**Source code for User Authentication:**

**Authentication application.java:**

**package** com.example.Authentication;

**import** org.springframework.boot.SpringApplication;

**import** org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication

**public** **class** AuthenticationApplication {

**public** **static** **void** main(String[] args) {

SpringApplication.*run*(AuthenticationApplication.**class**, args);

}

}

**Login controller.java:**

**package** com.example.Authentication.controllers;

**import** org.slf4j.Logger;

**import** org.slf4j.LoggerFactory;

**import** org.springframework.beans.factory.annotation.Autowired;

**import** org.springframework.stereotype.Controller;

**import** org.springframework.ui.ModelMap;

**import** org.springframework.web.bind.annotation.GetMapping;

**import** org.springframework.web.bind.annotation.PostMapping;

**import** org.springframework.web.bind.annotation.RequestParam;

**import** org.springframework.web.bind.annotation.ResponseBody;

**import** org.springframework.web.bind.annotation.RestController;

**import** com.example.Authentication.entities.User;

**import** com.example.Authentication.repositories.UserRepository;

@RestController

**public** **class** LoginController {

@Autowired

UserRepository userRepository;

@GetMapping(value="/")

**public** String showIndexPage(ModelMap model){

**return** "<html>\n"

+ "<head>\n"

+ " <style>\n"

+ " .center {\n"

+ " text-align: center;\n"

+ " }\n"

+ " \n"

+ " </style>\n"

+ "</head>\n"

+ "<body style=\"background-color:lightblue;\">\n"

+ " <div class=\"center\">\n"

+ " <h1>User Login Page</h1>\n"

+ " \n"

+ " <h2 class=\"hello-title\">Welcome</h2>\n"

+ " \n"

+ " <a href=\"/allusers\">View all users</a>\n"

+ " <br><br>\n"

+ " <form method=\"get\" action=\"login\">\n"

+ " <br><h3>Login below:</h3>\n"

+ " <input type=\"text\" id=\"name\" name=\"name\" placeholder=\"Name\" required>\n"

+ " <input type=\"text\" id=\"email\" name=\"email\" placeholder=\"Email\" required>\n"

+ " <input type=\"text\" id=\"password\" name=\"password\" placeholder=\"Password\" required> \n"

+ " <input type=\"submit\" value=\"Enter\" />\n"

+ " </form>"

+ " </div>\n"

+ "</body>\n"

+ "</html>";

}

@GetMapping("/login")

**public** String showLogin(@RequestParam("name") String name, @RequestParam("email") String email, @RequestParam("password") String password, ModelMap map) {

User u = **new** User(name,email,password);

userRepository.save(u);

**return** "<html>\n"

+ "<head>\n"

+ " <style>\n"

+ " .center {\n"

+ " text-align: center;\n"

+ " }\n"

+ " \n"

+ " </style>\n"

+ "</head>\n"

+ "<body style=\"background-color:lightblue;\">\n"

+ " <div class=\"center\">\n"

+ " <h1>Logged In</h1>\n"

+ " \n"

+ " <h2 class=\"hello-title\">Successfully Added Your Information</h2>\n"

+ " </div>\n"

+ "</body>\n"

+ "</html>";

}

@GetMapping("/allusers")

**public** @ResponseBody String getAllFeedbacks() {

// This returns a JSON or XML with the Feedbacks

Iterable<User> allUser = userRepository.findAll();

**return** "<html>\n"

+ "<head>\n"

+ " <style>\n"

+ " .center {\n"

+ " text-align: center;\n"

+ " }\n"

+ " \n"

+ " </style>\n"

+ "</head>\n"

+ "<body style=\"background-color:lightblue;\">\n"

+ " <div class=\"center\">\n"

+ "<h1>Users table</h1>\n"

+ allUser.toString()

+ " </div>\n"

+ "</body>\n"

+ "</html>";

}

@PostMapping("/login")

**public** String submitLogin(@RequestParam String username, @RequestParam String password){

//**TODO**:

**return** "Success";

}

}

**User.java:**

**package** com.example.Authentication.entities;

**import** javax.persistence.Entity;

**import** javax.persistence.GeneratedValue;

**import** javax.persistence.GenerationType;

**import** javax.persistence.Id;

@Entity // This tells Hibernate to make a table out of this class

**public** **class** User {

@Id

@GeneratedValue(strategy=GenerationType.***IDENTITY***)

