WEEK 4 : COGNIZANT DN 4.0 FSE HANDS-ON EXERCISES

(MANDATORY PLUS ADDITIONAL)

* **Spring-rest and JWT Exercises**

**Exercise 1: Create a Spring Web Project using Maven**

**SpringLearnApplication.java**

package com.cognizant;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

import org.slf4j.Logger;

import org.slf4j.LoggerFactory;

@SpringBootApplication

public class SpringLearnApplication {

private static final Logger LOGGER = LoggerFactory.getLogger(SpringLearnApplication.class);

public static void main(String[] args) {

SpringApplication.run(SpringLearnApplication.class, args);

LOGGER.info("STARTED SpringLearnApplication");

}

}

**Sample REST Controller HelloController.java**

package com.cognizant.springlearn;

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

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

@RestController

public class HelloController {

@GetMapping("/hello")

public String sayHello() {

return "Hello from Spring Boot!";

}

}

**Output:**

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AI-generated content may be incorrect.A screenshot of a computer screen

AI-generated content may be incorrect.

**Exercise 2: Spring Core – Load Country from Spring Configuration XML**

**SpringLearnApplication.java**

package com.cognizant.springlearn;

import org.slf4j.Logger;

import org.slf4j.LoggerFactory;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

public class SpringLearnApplication {

private static final Logger LOGGER = LoggerFactory.getLogger(SpringLearnApplication.class);

public static void displayCountry() {

ApplicationContext context = new ClassPathXmlApplicationContext("country.xml");

Country country = context.getBean("country", Country.class);

// Debug Log

LOGGER.debug("Country : {}", country.toString());

// Console Output

System.out.println("Country Details:");

System.out.println("Code: " + country.getCode());

System.out.println("Name: " + country.getName());

}

public static void main(String[] args) {

displayCountry();

}

}

**Country.java**

package com.cognizant.springlearn;

import org.slf4j.Logger;

import org.slf4j.LoggerFactory;

public class Country {

private static final Logger LOGGER = LoggerFactory.getLogger(Country.class);

private String code;

private String name;

public Country() {

LOGGER.debug("Inside Country Constructor.");

}

public String getCode() {

LOGGER.debug("Inside getCode");

return code;

}

public void setCode(String code) {

LOGGER.debug("Inside setCode");

this.code = code;

}

public String getName() {

LOGGER.debug("Inside getName");

return name;

}

public void setName(String name) {

LOGGER.debug("Inside setName");

this.name = name;

}

@Override

public String toString() {

return "Country{" +

"code='" + code + '\'' +

", name='" + name + '\'' +

'}';

}

}

**Output:**

A screenshot of a computer program

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**Exercise 3: Hello World RESTful Web Service**

**SpringLearnApplication.java**

package com.cognizant.springlearn;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication

public class SpringLearnApplication {

public static void main(String[] args) {

SpringApplication.run(SpringLearnApplication.class, args);

}

}

**HelloController.java**

package com.cognizant.springlearn.controller;

import org.slf4j.Logger;

import org.slf4j.LoggerFactory;

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

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

@RestController

public class HelloController {

private static final Logger LOGGER = LoggerFactory.getLogger(HelloController.class);

@GetMapping("/hello")

public String sayHello() {

LOGGER.info("START - sayHello()");

String message = "Hello World!!";

LOGGER.info("END - sayHello()");

return message;

}

}

**Output:**

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AI-generated content may be incorrect.

**Exercise 4: REST - Country Web Service**

**SpringLearnApplication.java**

package com.cognizant.springlearn;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication

public class SpringLearnApplication {

public static void main(String[] args) {

SpringApplication.run(SpringLearnApplication.class, args);

}

}

**Country.java**

package com.cognizant.springlearn.model;

public class Country {

private String code;

private String name;

public Country() {}

public Country(String code, String name) {

this.code = code;

this.name = name;

}

public String getCode() {

return code;

}

public void setCode(String code) {

this.code = code;

}

public String getName() {

return name;

}

public void setName(String name) {

this.name = name;

}

}

**CountryController.java**

package com.cognizant.springlearn.controller;

import com.cognizant.springlearn.model.Country;

import org.slf4j.Logger;

import org.slf4j.LoggerFactory;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

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

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

@RestController

public class CountryController {

private static final Logger LOGGER = LoggerFactory.getLogger(CountryController.class);

@RequestMapping("/country")

public Country getCountryIndia() {

LOGGER.info("START - getCountryIndia()");

ApplicationContext context = new ClassPathXmlApplicationContext("country.xml");

Country country = (Country) context.getBean("in");

LOGGER.info("END - getCountryIndia()");

return country;

}

}

**Output:**

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**Exercise 5: REST - Get country based on country code**

