**Project Synopsis**

**Title:**

Student Management System Using Java (OOP Approach)

**Objective:**

The primary objective of this project is to create a simple yet functional Student Management System that can register students, manage their examination data, calculate results, and display comprehensive student information. This system is developed using the Object-Oriented Programming (OOP) paradigm in Java.

**Scope of the Project:**

This system allows for:  
- Registering student details  
- Assigning courses  
- Recording marks for multiple subjects  
- Calculating and displaying results  
- Computing and displaying percentage and pass/fail status  
  
It serves as a fundamental prototype for college/school information systems and can be extended to include features like file handling, multiple users, GUI, and database integration.

**Tools and Technologies Used:**

|  |  |
| --- | --- |
| Component | Description |
| Programming Language | Java |
| IDE | Eclipse / VS Code |
| JDK Version | JDK 8 or higher |
| Input Handling | Java Scanner Class |
| OOP Concepts | Encapsulation, Classes, Methods |

**Functional Requirements:**

1. Student Registration: Student ID, name, age, gender  
2. Course Assignment: Assign a course to a student  
3. Examination Module: Enter marks for 5 subjects  
4. Result Calculation: Compute average percentage, declare pass/fail  
5. Display Full Details: Output all entered and computed student data

**Modules Description:**

1. Student Class

- Holds attributes: studentId, name, age, gender, course, marks[], and subjects[]  
- Methods:  
 - register() – Register student's personal details  
 - assignCourse() – Assigns the course  
 - giveExamination() – Accepts marks input  
 - calculatePercentage() – Returns average of marks  
 - showResult() – Prints percentage and result  
 - showDetails() – Displays full student profile

2. Main Class (student\_management)

- Contains the main() method  
- Handles user input via Scanner  
- Calls the appropriate methods in Student class in sequence

**Sample Subjects:**

Java  
C++  
English  
Python  
Software Engineering

**Result Logic:**

Pass: Percentage ≥ 40%  
Fail: Percentage < 40%

**Advantages:**

- Simple, easy-to-understand interface  
- Modular and extensible code  
- Can be used in educational institutions  
- Demonstrates core Java OOP principles

**Conclusion:**

This Student Management System serves as a basic educational project to demonstrate Java programming and OOP principles. It successfully records, processes, and displays student data and examination results. With further improvements, it can be scaled for real-world applications.

import java.util.Scanner;

class Student {

String studentId;

String name;

int age;

String gender;

String course;

int[] marks = new int[5];

String[] subjects = {"Java", "C++", "English", "Python", "Software Engineering"};

void register(String id, String name, int age, String gender) {

this.studentId = id;

this.name = name;

this.age = age;

this.gender = gender;

}

void assignCourse(String courseName) {

this.course = courseName;

}

void giveExamination(Scanner sc) {

System.***out***.println("Enter marks for 5 subjects (out of 100):");

for (int i = 0; i < subjects.length; i++) {

System.***out***.print(subjects[i] + ": ");

marks[i] = sc.nextInt();

}

}

double calculatePercentage() {

int total = 0;

for (int mark : marks) {

total += mark;

}

return total / 5.0;

}

// Show result

void showResult() {

double percent = calculatePercentage();

System.***out***.println("Percentage: " + percent + "%");

if (percent >= 40) {

System.***out***.println("Result: Pass");

} else {

System.***out***.println("Result: Fail");

}

}

void showDetails() {

System.***out***.println("\n--- Student Full Details ---");

System.***out***.println("Student ID : " + studentId);

System.***out***.println("Name : " + name);

System.***out***.println("Age : " + age);

System.***out***.println("Gender : " + gender);

System.***out***.println("Course : " + course);

System.***out***.println("Marks:");

for (int i = 0; i < subjects.length; i++) {

System.***out***.println(" " + subjects[i] + ": " + marks[i]);

}

showResult();

}

}

public class student\_management {

public static void main(String[] args) {

Scanner sc = new Scanner(System.***in***);

Student s = new Student();

System.***out***.print("Enter Student ID: ");

String id = sc.nextLine();

System.***out***.print("Enter Name: ");

String name = sc.nextLine();

System.***out***.print("Enter Age: ");

int age = sc.nextInt();

sc.nextLine();

System.***out***.print("Enter Gender: ");

String gender = sc.nextLine();

s.register(id, name, age, gender);

System.***out***.print("Enter Course Name: ");

String course = sc.nextLine();

s.assignCourse(course);

s.giveExamination(sc);

s.showDetails();

sc.close();

}

}

Output

