

# **Assignment 1**

## **Analysis and Design Document**

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# 1. Requirements Analysis

## 1.1 Assignment Specification

Design and implement a Java application for the management of students in the CS Department at TUCN.

## 1.2 Functional Requirements

The application should have two types of users (student and teacher/administrator user) which have to provide a username and a password in order to use the application.

The regular user can perform the following operations:

- Add/update/view client information (name, identity card number, personal numerical code, address, etc.).
- Create/update/delete/view student profile (account information: identification number, group, enrolments, grades).

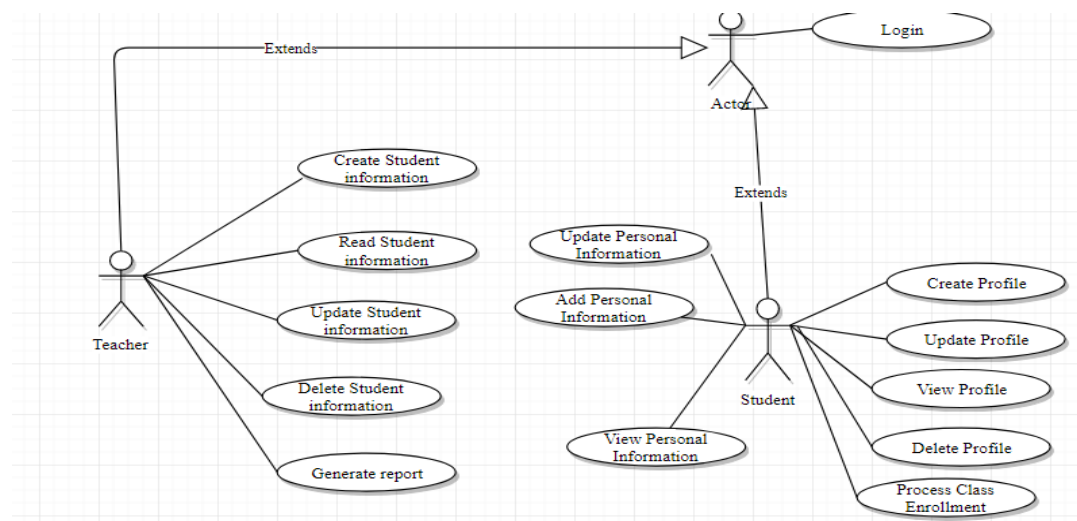
grades).

- Process class enrolment (enroll, exams, grades).

The administrator user can perform the following operations:

- CRUD on students information.
- Generate reports for a particular period containing the activities performed by a student.

## 2. Use-Case Model



Use case: Update Personal Information

Level: User-goal level

Primary actor: Student

Precondition: The Student has to login

Main success scenario:

1. The student logs in successfully.
2. The student chooses to update his personal information.
3. The student modifies the current information.
4. The updated information is saved.

Extensions: The user selects to cancel the operation.

Use case: Generate report

Level: User-goal level

Primary actor: Teacher

Precondition: The teacher has to login and to select a student.

Main success scenario:

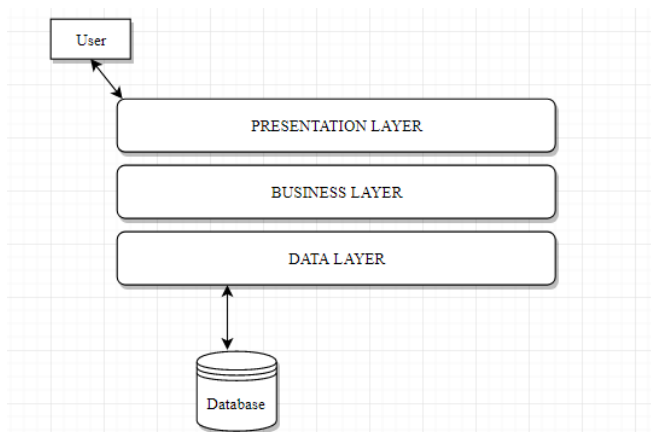
1. The teacher logs successfully.
2. The teacher selects a student.
3. The teacher selects a period.
4. The teacher generates a report based on the student's account information.

