

Design of Software Systems

Assignment 6

Deadline: 09.01.2026, 20:00:00

Task (30 Points)

For Assignment 6 we ask you to work on a small software project in groups of 1-2 students¹. Implement a full-stack **Spring Boot** service for an application domain of your choice. You are free to choose a specific application domain² related to, e.g., your personal interests and hobbies (e.g., sports, movies, or music), daily life (e.g., travel or shopping), work, or your studies.

Your domain model should comprise **at least four different classes** (entities), each involved in **at least a one-to-one or a one-to-many association**. Overall, your domain model should include **at least a one-to-one and a one-to-many association**.

Your application should provide the **basic CRUD** operations for managing the entities of your chosen domain and **at least three methods** that implement business logic beyond simple CRUD operations, which can be called from the user interface. Examples of business logic include automatically computing values for attributes of entities, aggregating multiple values from one or more entities into a single value or entity, or checking a domain-specific business rule and handling its violation (e.g., by showing an explanatory notification to the user). These methods implementing business logic should also be adequately tested with **Unit tests**.

The persistence should be implemented using Spring Data JPA and an in-memory H2 database (as demonstrated in lecture 10). Vaadin should be used to implement a web-based user interface. In addition, you should provide a **REST interface** to interact with your application via HTTP. You can find a suggested package structure for your project in the lecture slides (lecture 10, slide no. 33). You can use Lombok annotations to reduce boilerplate code in your implementation.

Provide a documentation (as PDF, max. 4 pages) of your project explaining the UI (with screenshots), the model classes (with an automatically generated UML implementation diagram), details about the persistence (entities, tables) and about the REST interface, and choice of Unit tests. Please also elaborate on the chosen domain and the implemented business logic. Describe an example workflow of a user interacting with your application. Provide a brief discussion of difficulties that you had and give an overview of the work distribution (i.e., who in your team was responsible for what). Please ensure that the workload is distributed equally among the team members.

¹ Please sign up in groups for “Assignment 6” using Canvas in your exercise group under the “People” – “Groups” tab. Note that you have to be in the same exercise group in Canvas to work together.

² Please align your choice of a concrete application domain with your tutors.

Hand-in Instructions

By the deadline indicated on the top of this assignment sheet, hand in your solution to the task as complete, self-contained, executable Java project (including the pom.xml) compressed in one zip file via “Assignment 6” in the Assignments tab in the Canvas course. Add the PDF file with your documentation to the root of the zip folder. One upload per group is sufficient. Please also add a **signed declaration of self-authorship (Eigenständigkeitserklärung)** including your names, place and date as PDF file to the zip file. You can find the official HSG template in [StudentWeb](#).