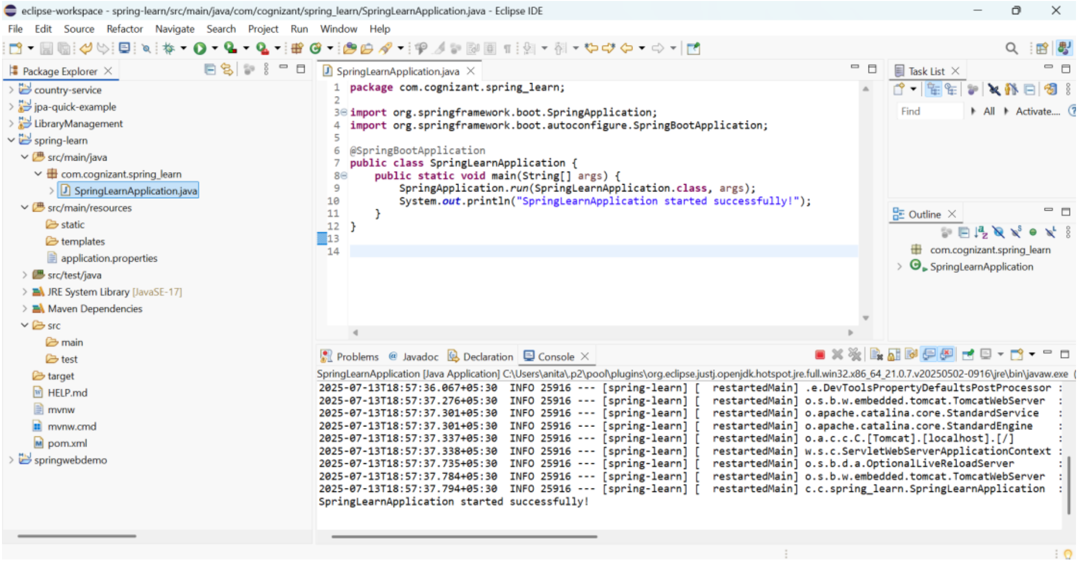
WEEK – 4

NAME : ANITA.P

SUPERSET ID : 6419735

Mandatory Hands-on

1) Create a Spring Web Project using Maven



eclipse-workspace - spring-learn/src/main/java/com/cognizant/spring_learn/SpringLearnApplication.java - Eclipse IDE

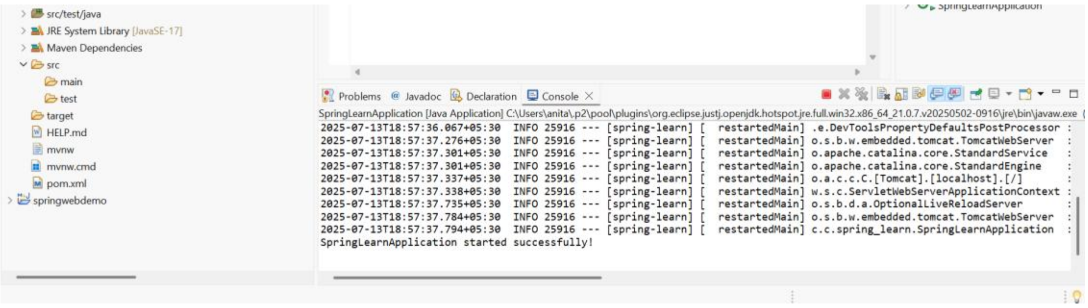
```java
package com.cognizant.spring_learn;

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);
        System.out.println("SpringLearnApplication started successfully!");
    }
}
```

SpringLearnApplication [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe

```
2025-07-13T18:57:36.067+05:30  INFO 25916 --- [spring-learn] [  restartedMain] .e.DevToolsPropertyDefaultsPostProcessor :
2025-07-13T18:57:37.276+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer  :
2025-07-13T18:57:37.301+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.apache.catalina.core.StandardService   :
2025-07-13T18:57:37.301+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.apache.catalina.core.StandardEngine    :
2025-07-13T18:57:37.337+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/]       :
2025-07-13T18:57:37.338+05:30  INFO 25916 --- [spring-learn] [  restartedMain] w.s.c.ServletWebServerApplicationContext :
2025-07-13T18:57:37.735+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.s.b.d.a.OptionalLiveReloadServer       :
2025-07-13T18:57:37.784+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer  :
2025-07-13T18:57:37.794+05:30  INFO 25916 --- [spring-learn] [  restartedMain] c.c.spring_learn.SpringLearnApplication  :
SpringLearnApplication started successfully!
```



SpringLearnApplication [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe

```
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2025-07-13T18:57:37.337+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/]       :
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2025-07-13T18:57:37.794+05:30  INFO 25916 --- [spring-learn] [  restartedMain] c.c.spring_learn.SpringLearnApplication  :
SpringLearnApplication started successfully!
```

2) Spring Core – Load Country from Spring Configuration XML

data-format.xml

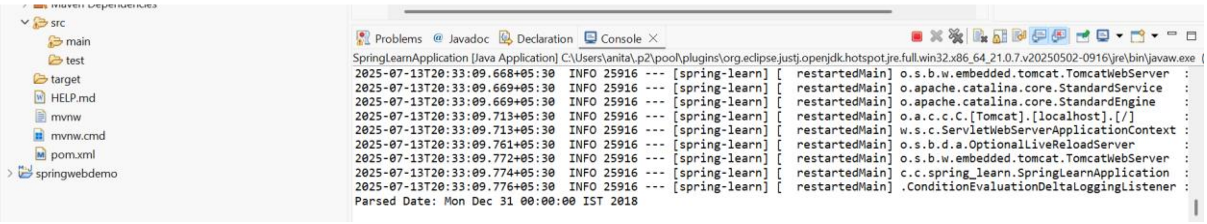
```xml
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://www.springframework.org/schema/beans
      https://www.springframework.org/schema/beans/spring-beans.xsd">

  <bean id="dateFormat" class="java.text.SimpleDateFormat">
```

```
        <constructor-arg value="dd/MM/yyyy" />
    </bean>
</beans>
```

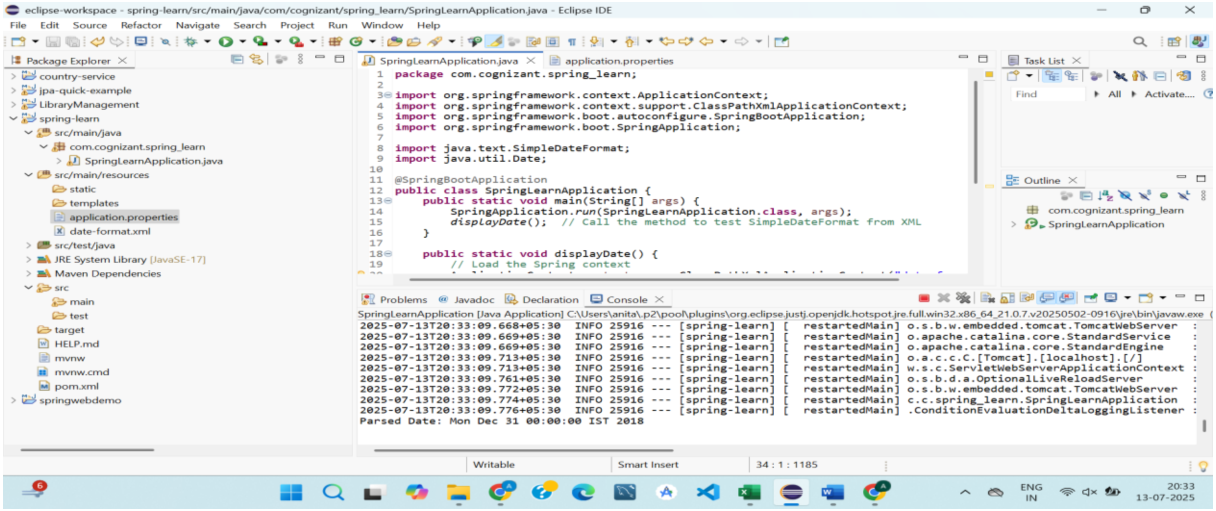
SpringLearnApplication.java

```
package com.cognizant.spring_learn;
import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.boot.SpringApplication;
import java.text.SimpleDateFormat;
import java.util.Date;
@SpringBootApplication
public class SpringLearnApplication {
    public static void main(String[] args) {
        SpringApplication.run(SpringLearnApplication.class, args);
        displayDate();
    }
    public static void displayDate() {
        ApplicationContext context = new ClassPathXmlApplicationContext("date-format.xml");
        SimpleDateFormat format = context.getBean("dateFormat", SimpleDateFormat.class);
        try {
            Date parsedDate = format.parse("31/12/2018");
            System.out.println("Parsed Date: " + parsedDate);
        } catch (Exception e) {
            e.printStackTrace();
        }}}
```

OUTPUT:



```
SpringLearnApplication [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe
2025-07-13T20:33:09.668+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer  :
2025-07-13T20:33:09.669+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.apache.catalina.core.StandardService   :
2025-07-13T20:33:09.669+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.apache.catalina.core.StandardEngine    :
2025-07-13T20:33:09.713+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/]       :
2025-07-13T20:33:09.713+05:30  INFO 25916 --- [spring-learn] [  restartedMain] w.s.c.ServletWebServerApplicationContext :
2025-07-13T20:33:09.761+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.s.b.d.a.OptionalLiveReloadServer       :
2025-07-13T20:33:09.772+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer  :
2025-07-13T20:33:09.774+05:30  INFO 25916 --- [spring-learn] [  restartedMain] c.c.spring_learn.SpringLearnApplication  :
2025-07-13T20:33:09.776+05:30  INFO 25916 --- [spring-learn] [  restartedMain] .ConditionEvaluationDeltaLoggingListener :
Parsed Date: Mon Dec 31 00:00:00 IST 2018
```



```java
package com.cognizant.spring_learn;

import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.boot.SpringApplication;

import java.text.SimpleDateFormat;
import java.util.Date;

@SpringBootApplication
public class SpringLearnApplication {
    public static void main(String[] args) {
        SpringApplication.run(SpringLearnApplication.class, args);
        displayDate();  // Call the method to test SimpleDateFormat from XML
    }

    public static void displayDate() {
        // Load the Spring context
```

SpringLearnApplication [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe

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2025-07-13T20:33:09.772+05:30  INFO 25916 --- [spring-learn] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer  :
2025-07-13T20:33:09.774+05:30  INFO 25916 --- [spring-learn] [  restartedMain] c.c.spring_learn.SpringLearnApplication  :
2025-07-13T20:33:09.776+05:30  INFO 25916 --- [spring-learn] [  restartedMain] .ConditionEvaluationDeltaLoggingListener :
Parsed Date: Mon Dec 31 00:00:00 IST 2018
```

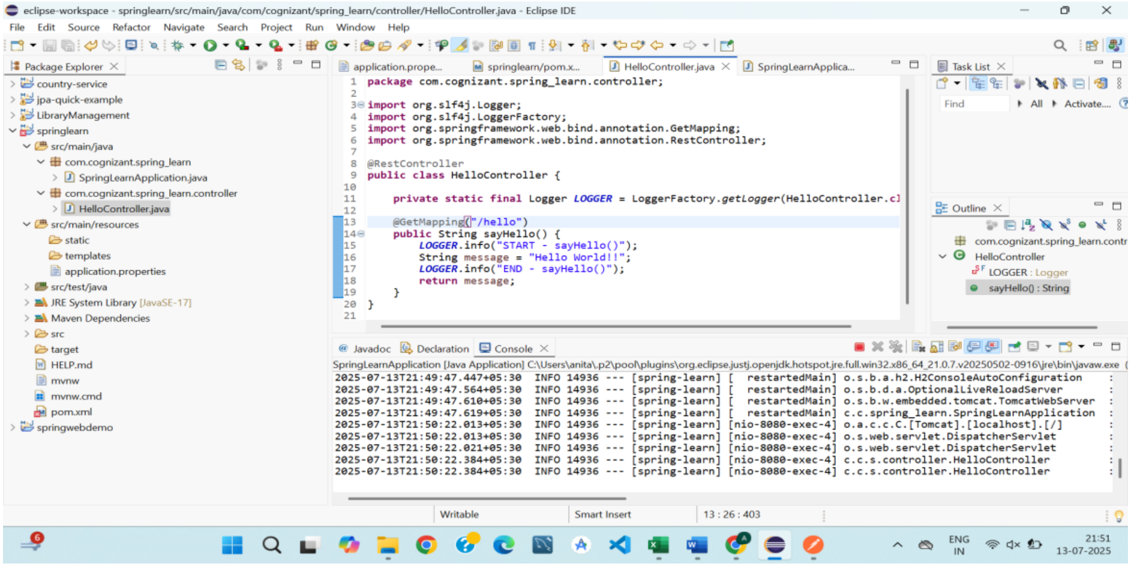
3) Hello World RESTful Web Service

HelloController.java

```java
package com.cognizant.spring_learn.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;
   }}
```

SpringLearnApplication.java

```java
package com.cognizant.spring_learn;
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);
   }
}
```

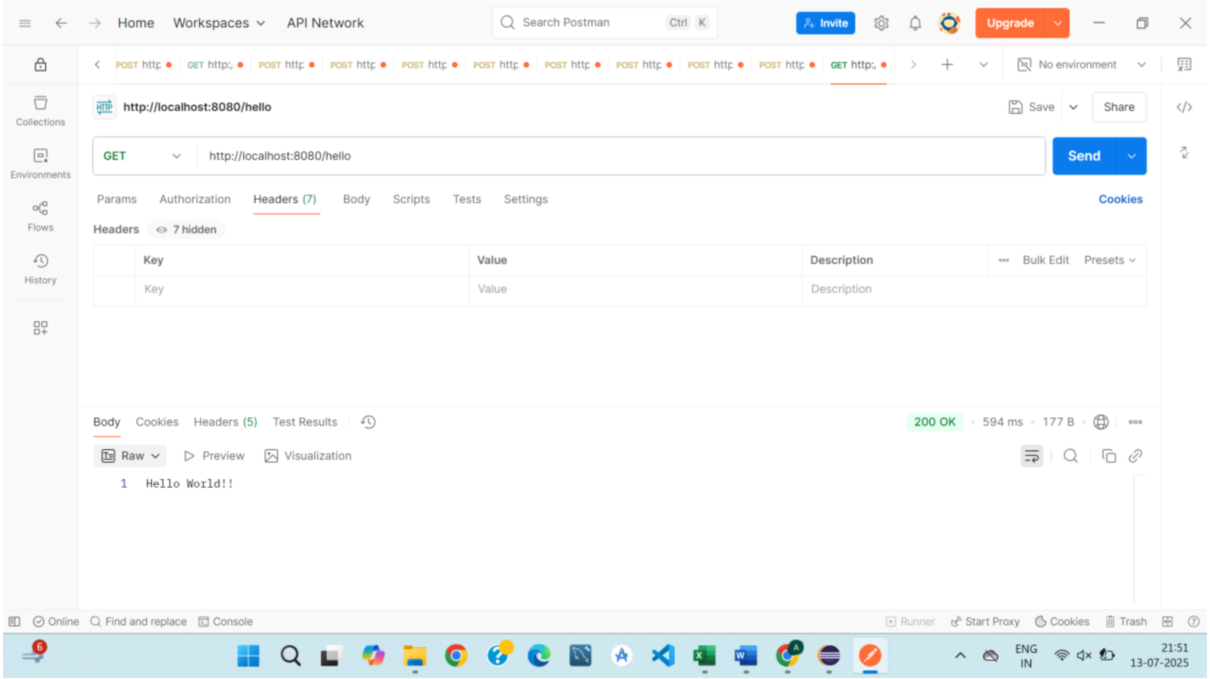


eclipse-workspace - springlearn/src/main/java/com/cognizant/spring_learn/controller/HelloController.java - Eclipse IDE

```java
package com.cognizant.spring_learn.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.cl

    @GetMapping("/hello")
    public String sayHello() {
        LOGGER.info("START - sayHello()");
        String message = "Hello World!!";
        LOGGER.info("END - sayHello()");
        return message;
    }
}
```

SpringLearnApplication [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe

```
2025-07-13T21:49:47.447+05:30  INFO 14936 --- [spring-learn] [  restartedMain] o.s.b.a.h2.H2ConsoleAutoConfiguration   :
2025-07-13T21:49:47.564+05:30  INFO 14936 --- [spring-learn] [  restartedMain] o.s.b.d.a.OptionalLiveReloadServer      :
2025-07-13T21:49:47.610+05:30  INFO 14936 --- [spring-learn] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer :
2025-07-13T21:49:47.619+05:30  INFO 14936 --- [spring-learn] [  restartedMain] c.c.spring_learn.SpringLearnApplication :
2025-07-13T21:50:22.013+05:30  INFO 14936 --- [spring-learn] [nio-8080-exec-4] o.a.c.c.C.[Tomcat].[localhost].[/]      :
2025-07-13T21:50:22.013+05:30  INFO 14936 --- [spring-learn] [nio-8080-exec-4] o.s.web.servlet.DispatcherServlet       :
2025-07-13T21:50:22.021+05:30  INFO 14936 --- [spring-learn] [nio-8080-exec-4] o.s.web.servlet.DispatcherServlet       :
2025-07-13T21:50:22.384+05:30  INFO 14936 --- [spring-learn] [nio-8080-exec-4] c.c.s.controller.HelloController        :
2025-07-13T21:50:22.384+05:30  INFO 14936 --- [spring-learn] [nio-8080-exec-4] c.c.s.controller.HelloController        :
```



GET http://localhost:8080/hello

Body Cookies Headers (5) Test Results — 200 OK • 594 ms • 177 B

