

Internet Application Design and Implementation – 2022/2023

MidTerm Test

October 21, 2022

Notes: The test is closed book and has a duration of 1h30m. You may bring 2 handwritten A4 pages. There are 5 open answer questions that should be answered in the provided answer sheets. Open answers are awarded 4 points each. Do not unstaple the questions. You may use a pencil.

Version: Open Answers

Name: _____ Number: _____

Part 1

Q-1 [4 pts] Describe the different elements of a software framework justify the advantages of using a framework with relation to ad-hoc methods to develop Internet applications. Use the example of layered architectures and SpringBoot to illustrate your answer.

Q-2 [4 pts] Consider the following JPA Entities.

```
@Entity data class StudyRoom(@Id val id:Long, val name:String, @OneToMany val appointments:List<Appointment>)  
  
@Entity data class Appointment(@Id val id:Long, val startDate:Date, val endDate: Date,  
                                @ManyToOne val room:StudyRoom, @ManyToOne val user:User)  
  
@Entity data class User (@Id val id:Long, val name:String)
```

Complete the most efficient query in the annotation of the repository's method

```
@Query(...)  
fun findByRoomAndDate(...):List<Appointment>
```

to implement the request below (using the httpie syntax):

```
http GET :8080/studyrooms/{id}/appointments?startdate="2021-11-10"&enddate="2021-11-21"
```

Complete the repository's method signature also.

Part 2

System Description: Consider a system for the management of printing requests on a 3D Printing Farm. The users of the 3D Printing Farm are either clients or technicians of the 3D Printing Farm. When a client accesses the 3D Printing Farm a printing request is submitted in the system, and the client can edit their printing requests. A printing request consists of a description, a set of files, and a date. The statuses of a printing request can be "created", "started", "completed", and "dispatched". clients can always see their own printing requests, and not anyone elses. They can only edit their own printing requests, and while the status has value "created". Once in status "started", they are no longer editable. The technicians of the 3D Printing Farm can only give a printing request the state "dispatched" when they have the status "completed". The main resource here is a printing request request.

The system described above is the development context for all questions below.

Q-3 [4 pts] Define a RESTful interface, Level 2 in the Richardson maturity scale, that defines the operations on the available printing requests to both clients and technicians. List all the endpoints by means of a Kotlin interface using data classes for DTO objects. No swagger annotations are needed. Remember to use different levels of detail in different endpoints.

Q-4 [4 pts] Define the JPA (data) classes for the system described above and relate them correctly using JPA annotations.

Q-5 [4 pts] Define two security policies, annotations, and corresponding services that regulate the access for reading, and also for changing the status of printing requests in the scenario above.