By-Junaid hussain

Sys.id-2022529486(**B. TECH-IT)**

Student Management System (Java GUI Project)

---

1. Problem Statement

Managing student data manually can be tedious, error-prone, and inefficient. Institutions require a system that allows seamless handling of student registration, course management, exam conduction, and result tracking. Currently, many educational platforms lack an integrated offline solution where students can register, select courses, read structured notes, appear in exams, and view results while allowing administrators to manage data effortlessly.

---

2. Solution Overview

This project provides a Java-based GUI Student Management System (SMS) using Swing. It facilitates the following:

- Student registration with field validation.
- Subject selection per course.
- Viewing of detailed subject-wise notes (50-60 paragraphs each).
- Conducting MCQ-based exams (10 questions, 2 per subject).
- Displaying student results with scores and feedback.
- Admin panel for viewing/updating student details and managing results.

The system uses Java collections (ArrayList, HashMap) for temporary in-memory storage and is designed with modular GUI classes for scalability.

---

3. How the Student Management System is Created

Technologies Used:

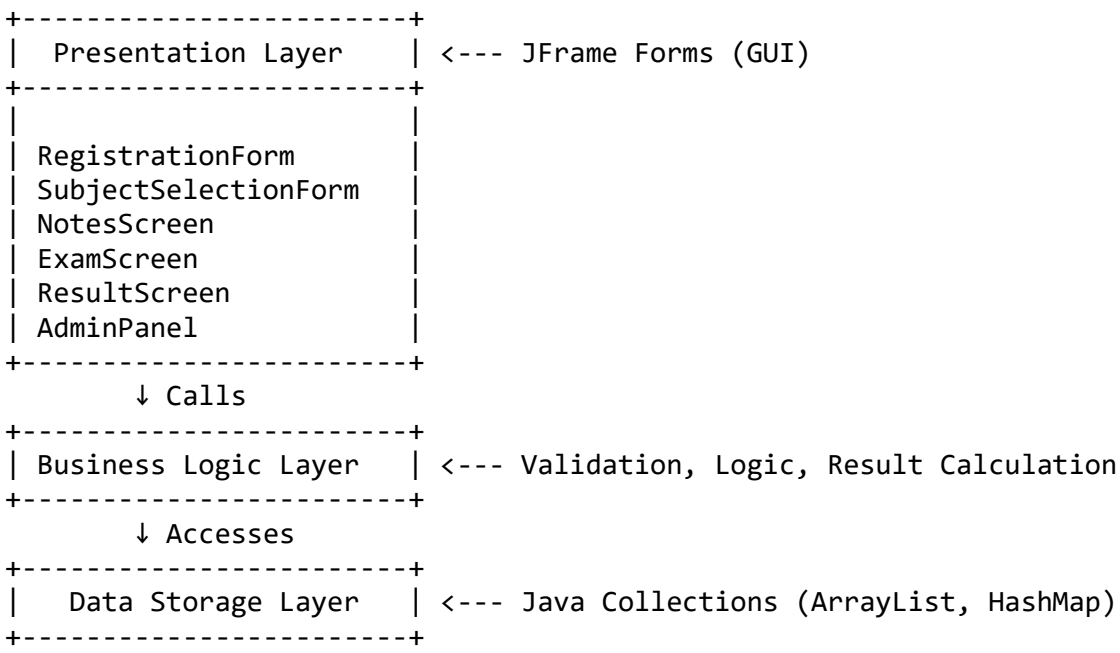
- **Language:** Java
- **GUI:** Swing (JFrame, JPanel, JComboBox, JTable, etc.)
- **IDE:** IntelliJ IDEA or Eclipse
- **Data Storage:** Java Collections (future-ready for database integration)

Steps:

1. Created GUI forms using Swing for all user actions (registration, notes, exams).
2. Implemented input validation in RegistrationForm.
3. Stored sample notes and questions in-memory for each subject.
4. Created subject-wise MCQs with correct answer tracking.
5. Developed AdminPanel to view, update, and manage student data.
6. Modularized code into packages for maintainability.

