

Students management Analysis and Design Document

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1. Requirements Analysis

1.1 Assignment Specification

The application developed will be used for the management of students in the CS Department of TUCN.

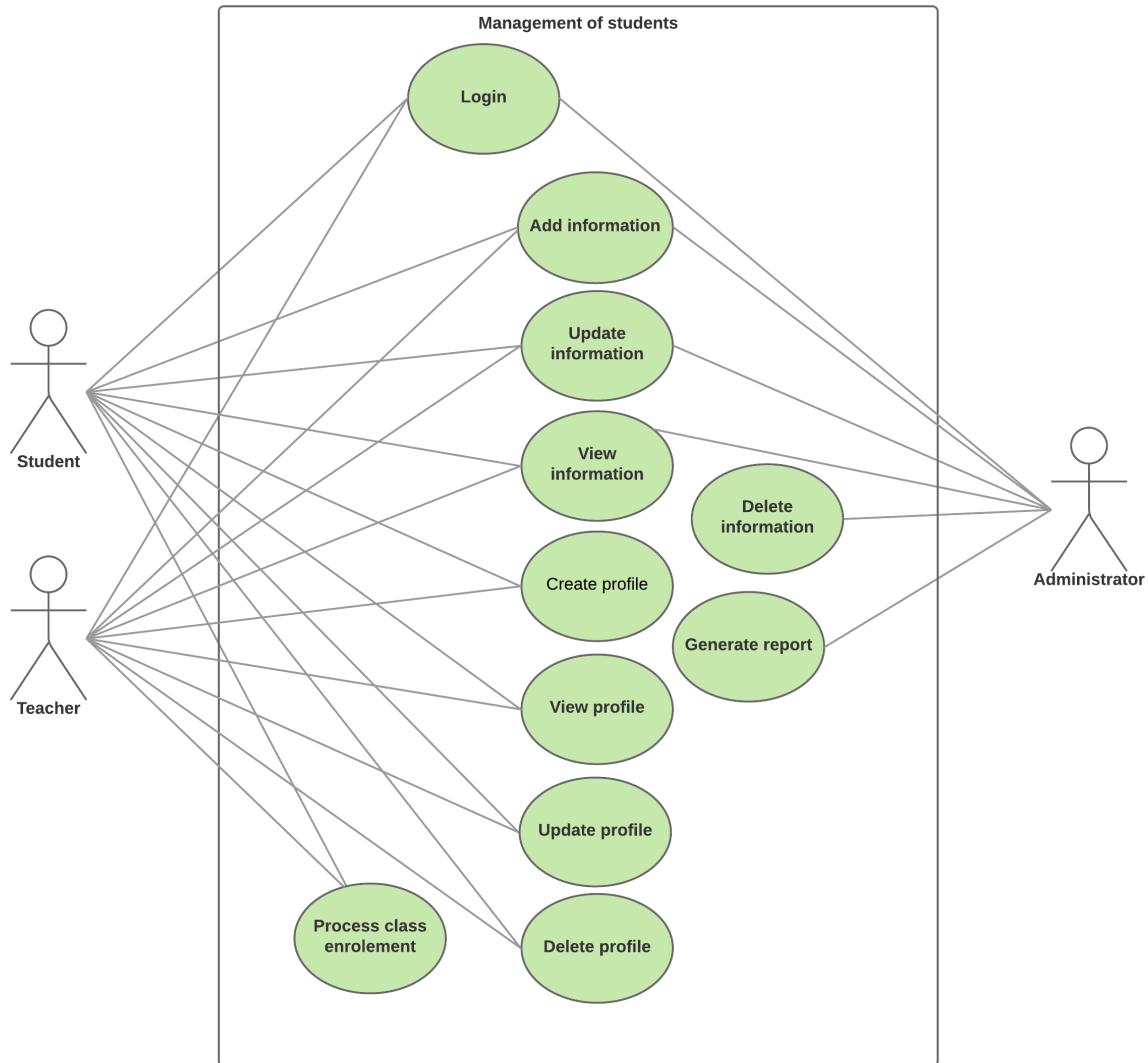
1.2 Functional Requirements

- The application should have two types of users (student and teacher/administrator user)
- Require a username and a password for users in order to use the application
- Add/update/view client information
- Create/update/delete/view student profile
- Process class enrolment.
- CRUD on students information
- Generate reports for a particular period containing the activities performed by a student
- Validate input against invalid data

1.3 Non-functional Requirements

- Store data in a relational database
- Use the Layers architectural pattern to organize the application
- Create the Data Access Layer using SQL statements

