

**ATTENDANCE MONITORING AND DISCIPLINARY
ACTION IN OUR COLLEGE MANAGEMENT**

A PROJECT REPORT

Submitted by

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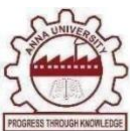
*in partial fulfillment for the award of the degree
of*

**BACHELOR OF ENGINEERING
IN
COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)**



**K.RAMAKRISHNAN COLLEGE OF ENGINEERING
(AUTONOMOUS)**

SAMAYAPURAM-621112



**ANNA UNIVERSITY
CHENNAI 600 025**

DECEMBER 2024

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IN
OUR COLLEGE MANAGEMENT**

PROJECT WORK

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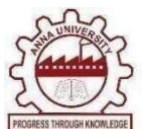
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BONAFIDE CERTIFICATE

Certified that this project report titled “**ATTENDANCE MONITORING AND DISCIPLINARY ACTIONS IN OUR COLLEGE MANAGEMENT**” is the bonafide work of **AASHIKA.A (8115U23AM001)**, **AFSHEEN.M (8115U23AM003)**, **SAAMBAVI.P (8115U23AM038)**, **SANA FATHIMA.J (8115U23AM043)** who carried out the work under my supervision.

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K. RAMAKRISHNAN COLLEGE OF ENGINEERING
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DECLARATION BY THE CANDIDATES

We declare that to the best of our knowledge the work reported here in has been composed solely by ourselves and that it has not been in whole or in part in any previous application for a degree.

Submitted for the project Viva- Voice held at K. Ramakrishnan College of Engineering on

SIGNATURE OF THE CANDIDATES

ACKNOWLEDGEMENT

We thank the almighty GOD, without whom it would not have been possible for us to complete our project.

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FATHIMA.J

INSTITUTE VISION AND MISSION

VISION OF THE INSTITUTE:

To achieve a prominent position among the top technical institutions.

MISSION OF THE INSTITUTE:

M1: To best standard technical education par excellence through state of the art infrastructure, competent faculty and high ethical standards.

M2: To nurturere search and entrepreneurial skills among students in cutting technologies.

M3: To provide education for developing high-quality professionals to transform the society.

DEPARTMENT VISION AND MISSION

VISION OF THE DEPARTMENT:

To create eminent professionals of Computer Science and Engineering by imparting quality education.

MISSION OF THE DEPARTMENT:

M1: To provide technical exposure in the field of Computer Science and Engineering through state of the art infrastructure and ethical standards.

M2: To engage the students in research and development activities in the field of Computer Science and Engineering.

M3: To empower the learners to involve in industrial and multi-disciplinary projects for addressing the societal needs.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

Our graduates shall,

PEO1:Analyze, design and create innovative products for addressing social needs.

PEO2:Equipthemselves for employ ability, higher studies and research.

PEO3:Nurture the leadership qualities and entrepreneurial skills for their successful career

PROGRAM SPECIFIC OUTCOMES (PSOs):

Students will be able to,

PSO1: Apply the basic and advanced knowledge in developing software, hardware and firmware solutions addressing real life problems.

PSO 2:Design, develop,test and implement product-based solutions for their career enhancement.

PROGRAM OUTCOMES (POs)

Engineering students will be able to:

1.Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2.Problem analysis: Identify,formulate,review research literature,and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences

3.Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

4.Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions

5.Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

6.The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and theconsequent responsibilities relevant to the professional engineering practice

7.Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and

demonstrate the knowledge of, and need for sustainable development

5. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

6. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

7. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

8. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

9. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

ABSTRACT

This project is The AI-driven attendance monitoring and disciplinary action system aims to improve student engagement and behavior management through real-time tracking, participation analysis, and violation detection. Using AI technologies like facial recognition and behavior analysis, the system ensures accurate attendance records and identifies misconduct. It provides actionable insights for administrators to enforce policies, issue appropriate disciplinary actions, and improve overall student conduct. Future enhancements, including advanced AI, mobile apps, and LMS integration, will further optimize the system's accuracy, scalability, and user experience.