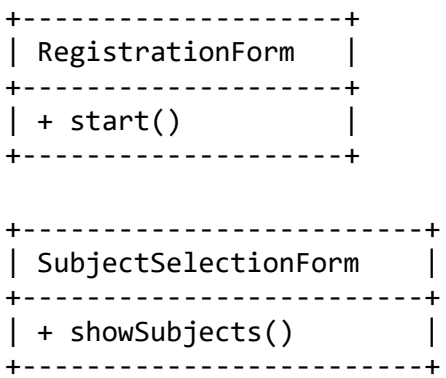
---

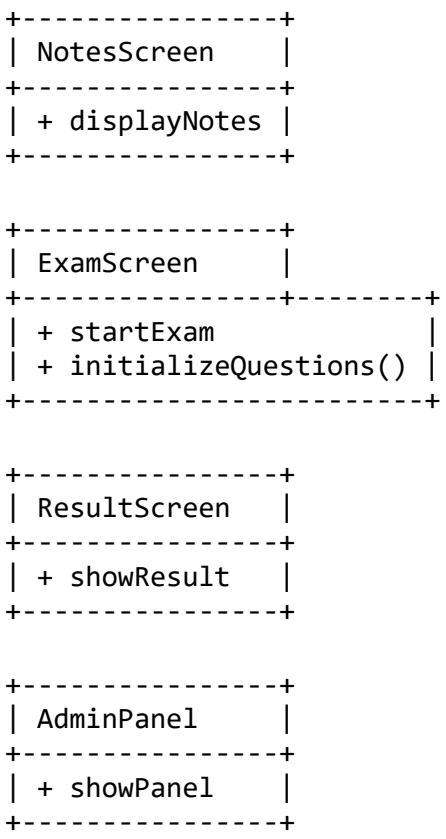
4. Architecture Diagram



---

5. UML Class Diagram





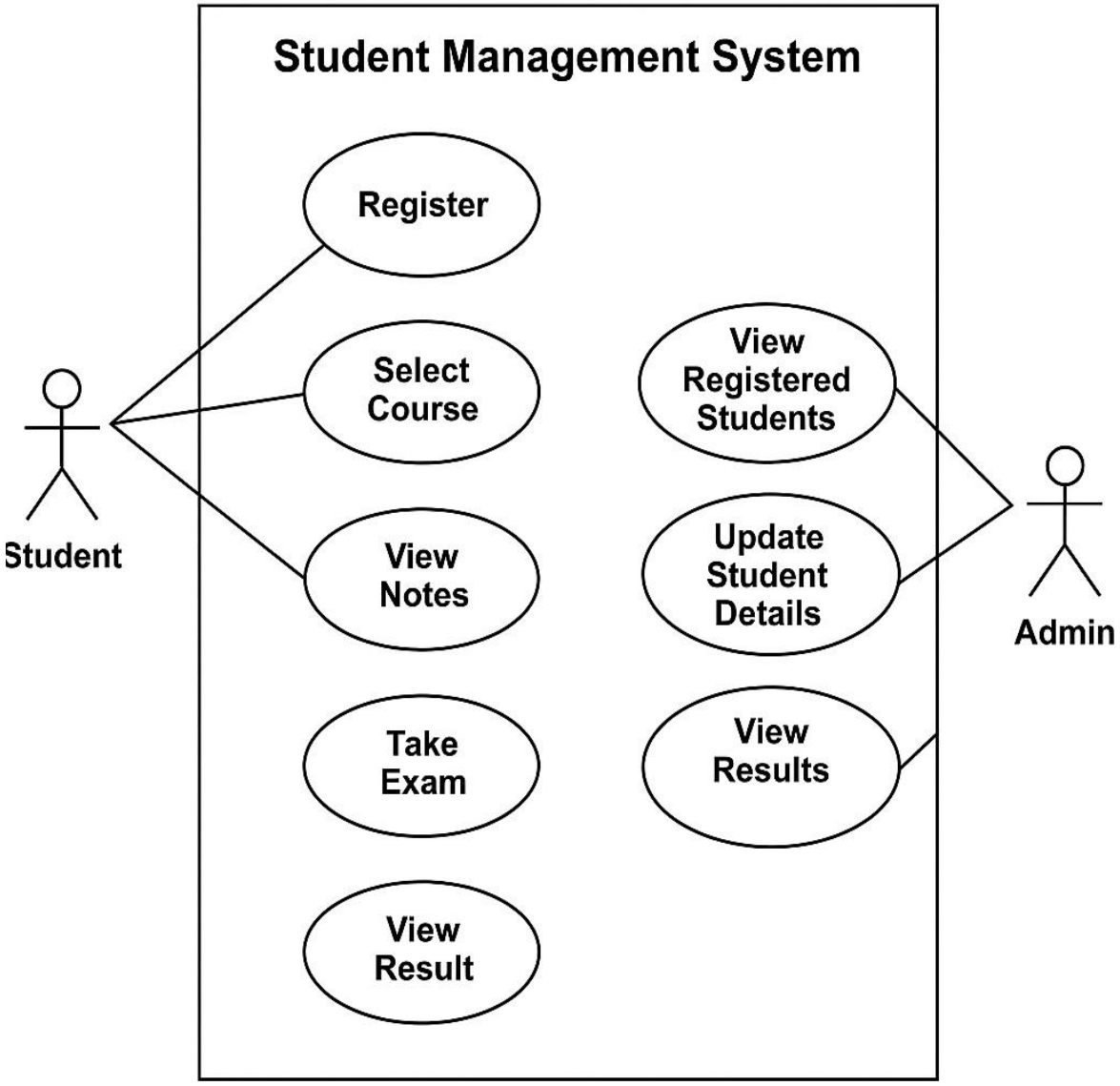
---

6. Use Case Diagram (Actors & Interactions)

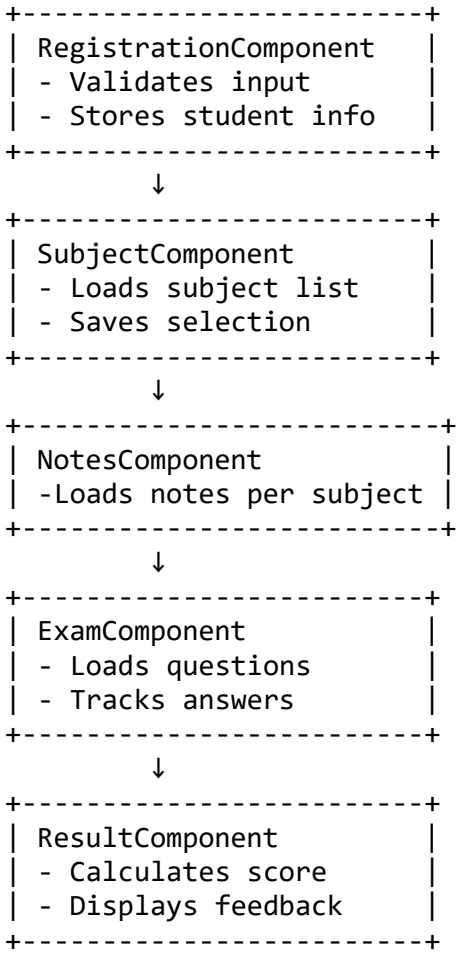
```
Actor: Student
 - Register
 - Select Subjects
 - Read Notes
 - Take Exam
 - View Results

Actor: Admin
 - View Student List
 - Update Student Info
 - View Results
```

```
[Student] ---> (Register) ---> [RegistrationForm]

