A Minor Project II Report on

GCES App

Submitted in partial fulfillment of the requirements for the degree of

Bachelor of Engineering in Computer Engineering at Pokhara University

By

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BONAFIDE CERTIFICATE

This is to certify that this project titled GCES App in partial fulfillment of requirements for the degree of BACHELOR OF ENGINEERING IN COMPUTER ENGINEERING is a bonafide work of **Ayush Sharma Kaundinya**, **Pramish Adhikari** and **Pratham Poudel** under the supervision of Er. Ranjan Adhikari. It is further certified that this work doesn't form part of any other project work on the basis of which a degree or award was conferred on any earlier occasion on this by any other candidate.

Date of Evaluation: October 2, 2024

……...…
Er.
External Examiner
Post
Institute Name

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Er. Ranjan Adhikari	Er. Bidur Devkota
Supervisor	Project Head
	Research Management Cell

ABSTRACT

The main objective of this project is to add mobility and automation to managing student information at Gandaki College of Engineering and Science. Currently, information is spread through notices, hand-written manuals, and verbal messages. The project aims to implement a web-based application, named GCES App, to improve communication and make it easier to manage information among students, teachers, and administrators. This project seeks to create a secure, efficient, and easy-to-use web application to help distribute and manage student information within the college. By using modern web technologies, the GCES App will offer real-time updates, safe data storage, and simple access, making campus communications much more efficient and effective.

Keywords: ***student information management, web application, GCES App, communication, educational technology.***

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LIST OF FIGURES

LIST OF TABELS

LIST OF SYMBOLS AND ABBREVIATIONS

API: Application Programming Interface

ERD: Entity Relationship Diagram

MVC: Model View Controller

ORM: Object Relational Mapping

SSD: System Sequence Diagram

SQL: Structured Query Language

Chapter 1

INTRODUCTION

1.1 BACKGROUND

Generally, Students want convenient digital access to information and services. With expectations and technical capabilities both on the increase, we believe it's important for colleges to think ahead. With our motto of keeping the institutes on the forefront of digital innovation we are very pleased to inform you about our Web based application, developed with an aim to increase the student and teacher engagement with the institute and increase the overall performance of the students. In present context, many colleges have been adopting online system to convey notice student in the college.

1.2 PROBLEM STATEMENT

At the instant, there is no any application dedicated to students in college. Also for the announcement it is very difficult to find and cannot be feasible to all students and teacher. For the solution we have developed “GCES App” to make easy for connecting the student, teacher and college admin.

1.3 OBJECTIVE

To develop a college management system that provides a platform for administrative, and operational tasks.

1.4 IMPLICATIONS

The implementation of the GCES App will significantly enhance college communication and information accessibility. By allowing users to obtain detailed information through the app which simplifies information retrieval. It will improve interactions between the administration, students, and staff, fostering a more connected campus environment. Additionally, the app will streamline the process of sending notices to students, ensuring they receive important updates promptly and efficiently.

CHAPTER 2

LITERATURE REVIEW

In the world of educational technology, early apps like Blackboard and Moodle were pioneers. They started back in the late 90s and early 2000s, helping teachers organize their classes online. Blackboard was one of the first platforms where teachers could store their class materials, like notes and assignments. Similarly, Moodle came along and let teachers create their own online classrooms for free, with features like quizzes and discussion boards. [1]

Before apps like Google Classroom, there were older versions of Blackboard and Moodle that laid the groundwork for today's tools. They were like the grandparents of online learning platforms. They didn't have all the fancy features we have now, but they were still a big deal back then.

Just like how Blackboard Learn changed the game for schools when it first came out, Moodle Classic also made waves in online learning. Even though they weren't as advanced as today's apps, they set the stage for what we have now. [2]

Let's not forget about other early apps like Sakai and WebCT. They were also important players in online learning, offering similar features to Blackboard and Moodle. While they might not be as popular now, they played a big role in shaping educational technology. [3]

When we talk about the GCES App for GCES College, it's like a fresh face in the world of educational tech. It's taking what the older apps did and improving it. It's packed with all the features we need for our college's classrooms, and it's super easy to use too. [4]

CHAPTER 3

TOOLS AND METHODOLOGY

3.1 REQUIRED TOOLS

To successfully develop the GCES App, the following tools will be used.

1. Frontend: HTML, CSS, JS
2. Backend: Django(Python)
3. Database: Sqlite3
4. Version Control: git
5. Text Editor: Visual Studio Code
6. Documentation and Writing: Microsoft Word
7. UI/UX Design: Figma
8. Visualization Tool: Draw.io
9. API Testing: Insomnia

3.2 SYSTEM DESIGN

To create an effective and efficient management system, a well-planned system design is essential. This involves identifying the necessary components, defining their interactions, and outlining the overall architecture of the platform. The system design for GCES App will include the following elements:

3.2.1 USE CASE DIAGRAM

A use-case diagram was created to visualize the interactions between the users (Admin, Staff ,Student) and the system. This helped in identifying the main functions of the System, such as user authentication, and communication between teacher and students.

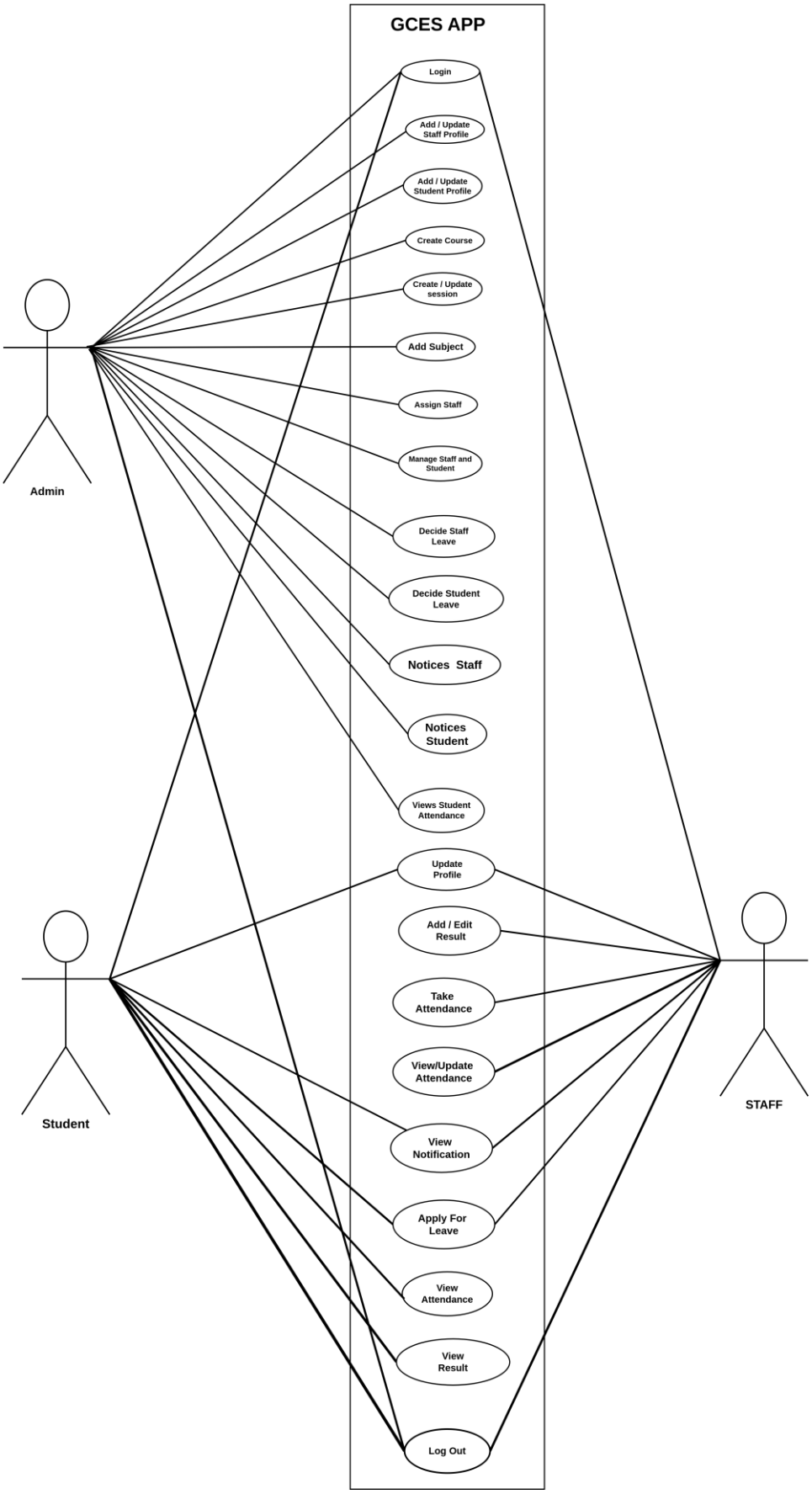


Figure 3.2. 1 USE CASE DIAGRAM

a. **UC1**: Login

   Actor: Admin, Staff, Student

   Description: Users log in to access the system.

