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PROJECT REPORT

Student Information Management System

Submitted in partial fulfillment of the requirements of **CSE 200: Software Development Project 2** for the B.Sc. Engineering in CSE.

SUPERVISED BY

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Student Information Management System

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DECLARATION OF AUTHORSHIP

We, Aktaruzzaman, Md. Naim Hossain Pranto, Md. Najmul Parves, Siam Hossain, Md. Abdullah Al Mamun and Md. Sohag declare that:

- This project is titled, "**STUDENT INFORMATION MANGEMENT SYSTEM**" and the work presented in it is our own.
- We confirm that: This work was done entirely while in candidature for a B.Sc. Engineering in CSE degree at Bangladesh University of Business and Technology.
- We own every single part of this Software.

CERTIFICATE

This is to certify that the project entitled, **"STUDENT INFORMATION MANGEMENT SYSTEM "** submitted Aktaruzzaman, Md. Naim Hoshain Pranto, Md. Najmul Parves, Siam Hossain, Md. Abdullah Al Mamun and Md. Sohag. ID respectively: 21222203031, 21222203030, 2122220305, 21222203037, 21222203017, 21222203042 in partial fulfillment of embodies and their requirements work under my supervision.

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ACKNOWLEDGEMENT

ABSTRACT

The Student Information Management System (SIMS) is a comprehensive software solution designed to streamline administrative and academic processes within an educational institution. This project aims to provide a user-friendly interface for both administrators and students, facilitating efficient management of student records, course registration, result tracking, and student demands.

The system offers two distinct panels, Admin and Student Panel:

- Admin login and student login with password and username
- Forget password option for both admin and student
- Admin panel with features to add, search, delete, and update student information, add results, and add courses with semester, intake, and year
- Student panel with features to view profile, view completed and registered courses, view demands, and view semester-wise results

The Student Information Management System is a comprehensive software solution designed to streamline and automate various administrative tasks related to student information management in educational institutions. This project report outlines the development and implementation of the Student Information Management System, its key features, and the potential for future improvements and enhancements. The SIMS app is developed using JAVA programming language, JAVA SWING JFRAME framework, and MySQL database. It is designed to be easy to use and scalable to meet the needs of educational institutions of all sizes.

APPROVAL

The project titled "STUDENT INFORMATION MANAGEMENT SYSTEM" was jointly submitted by Aktaruzzaman, Md. Naim Hossain Pranto, Md. Najmul Parves, Siam Hossain, Md. Abdullah Al Mamun, and Md. Sohag, bearing the following respective IDs: 21222203031, 21222203030, 2122220305, 21222203037, 21222203017, and 21222203042. This project was developed within the Department of Computer Science and Engineering (CSE) at Bangladesh University of Business and Technology (BUBT). It was completed under the guidance and supervision of Sondip Poul Singh, who holds the position of Lecturer within the Department of C.S.E.

The project has been formally accepted and deemed satisfactory in fulfillment of the requirements for the CSE 200: Software Development Project 2, a significant component in the pursuit of a Bachelor of Science (B.Sc. Engineering) degree in Computer Science and Engineering. Furthermore, it has been approved in terms of both its style and contents.

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CHAPTER 1
INTRODUCTION

1.1 Introduction:

The Student Management System is a crucial software solution that brings immense benefits to both students and school authorities by replacing the traditional manual system, known for its labor-intensive and resource-draining nature. This innovative system efficiently automates and simplifies a plethora of student-related tasks, resulting in significant time and cost savings. The comprehensive coverage of student activities ensures a more streamlined and cost-effective approach to overall school management.

The system comprises two primary modules:

- Admin Module: The Admin Module is tailored for administrators who wield the authority to register new users and possess the capability to edit and delete user profiles. This module empowers administrators with effective tools for managing student information seamlessly. By centralizing administrative tasks, the module ensures a more organized and efficient workflow.
- Student Module: The Student Module is designed to empower students by allowing them to register as users. Once registered, students gain the ability to create, modify, and delete their profiles, putting them in control of their academic information. Furthermore, administrators can utilize this module to record and update student marks, providing a transparent system where academic performance is readily accessible to all students.

The implementation of our Student Management System signifies a revolutionary shift from manual to automated processes, simplifying and streamlining tasks associated with student information and academic data. By leveraging the power of technology, the system not only enhances the accuracy and reliability of data but also contributes to an overall improvement in the efficiency of school management. This advanced solution is a testament to our commitment to ushering in a new era of educational administration, where technology serves as a catalyst for progress.

1.2 Motivation:

The Student Management System project is motivated by the need to overcome the challenges posed by manual student data management in educational institutions. With rising student enrollments and the increasing complexity of administrative processes, there is a compelling need for automation to streamline operations, improve efficiency, enhance accuracy, and bolster data security.

1.3 Objective:

The primary objective of this software development project is to design and implement a comprehensive Student Information Management System that addresses the specific needs of educational institutions. This system aims to streamline administrative and academic processes, improve data management, and enhance the overall educational experience for both students and school authorities.

The key objectives of this project can be summarized as follows:

- Efficient Data Management: Create a system that efficiently manages student data, reducing the time and resources required for manual data entry and maintenance.
- Improved Accessibility: Develop a user-friendly interface accessible to administrators and students, ensuring easy navigation and interaction with the system.
- Automation of Administrative Tasks: Automate administrative tasks, such as adding, updating, and deleting student records, and recording student results.
- Streamlined Course Management: Provide administrators with the ability to add and manage courses based on semester, intake, and academic year, while ensuring that students have access to courses relevant to their current enrollment.
- Semester Fee Automation: After course registration for the current semester, the system will automatically add the semester fee for those students.
- Result Tracking: Create a platform for tracking and viewing semester-wise results for students, promoting transparency and data accessibility.
- Password Recovery: Implement a "forgot password" feature for both students and administrators to facilitate easy password recovery.
- User-Friendly Profile Management: Develop profile management capabilities for students to view and update their personal information.

1.4 Development Environment:

This below table will show the configuration of the development environment used to create this Software.

Processor	Core i7 7th Generation
Operating System	Windows 10
Memory	8 GB
Storage	1 TB
IDE	Apache NetBeans 19
Compiler	OpenJDK version 20.0.2.1

CHAPTER 2
SYSTEM ANALYSIS

2.1 Existing System

System Analysis is a detailed study of the various operations performed by a system and their relationships within and outside of the system. Here the key question is- what all problems exist in   the present system? What must be done to solve the problem? Analysis begins when a user or manager begins a study of the program using existing system. During analysis, data collected on the various files, decision points and transactions handled by the present system. The commonly used tools in the system are Data Flow Diagram, interviews, etc. Training, experience and common sense are required for collection of relevant information needed to develop the system. The success of the system depends largely on how clearly the problem is defined, thoroughly investigated and properly carried out through the choice of solution. A good analysis model should provide not only the mechanisms of problem understanding but also the frame work of the solution. Thus it should be studied thoroughly by collecting data about the system. Then the proposed system should be analyzed thoroughly in accordance with the needs.

System analysis can be categorized into four parts:

- ✓ System planning and initial investigation
- ✓ Information Gathering
- ✓ Applying analysis tools for structured analysis
- ✓ Feasibility study
- ✓ Cost/ Benefit analysis.

In the current system we need to keep a number of records related to the student and want to enter the details of the student and the marks manually. In this system only the teacher or the school authority views the mark of the student and they want to enter the details of the student. This is time consuming and has much cost.

2.2 Proposed System

In our proposed system we have the provision for adding the details of the students by themselves. So the overhead of the school authorities and the teachers is become less. Another advantage of the system is that it is very easy to edit the details of the student and delete a student when it found unnecessary. The marks of the student are added in the database and so students can also view the marks whenever they want.

Our proposed system has several advantages:

- ✓ User friendly interface
- ✓ Fast access to database
- ✓ Less error
- ✓ More Storage Capacity
- ✓ Search facility
- ✓ Look and Feel Environment
- ✓ Quick transaction

All the manual difficulties in managing the student details in a school or college have been rectified by implementing computerization.

2.3 Feasibility Analysis

Whatever we think need not be feasible .It is wise to think about the feasibility of any problem we undertake. Feasibility is the study of impact, which happens in the organization by the development of a system. The impact can be either positive or negative. When the positives nominate the negatives, then the system is considered feasible. Here the feasibility study can be performed in two ways such as technical feasibility and Economical Feasibility.

1. Technical Feasibility: The project is technically feasible as all required resources for development and maintenance are readily available within the organization.
2. Economic Feasibility: The development is highly economically feasible since it leverages existing resources, requiring minimal additional expenditure for effective supervision.

CHAPTER 3
SYSTEM REQUIREMENTS
SPECIFICATION

3.1 Hardware Requirements:

Processor	Pentium III 630MHz
Ram	4 GB
Storage	512 GB
Monitor	15'' Color Monitor
Keyboard	104 keys

3.1 Software Requirements:

Operating System	Windows 7, 8, 10 or Ubuntu
Compiler	OpenJDK version 20.0.2.1
Software	Xampp Control Panel

3.3 Functional Requirements:

The functional requirements of the system are to the implement the solution for finding the student details and student result in the large existing management system.

1. **Processing:** The information regarding train details are retrieved from the database.
2. **Storage Requirements:** The information will be retrieved from the database.
3. **Control Requirements:** Alerts when any errors are there and when any of the field is not selected.

CHAPTER 4
SYSTEM DESIGN

4.1 Introduction:

System design is the process of translating requirements into a software representation. It starts with a holistic view and evolves into a design close to source code. Quality in software development is nurtured during design, providing a basis for quality assessment and translating customer requirements into the final software product. System design is the cornerstone of all subsequent software engineering and maintenance activities.

We look the design process from three distinct perspectives:
- Conceptual Design
- Logical Design
- Physical Design

Designing an application follows a sequence: conceptual view, logical view, and physical view. While these phases are typically sequential, they can overlap during the design process.

4.2 Conceptual Design:

Conceptual design is the first phase of the software development process. It involves defining the high-level requirements and functionality of the system, as well as the overall user experience. The goal of conceptual design is to create a shared understanding of the system among all stakeholders, including users, developers, and business analysts. One of the key activities in conceptual design is to develop usage scenarios. These scenarios are a description of how users will interact with the system to perform specific tasks. Usage scenarios help to ensure that the system is designed to meet the needs of the users and that it is easy to use. Conceptual design is also an important opportunity to identify and address potential risks and challenges. By carefully considering the system's requirements and functionality, designers can identify potential problems and develop solutions early in the development process.

4.3 Logical Design:

In logical design, business objects and services are derived from usage scenarios. It formalizes the solution and defines system boundaries, business objects, and interfaces with external entities. Logical design includes steps such as input/output specifications, file specifications, and processing specifications. It aims to be technologically independent, focusing on system behavior before considering implementation constraints.

Logical System Design consists of the following steps:

- Input/output Specifications
- File Specifications
- Processing Specifications

Logical design should aim for technological independence to separate system behavior from implementation.

4.4 Physical Design:

Physical design translates the logical design into an implementable solution that adheres to performance, administration, and development requirements. It's tied to specific technologies (hardware and software) on which the application will run. Physical design specifies how to build applications from software components with defined interfaces, ensuring the system's desired behavior. Interaction standards for component communication are a key consideration in physical design.

Physical design consists of the following steps:

1. Design the physical media

- Specify input/output media.
- Design the database and specify backup procedures.
- Design physical information flow through the system.

2. Plan the system implementation

- Prepare a conversion schedule target date.
- Determine training procedure, courses and timetable.

3. Device a test and implementation plan.

4. Specify any new Hardware/Software usage. Update benefits, costs, and conversion date and system constraints.

CHAPTER 5
DESIGN

5.1 Model & Diagram
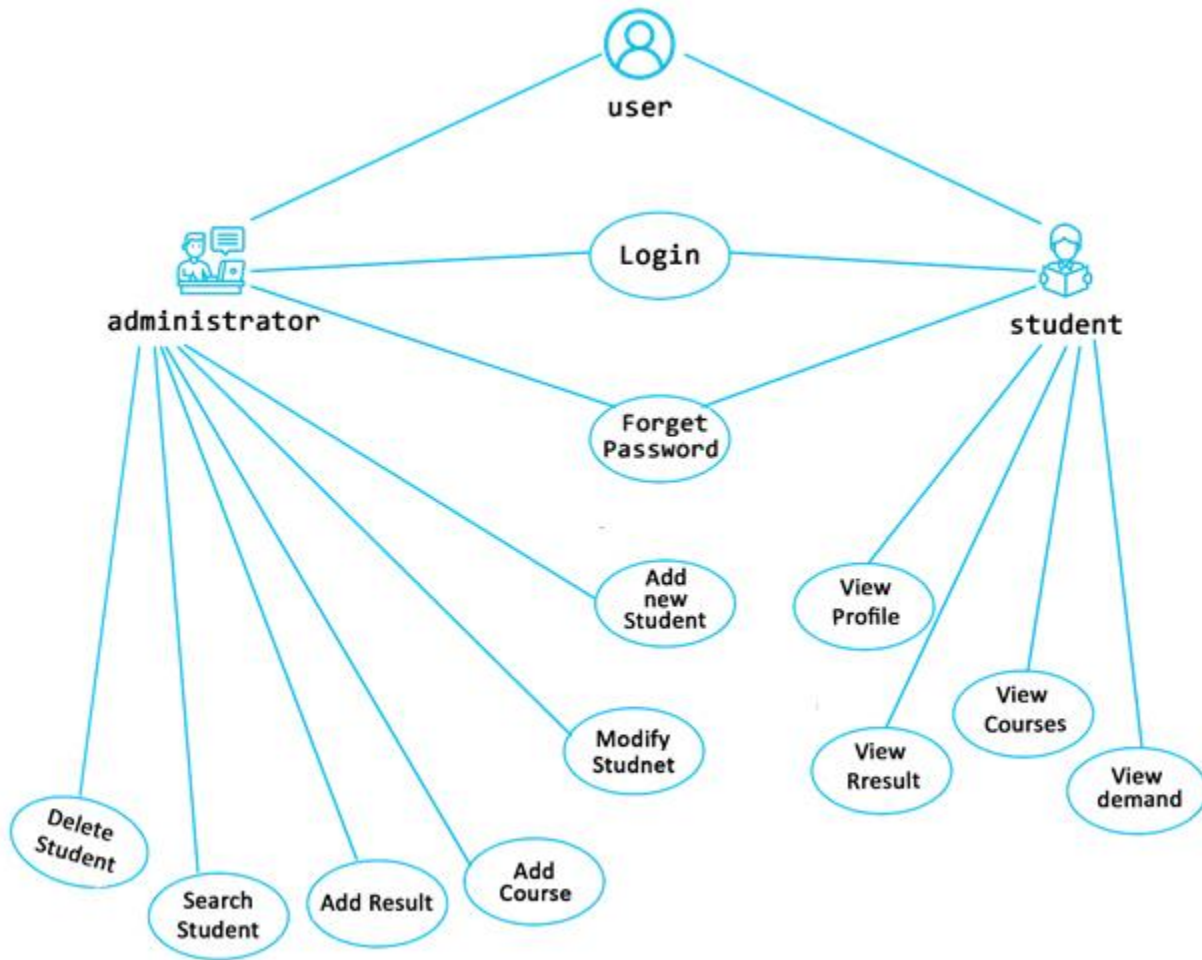
The model diagram of the student information management system shows a simplified view of how students interact with the system. The diagram shows the following main features:

- Users: Students and administrators can access the system.
- Login: Students and administrators must log in to use the system.
- Forget password: Students can reset their password if they forget it.
- Add new student: Administrators can add new students to the system.

- View profile: Students can view their personal profile information.
- Add course: Students can add courses to their schedule.
- View results: Students can view their grades and other academic results.
- View demand: Students can view their financial aid status and other financial information.
- Delete student: Administrators can delete students from the system.
- Search student: Administrators can search for students by name, ID number, or other criteria.
- Add result: Administrators can add grades and other academic results to students' records.
- Add course: Administrators can add courses to the system.

5.2 Entity Relationship Diagram
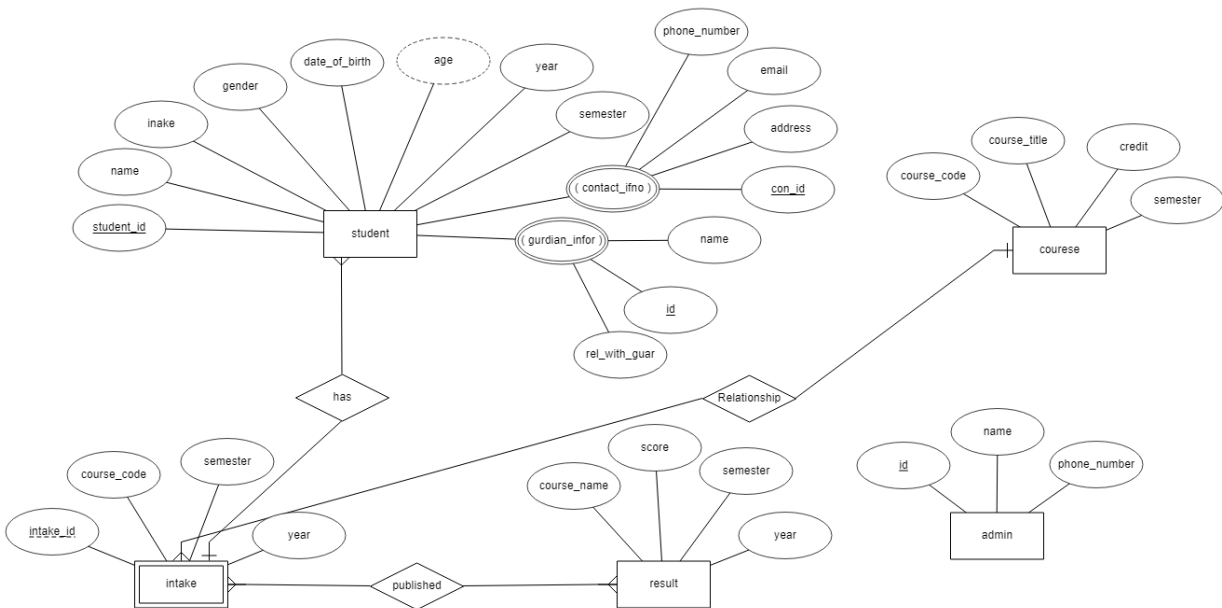
The Entity-Relationship (ER) data model represents the real world using entities and their relationships. Entities are distinct objects with relevance to an organization, organized into entity sets of the same type. A primary key is an attribute that uniquely identifies an entity in an entity set.

5.2 Relational Schema
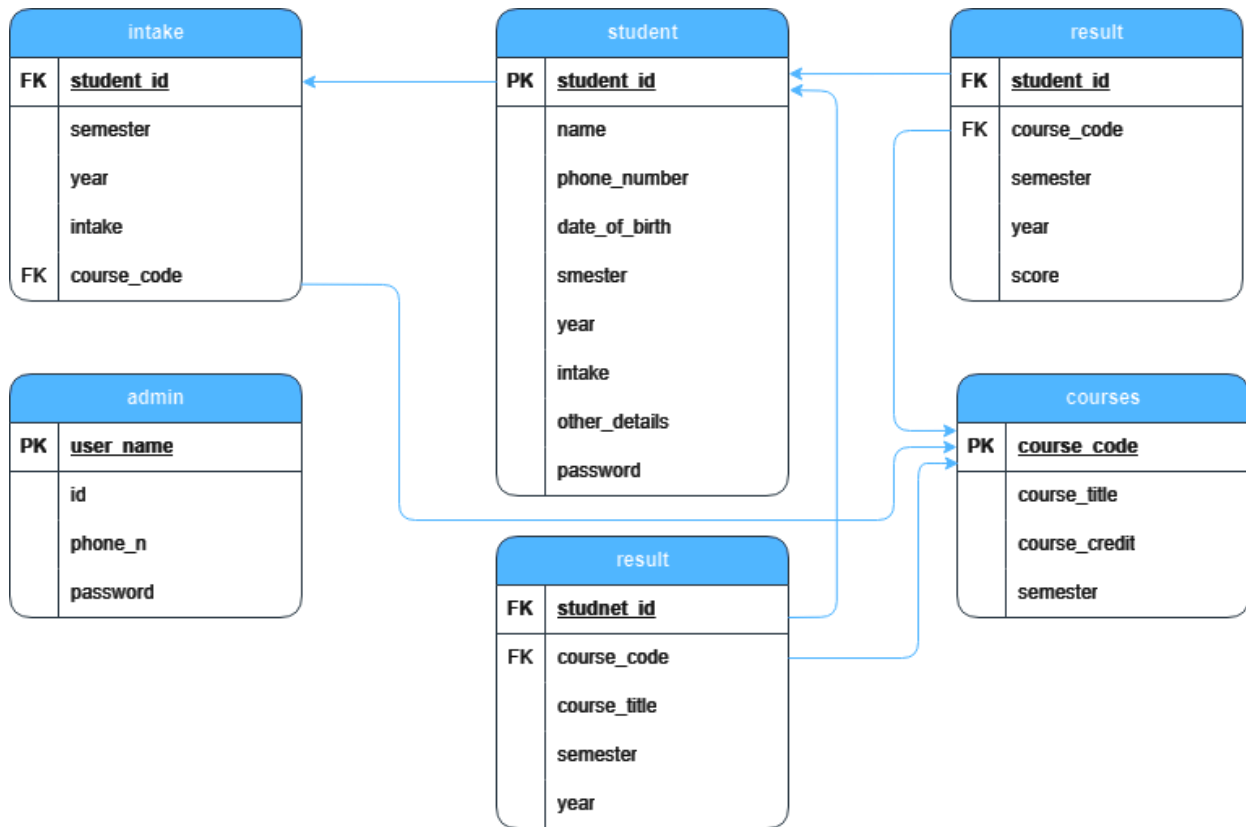
In a relational schema derived from the Entity-Relationship (ER) model, real-world entities become tables, and relationships are represented by connections between these tables. Each table corresponds to an entity set, and a primary key within each table uniquely identifies individual records, ensuring data integrity. This schema efficiently translates the ER model into a structure suitable for relational databases.