**SpringLearnApplication.java**

package com.cognizant.springlearn;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication

public class SpringLearnApplication {

public static void main(String[] args) {

SpringApplication.run(SpringLearnApplication.class, args);

}

}

**Country.java**

package com.cognizant.springlearn.model;

public class Country {

private String code;

private String name;

public Country() {}

public Country(String code, String name) {

this.code = code;

this.name = name;

}

public String getCode() {

return code;

}

public void setCode(String code) {

this.code = code;

}

public String getName() {

return name;

}

public void setName(String name) {

this.name = name;

}

}

**CountryController.java**

package com.cognizant.springlearn.controller;

import com.cognizant.springlearn.model.Country;

import org.slf4j.Logger;

import org.slf4j.LoggerFactory;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

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

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

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

import java.util.List;

@RestController

public class CountryController {

private static final Logger LOGGER = LoggerFactory.getLogger(CountryController.class);

@RequestMapping("/country")

public Country getCountryIndia() {

LOGGER.info("START - getCountryIndia()");

ApplicationContext context = new ClassPathXmlApplicationContext("country.xml");

Country country = (Country) context.getBean("in");

LOGGER.info("END - getCountryIndia()");

return country;

}

@GetMapping("/countries")

public List<Country> getAllCountries() {

LOGGER.info("START - getAllCountries()");

ApplicationContext context = new ClassPathXmlApplicationContext("country.xml");

List<Country> countryList = (List<Country>) context.getBean("countryList");

LOGGER.info("END - getAllCountries()");

return countryList;

}

}

**Output:**

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* **JWT-handson**

**Exercise 1: Create authentication service that returns JWT**

**Pom.xml**

<dependency>

<groupId>io.jsonwebtoken</groupId>

<artifactId>jjwt-api</artifactId>

<version>0.11.5</version>

</dependency>

<dependency>

<groupId>io.jsonwebtoken</groupId>

<artifactId>jjwt-impl</artifactId>

<version>0.11.5</version>

<scope>runtime</scope>

</dependency>

<dependency>

<groupId>io.jsonwebtoken</groupId>

<artifactId>jjwt-jackson</artifactId>

<version>0.11.5</version>

<scope>runtime</scope>

</dependency>

**JwtUtil.java**

package com.cognizant.util;

import io.jsonwebtoken.Jwts;

import io.jsonwebtoken.SignatureAlgorithm;

import io.jsonwebtoken.security.Keys;

import org.springframework.stereotype.Component;

import java.security.Key;

import java.util.Date;

@Component

public class JwtUtil {

private static final Key key = Keys.secretKeyFor(SignatureAlgorithm.HS256);

private static final long EXPIRATION\_TIME = 10 \* 60 \* 1000; // 10 minutes

public String generateToken(String username) {

return Jwts.builder()

.setSubject(username)

.setIssuedAt(new Date())

.setExpiration(new Date(System.currentTimeMillis() + EXPIRATION\_TIME))

.signWith(key)

.compact();

}

}

**AuthenticationController.java**

package com.cognizant.controller;

import com.cognizant.util.JwtUtil;

import org.springframework.http.ResponseEntity;

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

import java.util.Base64;

import javax.servlet.http.HttpServletRequest;

@RestController

public class AuthenticationController {

private final JwtUtil jwtUtil;

public AuthenticationController(JwtUtil jwtUtil) {

this.jwtUtil = jwtUtil;

}

@GetMapping("/authenticate")

public ResponseEntity<?> authenticate(HttpServletRequest request) {

String authHeader = request.getHeader("Authorization");

if (authHeader == null || !authHeader.startsWith("Basic ")) {

return ResponseEntity.status(401).body("Missing or invalid Authorization header");

}

String base64Credentials = authHeader.substring("Basic ".length());

byte[] credDecoded = Base64.getDecoder().decode(base64Credentials);

String credentials = new String(credDecoded);

String[] values = credentials.split(":", 2);

String username = values[0];

String password = values[1];

if ("user".equals(username) && "pwd".equals(password)) {

String token = jwtUtil.generateToken(username);

return ResponseEntity.ok().body("{\"token\":\"" + token + "\"}");

} else {

return ResponseEntity.status(401).body("Invalid Credentials");

}

}

}

**SecurityConfig.java**

package com.cognizant.config;

import org.springframework.context.annotation.Configuration;

import org.springframework.security.config.annotation.web.builders.HttpSecurity;

import org.springframework.security.web.SecurityFilterChain;

import org.springframework.context.annotation.Bean;

@Configuration

public class SecurityConfig {

@Bean

public SecurityFilterChain filterChain(HttpSecurity http) throws Exception {

http

.csrf(csrf -> csrf.disable())

.authorizeHttpRequests(auth -> auth

.requestMatchers("/authenticate").permitAll()

.anyRequest().authenticated()

);

return http.build();

}

}

**Output:**

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