2. Use-Case Model



Generate report

Use case: generate reports for a particular period containing the activities performed by a student

Level: user-goal level

Primary actor: administrator

Main success scenario: the administrator opens the application, logs into the system, selects generate report option, enters the student and the period, presses a button then the report is created

Extensions: - the administrator opens the application, enters the login information wrong and receives an error message then enter it correctly and successfully logs in, selects generate report option, enters the student and the period, presses a button then the report is created

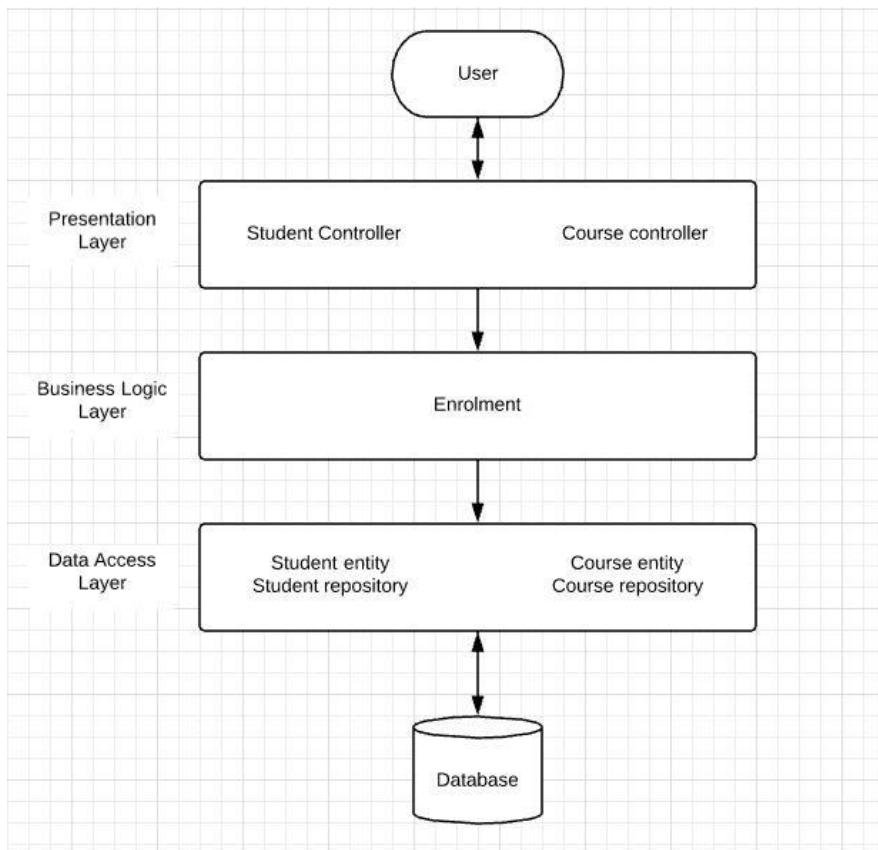
3. System Architectural Design

3.1 Architectural Pattern Description

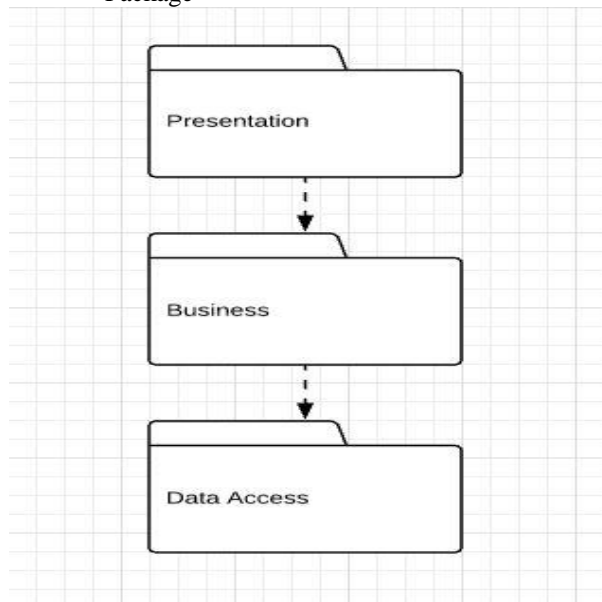
The Layers architectural pattern is used to structure the application by dividing it into groups of subtasks based on their functional responsibility. More specifically, the application is divided in 3 layers (bottom to top): data access, business logic and presentation layer. Each layer can only access the one beneath it. By using this pattern, the maintainability of the application and also the reusability of components are considerably increased.