## 3. System Architectural Design

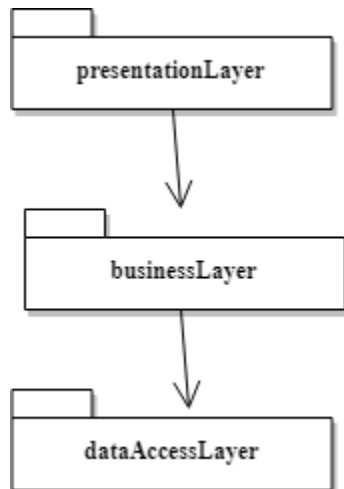
### 3.1 Architectural Pattern Description

The architectural pattern that will be used for this application will be the Layered Architecture Pattern. With this pattern we will logically group our components into separate layers that will communicate with each other. The logical separation will be done using packages.

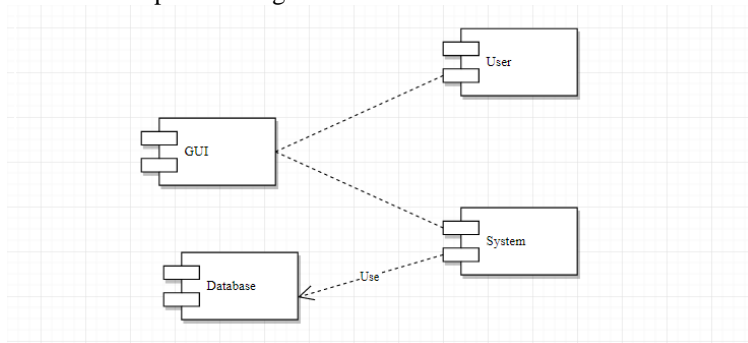
### 3.2 Diagrams



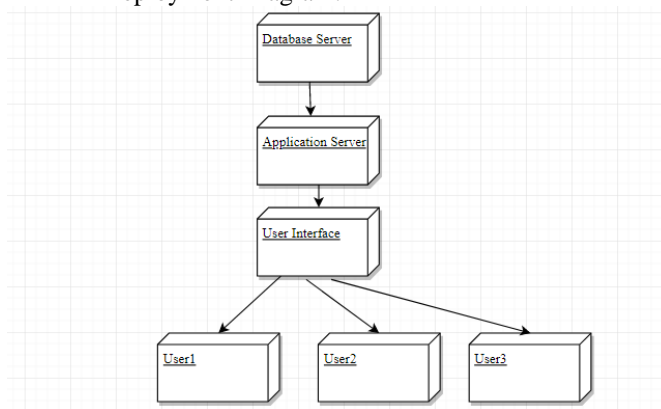
Package Diagram: We build the Layered Architecture using the three Packages.



Component Diagram:

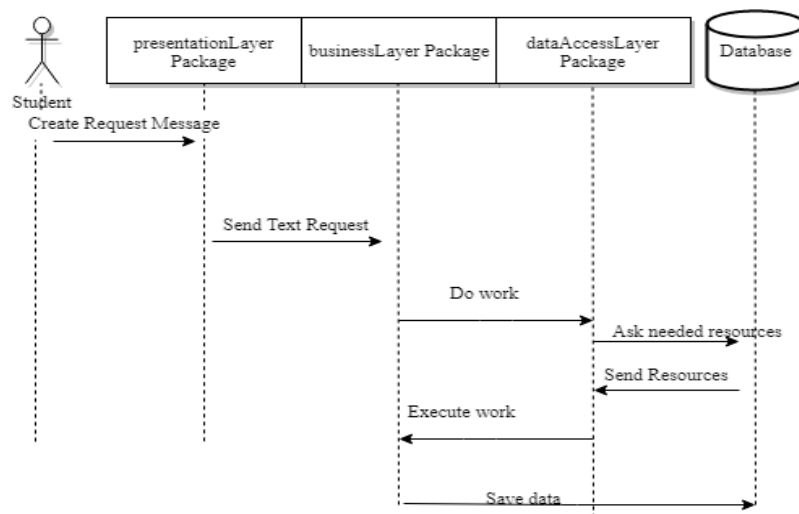


Deployment Diagram:



