**CENTRE FOR DEVELOPMENT OF ADVANCE COMPUTING ELECTRONIC CITY,BENGLURU**

# PROJECT REPORT

# ON

## Attendance Tracking And Management System

By


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UNDER THE SUPERVISION OF

**Mr.Bhupendra Pandey**

# Revision History

| Date (dd/mm/yyyy) | Version | Description | Author |
|---|---|---|---|
| 29/08/2023 | 1.0 | Generation of QR code using Reg number , QR code scanning and database updation with Reg no and timestamp marking of attendance with database QR Code entry, Automated notification of absentism to guardian and student(SMS/Email) | (230350120056)<br>(230350120058)<br>(230350120101)<br>(230350120145) |

# Candidate's Declaration

We hereby certify that the work being presented in the report entitled **Attendance Tracking And Management System,** in partial fullfillment of the requirements for the award of PG Diploma Certificate and submitted in the department of PG-DAC of the CDAC Bangalore, is an authentic record of our work carried out during the period, 1st August 2023 to 30th August 2023 under the supervision of **Mr.Bhupendra Pandey**,CDAC Bangalore. The matter presented in the report has not been submitted by us for the award of any degree of this or any other Institute/University.

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**Counter Signed by**

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# 1.Introduction

An attendance tracking and management system automates record-keeping, boosts efficiency, and ensures accuracy in monitoring attendance, while fostering transparency and aiding data-driven decision-making in various settings like education and workplaces.

## 1.1 Purpose

An attendance tracking and management system streamlines attendance record-keeping, reducing errors and saving time. It enhances transparency by enabling participants to monitor their attendance, while administrators benefit from real-time insights for informed decision-making and efficient resource allocation. This system is vital in educational, corporate, and event environments.

## 1.2 Scope

The scope of an attendance tracking and management system is broad, encompassing various sectors and scenarios such as education, corporate, healthcare, and events. It involves automating attendance recording, providing real-time monitoring, integrating with other systems, offering analytics, and supporting remote or hybrid work setups. With potential for customization, the scope extends to compliance management, security integration, and fostering communication between participants and administrators, And the feature of attendance tracking and management system--->

1. Automated Recording: Efficiently records attendance through automated check-in/check-out processes, reducing manual effort and errors.

2. User Accessibility: Allows students to view their attendance records, promoting transparency and accountability.

3. Notifications and Alerts: Sends notifications to students and their parents for absentism.

4. Remote and Mobile Access: Supports remote attendance tracking and mobile accessibility for students and administrators.

5. Data Security: Ensures data privacy and security through user authentication and encryption mechanisms.

6. Compliance Support: Helps adhere to legal and regulatory requirements by maintaining accurate attendance records.

7. Event Management: Manages attendance for conferences, workshops, and events, with features for registration and participant management.

8. User-Friendly Interface: Provides an intuitive interface for easy adoption by students and administrators.

9. Multi-platform Support: Functions across various devices and platforms, ensuring flexibility and accessibility.

10. Scalability: Scales to accommodate large participant numbers and expanding organizations.

11. Communication Tools: Facilitates communication between students and administrators regarding attendance-related matters.

12. Performance Metrics: Measures system performance, ensuring smooth operations and reliability.

## 2. Functional and non-functional Requirements :

## 2.1 Functional Requirements :

Functional requirements describe the specific behaviors, actions, and features that a software system must exhibit to fulfill the needs of its users. These requirements outline the system's interactions, capabilities, and functionalities. Following are functional requirements of my project.

2.1.1 User Authentication and Authorization :

a) Users shall be able to register for an account using a valid Reg Number and password.

b) The system shall differentiate between student, instructor, and administrator roles.

c) Students can only view their own attendance records.

d) Instructors can mark attendance and view records for assigned courses.

e) Administrators have full access to all functionalities.

2.1.2 Course and Section Management :

a) Administrators can create, update, and delete courses.

b) Each course shall have a unique course code, title, and description.

c) Instructors shall be assigned to specific courses and sections.

d) The system shall prevent duplicate course codes.

2.1.3 Attendance Recording :

a) Instructors can select a course and session date to mark attendance.

b) For each session, instructors can mark students as present, absent, or late.

c) The system displays real-time attendance status for each student.

d) Instructors can modify attendance records if needed.

2.1.4 Attendance Reports :

a) Instructors can generate attendance reports for their courses and sections.

b) Reports include attendance percentages, dates of attendance, and total classes held.

c) Administrators can generate attendance reports for all courses and sections.

2.1.5 Notifications :

a) Students receive notifications about enrollment approvals and denials.

b) Instructors receive notifications about student enrollment requests.

c) Instructors receive notifications about low attendance percentages for students.

d) Notifications can be sent via email or in-app messages.

## 2.2 Non-Functional Requirements :

2.2.1 Usability :

a) The user interface shall be intuitive and easy to navigate.

b) Response times for user interactions shall be within 2 seconds.

2.2.2 Security

a) User passwords shall be securely stored using encryption.

b) Only authorized users shall access specific functionalities based on their roles.

2.2.3 Performance

The system shall handle a concurrent load of 500 users without degradation in performance.

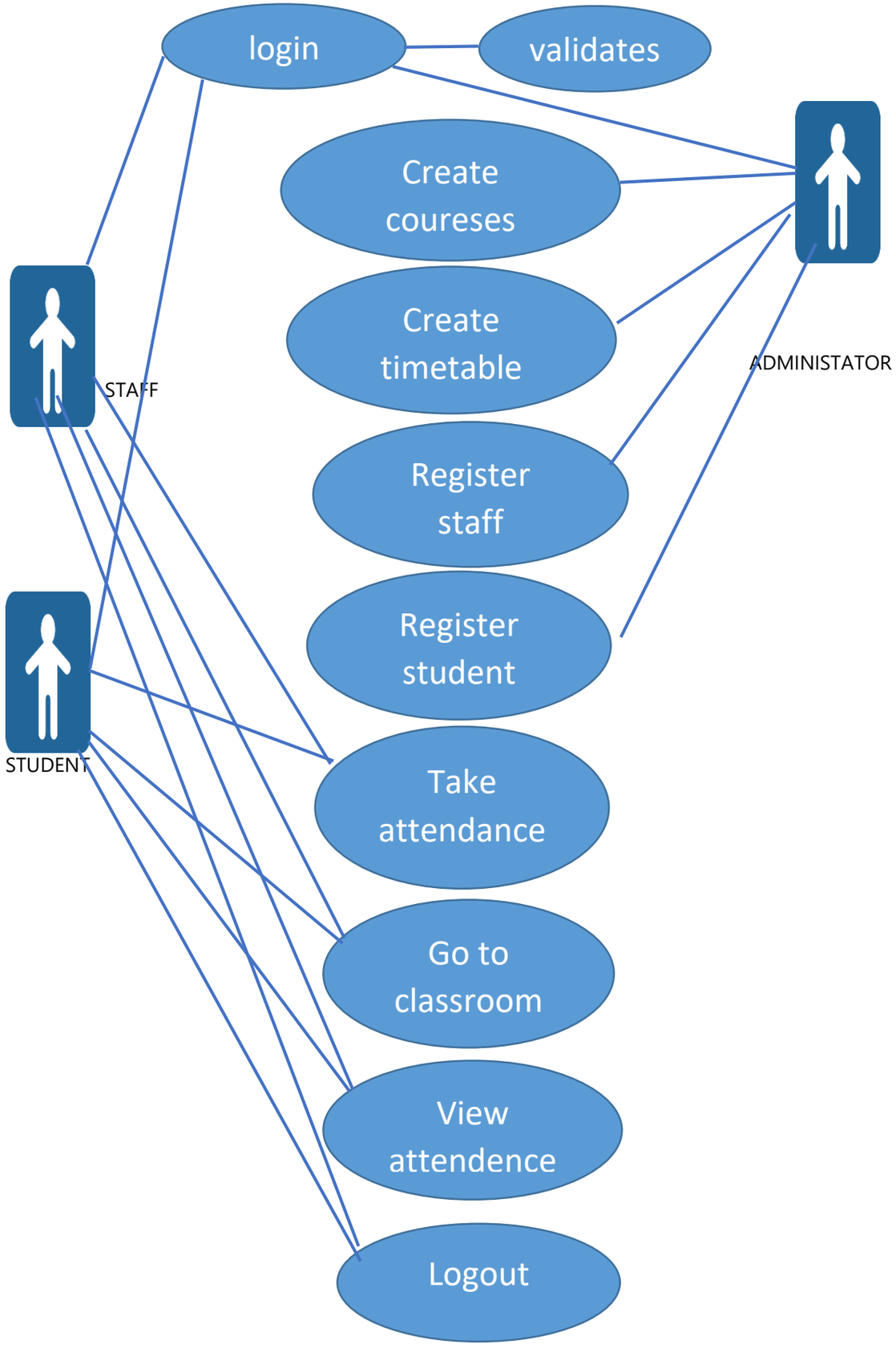
2.2.4 Reliability

The system shall have a backup and recovery mechanism to ensure data integrity.

2.2.5 Glossary

List of terms and acronyms used in the document.

# 3.0 Use Case Diagram :



## 4.0 EXTERNAL INTERFACE REQUIREMENTS :

External interface requirements refer to the specifications and characteristics that define how a software system or product interacts with external entities, systems, or users.

### 4.0.1 User Interface :

1. Login and Authentication: Users should be able to log in securely using regstration number and passwords or other authentication methods.
2. Dashboard: A user-friendly dashboard should display attendance summaries, student info., and relevant notifications.
4. Student Profiles: Users should be able to view and update student information.
4. Attendance Tracking: Interfaces for marking attendance should be straightforward, possibly using QR codes, manual entry.

### 4.0.2 Hardware Interfaces :

1. QR Code Scanners : The system can interface with handheld QR code scanners that instructors can use to scan student QR codes.

