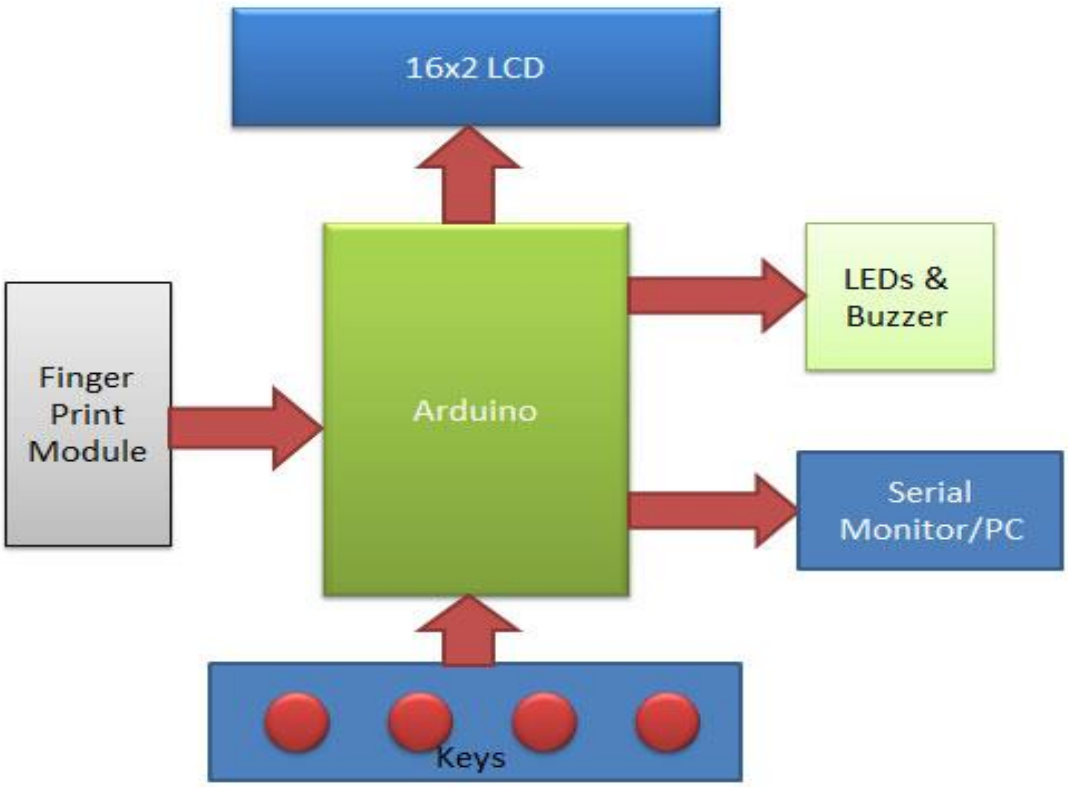
INTRODUCTION

"Modernizing attendance tracking in education, the Attendance Robot project introduces an innovative solution. Utilizing advanced sensors and biometric technology, it automates the process of recording student attendance during lectures. This report explores the development and implementation of the Attendance Robot, highlighting its potential to streamline attendance management and provide valuable insights into student engagement. By embracing technology, this project aims to revolutionize traditional attendance-taking methods for improved efficiency and accuracy."

- **Seamless Attendance Automation**: Through the integration of cutting-edge sensors and biometric technology, the Attendance Robot effortlessly records the presence of students, freeing educators from the cumbersome task of manual attendance-taking.
- **Instantaneous Attendance Updates**: Harnessing the power of real-time data processing, the system provides immediate updates on student attendance status, enabling educators to promptly address any discrepancies or concerns.
- **In-depth Attendance Analysis**: By meticulously analysing attendance data, the system generates detailed reports that offer valuable insights into student attendance patterns, including trends, frequency, and potential areas for improvement.
- **Robust Data Management**: Employing a secure database infrastructure, the system ensures the safe and organized storage of attendance records, safeguarding sensitive information while allowing for easy retrieval and analysis.

- **Cultivating Student Accountability and Engagement**: By transparently presenting attendance information, the system encourages students to take ownership of their attendance behaviour, fostering a culture of accountability and active participation in the learning process.

Block diagram



Hardware details

- **Fingerprint Sensor**: The robot is equipped with a special sensor that scans and captures students' fingerprints accurately. This sensor ensures reliable identification of individuals during attendance recording.
- **Microcontroller**: Acting as the brain of the robot, the microcontroller processes the data from the fingerprint sensor and controls the robot's movements. It executes commands to initiate the attendance-taking process and communicates with other components.
- **Mobile Base**: The robot is built upon a mobile base, in that case need a proper plastic body with good rigidness and durability.
- **Battery**: To ensure uninterrupted operation, the robot is powered by a rechargeable battery. This battery provides the necessary energy to drive the robot's movements and power its electronic components throughout the day.
- **Wireless Connectivity**: The robot may incorporate wireless communication modules, such as Wi-Fi or Bluetooth, to transfer attendance data to a central database or communicate with external devices. This enables seamless integration with existing school networks and systems.

Process flow chart

➔ Initialization

Turn on the robot.

Activate sensors and communication modules.

➔ Wait for User Interaction

Remain stationary until picked up by a user.

➔ User Interaction

User picks up the robot to initiate attendance marking.

➔ Attendance Recording

User activates the fingerprint sensor.

Students scan their fingerprints for attendance.

➔ Data Processing

Validate fingerprint scans.

Update attendance records.

Calculate total presence and absence.

➔ Feedback

Display real-time attendance status to the user.

➔ Database Update

Store attendance data securely in the database.

➔ End Interaction

User stops attendance marking by placing the robot back.

➔ Standby Mode

Return to standby mode until the next interaction.

➔ End Session

Complete attendance recording for all interactions.

Power off the robot until next use.