Student Management System - Project Documentation

Project Title: Student Management System

Language Used: Java

Development Environment: Java SE (Standard Edition)

Tools & Technologies:

- Java
- OOP Principles (Encapsulation, Inheritance)
- VS Code

Project Description: The Student Management System is a Java-based console application developed to facilitate the management of academic information related to courses, subjects, students, and administrative tasks like salary calculation and student assessments. The system is segregated into two main panels: **Employee Panel (Admin)** and **Student Panel**.

Modules Overview:

1. Course Module

- Stores course names.
- Maintains a list of subjects linked to each course.
- Methods:
- **addSubject(Subject**
- **subject) showSubjects()**

2. Subject Module

- Encapsulates subject name information.

3. Student Module

- Contains student personal details: name, email, age.
- Keeps track of selected course and chosen subjects.
- Records exam scores.
- Method:
- **displayInfo()**

4. Employee Panel (Admin)

- Accessible to administrative staff.
- Functionalities:

• Add Course
• Add Subject to Course
• View Registered Students
• View Student Exam Results
• Calculate Salary & Tax for employees

5. Student Panel

• Allows new student registration.
• Enables students to select courses and subjects.
• Administers a basic 5-question MCQ-based exam.
• Automatically evaluates exam performance.

6. Salary Module

• Calculates HRA, DA, TA, PF, gross and net salary.
• Method:
• **showSalary(Employee e, double**

7. IncomeTax Module

• Calculates 10% tax based on the basic salary.
• Method:
• **showTax(Employee e)**

8. Main Module

• Entry point of the application.
• Displays the main menu to choose between Admin and Student roles.
• Handles session control through loops and user input.

Features:

• **Admin Functionality**: Add/view courses and subjects, register students, process exam results.
• **Student Registration**: Capture personal information, enroll in courses and subjects.
• **Exam System**: Five multiple-choice questions automatically scored.
• **Salary Management**: Calculates detailed salary and income tax based on basic input.

Sample Output Snapshot:

```
--- Student Management System ---
1. Admin Login
2. Student Register/Login
3. Exit
Choice:  1
```

```
--- Employee Panel ---
1. Add Course
2. Add Subject to Course
3. View Registered Students
4. View Student Exam Results
5. Calculate Salary & Tax
6. Exit
```

Conclusion:

This console-based Student Management System successfully integrates key administrative and academic functionalities through modular OOP design. It demonstrates effective use of core Java concepts and lays the foundation for future scalability using GUI frameworks or databases.

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