3.2 Diagrams

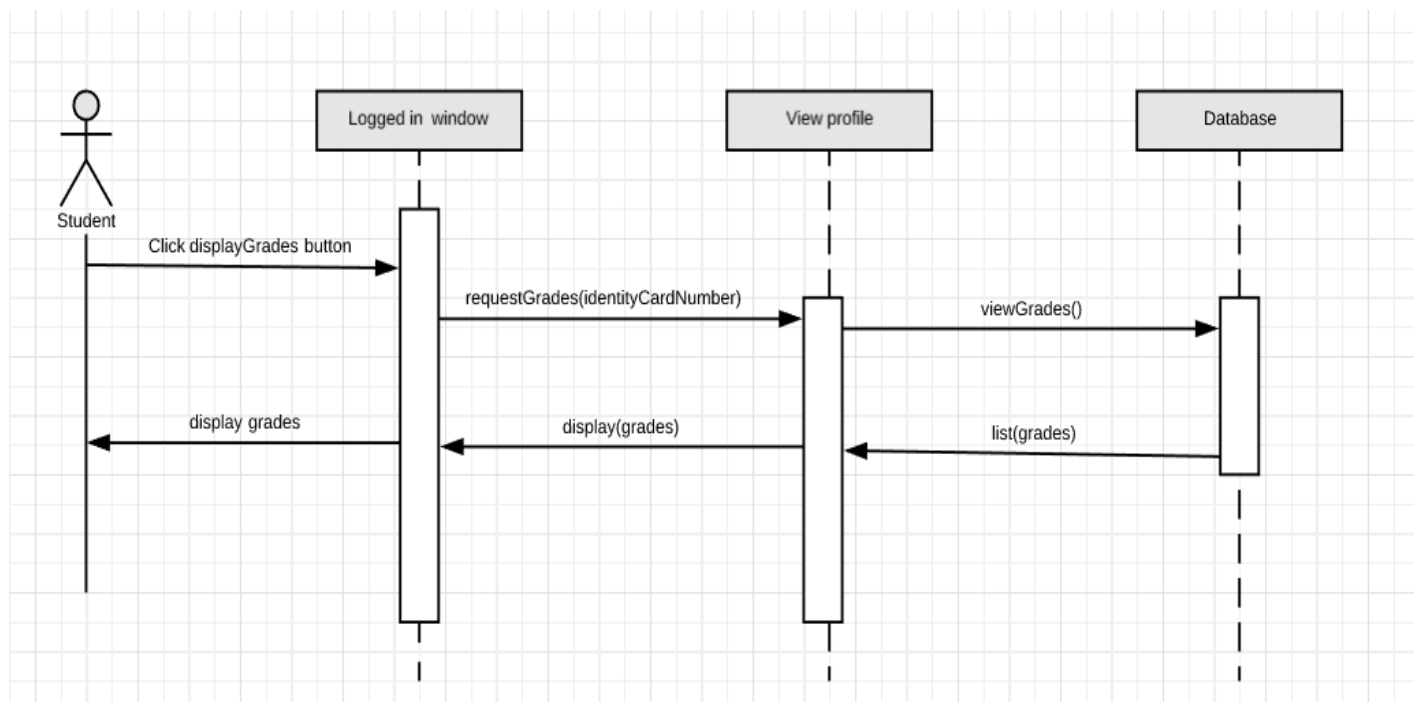
- Conceptual architecture



- Package



4. UML Sequence Diagrams

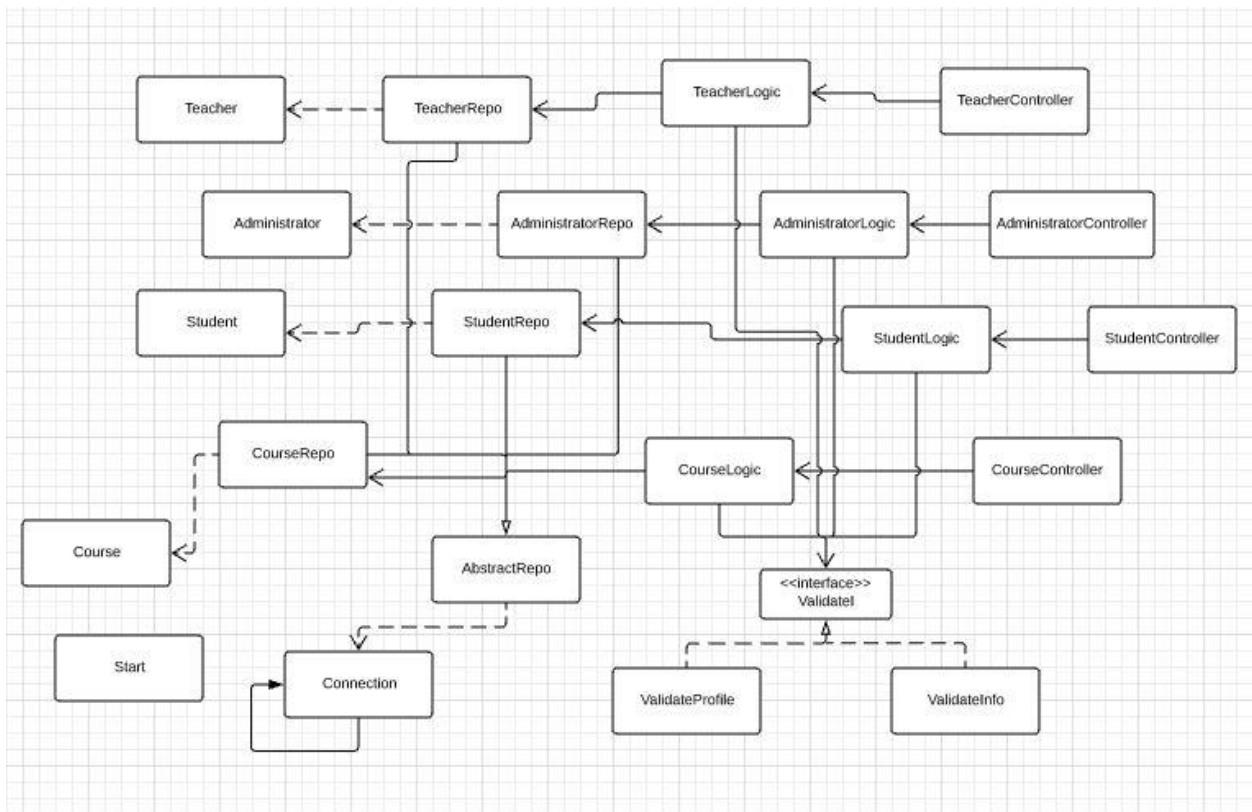


5. Class Design

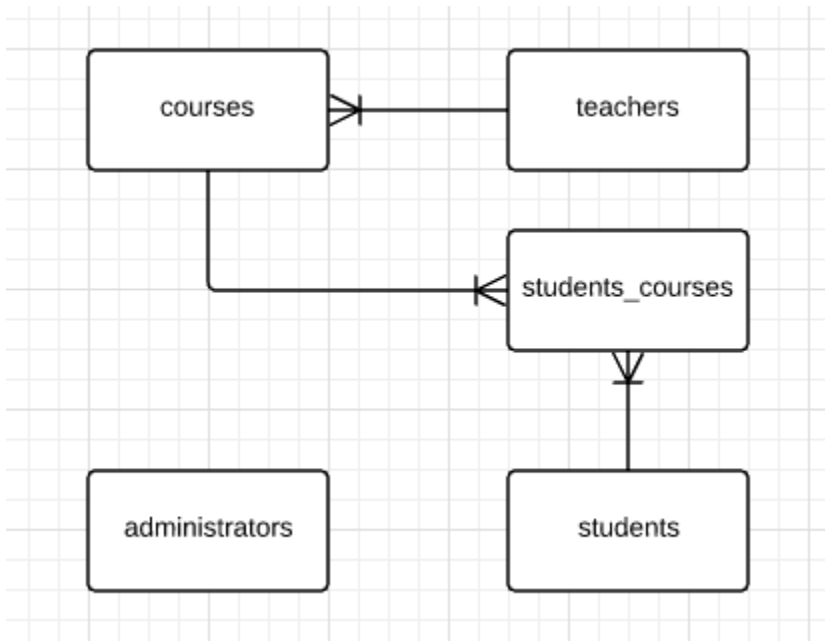
5.1 Design Patterns Description

Singleton design pattern involves a single class which is responsible to instantiate itself. It only creates one instance so it is useful for accessing resources that need to be controlled. In this application it is used for database management.

5.2 UML Class Diagram



6. Data Model



7. System Testing

Unit testing – software testing technique used to verify small functionalities of the system. It helps finding errors early in the development process.

8. Bibliography

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