2. Mobile Devices : Integration with smartphones or tablets as QR code scanners for marking attendance.

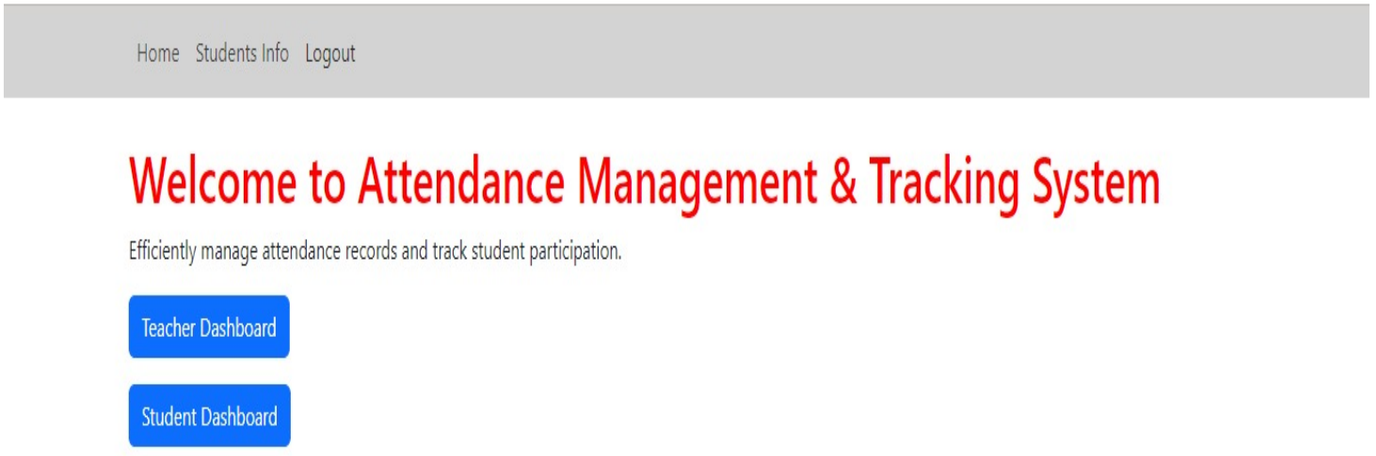
### 4.0.3 Software requirements :

The system will use :

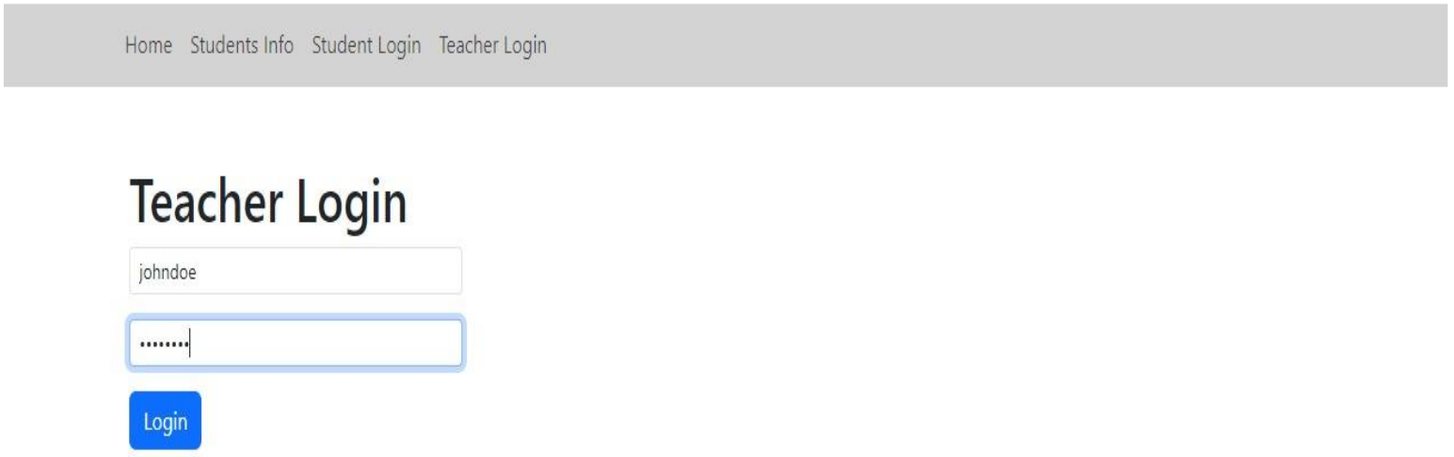
1. Front-End Languages : HTML, CSS, Javasript
2. Front-End Frameworks : React.js
3. Back-End Languages : Node.js
4. Back-End Framework : Express
5. Database : MySQL