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LIST OF ABBREVIATIONS

ABBREVIATIONS

AI	Artificial Intelligence
DFD	Data Flow Diagram
DLL	Doubly Linked List
DB	Database
UI	User Interface
UX	User Experience
API	Application Programming Interface
SQL	Structured Query Language
ML	Machine Learning
JSON	JavaScript Object Notation
OTP	One-Time Password
CSV	Comma-Separated Values
IoT	Internet of Things
IDE	Integrated Development Environment

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This project introduces an AI-powered app to streamline attendance tracking and disciplinary actions in colleges. It ensures accuracy, real-time monitoring, and automated enforcement, reducing manual effort and promoting a transparent academic environment..

1.2 PURPOSE AND IMPORTANCE

The purpose of this project is to develop an AI-powered system that automates attendance monitoring and disciplinary management in colleges. It aims to replace traditional, error-prone methods with an efficient, accurate, and real-time solution that ensures students' presence and behavior are systematically tracked.

This system addresses key challenges in educational management, such as attendance fraud, lack of timely disciplinary action, and inefficient manual processes. By leveraging AI, it ensures reliable data collection, reduces administrative workload, and fosters accountability among students and staff.

Moreover, the system's real-time analytics and automated alerts help identify and address issues proactively, improving overall academic discipline and creating a structured, technology-driven learning environment.

A doubly linked list can efficiently manage student records in an attendance and disciplinary system, with each node storing details like name, ID, attendance, and behavior. It enables easy updates, additions, and deletions for real-time data management.

1.3 OBJECTIVES

1. Attendance Management
2. Behavior Monitoring
3. Efficient Data Handling
4. User-Friendly Interface
5. Scalability

1.4 PROJECT SUMMARIZATION

The Attendance Monitoring and Disciplinary Action System is an AI-powered application designed to manage student attendance and behavioral records efficiently using advanced data structures. The system offers features such as real-time attendance tracking, automated violation reporting, and policy enforcement. With a user-friendly interface, it ensures seamless interaction for administrators and faculty while maintaining accuracy and reliability in data management.

This project highlights the application of data structures, such as doubly linked lists, to dynamically manage student records and demonstrates the potential of AI in educational systems. It addresses the need for efficient attendance and discipline management while showcasing the advantages of modern technology in enhancing administrative workflows. Some benefits of this project are as follows:

- **Dynamic and Flexible:** The doubly linked list structure allows for efficient insertion, deletion, and updates of student records.
- **User-Friendly:** The intuitive interface simplifies attendance tracking and disciplinary management tasks.
- **Real-Time Insights:** Provides timely updates and analytics for better decision-making.
- **Data Integrity:** Ensures accuracy in attendance and behavior records, reducing errors.
- **Scalability:** Capable of handling a growing number of student records as the institution expands.

CHAPTER 2

PROJECT METHODOLOGY

2.1 SYSTEM ARCHITECTURE OVERVIEW

The system architecture for the AI-based attendance and disciplinary monitoring platform includes layers for data collection, real-time processing, AI analysis, backend storage, and reporting. It uses machine learning and rule-based systems to track attendance, analyze behavior, and enforce policies, ensuring scalability, security, and efficient decision-making.

High-Level System Architecture

The high-level system architecture for attendance monitoring application typically consists of several key components:

1. User Interface(UI)
2. Application Logic
3. Data Management Layer

Components of the System Architecture

a. User Interface (UI)

The User Interface is the layer with The front-end where administrators, educators, and students interact with the app. It allows users to view attendance records ,receive real-time notifications.

b. Application Logic

The Application Logic is the core of the system that processes user interactions, tracks attendance, monitors student behavior, and applies disciplinary rules. It integrates AI to analyze attendance patterns and flag behavioral violations, triggering appropriate actions.

c .Data Management Layer

Responsible for storing and managing data related to attendance logs, student profiles, behavior data, and disciplinary records. This layer ensures data integrity, security, and efficient retrieval for real-time decision-making..

