

Academic Departmental Automation

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Abstract: This project presents a comprehensive solution aimed at improving the operational efficiency of educational institutions. The system consists of two main components: the Automated Absence Notification System and the Internal Marks Management System.

The Automated Absence Notification System allows for free flow of information from students to mentors by means of automated reminders every time a student is absent. Each student has a corresponding mentor assigned to them, which allows for effective workload handling and effective absence tracking. Mentors can provide reasons for being absent, thereby ensuring correct attendance records. The Internal Marks Management System automates the calculation of internal marks by shifting mid-term exam marks onto a normalized 20-point scale based on the application of weighted averages. The system also aggregates term work, assignment, and attendance marks to calculate consistent internal grades. The system also generates categorized report cards which put students into least marks, average marks, and good marks categories. Overall, this solution significantly reduces administrative workload, which improves efficiency and accuracy in all educational departments.

Keywords: Absence Notification System, Internal Marks Management, Educational Automation.

I. INTRODUCTION

The Academic Departmental Automation project is a new solution designed to automate administrative tasks in academic institutions. The system addresses two critical areas: absence notifications and internal marks handling, both of which are crucial for academic efficiency and transparency.

The Automated Absence Notification System facilitates the communication process between a student and their respective mentor using automated notifications when a student is reported absent. The system will automatically assign every student to a specific mentor so that there is better workload management and personalized absence tracking. Even the mentors are able to interact with students in more ways by responding to absence notifications so that there are proper attendance records and timely interventions.

II. EXISTING SYSTEM

This process has manual processes of attendance tracking and internal grading, which are inefficient and likely to be in error. Interaction between the students and the mentors is usually asynchronous, further aggravating the problem by not providing the opportunity for timely action. The mark calculation process involves manual data entry and manual calculation of the averages, which presents ample scope for errors. The writing of reports is also manual, which involves much effort and time resulting in inaccuracy and not providing essential information on time to the Head of Department (HOD).

DISADVANTAGES

Prone to Human Errors: The processes of manually tracking attendance and grading leave a lot of room for human error that translates into inaccuracies in student records and assessments, which can impact the performance evaluations academically.

Time-Intensive Process: The effort required for implementing weighted averages manually and then generating the report takes a lot of time, bringing down operational efficiency, which affects timely academic decisions.

Ineffective Communication: Lack of an automated system means any update regarding a student's absence is communicated after a long period of time.

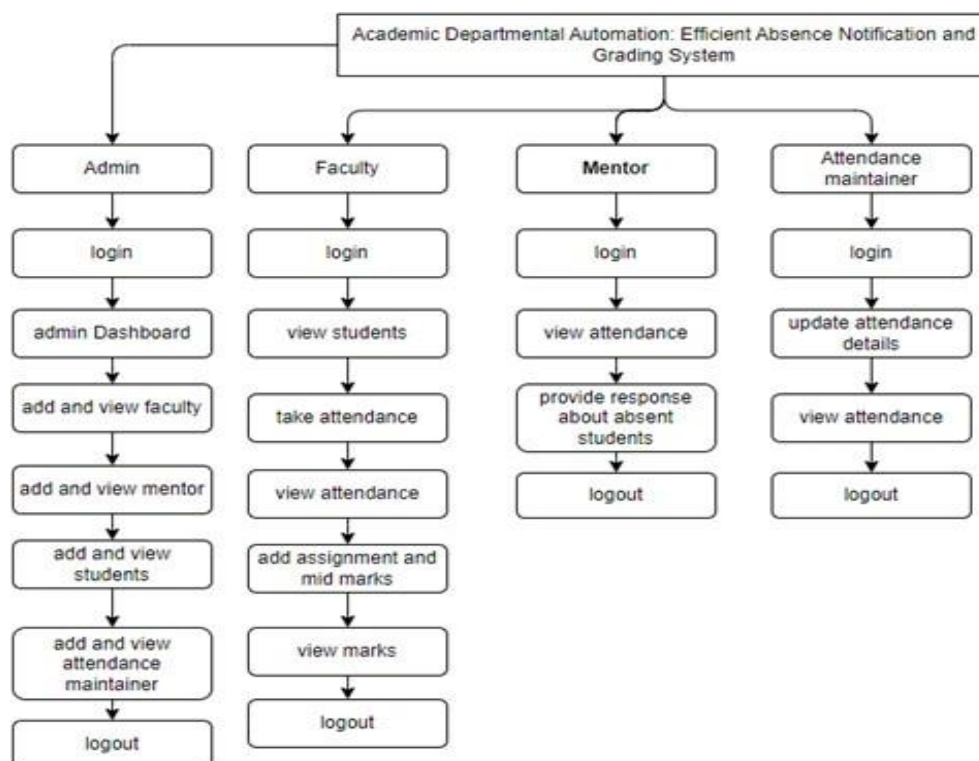
III. PROPOSED SYSTEM

The method enters a spring boot backnd with proposed absence notification automation and internal grading with a spring boot backnd, React.JS Frontnd and MySQL database. Attendance notifications are provided to mentors for absence, and grade is calculated by a weighted average and cumulative terminal score. Manual work is minimized by this system, which ensures timely communication, accuracy in grading and report generations in educational departments.

Benefits:

- Low Administrative Foundation: Attendance automates the tracking and grading, reduces manual efforts and errors.
- Efficient communication: Ensuring timely updates, the student immediately informs the masters about the appearance.
- Accurate internal grading: Automatic grade calculation for stability and low human error.

Work Flow of Proposed System



Proposed Functioning:

The proposed functioning for the development of academic departmental automation includes several major stages, from initial plan and design to deployment and maintenance. The following step-by-step underlines the process:

Requirement Analysis:

- Objective: Identify major requirements to automate the attendance tracking and internal grading in educational institutions.
- Collect requirements from faculty, patron and department heads.
- Define essential features such as automatic absence information, weighted grading calculations and report generations.

Authentication of attendance tracking and internal grading is necessary to improve efficiency, reduce manual errors and increase transparency in educational institutions. To achieve this, the first step is to gather requirements from the key stakeholders, including faculty members, patrons and heads of department. Faculty members can provide insight into the challenges faced by them with manual procedures, while mentor and advisory can highlight the requirement of academic performance tracking. The department heads play an important role in ensuring that the system complies with institutional policies and reporting requirements. Additionally, analyzing existing systems and collecting student response may help identify gaps and areas for intervals.

Once you collect the requirements, it becomes important to define the necessary features. For attendance tracking, automation can be obtained through biometric authentication (fingerprint or facial identification), RFID-based scanning, QR code-based check-in or mobile application. The system should provide real-time tracking to prevent proxy appearance and generate automatic absence information via SMS or email. For internal grading, weighted grading calculations should be included, allowing institutions to adapt to grading scales and update gradebooks automatically. Along with the error-creating mechanism to ensure accurate grading to the system, students should also provide analytics to track progress.

System Design

The design phase uses as its initial point that requirements were found in the documents of approved requirements. For each requirement, one or more sets of design elements will be made as a by-product of interviews, workshops and/or prototype efforts. These design artifacts expand the desired characteristics of software and usually include functional hierarchy diagram, screen composition diagram, business rules table, business process diagram, pseudo-code, and a unit-relationship diagram with a full data dictionary. These design artifacts are meant to expand the software enough to apply experienced programmer software without much further point. In this phase, it is important to ensure that the design as a whole is corresponding to the architecture and meets all the performance requirements. The design process also includes developing user interface mock-up and navigation flow to ensure a spontaneous user experience. Data integrity and user privacy protection are fully included in the design.

IV. EXPERIMENTAL RESULT

Usually, the login screen comes under the Authentication module. Here, we authenticate the user and Admin and Driver them the access to the data in the application regarding the type of the user being login. The application accepts the 2 credentials as the login credentials as shown in the figure. They are Email Address and the Password. If data entered in both the fields are correct, then the application will redirect them to the home page. else, the application will toast a message as invalid credentials.

This login screen is developed and provided with 3 fields. They are

1. Email Id
2. Password
3. Login button

Below is the home screen of the admin in the application. Once the admin login into the application, then the application will show him this page as a result as shown in the figure.

