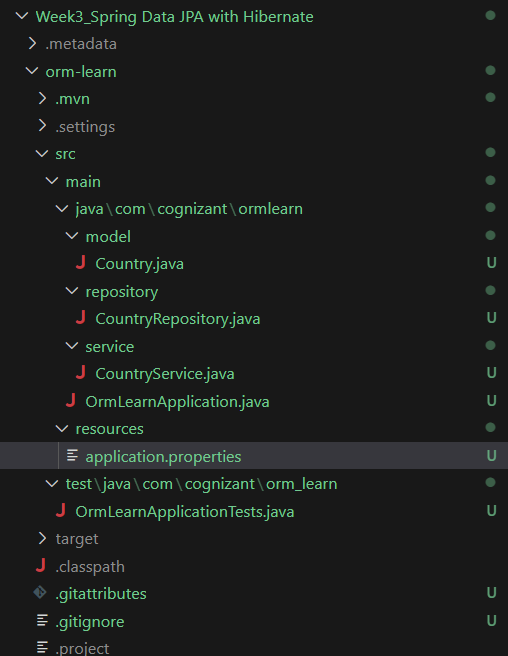
**Mandatory Exercise:**

**Week3\_Spring Data JPA with Hibernate**

**1. Spring Data JPA - Quick Example**

Folder Structure



**Application.properties**

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

spring.datasource.username=root

spring.datasource.password=your\_mysql\_password

spring.datasource.driver-class-name=com.mysql.cj.jdbc.Driver

spring.jpa.hibernate.ddl-auto=update

spring.jpa.show-sql=true

spring.jpa.properties.hibernate.dialect=org.hibernate.dialect.MySQLDialect

**OrmLearnApplication.java**

package com.cognizant.ormlearn;

import java.util.List;

import org.slf4j.Logger;

import org.slf4j.LoggerFactory;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

import org.springframework.context.ApplicationContext;

import com.cognizant.ormlearn.model.Country;

import com.cognizant.ormlearn.service.CountryService;

@SpringBootApplication

public class OrmLearnApplication {

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

    private static CountryService countryService;

    public static void main(String[] args) {

        ApplicationContext context = SpringApplication.run(OrmLearnApplication.class, args);

        LOGGER.info("Inside main");

        countryService = context.getBean(CountryService.class);

        testGetAllCountries();

    }

    private static void testGetAllCountries() {

        LOGGER.info("Start");

        List<Country> countries = countryService.getAllCountries();

        LOGGER.debug("countries={}", countries);

        LOGGER.info("End");

    }

}

**CountryService.java**

package com.cognizant.ormlearn.service;

import jakarta.transaction.Transactional;

import org.springframework.stereotype.Service;

import java.util.List;

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

import com.cognizant.ormlearn.model.Country;

import com.cognizant.ormlearn.repository.CountryRepository;

@Service

public class CountryService {

    @Autowired

    private CountryRepository countryRepository;

    @Transactional

    public List<Country> getAllCountries() {

        return countryRepository.findAll();

    }

}

**CountryRepository.java**

package com.cognizant.ormlearn.repository;

import org.springframework.data.jpa.repository.JpaRepository;

import org.springframework.stereotype.Repository;

import com.cognizant.ormlearn.model.Country;

@Repository

public interface CountryRepository extends JpaRepository<Country, String> {

}

Country.java

package com.cognizant.ormlearn.model;

import jakarta.persistence.\*;

@Entity

@Table(name = "country")

public class Country {

    @Id

    @Column(name = "co\_code")

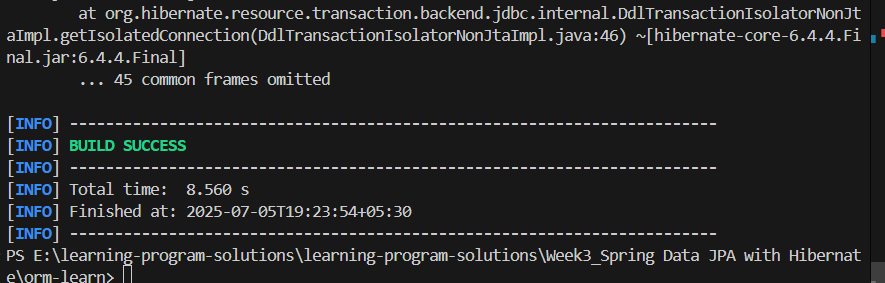
    private String code;

    @Column(name = "co\_name")

    private String name;

}

**Output**

****

**Difference between JPA, Hibernate and Spring Data JPA**

**1. Java Persistence API (JPA)**

What it is:

* JPA is a Java specification (JSR 338) for accessing, persisting, and managing data between Java objects and relational databases.
* It defines interfaces and annotations but does not provide any implementation.

Key Features:

* It’s just a standard API.
* Common annotations: @Entity, @Table, @Id, @OneToMany, etc.
* Needs a provider (like Hibernate, EclipseLink) to work.

**Example:**

@Entity

@Table(name = "employee")

public class Employee {

@Id

private int id;

private String name;

}

**2. Hibernate**

What it is:

* Hibernate is a popular ORM tool (Object-Relational Mapping) and the most commonly used implementation of JPA.
* It provides additional features beyond JPA like lazy loading, caching, etc.

Responsibilities:

* Implements the JPA specification.
* Handles session, transaction, caching, and other low-level details.

Hibernate Code Example:

public Integer addEmployee(Employee employee) {

Session session = factory.openSession();

Transaction tx = null;

Integer employeeID = null;

try {

tx = session.beginTransaction();

employeeID = (Integer) session.save(employee);

tx.commit();

} catch (HibernateException e) {

if (tx != null) tx.rollback();

e.printStackTrace();

} finally {

session.close();

}

return employeeID;

}

**3. Spring Data JPA**

What it is:

* Spring Data JPA is a Spring project that provides a higher-level abstraction over JPA.
* It simplifies repository creation and removes boilerplate code like manually handling EntityManager, Session, or Transaction.

Features:

* Automatically provides CRUD operations.
* Uses JPA repositories (JpaRepository) to auto-generate SQL.
* Built on top of JPA + JPA Provider (e.g., Hibernate).
* Manages transactions automatically with annotations like @Transactional.

Spring Data JPA Code Example:

**@Repository**

**public interface EmployeeRepository extends JpaRepository<Employee, Integer> {**

**}**

**@Service**

**public class EmployeeService {**

**@Autowired**

**private EmployeeRepository employeeRepository;**

**@Transactional**

**public void addEmployee(Employee employee) {**

**employeeRepository.save(employee);**

**}**

**}**

**Tabular Comparison**

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **JPA** | **Hibernate** | **Spring Data JPA** |
| **Type** | **Specification (API)** | **Implementation (Library)** | **Framework abstraction** |
| **Provides implementation** | **No** | **Yes** | **No (uses JPA provider like Hibernate)** |
| **Main Purpose** | **Define persistence behavior** | **ORM tool** | **Simplify JPA/Hibernate usage** |
| **Handles boilerplate** | **No** | **Partially** | **Yes** |
| **Transaction Handling** | **Manual or declarative** | **Manual or declarative** | **✅ Auto-managed with annotations** |
| **Requires EntityManager** | **Yes** | **Yes** | **No (uses Repository abstraction)** |
| **Example Usage** | **Java EE, Spring** | **Java SE, Spring** | **Spring (Spring Boot preferred)** |

**Summary**

* JPA: Specification only. Think of it like an interface in Java.
* Hibernate: The most common implementation of JPA with extra features.
* Spring Data JPA: Simplifies working with JPA by abstracting repetitive code, often using Hibernate under the hood.

**Implement services for managing Country**

**Code:**

**application.properties**

spring.datasource.url=jdbc:h2:mem:testdb

spring.datasource.driver-class-name=org.h2.Driver

spring.datasource.username=sa

spring.datasource.password=

spring.jpa.hibernate.ddl-auto=validate

spring.jpa.show-sql=true

spring.h2.console.enabled=true

**Country.java:**

import jakarta.persistence.Entity;

import jakarta.persistence.Id;

import jakarta.persistence.Table;

import lombok.\*;

@Entity

@Table(name = "country")

@Data

@NoArgsConstructor

@AllArgsConstructor

public class Country {

@Id

private String coCode;

private String coName;

}

**CountryRepository.java**

import org.springframework.data.jpa.repository.JpaRepository;

import java.util.List;

public interface CountryRepository extends JpaRepository<Country, String> {

List<Country> findByCoNameContainingIgnoreCase(String namePart);

}

**CountryService.java**

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

import org.springframework.stereotype.Service;

import java.util.List;

import java.util.Optional;

@Service

public class CountryService {

@Autowired

private CountryRepository countryRepository;

public Country getCountryByCode(String code) {

return countryRepository.findById(code).orElse(null);

}

public Country addCountry(Country country) {

return countryRepository.save(country);

}

public Country updateCountry(String code, Country updatedCountry) {

Optional<Country> optionalCountry = countryRepository.findById(code);

if (optionalCountry.isPresent()) {

Country existing = optionalCountry.get();

existing.setCoName(updatedCountry.getCoName());

return countryRepository.save(existing);

}

return null;

}

public void deleteCountry(String code) {

countryRepository.deleteById(code);

}

public List<Country> searchCountriesByName(String namePart) {

return countryRepository.findByCoNameContainingIgnoreCase(namePart);

}

}

**CountryService.java**

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

import org.springframework.stereotype.Service;

import java.util.List;

import java.util.Optional;

@Service

public class CountryService {

@Autowired

private CountryRepository countryRepository;

public Country getCountryByCode(String code) {

return countryRepository.findById(code).orElse(null);

}

public Country addCountry(Country country) {

return countryRepository.save(country);

}

public Country updateCountry(String code, Country updatedCountry) {

Optional<Country> optionalCountry = countryRepository.findById(code);

if (optionalCountry.isPresent()) {

Country existing = optionalCountry.get();

existing.setCoName(updatedCountry.getCoName());

return countryRepository.save(existing);

}

return null;

}

public void deleteCountry(String code) {

countryRepository.deleteById(code);

}

public List<Country> searchCountriesByName(String namePart) {

return countryRepository.findByCoNameContainingIgnoreCase(namePart);

}

}

**CountryController.java**

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

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

import java.util.List;

@RestController

@RequestMapping("/countries")

public class CountryController {

@Autowired

private CountryService countryService;

@GetMapping("/{code}")

public Country getCountry(@PathVariable String code) {

return countryService.getCountryByCode(code);

}

@PostMapping

public Country addCountry(@RequestBody Country country) {

return countryService.addCountry(country);

}

@PutMapping("/{code}")

public Country updateCountry(@PathVariable String code, @RequestBody Country country) {

return countryService.updateCountry(code, country);

}

@DeleteMapping("/{code}")

public void deleteCountry(@PathVariable String code) {

countryService.deleteCountry(code);

}

@GetMapping("/search")

public List<Country> searchCountries(@RequestParam String name) {

return countryService.searchCountriesByName(name);

}

}

DELETE FROM country;

insert into country (co\_code, co\_name) values ("AF", "Afghanistan");

insert into country (co\_code, co\_name) values ("AL", "Albania");

insert into country (co\_code, co\_name) values ("DZ", "Algeria");

insert into country (co\_code, co\_name) values ("AS", "American Samoa");

insert into country (co\_code, co\_name) values ("AD", "Andorra");

insert into country (co\_code, co\_name) values ("AO", "Angola");

insert into country (co\_code, co\_name) values ("AI", "Anguilla");

insert into country (co\_code, co\_name) values ("AQ", "Antarctica");

insert into country (co\_code, co\_name) values ("AG", "Antigua and Barbuda");

insert into country (co\_code, co\_name) values ("AR", "Argentina");

insert into country (co\_code, co\_name) values ("AM", "Armenia");

insert into country (co\_code, co\_name) values ("AW", "Aruba");

insert into country (co\_code, co\_name) values ("AU", "Australia");

insert into country (co\_code, co\_name) values ("AT", "Austria");

insert into country (co\_code, co\_name) values ("AZ", "Azerbaijan");

insert into country (co\_code, co\_name) values ("BS", "Bahamas");

insert into country (co\_code, co\_name) values ("BH", "Bahrain");

insert into country (co\_code, co\_name) values ("BD", "Bangladesh");

insert into country (co\_code, co\_name) values ("BB", "Barbados");

insert into country (co\_code, co\_name) values ("BY", "Belarus");

insert into country (co\_code, co\_name) values ("BE", "Belgium");

insert into country (co\_code, co\_name) values ("BZ", "Belize");

insert into country (co\_code, co\_name) values ("BJ", "Benin");

insert into country (co\_code, co\_name) values ("BM", "Bermuda");

insert into country (co\_code, co\_name) values ("BT", "Bhutan");

insert into country (co\_code, co\_name) values ("BO", "Bolivia, Plurinational State of");

insert into country (co\_code, co\_name) values ("BQ", "Bonaire, Sint Eustatius and Saba");

insert into country (co\_code, co\_name) values ("BA", "Bosnia and Herzegovina");

insert into country (co\_code, co\_name) values ("BW", "Botswana");

insert into country (co\_code, co\_name) values ("BV", "Bouvet Island");

insert into country (co\_code, co\_name) values ("BR", "Brazil");

insert into country (co\_code, co\_name) values ("IO", "British Indian Ocean Territory");

insert into country (co\_code, co\_name) values ("BN", "Brunei Darussalam");

insert into country (co\_code, co\_name) values ("BG", "Bulgaria");

insert into country (co\_code, co\_name) values ("BF", "Burkina Faso");

insert into country (co\_code, co\_name) values ("BI", "Burundi");

insert into country (co\_code, co\_name) values ("KH", "Cambodia");

insert into country (co\_code, co\_name) values ("CM", "Cameroon");

insert into country (co\_code, co\_name) values ("CA", "Canada");

insert into country (co\_code, co\_name) values ("CV", "Cape Verde");

insert into country (co\_code, co\_name) values ("KY", "Cayman Islands");

insert into country (co\_code, co\_name) values ("CF", "Central African Republic");

insert into country (co\_code, co\_name) values ("TD", "Chad");

insert into country (co\_code, co\_name) values ("CL", "Chile");

insert into country (co\_code, co\_name) values ("CN", "China");

insert into country (co\_code, co\_name) values ("CX", "Christmas Island");

insert into country (co\_code, co\_name) values ("CC", "Cocos (Keeling) Islands");

insert into country (co\_code, co\_name) values ("CO", "Colombia");

insert into country (co\_code, co\_name) values ("KM", "Comoros");

insert into country (co\_code, co\_name) values ("CG", "Congo");

insert into country (co\_code, co\_name) values ("CD", "Congo, the Democratic Republic of the");

insert into country (co\_code, co\_name) values ("CK", "Cook Islands");

insert into country (co\_code, co\_name) values ("CR", "Costa Rica");

insert into country (co\_code, co\_name) values ("HR", "Croatia");

insert into country (co\_code, co\_name) values ("CU", "Cuba");

insert into country (co\_code, co\_name) values ("CW", "Curaçao");

insert into country (co\_code, co\_name) values ("CY", "Cyprus");

insert into country (co\_code, co\_name) values ("CZ", "Czech Republic");

insert into country (co\_code, co\_name) values ("CI", "Côte d'Ivoire");

insert into country (co\_code, co\_name) values ("DK", "Denmark");

insert into country (co\_code, co\_name) values ("DJ", "Djibouti");

insert into country (co\_code, co\_name) values ("DM", "Dominica");

insert into country (co\_code, co\_name) values ("DO", "Dominican Republic");

insert into country (co\_code, co\_name) values ("EC", "Ecuador");

insert into country (co\_code, co\_name) values ("EG", "Egypt");

insert into country (co\_code, co\_name) values ("SV", "El Salvador");

insert into country (co\_code, co\_name) values ("GQ", "Equatorial Guinea");

insert into country (co\_code, co\_name) values ("ER", "Eritrea");

insert into country (co\_code, co\_name) values ("EE", "Estonia");

insert into country (co\_code, co\_name) values ("ET", "Ethiopia");

insert into country (co\_code, co\_name) values ("FK", "Falkland Islands (Malvinas)");

insert into country (co\_code, co\_name) values ("FO", "Faroe Islands");

insert into country (co\_code, co\_name) values ("FJ", "Fiji");

insert into country (co\_code, co\_name) values ("FI", "Finland");

insert into country (co\_code, co\_name) values ("FR", "France");

insert into country (co\_code, co\_name) values ("GF", "French Guiana");

insert into country (co\_code, co\_name) values ("PF", "French Polynesia");

insert into country (co\_code, co\_name) values ("TF", "French Southern Territories");

insert into country (co\_code, co\_name) values ("GA", "Gabon");

insert into country (co\_code, co\_name) values ("GM", "Gambia");

insert into country (co\_code, co\_name) values ("GE", "Georgia");

insert into country (co\_code, co\_name) values ("DE", "Germany");

insert into country (co\_code, co\_name) values ("GH", "Ghana");

insert into country (co\_code, co\_name) values ("GI", "Gibraltar");

insert into country (co\_code, co\_name) values ("GR", "Greece");

insert into country (co\_code, co\_name) values ("GL", "Greenland");

insert into country (co\_code, co\_name) values ("GD", "Grenada");

insert into country (co\_code, co\_name) values ("GP", "Guadeloupe");

insert into country (co\_code, co\_name) values ("GU", "Guam");

insert into country (co\_code, co\_name) values ("GT", "Guatemala");

insert into country (co\_code, co\_name) values ("GG", "Guernsey");

insert into country (co\_code, co\_name) values ("GN", "Guinea");

insert into country (co\_code, co\_name) values ("GW", "Guinea-Bissau");

insert into country (co\_code, co\_name) values ("GY", "Guyana");

insert into country (co\_code, co\_name) values ("HT", "Haiti");

insert into country (co\_code, co\_name) values ("HM", "Heard Island and McDonald Islands");

insert into country (co\_code, co\_name) values ("VA", "Holy See (Vatican City State)");

insert into country (co\_code, co\_name) values ("HN", "Honduras");

insert into country (co\_code, co\_name) values ("HK", "Hong Kong");

insert into country (co\_code, co\_name) values ("HU", "Hungary");

insert into country (co\_code, co\_name) values ("IS", "Iceland");

insert into country (co\_code, co\_name) values ("IN", "India");

insert into country (co\_code, co\_name) values ("ID", "Indonesia");

insert into country (co\_code, co\_name) values ("IR", "Iran, Islamic Republic of");

insert into country (co\_code, co\_name) values ("IQ", "Iraq");

insert into country (co\_code, co\_name) values ("IE", "Ireland");

insert into country (co\_code, co\_name) values ("IM", "Isle of Man");

insert into country (co\_code, co\_name) values ("IL", "Israel");

insert into country (co\_code, co\_name) values ("IT", "Italy");

insert into country (co\_code, co\_name) values ("JM", "Jamaica");

insert into country (co\_code, co\_name) values ("JP", "Japan");

insert into country (co\_code, co\_name) values ("JE", "Jersey");

insert into country (co\_code, co\_name) values ("JO", "Jordan");

insert into country (co\_code, co\_name) values ("KZ", "Kazakhstan");

insert into country (co\_code, co\_name) values ("KE", "Kenya");

insert into country (co\_code, co\_name) values ("KI", "Kiribati");

insert into country (co\_code, co\_name) values ("KP", "Democratic People's Republic of Korea");

insert into country (co\_code, co\_name) values ("KR", "Republic of Korea");

insert into country (co\_code, co\_name) values ("KW", "Kuwait");

insert into country (co\_code, co\_name) values ("KG", "Kyrgyzstan");

insert into country (co\_code, co\_name) values ("LA", "Lao People's Democratic Republic");

insert into country (co\_code, co\_name) values ("LV", "Latvia");

insert into country (co\_code, co\_name) values ("LB", "Lebanon");

insert into country (co\_code, co\_name) values ("LS", "Lesotho");

insert into country (co\_code, co\_name) values ("LR", "Liberia");

insert into country (co\_code, co\_name) values ("LY", "Libya");

insert into country (co\_code, co\_name) values ("LI", "Liechtenstein");

insert into country (co\_code, co\_name) values ("LT", "Lithuania");

insert into country (co\_code, co\_name) values ("LU", "Luxembourg");

insert into country (co\_code, co\_name) values ("MO", "Macao");

insert into country (co\_code, co\_name) values ("MK", "Macedonia, the Former Yugoslav Republic of");

insert into country (co\_code, co\_name) values ("MG", "Madagascar");

insert into country (co\_code, co\_name) values ("MW", "Malawi");

insert into country (co\_code, co\_name) values ("MY", "Malaysia");

insert into country (co\_code, co\_name) values ("MV", "Maldives");

insert into country (co\_code, co\_name) values ("ML", "Mali");

insert into country (co\_code, co\_name) values ("MT", "Malta");

insert into country (co\_code, co\_name) values ("MH", "Marshall Islands");

insert into country (co\_code, co\_name) values ("MQ", "Martinique");

insert into country (co\_code, co\_name) values ("MR", "Mauritania");

insert into country (co\_code, co\_name) values ("MU", "Mauritius");

insert into country (co\_code, co\_name) values ("YT", "Mayotte");

insert into country (co\_code, co\_name) values ("MX", "Mexico");

insert into country (co\_code, co\_name) values ("FM", "Micronesia, Federated States of");

insert into country (co\_code, co\_name) values ("MD", "Moldova, Republic of");

insert into country (co\_code, co\_name) values ("MC", "Monaco");

insert into country (co\_code, co\_name) values ("MN", "Mongolia");

insert into country (co\_code, co\_name) values ("ME", "Montenegro");

insert into country (co\_code, co\_name) values ("MS", "Montserrat");

insert into country (co\_code, co\_name) values ("MA", "Morocco");

insert into country (co\_code, co\_name) values ("MZ", "Mozambique");

insert into country (co\_code, co\_name) values ("MM", "Myanmar");

insert into country (co\_code, co\_name) values ("NA", "Namibia");

insert into country (co\_code, co\_name) values ("NR", "Nauru");

insert into country (co\_code, co\_name) values ("NP", "Nepal");

insert into country (co\_code, co\_name) values ("NL", "Netherlands");

insert into country (co\_code, co\_name) values ("NC", "New Caledonia");

insert into country (co\_code, co\_name) values ("NZ", "New Zealand");

insert into country (co\_code, co\_name) values ("NI", "Nicaragua");

insert into country (co\_code, co\_name) values ("NE", "Niger");

insert into country (co\_code, co\_name) values ("NG", "Nigeria");

insert into country (co\_code, co\_name) values ("NU", "Niue");

insert into country (co\_code, co\_name) values ("NF", "Norfolk Island");

insert into country (co\_code, co\_name) values ("MP", "Northern Mariana Islands");

insert into country (co\_code, co\_name) values ("NO", "Norway");

insert into country (co\_code, co\_name) values ("OM", "Oman");

insert into country (co\_code, co\_name) values ("PK", "Pakistan");

insert into country (co\_code, co\_name) values ("PW", "Palau");

insert into country (co\_code, co\_name) values ("PS", "Palestine, State of");

insert into country (co\_code, co\_name) values ("PA", "Panama");

insert into country (co\_code, co\_name) values ("PG", "Papua New Guinea");

insert into country (co\_code, co\_name) values ("PY", "Paraguay");

insert into country (co\_code, co\_name) values ("PE", "Peru");

insert into country (co\_code, co\_name) values ("PH", "Philippines");

insert into country (co\_code, co\_name) values ("PN", "Pitcairn");

insert into country (co\_code, co\_name) values ("PL", "Poland");

insert into country (co\_code, co\_name) values ("PT", "Portugal");

insert into country (co\_code, co\_name) values ("PR", "Puerto Rico");

insert into country (co\_code, co\_name) values ("QA", "Qatar");

insert into country (co\_code, co\_name) values ("RO", "Romania");

insert into country (co\_code, co\_name) values ("RU", "Russian Federation");

insert into country (co\_code, co\_name) values ("RW", "Rwanda");

insert into country (co\_code, co\_name) values ("RE", "Réunion");

insert into country (co\_code, co\_name) values ("BL", "Saint Barthélemy");

insert into country (co\_code, co\_name) values ("SH", "Saint Helena, Ascension and Tristan da Cunha");

insert into country (co\_code, co\_name) values ("KN", "Saint Kitts and Nevis");

insert into country (co\_code, co\_name) values ("LC", "Saint Lucia");

insert into country (co\_code, co\_name) values ("MF", "Saint Martin (French part)");

insert into country (co\_code, co\_name) values ("PM", "Saint Pierre and Miquelon");

insert into country (co\_code, co\_name) values ("VC", "Saint Vincent and the Grenadines");

insert into country (co\_code, co\_name) values ("WS", "Samoa");

insert into country (co\_code, co\_name) values ("SM", "San Marino");

insert into country (co\_code, co\_name) values ("ST", "Sao Tome and Principe");

insert into country (co\_code, co\_name) values ("SA", "Saudi Arabia");

insert into country (co\_code, co\_name) values ("SN", "Senegal");

insert into country (co\_code, co\_name) values ("RS", "Serbia");

insert into country (co\_code, co\_name) values ("SC", "Seychelles");

insert into country (co\_code, co\_name) values ("SL", "Sierra Leone");

insert into country (co\_code, co\_name) values ("SG", "Singapore");

insert into country (co\_code, co\_name) values ("SX", "Sint Maarten (Dutch part)");

insert into country (co\_code, co\_name) values ("SK", "Slovakia");

insert into country (co\_code, co\_name) values ("SI", "Slovenia");

insert into country (co\_code, co\_name) values ("SB", "Solomon Islands");

insert into country (co\_code, co\_name) values ("SO", "Somalia");

insert into country (co\_code, co\_name) values ("ZA", "South Africa");

insert into country (co\_code, co\_name) values ("GS", "South Georgia and the South Sandwich Islands");

insert into country (co\_code, co\_name) values ("SS", "South Sudan");

insert into country (co\_code, co\_name) values ("ES", "Spain");

insert into country (co\_code, co\_name) values ("LK", "Sri Lanka");

insert into country (co\_code, co\_name) values ("SD", "Sudan");

insert into country (co\_code, co\_name) values ("SR", "Suriname");

insert into country (co\_code, co\_name) values ("SJ", "Svalbard and Jan Mayen");

insert into country (co\_code, co\_name) values ("SZ", "Swaziland");

insert into country (co\_code, co\_name) values ("SE", "Sweden");

insert into country (co\_code, co\_name) values ("CH", "Switzerland");

insert into country (co\_code, co\_name) values ("SY", "Syrian Arab Republic");

insert into country (co\_code, co\_name) values ("TW", "Taiwan, Province of China");

insert into country (co\_code, co\_name) values ("TJ", "Tajikistan");

insert into country (co\_code, co\_name) values ("TZ", "Tanzania, United Republic of");

insert into country (co\_code, co\_name) values ("TH", "Thailand");

insert into country (co\_code, co\_name) values ("TL", "Timor-Leste");

insert into country (co\_code, co\_name) values ("TG", "Togo");

insert into country (co\_code, co\_name) values ("TK", "Tokelau");

insert into country (co\_code, co\_name) values ("TO", "Tonga");

insert into country (co\_code, co\_name) values ("TT", "Trinidad and Tobago");

insert into country (co\_code, co\_name) values ("TN", "Tunisia");

insert into country (co\_code, co\_name) values ("TR", "Turkey");

insert into country (co\_code, co\_name) values ("TM", "Turkmenistan");

insert into country (co\_code, co\_name) values ("TC", "Turks and Caicos Islands");

insert into country (co\_code, co\_name) values ("TV", "Tuvalu");

insert into country (co\_code, co\_name) values ("UG", "Uganda");

insert into country (co\_code, co\_name) values ("UA", "Ukraine");

insert into country (co\_code, co\_name) values ("AE", "United Arab Emirates");

insert into country (co\_code, co\_name) values ("GB", "United Kingdom");

insert into country (co\_code, co\_name) values ("US", "United States");

insert into country (co\_code, co\_name) values ("UM", "United States Minor Outlying Islands");

insert into country (co\_code, co\_name) values ("UY", "Uruguay");

insert into country (co\_code, co\_name) values ("UZ", "Uzbekistan");

insert into country (co\_code, co\_name) values ("VU", "Vanuatu");

insert into country (co\_code, co\_name) values ("VE", "Venezuela, Bolivarian Republic of");

insert into country (co\_code, co\_name) values ("VN", "Viet Nam");

insert into country (co\_code, co\_name) values ("VG", "Virgin Islands, British");

insert into country (co\_code, co\_name) values ("VI", "Virgin Islands, U.S.");

insert into country (co\_code, co\_name) values ("WF", "Wallis and Futuna");

insert into country (co\_code, co\_name) values ("EH", "Western Sahara");

insert into country (co\_code, co\_name) values ("YE", "Yemen");

insert into country (co\_code, co\_name) values ("ZM", "Zambia");

insert into country (co\_code, co\_name) values ("ZW", "Zimbabwe");

insert into country (co\_code, co\_name) values ("AX", "Åland Islands");

**Q- Add a new country**

**CountryService.java**

import jakarta.transaction.Transactional;

@Service

public class CountryService {

@Autowired

private CountryRepository countryRepository;

public Country findCountryByCode(String code) {

return countryRepository.findById(code).orElse(null);

}

@Transactional

public void addCountry(Country country) {

countryRepository.save(country);

}

}

**OrmLearnApplication.java**

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

import org.springframework.boot.CommandLineRunner;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication

public class OrmLearnApplication implements CommandLineRunner {

@Autowired

private CountryService countryService;

public static void main(String[] args) {

SpringApplication.run(OrmLearnApplication.class, args);

}

@Override

public void run(String... args) throws Exception {

testAddCountry();

}

public void testAddCountry() {

System.out.println("==== Testing Add Country ====");

Country newCountry = new Country("IN", "India");

countryService.addCountry(newCountry);

System.out.println("Country added successfully");

Country retrieved = countryService.findCountryByCode("IN");

if (retrieved != null) {

System.out.println("Retrieved Country: " + retrieved.getCoCode() + " - " + retrieved.getCoName());

} else {

System.out.println("Country not found!");

}

}

}

Output