2.1 DATA FLOW DIAGRAM

Include a diagram that visually represents the system architecture. The diagram should depict how each component interacts with the others. For example, it can show the User Interface sending requests to the Application Logic, which in turn interacts with the Data Management Layer and the Storage Layer.

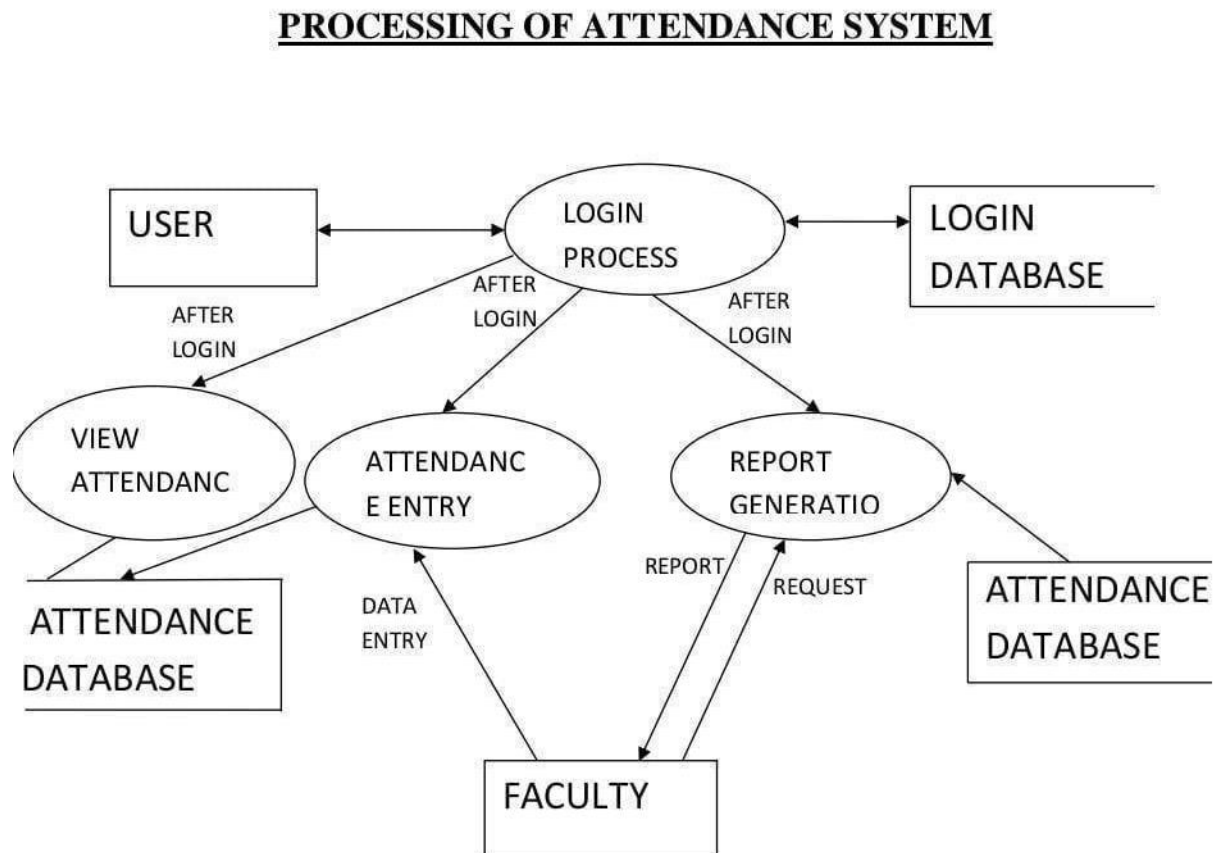


Figure2.1:Architecture Diagram

CHAPTER 3

AI-DRIVEN ATTENDANCE MONITORING

3.1 Real-Time Attendance Tracking

Real-Time Attendance Tracking uses AI to automatically monitor and record student presence during live sessions. The system leverages technologies like facial recognition, login data, and activity monitoring to detect when students join or leave a session, ensuring accurate and timely attendance logging. It eliminates manual checks, providing real-time updates to instructors and administrators, and can trigger alerts for any irregularities, such as late arrivals or early departures. This approach ensures seamless, automated attendance management and enhances efficiency in virtual and physical learning environments..

