**Handling User Authentication**

**Project objective:**

Set up a standalone project to do unit testing of the user authentication class which is used in the main web application. The objective is to create a JUnit class that will test all aspects of the authentication class.

**Background of the problem statement:**

As a part of developing an ecommerce web application, a test-suite is being created to do unit testing of all backend components in the web application. This project will test the user authentication class. This project will be a standalone Java application, since Junit does not directly test servlets or web pages. We are only testing the classes that have the business logic.

**Source Code :-**

**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.project</groupId>

<artifactId>Authentication</artifactId>

<version>0.0.1-SNAPSHOT</version>

<name>Authentication</name>

<description>Demo project for Spring Boot</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-jersey</artifactId>

</dependency>

<dependency>

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

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

</dependency>

<dependency>

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

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

<scope>runtime</scope>

<optional>true</optional>

</dependency>

<dependency>

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

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

<scope>test</scope>

</dependency>

<dependency>

<groupId>org.apache.tomcat.embed</groupId>

<artifactId>tomcat-embed-jasper</artifactId>

<scope>provided</scope>

</dependency>

<dependency>

<groupId>javax.xml.bind</groupId>

<artifactId>jaxb-api</artifactId>

</dependency>

<dependency>

<groupId>org.javassist</groupId>

<artifactId>javassist</artifactId>

<version>3.25.0-GA</version>

</dependency>

<dependency>

<groupId>javax.servlet</groupId>

<artifactId>jstl</artifactId>

<version>1.2</version>

</dependency>

<dependency>

<groupId>org.projectlombok</groupId>

<artifactId>lombok-maven-plugin</artifactId>

<version>1.18.18.0</version>

<type>maven-plugin</type>

</dependency>

<dependency>

<groupId>com.h2database</groupId>

<artifactId>h2</artifactId>

<scope>runtime</scope>

</dependency>

</dependencies>

<build>

<plugins>

<plugin>

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

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

<configuration>

</configuration>

</plugin>

<plugin>

<groupId>org.projectlombok</groupId>

<artifactId>lombok-maven-plugin</artifactId>

<version>1.18.18.0</version>

</plugin>

</plugins>

</build>

</project>

**Authentication\_Application.java:-**

**package** com.project.Authentication;

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

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

**import** org.springframework.context.annotation.Import;

**import** com.project.Authentication.controllers.AuthenticationController;

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

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

**import** com.project.Authentication.services.AuthenticationService;

@SpringBootApplication

@Import({

AuthenticationController.**class**,

UserNotFoundException.**class**,

AuthenticationService.**class**,

User.**class**

})

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

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

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

}

}

**Authentication\_Controller.java:-**

package com.project.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.web.bind.annotation.GetMapping;

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

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

import com.project.Authentication.entities.User;

import com.project.Authentication.services.AuthenticationService;

@Controller

public class AuthenticationController {

Logger logger = LoggerFactory.getLogger(AuthenticationController.class);

@Autowired

AuthenticationService authService;

@GetMapping("/")

public String showGreeting() {

return "greeting";

}

@GetMapping("/Auth")

public String showLogin() {

return "authenticate";

}

@PostMapping("/Auth")

public String authenticateUser(@RequestParam("username") String username, @RequestParam("password") String pswd) {

User user = authService.GetUserByName(username);

logger.info(user.getName() + " attempted to login with " + user.getPassword());

String path = (authService.isValidPassword(pswd, user.getPassword())) ? "success" : "failure";

logger.info("The path return: " + path);

return path;

}

}

**User.java:-**

package com.project.Authentication.entities;

import javax.persistence.Column;

import javax.persistence.Entity;

import javax.persistence.GeneratedValue;

import javax.persistence.GenerationType;

import javax.persistence.Id;

import javax.persistence.Table;

import javax.validation.constraints.NotNull;

@Entity

@Table(name = "user")

public class User {

@Id

@GeneratedValue(strategy = GenerationType.AUTO)

@NotNull

private Integer id;

@Column(name = "name")

@NotNull

private String name;

@Column(name = "email")

@NotNull

private String email;

@Column(name = "password")

@NotNull

private String password;

public User() {

super();

}

public User(@NotNull String name, @NotNull String password) {

this.name = name;

this.password = password;

}

public User(@NotNull String name, @NotNull String email, @NotNull String password) {

super();

this.name = name;

this.email = email;

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;

}

public String getPassword() {

return password;

}

public void setPassword(String password) {

this.password = password;

}

@Override

public String toString() {

return "User [id=" + id + ", name=" + name + ", email=" + email + ", password=" + password + "]";

}

}

**UserNotFound\_Exception.java:-**

**package** com.project.Authentication.exceptions;

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

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

}

**Authentication\_Repository.java:-**

package com.project.Authentication.repositories;

import java.util.Optional;

import org.springframework.data.repository.CrudRepository;

import org.springframework.stereotype.Repository;

import com.project.Authentication.entities.User;

@Repository

public interface AuthenticationRepository extends CrudRepository<User, Integer> {

public Optional<User> findUserByName(String name);

}

**Authentication\_Service.java:-**

package com.project.Authentication.services;

import java.util.Optional;

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

import org.springframework.stereotype.Service;

import com.project.Authentication.entities.User;

import com.project.Authentication.exceptions.UserNotFoundException;

import com.project.Authentication.repositories.AuthenticationRepository;

@Service

public class AuthenticationService {

@Autowired

AuthenticationRepository authRepo;

public User GetUserByName(String name) {

Optional<User> found = authRepo.findUserByName(name);

if(found.isPresent()) return found.get();

else throw new UserNotFoundException();

}

public Boolean isValidPassword(String cmp, String actual) {

return ((cmp.equals(actual)) ? true : false);

}

}

**Application\_properties:-**

spring.jpa.hibernate.ddl-auto=update

spring.datasource.url=jdbc:mysql://localhost:3306/mywork

spring.datasource.username=root

spring.datasource.password=password

logging.level.org.springframework.web: DEBUG

spring.mvc.view.prefix=/WEB-INF/jsp/

spring.mvc.view.suffix=.jsp

server.port=8080

**Authenticate.jsp:-**

<%@ page language=*"java"* contentType=*"text/html; charset=ISO-8859-1"*

pageEncoding=*"ISO-8859-1"*%>

<%@ taglib prefix=*"form"* uri=*"http://www.springframework.org/tags/form"*%>

<!DOCTYPE html>

<html>

<head>

<meta charset=*"ISO-8859-1"*>

<title>Authentication Page</title>

</head>

<h2>Login Page</h2>

<body>

welcome to the authentication page

<form:form action=*"Auth"* method=*"post"* commandName=*"login"*>

<label for=*"username"*> Username:</label>

<input name=*"username"* id=*"username"* type=*"text"* placeholder=*"Username"* required/>

<label for=*"password"*>Password:</label>

<input name=*"password"* id=*"password"* type=*"password"* placholder=*"Password"* required/>

<input type=*"submit"* name=*"Submit"*/>

</form:form>

</body>

</html>

**failure.jsp:-**

<%@ page language=*"java"* contentType=*"text/html; charset=ISO-8859-1"*

pageEncoding=*"ISO-8859-1"*%>

<!DOCTYPE html>

<html>

<head>

<meta charset=*"ISO-8859-1"*>

<title>Failed Login</title>

</head>

<body>

<h1>You failed your login pal!

</h1><br/>

<a href=*"/Auth"*>Attempt Login again</a>

</body>

</html>

**greeting.jsp:-**

<%@ page language=*"java"* contentType=*"text/html; charset=ISO-8859-1"*

pageEncoding=*"ISO-8859-1"*%>

<!DOCTYPE html>

<html>

<head>

<meta charset=*"ISO-8859-1"*>

<title>Landing Page</title>

</head>

<h2>Welcome Page</h2>

<body>

you reached the landing page

<a href=*"Auth"*>Login</a>

</body>

</html>

**Success.jsp:-**

<%@ page language=*"java"* contentType=*"text/html; charset=ISO-8859-1"*

pageEncoding=*"ISO-8859-1"*%>

<!DOCTYPE html>

<html>

<head>

<meta charset=*"ISO-8859-1"*>

<title>Successful Login Page</title>

</head>

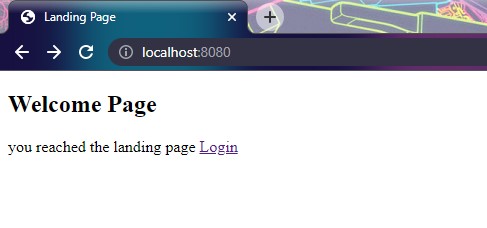
<body>

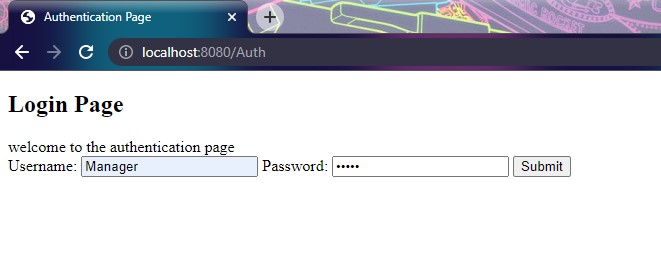
<h1>Successful Login</h1>

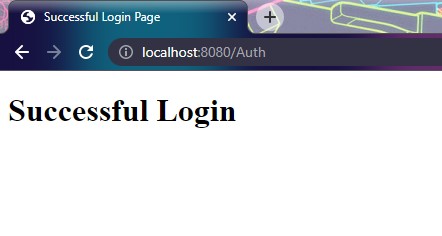
</body>

</html>

**Output :-**

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