FWA

Java Servlet API

Summary:
In this project you will develop your First Web Application using standard Java technologies

Version: 1.00

Contents

Chapter I

Preamble

- 200 - no worries, everything is fine
- 400 - you did not meet server's expectations
- 403 - you entered a wrong area
- 404 - a server did not meet your expectations
- 500 - Congratulations! You have broken the server.
- 504 - Have you seen Hachiko movie?

Chapter II

General Rules

- Use this page as the only reference. Do not listen to any rumors and speculations about how to prepare your solution.
- You mus use the latest LTS version of Java. Make sure that compiler and interpreter of this version are installed on your machine.
- You must use GraalVM to run your code.
- You can use IDE to write and debug the source code (we recommend IntelliJ Idea).
- The code is read more often than written. Read carefully the document where code formatting rules are given. When performing each exercise, make sure you follow the generally accepted Oracle standards
- Pay attention to the permissions of your files and directories.
- To be assessed, your solution must be in your GIT repository.
- You should not leave in your directory any other file than those explicitly specified by the exercise instructions. It is recommended that you modify your .gitignore to avoid accidents.
- When you need to get precise output in your programs, it is forbidden to display a precalculated output instead of performing the exercise correctly.
- Have a question? Ask your neighbor on the right. Otherwise, try with your neighbor on the left.
- Your reference manual: mates / Internet / Google. And one more thing. There's an answer to any question you may have on Stackoverflow. Learn how to ask questions correctly.
- Read the examples carefully. They may require things that are not otherwise specified in the subject.
- Use "System.out" for output
- And may the Force be with you!
- Never leave that till tomorrow which you can do today ;)

Chapter III

Rules of the project

- Implemented solutions should enable creating a `WAR` archive using `maven` package command. Such archive shall be deployed in `Tomcat`.
- In this project, the use of `Spring MVC` and `Hibernate` components is prohibited (repository layer shall be implemented using `JdbcTemplate`).
- For each task, you will need to create a `README.txt` file with instructions on how to deploy and use your application.
- For each task, you shall attach schema.sql and data.sql files where you describe a schema of a database being created and test data, respectively.
- You can add custom classes and files to each of the projects without breaking the overall suggested structure:

```
Cinema
├── src
│   └── main
│       ├── java
│       │   └── fr.42.cinema
│       │       ├── config
│       │       ├── services
│       │       ├── models
│       │       ├── repositories
│       │       ├── servlets
│       │       ├── listeners
│       │       └── filters
│       ├── resources
│       │   └── sql
│       │       ├── schema.sql
│       │       └── data.sql
│       └── webapp
│           └── WEB-INF
│               ├── application.propreties
│               ├── web.xml
│               ├── html
│               └── jsp
├── pom.xml
└── README.txt
```

Chapter IV

Exercice 00: Welcome To Servlets

	Exercise 00
First Web Application	
Turn-in directory : *ex*00/	
Files to turn in : `Cinema-folder`	
Allowed functions : `n/a`	

You need to develop a web application prototype using `Java Servlet API` stack. The application will automate the booking business process of a movie theater later on.

Now you will develop an `MVP` application to partially implement registration and authentication mechanisms. Thus, your web application should provide `HTML` registration and authentication pages in response to `/signIn` and `/signUp` `URL` requests, respectively.

When registering, a user specifies the following data:

- first name
- last name
- phone number
- password

All data should go to `SignUp` servlet in a `POST` request using `<form> HTML tag`. The information is stored in a database, while the password shall be encrypted using `BCrypt` algorithm.

When a `POST` request is sent to `SignIn` servlet with an email and a password, a check is performed if a corresponding user exists in the database, as well as their password is correct. If the check is successful, an `HttpSession` object with user attribute shall be generated (attribute's value is an object containing current user data). The user will be redirected to a blank profile page. In case of a failed authentication, user should be redirected back to the login page.

Technical requirements:

Application's Spring context should be a separate configuration class (see `Spring Java Config`) accessible to all servlets via `ServletContextListener`.

In this configuration, you shall specify .bin files to connect to the database (`DataSource`) and encrypt passwords (`PasswordEncoder`), as well as for all services and repositories.

Data for connecting to the database shall be available in application.properties.

Here is an example of the use of this configuration in a servlet:

```
@WebServlet("/users")
public class UsersServlet extends HttpServlet {

   private UsersService usersService;

   @Override
   public void init(ServletConfig config) throws ServletException {
      ServletContext context = config.getServletContext();
      ApplicationContext springContext = (ApplicationContext) context.getAttribute("springContext");
      this.usersService = springContext.getBean(UsersService.class);
   }

   ...
}
```

Chapter V

Exercice 01: Authentication

	Exercise 01
Authentication	
Turn-in directory : *ex*01/	
Files to turn in : `Cinema-folder`	
Allowed functions : `n/a`	

Let us expand the functionality of our application by providing an authorization mechanism. You know from the previous task that for authenticated users there is a session that has user attribute with the specified value. You shall provide profile page access (the one with a single `<h1>Profile</h1>` tag) only to authenticated users.