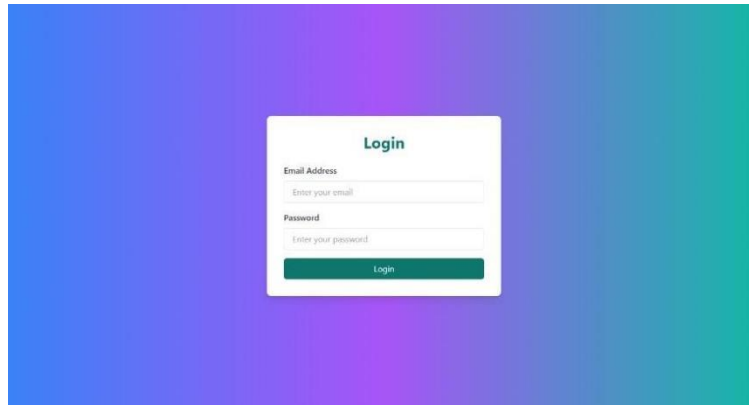


Fig 1: Login Screen

The snapshot is of an Add Students form of an Admin Dashboard of an academic management system. The form provides fields for administrators to input student information, such as:

- Name
- Email
- Password
- Mobile Number
- Address
- Department (dropdown menu) Section (dropdown menu)
- Profile Image (option to upload a file)

Fig 2: Admin add students

After adding the student information into the database, the details can be viewed on a dedicated page. On this page, the student's roll number, name, department, year, and semester are displayed in an organized manner as shown in the figure, providing a clear and comprehensive overview of each student's information.

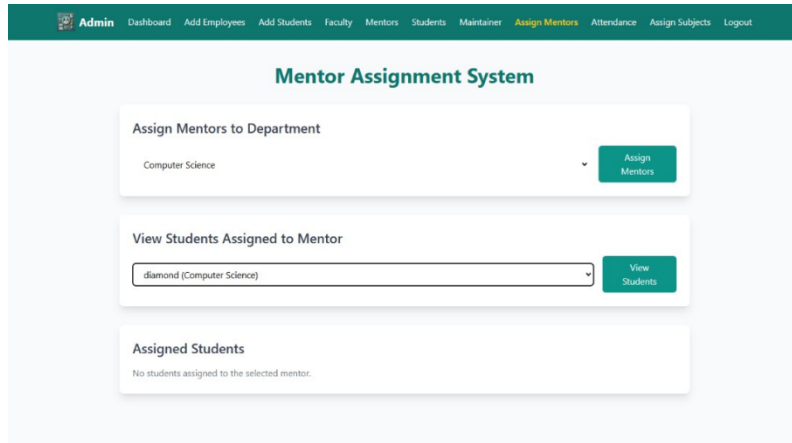


Fig 3: Admin assign mentors

Here the admin can assign mentors to department, view students assigned to mentor and can view assigned students to each mentor as shown in the figure, offering a clear and comprehensive overview of each user's information. Additionally, Moreover, the admin has the authority to remove a driver from the database by clicking the delete button, allowing for prompt and effective management of outdated or incorrect entries. This functionality ensures that the database remains accurate and reliable while streamlining administrative tasks.

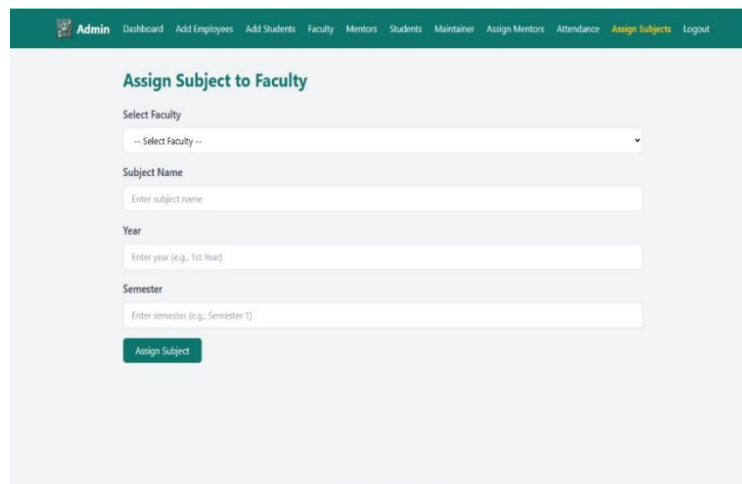


Fig 4: Admin assign subject to faculty

The screenshot depicts an "Assign Subject to Faculty" form of an Admin Dashboard of an academic management system. The interface is designed to allow administrators to efficiently assign subjects to faculty members. The form has a dropdown list to select a faculty member so that subjects are assigned to the right teacher. Moreover, there are input text areas for entering the subject name, the year of study (for instance, "1st Year"), and the term (for instance, "Semester 1"). Upon entering the required data, the administrator may click on the "Assign Subject" button to complete the assignment process. The top navigation bar provides links to various features like Dashboard, Add Employees, Add Students, Faculty, Mentors, Students, Maintainer, Assign Mentors, Attendance, Assign Subjects, and Logout, which implies that the system is designed for faculty management and academic administration. This systematic approach helps organize subjects in a systematic way with efficient faculty assignment in an institution.