```
Hello World!!
```

4) REST - Country Web Service

<u>CountryController.java</u>

package com.cognizant.spring_learn.controller;
import com.cognizant.spring_learn.model.Country;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.ApplicationContext;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;
@RestController

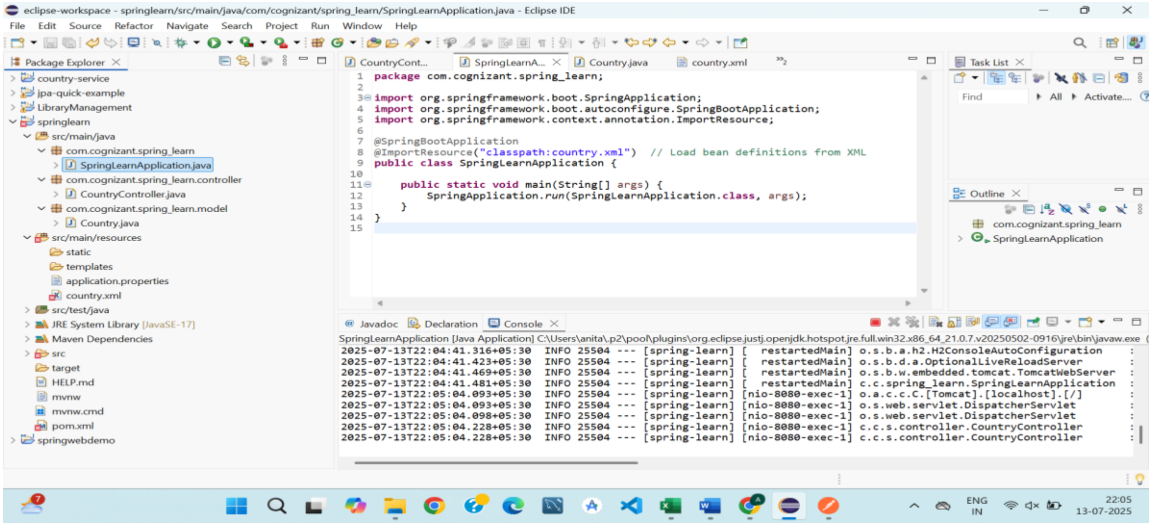
```
public class CountryController {
   private static final Logger LOGGER = LoggerFactory.getLogger(CountryController.class);
   @Autowired
   private ApplicationContext context;
   @RequestMapping("/country")
   public Country getCountryIndia() {
      LOGGER.info("START - getCountryIndia()");
      Country country = (Country) context.getBean("country");
      LOGGER.info("END - getCountryIndia()");
      return country;
   }
}
```

Country.java

```
package com.cognizant.spring_learn.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;
   }}
```

SpringLearnApplication.java

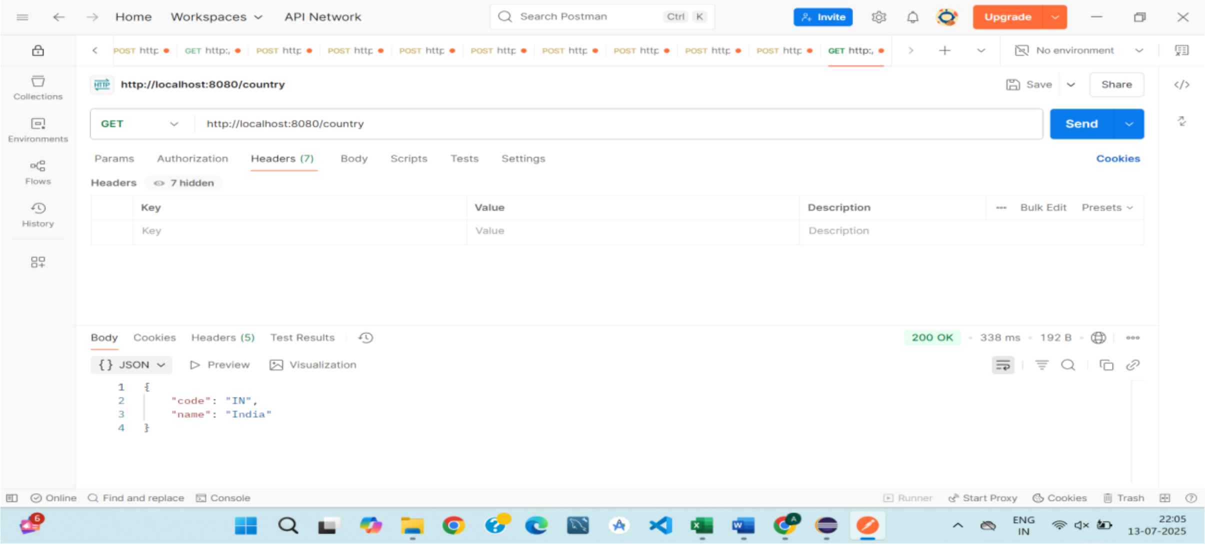
```
package com.cognizant.spring_learn;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.context.annotation.ImportResource;
@SpringBootApplication
@ImportResource("classpath:country.xml")  // Load bean definitions from XML
public class SpringLearnApplication {

   public static void main(String[] args) {
        SpringApplication.run(SpringLearnApplication.class, args);
    }}
```



eclipse-workspace - springlearn/src/main/java/com/cognizant/spring_learn/SpringLearnApplication.java - Eclipse IDE

```java
package com.cognizant.spring_learn;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.context.annotation.ImportResource;

@SpringBootApplication
@ImportResource("classpath:country.xml")  // Load bean definitions from XML
public class SpringLearnApplication {

    public static void main(String[] args) {
        SpringApplication.run(SpringLearnApplication.class, args);
    }
}
```

```
SpringLearnApplication [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe
2025-07-13T22:04:41.316+05:30  INFO 25504 --- [spring-learn] [  restartedMain] o.s.b.a.h2.H2ConsoleAutoConfiguration  :
2025-07-13T22:04:41.423+05:30  INFO 25504 --- [spring-learn] [  restartedMain] o.s.b.d.a.OptionalLiveReloadServer     :
2025-07-13T22:04:41.469+05:30  INFO 25504 --- [spring-learn] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer :
2025-07-13T22:04:41.481+05:30  INFO 25504 --- [spring-learn] [  restartedMain] c.c.spring_learn.SpringLearnApplication :
2025-07-13T22:05:04.093+05:30  INFO 25504 --- [spring-learn] [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]     :
2025-07-13T22:05:04.093+05:30  INFO 25504 --- [spring-learn] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet      :
2025-07-13T22:05:04.098+05:30  INFO 25504 --- [spring-learn] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet      :
2025-07-13T22:05:04.228+05:30  INFO 25504 --- [spring-learn] [nio-8080-exec-1] c.c.s.controller.CountryController     :
2025-07-13T22:05:04.228+05:30  INFO 25504 --- [spring-learn] [nio-8080-exec-1] c.c.s.controller.CountryController     :
```



GET http://localhost:8080/country

Headers (7) — 7 hidden

Key	Value	Description
Key	Value	Description

Body — 200 OK · 338 ms · 192 B

```
{
    "code": "IN",
    "name": "India"
}
```

5) REST - Get country based on country code

CountryController.java

```java
package com.cognizant.spring_learn.controller;
import com.cognizant.spring_learn.model.Country;
import com.cognizant.spring_learn.service.CountryService;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.web.bind.annotation.*;
@RestController
public class CountryController {
    private static final Logger LOGGER = LoggerFactory.getLogger(CountryController.class);
    @Autowired
```

```
  private CountryService countryService;
  @GetMapping("/country/{code}")
  public Country getCountry(@PathVariable String code) {
    LOGGER.info("START - getCountry() with code: {}", code);
    Country country = countryService.getCountry(code);
    LOGGER.info("END - getCountry()");
    return country;
  }}
```

Country.java

```
package com.cognizant.spring_learn.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;
  }}
```

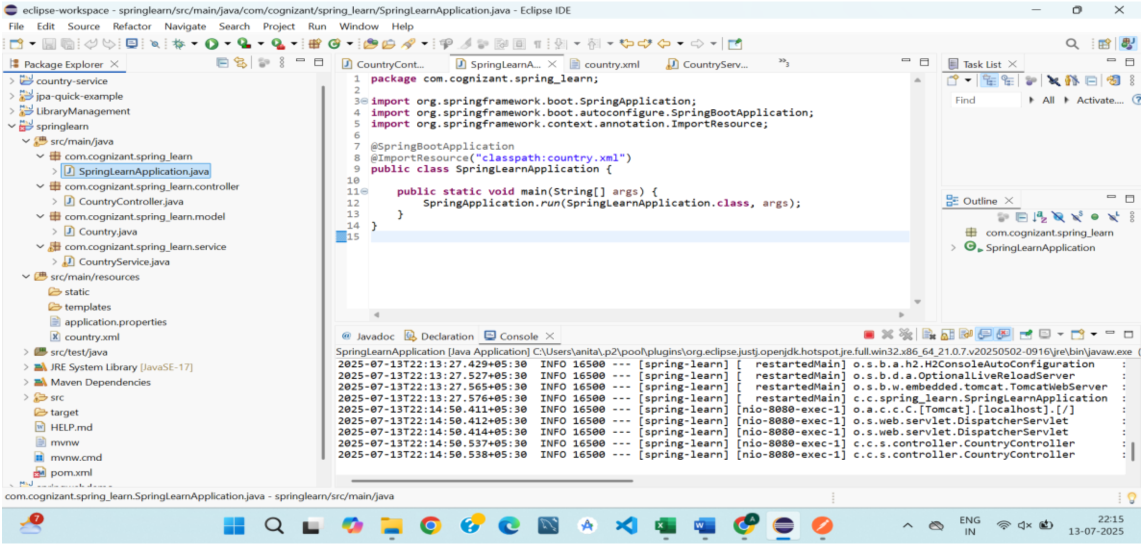
CountryService.java

```
package com.cognizant.spring_learn.service;

import com.cognizant.spring_learn.model.Country;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.ApplicationContext;
import org.springframework.stereotype.Service;
import java.util.List;
@Service
public class CountryService {
  @Autowired
  private ApplicationContext context;
  public Country getCountry(String code) {
    List<Country> countries = (List<Country>) context.getBean("countryList");
    return countries.stream()
        .filter(country -> country.getCode().equalsIgnoreCase(code))
```

```
            .findFirst()
            .orElse(null); // or throw a custom CountryNotFoundException
    }}
```

SpringLearnApplication.java

```
package com.cognizant.spring_learn;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.context.annotation.ImportResource;
@SpringBootApplication
@ImportResource("classpath:country.xml")
public class SpringLearnApplication {
    public static void main(String[] args) {
        SpringApplication.run(SpringLearnApplication.class, args);
    }
}
```

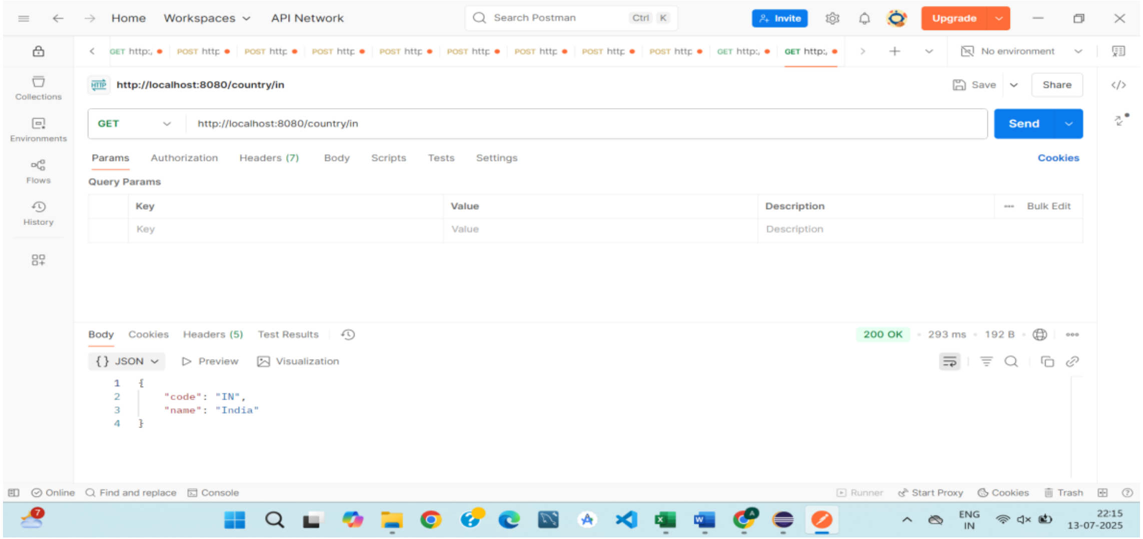


eclipse-workspace - springlearn/src/main/java/com/cognizant/spring_learn/SpringLearnApplication.java - Eclipse IDE

```
package com.cognizant.spring_learn;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.context.annotation.ImportResource;

@SpringBootApplication
@ImportResource("classpath:country.xml")
public class SpringLearnApplication {

    public static void main(String[] args) {
        SpringApplication.run(SpringLearnApplication.class, args);
    }
}
```

SpringLearnApplication [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe

```
2025-07-13T22:13:27.429+05:30  INFO 16500 --- [spring-learn] [  restartedMain] o.s.b.a.h2.H2ConsoleAutoConfiguration
2025-07-13T22:13:27.527+05:30  INFO 16500 --- [spring-learn] [  restartedMain] o.s.b.d.a.OptionalLiveReloadServer
2025-07-13T22:13:27.565+05:30  INFO 16500 --- [spring-learn] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer
2025-07-13T22:13:27.576+05:30  INFO 16500 --- [spring-learn] [  restartedMain] c.c.spring_learn.SpringLearnApplication
2025-07-13T22:14:50.411+05:30  INFO 16500 --- [spring-learn] [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2025-07-13T22:14:50.412+05:30  INFO 16500 --- [spring-learn] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet
2025-07-13T22:14:50.414+05:30  INFO 16500 --- [spring-learn] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet
2025-07-13T22:14:50.537+05:30  INFO 16500 --- [spring-learn] [nio-8080-exec-1] c.c.s.controller.CountryController
2025-07-13T22:14:50.538+05:30  INFO 16500 --- [spring-learn] [nio-8080-exec-1] c.c.s.controller.CountryController
```



GET http://localhost:8080/country/in

200 OK · 293 ms · 192 B

```
{
    "code": "IN",
    "name": "India"
}
```

6) Create authentication service that returns JWT

SpringLearnApplication.java

```
package com.cognizant.spring_learn.config.SecurityConfig;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;
import org.springframework.security.config.annotation.web.builders.HttpSecurity;
import org.springframework.security.config.annotation.web.configuration.*;
import org.springframework.security.core.userdetails.*;
import org.springframework.security.provisioning.InMemoryUserDetailsManager;
import org.springframework.security.web.SecurityFilterChain;
@Configuration
@EnableWebSecurity
public class SecurityConfig {
  @Bean
  public InMemoryUserDetailsManager userDetailsService() {
    UserDetails user = User.withDefaultPasswordEncoder()
        .username("user")
        .password("pwd")
        .roles("USER")
        .build();
    return new InMemoryUserDetailsManager(user);
  }
  @Bean
  public SecurityFilterChain filterChain(HttpSecurity http) throws Exception {
    http.csrf().disable()
      .authorizeHttpRequests()
      .requestMatchers("/authenticate").authenticated()
      .anyRequest().permitAll()
      .and()
      .httpBasic(); // enable basic authentication
    return http.build();
  }
}
```

SecurityConfig.java

```
package com.cognizant.spring_learn.config.SecurityConfig;

import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;
import org.springframework.security.config.annotation.web.builders.HttpSecurity;
import org.springframework.security.config.annotation.web.configuration.*;
import org.springframework.security.core.userdetails.*;
import org.springframework.security.provisioning.InMemoryUserDetailsManager;
import org.springframework.security.web.SecurityFilterChain;
@Configuration
@EnableWebSecurity
public class SecurityConfig {
  @Bean
  public InMemoryUserDetailsManager userDetailsService() {
    UserDetails user = User.withDefaultPasswordEncoder()
        .username("user")
        .password("pwd")
        .roles("USER")
        .build();
    return new InMemoryUserDetailsManager(user);
  }
  @Bean
  public SecurityFilterChain filterChain(HttpSecurity http) throws Exception {
    http.csrf().disable()
      .authorizeHttpRequests()
      .requestMatchers("/authenticate").authenticated()
      .anyRequest().permitAll()
      .and()
      .httpBasic(); // enable basic authentication
    return http.build();  }}
```

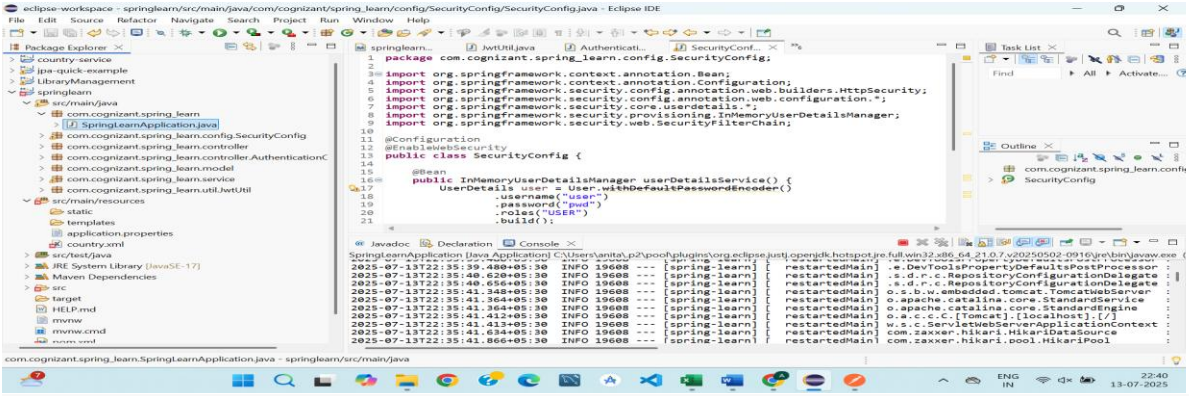
AuthenticationController.java

```
package com.cognizant.spring_learn.controller.AuthenticationController;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.security.core.Authentication;
import org.springframework.web.bind.annotation.*;
import com.cognizant.spring_learn.util.JwtUtil.JwtUtil;
import java.util.HashMap;
import java.util.Map;
@RestController
public class AuthenticationController {
  @Autowired
  private JwtUtil jwtUtil;
  @GetMapping("/authenticate")
  public Map<String, String> authenticate(Authentication authentication) {
    String username = authentication.getName();
    String token = jwtUtil.generateToken(username);
    Map<String, String> response = new HashMap<>();
    response.put("token", token);
    return response;
  }
}
```

JwtUtil.java

```
package com.cognizant.spring_learn.util.JwtUtil;
import io.jsonwebtoken.Jwts;
import io.jsonwebtoken.SignatureAlgorithm;
import org.springframework.stereotype.Component;
import java.util.Date;
@Component
public class JwtUtil {
  private final String SECRET_KEY = "secret";
  public String generateToken(String username) {
```

```
return Jwts.builder()
        .setSubject(username)
        .setIssuedAt(new Date(System.currentTimeMillis()))
        .setExpiration(new Date(System.currentTimeMillis() + 1000 * 60 * 60)) // 1 hour
        .signWith(SignatureAlgorithm.HS256, SECRET_KEY)
        .compact();  }}
```



```
package com.cognizant.spring_learn.config.SecurityConfig;

import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;
import org.springframework.security.config.annotation.web.builders.HttpSecurity;
import org.springframework.security.config.annotation.web.configuration.*;
import org.springframework.security.core.userdetails.*;
import org.springframework.security.provisioning.InMemoryUserDetailsManager;
import org.springframework.security.web.SecurityFilterChain;

@Configuration
@EnableWebSecurity
public class SecurityConfig {

    @Bean
    public InMemoryUserDetailsManager userDetailsService() {
        UserDetails user = User.withDefaultPasswordEncoder()
                .username("user")
                .password("pwd")
                .roles("USER")
                .build();
```

```
SpringLearnApplication [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe
2025-07-13T22:35:39.480+05:30  INFO 19608 --- [spring-learn] [  restartedMain] .e.DevToolsPropertyDefaultsPostProcessor :
2025-07-13T22:35:40.620+05:30  INFO 19608 --- [spring-learn] [  restartedMain] .s.d.r.c.RepositoryConfigurationDelegate :
2025-07-13T22:35:40.656+05:30  INFO 19608 --- [spring-learn] [  restartedMain] .s.d.r.c.RepositoryConfigurationDelegate :
2025-07-13T22:35:41.348+05:30  INFO 19608 --- [spring-learn] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer  :
2025-07-13T22:35:41.364+05:30  INFO 19608 --- [spring-learn] [  restartedMain] o.apache.catalina.core.StandardService   :
2025-07-13T22:35:41.364+05:30  INFO 19608 --- [spring-learn] [  restartedMain] o.apache.catalina.core.StandardEngine    :
2025-07-13T22:35:41.412+05:30  INFO 19608 --- [spring-learn] [  restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/]       :
2025-07-13T22:35:41.413+05:30  INFO 19608 --- [spring-learn] [  restartedMain] w.s.c.ServletWebServerApplicationContext :
2025-07-13T22:35:41.634+05:30  INFO 19608 --- [spring-learn] [  restartedMain] com.zaxxer.hikari.HikariDataSource       :
2025-07-13T22:35:41.866+05:30  INFO 19608 --- [spring-learn] [  restartedMain] com.zaxxer.hikari.pool.HikariPool        :
```

eclipse-workspace - springlearn/src/main/java/com/cognizant/spring_learn/config/SecurityConfig/SecurityConfig.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
country-service
jpa-quick-example
LibraryManagement
springlearn
src/main/java
com.cognizant.spring_learn
SpringLearnApplication.java
com.cognizant.spring_learn.config.SecurityConfig
com.cognizant.spring_learn.controller
com.cognizant.spring_learn.controller.AuthenticationC
com.cognizant.spring_learn.model
com.cognizant.spring_learn.service
com.cognizant.spring_learn.util.JwtUtil
src/main/resources
static
templates
application.properties
country.xml
src/test/java
JRE System Library [JavaSE-17]
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target
HELP.md
mvnw
mvnw.cmd
pom.xml
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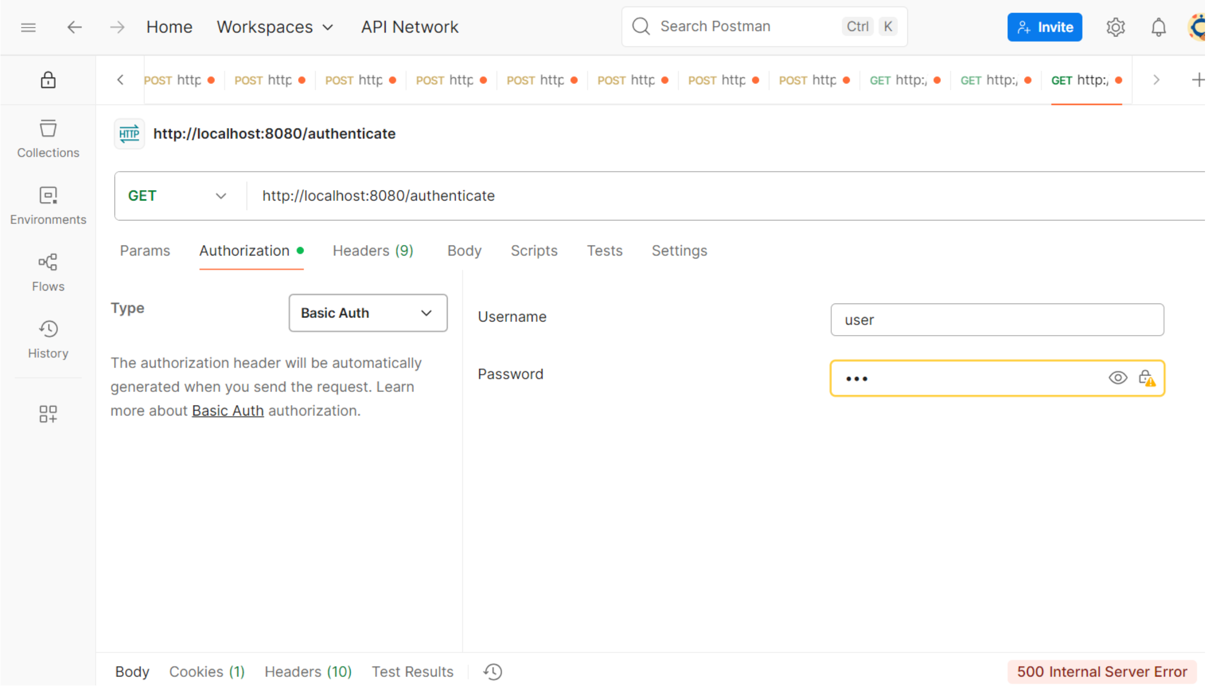
JwtUtil.java
Authenticati...
SecurityConf...
Task List
Outline
com.cognizant.spring_learn.config
SecurityConfig
Javadoc
Declaration
Console
com.cognizant.spring_learn.SpringLearnApplication.java - springlearn/src/main/java
ENG IN
22:40
13-07-2025



GET http://localhost:8080/authenticate

Authorization: Type Basic Auth

The authorization header will be automatically generated when you send the request. Learn more about Basic Auth authorization.

Username: user

Password: •••

500 Internal Server Error

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GET http:
http://localhost:8080/authenticate
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Authorization
Headers (9)
Body
Scripts
Tests
Settings
Body
Cookies (1)
Headers (10)
Test Results

ADDITIONAL EXERCISES

1) Display Employee List and Edit Employee form using RESTful Web Service

Employee.java

```
package com.cognizant.employee_rest.model;
public class Employee {
    private int id;
    private String name;
    private double salary;
    private String department;
    public Employee() {}
    public Employee(int id, String name, double salary, String department) {
        this.id = id;
        this.name = name;
        this.salary = salary;
        this.department = department;
    }
    public int getId() { return id; }
    public void setId(int id) { this.id = id; }
    public String getName() { return name; }
    public void setName(String name) { this.name = name; }
    public double getSalary() { return salary; }
    public void setSalary(double salary) { this.salary = salary; }
    public String getDepartment() { return department; }
    public void setDepartment(String department) { this.department = department; }
}
```

EmployeeController.java

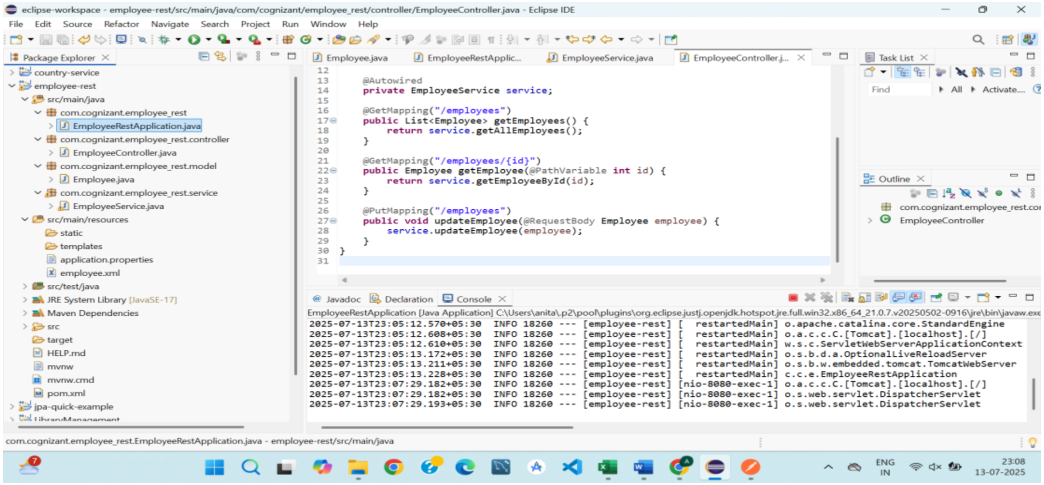
```
package com.cognizant.employee_rest.controller;
import com.cognizant.employee_rest.model.Employee;
import com.cognizant.employee_rest.service.EmployeeService;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.web.bind.annotation.*;
import java.util.List;
@RestController
public class EmployeeController {
    @Autowired
    private EmployeeService service;
    @GetMapping("/employees")
    public List<Employee> getEmployees() {
        return service.getAllEmployees();
    }
    @GetMapping("/employees/{id}")
    public Employee getEmployee(@PathVariable int id) {
        return service.getEmployeeById(id);
    }
    @PutMapping("/employees")
    public void updateEmployee(@RequestBody Employee employee) {
        service.updateEmployee(employee);
    }
}
```

EmployeeService.java

```
package com.cognizant.employee_rest.service;
import com.cognizant.employee_rest.model.Employee;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.ApplicationContext;
import org.springframework.stereotype.Service;
import java.util.List;
@Service
public class EmployeeService {
  @Autowired
  private ApplicationContext context;
  public List<Employee> getAllEmployees() {
    return (List<Employee>) context.getBean("employeeList");
  }
  public Employee getEmployeeById(int id) {
    List<Employee> employees = getAllEmployees();
    return employees.stream()
          .filter(e -> e.getId() == id)
          .findFirst()
          .orElse(null);
  }
  public void updateEmployee(Employee updatedEmployee) {
    List<Employee> employees = getAllEmployees();
    for (Employee e : employees) {
      if (e.getId() == updatedEmployee.getId()) {
        e.setName(updatedEmployee.getName());
        e.setSalary(updatedEmployee.getSalary());
        e.setDepartment(updatedEmployee.getDepartment());
        break;
      }}}}
```

EmployeeRestApplication.java

```
package com.cognizant.employee_rest;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.context.annotation.ImportResource;
@SpringBootApplication
@ImportResource("classpath:employee.xml")
public class EmployeeRestApplication {
  public static void main(String[] args) {
    SpringApplication.run(EmployeeRestApplication.class, args);
  }}
```

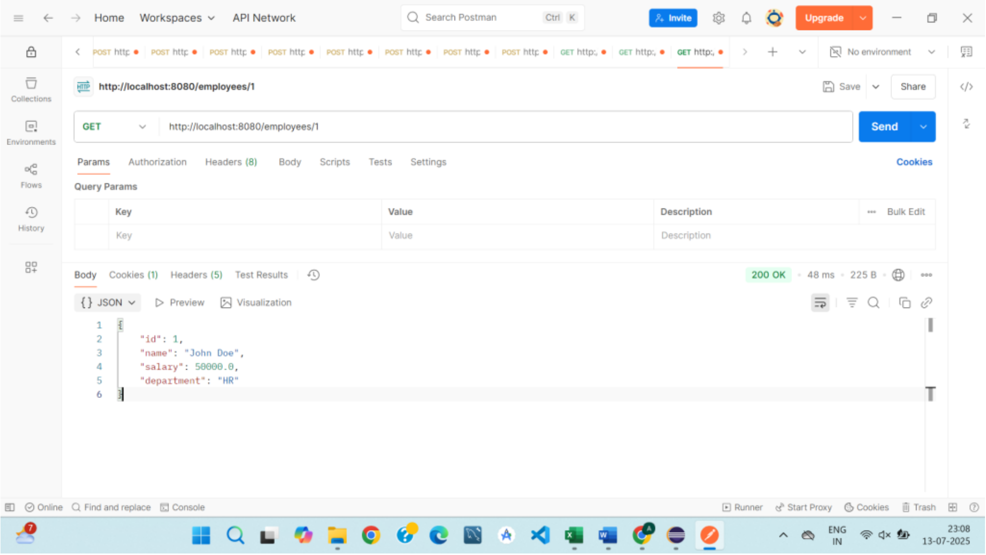


eclipse-workspace - employee-rest/src/main/java/com/cognizant/employee_rest/controller/EmployeeController.java - Eclipse IDE

```
    @Autowired
    private EmployeeService service;

    @GetMapping("/employees")
    public List<Employee> getEmployees() {
        return service.getAllEmployees();
    }

    @GetMapping("/employees/{id}")
    public Employee getEmployee(@PathVariable int id) {
        return service.getEmployeeById(id);
    }

    @PutMapping("/employees")
    public void updateEmployee(@RequestBody Employee employee) {
        service.updateEmployee(employee);
    }
}
```

```
EmployeeRestApplication [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe
2025-07-13T23:05:12.570+05:30  INFO 18260 --- [employee-rest] [  restartedMain] o.apache.catalina.core.StandardEngine
2025-07-13T23:05:12.608+05:30  INFO 18260 --- [employee-rest] [  restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/]
2025-07-13T23:05:12.610+05:30  INFO 18260 --- [employee-rest] [  restartedMain] w.s.c.ServletWebServerApplicationContext
2025-07-13T23:05:13.172+05:30  INFO 18260 --- [employee-rest] [  restartedMain] o.s.b.d.a.OptionalLiveReloadServer
2025-07-13T23:05:13.211+05:30  INFO 18260 --- [employee-rest] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer
2025-07-13T23:05:13.228+05:30  INFO 18260 --- [employee-rest] [  restartedMain] c.c.e.EmployeeRestApplication
2025-07-13T23:07:29.182+05:30  INFO 18260 --- [employee-rest] [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2025-07-13T23:07:29.182+05:30  INFO 18260 --- [employee-rest] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet
2025-07-13T23:07:29.193+05:30  INFO 18260 --- [employee-rest] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet
```

com.cognizant.employee_rest.EmployeeRestApplication.java - employee-rest/src/main/java



http://localhost:8080/employees/1

GET http://localhost:8080/employees/1

200 OK · 48 ms · 225 B

```
{
    "id": 1,
    "name": "John Doe",
    "salary": 50000.0,
    "department": "HR"
}
```

2) Create static employee list data using spring xml configuration

Employee.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xsi:schemaLocation="http://www.springframework.org/schema/beans
         http://www.springframework.org/schema/beans/spring-beans.xsd">
    <!-- Departments -->
    <bean id="department1" class="com.cognizant.spring_learn.model.Department">
        <property name="id" value="1" />
        <property name="name" value="HR" />
    </bean>
    <bean id="department2" class="com.cognizant.spring_learn.model.Department">
        <property name="id" value="2" />
        <property name="name" value="IT" />
    </bean>
    <!-- Skills -->
    <bean id="skill1" class="com.cognizant.spring_learn.model.Skill">
        <property name="id" value="1"/>
        <property name="name" value="Java"/>
    </bean>
    <bean id="skill2" class="com.cognizant.spring_learn.model.Skill">
        <property name="id" value="2"/>
        <property name="name" value="Spring"/>
    </bean>
    <bean id="skillList1" class="java.util.ArrayList">
        <constructor-arg>
            <list>
                <ref bean="skill1"/>
                <ref bean="skill2"/>
            </list>
    </constructor-arg>
  </bean>
  <!-- Employees -->
  <bean id="employee1" class="com.cognizant.spring_learn.model.Employee">
    <property name="id" value="1"/>
    <property name="name" value="John Doe"/>
    <property name="salary" value="50000"/>
    <property name="permanent" value="true"/>
    <property name="department" ref="department1"/>
    <property name="skillList" ref="skillList1"/>
  </bean>
  <bean id="employee2" class="com.cognizant.spring_learn.model.Employee">
    <property name="id" value="2"/>
    <property name="name" value="Jane Smith"/>
    <property name="salary" value="60000"/>
    <property name="permanent" value="false"/>
    <property name="department" ref="department2"/>
    <property name="skillList" ref="skillList1"/>
  </bean>
  <bean id="employee3" class="com.cognizant.spring_learn.model.Employee">
    <property name="id" value="3"/>
    <property name="name" value="Alice"/>
    <property name="salary" value="55000"/>
    <property name="permanent" value="true"/>
    <property name="department" ref="department1"/>
    <property name="skillList" ref="skillList1"/>
  </bean>
  <bean id="employee4" class="com.cognizant.spring_learn.model.Employee">
    <property name="id" value="4"/>
    <property name="name" value="Bob"/>
    <property name="salary" value="45000"/>
    <property name="permanent" value="false"/>
    <property name="department" ref="department2"/>
    <property name="skillList" ref="skillList1"/>
  </bean>
  <!-- Employee List -->
  <bean id="employeeList" class="java.util.ArrayList">
    <constructor-arg>
      <list>
        <ref bean="employee1"/>
        <ref bean="employee2"/>
        <ref bean="employee3"/>
        <ref bean="employee4"/>
      </list>
    </constructor-arg>
  </bean>
</beans>
```

Department.java

```
package com.cognizant.spring_learn.model;
```

```
public class Department {
   private int id;
   private String name;
   public Department() {}

   public int getId() {
      return id;
   }
   public void setId(int id) {
      this.id = id;
   }
   public String getName() {
      return name;
   }
   public void setName(String name) {
      this.name = name;
   }
}
```

Employee.java

```
package com.cognizant.spring_learn.model;
import java.util.List;
public class Employee {
   private int id;
   private String name;
   private double salary;
   private boolean permanent;
   private Department department;
   private List<Skill> skillList;
   public Employee() {}
  public int getId() {
      return id;
   }
   public void setId(int id) {
      this.id = id;
   }
   public String getName() {
      return name;
   }
   public void setName(String name) {
      this.name = name;
   }
   public double getSalary() {
      return salary;
   }
   public void setSalary(double salary) {
      this.salary = salary;
   }
   public boolean isPermanent() {
      return permanent;
   }
  public void setPermanent(boolean permanent) {
    this.permanent = permanent;
  }
  public Department getDepartment() {
    return department;
  }
  public void setDepartment(Department department) {
    this.department = department;
  }
  public List<Skill> getSkillList() {
    return skillList;
  }
  public void setSkillList(List<Skill> skillList) {
    this.skillList = skillList;
  }
}
```

Skill.java

```
package com.cognizant.spring_learn.model;
public class Skill {
  private int id;
  private String name;
  public Skill() {}
   public int getId() {
    return id;
  }
  public void setId(int id) {
    this.id = id;
  }
  public String getName() {
    return name;
  }
  public void setName(String name) {
    this.name = name;
  }
}
```

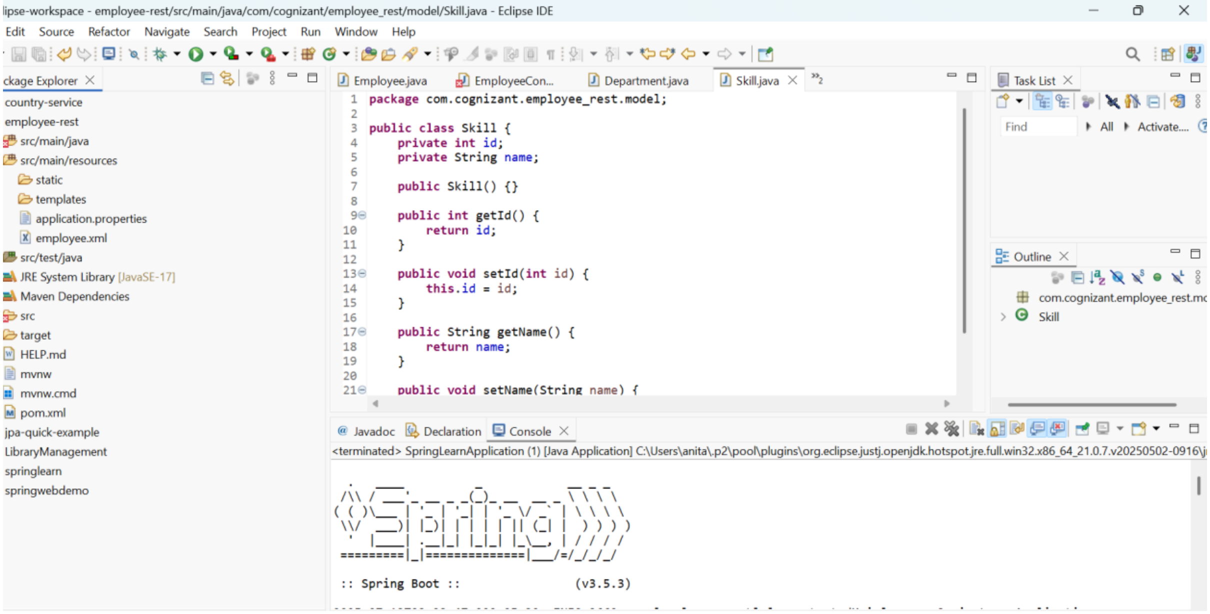
EmployeeDao.java

```
package com.cognizant.spring_learn.dao;

import com.cognizant.spring_learn.model.Employee;
import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;
import org.springframework.stereotype.Repository;
import java.util.ArrayList;
@Repository
public class EmployeeDao {
  public static ArrayList<Employee> EMPLOYEE_LIST;
```

```
    public EmployeeDao() {
        ApplicationContext context = new ClassPathXmlApplicationContext("employee.xml");
        EMPLOYEE_LIST = (ArrayList<Employee>) context.getBean("employeeList");
    }
    public ArrayList<Employee> getAllEmployees() {
        return EMPLOYEE_LIST;
    }
}
```

SpringLearnApplication.java

```
package com.cognizant.spring_learn;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.context.annotation.ImportResource;
@SpringBootApplication
@ImportResource("classpath:employee.xml")
public class SpringLearnApplication {
    public static void main(String[] args) {
        SpringApplication.run(SpringLearnApplication.class, args);
    }
}
```



lipse-workspace - employee-rest/src/main/java/com/cognizant/employee_rest/model/Skill.java - Eclipse IDE

```
package com.cognizant.employee_rest.model;

public class Skill {
    private int id;
    private String name;

    public Skill() {}

    public int getId() {
        return id;
    }

    public void setId(int id) {
        this.id = id;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
```

<terminated> SpringLearnApplication (1) [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\j

```
  .   ____          _            __ _ _
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( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
 \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_\__, | / / / /
 =========|_|==============|___/=/_/_/_/

 :: Spring Boot ::                (v3.5.3)
```

3) **Create REST service to gets all employees**

EmployeeService.java

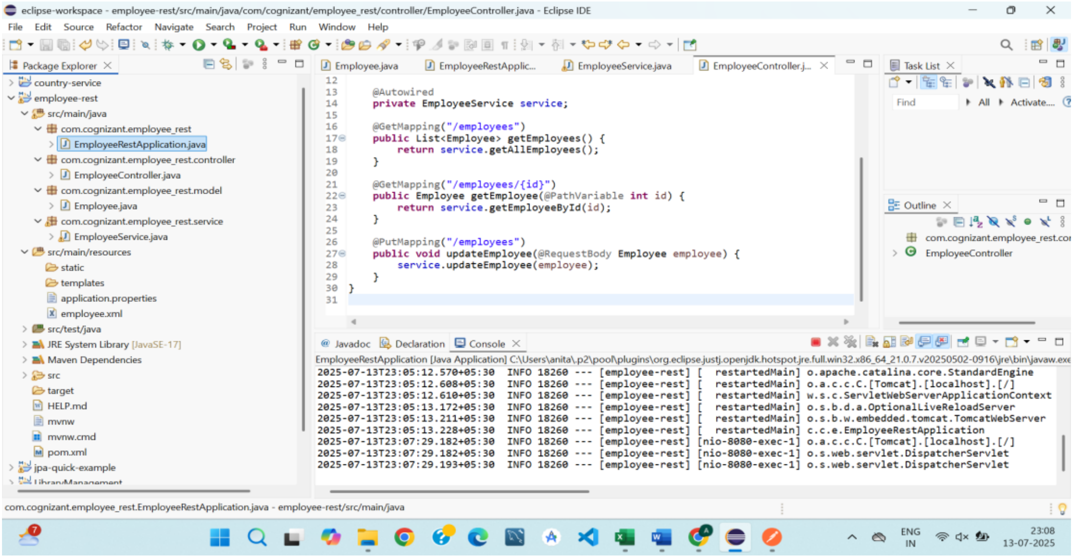
```
package com.cognizant.spring_learn.service;
import com.cognizant.spring_learn.dao.EmployeeDao;
import com.cognizant.spring_learn.model.Employee;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;
import org.springframework.transaction.annotation.Transactional;
import java.util.List;
@Service
public class EmployeeService {
@Autowired
private EmployeeDao employeeDao;
@Transactional
public List<Employee> getAllEmployees() {
return employeeDao.getAllEmployees();
}
}
```

EmployeeController.java

```
package com.cognizant.spring_learn.controller;
import com.cognizant.spring_learn.model.Employee;
import com.cognizant.spring_learn.service.EmployeeService;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.web.bind.annotation.*;
import java.util.List;
@RestController
public class EmployeeController {

  @Autowired
  private EmployeeService employeeService;
  @GetMapping("/employees")
  public List<Employee> getAllEmployees() {
    return employeeService.getAllEmployees();
  }
}
```

EmployeeDao.java

```
package com.cognizant.spring_learn.dao;
import com.cognizant.spring_learn.model.Employee;
import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;
import org.springframework.stereotype.Repository;
import java.util.ArrayList;
@Repository
public class EmployeeDao {
  public static ArrayList<Employee> EMPLOYEE_LIST;
  public EmployeeDao() {
    ApplicationContext context = new ClassPathXmlApplicationContext("employee.xml");
    EMPLOYEE_LIST = (ArrayList<Employee>) context.getBean("employeeList");
  }
  public ArrayList<Employee> getAllEmployees() {
    return EMPLOYEE_LIST;
  }
}
```

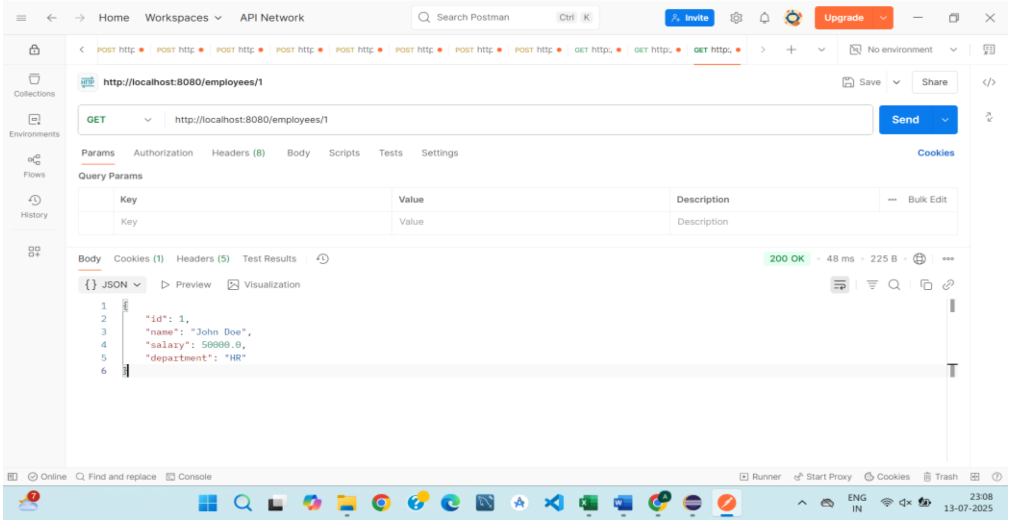


eclipse-workspace - employee-rest/src/main/java/com/cognizant/employee_rest/controller/EmployeeController.java - Eclipse IDE

```java
    @Autowired
    private EmployeeService service;

    @GetMapping("/employees")
    public List<Employee> getEmployees() {
        return service.getAllEmployees();
    }

    @GetMapping("/employees/{id}")
    public Employee getEmployee(@PathVariable int id) {
        return service.getEmployeeById(id);
    }

    @PutMapping("/employees")
    public void updateEmployee(@RequestBody Employee employee) {
        service.updateEmployee(employee);
    }
}
```

EmployeeRestApplication [Java Application] C:\Users\anita\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.7.v20250502-0916\jre\bin\javaw.exe

```
2025-07-13T23:05:12.570+05:30  INFO 18260 --- [employee-rest] [  restartedMain] o.apache.catalina.core.StandardEngine
2025-07-13T23:05:12.608+05:30  INFO 18260 --- [employee-rest] [  restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/]
2025-07-13T23:05:12.610+05:30  INFO 18260 --- [employee-rest] [  restartedMain] w.s.c.ServletWebServerApplicationContext
2025-07-13T23:05:13.172+05:30  INFO 18260 --- [employee-rest] [  restartedMain] o.s.b.d.a.OptionalLiveReloadServer
2025-07-13T23:05:13.211+05:30  INFO 18260 --- [employee-rest] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer
2025-07-13T23:05:13.228+05:30  INFO 18260 --- [employee-rest] [  restartedMain] c.c.e.EmployeeRestApplication
2025-07-13T23:07:29.182+05:30  INFO 18260 --- [employee-rest] [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2025-07-13T23:07:29.182+05:30  INFO 18260 --- [employee-rest] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet
2025-07-13T23:07:29.193+05:30  INFO 18260 --- [employee-rest] [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet
```



GET http://localhost:8080/employees/1

Body — 200 OK · 48 ms · 225 B

```json
{
    "id": 1,
    "name": "John Doe",
    "salary": 50000.0,
    "department": "HR"
}
```

4) Create REST service for department

Department.java

```java
package com.cognizant.spring_learn.model;
public class Department {
    private int id;
    private String name;
    public Department() {}
    public int getId() {
        return id;
    }
    public void setId(int id) {
        this.id = id;
    }
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
}
```

Department.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
       xsi:schemaLocation="http://www.springframework.org/schema/beans
           http://www.springframework.org/schema/beans/spring-beans.xsd">
    <bean id="departmentList" class="java.util.ArrayList">
        <constructor-arg>
            <list>
                <bean class="com.cognizant.spring_learn.model.Department">
                    <property name="id" value="1" />
                    <property name="name" value="HR" />
                </bean>
                <bean class="com.cognizant.spring_learn.model.Department">
                    <property name="id" value="2" />
                    <property name="name" value="IT" />
                </bean>
                <bean class="com.cognizant.spring_learn.model.Department">
                    <property name="id" value="3" />
                    <property name="name" value="Finance" />
                </bean>
            </list>
        </constructor-arg>
    </bean>
</beans>
```

DepartmentDao.java

```
package com.cognizant.spring_learn.dao;
import com.cognizant.spring_learn.model.Department;
import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;
import org.springframework.stereotype.Repository;
import java.util.ArrayList;
@Repository
public class DepartmentDao {
   public static ArrayList<Department> DEPARTMENT_LIST;
    public DepartmentDao() {
        ApplicationContext context = new ClassPathXmlApplicationContext("department.xml");
        DEPARTMENT_LIST = (ArrayList<Department>) context.getBean("departmentList");
    }
    public ArrayList<Department> getAllDepartments() {
        return DEPARTMENT_LIST;
    }
}
```

<u>DepartmentService.java</u>

```
package com.cognizant.spring_learn.service;
import com.cognizant.spring_learn.dao.DepartmentDao;
import com.cognizant.spring_learn.model.Department;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;
import org.springframework.transaction.annotation.Transactional;
import java.util.List;
@Service
public class DepartmentService {
  @Autowired
  private DepartmentDao departmentDao;
  @Transactional
  public List<Department> getAllDepartments() {
    return departmentDao.getAllDepartments(); }}
```

DepartmentController.java

```
package com.cognizant.spring_learn.controller;

import com.cognizant.spring_learn.model.Department;
import com.cognizant.spring_learn.service.DepartmentService;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.web.bind.annotation.*;
import java.util.List;
@RestController
public class DepartmentController {
  private static final Logger LOGGER = LoggerFactory.getLogger(DepartmentController.class);
  @Autowired
  private DepartmentService departmentService;
  @GetMapping("/departments")
  public List<Department> getAllDepartments() {
    LOGGER.info("START getAllDepartments()");
    List<Department> departments = departmentService.getAllDepartments();
    LOGGER.info("END getAllDepartments()");
    return departments;
  }
}
```

Response

```
[
 {
  "id": 1,
  "name": "HR"
 },
 {
    "id": 2,
    "name": "IT"
  },
  {
    "id": 3,
    "name": "Finance"
  }
]
```