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**COGNIZANT DIGITAL NURTURE 4.0 JAVA FSE**

**WEEK-3:Spring Data JPA**

**Hands on 1**

**Spring Data JPA - Quick Example**

**Create MySQL Schema**

mysql -u root -p

create schema ormlearn;

use ormlearn;

create table country (

co\_code varchar(2) primary key,

co\_name varchar(50)

);

insert into country values ('IN', 'India');

insert into country values ('US', 'United States of America');

**application.properties**

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

# DB Configuration

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=root

# Hibernate

spring.jpa.hibernate.ddl-auto=validate

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

**Build via Command Line**

mvn clean package -Dhttp.proxyHost=proxy.cognizant.com -Dhttp.proxyPort=6050 -Dhttps.proxyHost=proxy.cognizant.com -Dhttps.proxyPort=6050 -Dhttp.proxyUser=123456

**OrmLearnApplication.java**

package com.cognizant.orm\_learn;

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

import com.cognizant.orm\_learn.service.CountryService;

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 java.util.List;

*@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");

}

}

**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;

// Getters, Setters, toString()

}

**CountryRepository.java**

package com.cognizant.orm\_learn.repository;

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

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

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*(readOnly = true)

public List<Country> getAllCountries() {

return countryRepository.findAll();

}

}

**OrmLearnApplication.java**

package com.cognizant.orm\_learn;

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

import com.cognizant.orm\_learn.service.CountryService;

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 java.util.List;

*@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();

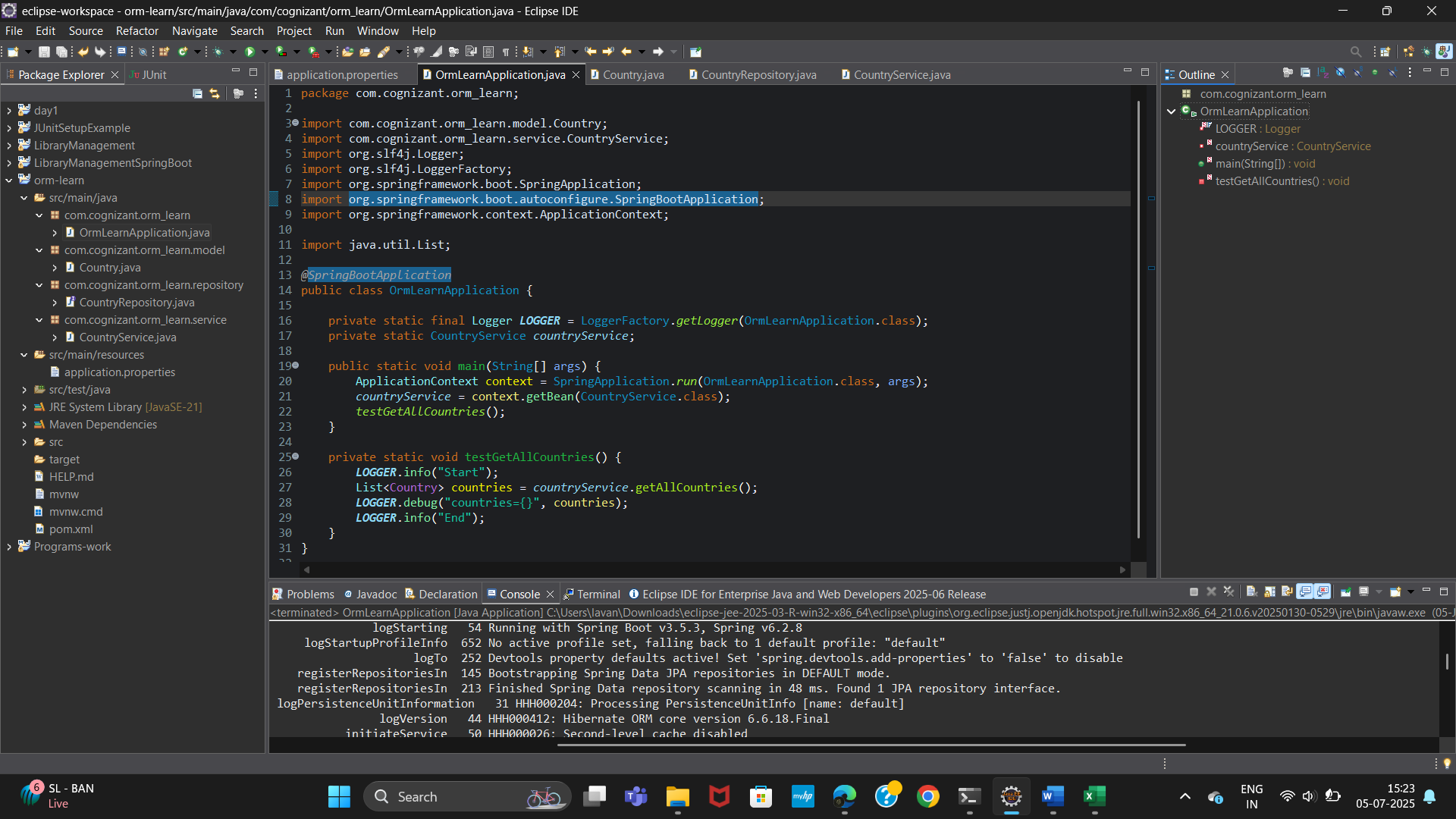
***LOGGER***.debug("countries={}", countries);

