GAMIFIED STUDENT ASSESSMENT SYSTEM WITH REAL-TIME FEEDBACK

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Abstract: This Java Spring Boot-based Student Assignment Management System is designed to automate and simplify the management of academic activities within educational institutions. The system provides distinct roles for students and teachers, enabling teachers to create and manage courses and assignments, while students can enroll in courses and submit their assignments online. The core entities—Student, Teacher, Course, Assignment, and Submission—are mapped to a relational database using JPA, ensuring robust data integrity and efficient access. Teachers can assign coursework, set deadlines, and grade submissions, while students can upload their work and track their progress. The platform also incorporates user authentication for secure access, document management for handling assignment files, and a user-friendly interface to facilitate seamless interaction between all stakeholders. This comprehensive solution enhances academic workflow, reduces manual paperwork, and provides a centralized digital record for all assignment-related activities.

Keywords: Java, Spring Boot, MySQL, HTML, CSS, RESTful APIs, Student assessment, Assignment management system

1.INTRODUCTION

The Student Assignment Management System is a comprehensive web-based application developed using Java Spring Boot, designed to facilitate and automate the management of academic assignments within educational institutions. The system provides a structured environment where teachers can create and manage courses, assign homework, and evaluate student submissions, while students can enroll in courses, access assignments, and submit their work electronically. The platform leverages a robust backend with entities such as Student, Teacher, Course, Assignment, and Submission, all mapped to a relational database using JPA for efficient data handling and integrity. User authentication ensures secure access, and the system supports document uploads for assignment submissions, grading, and feedback. By digitizing the assignment workflow, the system reduces manual paperwork, enhances communication between students and teachers, and provides a centralized repository for academic records, ultimately improving the efficiency and transparency of the educational process.

2. LITERATURE SURVEY

1. Integrated Web-Based Assignment Management and Peer Evaluation
A study by Luxton-Reilly et al. (2007) proposed an integrated web-based system that supports assignment creation, management, and peer evaluation within a single platform. This system enables instructors to create assignments using static or parameterized questions and allows students to submit solutions and anonymously evaluate peers using rubrics. The approach improves learning by encouraging peer feedback and reduces instructor workload through automation

2. Automated Assignment Evaluation and Grading Systems
Jananika et al. (2025) presented a Smart Educational Management System (SEMS) that automates assignment submission, plagiarism detection, keyword-based grading, and feedback generation. The system employs role-based access, secure authentication, and dashboards for insights, enhancing academic workflow and integrity. This research highlights the importance of automation and real-time feedback in improving assignment management efficiency

3. Java Spring Boot-Based College and Student Management Systems
Several projects have leveraged Java Spring Boot for developing educational management applications, focusing on modular design and CRUD operations for entities such as students, teachers, courses, and assignments. For example, the College Management System by SriMani-7 (2023) and the Student Management System by Maghouti (2023) utilize Spring Data JPA for ORM, MySQL for data persistence, and Bootstrap for responsive UI. These systems emphasize secure role-based access, efficient data handling, and user-friendly interfaces, aligning with modern software engineering practices for academic administration

4. Full-Stack Student Management Implementations
Recent tutorials and projects demonstrate full-stack implementations combining React for frontend and Spring Boot for backend APIs to manage student data effectively. These systems provide RESTful endpoints for CRUD operations, secure authentication, and database integration with MySQL, illustrating practical approaches to building scalable and maintainable educational platforms

3. PROPOSED SYSTEM

The proposed Student Assignment System is a workflow-based digital platform designed to streamline the management of assignments for educational institutions. It aims to centralize assignment distribution, submission, tracking, and feedback, providing an efficient and user-friendly interface for both students and teachers.

1. User Registration and Authentication

- Students and teachers register through a secure client application.
- User credentials and profiles are stored in the system database, ensuring secure access and personalized experiences.

2. Assignment Creation and Distribution

- Teachers can create assignments, set deadlines, attach resources, and distribute tasks to selected students or groups.
- The system supports various file formats and resource types for comprehensive assignment instructions.

3. Assignment Submission

- Students submit assignments electronically through the platform.
- The system tracks submission status, timestamps, and allows for resubmissions if permitted by the teacher.

4. Automated Notifications and Reminders

- Students receive automated reminders about upcoming deadlines and pending submissions.
- Teachers are notified of new submissions and late assignments, streamlining follow-up and grading.

5. Feedback and Evaluation

- Teachers can review submissions, provide feedback, and assign grades directly within the system.
- Feedback is delivered to students promptly, supporting continuous improvement and learning.

6. Progress Tracking and Reporting

- The system generates reports on assignment completion, student performance, and submission trends.
- Both students and teachers can access analytics to monitor progress and identify areas needing attention.

Technologies Used:

- **Backend:** Java, Spring Boot, Spring Security, Hibernate/JPA
- **Frontend:** HTML, CSS, JavaScript, Thymeleaf (or can be Angular/React if using REST APIs)
- **Database:** MySQL or PostgreSQL
- **APIs:** RESTful services for modularity and integration
- **Deployment:** Can be hosted on a local server or cloud (e.g., AWS, Heroku)

System Advantages:

- Centralized Access and Management
- Improved Efficiency and Time-Saving.
- Automated Notifications and Deadline Reminders.
- Remote and Flexible Access.
- Enhanced Transparency and Accountability

Advantages of the Proposed System

- **- Centralizes assignment, course, and user management, making academic processes more organized and efficient.**
- **- Automates assignment distribution, submission, and grading, reducing manual workload for teachers and students.**
- **- Enhances accessibility by allowing users to interact with the system remotely at any time.**
- **- Improves data security and integrity through secure authentication and structured database management.**
- **- Promotes transparency and accountability by maintaining detailed digital records of all academic activities.**