3.2 Presence Verification Technique

Presence Verification Techniques ensure that students are actively participating in a session, beyond just being logged in. Some common AI- driven methods for verifying presence include:

1. **Facial Recognition:** Uses camera feeds to verify that the student present matches their profile. This method is commonly used in virtual classrooms or for physical attendance in educational institutions.
2. **Keystroke and Mouse Activity Tracking:** Monitors if a student is actively engaging with the content by tracking keyboard or mouse movements. This can help verify that the student is not just logged in but is actively participating in the session.
3. **Voice Recognition:** Analyzes the student's voice to ensure they are present and engaging in the class, often used in interactive learning environments.
4. **Browser/Device Tracking:** Monitors whether the student's device is continuously connected to the session, ensuring no unauthorized switching or leaving without logging out.
5. **Interaction-Based Presence Detection:** Tracks interaction with the learning platform (e.g., quiz submissions, chat participation, screen-sharing) to confirm the student's active presence.

.

3.2 Participation analysis

Participation Analysis in an AI-driven attendance and disciplinary action system involves evaluating a student's level of engagement and interaction during a session. It uses various data points to assess how actively a student is involved in the learning process. Key methods for participation analysis include:

1. **Interaction Frequency:** Tracks how often a student interacts with the platform, such as answering questions, responding in discussions, or participating in polls.
2. **Content Engagement:** Analyzes how much time a student spends on course materials, watching videos, reading, or completing tasks, indicating their level of interest and involvement.
3. **Discussion and Collaboration:** Monitors participation in group discussions, chats, or collaborative projects, assessing the quality and frequency of contributions.
4. **Quiz and Assignment Performance:** Measures student engagement by evaluating their participation in quizzes, assignments, and tests, providing insights into their understanding and interest in the subject matter.
5. **Behavioral Indicators:** AI can analyze behavior patterns, such as attentiveness, keystrokes, or mouse activity, to determine how actively a student is engaged in the session.

CHAPTER 4

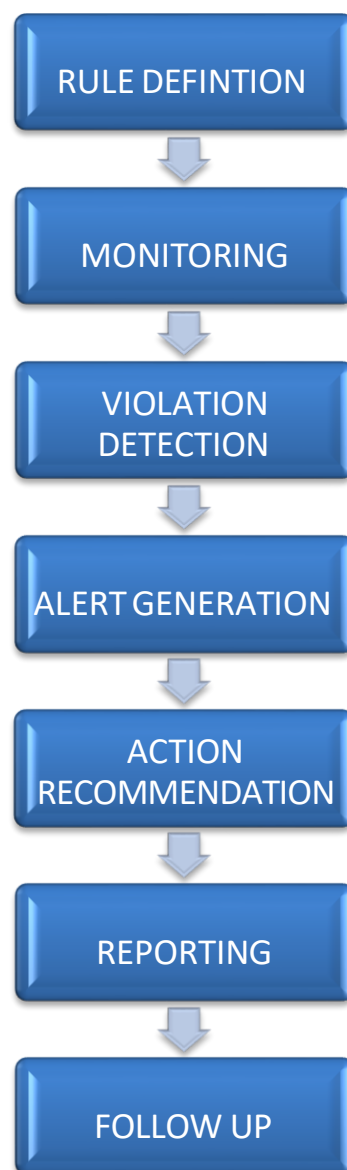
DISCIPLINARY ACTION MECHANISMS

4.1 CONDUCT MONITORING

Conduct Monitoring involves tracking and analyzing student behavior during sessions to ensure adherence to established rules and standards. AI-driven systems can assess communication patterns, language use, participation, and interaction with others to detect inappropriate behavior such as disruptive actions, bullying, or cheating. The system automatically flags violations, generating alerts or reports for educators and administrators to take necessary disciplinary actions, ensuring a respectful and productive learning environment.

