Code:**

**System Testing:**

**Experimental Result:**

**Prototype Design:**

**Discussion:**

**Conclusion:**

**Reference:**