   Precondition: User is registered.

   Postcondition: User is authenticated.

b. **UC2**: Add/Update Staff Profile

   Actor: Admin

   Description: Admin adds or updates staff profiles.

   Precondition: Admin is logged in.

   Postcondition: Staff profile is updated.

c. **UC3**: Add/Update Student Profile

   Actor: Admin

   Description: Admin adds or updates student profiles.

   Precondition: Admin is logged in.

   Postcondition: Student profile is updated.

d. **UC4**: Create Course

   Actor: Admin

   Description: Admin creates courses.

   Precondition: Admin is logged in.

   Postcondition: Course is created.

e. **UC5**: Create/Update Session

   Actor: Admin

   Description: Admin creates or updates sessions.

   Precondition: Admin is logged in.

   Postcondition: Session is updated.

f. **UC6**: Add Subject

   Actor: Admin

   Description: Admin adds subjects to courses.

   Precondition: Admin is logged in.

Postcondition: Subject is added.

g. **UC7**: Assign Staff
   Actor: Admin
   Description: Admin assigns staff to subjects.
   Precondition: Admin is logged in.
   Postcondition: Staff is assigned.

h. **UC8**: Manage Staff/Students
   Actor: Admin
   Description: Admin manages staff and student records.
   Precondition: Admin is logged in.
   Postcondition: Records are managed.

i. **UC9**: View/Update Attendance
   Actor: Admin, Staff
   Description: Admin or Staff views and updates attendance.
   Precondition: Admin or Staff is logged in.
   Postcondition: Attendance records are updated.

j. **UC10**: Apply for Leave
   Actor: Student
   Description: Student applies for leave.
   Precondition: Student is logged in.
   Postcondition: Leave request is submitted.

3.2.2 ENTITY RELATIONSHIP DIAGRAM

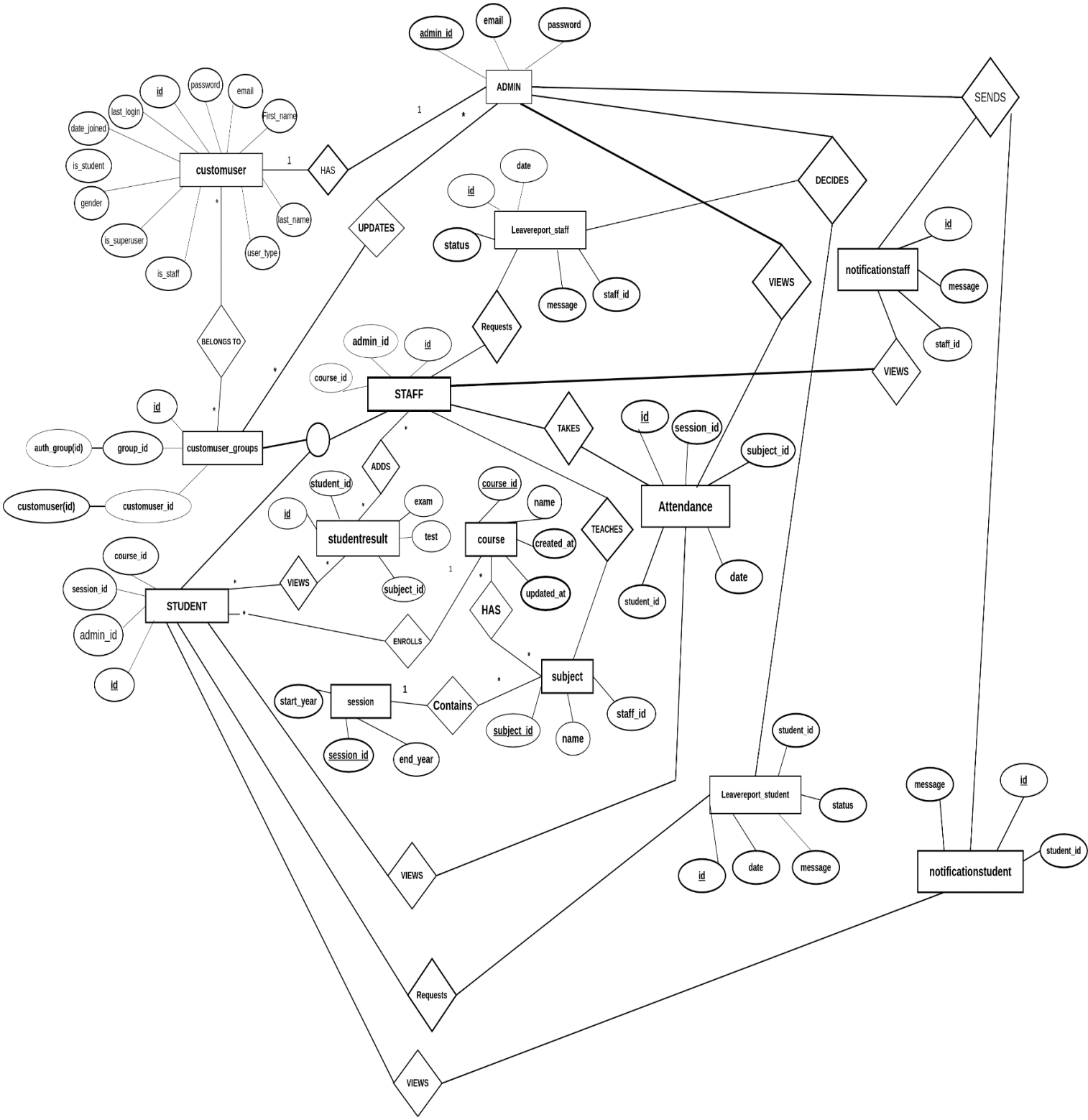


Figure 3.2. 2 ENTITY RELATIONSHIP DIAGRAM

SYSTEM SEQUENCE DIAGRAM

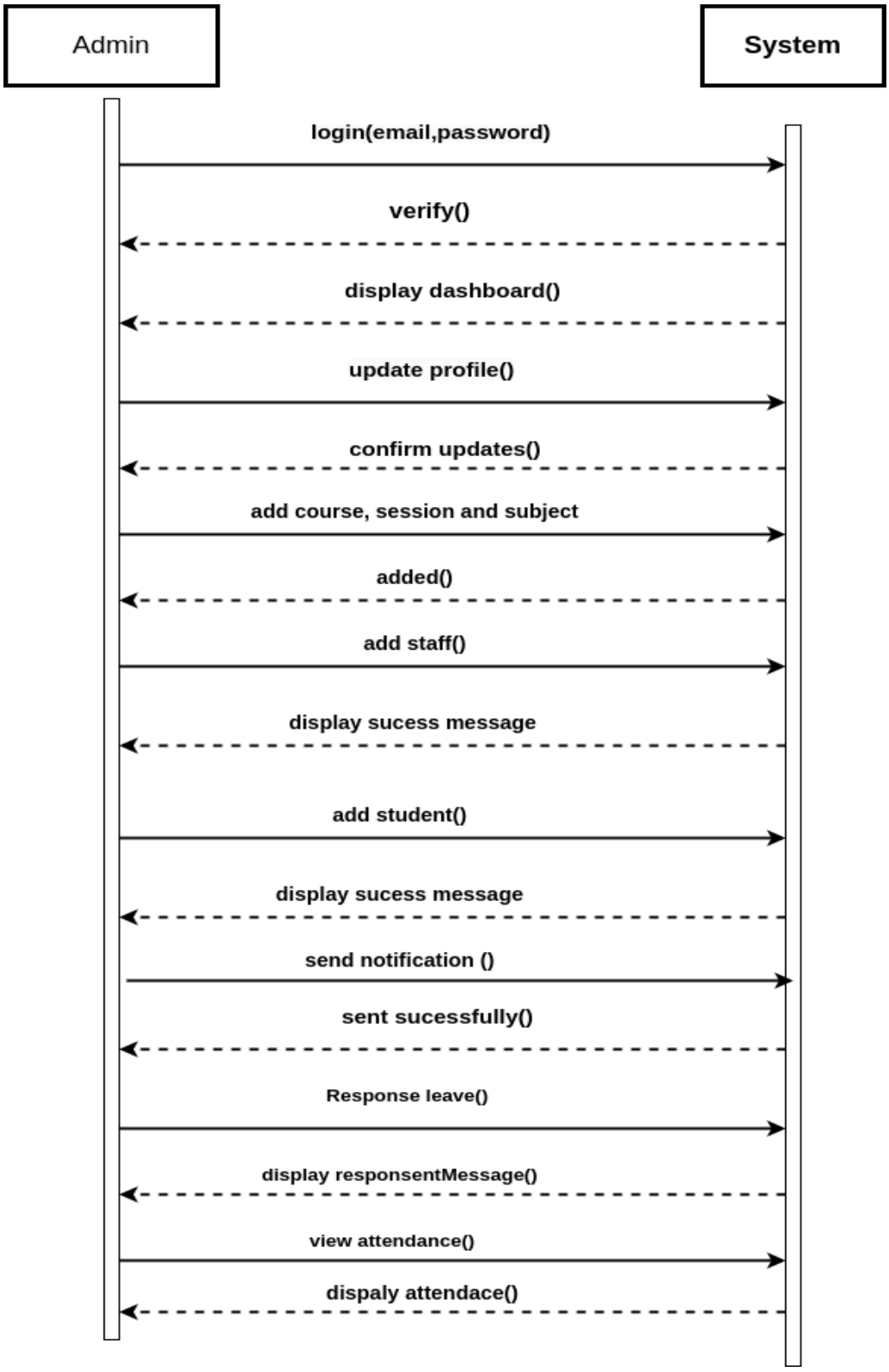


Figure 3.2.3 a System Sequence Diagram for Admin

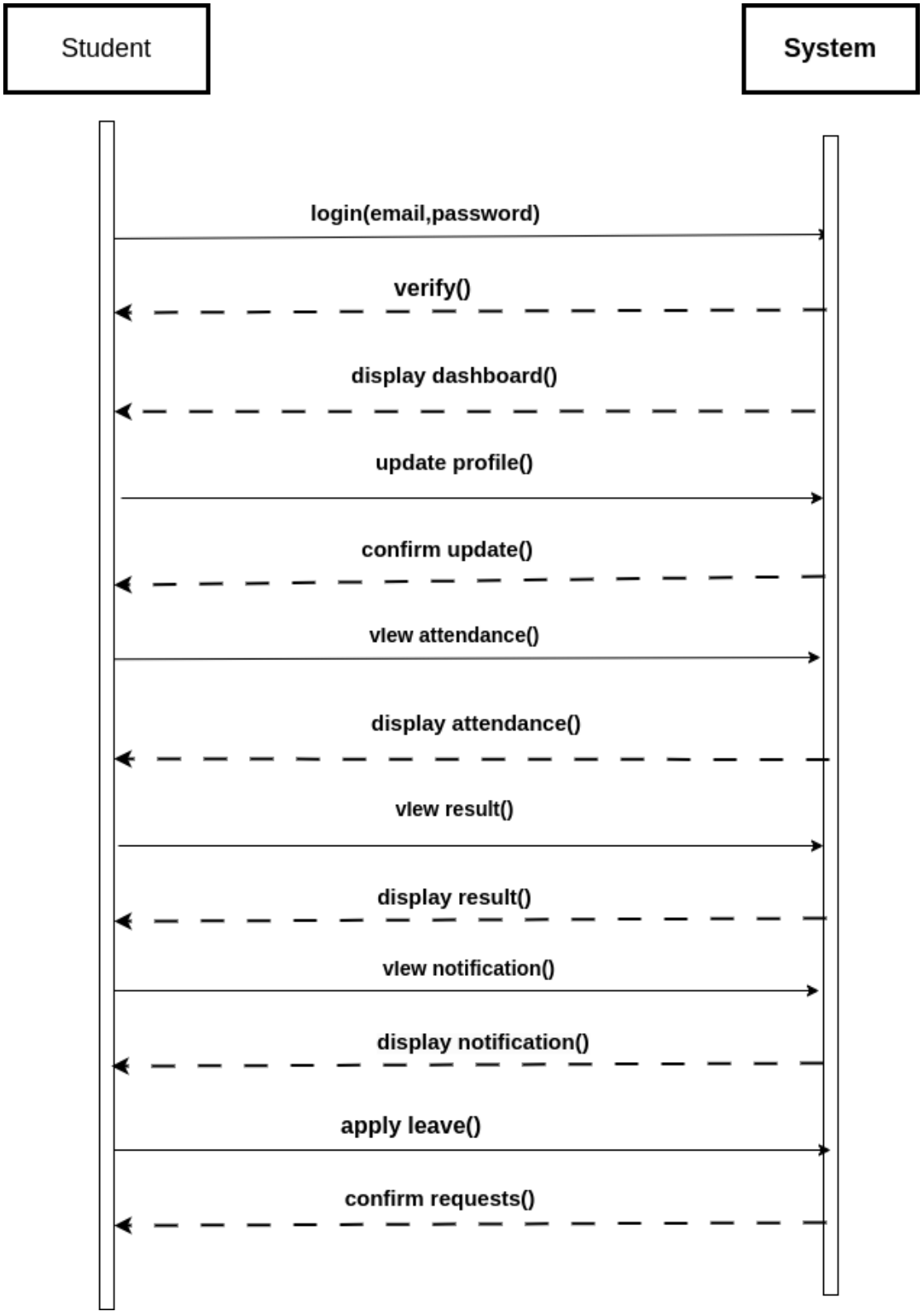


Figure 3.2.3 b System Sequence Diagram for Student

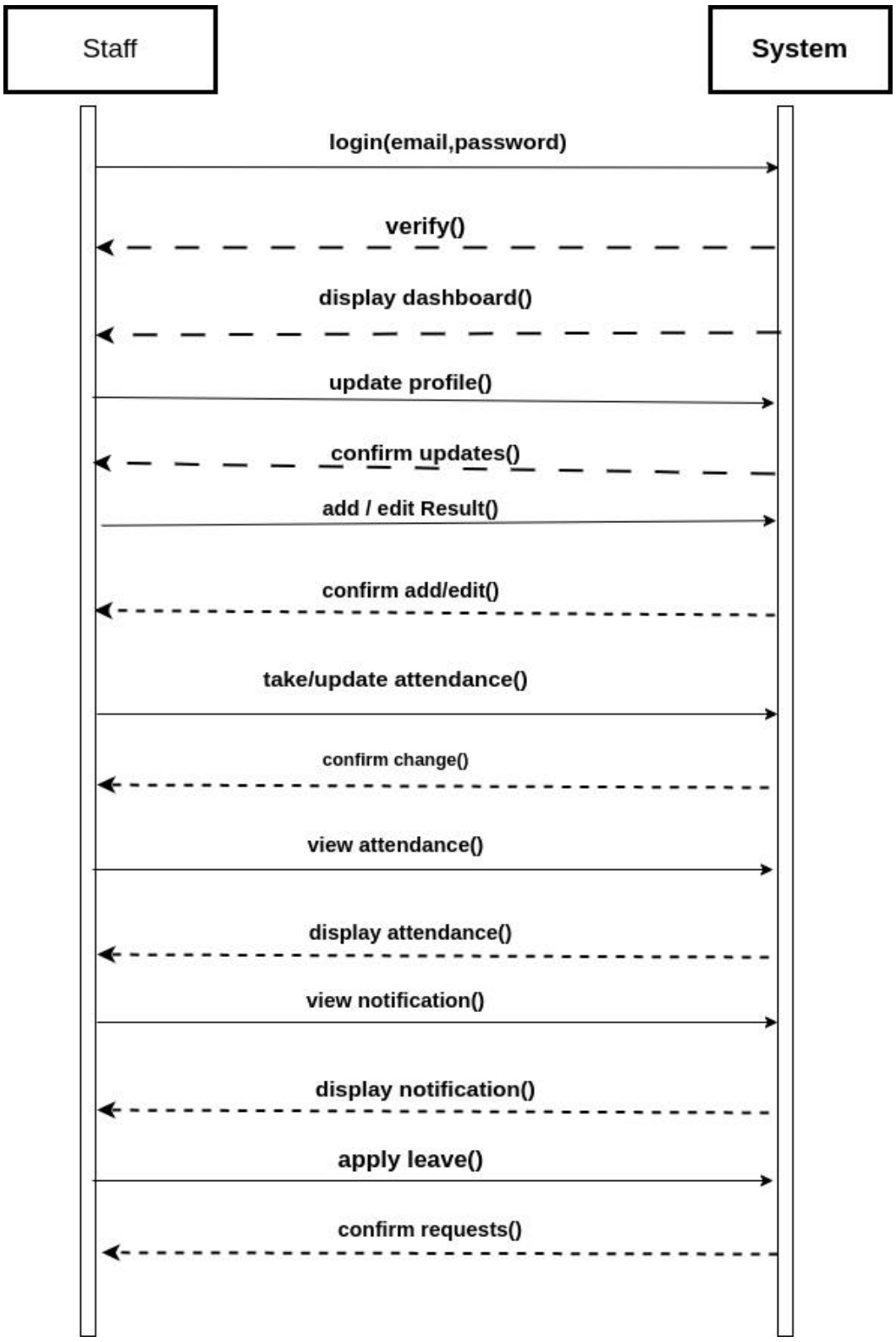
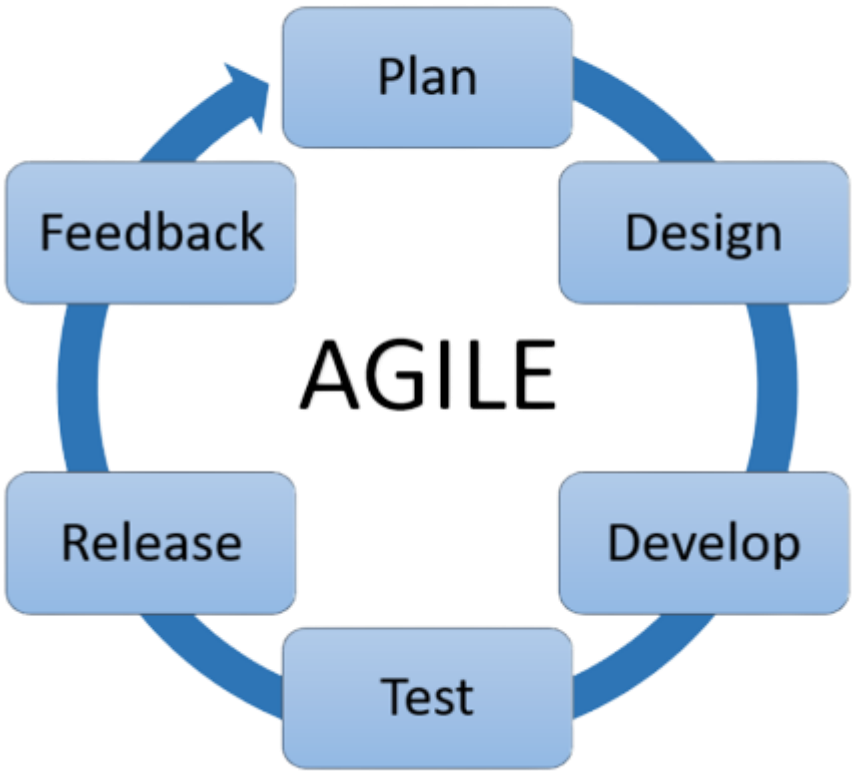


Figure 3.2.3 c System Sequence Diagram for Staff

a. APPROACH USED

Agile development is focused on quick responses to change and continuous development. The Agile process aligns the development with the customer needs and also processes a lot of flexibility and adaptability. It is a very realistic approach to software development and suitable for fixed or changing requirements.



Source :[10] "Agile Alliance," 2018. [Online].

During the development of the College Management System, we applied the basic principles of Agile methodology to ensure an iterative and flexible approach to building the project. Agile allowed the project to evolve through small, incremental stages, making it easier to adapt to new requirements or changes in the system design.

We broke down the project into manageable sprints, each focusing on specific tasks such as user authentication, database management, or attendance tracking. Regular

meetings and feedback loops enabled constant communication among team members, ensuring that any issues were quickly identified and addressed. This approach not only helped in delivering functional parts of the system early but also allowed us to improve and enhance features based on user feedback and testing.

By using Agile, we maintained flexibility throughout the project, quickly adapting to changes and ensuring that each component was thoroughly tested before moving forward. This iterative process led to a more reliable and user-centered system, with the ability to scale and evolve based on future needs. Agile principles helped us achieve continuous improvement and deliver the final product efficiently, while still allowing room for further development.

Chapter 4

TESTING

Testing is a critical part of any software development process. It involves validating and verifying that the software program or application functions as intended, meets the specified requirements, and provides a positive user experience. Without adequate testing, the software could have bugs, security vulnerabilities, or usability issues that negatively impact the end-user.

4.1 TEST PLANS

For the GCES App project, our testing approach involved creating specific test plans for each component of the system. Each test plan included the objectives, scope, test approach, resources, schedule, deliverables, and exit criteria. This ensures a structured and comprehensive approach to testing each component of the GCES application. These test plans focused on the following areas:

- Functional Testing
- User Interface (UI) Testing
- Security Testing
- Integration Testing
- Performance Testing

4.2 TEST RESULTS

Test Case ID	Purpose	Test Case	Expected Outcome	Outcome	Result
TC 1	Admin Registration	Create Super user.	Admin account created.	Admin account was created.	OK
TC 2	Staff Registration	Add Staff account	Staff added.	Staff account was registered successfully.	OK
TC 3	Student Registration	Add Student account	Student added.	Student account was created.	OK
TC 4	User Profile	Edit profile details	User profile is updated and changes are reflected	User profile was updated and changes were reflected	OK
TC 5	Admin Login	Admin login portal.	Admin is logged In.	Admin was logged In successfully.	OK
TC 6	Staff Login	Staff login Portal	Staffed is logged In.	Staff was logged In successfully.	OK
TC 7	Student Login	Student login Portal	Student is logged In.	Student was logged In successfully.	OK
TC 8	Manage Staff	Add/delete Staff details.	Staff is updated and changes are reflected	Staff was updated and changes were reflected.	OK
TC 9	Manage Student	Add/delete Student details	Student is updated and changes are reflected	Student was updated and changes were reflected.	OK
TC 10	Notification	Send Notification	Notification is sent and viewed by users.	Notification was sent and viewed by users.	OK

TC 11	Leave Request	Request Leave.	Request for leave is viewed by admin.	Request was approved/rejected.	OK
TC 12	Attendance	View Attendance	Attendance is viewed/taken.	Attendance was viewed/taken.	OK

Table 4.2. 1 TEST RESULTS

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

The GCES App has successfully streamlined various administrative tasks, enhancing efficiency and accuracy in managing student records, attendance, courses, and staff information. The project has also introduced features that enable easier communication between students, teachers, and administrators. With a secure authentication system, it provides a reliable solution for the college to manage daily operations. By integrating modern technologies and database management, the system has minimized errors, saved time, and improved overall organizational workflow.