**private** Integer id;

**private** String name;

**private** String email;

**private** String password;

**public** User()

{

}

**public** User(String name, String email, String password) {

**this**.name = name;

**this**.email = email;

**this**.password = password;

}

**public** String getPassword() {

**return** password;

}

**public** **void** setPassword(String password) {

**this**.password = password;

}

**public** Integer getId() {

**return** id;

}

**public** **void** setId(Integer id) {

**this**.id = id;

}

**public** String getName() {

**return** name;

}

**public** **void** setName(String name) {

**this**.name = name;

}

**public** String getEmail() {

**return** email;

}

**public** **void** setEmail(String email) {

**this**.email = email;

}

@Override

**public** String toString() {

**return**(

"<style>\n" +

"table {\n" +

" font-family: Arial, Helvetica, sans-serif;\n" +

" border-collapse: collapse;\n" +

" width: 100%;\n" +

"}\n" +

"\n" +

"table td, table th {\n" +

" border: 1px solid #ddd;\n" +

" padding: 8px;\n" +

"}\n" +

"\n" +

"table tr:nth-child(even){background-color: #f2f2f2;}\n" +

"\n" +

"table tr:hover {background-color: #ddd;}\n" +

"\n" +

"table th {\n" +

" padding-top: 12px;\n" +

" padding-bottom: 12px;\n" +

" text-align: left;\n" +

" background-color: #16E2F5;\n" +

" color: white;\n" +

"}\n" +

"</style>"

+ "<table border='2' style='margin-left: auto;\n" +

" margin-right: auto;width:50%;'>"

+"<tr>"

+"<th> Id </th>"

+"<th> Name </th>"

+"<th> Email </th>"

+"<th> Password </th>"

+"</tr>"

+"<td>"+id+"</td>"

+"<td>"+name+"</td>"

+"<td>"+email+ "</td>"

+"<td>"+password+"</td>"

+"</tr>"

+"</table>");

}

}

**User not found exception.java:**

**package** com.example.Authentication.exceptions;

**public** **class** UserNotFoundException **extends** RuntimeException {

**private** **static** **final** **long** ***serialVersionUID*** = 1L;

}

**User Repository.java:**

**package** com.example.Authentication.repositories;

**import** org.springframework.data.repository.CrudRepository;

**import** com.example.Authentication.entities.User;

**public** **interface** UserRepository **extends** CrudRepository<User, Integer> {

**public** User findByName(String name);

}

**User service.java:**

**package** com.example.Authentication.services;

**import** java.util.Optional;

**import** org.springframework.beans.factory.annotation.Autowired;

**import** org.springframework.stereotype.Service;

**import** com.example.Authentication.entities.User;

**import** com.example.Authentication.exceptions.UserNotFoundException;

**import** com.example.Authentication.repositories.UserRepository;

@Service

**public** **class** UserService {

@Autowired

**private** UserRepository userRepository;

**public** Iterable<User> GetAllUsers()

{

**return** userRepository.findAll();

}

**public** User GetUserByName(String name) {

User foundUser = userRepository.findByName(name);

**return** foundUser;

}

**public** User GetUserById(**int** id) {

Optional<User> foundUser = userRepository.findById(id);

//**TODO**: we need to decide how to handle a "Not Found" condition

**if** (!foundUser.isPresent()) {

**throw** **new** UserNotFoundException();

}

**return**(foundUser.get());

}

**public** **void** UpdateUser(User usertoUpdate) {

userRepository.save(usertoUpdate);

}

}

**Authentication application tests.java:**

**package** com.example.Authentication;

**import** **static** org.junit.jupiter.api.Assertions.*assertEquals*;

**import** **static** org.junit.jupiter.api.Assertions.*assertNotEquals*;

**import** **static** org.junit.jupiter.api.Assertions.*assertNotNull*;

**import** org.junit.jupiter.api.Test;

**import** org.springframework.beans.factory.annotation.Autowired;

**import** org.springframework.boot.test.context.SpringBootTest;

**import** com.example.Authentication.entities.User;

**import** com.example.Authentication.services.UserService;

@SpringBootTest

**class** AuthenticationApplicationTests {

@Autowired

**private** UserService userService;

@Test

**void** contextLoads() {

}

@Test

**void** testServiceCall() {

Iterable<User> users = userService.GetAllUsers();

Integer count = 0;

