Project Title: **Student Inventory Management System (SIMS)**

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Date: **March 05, 2025**

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Introduction

The Student Inventory Management System (SIMS) is designed to help IT students efficiently manage resources such as hardware components, software licenses, and study materials. The system provides real-time inventory tracking, automated reordering alerts, and resource utilization reports, offering a user-friendly interface for streamlined inventory management.

Objectives:

1. Real-Time Inventory Tracking: To allow students to monitor their resources and supplies in real-time.

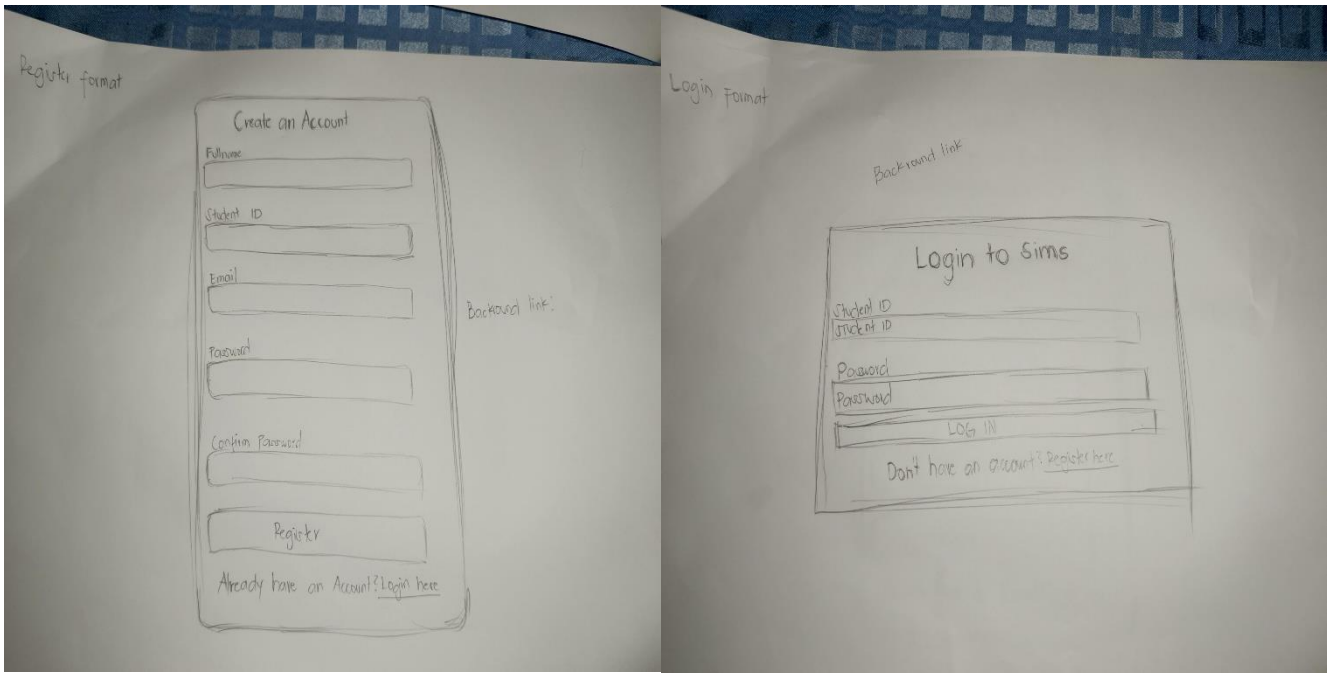
2. Automated Alerts: To notify students when they are running low time on essential items.

3. Resource Utilization Reports: To provide insights into resource usage, helping students plan better for future projects.

4. User-Friendly Interface: To create an intuitive platform for easy navigation and management of inventory.

Prototyping Phase

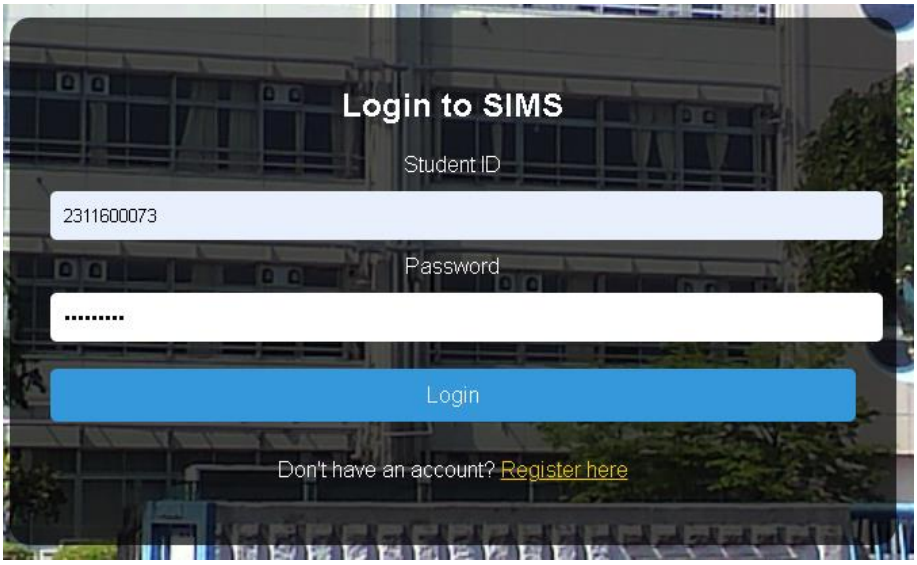
Wireframe and UI Design



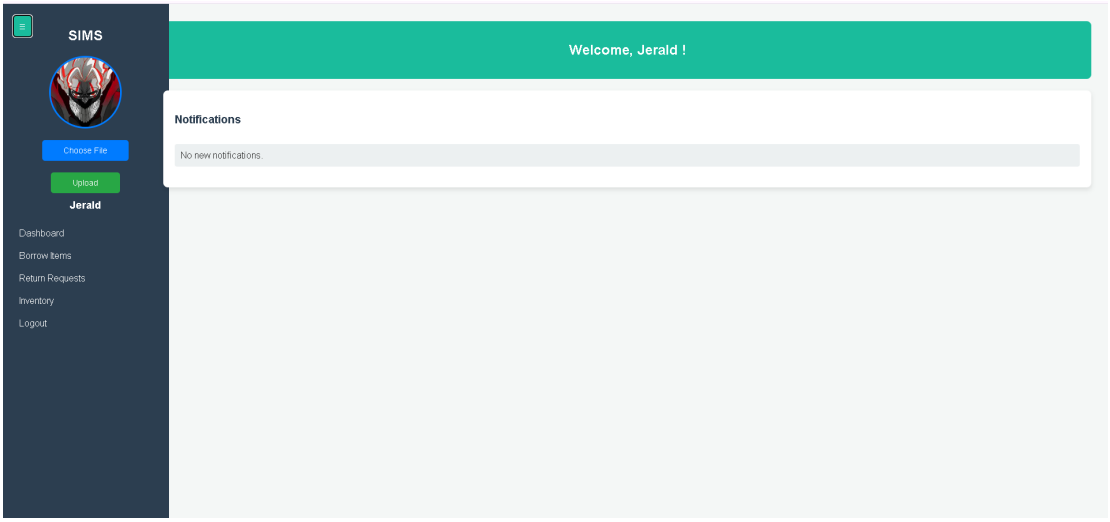
Database Schema Setup

System log in and Dashboard

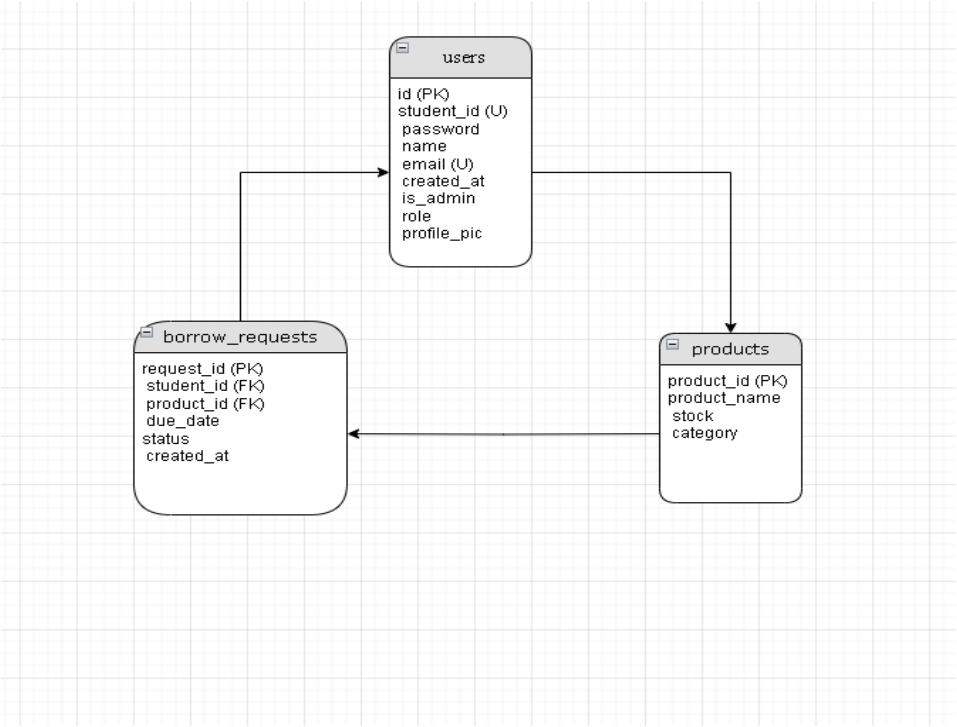
Log in



Dashboard



Database Schema Diagram



Implemented Features

Our Student Inventory Management System is designed to help students keep track of their belongings, making it easier to manage and retrieve their items. The system includes the following key features:

User Registration & Login

- New users can create an account through the registration page.
- Registered users can log in securely using their credentials.

Dashboard

- Once logged in, users are directed to the dashboard where they can access all the main functions.
- It provides an overview of stored items and quick access to features.