5.3 Data Flow Diagram:
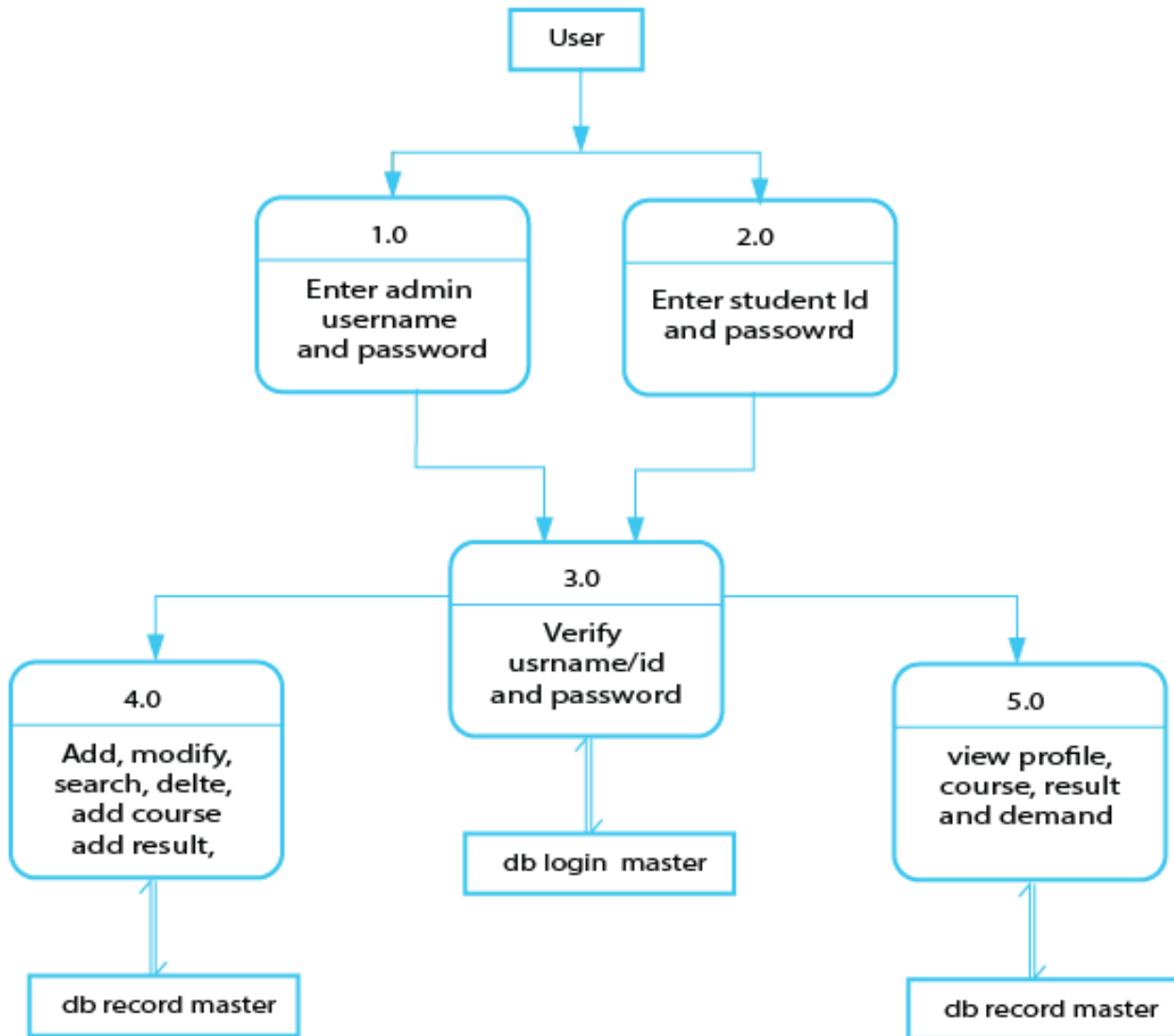
The data flow diagram for the student information system outlines the flow of data and processes within the system. It primarily consists of two main processes:

1. User Authentication:
- Admin and students input their username and password.
- The system validates the entered username/ID and password.
- Upon successful verification, users gain access to the system.

2. System Functionality:

- Admins have the capability to perform actions like adding, modifying, searching, deleting, adding courses, and entering results for students.
- Users (likely students) can view their profile, course schedules, results, and financial information.

This diagram illustrates how data moves within the system, primarily focused on user authentication and the actions users can perform once verified. The data stores mentioned are not detailed, but they likely store user account information and possibly the student records.

5.4 Context Diagram:
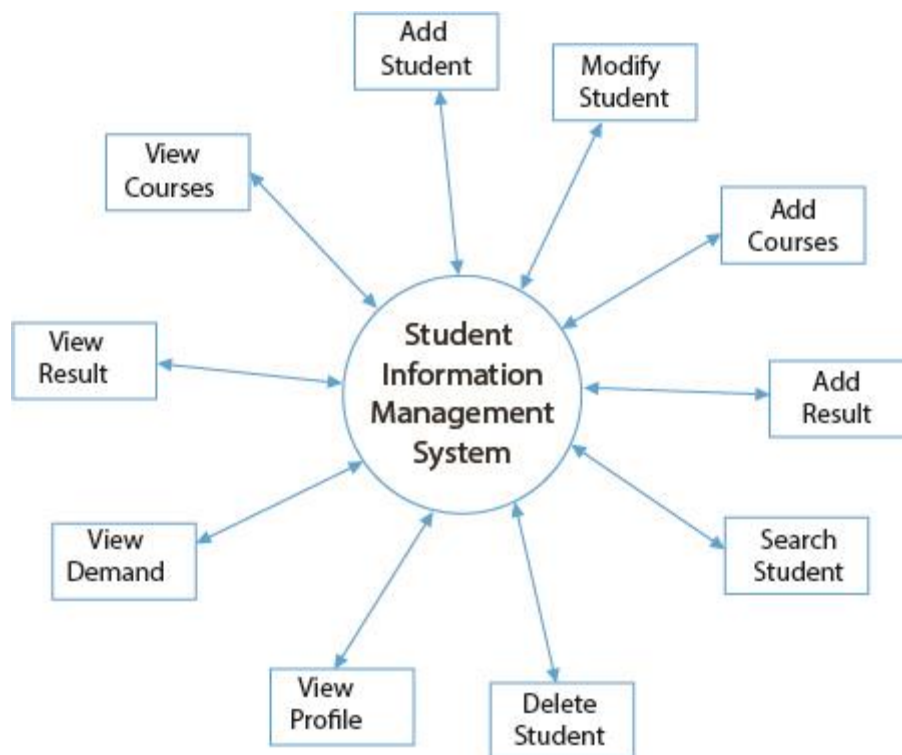
This data flow diagram illustrates the flow of data within a student information system, featuring interactions with two external entities: students and administrators. Students can input, update, and access their personal data, view course schedules, academic results, and financial details. Administrators have the authority to create, modify, and delete student records and manage courses. The system comprises two data stores: a student database for student details like names, addresses, contact information, and academic records, and a course database for course information, including course names, instructors, and schedules.