**for**(User u: users)

count++;

*assertNotEquals*(count, 0);

}

@Test

**void** countUsers() {

Iterable<User> users = userService.GetAllUsers();

Integer count = 0;

**for**(User u: users)

count++;

*assertEquals*(count, 3);

}

@Test

**void** checkAllUsers() {

Iterable<User> users = userService.GetAllUsers();

**for**(User u: users)

*assertNotNull*(u);

}

}

**Authentication tests.java:**

**package** com.example.Authentication;

**import** com.example.Authentication.entities.User;

**import** com.example.Authentication.repositories.UserRepository;

**import** com.example.Authentication.services.UserService;

**import** org.junit.jupiter.api.Test;

**import** org.springframework.beans.factory.annotation.Autowired;

**import** org.springframework.boot.test.autoconfigure.orm.jpa.DataJpaTest;

**import** org.springframework.boot.test.autoconfigure.orm.jpa.TestEntityManager;

**import** org.springframework.boot.test.context.SpringBootTest;

**import** org.junit.jupiter.api.Assertions.\*;

**import** **static** org.junit.jupiter.api.Assertions.*assertEquals*;

**import** **static** org.junit.jupiter.api.Assertions.*assertNotNull*;

@DataJpaTest

**public** **class** AuthenticationTests {

@Autowired

**private** TestEntityManager entityManager;

@Autowired

**private** UserRepository userRepository;

@Test

**public** **void** returnUserFromName() {

User testUser = **new** User();

testUser.setName("newTest");

testUser.setEmail("test@gmail.com");

testUser.setPassword("testpw");

entityManager.persist(testUser);

entityManager.flush();

User found = userRepository.findByName(testUser.getName());

*assertEquals*(found.getName(), testUser.getName());

}

@Test

**public** **void** passwordNotNull() {

Iterable<User> users = userRepository.findAll();

**for**(User u: users)

*assertNotNull*(u.getPassword());

}

@Test

**public** **void** nameNotNull() {

Iterable<User> users = userRepository.findAll();

**for**(User u: users)

*assertNotNull*(u.getName());

}

@Test

**public** **void** emailNotNull() {

Iterable<User> users = userRepository.findAll();

**for**(User u: users)

*assertNotNull*(u.getEmail());

}

}

**Authentication web tests.java:**

**package** com.example.Authentication;

**import** com.example.Authentication.controllers.LoginController;

**import** org.junit.jupiter.api.Test;

**import** org.springframework.beans.factory.annotation.Autowired;

**import** org.springframework.boot.test.context.SpringBootTest;

**import** org.springframework.boot.web.server.LocalServerPort;

**import** org.springframework.test.web.servlet.MockMvc;

**import** org.springframework.boot.test.autoconfigure.web.servlet.AutoConfigureMockMvc;

**import** **static** org.junit.jupiter.api.Assertions.*assertEquals*;

**import** **static** org.hamcrest.Matchers.*containsString*;

**import** **static** org.springframework.test.web.servlet.request.MockMvcRequestBuilders.*get*;

**import** **static** org.springframework.test.web.servlet.result.MockMvcResultHandlers.*print*;

**import** **static** org.springframework.test.web.servlet.result.MockMvcResultMatchers.*content*;

**import** **static** org.springframework.test.web.servlet.result.MockMvcResultMatchers.*status*;

@SpringBootTest(webEnvironment = SpringBootTest.WebEnvironment.***RANDOM\_PORT***)

@AutoConfigureMockMvc

**public** **class** AuthenticationWebTests {

@LocalServerPort

**private** **int** port;

@Autowired

**private** LoginController controller;

@Autowired

**private** MockMvc mockMvc;

@Test

**public** **void** shouldReturnDefaultMessage() **throws** Exception {

**this**.mockMvc.perform(*get*("/")).andDo(*print*()).andExpect(*status*().isOk());

}

@Test

**public** **void** checkLoginPage() **throws** Exception {

**this**.mockMvc.perform(*get*("/login")).andDo(*print*()).andExpect(*status*().is4xxClientError());

}

@Test

**public** **void** checkUsersPage() **throws** Exception {

**this**.mockMvc.perform(*get*("/allusers")).andDo(*print*()).andExpect(*status*().isOk());

}

}

**Entity tests.java:**

**package** com.example.Authentication;

**import** com.example.Authentication.entities.User;

**import** com.example.Authentication.repositories.UserRepository;

**import** com.example.Authentication.services.UserService;

**import** org.junit.jupiter.api.Test;

**import** org.junit.jupiter.api.Assertions.\*;

**import** **static** org.junit.jupiter.api.Assertions.*assertEquals*;

**import** **static** org.junit.jupiter.api.Assertions.*assertNotNull*;

**public** **class** EntityTests {

@Test

**public** **void** getAndSetPassword() {

User testUser = **new** User();

testUser.setPassword("mypassword");

