Student Management System

## Project Overview:

This project is a **Student Management System** designed to manage:

- Student registration
- Course registration
- Grade processing
- Database connectivity using **SQLite**

It includes a graphical interface for interacting with the system and supports different student types such as:

- **Undergraduate**
- **Graduate**
- **Part-Time**

## Design Patterns Used

## 1-Singleton Pattern:

**Description: Ensures that only one instance of database connection exists throughout the application.**

**Benefit: Reduces resource usage and improves performance.**

**2-Factory Pattern:**

**Files: StudentFactory.java and CourseFactory.java**

**Description: Used to create objects of various types (e.g., different student types or courses) without specifying the exact class name in the code.**

**Benefit: Adds flexibility and makes it easy to introduce new types**

**3-Prototype Pattern:**

**File: Student.java**

**Description: Allows cloning of student objects using the clone() method.**

**Benefit: Useful when you need multiple copies of an object with the same properties.**

**4-Builder Pattern:**

**File: studentBuild.java**

**Description: Builds complex Student objects step-by-step using a fluent interface.**

**Benefit: Improves readability and manageability when dealing with objects that have many properties.**