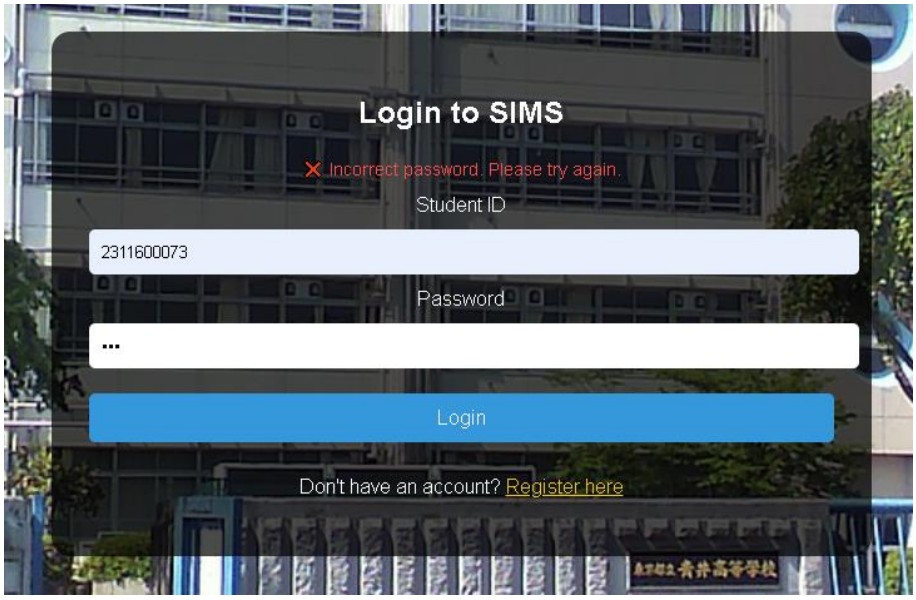
Home Page

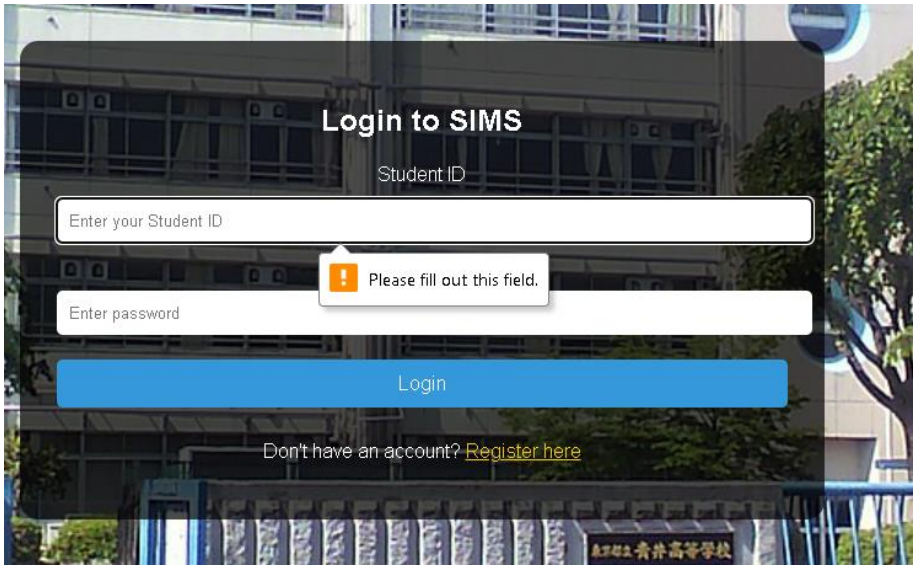
- Displays a welcoming interface with basic information about the system.

