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2.spring-rest-handson

Hello World RESTful Web Service

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>3.5.3</version>
		<relativePath/> <!-- lookup parent from repository -->
	</parent>
	<groupId>com.cognizant</groupId>
	<artifactId>spring-learn</artifactId>
	<version>0.0.1-SNAPSHOT</version>
	<name>spring-learn</name>
	<description>Spring Web Project</description>
	<url/>
	<licenses>
		<license/>
	</licenses>
	<developers>
		<developer/>
	</developers>
	<scm>
```

```
        <connection/>
        <developerConnection/>
        <tag/>
        <url/>
    </scm>
    <properties>
        <java.version>17</java.version>
    </properties>
    <dependencies>
        <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>
    </dependencies>
    <build>
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
            </plugin>
```

```
            </plugins>
        </build>
</project>
```

application.properties

```
spring.application.name=spring-learn
server.port=8083
```

HelloController.java

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

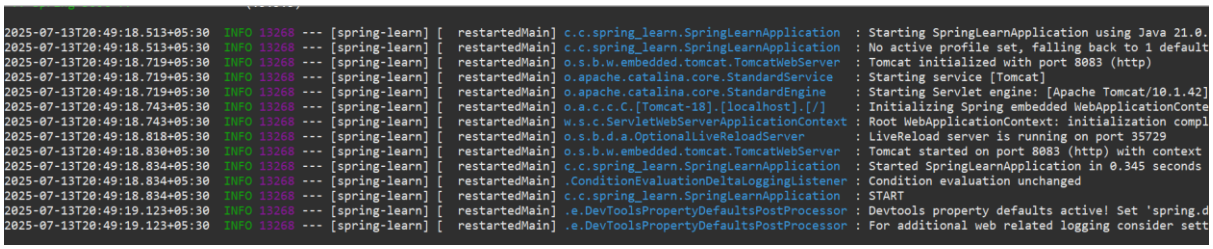
SpringLearnApplication.java

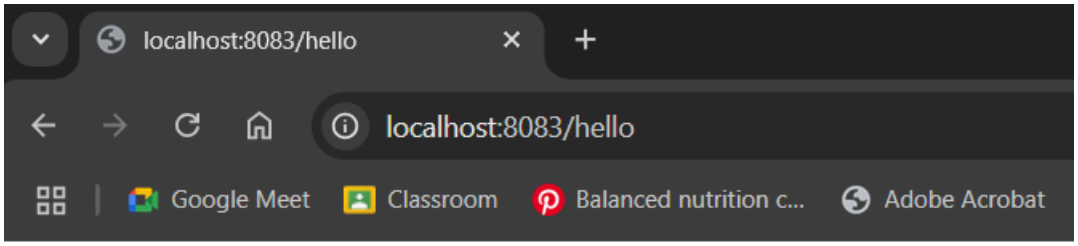
```
package com.cognizant.spring_learn;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.boot.SpringApplication;
```

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

@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("START");
	}
}
```

Output :





Hello World!!

Headers Explanation (Browser vs Postman)

In Chrome Browser:

1. Open Developer Tools (F12 or Right Click → Inspect → Network tab).
2. Reload the page.
3. Click on the /hello request.
4. Go to the Headers tab:
    - **Request Headers** (sent by browser)
        - Host: localhost:8083
        - User-Agent: Chrome version
        - Accept: text/html,...
    - **Response Headers** (received from server)
        - Content-Type: text/plain;charset=UTF-8
        - Content-Length: 13
        - Date: [server timestamp]

In Postman:

1. Open Postman and send a GET request to http://localhost:8083/hello.
2. Click on the **Headers** tab in the response section:
    - You will see response headers like:
        - Content-Type: text/plain;charset=UTF-8
        - Content-Length: 13
        - Date: [server timestamp]

REST - Country Web Service

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>3.5.3</version>

		<relativePath/>

	</parent>

	<groupId>com.cognizant</groupId>

	<artifactId>spring-learn</artifactId>

	<version>0.0.1-SNAPSHOT</version>

	<name>spring-learn</name>

	<description>Spring Web Project</description>

	<url/>

	<licenses>

		<license/>

	</licenses>

	<developers>

		<developer/>

	</developers>

	<scm>

		<connection/>

		<developerConnection/>

		<tag/>
```

```
		<url/>
	</scm>
	<properties>
		<java.version>17</java.version>
	</properties>
	<dependencies>
		<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>
	</dependencies>
	<build>
		<plugins>
			<plugin>
				<groupId>org.springframework.boot</groupId>
				<artifactId>spring-boot-maven-plugin</artifactId>
			</plugin>
		</plugins>
	</build>
</project>
```

country.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="in" class="com.cognizant.spring_learn.Country">
                <property name="code" value="IN" />
                <property name="name" value="India" />
        </bean>
</beans>
```

application.properties

```
spring.application.name=spring-learn
server.port=8083
```

Country.java

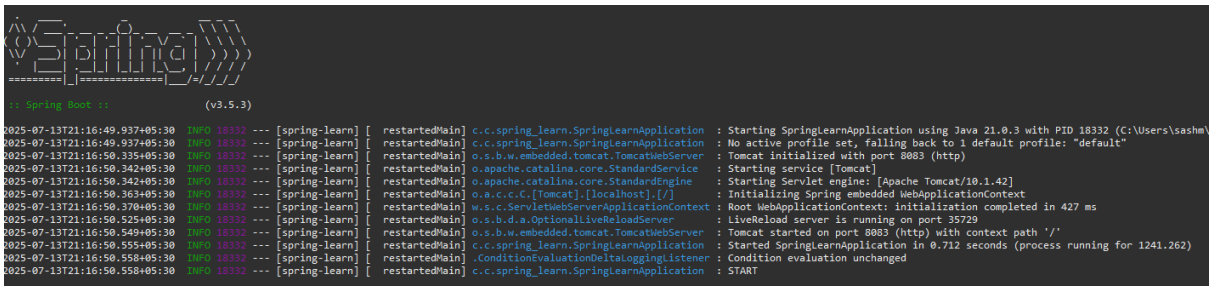
```
package com.cognizant.spring_learn;
public class Country {
   private String code;
   private String name;
   public Country() {}
   public Country(String code, String name) {
      this.code = code;
      this.name = name;
   }
   public String getCode() {
      return code;
   }
   public void setCode(String code) {
      this.code = code;
```

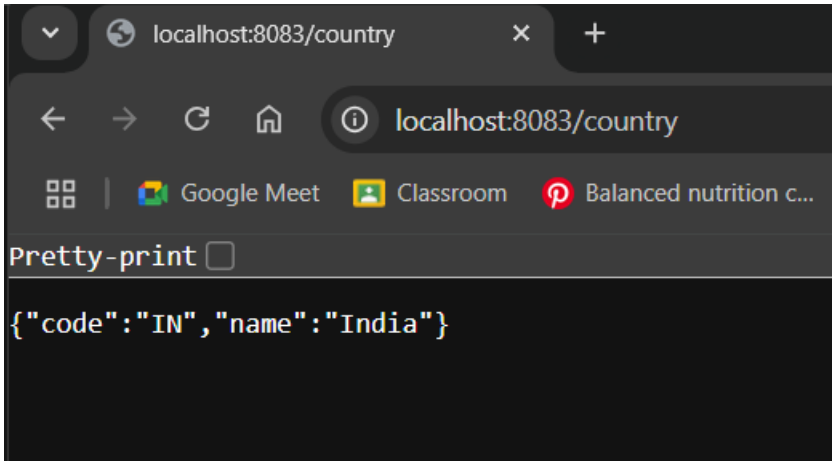
```
    }
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
}
```

CountryController.java

```
package com.cognizant.spring_learn;
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 :





SME Explanation

1. What Happens in the Controller Method?

- When a request is made to /country, Spring calls getCountryIndia().
- It logs the start of the method.
- It loads the Spring context from country.xml.
- It retrieves the bean with ID "in" (which is the India country bean).
- Returns the bean as a response.
- Logs the end of the method.

---

2. How is the Bean Converted to JSON?

- Spring Boot uses **Jackson** (automatically included in spring-boot-starter-web) to convert Java objects into JSON.
- When you return a Country object from a @RestController, Spring uses Jackson to serialize it.
- Jackson inspects getters (getCode(), getName()) and creates the JSON:

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

---

3. View HTTP Headers in Browser Developer Tools

- Open Chrome → Dev Tools (F12) → **Network** tab.
- Hit the URL: http://localhost:8083/country
- Click on the /country request.
- Go to **Headers** tab:
    - **Request Headers**:
        - Host: localhost:8083
        - User-Agent: Chrome
        - Accept: application/json
    - **Response Headers**:
        - Content-Type: application/json
        - Content-Length: XX
        - Date: [Timestamp]

---

4. View HTTP Headers in Postman

- Open Postman → Send GET http://localhost:8083/country
- Click **Headers** tab in the **response** section:
    - You will see:
        - Content-Type: application/json
        - Content-Length: XX
        - Date: [Timestamp]
        - Connection: keep-alive

REST - Get country based on country code

country.xml

```
<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="countryList" class="java.util.ArrayList">
       <constructor-arg>
          <list>
             <bean class="com.cognizant.spring_learn.Country">
                <property name="code" value="IN" />
                <property name="name" value="India" />
             </bean>
             <bean class="com.cognizant.spring_learn.Country">
                <property name="code" value="US" />
                <property name="name" value="United States" />
             </bean>
             <bean class="com.cognizant.spring_learn.Country">
                <property name="code" value="CN" />
                <property name="name" value="China" />
             </bean>
          </list>
       </constructor-arg>
   </bean>
</beans>
```

Country.java

```
package com.cognizant.spring_learn;
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.spring_learn;
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("/countries/{code}")
    public Country getCountry(@PathVariable String code) {
        LOGGER.info("START: getCountry()");
        Country country = countryService.getCountry(code);
        LOGGER.info("END: getCountry()");
        return country;
    }
}
```

CountryService.java

```
package com.cognizant.spring_learn;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

import org.springframework.stereotype.Service;

import java.util.List;

@Service

public class CountryService {

    public Country getCountry(String code) {

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

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

        return countryList.stream()

                .filter(c -> c.getCode().equalsIgnoreCase(code))

                .findFirst()

                .orElse(null);

    }

}
```

SpringLearnApplication.java

```
package com.cognizant.spring_learn;

import org.slf4j.Logger;

import org.slf4j.LoggerFactory;

import org.springframework.boot.SpringApplication;

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

```
@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("START");
	}
}
```

Output :