



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

PROJECT REPORT ON

Attendance Tracking And Management System

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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) (230350120058) (230350120101) (230350120145)

Candidate's Declaration

We hereby certify that the work being presented in the report entitled **Attendance Tracking And Management System**, in partial fulfillment 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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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 absenteeism.
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.

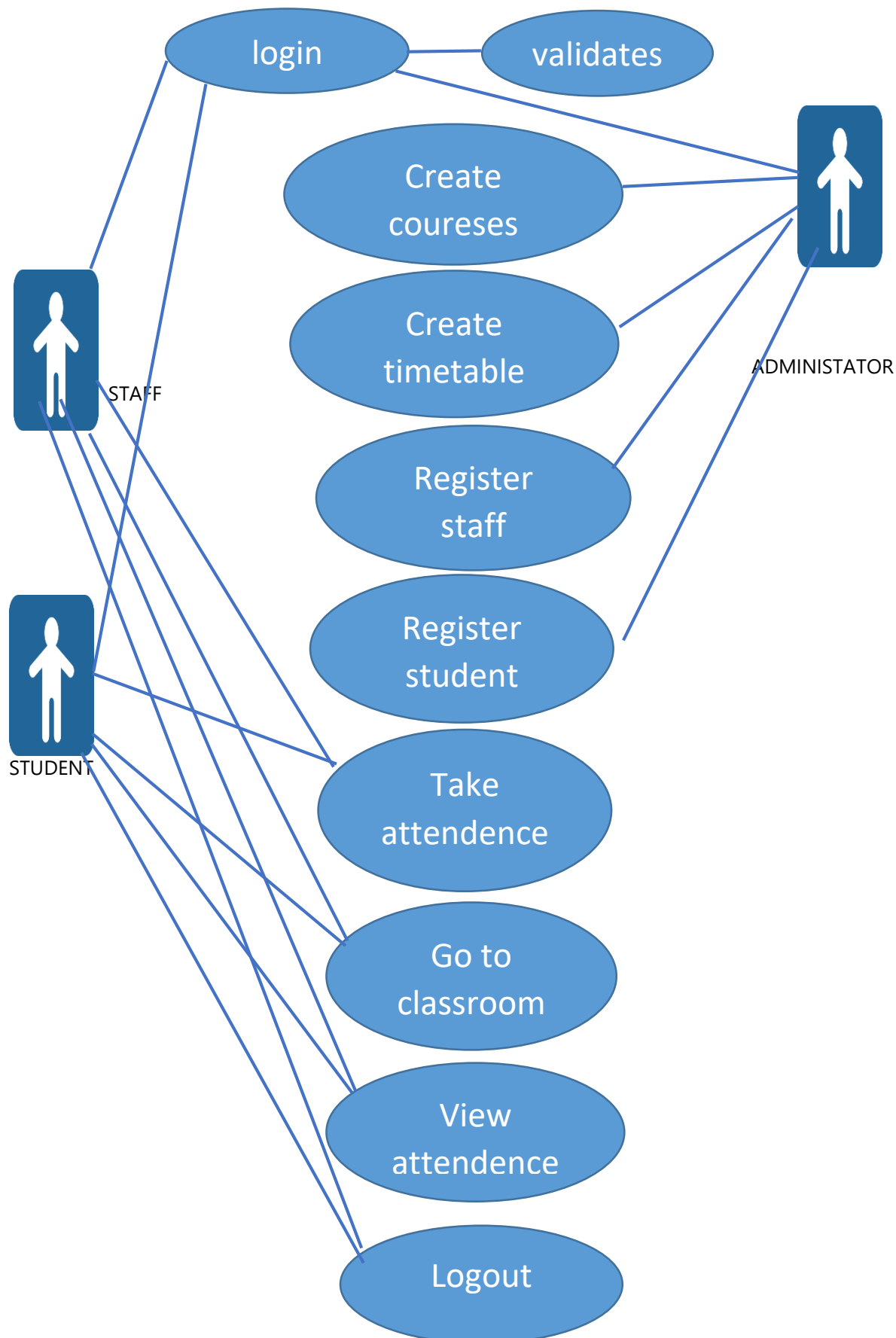
2.2.4 Reliability

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 registration 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, Javascript
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 :

[Home](#) [Students Info](#) [Logout](#)

Welcome to Attendance Management & Tracking System

Efficiently manage attendance records and track student participation.

[Teacher Dashboard](#)

[Student Dashboard](#)

2. Teacher's Login Page :

[Home](#) [Students Info](#) [Student Login](#) [Teacher Login](#)

Teacher Login

3. Teacher Dashboard :

[Home](#) [Students Info](#) [Logout](#)

Teacher Dashboard

Select a Subject:

[Java](#)

[.NET](#)

[Operating System](#)

Track QR Scanned History

Track Attendance

Notification Page

4. Attendance Form :

[Home](#) [Students Info](#) [Logout](#)

Attendance Form - java

Generate QR Code



5. Student Login:

.

[Home](#) [Students Info](#) [Student Login](#) [Teacher Login](#)

Student Login

6. Student Dashboard :

[Home](#) [Students Info](#) [Logout](#)

Student Dashboard

Mark Attendance

Track Attendance



7. Attendance Tracker :

Attendance Tracker

230350120001 - John Doe

DotNet

2023

08

dd-----yyyy

Fetch Attendance

Registration No	Name	Subject	Date	Attendance
230350120001	John Doe	dotnet	01/08/2023	Absent
230350120001	John Doe	dotnet	02/08/2023	Absent
230350120001	John Doe	dotnet	03/08/2023	Absent
230350120001	John Doe	dotnet	04/08/2023	Absent
230350120001	John Doe	dotnet	05/08/2023	Absent
230350120001	John Doe	dotnet	06/08/2023	Absent
230350120001	John Doe	dotnet	07/08/2023	Absent
230350120001	John Doe	dotnet	08/08/2023	Absent
230350120001	John Doe	dotnet	09/08/2023	Absent

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 :

[Home](#) [Students Info](#) [Logout](#)

Scan QR Code to Mark Attendance



[Request Camera Permissions](#)

[Scan an Image File](#)

9. Attendance Record :

Your Attendance Records

dd-----yyyy

Select Month: August 2023

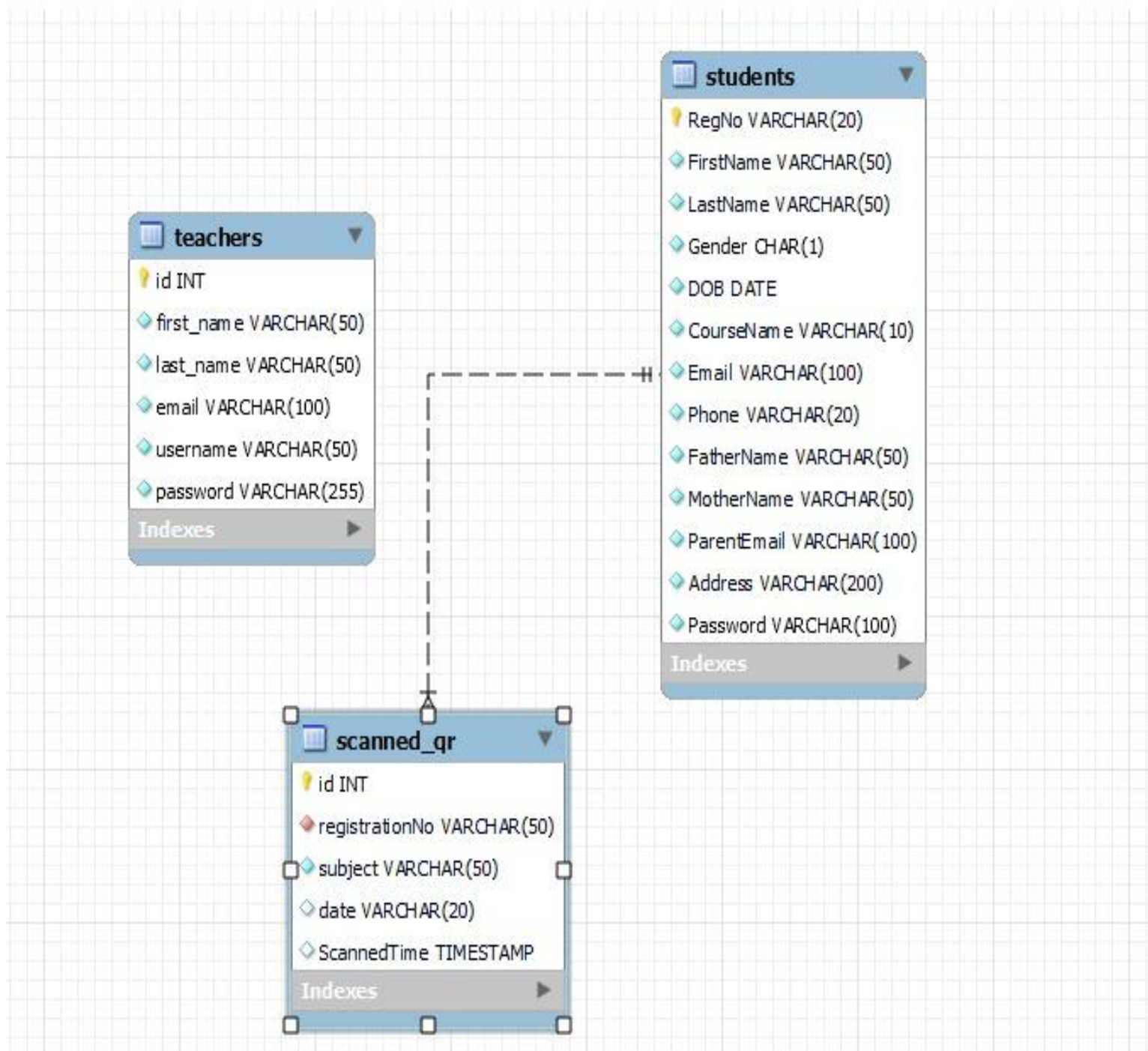
Select Subject: Java

Apply Filters

Date	Subject	Attendance
1/08/2023	java	Absent
2/08/2023	java	Absent
3/08/2023	java	Absent
4/08/2023	java	Absent
5/08/2023	java	Absent
6/08/2023	java	Absent
7/08/2023	java	Absent
8/08/2023	java	Absent

19/08/2023	java	Absent
20/08/2023	java	Absent
21/08/2023	java	Absent
22/08/2023	java	Absent
23/08/2023	java	Absent
24/08/2023	java	Absent
25/08/2023	java	Absent
26/08/2023	java	Present
27/08/2023	java	Present
28/08/2023	java	Absent
29/08/2023	java	Absent
30/08/2023	java	Absent
31/08/2023	java	Absent

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
<ol style="list-style-type: none">1. User will put the login details.2. If the login details are correct then user will login successfully.3. User will put the correct details and then login.4. If login details are not correct then system will generate the error.	<ol style="list-style-type: none">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. 2. The system periodically checks attendance data. 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. 2. The system displays a dashboard with the classes the teacher is assigned to. The teacher selects a specific class to view the roster. 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.