4.2 POLICY ENFORCEMENT WORKFLOW

The Policy Enforcement Workflow in an AI-driven attendance and disciplinary system ensures that rules and guidelines are consistently applied and violations are addressed promptly. The typical work flow involves



4.3 VIOLATION REPORTING AND ACTION

Violation Reporting and Action involves detecting policy violations through AI monitoring, generating detailed reports with violation specifics, and sending alerts to relevant stakeholders. The system recommends appropriate actions, such as warnings or escalations, based on the severity of the violation. Administrators can review and decide on further actions, with follow-up tracking to ensure compliance. All actions are documented for transparency and accountability.

CHAPTER 5

IMPLEMENTATION AND DETAILS

5.1 DATABASE STRUCTURE

The database structure for an AI-driven attendance and disciplinary action system includes several key tables:

1. **Users:** Stores student and administrator data (e.g., name, role, email).
2. **Courses:** Tracks course details (e.g., name, instructor, time).
3. **Attendance:** Logs student attendance for each session (e.g., status, timestamp).
4. **Participation:** Records student engagement in activities like quizzes or discussions.
5. **Behavior Logs:** Captures student behavior data (e.g., disruptive actions, language use).
6. **Violations:** Stores details of detected violations and corresponding actions.
7. **Notifications:** Tracks alerts sent to users about attendance or violations.
8. **Audit Logs:** Monitors actions within the system for security and accountability.

These tables are interlinked to ensure efficient tracking and management of attendance, behavior, and disciplinary actions.

5.2 BACKEND INTEGRATION

Backend Integration involves:

1. **Database Integration:** Connects to the database to manage attendance, user data, and violations using ORM tools.
2. **API Integration:** Provides Restful APIs for frontend interactions and integrates with external systems like facial recognition or authentication services.
3. **AI Model Integration:** Connects AI models for attendance tracking, participation analysis, and violation detection.
4. **Authentication & Authorization:** Ensures secure user authentication and role-based access control.
5. **Notification System:** Sends real-time alerts via push notifications, email, or SMS for violations and attendance issues.
6. **Event-Driven Architecture:** Handles real-time data processing and scalability using microservices and tools like Kafka.
7. **Logging & Monitoring:** Implements audit logs and performance monitoring for security and reliability.
8. **Security & Data Privacy:** Encrypts sensitive data and secures APIs for data protection.

5.3 USER INTERFACE OVERVIEW

User Interface Overview focuses on providing an intuitive and responsive design:

1. **Student Interface:** Displays real-time attendance, participation metrics, and violation alerts. Students can track their progress and view personal records.
2. **Instructor/Administrator Interface:** Enables monitoring of attendance and behavior, violation management, analytics, and policy management. Admins can also send notifications and track disciplinary actions.
3. **Design Considerations:** Ensures a user-friendly, responsive design compatible with various devices, with accessibility features like text-to-speech and font resizing for inclusivity.

The UI aims to offer efficient and easy navigation for students, educators, and administrators.

CHAPTER 6

RESULT AND ANALYSIS

6.1 ATTENDENCE METRICES

Attendance Metrics track and evaluate student engagement:

1. **Overall Attendance Rate:** Percentage of sessions attended.
2. **Session Attendance:** Presence or absence in each session.
3. **Absence Frequency:** Number of absences in a period.
4. **Late Arrival Rate:** Percentage of late arrivals.
5. **Participation Ratio:** Active participation in attended sessions.
6. **Absence Trend:** Patterns in absenteeism over time.
7. **Excused vs. Unexcused Absences:** Categorization of absences.
8. **Attendance Gaps:** Duration of missed sessions.
9. **Recovery Rate:** Rate of making up missed sessions.
10. **Compliance Rate:** Percentage meeting attendance policies.

These metrics provide insights into attendance patterns and help improve engagement.