5.2 RECOMMENDATIONS

A user feedback system could be introduced, allowing students, teachers, and administrators to report issues or suggest improvements. This ensures the system evolves based on real user needs. Implementing automated backup solutions would safeguard data in case of accidental loss or technical failures, ensuring the system remains reliable and secure. Performance optimization is also important as the system grows, especially for larger databases and concurrent users, to prevent slowdowns or crashes.

Training programs or user guides should be provided to faculty and staff so they can effectively use all features of the system. Planning for scalability will allow the system to accommodate more users and complex features as the institution expands. Multi-language support could be added to make the system more inclusive for users who prefer their native language.

Incorporating advanced analytics tools for generating detailed reports on student performance, attendance, and staff efficiency would help the administration make data-driven decisions. Expanding the system to integrate with other departments, such as finance, library, or examination departments, could create a unified system for the entire college. Additionally, by reducing paperwork through digital records, the system could contribute to sustainability goals, further modernizing the institution’s operations.

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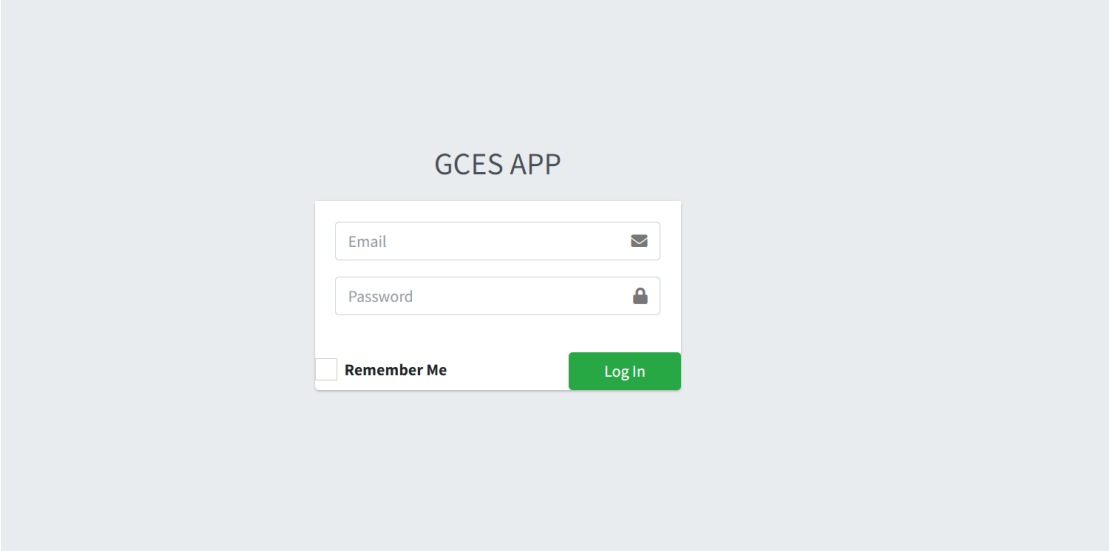
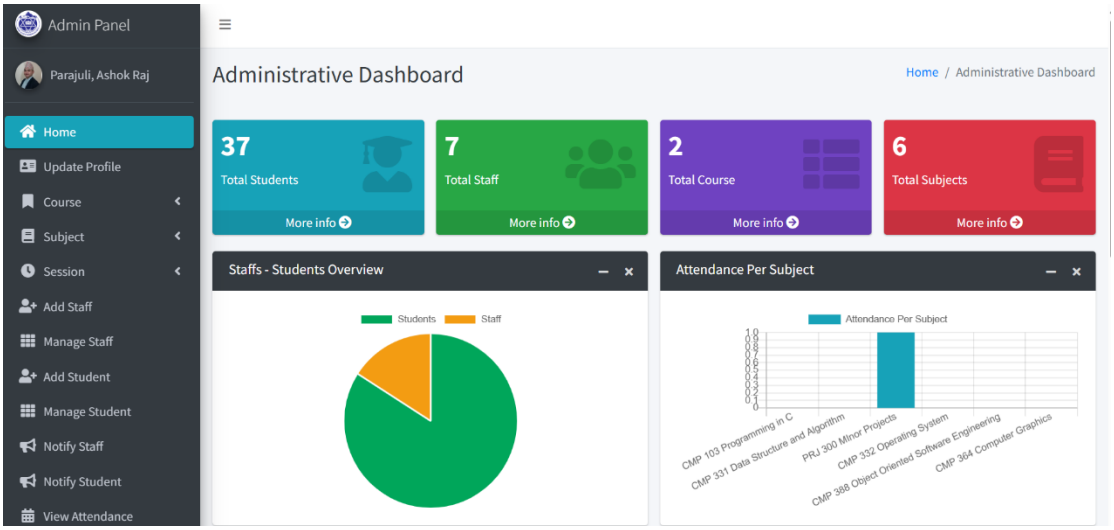
[11] “Agile Alliance,” 2018. [Online].