# 5.0 ARCHITECTURE :

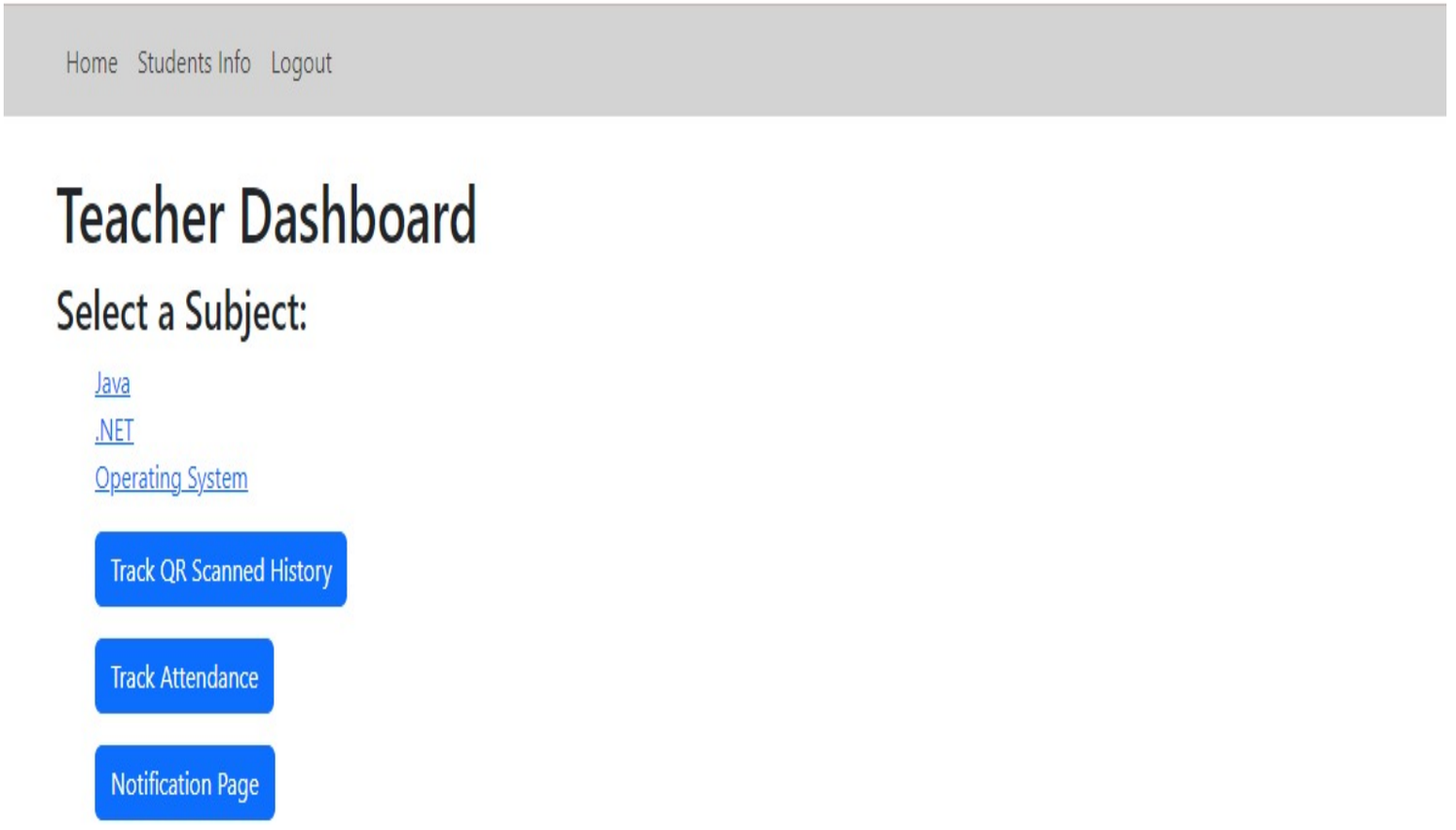
## 1.HOMEPAGE :



# 2. Teacher's Login Page :

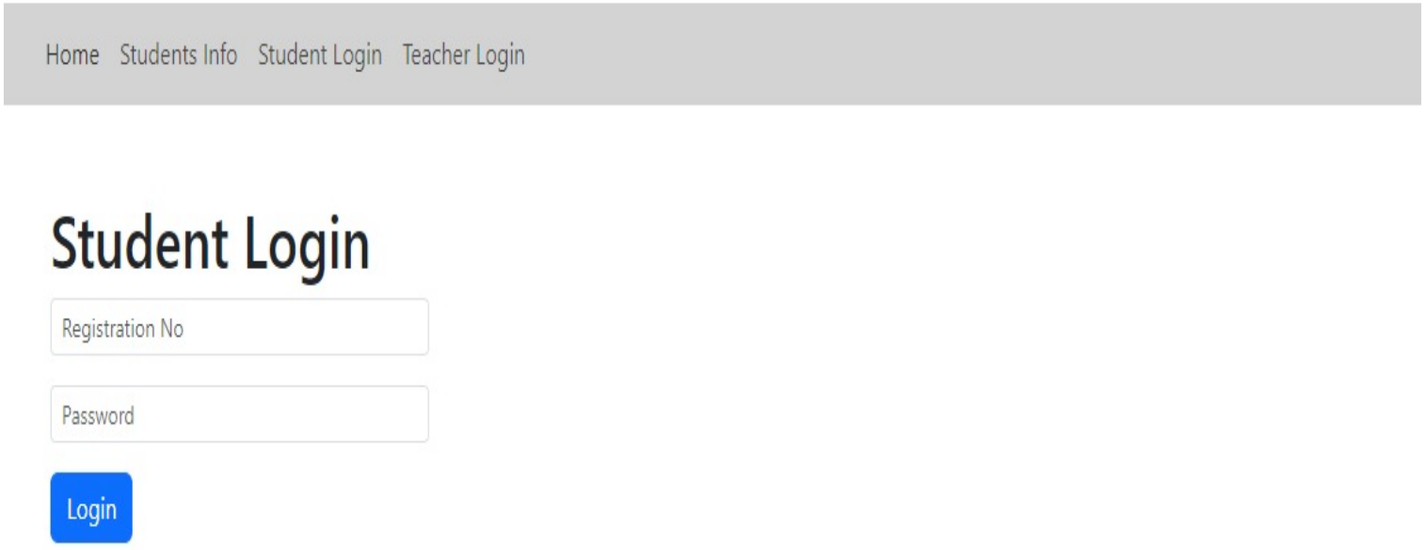


# 3. Teacher Dashboard :

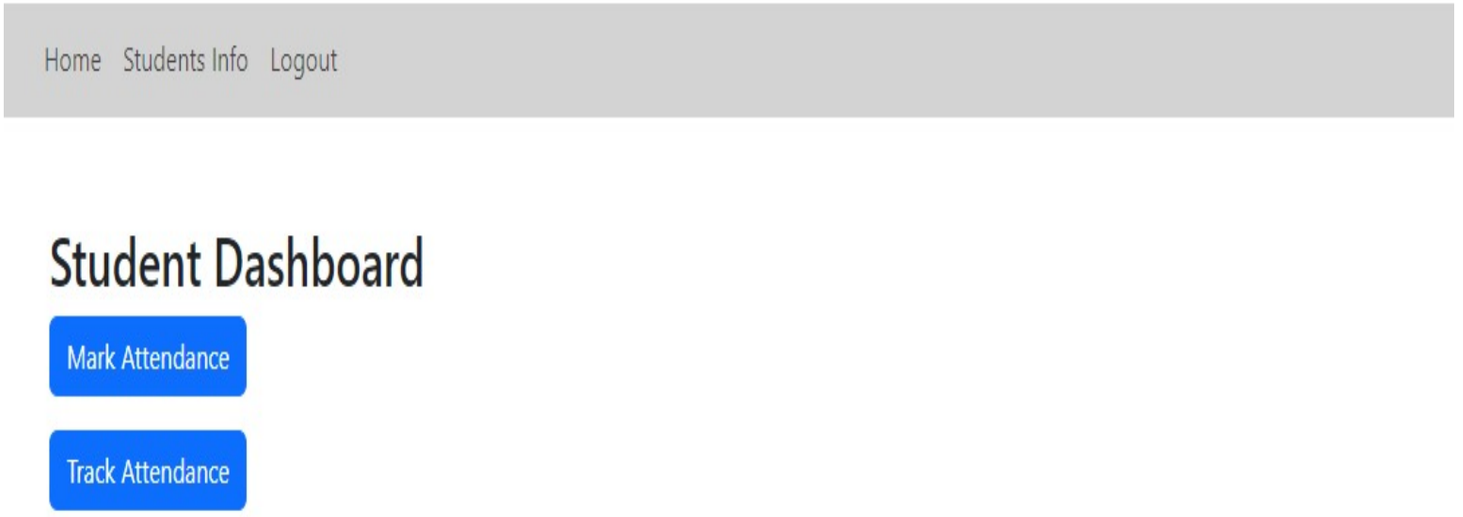


# 4. Attendance Form :

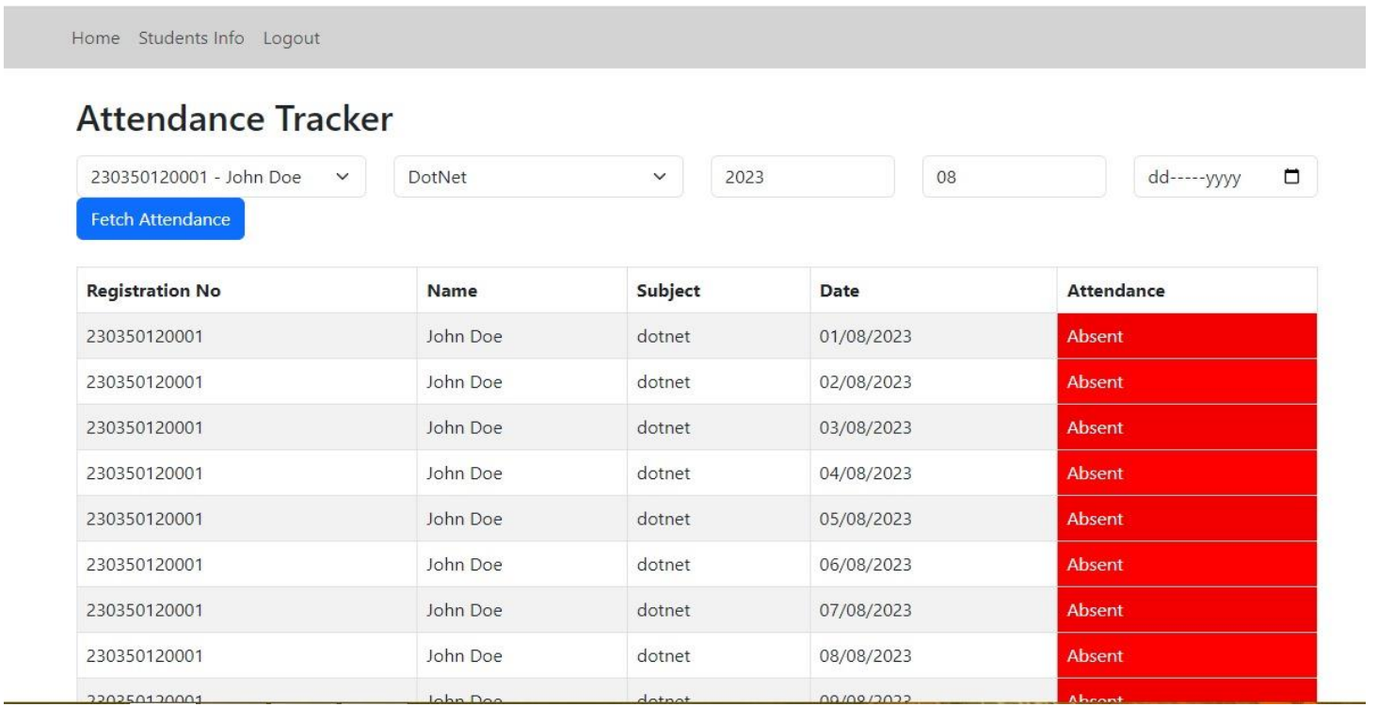
# 5. Student Login:



# 6. Student Dashboard :

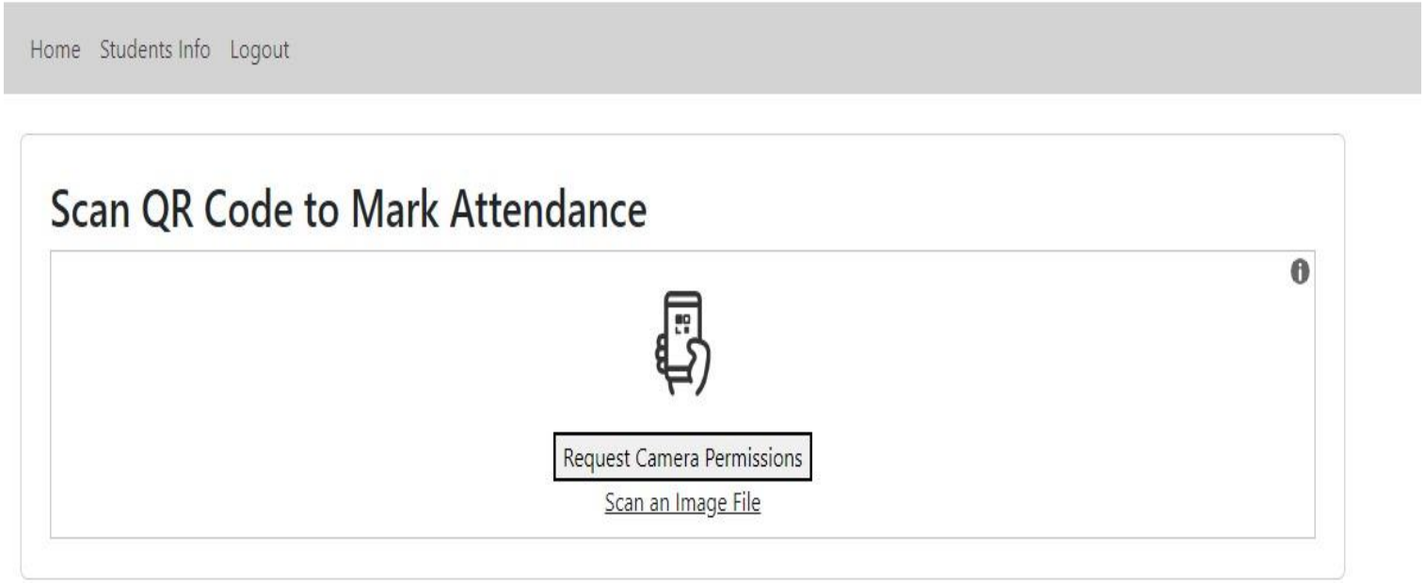


# 7. Attendence Tracker :

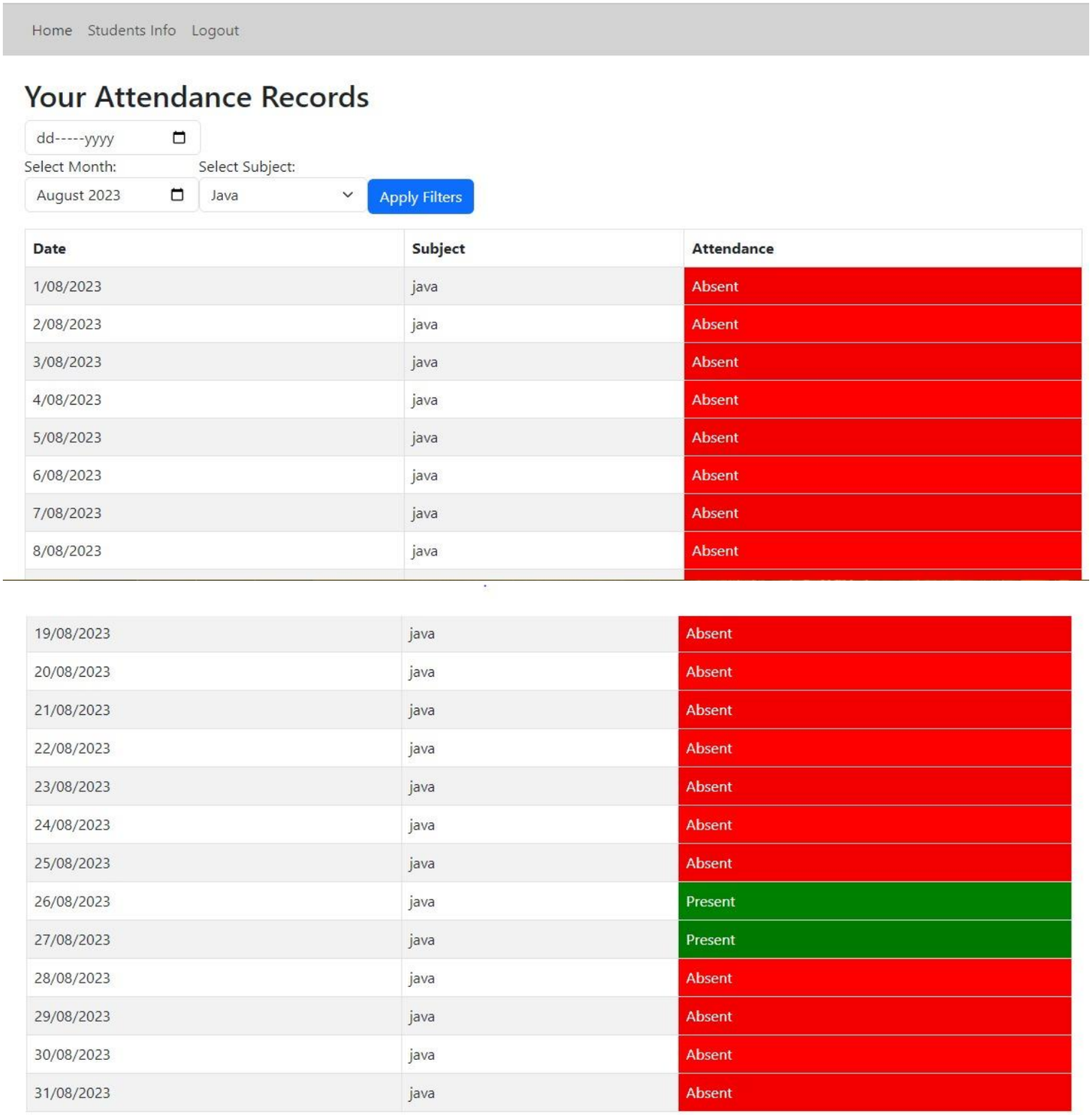



| | | | | |
|---|---|---|---|---|
| 230350120001 | John Doe | dotnet | 17/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 18/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 19/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 20/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 21/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 22/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 23/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 24/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 25/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 26/08/2023 | Present |
| 230350120001 | John Doe | dotnet | 27/08/2023 | Present |
| 230350120001 | John Doe | dotnet | 28/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 29/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 30/08/2023 | Absent |
| 230350120001 | John Doe | dotnet | 31/08/2023 | Absent |

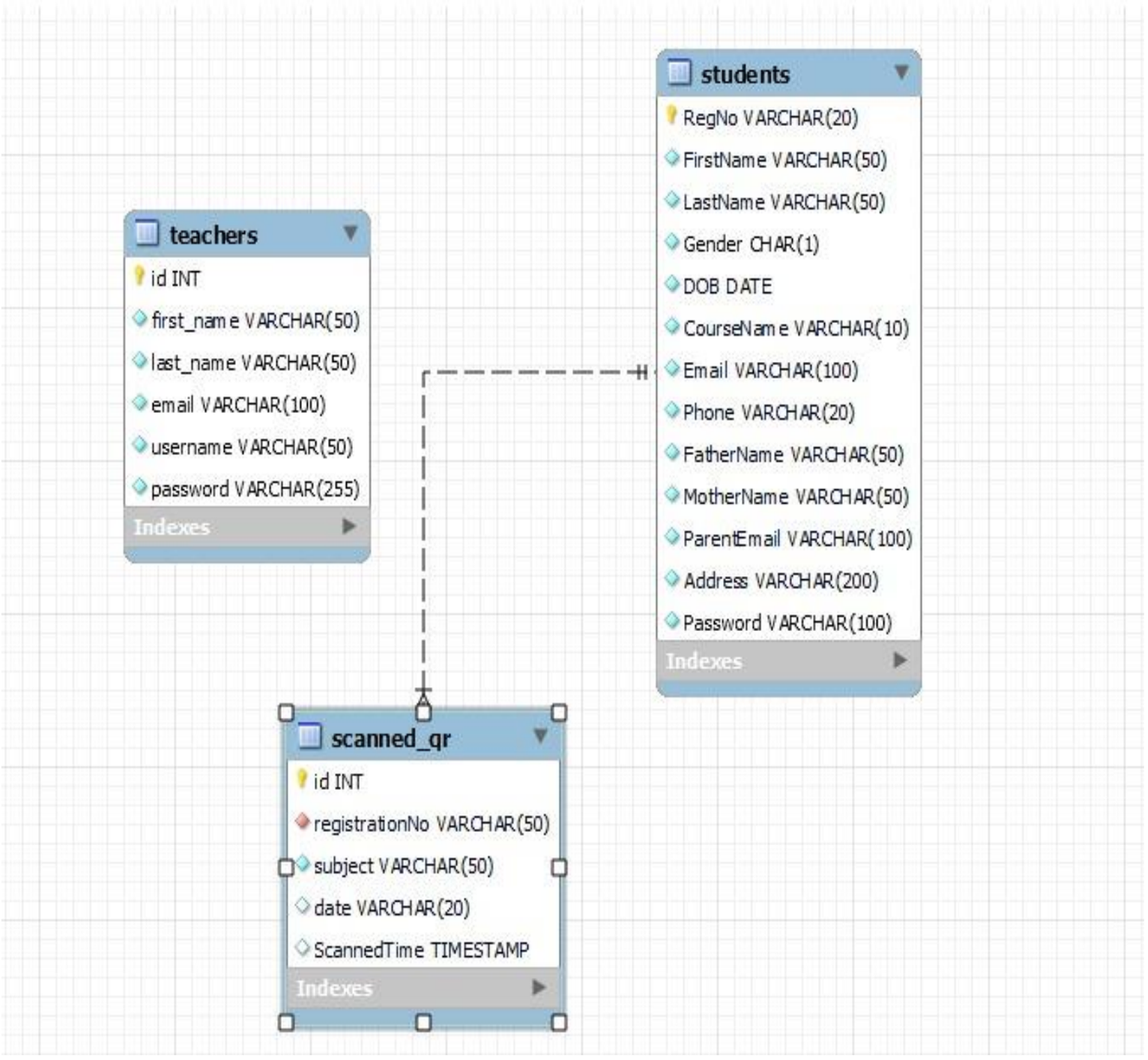
# 8. Scan QR Code to Mark Attendance :



