# Spring Advanced

# Individual Project Assignment

This is the Individual Project Assignment for the [Spring Advanced Course @ SoftUni.](https://softuni.bg/trainings/4236/spring-advanced-october-2023)

## General Requirements

Your Web application should use the following technologies, frameworks, and development techniques:

* The application must be implemented using **Spring Framework**.
  + The application must have at least **12 web pages** (views/components).
  + The application must have at least **5 independent entity models**.
  + The application must have at least **5 controllers**.
  + The application must have at least **5 services**.
  + The application must have at least **5 repositories**.
* Use **Thymeleaf** template engine **or** make the **Front-End** using **JavaScript**,   
  **consuming** **REST services** from a **Web API**.
* Use **MySQL / Oracle / PostgreSQL / MariaDB** as a **database**.
* Use **Spring Data** to access your database.
  + Use **Hibernate** or any other provider as a **JPA implementation**.
* Implement **Responsive Web Page Design** based on **Bootstrap / Google Material Design**.
* Use the standard **Spring Security** for managing **users** and **roles**.
  + Your **registered** users should have at least **these** **roles**: **user** and **administrator**.
  + User **roles** should be **manageable** from the application.
  + Make sure the **role management** is **secured** and **error-safe**.
  + ***\*Only for retake exam – Users and administrators should be able to edit their usernames.***
* Use **Fetch** to asynchronously **load** and **display data** somewhere in your application.
* Writetests **(Unit & Integration)** for your **logic**, **services**, **repository query methods**, **helpers**, etc.
  + You should have at least **60% coverage** on your **business logic**. **(Line Coverage)** **/ \**for retake exam 70% coverage.***
* Implement **Error Handling** and **Data Validation** to avoid **crashes** when **invalid data** is entered   
  (both **client-side** and **server-side**).
  + When validating data, show appropriate messages to the user
* **Use at least 1 Interceptor. / \**for retake exam use at least 2 Interceptors.***
* **Schedule jobs that impact the whole application running e.g. once/twice a day.**
* **Use ModelМapper or another mapping library.**

*\**For retake exam 3 general requirements are different:

*-* ***Users and administrators should be able to edit their usernames.***

*- You should have at least* ***70% coverage*** *on your* ***business logic****.*

*-* ***Use at least 2 Interceptors.***

## Online Project Defense

Each student will have to deliver an **online defense** of their work in front of a trainer jury.   
Students will have **only 20 minutes** for the following:

* **Demonstrate** how the application works (very shortly).
* Show the **source code** and explain how it works.
* Answer the jury's **questions**

Please be **strict in the timing**! On the **20th** minute, you **will be interrupted**!

Be **well prepared** for **presenting the maximum** of **your work** for the **minimum time**.

## Assessment Criteria

**General Requirements – 70%**

* **Functionality** – **0…20**
* **Implementing controllers correctly** (controllers should only do their work) **– 0...5**
* **Implementing views correctly** (using the display and editor templates) **– 0…5**
* **Testing** (unit test and integration tests for some of the controllers using mocking) **– 0…10**
* **Security** (prevent SQL injection, XSS, CSRF, parameter tampering, etc.) **– 0…5**
* **Data validation** (validation in the models and input models) **– 0…10**
* **Using model mapper and inversion of control – 0…5**
* **Using layers with multiple layouts – 0…10**
* **Code quality** (well-structured code, following the MVC pattern, following SOLID principles, etc.) – **0…10**

**Answering Questions – 30 %**

Answer questions about potential functionality outside the scope of the project.

**Bonuses – up to 15 %**

* **Use Spring Event somewhere in your application.**
* **Implement one or more Advice (AOP).**
* **Implement HATEOAS.**
* **Using Spring WebFlux.**
* **Using Apache Kafka.**
* Using **Angular/React/Vue** for Front-End
* Host the application in a **cloud environment**.
* Use a **file storage cloud API**, e.g., **Cloudinary**, **Dropbox**, **Google Drive,** or others for storing the files.
* Implement **Microservice architecture** in your application.
* **Anything** that is **not described** in the assignment is a bonus **if it has some practical use**.

## Submission Deadline

* You **must** submit your project before 23:59 on the **17-Nov-2023** using a survey that will show up on the **13-Nov-2023**.
* A presentation schedule will be available on **7-Dec-2023** and will include only the projects that were **submitted beforehand**. Non-submitted projects will **NOT** be evaluated.

## Additional Requirements

* Follow the **best practices** for **Object-Oriented design** and **high-quality code** for the **Web application**:
  + Use **data encapsulation**.
  + Use **exception handling** properly.
  + Use **inheritance**, **abstraction,** and **polymorphism** properly.
  + Follow the **principles** of **strong cohesion** and **loose coupling**.
  + Correctly **format** and **structure** your **code**, name your **identifiers** and make the code **readable**.
  + Follow the concept of **thin controllers**.
* Well looking **user interface** (**UI**).
* Gooduserexperience (**UX**).
* Use a **source control system** by choice, e.g. **GitHub**, **BitBucket**.
  + Submit a link to your public source code repository.

## Project Challenge

The **best three projects** will win a discount for the next course or module:

* First place – 80% discount voucher
* Second place – 50% discount voucher
* Third place – 30% discount voucher

The ranking of the projects is done **based only on the submitted project** (it does not include the assessment of the

theoretical exam). The voucher could be used for **one course or one module in the open or the professional**

**program at SoftUni**. It **cannot be divided** into parts or **given to another person**. The voucher is valid for **one year**

after the announcement of the winners.