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

- Availability – the system should achieve 95% available time
- Usability – the system should be easy to use by adult members, self-explanatory and intuitive

2. Use-Case Model

USE CASE DIAGRAM

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 Patterns Description

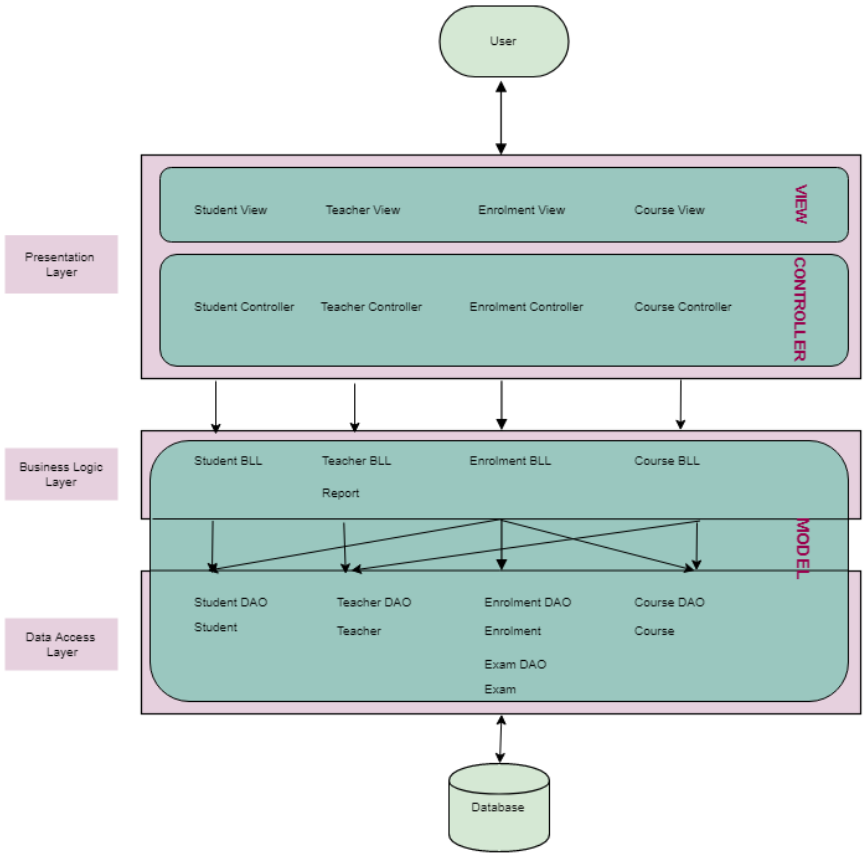
The Layers architectural pattern is used to structure the application by dividing it into groups of subtasks based on their functional responsibility. More specifically, the application is divided in 3 layers (bottom to top): data access, business logic and presentation layer. Each layer can only access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

Also, the MVC architectural pattern is used to separate application's concerns: handle input, processing and output.

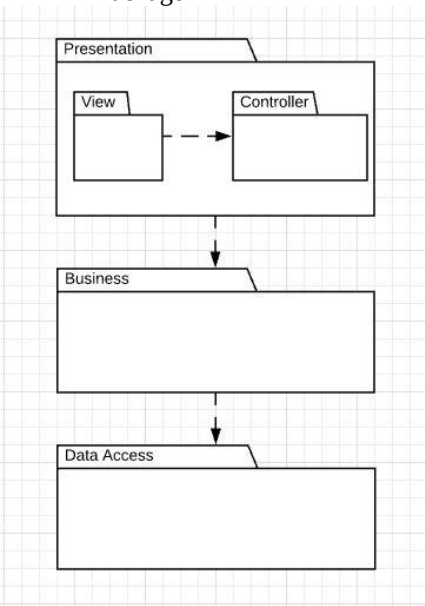
- The model component encapsulates data and functionality (processing).
- View components display information obtained from the model to the user (output).
- Each view has an associated controller component that handles input.

3.2 Diagrams

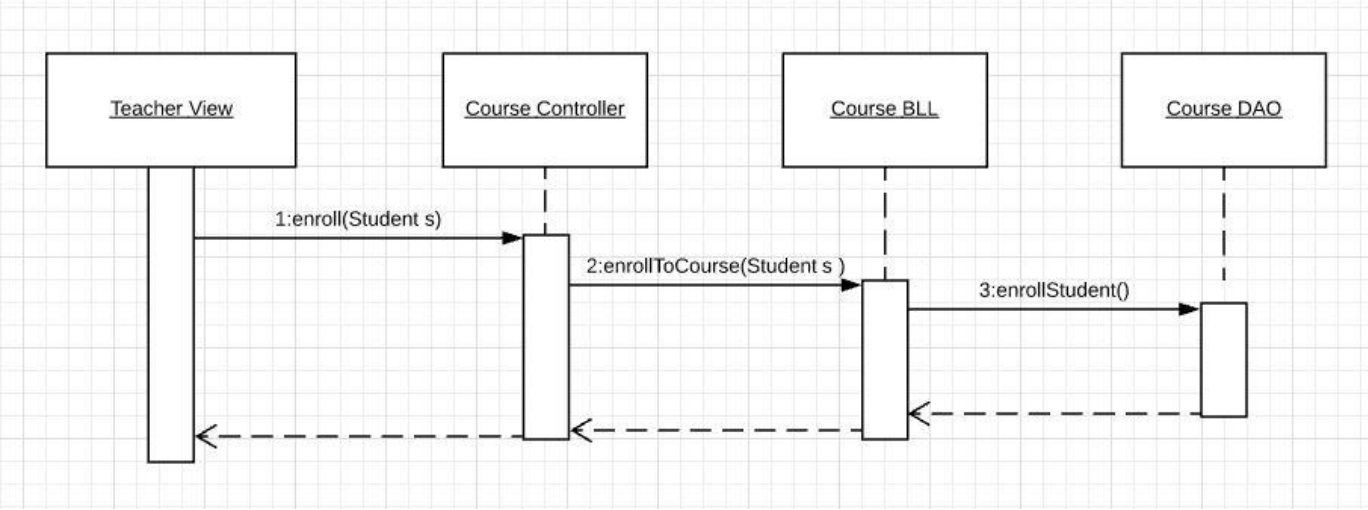
- Conceptual architecture



- Package



4. UML Sequence Diagrams



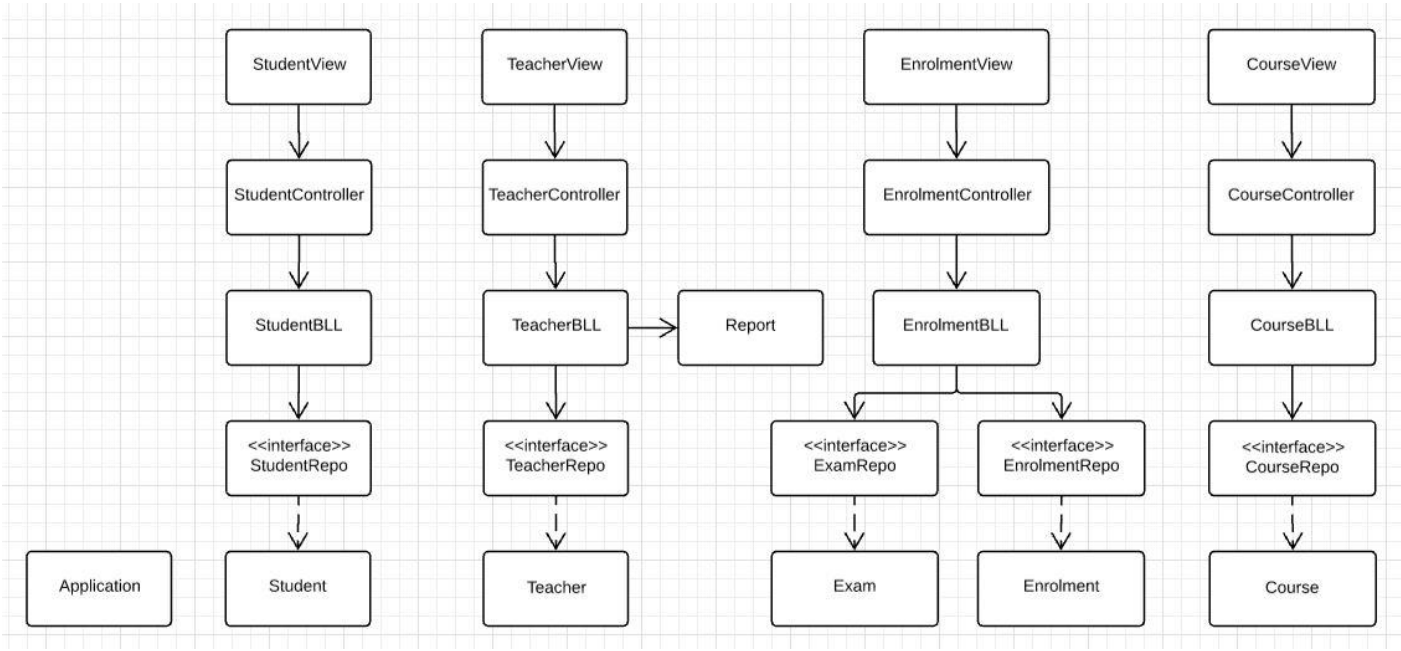
5. Class Design

5.1 Design Patterns Description

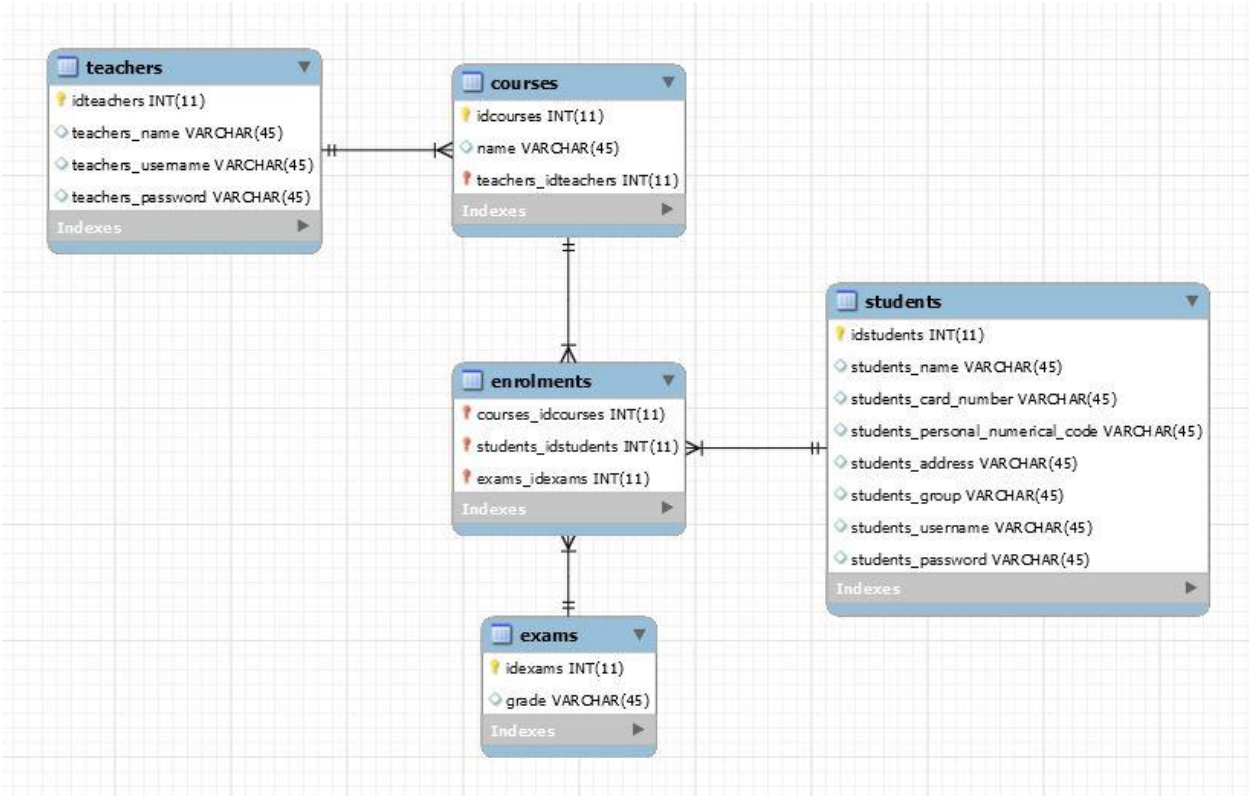
Singleton design pattern involves a single class which is responsible to instantiate itself. It only creates one instance so it is useful for accessing resources that need to be controlled. In this application it is used for database management.

FactoryMethod design pattern is a creational pattern that provides an interface for creating objects in superclass, but allow subclasses to set the type of objects that will be created. It promotes loose-coupling by eliminating the need to bind application-specific classes into the code.

5.2 UML Class Diagram



6. Data Model



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