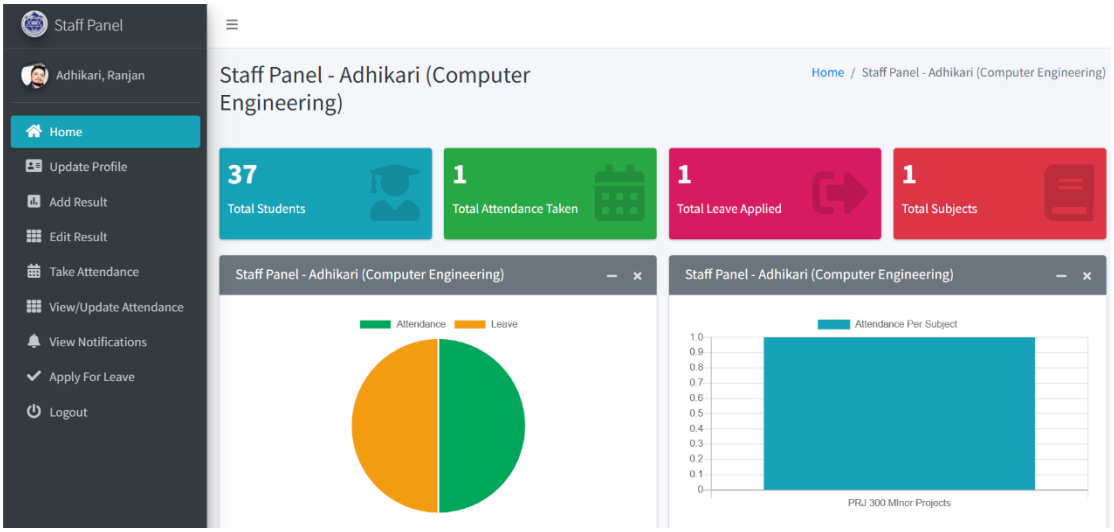
APPENDICES



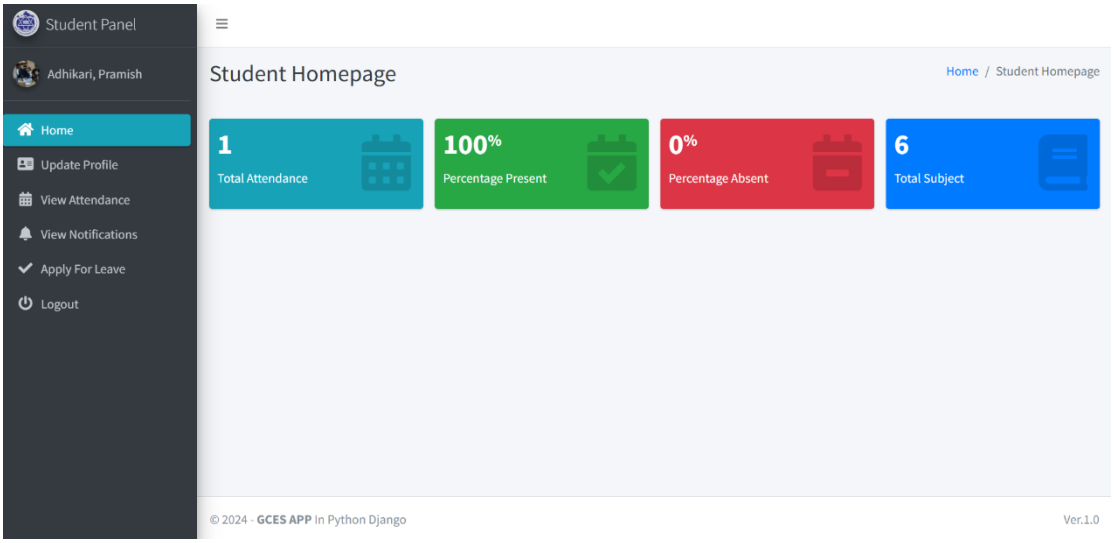
Appendix 1: Login



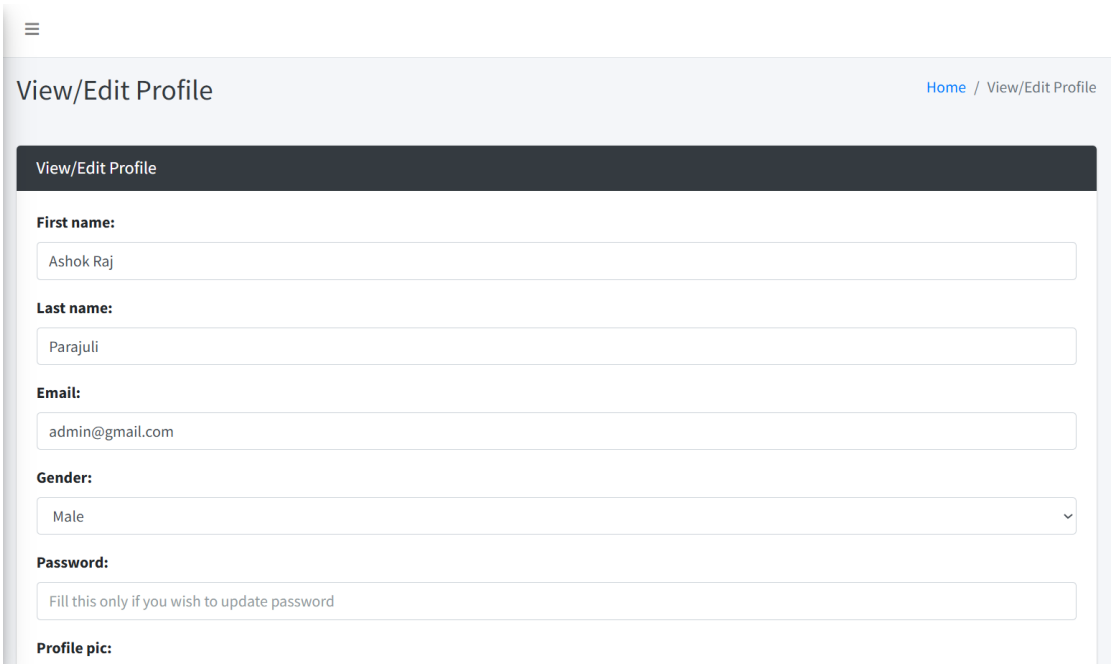
Appendix 2: Admin Homepage



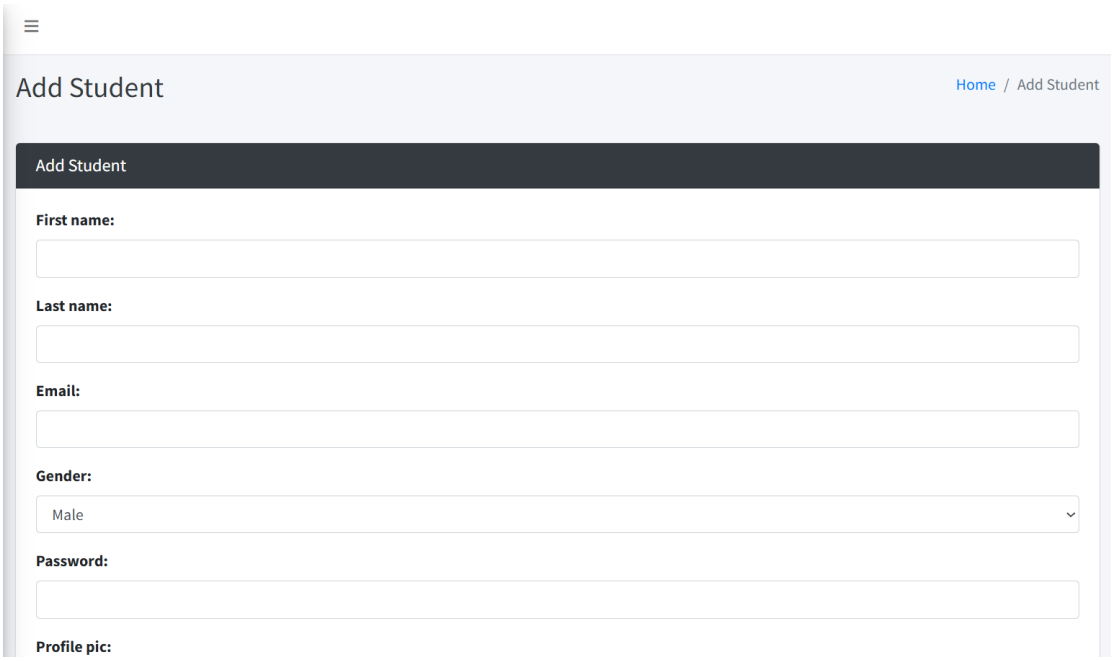
Appendix 3: Teacher Homepage



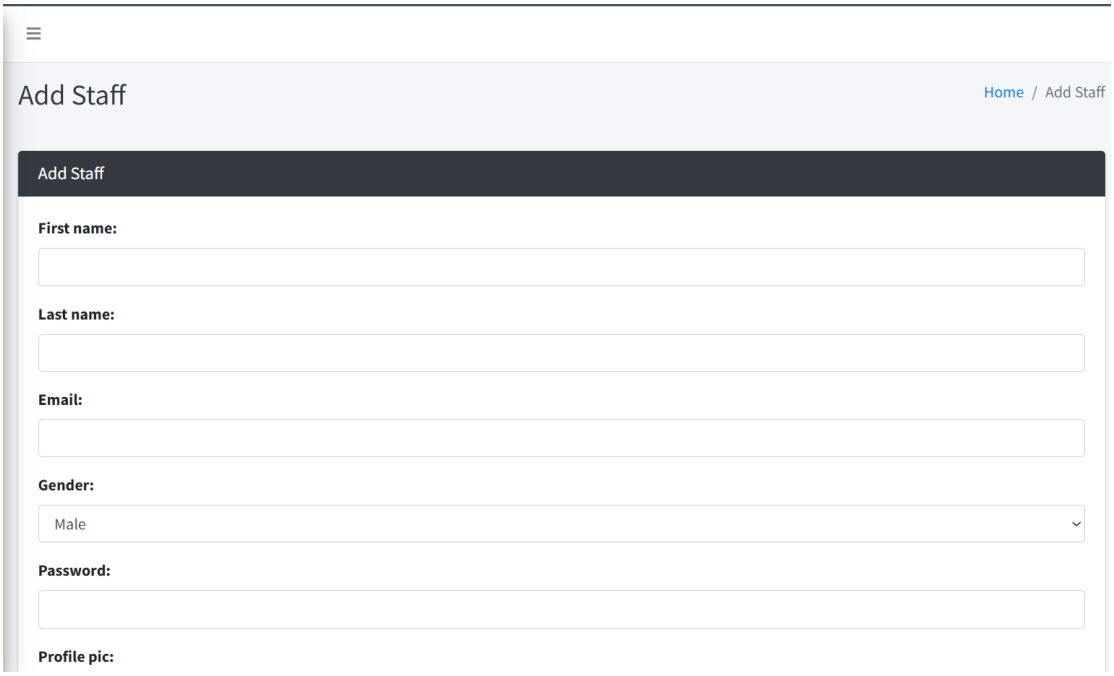
Appendix 4: Student Homepage



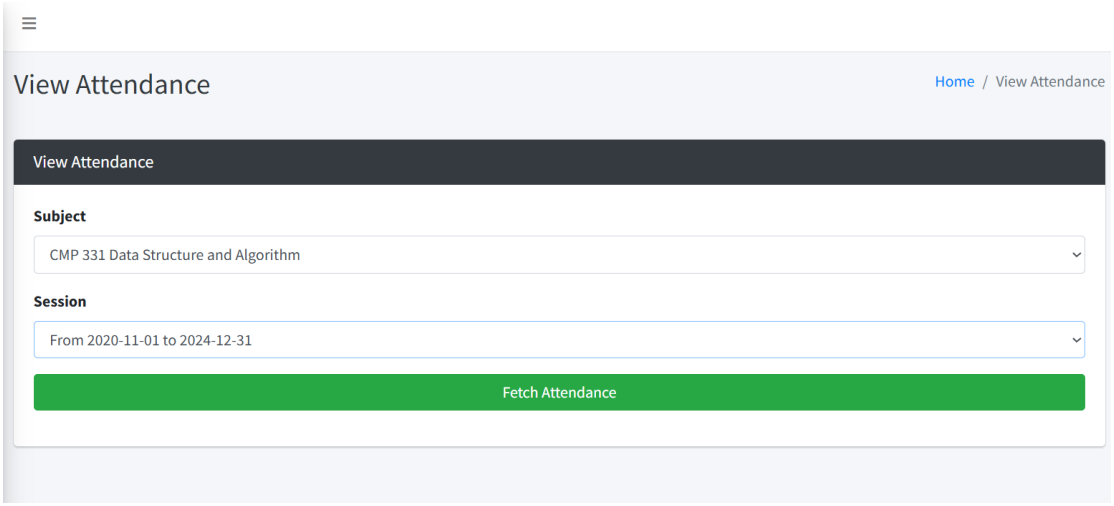
Appendix 5: Edit/view Profile



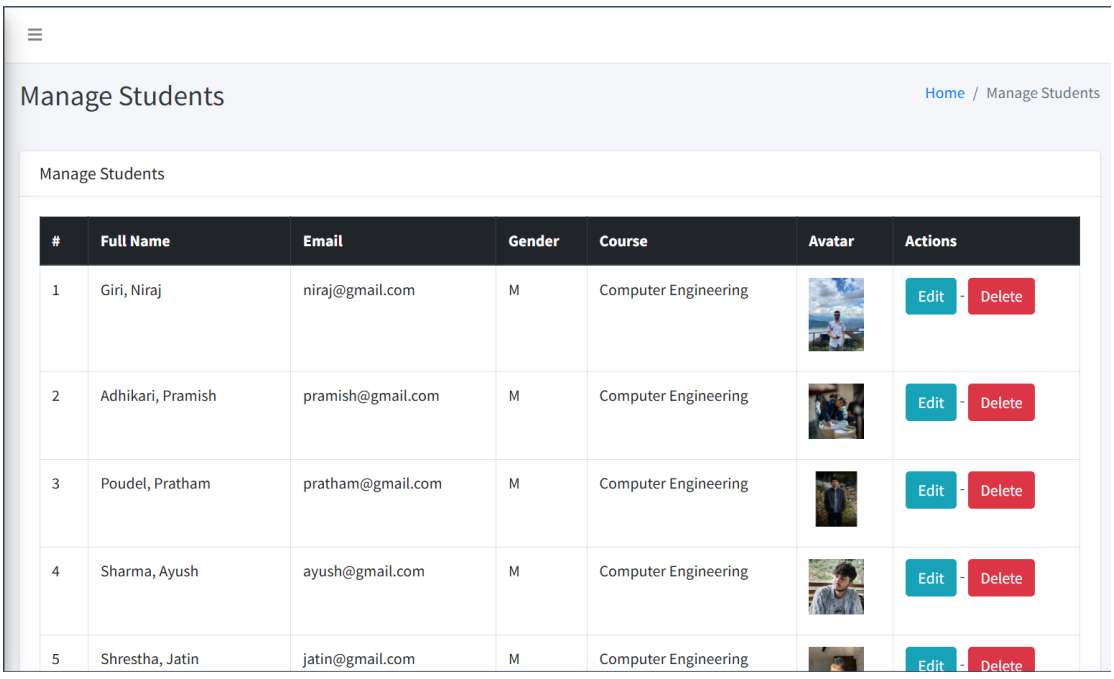
Appendix 6: Add Student



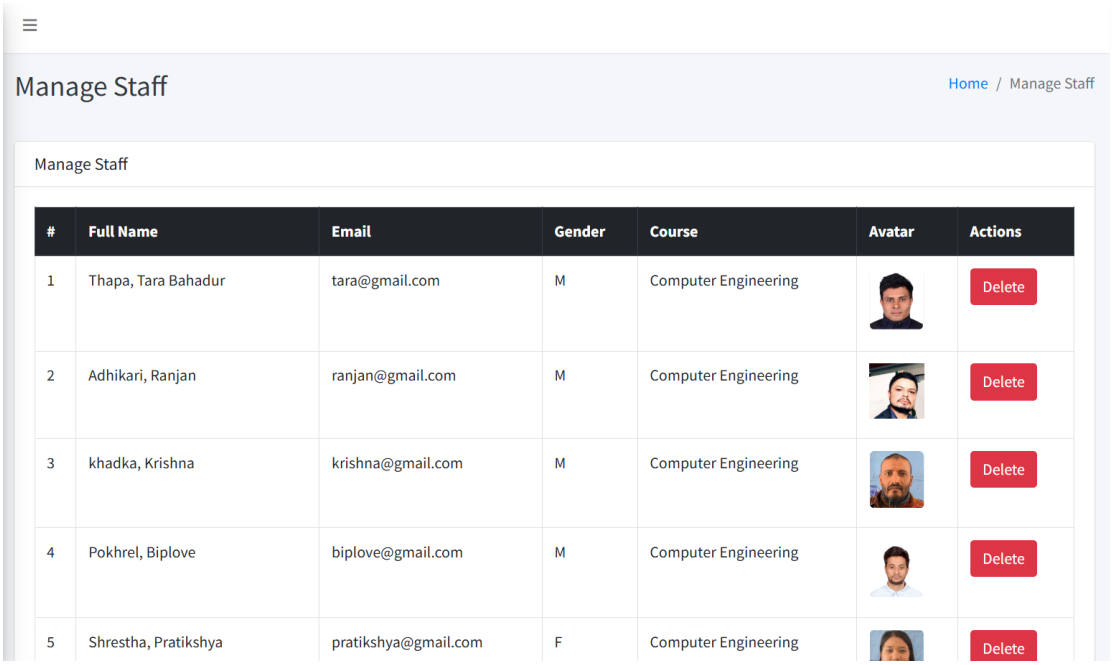
Appendix 7: Add Staff



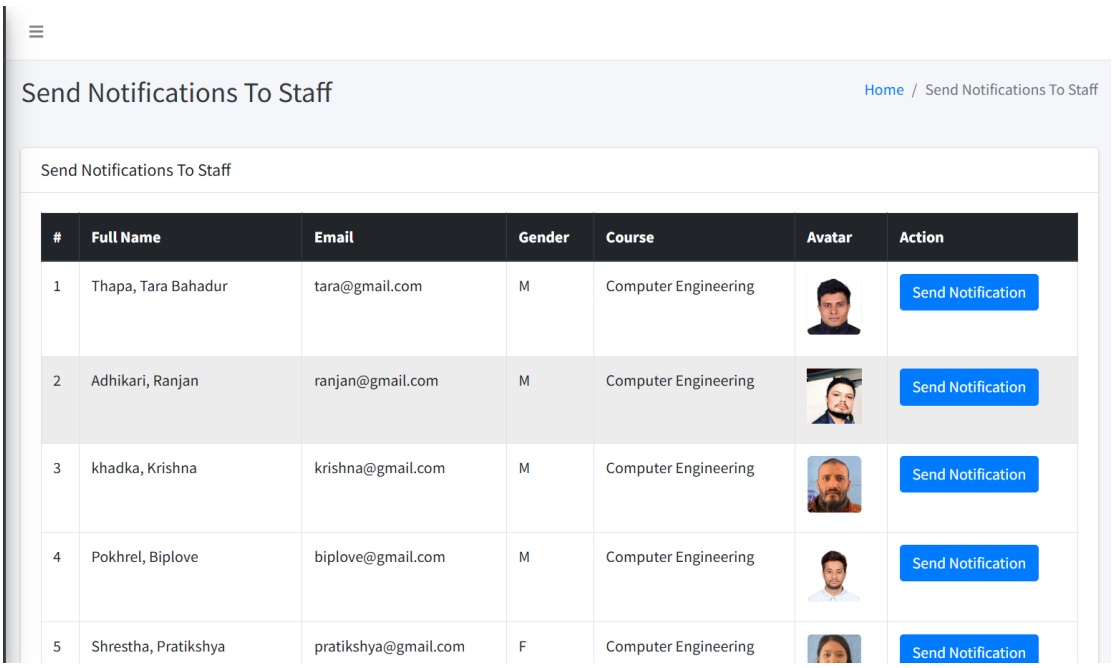
Appendix 8: View Attendance



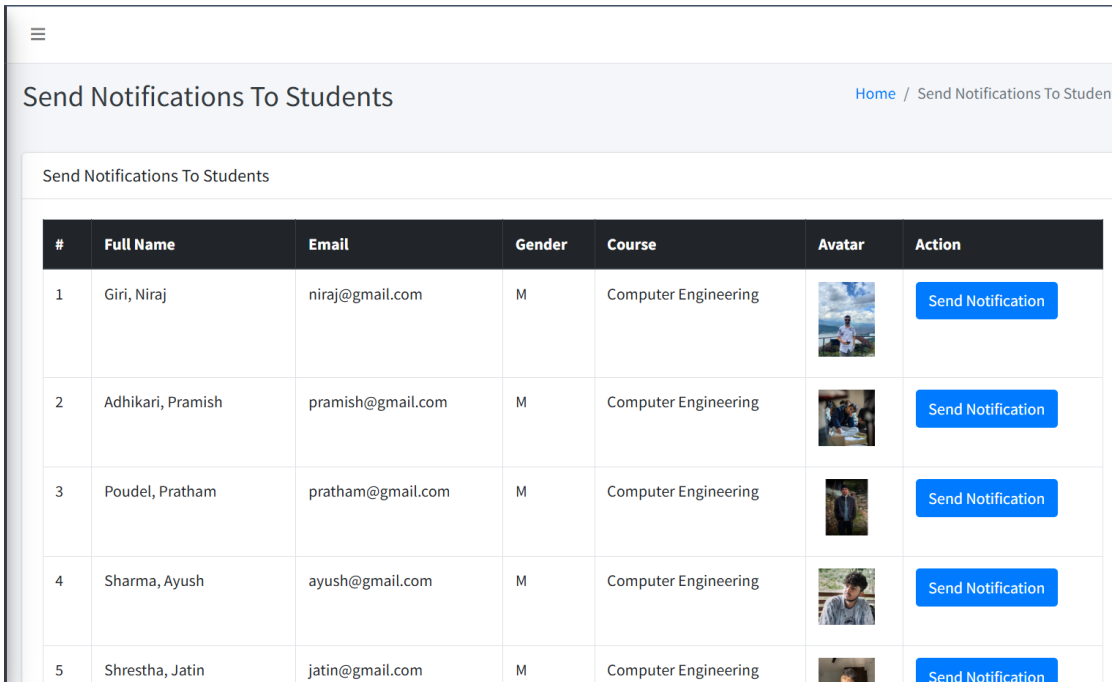
Appendix 9: Manage Student



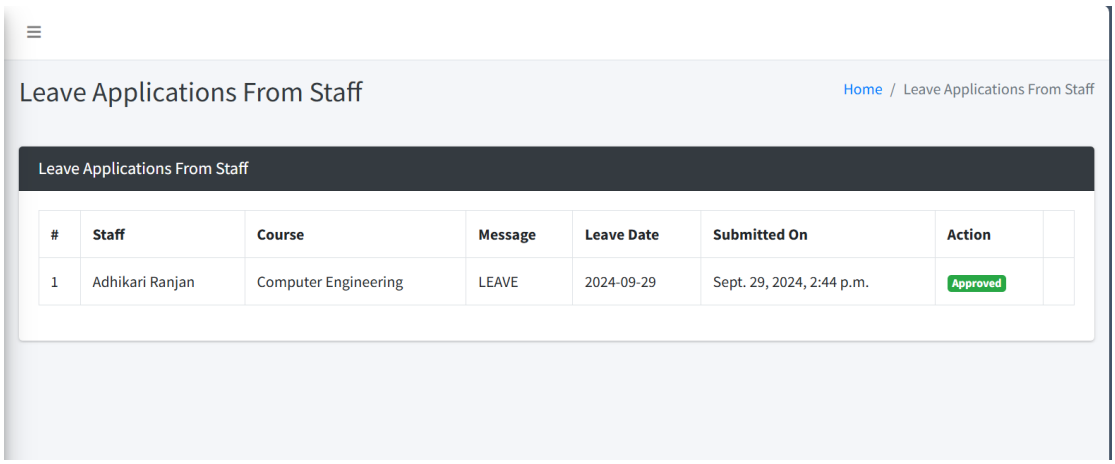
Appendix 10: Manage Staff



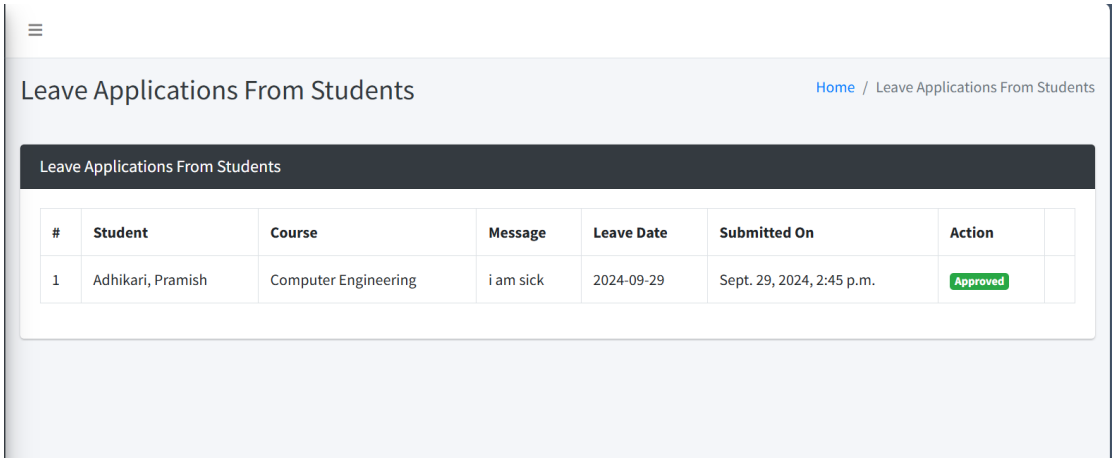
Appendix 11: Staff Notification



Appendix 12: Student Notification



Appendix 13: Staff Leave



Appendix 14: Student Leave