6.2 DISCIPLINARY INSIGHTS

Disciplinary Insights focus on analyzing student behavior to detect misconduct and ensure compliance with rules. Key insights include detecting violations using AI tools, tracking behavioral trends, categorizing violation severity, and monitoring incident frequency. It also involves assessing policy compliance and the effectiveness of interventions like warnings or counseling. These insights help institutions manage conduct, enforce policies, and improve overall discipline

CHAPTER 7

CONCLUSION AND FUTURE SCOPE

7.1 SUMMARY OF FINDINGS

The Summary of Findings shows that the AI-driven system successfully tracks attendance, monitors participation, and detects behavioral issues in real-time. It categorizes violations, ensuring appropriate disciplinary actions. The system improves engagement, ensures policy compliance, and helps administrators manage attendance and discipline more effectively.

7.2 FUTURE ENHANCEMENT

Future Enhancements include advanced AI for better behavior prediction, integration with Learning Management Systems (LMS), a mobile app for real-time tracking, gamification for engagement, automated reports, improved violation detection, and cloud integration for scalability and flexibility. These upgrades aim to enhance accuracy and effectiveness.

APPENDICES
APPENDIX A-SOURCECODE

HTML CODE

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <link rel="stylesheet" href="styles.css">
  <title>Attendance Monitor</title>
</head>
<body>
  <div class="container">
    <h1>College Attendance Monitor</h1>
    <form id="attendance-form">
      <input type="text" id="name" placeholder="Name" required>
      <input type="text" id="id" placeholder="Student ID" required>
      <input type="text" id="regNo" placeholder="Registration No" required>
      <input type="date" id="date" required>
      <label>
        Upload Profile Photo:
        <input type="file" id="photo" accept="image/*">
      </label>
      <select id="attendance-status" required>
        <option value="">Select Status</option>
        <option value="present">Present</option>
        <option value="absent">Absent</option>
      </select>
      <button type="button" id="mark-attendance">Mark Attendance</button>
    </form>
    <h2>Attendance Records</h2>
    <div id="attendance-records"></div>
    <h3>Attendance Percentage</h3>
    <p id="attendance-percentage">0%</p>
  </div>
  <script src="script.js"></script>
</body>
</html>
```

CSSCODE

```
body {
  font-family: Arial, sans-serif;
  margin: 0;
  padding: 0;
  background-color: lavender;
}

.container {
  max-width: 500px;
  margin: 20px auto;
  background: #ffffff;
  padding: 20px;
  border-radius: 8px;
  box-shadow: 0 2px 4px rgba(0, 0, 0, 0.1);
}

h1, h2, h3 {
  text-align: center;
  color: #333;
}

form {
  display: flex;
  flex-direction: column;
  gap: 10px;
}

input, select {
  padding: 10px;
  font-size: 16px;
  border: 1px solid #ddd;
  border-radius: 5px;
}
```

```
button {
  padding: 10px;
  font-size: 16px;
  border: none;
  border-radius: 5px;
  background-color: #007BFF;
  color: white;
  cursor: pointer;
}
```

```
button:hover {
  background-color: #0056b3;
}
```

```
#attendance-records {
  margin-top: 20px;
  background: #f9f9f9;
  padding: 10px;
  border-radius: 5px;
}
```

```
.record {
  display: flex;
  align-items: center;
  gap: 10px;
  margin-bottom: 10px;
  padding: 10px;
  background: #e6f7ff;
  border: 1px solid #b3e0ff;
  border-radius: 5px;
}
```

```
.record img {
  width: 50px;
  height: 50px;
  border-radius: 50%;
}
```

```
}

.record img {
  width: 50px;
  height: 50px;
  border-radius: 50%;
  border: 2px solid #ddd;
}

.status {
  font-size: 24px;
}

.present {
  color: green;
}

.absent {
  color: red;
}

#attendance-percentage {
  text-align: center;
  font-size: 24px;
  color: #28a745;
}
```

JAVASCRIPT CODE

```
const form = document.getElementById('attendance-form');
const recordsDiv = document.getElementById('attendance-records');
const percentageDisplay = document.getElementById('attendance-percentage');

let attendanceRecords = JSON.parse(localStorage.getItem('attendanceRecords')) || [];

function updateUI() {
  recordsDiv.innerHTML = '';
  attendanceRecords.forEach(record => {
    const recordDiv = document.createElement('div');
    recordDiv.classList.add('record');

    const profileImg = document.createElement('img');
    profileImg.src = record.photo || 'https://via.placeholder.com/50';
    profileImg.alt = 'Profile Photo';

    const details = document.createElement('div');
    details.innerHTML = `
      <strong>Name:</strong> ${record.name}<br>
      <strong>ID:</strong> ${record.id}<br>
      <strong>Reg No:</strong> ${record.regNo}<br>
      <strong>Date:</strong> ${record.date}
    `;

    const status = document.createElement('span');
    status.classList.add('status', record.status === 'present' ? 'present' : 'absent');
    status.textContent = record.status === 'present' ? '✓' : 'A';

    recordDiv.appendChild(profileImg);
    recordDiv.appendChild(details);
    recordDiv.appendChild(status);

    recordsDiv.appendChild(recordDiv);
  });
}
```

```

const totalRecords = attendanceRecords.length;
const presentRecords = attendanceRecords.filter(record => record.status === 'present').length;
const percentage = totalRecords > 0 ? ((presentRecords / totalRecords) * 100).toFixed(2) : 0;

percentageDisplay.textContent = `${percentage}%`;
}

function addAttendanceRecord() {
  const name = document.getElementById('name').value.trim();
  const id = document.getElementById('id').value.trim();
  const regNo = document.getElementById('regNo').value.trim();
  const date = document.getElementById('date').value;
  const status = document.getElementById('attendance-status').value;
  const photoInput = document.getElementById('photo');
  const photo = photoInput.files[0] ? URL.createObjectURL(photoInput.files[0]) : null;

  if (!name || !id || !regNo || !date || !status) {
    alert('Please fill in all fields.');
```

```

    return;
  }

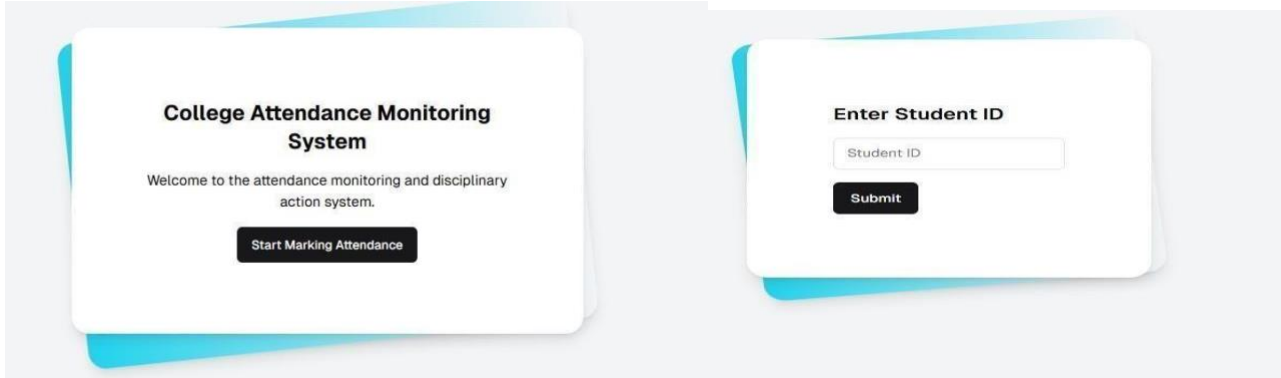
  const newRecord = { name, id, regNo, date, status, photo };
  attendanceRecords.push(newRecord);
  localStorage.setItem('attendanceRecords', JSON.stringify(attendanceRecords));
  updateUI();
  form.reset();
}

document.getElementById('mark-attendance').addEventListener('click', addAttendanceRecord);
updateUI();
|

```

APPENDIXB-SCREENSHOTS

RESULT AND DISCUSSION



Mark Attendance for Student ID: am2304

Date: 11/27/2024

Day: Wednesday

Location: Location not available

Attendance Record

Student ID: am2301
Date: 11/27/2024
Status: present
Student ID: am2302
Date: 11/27/2024
Status: absent
Student ID: am2303
Date: 11/27/2024
Status: present

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