CHAPTER 6
SNAPSHOOT
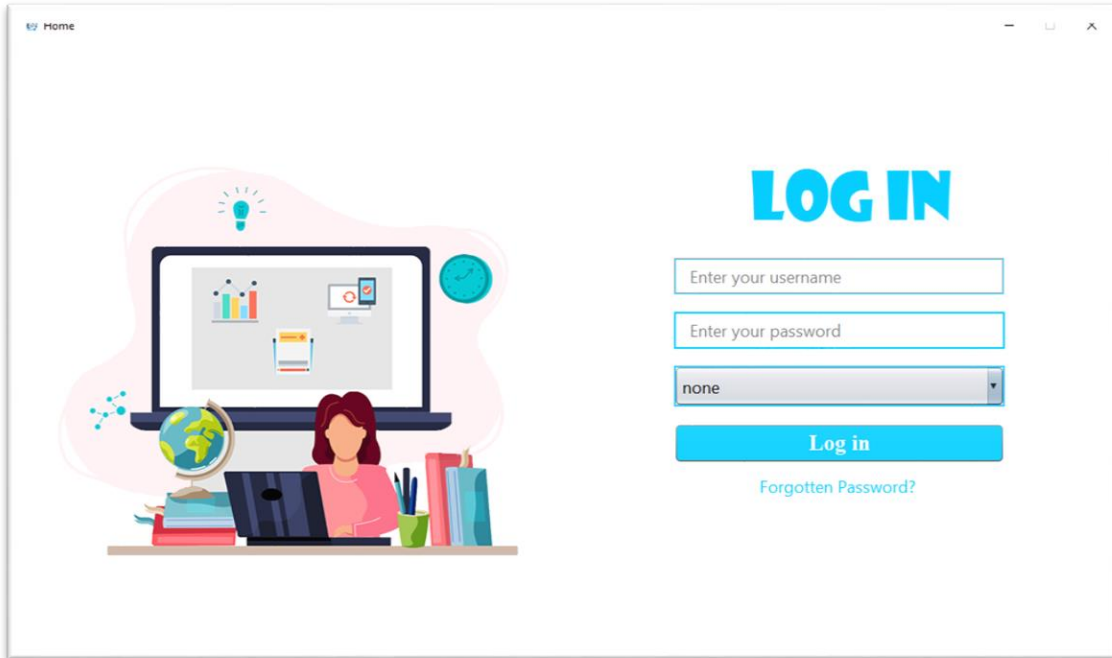
6.1 Admin Panel

Login page
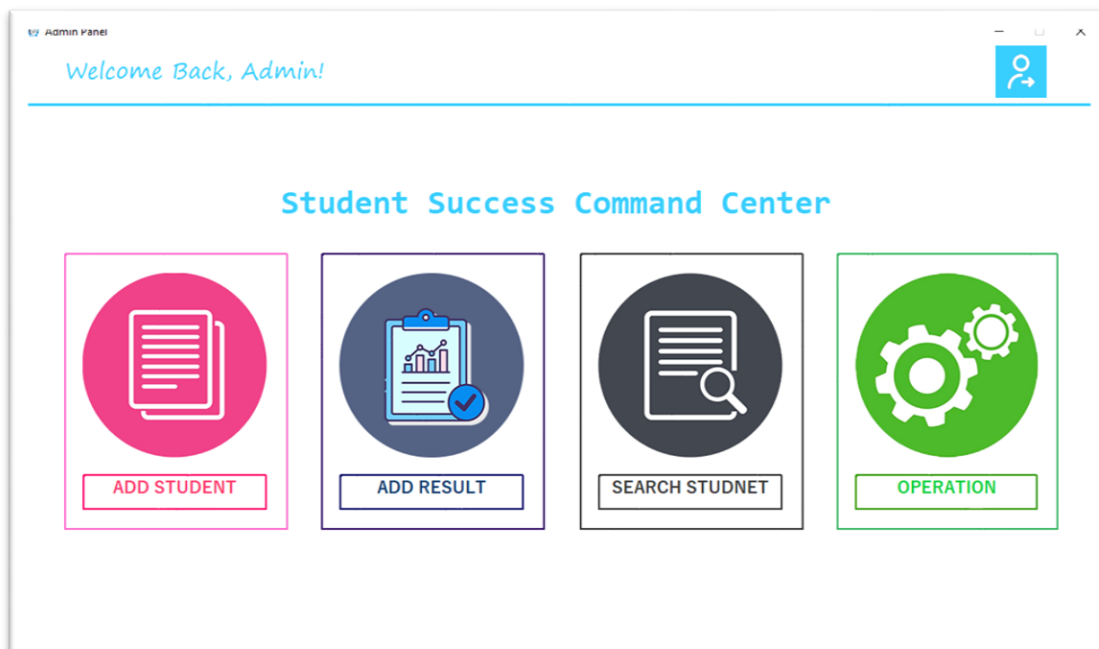
Admin Panel

Add Student

stdId ▲ 1	stdName	stdBirth	stdGender	stdPhone	stdDept	stdSemester	stdYear
1	Jamanl Hossain	April 19, 1998	Male	01818889990	Computer Science and Engineering	Fall	2025
10	Asiya	March 3, 1999	Female	01818889990	Computer Science and Engineering	Fall	2023
11	Midul Islam	March 5, 1998	Male	01899900011	Computer Science and Engineering	Fall	2023
12	Mahmudullah	April 7, 1998	Male	01488877777	Computer Science and Engineering	Fall	2023
13	Aktaruzzaman	March 13, 1998	Male	01829345667	Computer Science and Engineering	Spring	2023
2	Kamal Hossain	April 25, 1998	Male	01818889990	Computer Science and Engineering	Fall	2023

