UTCN
Computer Science Department
Software Design 2023

FINAL PROJECT & ASSIGNMENT A3

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- **Objective**

[A3] The objective of this assignment is to allow students to become familiar with Common Design Patterns.
[Project] The objective of the project is to learn MVC design & implementation, or Layered architecture pattern.

- **Application Description**

Use JAVA Spring/C# Web API to design and implement a MVC/Layered application of your choice. At the minimum the application should have the following:

  - [Project] Two types of users (Administrator, Normal User). Administrator can CRUD on elevated entities while Normal Users can do the normal activities.
  - [Project] Business domain must contain at least 3 entities besides users & admins.
  - [Assignment] Implement Observable Pattern to send notifications. Upon an important event in your project (such as billing report generated); a notification must be sent (Observer). The event should have two observers: one that writes the data to a log event file and one that sends the event via email. The two subscribers must be implemented as Separate Observers and the Notification as a Subject (https://www.dofactory.com/net/observer-design-pattern)
  - [Assignment] For a complex business logic flow implement a behavioral pattern of your choice from the list: Chain Of Responsibility, Strategy, State, Command, Visitor, etc.
  - [Assignment] For a complex business logic flow implement a set of unit tests for the happy flow and edge scenarios.

- **Application Constraints for Project**

  - The data will be stored in a database.
  - Use the MVC/Layered architectural pattern to organize your application. For this assignment we will create only the backend part (Model, Controller, Services and Repositories).
  - API design should be RESTful.

- Use ORM (Hibernate / Entity framework) to access the database
- Use dependency injection to inject Services in Controllers and Repositories in Services
- Install and use Swagger / Postman to call your APIs.
- Connection string should be stored in a separate config file

- **Requirements**

Project

- Create the analysis and design document – already discussed
- Implement and test the application.

Assignment A3

- Create the analysis and design document (see the template).
- Implement and test the application.

- **Deliverables**
  - GIT/TFS link with:
    - Analysis and design document.
    - Source files.
    - SQL script for creating and populating the database with initial values.
- **Deadline – Weeks 9 & 12**
- **Grading:**

Project documentation – already discussed
Project code:

4 points	Correct & complete database & entity model
1 points	Correct usage of response codes (200,400,500) No magic strings Proper design of JSON Payloads when calling Rest APIs (use of ids and not strings) Other best practices already discussed
4 points	Solution Complexity
1 point	Default

Assignment documentation – already discussed
Assignment code:

4 points	Implementation of Observer Pattern
3 points	Implementation of Behavior Pattern

2 points	Unit tests
1 point	Default