CS544 EA Project– September 2021

Goal

The goal of this project is to give you hands-on, practical experience with building a RESTful web services system using Spring, Spring Boot, Spring MVC, Spring Data and JPA/Hibernate.

Working as a team

You are required to work with your team to create a project. But you should be aware that everyone still must give their own presentation; there are no "team" presentations, although I do ask that members of a team to present consecutively (no gaps / other people in between). You need to work together and share responsibilities and workload.

Appointment System

We are trying to create a RESTful web services application (you only need to write the backend part of it; no UI is necessary) to automate the process of making appointments. For example, students can create, update, view and cancel (CRUD operations) their appointment reservations and TM checkers can create, update, view and delete appointments. Admins have full access. Make your application generic and generalize it so that it can be used for any kind of appointment. In general, "providers" create appointments and "clients" can make reservations for those appointments (please note the difference between appointment and reservation); then the providers must go back and accept or decline those reservations. There are multiple categories of appointments, each category has a title and has a default duration. Clients /providers receive an email once an appointment has been accepted/declined and also 48 hours and an hour before the appointment.

Extra Credit

Here are some ideas for extra credit:

- Make the process of sending an email asynchronous. Use a message queue and a DB table to log messages.
- Send an email reminder 48 hours and 1 hour prior to an appointment. Requires scheduled tasks.
- See if you can create a security and gateway for your system. JWT is a good method.
- Create an automated pipeline for CI/CD (continuous integration/continuous delivery)
- Deploy to cloud. I will provide a tutorial for VMware Tanzu over Azure.

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Step 1 – Requirements (Domain Driven Design)

Create a UML class diagram of the domain based on the concepts below

- An **Appointment** has an id, date and time, location, provider (e.g., PTM checker providing the appointment) and list of reservations associated with it.
- A **Reservation** has an id, status (PENDING, ACCEPTED or DECLINED), date and time and a client (person requesting the reservation). There could be multiple reservations made for the same appointment, but only one of them could be in "ACCEPTED" status.
- A **User** has an id, first name, last name, email address and gender
- A **UserRole** has an id, userId and user role. A user can have multiple roles.

Step 2 - Architectural Analysis and Design

Sit with your team and agree on a high-level architecture for your application. Your decision should include your choice of technologies. How do you secure the application?

Step 3 – Proof of Concept (POC)

Choose one simple use-case and make sure it works end to end. For example, login for one type of user.

Step 4 – Divide and Conquer

Carefully read the requirements and divide the tasks (use-cases) among team members. Each team member is responsible for designing, developing, and testing his/her use-case.

Step 5 – Integration Testing

At least once a day sit together and integrate your code and test together and iterate (correct mistakes and refactor your design and development).

Presentation Delivery

I will schedule your presentations from 9:30-12:30 and 1:30 – 4:30 on Thursday. You will have to present individually. Each group will have one hour, which means each member of the group gets to present for about 9 minutes.

I will evaluate you based on the following factors:

1. Clarity of Speech – Your presentation should be coherent and understandable. It is ok if you have an accent. It is ok if your English is not as fluent as a native speaker. However, it is not ok if you talk too fast! Enunciate and speak clearly.
2. Knowledge of Your Application – You are expected to be knowledgeable about the overall design of your app
3. Ability to Answer Questions – You need to be able to answer questions about the design and coding of your app. It always shows when your team members have done all the work and you have been mostly observing. Try to be an active participant and you will get full grade for this category.
4. Working Demo – Your app needs to work (obviously!). So, if you succeed to show me working features, you will get maximum grade.
5. Creativity – Your whole team will get the same grade on creativity. You will be evaluated based on your creative choice of technologies you have used in your application.