ID	Name	Department	Section	Attendance
7	queen	Computer Science	A	<input type="button" value="Present"/> <input type="button" value="Absent"/>
9	jack	Computer Science	B	<input type="button" value="Present"/> <input type="button" value="Absent"/>
10	king	Computer Science	B	<input type="button" value="Present"/> <input type="button" value="Absent"/>

Fig 5: Take attendance

Here the faculty or the mentor can take the attendance by selecting the subject, entering the period number, selecting the department and section. Then the list of students will be appeared based on the entered information as shown in the figure. After taking attendance the user can click on submit attendance.

Filter by Department: All Departments
Filter by Section: All Sections
Filter by Name: Enter student name

Select Student: -- Select Student --

Assignment Name: Enter assignment name

Module: 0

Marks: 0

Add Marks

Fig 6: Add assignment marks

Here, the faculty can add assignment marks and mid marks to each student based on department, section and the respective assignment as shown in the figure. After adding marks the faculty need to click the add marks button.

Filter by Department: -- All Departments --

Filter by Section: -- All Sections --

Search by Name: Enter student name

Select Student: -- Select Student --

Select Grading System: JNTU

Calculate Marks

Fig 7: Internal Marks

Here the faculty can add internal marks to each student based on the department and section and based on the grading system as shown in the figure.

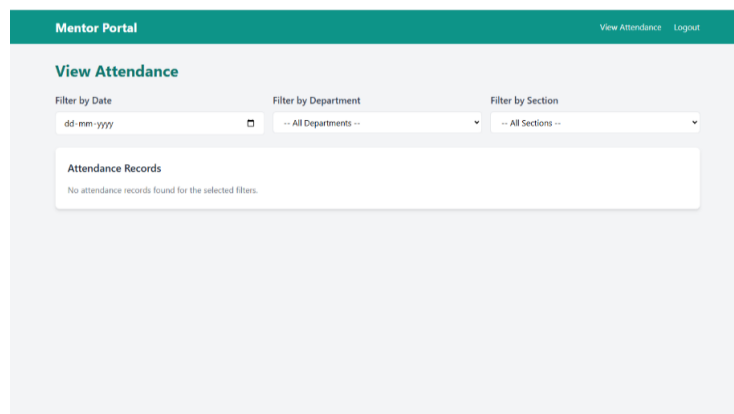


Fig 8: Mentor View Absentees and give response

The image represents a Mentor Portal - View Attendance page, designed for mentors to track student attendance efficiently. The interface provides multiple filtering options:

- Filter by Date: Allows mentors to select a specific date to check attendance records.
- Filter by Department: Enables selection of a particular department for more focused tracking.
- Filter by Section: Helps narrow down attendance records by specific sections within a department.

A message "No attendance records found for the selected filters" indicates that no data is available based on the selected criteria. The top navigation bar includes options for "View Attendance" and "Logout," ensuring smooth navigation and secure session management. This interface enhances attendance monitoring, streamlining mentor responsibilities in academic institutions.

V. CONCLUSION

The Academic Departmental Automation system simplifies academic management by mechanizing absence notifications and internal marks handling, minimizing manual work and errors and maximizing real-time communication. Designed using Spring Boot, React.js, and MySQL, the system guarantees scalability, reliability, and simplicity. It mechanizes attendance tracking, weighted grading computation, and report generation in PDF and Excel formats, maximizing efficiency and workload allocation among staff.

By offering instantaneous access to data and organized monitoring of performance, it brings up-to-date schooling operations and helps with data-based decision-making. Its functionality may be enhanced with additional features, like AI-enhanced analytics, integration with a mobile app, and biometric attendance, enhancing its strength as a solution to schools.

VI. REFERENCES

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