            ---> (Select Course) ---> [SubjectSelectionForm]

            ---> (View Notes) ---> [NotesScreen]

            ---> (Take Exam) ---> [ExamScreen]

            ---> (View Result) ---> [ResultScreen
```

```
[Admin] ---> (View Registered Students)
           ---> (Update Student Details)
           ---> (View Results)
           ---> [AdminPanel]
```

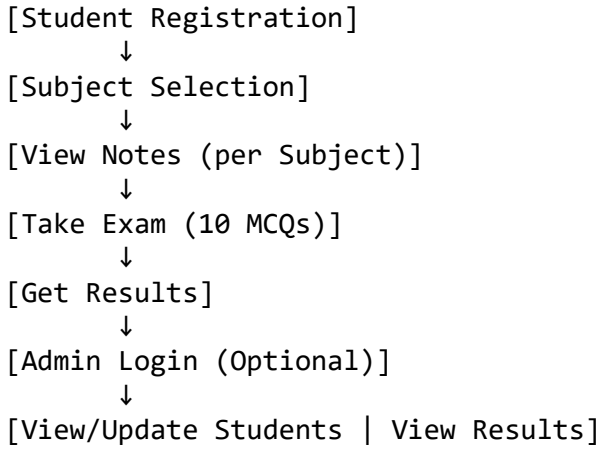


7. Component Diagram



---

8. System Workflow



---

9. Screenshots: