Assignment #3

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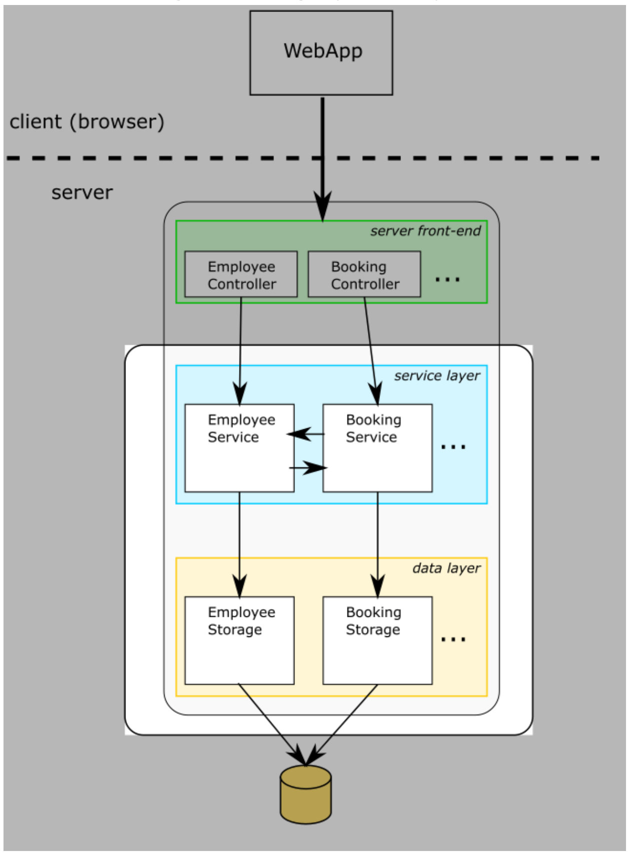
1 Booking System

You are going to work on a skeleton of a simple booking system. The idea is for customers to book appointments with an employee. The overview of the system is illustrated below. For now, we ignore the greyed-out parts.



1.1 The Repository

The project can be found at the following location: https://github.com/mvdk-cph/test2020fall-BookingSystem

1.2 The Database

Data is stored in a MySQL database with the following tables:

Listing 1: Customers table

```
create table Customers (
        ID int not null auto_increment,
        Firstname varchar(255) not null,
        lastname varchar(255),
        birthdate date,
        PRIMARY KEY (ID)
)
```

Listing 2: Employees table

```
create table Employees (
        ID int not null auto_increment,
        firstname varchar(255) not null,
        lastname varchar(255) not null,
        birthdate date, PRIMARY KEY (ID)
)
```

Listing 3: Bookings table

```
create table Bookings (
        ID int not null auto_increment,
        customerId int not null,
        employeeId int not null,
        date Date not null,
        start Time not null,
        end Time not null,
        primary key (ID),
        foreign key (customerId) references Customers(ID) on delete cascade,
        foreign key (employeeId) references Employees(ID) on delete cascade
)
```

1.2.1 Running the MySQL server

If you don't want to pollute your workstation with a MySql server installation, you can easily run mysql in a docker container. That can be achieved by running the following command.

```
docker run -d --rm \
   --name mysql-test-db \
   -e MYSQL_ROOT_PASSWORD=testuser123 \
   -p 3307:3306 mysql
```

You are welcome to come up with a better and easier way to run the SQL server. For example, you could look into testcontainers (https://www.testcontainers.org).

1.3 Task 1: Acquire the System

Get the booking system. Create the database. Create the tables by running the scripts above (in the repository, they are located under src/main/resources/db/migration/ *.sql).

For the rest of the tasks, you have to imagine that this system is now in production, and the tables are filled with data.

1.4 Task 2: Implement Requirements

R1: It must be possible to create customers, employees and bookings.

R2: A customer may have a phone number (this change requires a database migration script).

R3: When booking an appointment with a customer, an SMS must be sent[1].

Remember, because the system is already deployed in production (as we imagine), the tables are already filled with data. This should be taken into account when adding a phone number column: It must be added as a new migration script.

[1] we only have the interface to the SMS service – imagine it's being developed elsewhere. But the behavior of calling the sms service must be verified in a unit test.

Implement the following, with unit tests and integration tests:

Data layer

1. Create BookingStorage[1] and BookingStorageImpl[2] with methods
    - int createBooking(Booking booking)[3]
    - Collection<Booking> getBookingsForCustomer(int customerId)
2. Create EmployeeStorage and EmployeeStorageImpl with methods
    - int createEmployee(Employee employee)[4]
    - Collection<Employee> getEmployeeWithId(int employeeId)

Service layer

1. Create BookingService and BookingServiceImpl with methods
    - int createBooking(customerId, employeeId, date, start, end)
    - Collection<Booking> getBookingsForCustomer(customerId)
    - Collection<Booking> getBookingsForEmployee(employeeId)
2. Create EmployeeService and EmployeeServiceImpl with methods
    - int createEmployee(employee)
    - Employee getEmployeeById(employeeId)

2 HAND-IN

May be done in groups. It's a good opportunity to try out pair programming. Hand-in on the date given in peergrade. The hand-in should be code in a repository or zip-file, and a README.md with the written answers.

[1] interface
[2] implementation
[3] returns id of new booking
[4] returns id of new employee