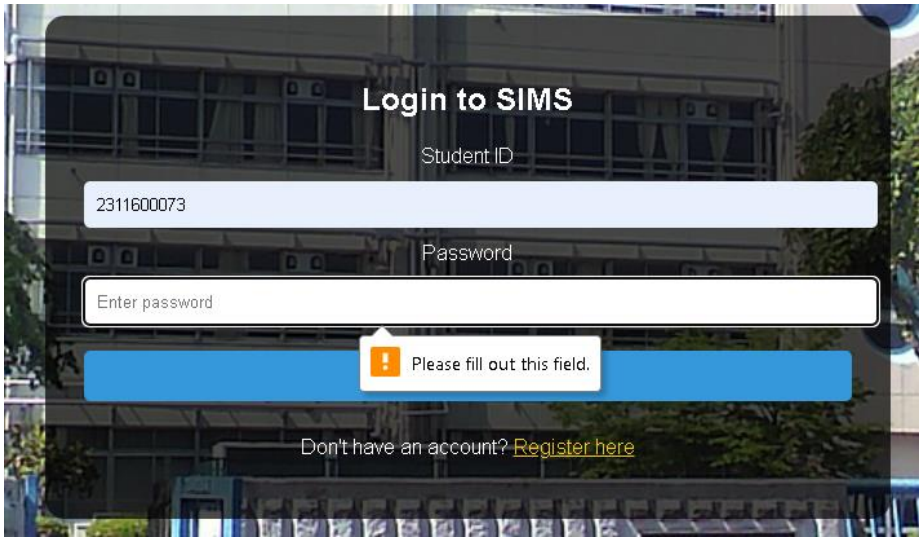
Featured Items Section

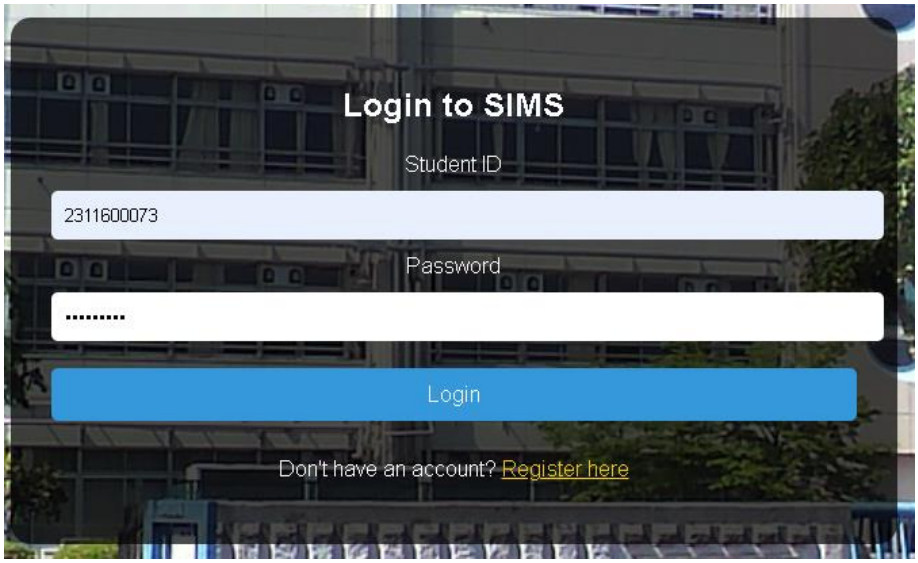
- Highlights important or frequently used items in the inventory.

Testing and Debugging









Challenges encountered and solutions applied

1. Implementing a Secure Login & Registration System

Challenge:

- Preventing SQL injection and unauthorized access.
- Handling password encryption properly.

Solution:

- Used password hashing (bcrypt or Argon2) before storing user credentials.
- Implemented prepared statements to avoid SQL injection.
- Added session-based authentication for secure login.

2. **Designing an Efficient Database Schema for SIMS**

Challenge:

- Structuring the database with relationships that prevent redundancy.
- Handling constraints for user roles (admin vs. student).

Solution:

- Used foreign keys to enforce referential integrity.
- Normalized the database to reduce duplication (e.g., separate categories table).
- Assigned role-based authentication to restrict access levels

3. **Role-Based Access Control (Confusing User Permissions in PHP Dashboard)**

Challenge:

- Hard to differentiate between **admin** and **student** permissions in PHP files.
- Risk of unauthorized access to sensitive pages.

Solution:

Implemented **session-based authentication** with role checking.

Used middleware-like logic to redirect users based on roles.

Before (No restriction, students could access admin page):

There are actually many difficult challenges, but with continuous research and learning, they can eventually be understood although they still remain quite challenging.

Conclusion

The Student Inventory Management System (SIMS) helps students keep track of their items easily. We successfully made a **login system and dashboard**, allowing users to sign in and use the system based on their roles. We also added **security features** like password hashing and session authentication to keep user data safe.

We faced some challenges, like setting up the database properly and managing user roles, but we found solutions through research and testing. Overall, the system works well, but we can still improve it by making the **search feature better, improving the design, and optimizing the database**. This project was a great learning experience in building a working system.

References:

Visual Studio Code (VS Code) – Used as the primary code editor for building and testing the Student Inventory Management System (SIMS).

Live Server Extension (VS Code) – Enabled real-time browser refresh while developing the HTML, CSS, and JavaScript frontend.

W3Schools and MDN Web Docs – Resources for JavaScript form validation, DOM manipulation, and CSS styling best practices.

MySQL Official Documentation – Guidance for designing the database schema and running SQL queries.

XAMPP and phpMyAdmin – Local server setup for testing the MySQL database connection and managing tables.