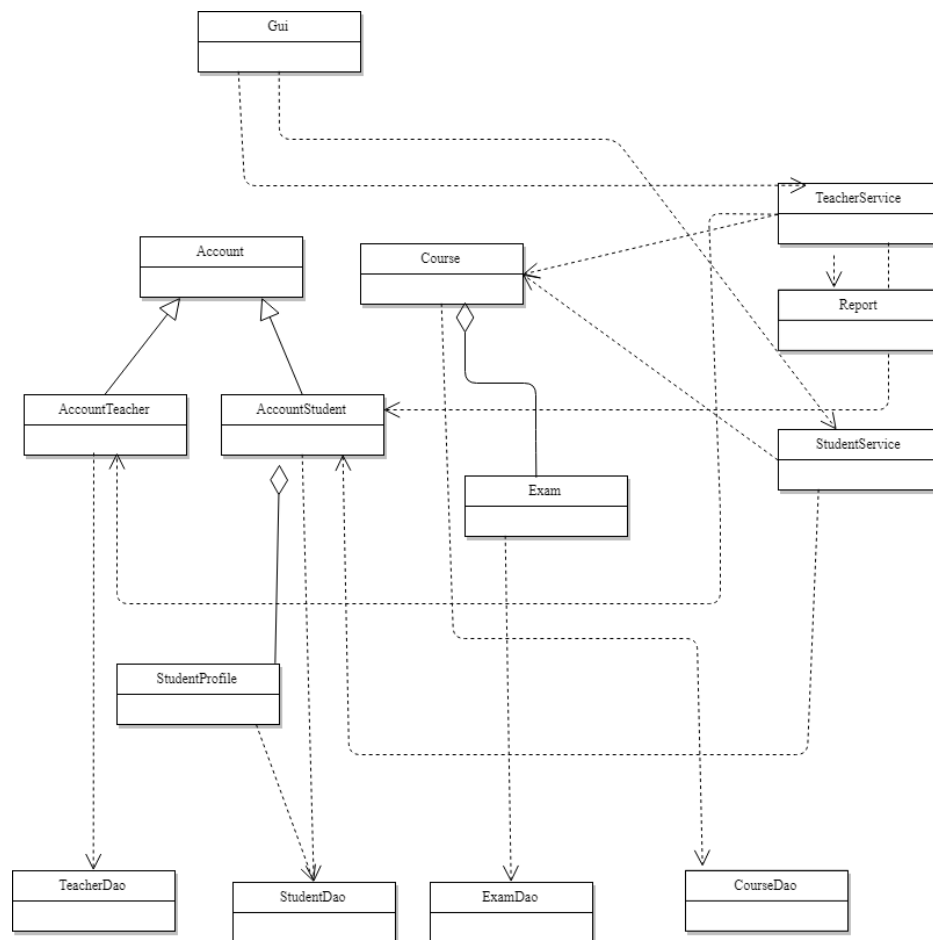
## 4. UML Sequence Diagrams

Update Personal Information



## 5. Class Design

## 5.1 UML Class Diagram



## 6.Data Model

A data model consists of three different phases.

Structural part: Consisting a set of rules

Manipulating part: Types of operations allowed, such as updating, retrieving, and changing the database.

Integrity part: Validate the accuracy of data.

## 7. System Testing

I will test the application using the JUnit framework.

JUnit is an open source framework designed by [Kent Beck, Erich Gamma](#) for the purpose of writing and running test cases for java programs. In the case of web applications JUnit is used to test the application without server. This framework builds a relationship between development and testing process.

## 8. Bibliography

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