Since security rules within our application will expand, it makes sense to create a `Filter` that can handle any incoming requests. This filter will check for presence of the attribute in the current session. If the attribute is found, access to the requested resource (`/profile` in our case) shall be provided.

Pages for `/signUp` and `/signIn` URLs may be retrieved for unauthorized requests. If the attribute is present, a user shall be redirected to `/profile` page. Also, in case of an unauthorized request of a page that requires an attribute, you shall return `403 (FORBIDDEN)` status.

Chapter VI

Exercice 01 : JSP

	Exercise 01
JSP	
Turn-in directory : *ex*01/	
Files to turn in : `Cinema-folder`	
Allowed functions : `n/a`	

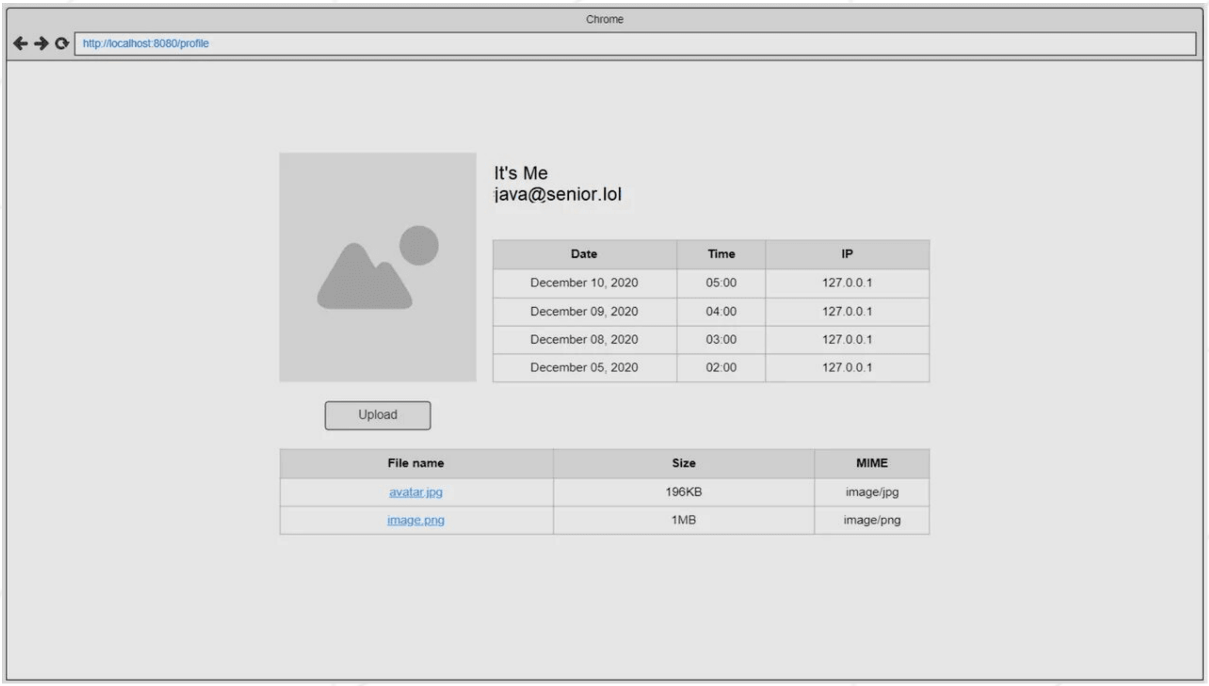
Now you need to implement your profile page as a `JSP` file. The page shall display the following current user data:

- First name
- Last name
- email

Information about the date/time/IP address of all user authentications as a list shall also be displayed on this page.

In addition, the page shall have a user's "avatar" loading functionality. To implement that, you shall provide for processing a `POST` request to `/images` URL. The uploaded image shall be saved to disk. Since users can upload images in identical files, you shall ensure the uniqueness of file names on the disk.

All uploaded images with their original names shall be available as a list of links. When a user clicks on the link, the image shall be opened in a new tab. An example of a profile page interface is shown below:



It's Me
java@senior.lol

Date	Time	IP
December 10, 2020	05:00	127.0.0.1
December 09, 2020	04:00	127.0.0.1
December 08, 2020	03:00	127.0.0.1
December 05, 2020	02:00	127.0.0.1

File name	Size	MIME
avatar.jpg	196KB	image/jpg
image.png	1MB	image/png

Additional requirements:

- To display a list of authentications and uploaded files, you shall use corresponding `JSTL` tags.
- An uploaded image shall be available via its URL - http://host:port/app-name/images/{image-unique-name}
- In application.properties, there shall be storage.path parameter to indicate the path to the folder where uploaded files are stored.