# 9. Attendance Record :



# 6.0 ER Diagram :



## 7.0 Usage Scenerios :

## USE CASE ID :001

| **Use case related to login in process of user** | |
|---|---|
| **Title** | Student login |
| **Pre-condition** | Internet connection should be available |
| **Description** | Students should be able to mark their attendance for their classes. |

| **Task sequence** | **Exceptions** |
|---|---|
| 1. User will put the login details.<br>2. If the login details are correct then user will login successfully.<br>3. User will put the correct details and then login.<br>4. If login details are not correct then system will generate the error. | 1. User has entered the invalid login details. |

| **Post-condition** | User has login successfully |
|---|---|

## USE CASE ID :002

| **Use case related to receiving absence notification** | | |
|---|---|---|
| **Title** | (SMS/Email) notification | |
| **Pre-condition** | The student is registered in the system, and attendance is not marked. | |
| **Description** | Students should receive notifications when their attendance is not marked. | |
| **Task sequence** | | **Exceptions** |
| 1. The student logs into the system.<br>2. The system periodically checks attendance data.<br>3. If attendance is not marked for a class, the system sends a notification to the student's registered email or app. | | If the student's attendance is marked after the notification is sent, the system cancels the absence alert. |
| **Post-condition** | The student receives a notification about the missing attendance. | |

# USE CASE ID :003

| Use case related to teacher's login | |
|---|---|
| **Title** | Viewing Class Roster |
| **Pre-condition** | The teacher is registered in the system and assigned to a class. |
| **Description** | Teachers should have access to the list of students enrolled in their classes. |

| **Task sequence** | **Exceptions** |
|---|---|
| 1. The teacher logs into the system using their credentials.<br>2. The system displays a dashboard with the classes the teacher is assigned to.<br>The teacher selects a specific class to view the roster.<br>3. The system presents the list of students enrolled in that class. | If the teacher is not assigned to any classes, the system displays a message indicating no classes. |

| | |
|---|---|
| **Post-condition** | The teacher views the roster for the selected class. |

# 8.0 Acid properties :

The ACID properties are a set of characteristics that ensure the reliability and consistency of transactions in a database system. While these properties are typically associated with databases, they can also be relevant for certain aspects of an attendance tracking and management system, particularly when dealing with data transactions. Here's how the ACID properties can apply:

1. Atomicity:

In the context of attendance tracking, atomicity ensures that attendance transactions are treated as indivisible units of work.

When an instructor marks attendance for a class, the entire process should either complete successfully or fail entirely. There should be no partial updates to attendance records.

2. Consistency:

Consistency ensures that data remains in a valid state before and after a transaction.

In the attendance system, consistency would mean that marking attendance doesn't violate any integrity constraints. For example, attendance should only be marked for valid classes and registered students.

3. Isolation:

Isolation ensures that concurrent transactions do not interfere with each other and that they are executed in isolation.

In the attendance system, isolation prevents scenarios where two instructors are marking attendance for the same class simultaneously. Each instructor's transaction should not affect the other.

4. Durability:

Durability guarantees that once a transaction is committed, its changes are permanent and will survive system failures.

In the attendance system, once attendance is marked and confirmed, the data should be stored safely and remain intact even if the system crashes.

# 9.0 Conclusion:

The attendance tracking and management system offers a comprehensive and efficient solution to streamline the process of monitoring and recording attendance in educational institutions and organizations. Through the integration of technology and user-friendly interfaces, this system aims to enhance accuracy, accessibility, and overall management of attendance-related tasks. As we conclude our exploration of this system, several key takeaways and benefits come to light:

1. Efficiency and Accuracy: The system's automated attendance tracking minimizes the chances of errors and inaccuracies that can arise from manual recording. This accuracy is essential for maintaining reliable attendance records.

2. Real-time Monitoring: Instructors and administrators can monitor attendance in real time, allowing for timely interventions and adjustments as needed. Students can also view their attendance history, promoting accountability.

3. Data Analysis and Insights: The attendance tracking system provides valuable data and analytics, enabling educational institutions to identify attendance trends, assess student engagement, and make informed decisions.

4. Enhanced Communication: Automated notifications keep students and instructors informed about class schedules, changes, and attendance status. This proactive communication fosters engagement and reduces confusion.

5. Adaptability and Flexibility: The system accommodates different attendance marking methods, such as QR codes, biometrics, and manual entry. It also offers customization options to align with diverse educational environments.

6. Student Empowerment: Students gain access to their attendance records, empowering them to take ownership of their academic commitments and attendance habits.