EA Project Description – June 2020

Goal

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

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 present consecutively (no gaps / other people in between). You need to work together and share responsibilities and workload.

Airline Reservation System

We are trying to create a RESTful application (you only need to write the backend part of it; no UI is necessary) for an "Airline Reservation System".

Extra Credit

Here are some ideas for extra credit:

- Make the process of sending an email asynchronous. Use a JMS message queue or a DB table
- Send an email reminder 24 hours prior to the first flight in a reservation
- See if you can Spring Security using JWT using a ***separate*** security service
- Create an automated pipeline for CI/CD (continuous integration/continuous delivery)

Step 1 – Requirements (Domain Driven Design)

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

- An **Airline** has an id, code ("UA"), name ("United Airlines") and history (history is a maximum of 2000 characters and is saved in a separate table in database)
- An **Airport** has an id, a three-letter code (e.g. CID), name ("Eastern Iowa Airport") and **Address**
- An **Address** has an id, street, city, state and zip code
- A **Flight** has an id, number ("1248"), capacity (number of seats), belongs to an Airline and is between a departure Airport and an arrival airport. Also, has a departure & arrival time.
- A **Passenger** has an id, first name, last name, date of birth, email address and residence address
- A **Reservation** connects a passenger to multiple flights to get the passenger from point A to B
- A **Ticket** has an id, number (twenty-digit number), reservation code (6 character alphanumeric), flight date and connects a passenger to a single flight.
- Use a surrogate id for all entities.

EA Project Description – June 2020

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 5 minutes and I get to ask questions for a couple of more 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. All layers and all use-cases, not just yours.
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.
6. Extra credit – you can get up to 10% of extra credit based on how well you design your application and how well you integrate it.

EA Project Description – June 2020

Use-cases

There are three main actors (user roles). Passenger, agent and admin.

- Passengers can:
  - View list of airports
  - View list of airlines flying out of an airport (search by airport three letter code)
  - View list of flights between a departure and destination for a date
  - View list of own reservations
  - View details of a reservation (flights, departure times, etc.)
  - Make a reservation (note: payload will be a list of flights)
  - Cancel a reservation
  - Confirm and purchase a reservation. This will result in multiple tickets (one for each flight in the reservation)
- Agents (this role is optional and extra credit):
  - View list of airports
  - View list of airlines flying out of an airport (search by airport three letter code)
  - View list of flights between a departure and destination for a date
  - View list of passengers and reservations made for them ***"by this agent"***
  - View details of a reservation (flights, departure times, etc.) – only if done by this agent
  - Make a reservation (note: payload will be a list of flights)
  - Cancel a reservation
  - Confirm and purchase a reservation. This will result in multiple tickets (one for each flight in the reservation)
- Admins
  - Can perform CRUD operations on all resources

You can choose to use the common-base-module framework or not. You should feel free to expand and change the framework if you like.