*assertEquals*(testUser.getPassword(),"mypassword");

}

@Test

**public** **void** getAndSetName() {

User testUser = **new** User();

testUser.setName("Mohan");

*assertEquals*(testUser.getName(),"Mohan");

}

@Test

**public** **void** getAndSetEmail() {

User testUser = **new** User();

testUser.setEmail("Mohan@gmail.com");

*assertEquals*(testUser.getEmail(),"Mohan@gmail.com");

}

@Test

**public** **void** checkToString() {

User testUser = **new** User();

*assertNotNull*(testUser.toString());

}

@Test

**public** **void** checkConstructor() {

User testUser = **new** User("Mohan","Mohan@gmail.com","123");

User checkUser = **new** User();

checkUser.setName("Mohan");

checkUser.setEmail("Mohan@gmail.com");

checkUser.setPassword("123");

*assertEquals*(testUser.getName(), checkUser.getName());

*assertEquals*(testUser.getEmail(), checkUser.getEmail());

*assertEquals*(testUser.getPassword(), checkUser.getPassword());

}

@Test

**public** **void** testDefaultConstructor() {

User testUser = **new** User();

*assertNotNull*(testUser);

}

}

**Pom.xml:**

<?xml version="1.0" encoding="UTF-8"?>

<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 https://maven.apache.org/xsd/maven-4.0.0.xsd">

<modelVersion>4.0.0</modelVersion>

<parent>

<groupId>org.springframework.boot</groupId>

<artifactId>spring-boot-starter-parent</artifactId>

<version>2.4.3</version>

<relativePath/> <!-- lookup parent from repository -->

</parent>

<groupId>com.example</groupId>

<artifactId>Authentication</artifactId>

<version>0.0.1-SNAPSHOT</version>

<name>Authentication</name>

<description>Test</description>

<properties>

<java.version>1.8</java.version>

</properties>

<dependencies>

<dependency>

<groupId>org.springframework.boot</groupId>

<artifactId>spring-boot-starter-data-jpa</artifactId>

</dependency>

<dependency>

<groupId>org.springframework.boot</groupId>

<artifactId>spring-boot-starter-web</artifactId>

</dependency>

<dependency>

<groupId>com.h2database</groupId>

<artifactId>h2</artifactId>

<scope>runtime</scope>

</dependency>

<dependency>

<groupId>mysql</groupId>

<artifactId>mysql-connector-java</artifactId>

<scope>runtime</scope>

</dependency>

<dependency>

<groupId>org.projectlombok</groupId>

<artifactId>lombok</artifactId>

<optional>true</optional>

</dependency>

<dependency>

<groupId>org.springframework.boot</groupId>

<artifactId>spring-boot-starter-test</artifactId>

<scope>test</scope>

</dependency>

<dependency>

<groupId>org.springframework.boot</groupId>

<artifactId>spring-boot-devtools</artifactId>

</dependency>

</dependencies>

<build>

<plugins>

<plugin>

<groupId>org.springframework.boot</groupId>

<artifactId>spring-boot-maven-plugin</artifactId>

<configuration>

<excludes>

<exclude>

<groupId>org.projectlombok</groupId>

<artifactId>lombok</artifactId>

</exclude>

</excludes>

</configuration>

</plugin>

</plugins>

</build>

</project>

**Error.jsp:**

<html>

<body>

<h2>Page not found</h2>

</body>

</html>

**Greeting.jsp:**

<html>

<body>

<h2>Spring Application</h2>

</body>

</html>

**Application Properties:**

spring.jpa.hibernate.ddl-auto=update

spring.datasource.url=jdbc:mysql://${MYSQL\_HOST:localhost}:3306/phase3

spring.datasource.username=root

spring.datasource.password=Mohan@4635

logging.level.org.springframework.web: DEBUG

server.port=8090

server.error.whitelabel.enabled=false