Added students to the database

6.2 Student Panel
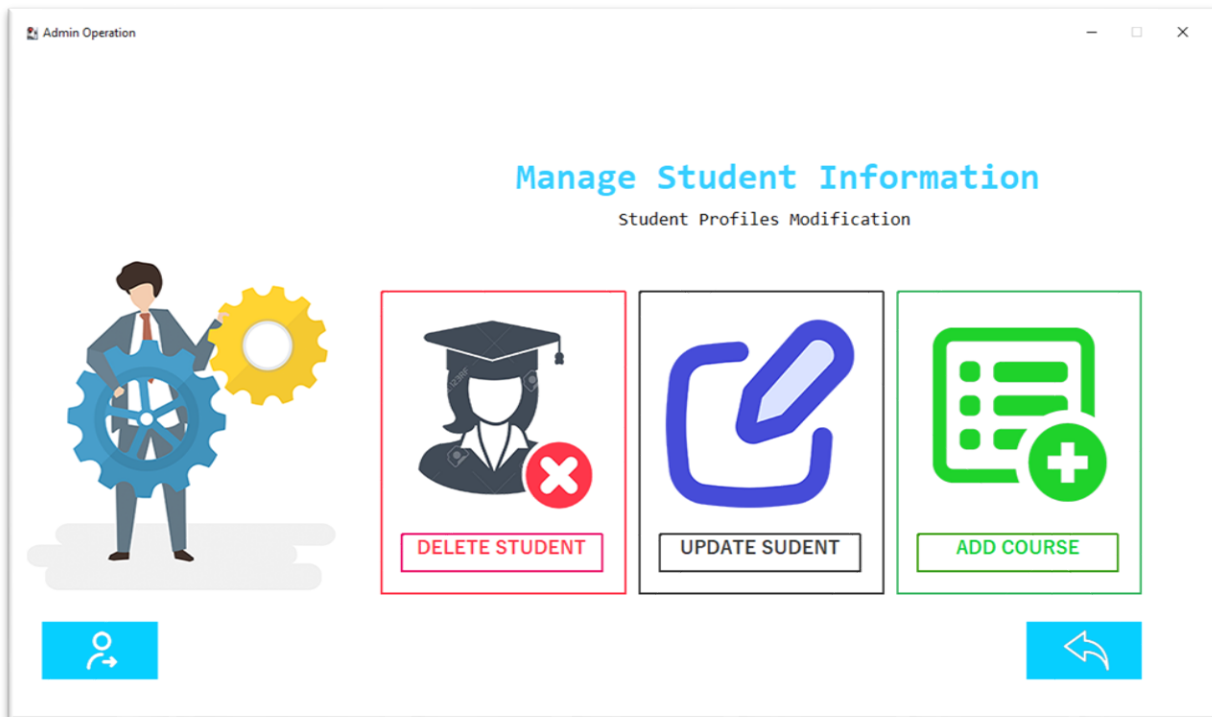
More Admin Operation
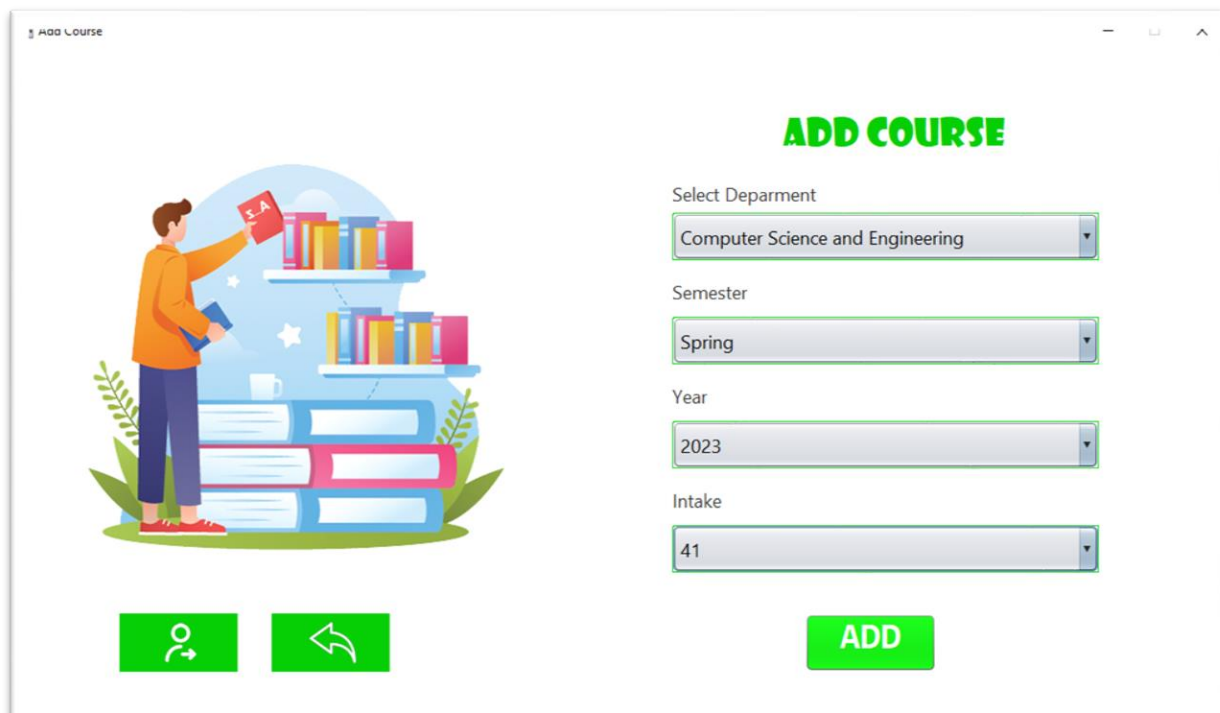
Add Courses

Search Student

Student Home page

Student Profile

Student Register Courses

Student Demand

Student Result

CHAPTER 7
CONCLUSION

7.1 Conclusion:

In conclusion, this Student Information Management System (SIMS) has demonstrated its ability to streamline administrative and academic processes. It offers efficient student and course management, enhancing transparency and communication between students and administrators.

7.2 Future Implementation:

For future enhancements, consider improving the user experience, creating a mobile app, integrating with other systems, implementing analytics, enhancing cybersecurity, enabling a feedback mechanism, and ensuring scalability. These improvements will keep the system relevant and adaptable to changing educational needs and technological advancements.

- **Timetable Generation:** Develop an automated timetable generation feature to optimize the scheduling of classes and exams, taking into account faculty availability and room allocation.
- **Library Integration:** Integrate the SMS with the institution's library system to allow students to check the availability of books, reserve them, and view their borrowing history.
- **Mobile Application:** Develop a mobile application for the Student Management System to provide on-the-go access for students, faculty, and administrators.
- **Data Analytics and Reporting:** Implement advanced data analytics and reporting tools to help administrators gain insights into student performance, attendance trends, and financial data.
- **Online Admission Process:** Create an online admission module to streamline the admission process and allow prospective students to apply online.
- **Automated Fee Reminders:** Set up automated reminders for fee payment deadlines to reduce outstanding balances.
- **Feedback Mechanism:** Implement a robust feedback mechanism for students and administrators to suggest improvements and report issues
- **Machine Learning:** Incorporate machine learning algorithms to predict student course demands, helping universities allocate resources more effectively.

7.3 References

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- **Student information management system:** https://en.wikipedia.org/wiki/Student_information_system
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- Google Bard: https://bard.google.com/
- Stack overflow: https://stackoverflow.com/
- https://www.researchgate.net/publication/362301918_Student_Management_System_-_Group_Project_Report