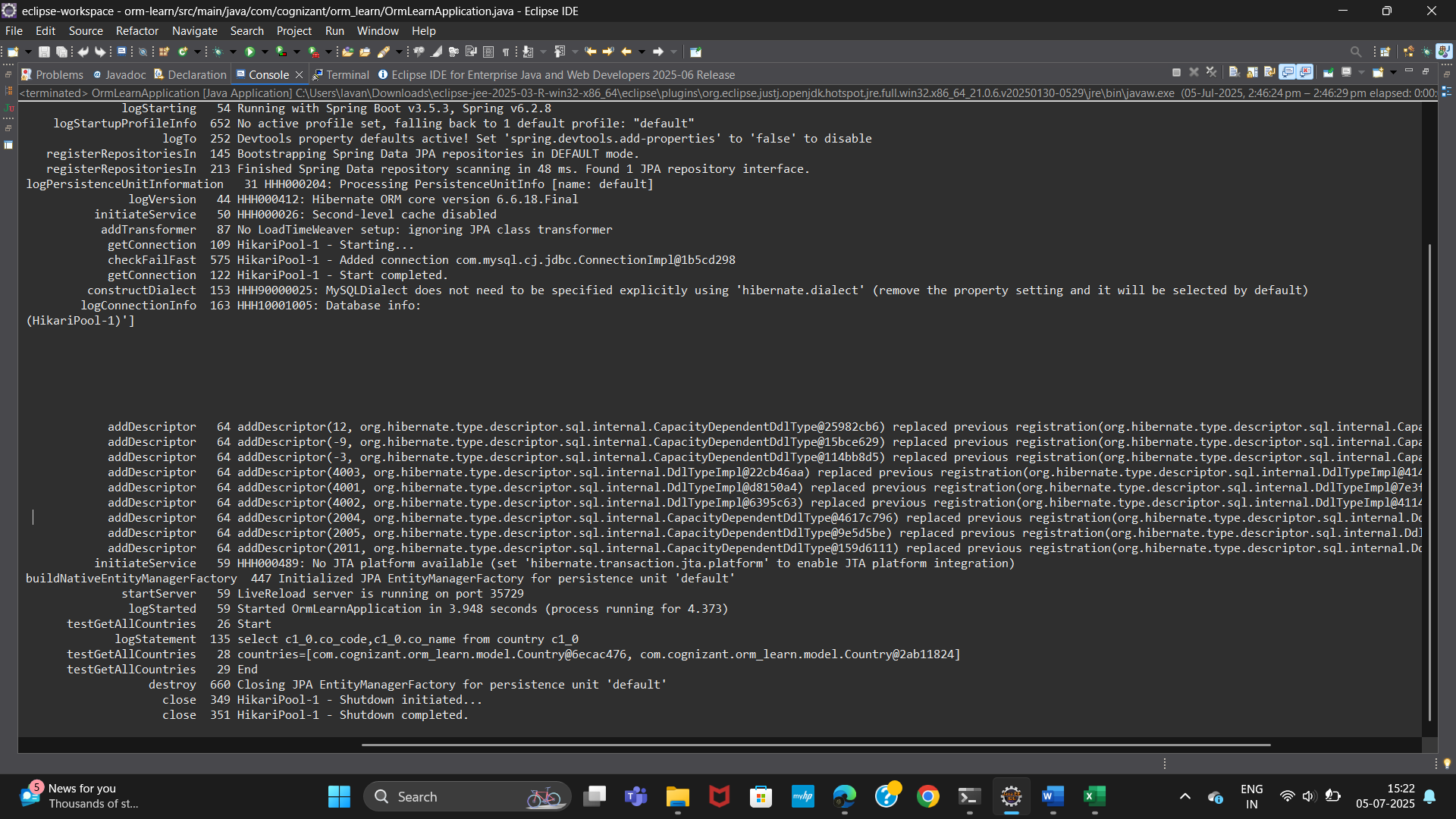
***LOGGER***.info("End");

}

}

**OUTPUT:**





**Hands on 4**

**Difference between JPA, Hibernate and Spring Data JPA**   
  
Java Persistence API (JPA)

* JSR 338 Specification for persisting, reading and managing data from Java objects
* Does not contain concrete implementation of the specification
* Hibernate is one of the implementation of JPA

Hibernate

* ORM Tool that implements JPA

Spring Data JPA

* Does not have JPA implementation, but reduces boiler plate code
* This is another level of abstraction over JPA implementation provider like Hibernate
* Manages transactions

**Java Persistence API (JPA)**

* Specification (JSR 338) for persisting, reading, and managing data in Java objects.
* Not an implementation—just a set of interfaces and annotations (like @Entity, @Id, etc.).
* Needs a provider to function (e.g., Hibernate, EclipseLink).

**Hibernate**

* A popular ORM (Object-Relational Mapping) framework that implements the JPA specification.
* Offers extra features beyond JPA like:
  + Lazy initialization outside transactions
  + Better caching
  + Native SQL support
* Can be used with or without JPA.

**Spring Data JPA**

* Part of the Spring ecosystem.
* Does not implement JPA itself—relies on a provider like Hibernate.
* Adds an abstraction layer to:
  + Reduce boilerplate code (e.g., repositories, queries)
  + Simplify CRUD operations and query creation
  + