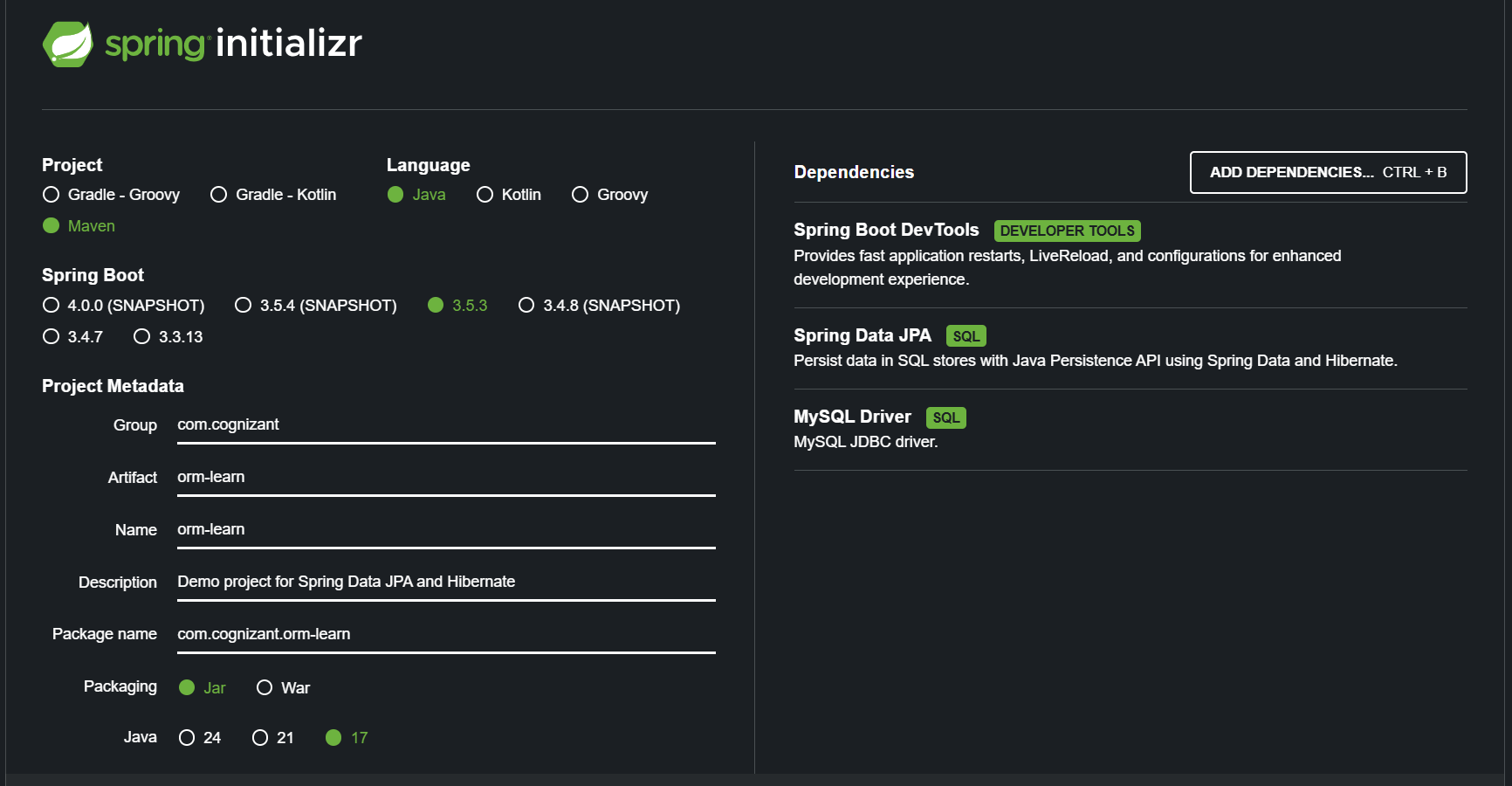
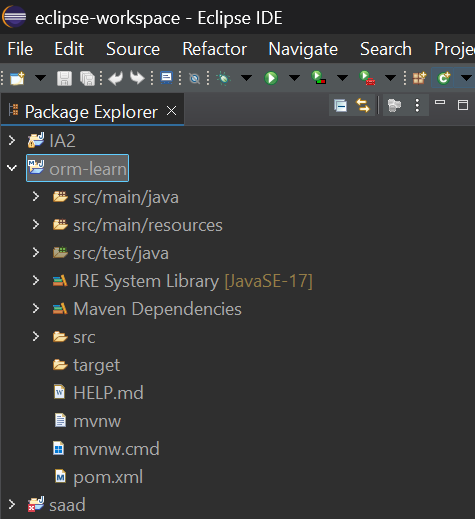
**WEEK 3: SPRING DATA JPA WITH SPRING BOOT, HIBERNATE**

**Hands on 1: Spring Data JPA - Quick Example**

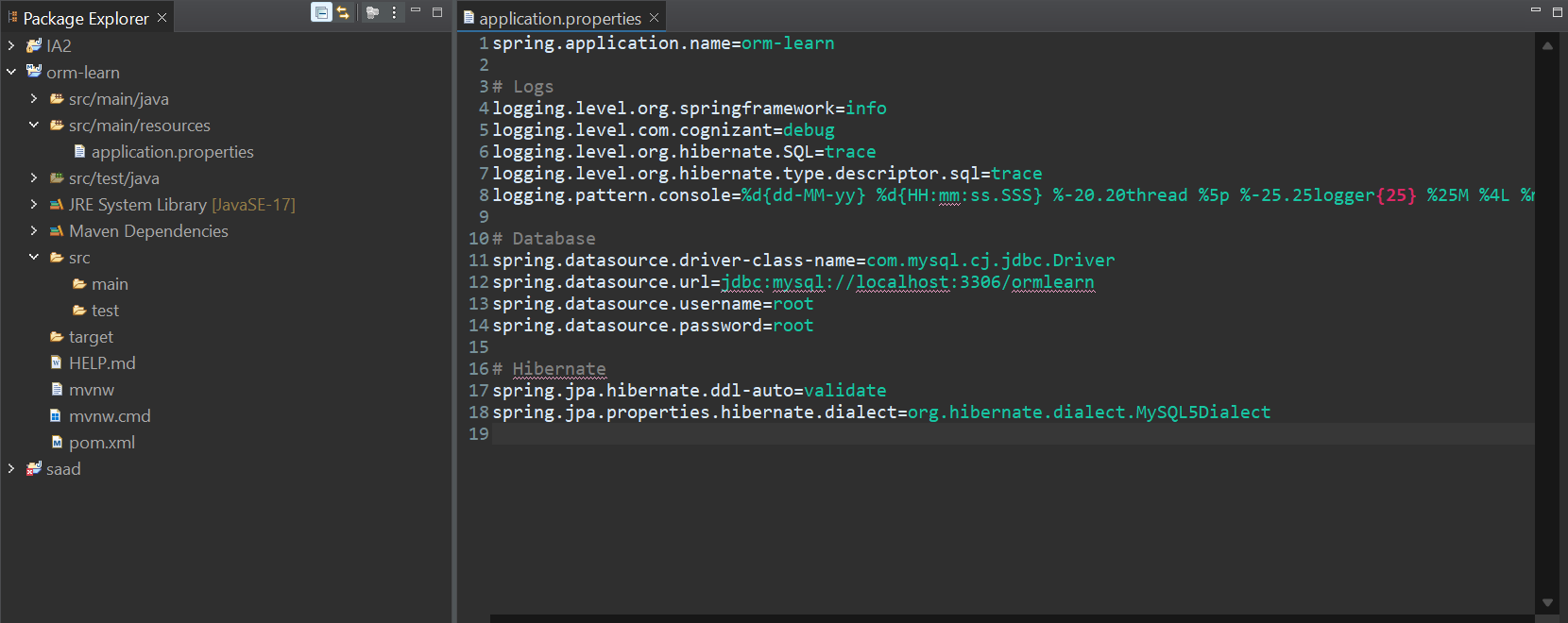
**Step 1: Generate Spring Boot Project**



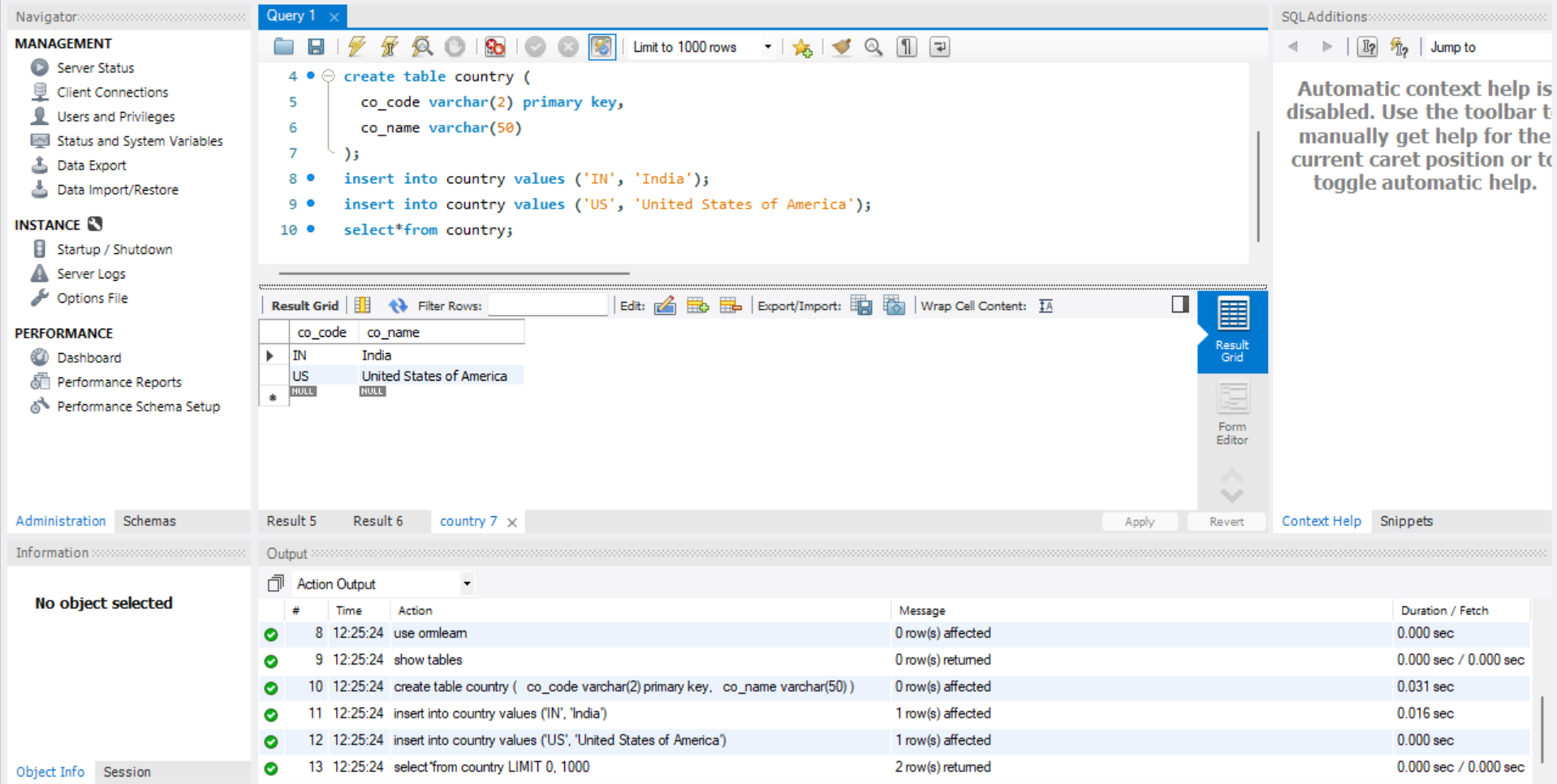
**Step 2: Import the jar file in Eclipse**

****

**Step 3:**

****

**Step 4: Open Workbench and create schema, tables and add values**

****

**Step 5: src/main/resources/application.properties**

spring.application.name=orm-learn

**# Logs**

logging.level.org.springframework=info

logging.level.com.cognizant=debug

logging.level.org.hibernate.SQL=trace

logging.level.org.hibernate.type.descriptor.sql=trace

logging.pattern.console=%d{dd-MM-yy} %d{HH:mm:ss.SSS} %-20.20thread %5p %-25.25logger{25} %25M %4L %m%n

**# Database**

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

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

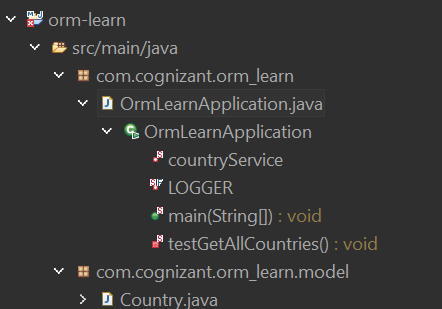
spring.datasource.username=root

spring.datasource.password=saadma11

**# Hibernate**

spring.jpa.hibernate.ddl-auto=validate

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



**Country.java**

package com.cognizant.orm\_learn.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;

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; }

*@Override*

public String toString() {

return "Country [code=" + code + ", name=" + name + "]";

}

}

**POM file:**

<?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>orm-learn</artifactId>

<version>0.0.1-SNAPSHOT</version>

<name>orm-learn</name>

<description>Demo project for Spring Data JPA and Hibernate</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-data-jpa</artifactId>

</dependency>

<dependency>

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

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

<scope>runtime</scope>

<optional>true</optional>

</dependency>

<dependency>

<groupId>com.mysql</groupId>

<artifactId>mysql-connector-j</artifactId>

<scope>runtime</scope>

</dependency>

<dependency>

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

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

<scope>test</scope>

</dependency>

<dependency>

<groupId>jakarta.persistence</groupId>

<artifactId>jakarta.persistence-api</artifactId>

<version>3.1.0</version> <!-- or similar -->

</dependency>

</dependencies>

<build>

<plugins>

<plugin>

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

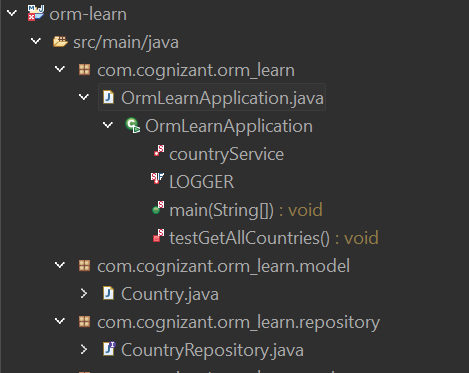
<artifactId>spring-boot-maven-plugin</artifactId>

</plugin>

</plugins>

</build>

</project>



**CountryRepository.java**

package com.cognizant.orm\_learn.repository;

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

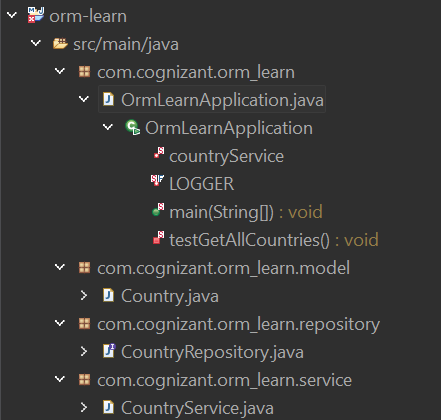
import org.springframework.stereotype.Repository;

import com.cognizant.orm\_learn.model.Country;

*@Repository*

public interface CountryRepository extends JpaRepository<Country, String> {

}



**CountryService.java**

package com.cognizant.orm\_learn.service;

import java.util.List;

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

import org.springframework.stereotype.Service;

import org.springframework.transaction.annotation.Transactional;

import com.cognizant.orm\_learn.model.Country;

import com.cognizant.orm\_learn.repository.CountryRepository;

*@Service*

public class CountryService {

*@Autowired*

private CountryRepository countryRepository;

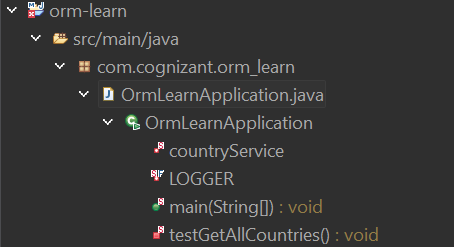
*@Transactional*

public List<Country> getAllCountries() {

return countryRepository.findAll();

}

}



**OrmLearnApplication.java**

package com.cognizant.orm\_learn;

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.orm\_learn.model.Country;

import com.cognizant.orm\_learn.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);

*countryService* = context.getBean(CountryService.class);

*testGetAllCountries*();

}

private static void testGetAllCountries() {

*LOGGER*.info("Start");

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

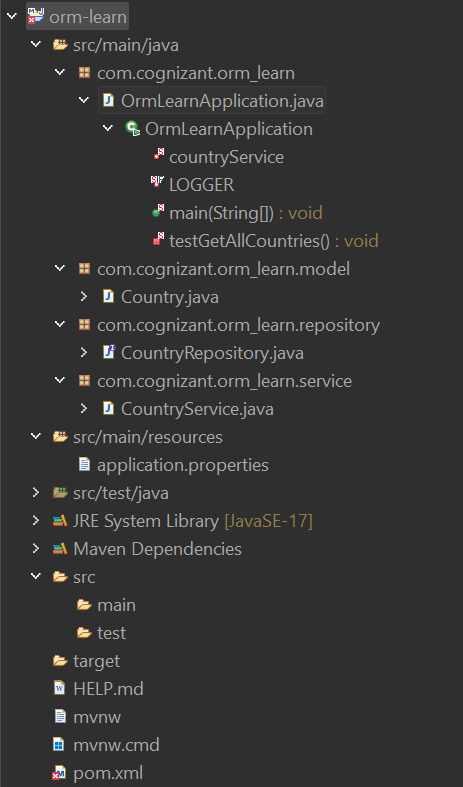
*LOGGER*.debug("countries={}", countries);

*LOGGER*.info("End");

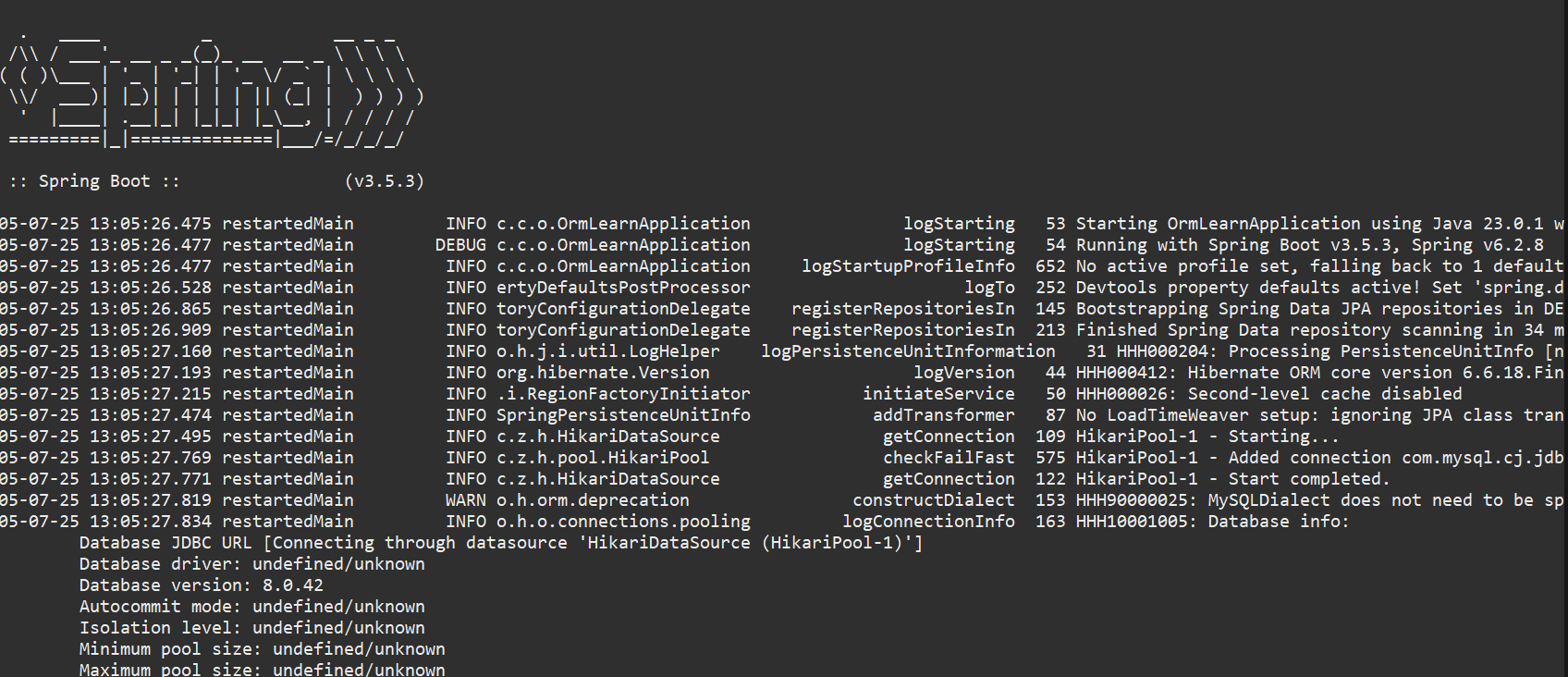
}

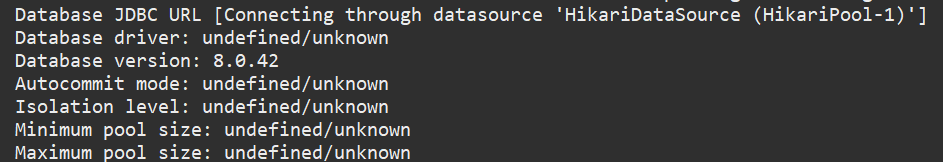
}

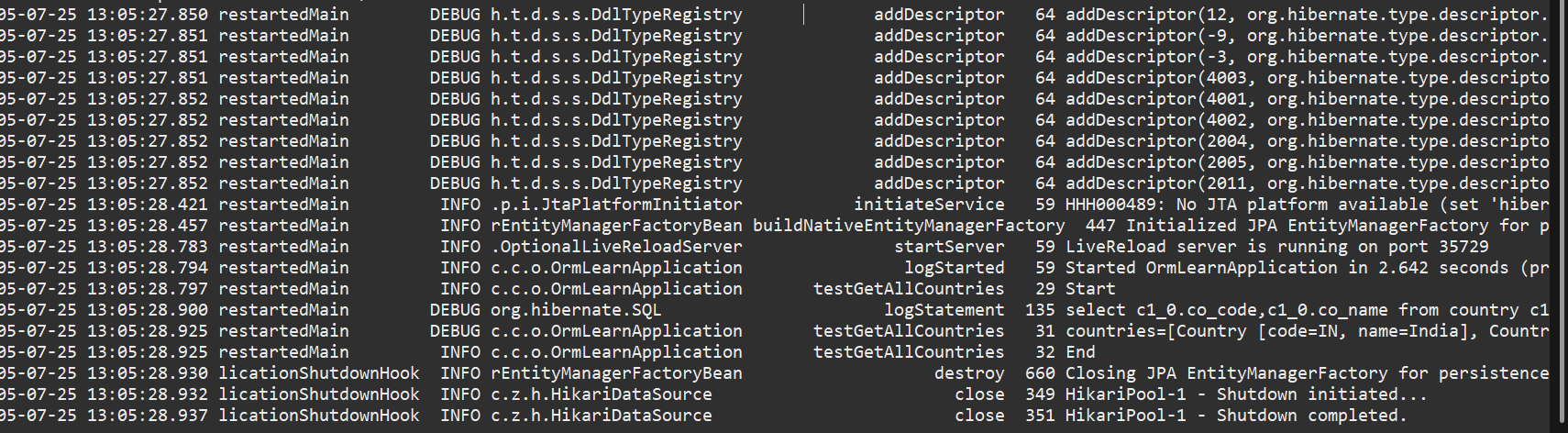
**Project Workflow/Structure:**

****

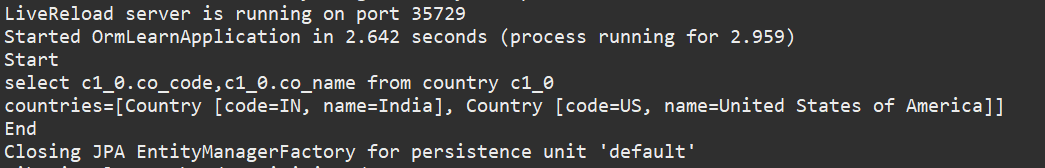
**Output:**

****

****

****

**The countries from the database are displayed successfully**

****

**Hands on 2: Difference between JPA, Hibernate and Spring Data JPA**

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **JPA** | **Hibernate** | **Spring Data JPA** |
| Type | Specification | Implementation of JPA | Abstraction over JPA and Hibernate |
| Provided by | javax.persistence or jakarta.persistence | org.hibernate | org.springframework.data.jpa.repository |
| Config Required | Yes (persistence.xml) | Yes (hibernate.cfg.xml) | No (Spring Boot auto-config) |
| API Used | EntityManager | Session, Transaction | JpaRepository |
| Boilerplate Code | Moderate | High | Minimal |
| Transaction Mgmt | Manual | Manual | Auto-managed |
| Ease of Use | Medium | Harder | Very easy |

**JPA Example (Using EntityManager):**

EntityManagerFactory emf = Persistence.createEntityManagerFactory("persistenceUnit");

EntityManager em = emf.createEntityManager();

em.getTransaction().begin();

Country country = new Country();

country.setCode("FR");

country.setName("France");

em.persist(country);

em.getTransaction().commit();

em.close();

**Hibernate Example (Using Session and Transaction):**

SessionFactory factory = new Configuration().configure().buildSessionFactory();

Session session = factory.openSession();

Transaction tx = session.beginTransaction();

Country country = new Country();

country.setCode("FR");

country.setName("France");

session.save(country);

tx.commit();

session.close();

**Spring Data JPA Example (what we used in Hands-on 1)**

@Autowired

private CountryRepository countryRepository;

public void saveCountry() {

Country country = new Country();

country.setCode("FR");

country.setName("France");

countryRepository.save(country);

}