Student Management System – Java

# Project Overview

The Student Management System is a console-based Java application that helps manage student information and their examination records. It allows the user to add student details, input subject marks, calculate grades, and view academic performance using a simple, menu-driven interface.

# Features

* Add new students with personal details
* Add marks for 5 subjects per student
* Auto-calculation of subject grades and overall grade
* View student profile by roll number
* View subject-wise and overall exam performance
* Simple and interactive text-based menu system

# Technologies Used

* Language: Java
* Input Handling: Scanner class
* Data Structures: ArrayList, HashMap
* OOP Concepts: Classes, Encapsulation, Composition

# Class Structure

* Student: - Fields: name, rollNumber, dob, email, studentId, course  
  - Methods: getName(), getRollNumber(), displayDetails()
* Subject: - Fields: name, marks, grade, percentage  
  - Methods: calculateGradeAndPercentage(), displaySubjectDetails()
* Examination: - Stores a list of Subject objects for a student  
  - Calculates total percentage and overall grade  
  - Methods: addSubject(), displayExamResults()
* StudentManagementSystem: - Handles user interaction and operations via a main menu  
  - Stores:  
   - List of students (ArrayList<Student>)  
   - Exam data mapped by roll number (HashMap<Integer, Examination>)

# Application Flow

* Start Application: Displays a menu with options to manage students and exams.
* Add Student: Collects and stores student details.
* Add Exam Details: Inputs marks for 5 subjects, auto-calculates grades and percentage.
* View Details / Results: Allows retrieval of student or exam data using roll number.
* Exit: Ends the session gracefully.

# Sample Console Output

Student Management System  
1. Add New Student  
2. Add Examination Details  
3. View Student Details  
4. View Examination Results  
5. Exit  
Enter your choice:

# How to Run

* Compile the code:  
   javac StudentManagementSystem.java
* Run the program:  
   java StudentManagementSystem

# Future Enhancements

* Save/load student data to/from files (JSON, CSV)
* GUI version using JavaFX or Swing
* Email and DOB format validation
* Search or sort students by name/course