Project Report On

Class Compass

Submitted in partial fulfillment for the award of

Post Graduate Diploma in Advanced Computing

from

C-DAC ACTS (Pune)

Guided by

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CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is to certify that

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have successfully completed their project titled

"Class Compass"

Under the Guidance of Mr. Vinu Josy

Project Guide **HOD ACTS**

ACKNOWLEDGEMENT

This project **"Class Compass"** was a great learning experience for us and we are submitting this work to Advanced Computing Training School (CDAC ACTS).

We all are very glad to mention the name of **Mr. Vinu Josy** for his valuable guidance to work on this project. His guidance and support helped us to overcome various obstacles and intricacies during the course of project work.

Our most heartfelt thank goes to Ms. **Swati Mam** (Course Coordinator, PG- DAC) who gave all the required support and kind coordination to provide all the necessities like required hardware, internet facility and extra Lab hours to complete the project and throughout the course up to the last day here in C-DAC ACTS, Pune.

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1. Introduction

This project aims to develop an advanced online portal that bridges the communication gap between students and college administration, fundamentally transforming the efficiency and accessibility of academic management. In an era where digital solutions are integral to education, it is crucial for institutions to harness technology to streamline operations and enhance the overall student experience. This portal is thoughtfully designed to be a comprehensive platform, offering a seamless interface for the college to effectively communicate essential academic resources, updates, and information to students.

A key feature of this portal is its ability to provide real-time access to academic results. Traditionally, students have had to wait for printed results or navigate cumbersome systems to retrieve their grades. With this portal, students will be able to view their academic performance instantly, with just a few clicks. This feature fosters greater transparency and ensures timely feedback, significantly reducing administrative workload. By providing immediate access to grades, the portal enables students to stay informed about their academic progress and take proactive steps as needed.

The portal will also revolutionize attendance management, a crucial aspect of academic success. By digitizing attendance recording, faculty members will simplify the process, and students will gain instant access to their attendance records. This transparency encourages consistent class participation and allows students to closely monitor their attendance, helping them remain on track with their academic responsibilities. The streamlined approach to attendance management will contribute to improved student engagement and accountability.

Another essential aspect of the portal is its timetable management feature. Managing class schedules can be complex, especially in institutions with a large number of courses, students, and faculty members. The portal will centralize timetable management, allowing students to access their schedules anytime. Real-time updates on class timings, room assignments, and faculty availability will minimize confusion and ensure that all stakeholders are aligned. This feature enhances organization and helps maintain a smooth flow in the academic day.

Lecture notes will also be managed through the portal, addressing common challenges such as missed classes or misplaced notes. Faculty members will upload lecture materials directly to the system, ensuring that all students, regardless of their attendance, have access to the same educational resources. This feature promotes educational equity by providing equal access to essential learning materials, helping every student succeed.

The portal will serve as the central hub for important notices and announcements, such as upcoming events, assignment deadlines, and policy changes. By centralizing communication, the portal will reduce the risk of miscommunication and missed information. Timely updates will contribute to a more organized and efficient college environment, ensuring that students, faculty, and administration stay well-informed.

Student profiles will be another significant feature of the portal. These profiles will offer a comprehensive view of each student's academic journey, including grades, attendance records, and extracurricular activities. A centralized profile view enables students to track their progress, set goals, and stay motivated. This holistic approach empowers students to take control of their education and make informed decisions about their academic paths.

Technologically, the portal will leverage advanced tools to deliver a robust and user-friendly experience. The frontend will be developed using React.js and Bootstrap. React's component-based architecture allows for the creation of reusable UI elements, enhancing development efficiency and consistency. Bootstrap will ensure a modern, responsive design that adapts seamlessly to various devices, catering to the needs of today's mobile-centric users. This design approach guarantees that students can access the portal comfortably on desktops, tablets, or smartphones.

On the backend, Java Spring Boot will provide a secure and scalable foundation for the portal. Known for its performance and reliability, Spring Boot will efficiently handle complex tasks associated with managing academic data. MySQL will be employed as the database management system, ensuring reliable storage and retrieval of information. Its scalability and efficiency make it well-suited for the extensive data needs of the portal.

In summary, this portal represents more than just a tool for managing academic information; it is a comprehensive solution designed to enhance the educational experience. By improving communication, promoting transparency, and offering easy access to crucial resources, the portal empowers students to take charge of their academic journey while streamlining administrative tasks for faculty and staff. This project will contribute to a more organized, connected, and efficient academic environment, benefiting everyone involved.

2.Software/Hardware Requirement

Server Requirements:

- **Processor**: Intel Core i5 or an equivalent AMD processor (e.g., AMD Ryzen 5).
- **RAM**: Minimum of 8GB.
- **Storage**: SSD for enhanced performance and faster data access.
- **Network**: Ethernet or Wi-Fi for reliable connectivity.
- **Operating System**: Preferably a Linux distribution such as Ubuntu or CentOS for optimal server performance.

Client Device Requirements:

- **Processor**: Dual-core processor or better.
- **RAM**: Minimum of 4GB.
- **Storage**: Adequate space for caching and local data.
- **Network**: Ethernet or Wi-Fi for stable internet access.
- **Browser**: Latest versions of popular browsers like Google Chrome, Mozilla Firefox, or Safari for full compatibility.

3. Tools and technologies used

- Spring Boot
- Spring Data JPA
- RESTful Web Services
- Node JS
- Express JS
- Spring Web
- MYSQL
- JWT
- Git
- Spring Security
- React JS
- HTML, Bootstrap and CSS
- Material UI

- Spring Boot

A framework that simplifies the development of production-ready Spring applications by providing a set of defaults and configurations. It reduces boilerplate code, enables stand-alone applications with embedded servers, and accelerates the development process.

- Spring Data JPA

An extension of the Spring Data project, simplifying data access using JPA (Java Persistence API). It reduces boilerplate code for data operations, integrates seamlessly with relational databases, and provides repository abstractions.

- RESTful Web Services

Architectural style for designing networked applications using HTTP requests for CRUD operations. RESTful services are stateless and scalable, providing a standard way to build

APIs that are easy to use and integrate with various clients.

- Node.js

  A JavaScript runtime built on Chrome's V8 engine for server-side scripting. It uses an event-driven, non-blocking I/O model, making it efficient for building scalable network applications and handling numerous simultaneous connections.

- Express.js

  A minimal and flexible Node.js web application framework providing robust features for building web and mobile applications. It simplifies routing, middleware integration, and request handling, enabling rapid development of server-side applications.

- Spring Web

  A module in the Spring Framework that provides support for building web applications. It offers features for handling web requests, managing views, and integrating with other web technologies, enhancing the development of dynamic web applications.

- MySQL

  An open-source relational database management system known for its reliability and performance. It uses SQL (Structured Query Language) for database management and is widely used in web applications for its ease of use and scalability.

- JWT

  JSON Web Token, a compact, URL-safe token format used for securely transmitting information between parties. JWTs are commonly used for authentication and authorization, ensuring secure and stateless communication in web applications.

- Git

  A distributed version control system that tracks changes in source code during software development. It allows multiple developers to collaborate, manage code changes, and maintain project history with features like branching and merging.

- Spring Security

A powerful and customizable authentication and access control framework for Java applications. It provides comprehensive security services for Java EE-based enterprise applications, including authentication, authorization, and protection against common security vulnerabilities.

- React.js

A JavaScript library for building user interfaces, particularly single-page applications. React enables the creation of reusable UI components and efficiently updates the user interface through its virtual DOM, enhancing performance and user experience.

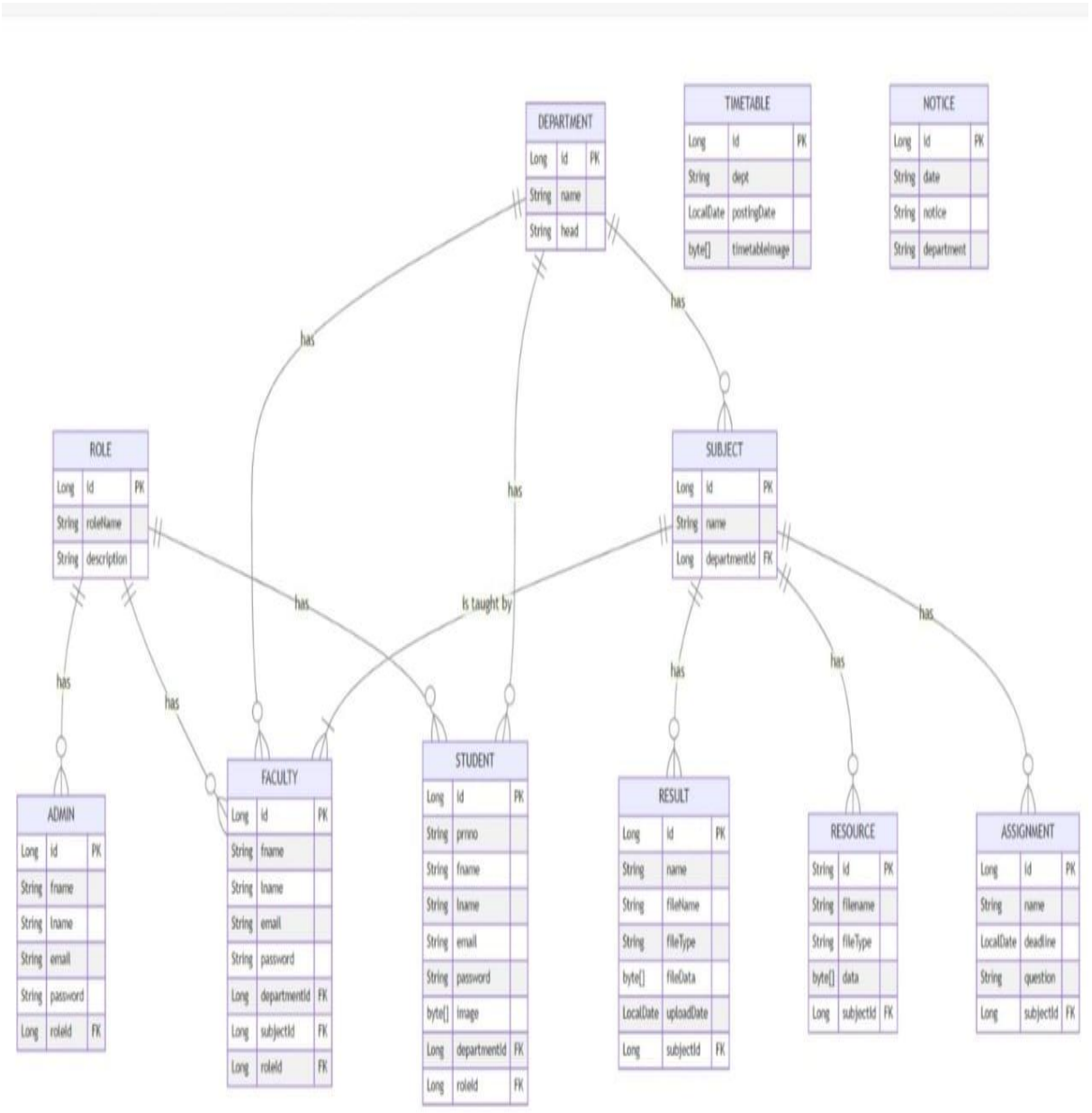
- HTML and CSS

Fundamental technologies for creating and styling web pages. HTML (Hypertext Markup Language) structures content on the web, while CSS (Cascading Style Sheets) controls the layout, appearance, and design, making them essential for front-end web development.

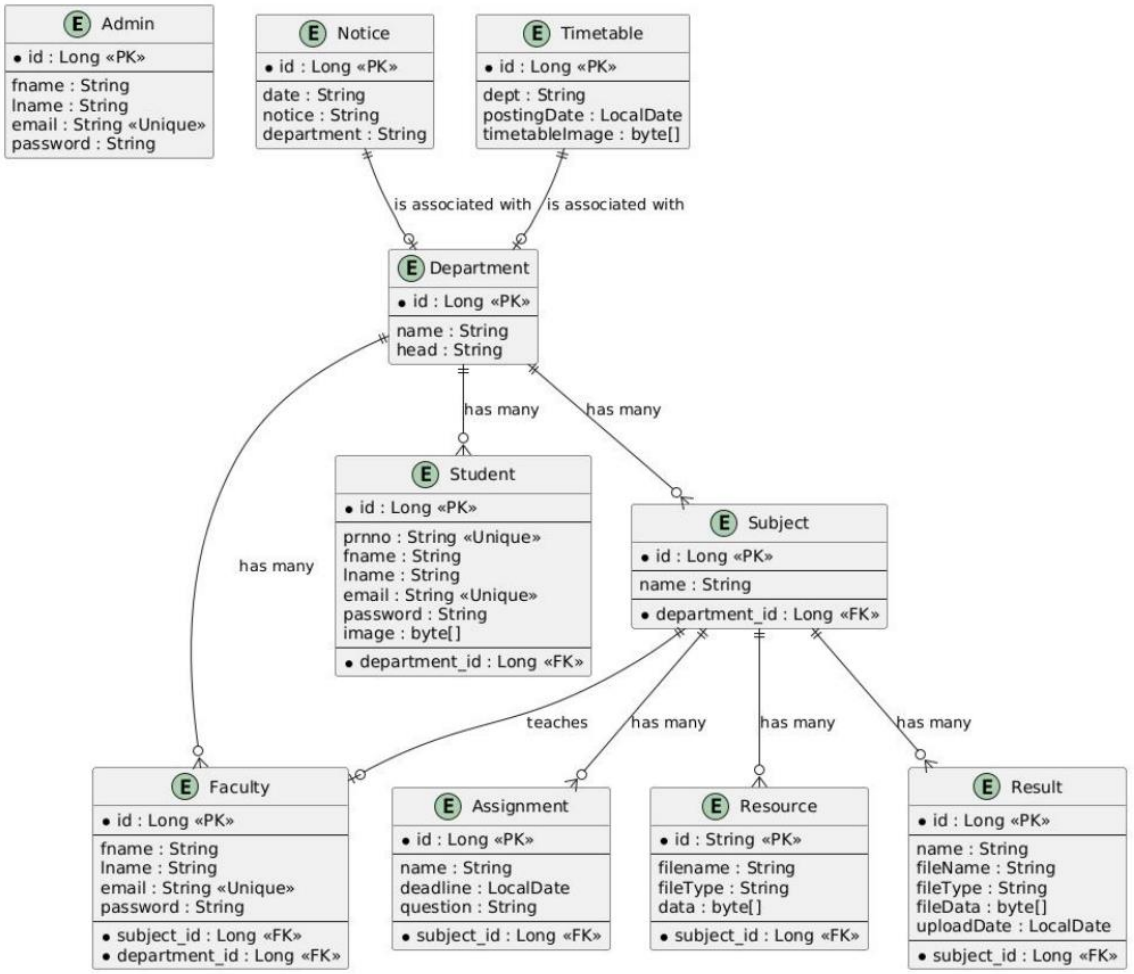
- Material UI

A popular React component library that implements Google's Material Design. It provides a set of customizable and responsive components, enabling developers to build modern, visually appealing user interfaces with consistent design patterns.

4. Project Database Diagram



5.Project E-R(Entity relationship) Diagram



6. Advantages

Benefits of Implementing a Comprehensive Student-College Portal

Streamlined Communication:

The portal bridges the gap between students and college administration, centralizing communication into a single platform. It facilitates the efficient posting of results, attendance, timetables, lecture notes, and important notices, significantly reducing the complexity and time required for information dissemination.

Instant Access to Academic Records:

Students gain immediate access to crucial academic information through the portal. This real-time availability of results and attendance records enhances transparency and enables students to quickly identify and address any academic issues or discrepancies.

Unified Timetable Management:

By consolidating timetable management, the portal ensures that students can effortlessly access their schedules. It offers real-time updates on class timings, locations, and faculty availability, thereby minimizing confusion and helping students stay organized.

Centralized Lecture Notes Repository:

Faculty members can upload and share lecture notes directly through the portal. This feature guarantees that all students, whether present in class or not, have access to the same educational materials, fostering an equitable learning environment.

Efficient Notice and Announcement System:

The portal serves as a central hub for all important notices and announcements. It consolidates information regarding upcoming events, assignment deadlines, and policy changes, reducing the chances of missed communications and ensuring timely updates for

students.

Comprehensive Student Profiles:

The portal will manage detailed student profiles, offering insights into each student's academic history and progress. This includes grades, attendance records, and extracurricular activities, empowering students to track their achievements and set academic goals effectively.

Advanced Technological Integration:

Utilizing advanced technologies like Java for backend development, Bootstrap for responsive design, and React for interactive user interfaces ensures a robust and dynamic portal. This integration not only enhances functionality but also delivers a modern and engaging user experience.

Scalable and High-Performance Architecture:

The combination of Java, Bootstrap, and React supports the portal's scalability and performance. Java provides a powerful backend framework, Bootstrap ensures a responsive design, and React offers efficient component rendering, all contributing to a high-performing and scalable system.

Enhanced Security Measures:

The portal will incorporate strong security measures to protect sensitive student data. By leveraging secure authentication, data encryption, and regular security updates, the portal ensures that personal and academic information remains confidential and protected.

Administrative Efficiency Gains:

The portal streamlines administrative tasks by automating data management and communication processes. This efficiency reduces the administrative burden, allowing staff to focus on more strategic tasks and improving overall operational effectiveness.

Cost-Effective Development Approach:

The use of Java, Bootstrap, and React provides a cost-effective solution for development and maintenance. These technologies are supported by extensive communities, offer reusable

components, and follow best practices, making the development process more economical.

Future-Proof and Adaptable Design:

Designed with modern web standards, the portal is future-proof and adaptable to emerging technologies. This ensures that the portal remains relevant and continues to meet the evolving needs of both students and college administration.

Enhanced User Experience:

With a focus on user-friendly design and interactive features, the portal offers a superior user experience. Students and administrators will benefit from an intuitive interface and seamless navigation, making the portal a valuable tool for managing academic activities.

Improved Educational Outcomes:

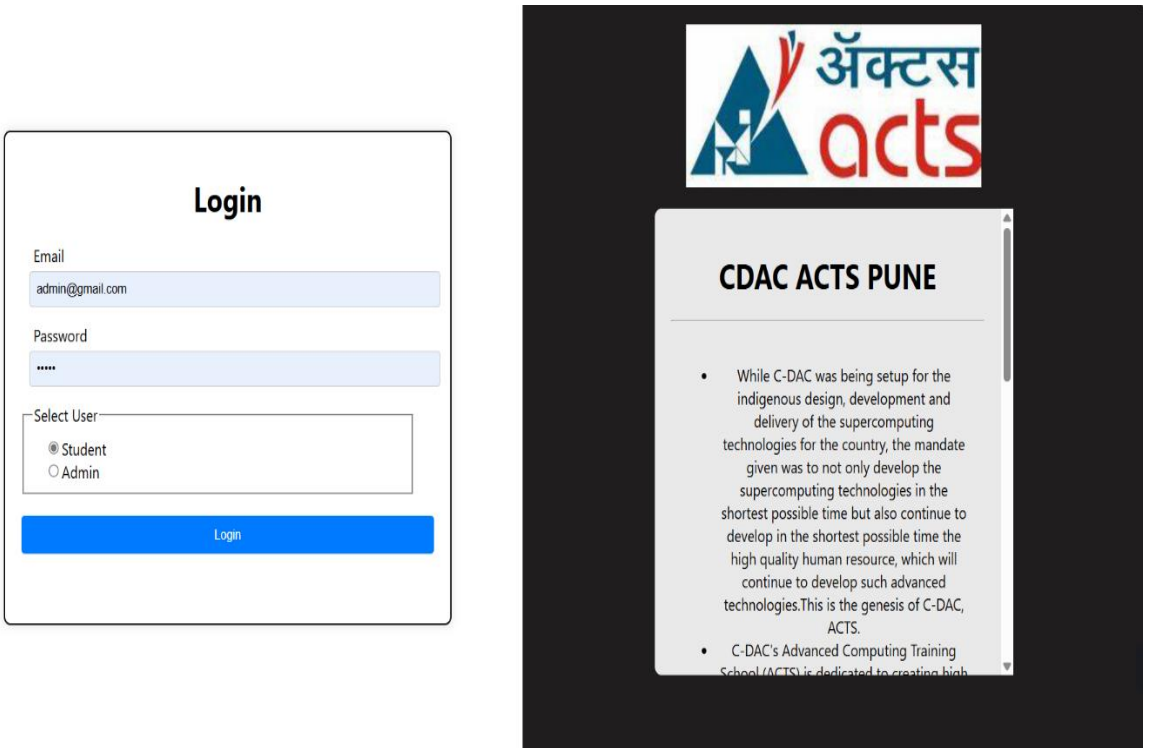
By providing students with easy access to academic resources and performance data, the portal supports better educational outcomes. It helps students stay informed, track their progress, and actively engage with their studies, leading to enhanced learning experiences.

Simplified Information Management:

The portal simplifies the management of academic information by consolidating various functions into a single platform. This integration reduces the need for multiple systems, making it easier for both students and faculty to access and manage information efficient

7. Screenshots

1. Login Page



Fig–User login page

2. Admin Dashboard

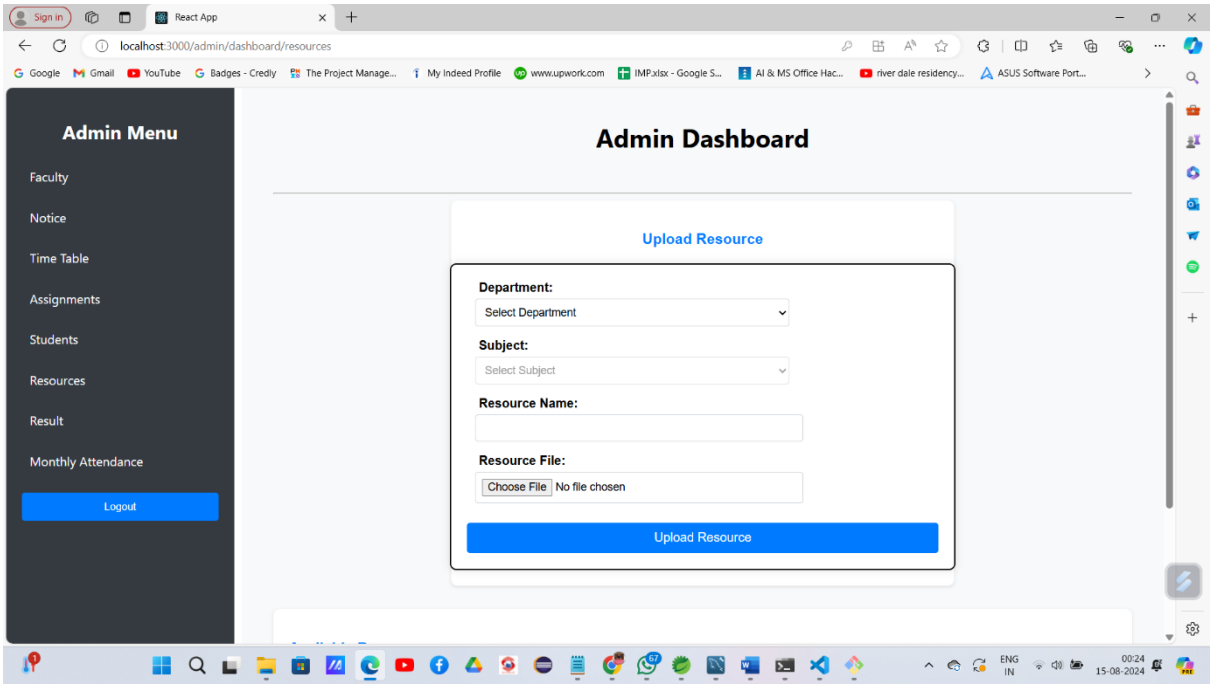
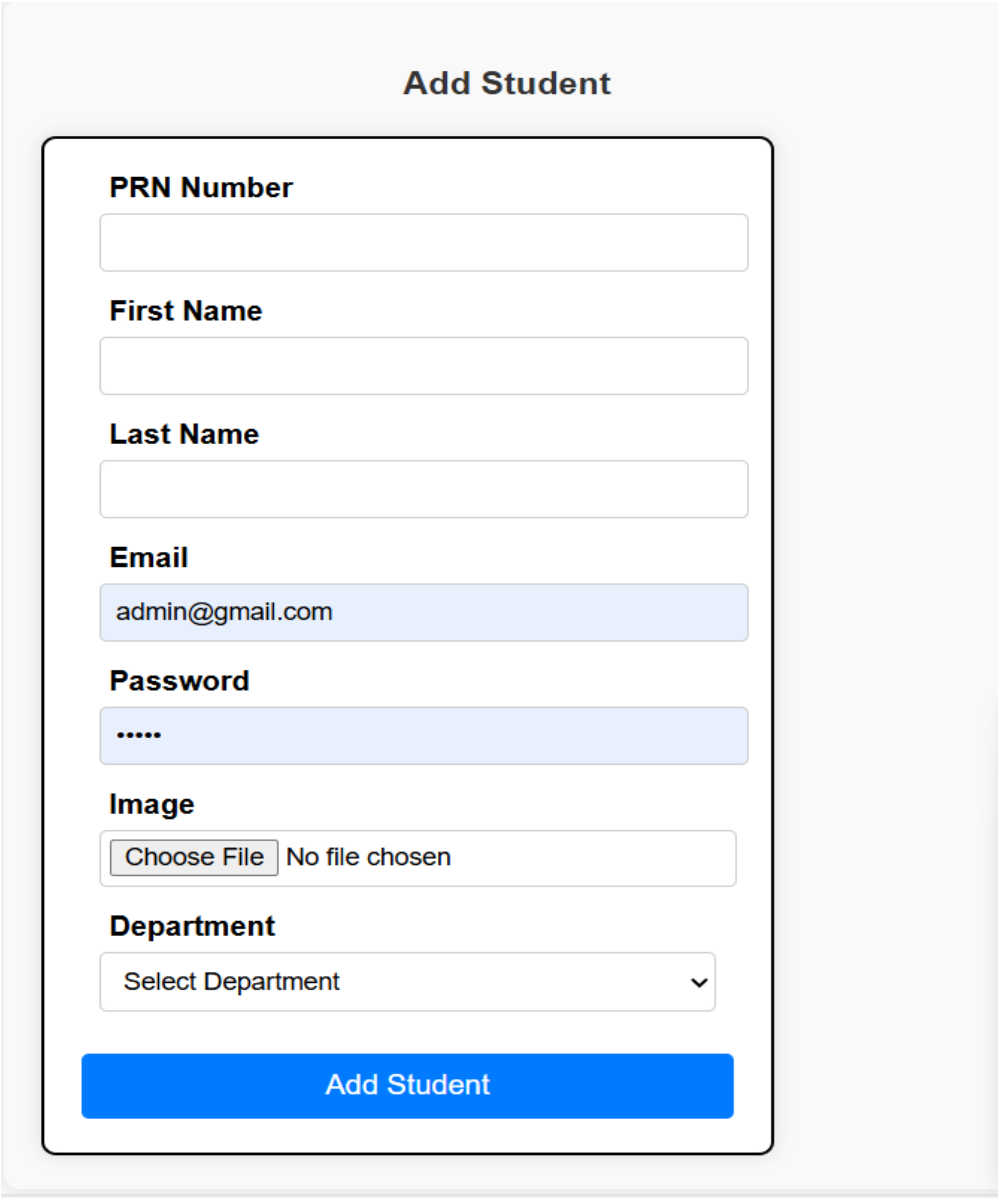


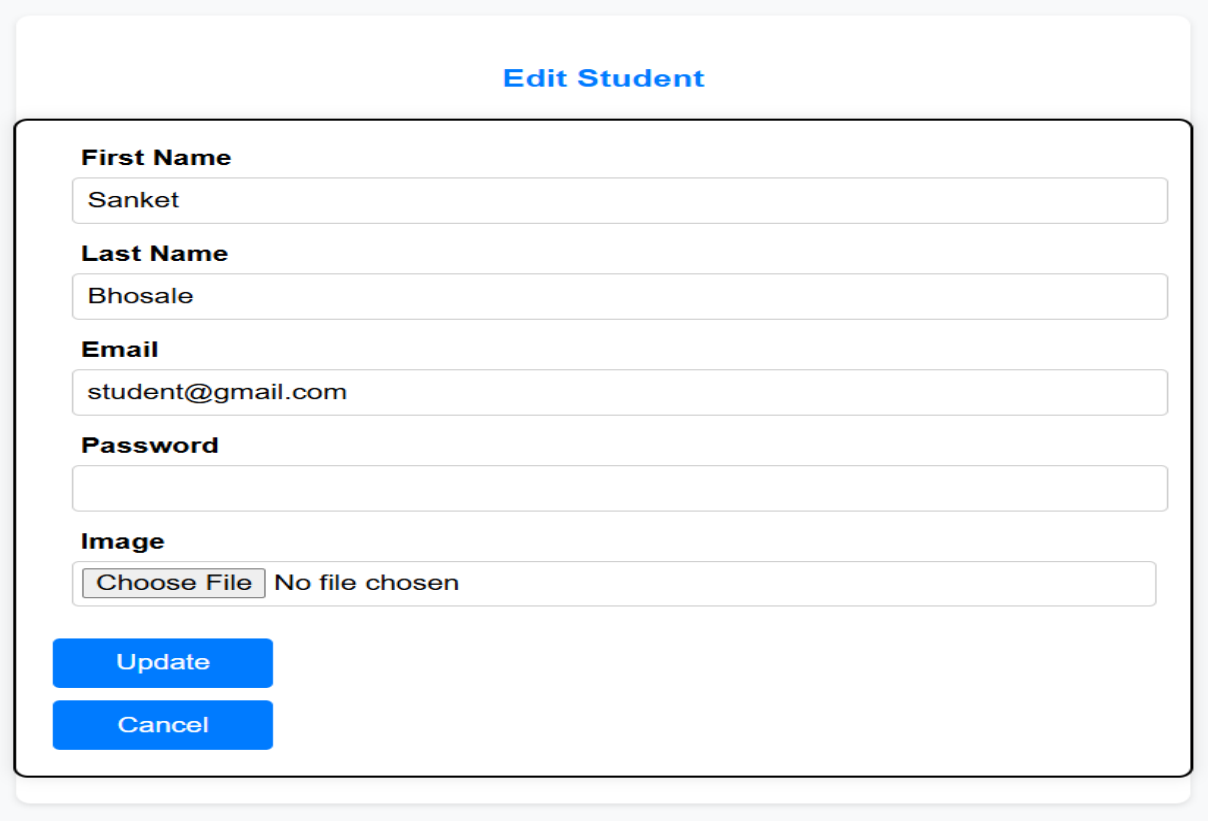
Fig- Dashboard

3. Adding a student



Fig– Add Student

4 . Edit student data



Fig–Edit student

5. Updating a Student

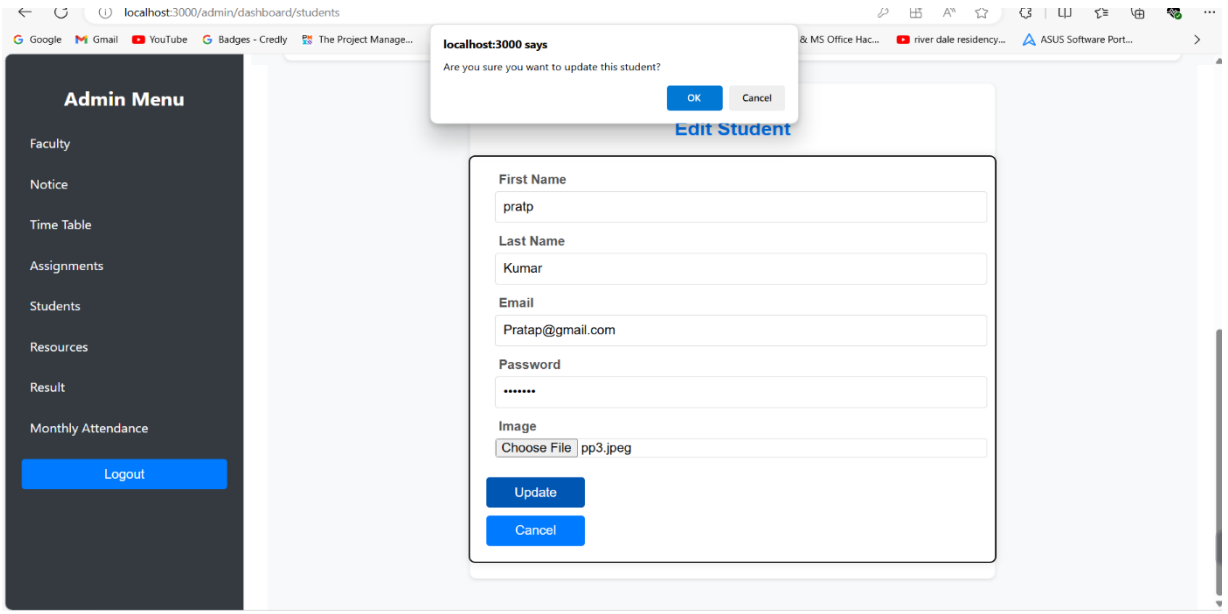


Fig-Update Student

6. Admin page after adding a student

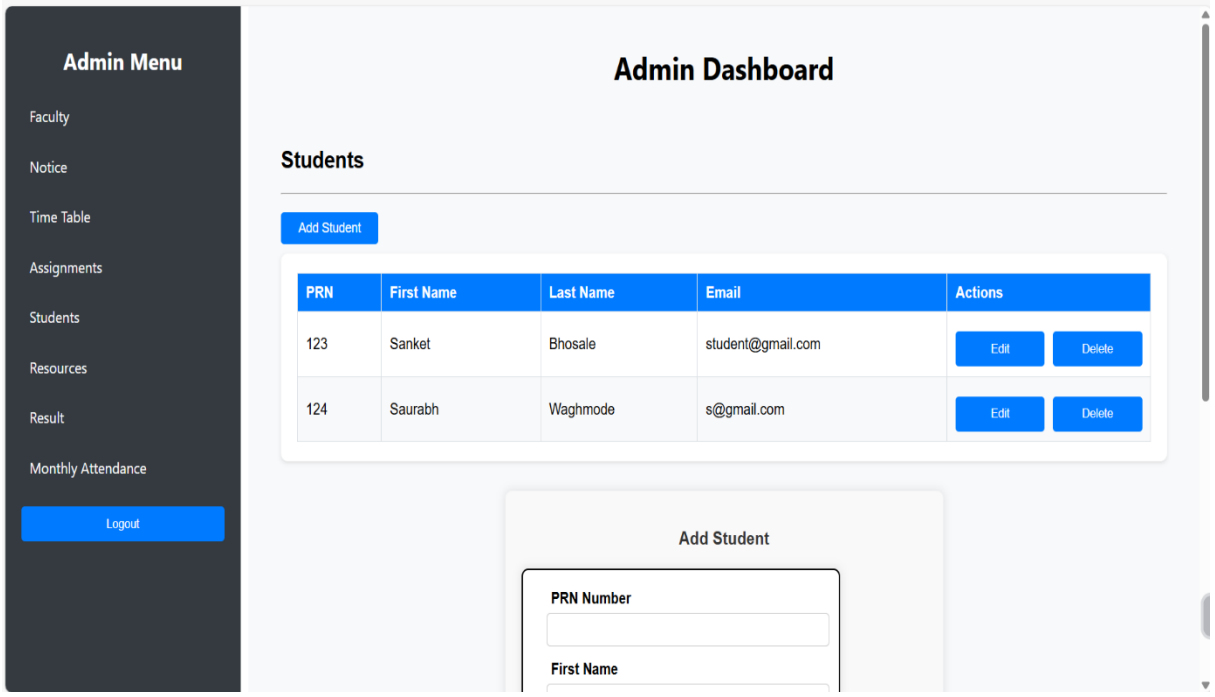


Fig-Admin Page

7.Admin dashboard after adding Faculty

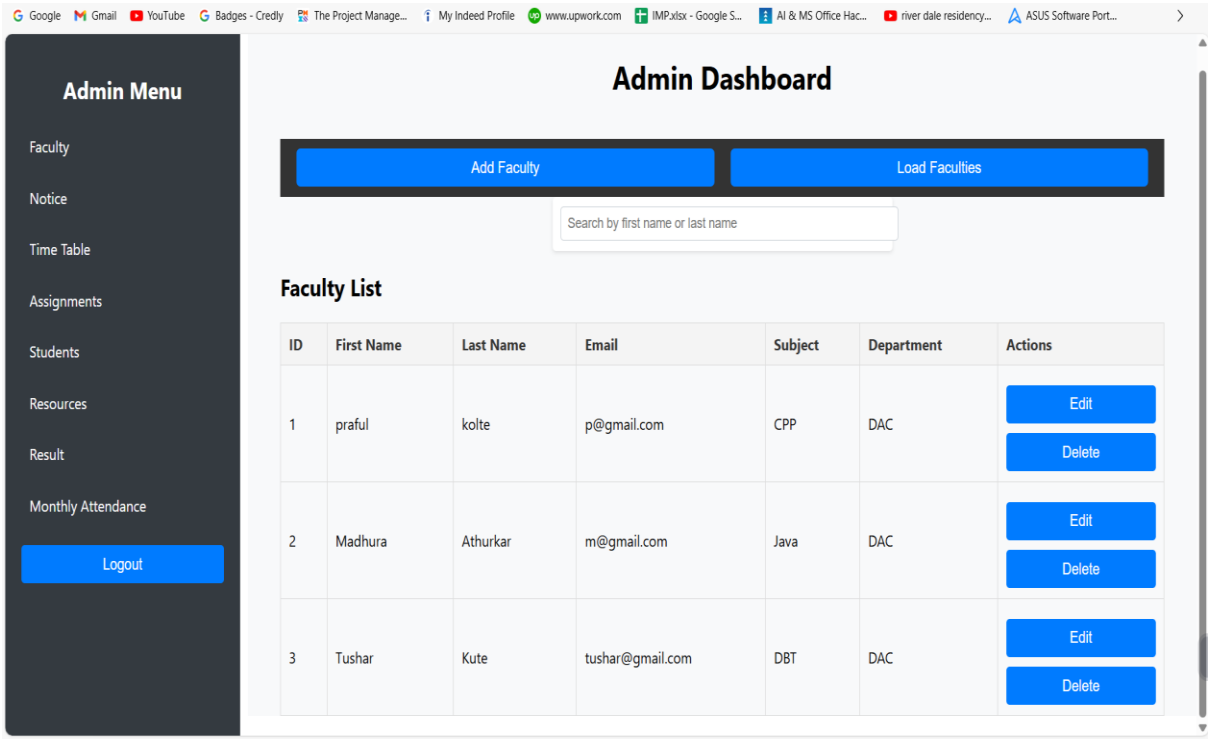


Fig-Faculty

8. Notice

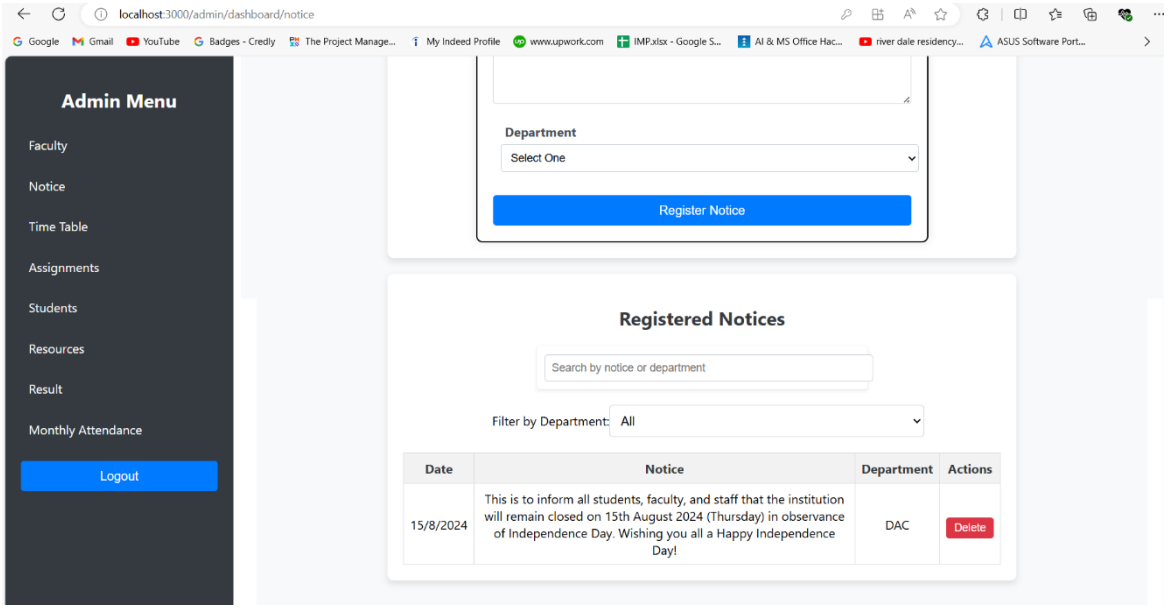


Fig-Notice

9. Timetable Page

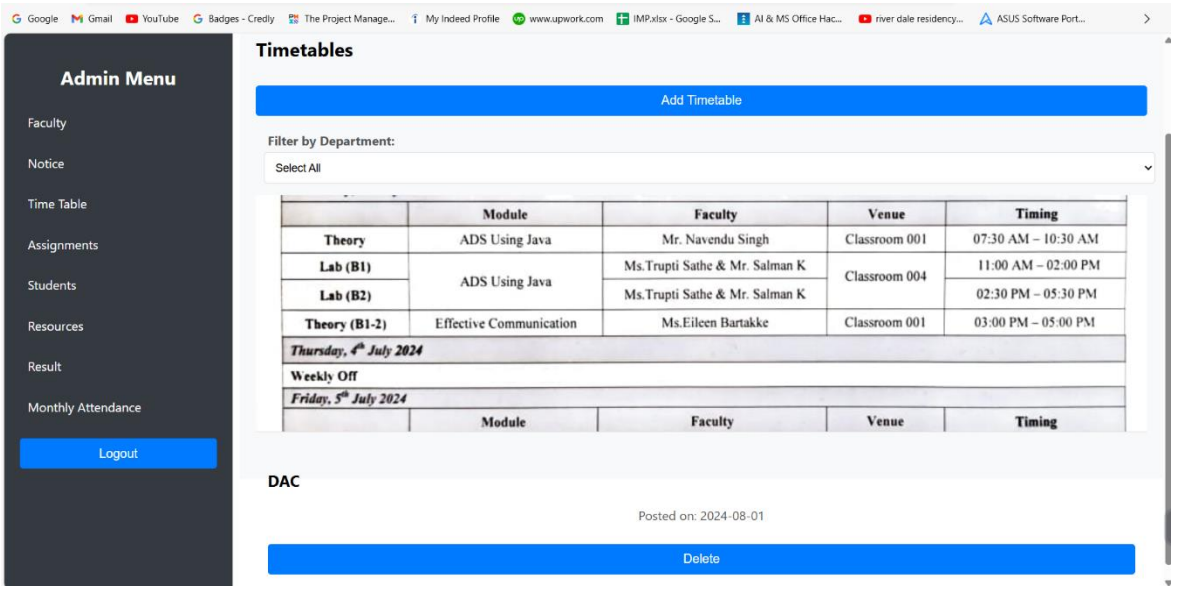


Fig-Timetable Page

10. Assignment Management

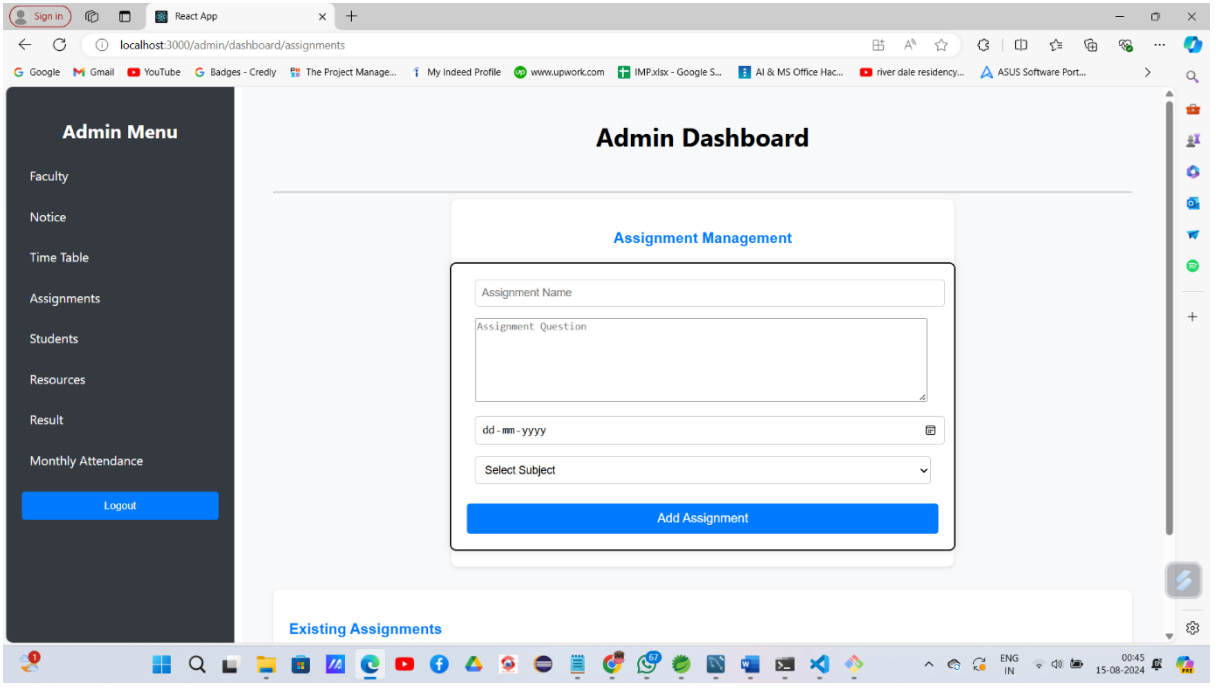


Fig-Assignment page

8. FUTURE SCOPE:

1. Mobile App Development:

Develop iOS and Android apps to provide convenient access to the portal's features on mobile devices.

2. Data Analytics and Reporting:

Integrate advanced analytics tools to deliver insights into academic performance, attendance trends, and usage patterns for data-driven decision-making.

3. Personalized Learning Paths:

Introduce customizable learning paths and resource recommendations based on individual student performance and learning goals.

4. Enhanced Communication Tools:

Add real-time chat and video conferencing to improve interaction and collaboration between students and faculty.

5. Blockchain for Records:

Explore blockchain technology to securely store and verify academic records, ensuring authenticity and easy sharing.

6. Multi-Language Support:

Add support for multiple languages to make the portal more accessible to a diverse user base, accommodating different linguistic backgrounds.

9.Conclusion

The "Class Compass" project represents a significant advancement in academic management by integrating technology into the core operations of educational institutions. This project successfully developed a comprehensive online portal that addresses the communication gap between students and college administration. By providing real-time access to crucial academic resources such as grades, attendance, timetables, and lecture notes, the portal enhances transparency, efficiency, and accessibility for both students and faculty.

The use of modern technologies like React.js, Spring Boot, and MySQL has ensured a robust, scalable, and user-friendly platform that meets the demands of today's digital age. The portal not only simplifies administrative tasks but also empowers students to take control of their academic journey, fostering a more organized and engaged learning environment.

Throughout the development of this project, we gained valuable experience in web development, database management, and software engineering practices. The challenges we faced were opportunities to apply our knowledge and skills, resulting in a well-rounded learning experience. The successful completion of this project underlines our ability to work collaboratively, solve complex problems, and deliver a solution that meets real-world needs.

In conclusion, "Class Compass" is more than just a project; it is a step towards modernizing academic management, providing benefits that will extend beyond the classroom to improve the overall educational experience. We believe that this portal will serve as a model for future developments in educational technology, contributing to a more connected and efficient academic community.

10. References

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