4.OUTPUT SCREENS

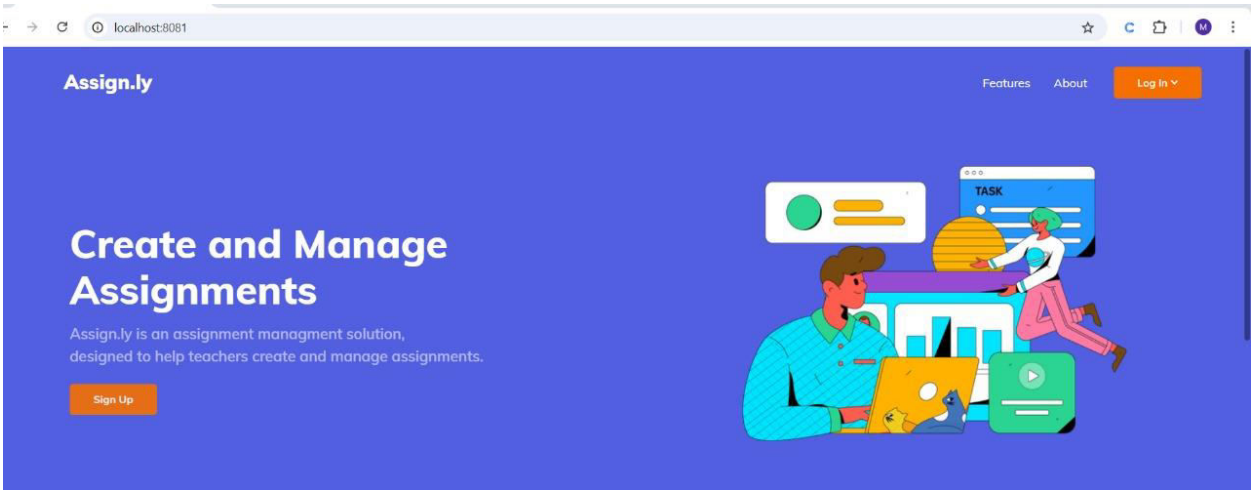

Fig 4.1: landing page

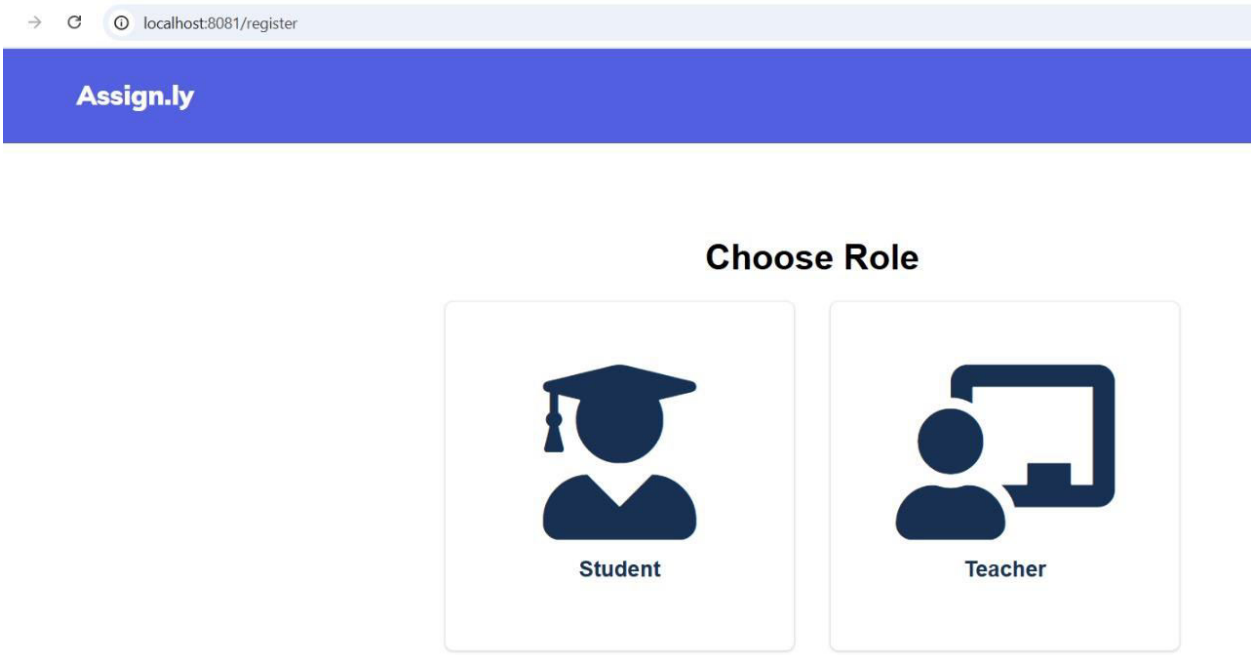

Fig 4.2: login page

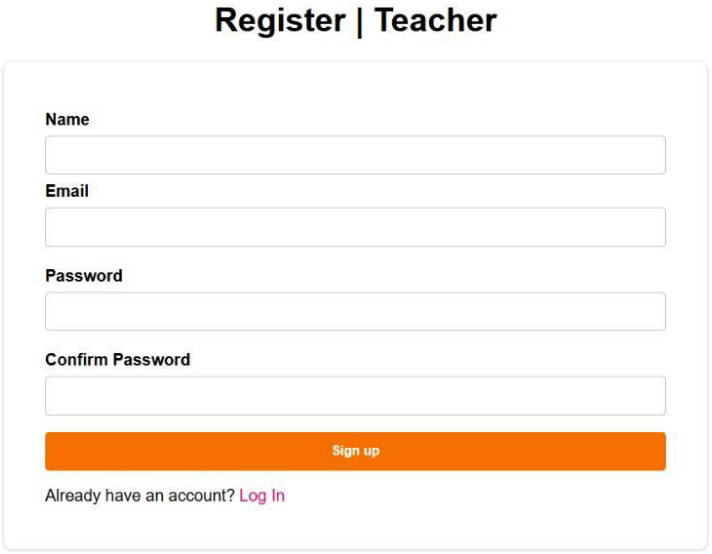

Fig 4.3: Teacher register page

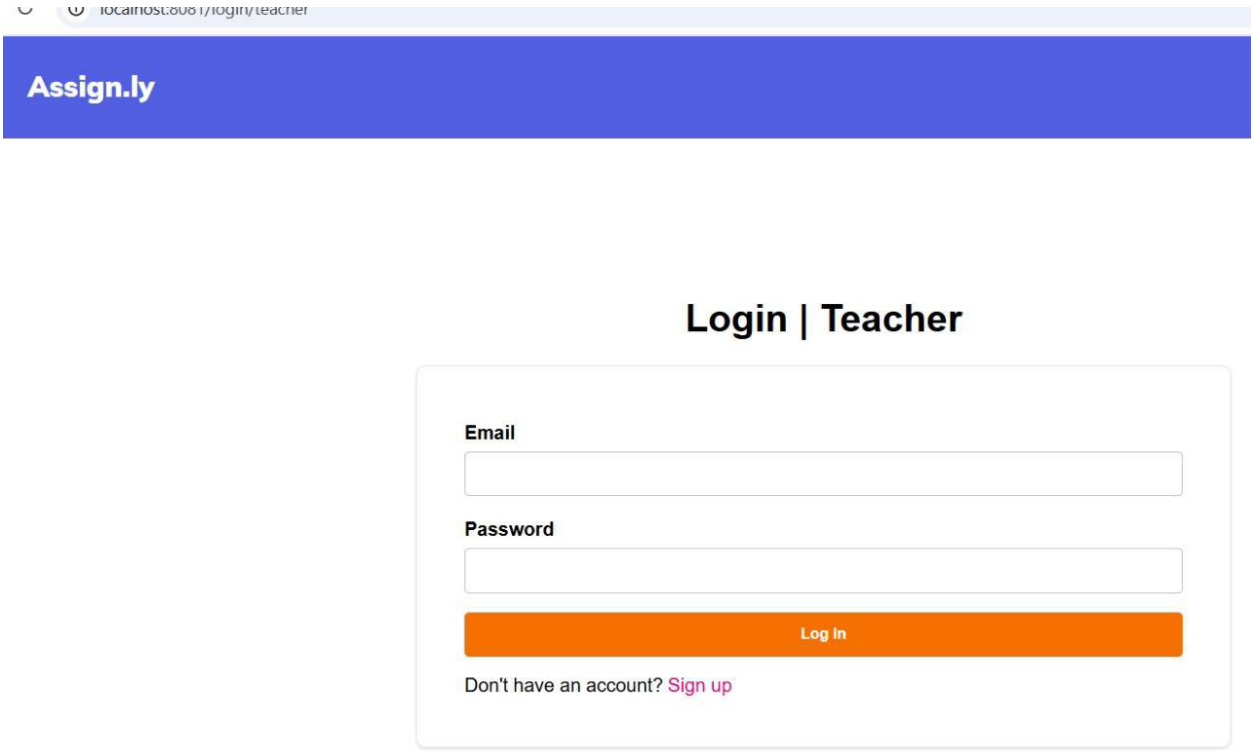

Fig 4.4 : Teacher login page

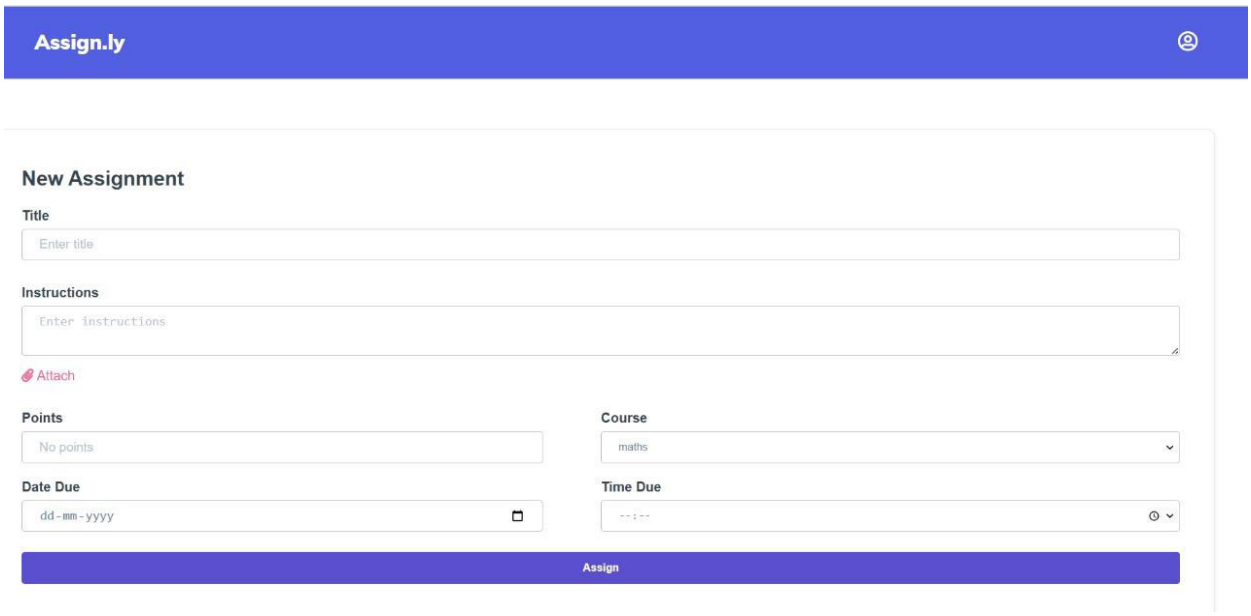

Fig 4.5: Assignment creation

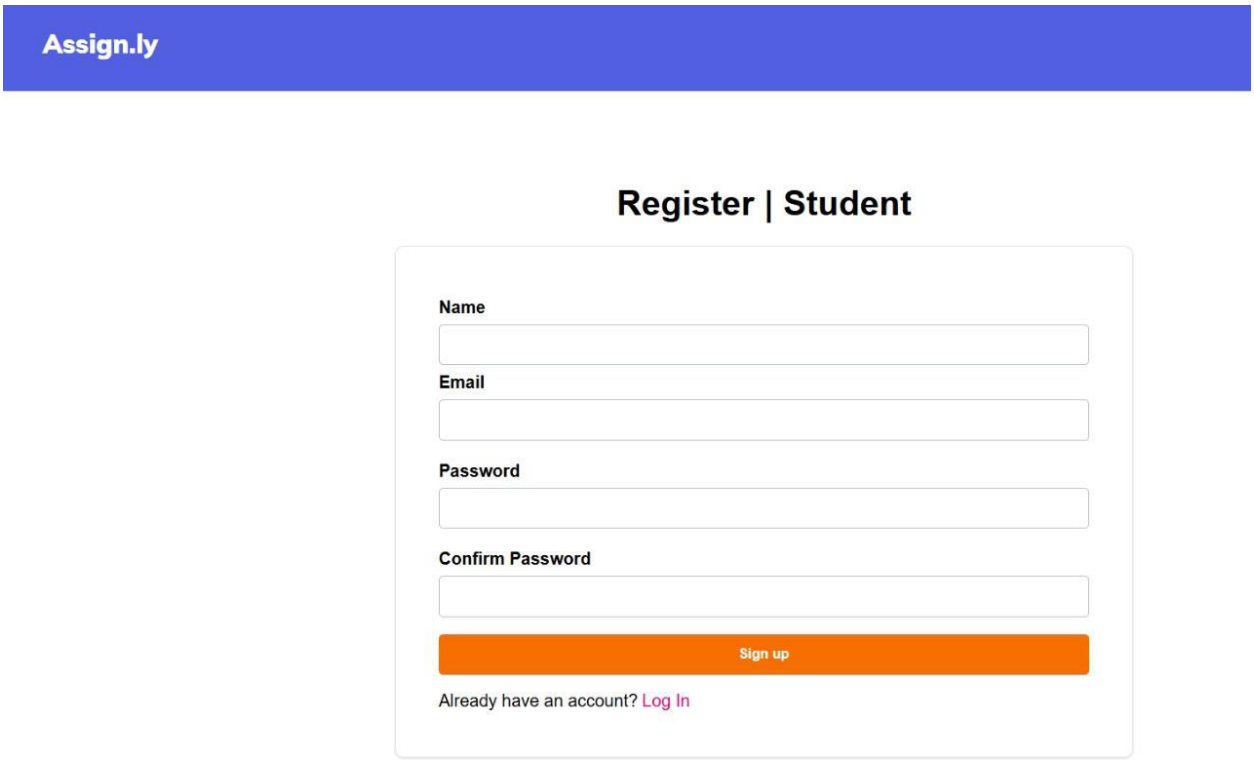

Fig 4.6: Student registration form

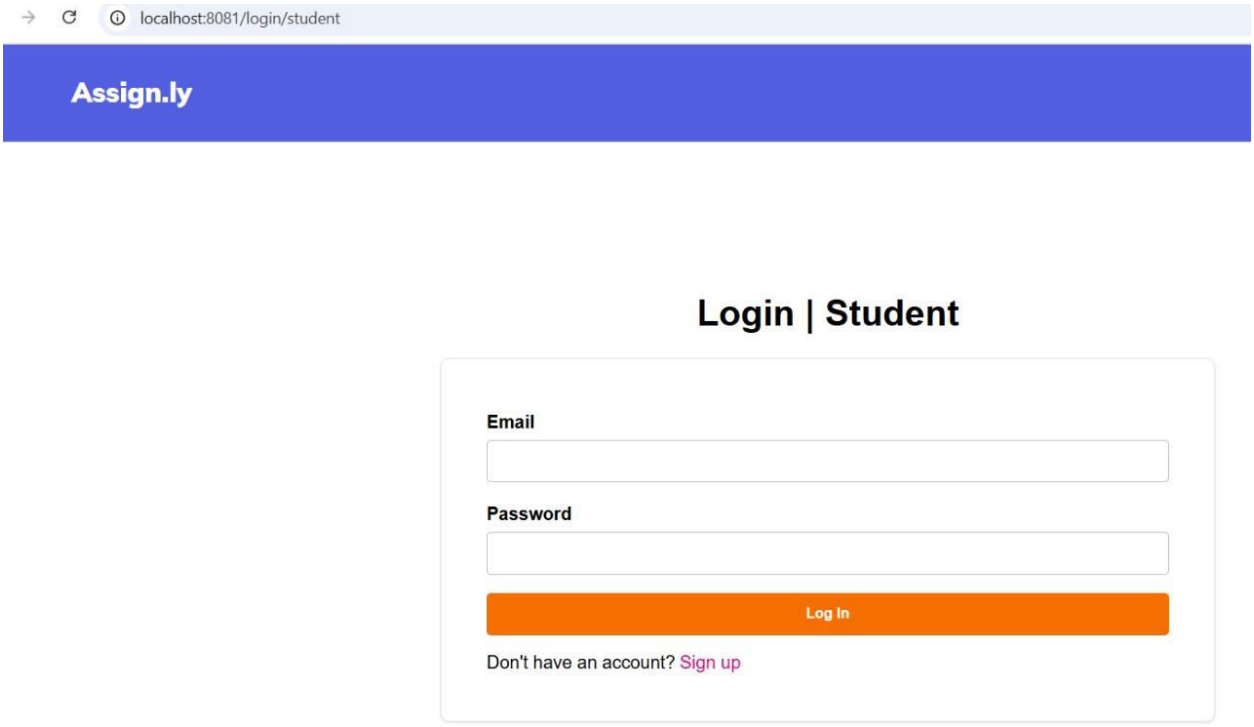

Fig 4.7: Student login form

Fig 4.8: Student dashboard

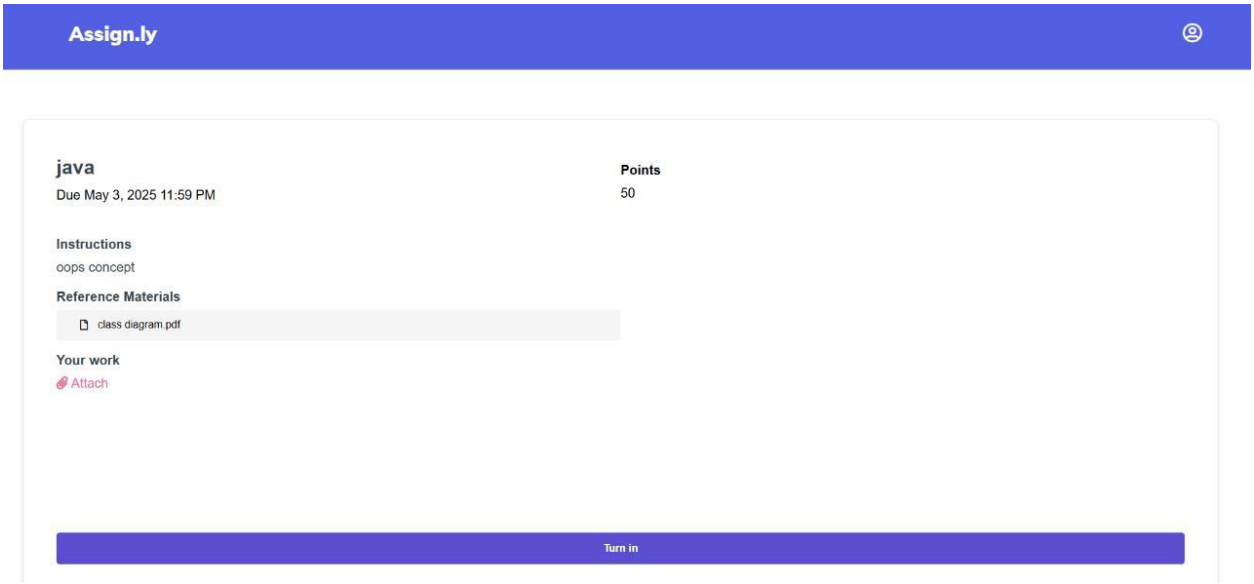

Fig 4.9: Uploading assignments

5. CONCLUSION

The development of the Student Assignment Management System using Java Spring Boot marks a significant advancement in the digital transformation of educational processes. By centralizing assignment management, the system not only streamlines the workflow for teachers and students but also ensures that academic records are securely maintained and easily accessible. The platform's modular architecture allows for scalability and adaptability, making it suitable for institutions of varying sizes and requirements. Through features such as automated grading, secure document handling, and real-time communication, the system reduces administrative burdens and fosters a more collaborative learning environment. Ultimately, this project demonstrates how leveraging modern software technologies can enhance educational efficiency, transparency, and the overall academic experience for all stakeholders involved.

6. FURTHER ENHANCEMENT

The Student Assignment Management System has significant potential for future growth and enhancement. As educational needs evolve, the system can be expanded to include advanced features such as real-time collaboration tools, integration with external learning management systems, and support for multimedia assignment submissions. Incorporating artificial intelligence for automated grading and personalized feedback could further streamline the evaluation process. Additionally, implementing analytics dashboards would provide valuable insights into student performance and engagement. By continuously adapting to technological advancements and user feedback, the system can remain a robust and versatile solution for modern educational environments.

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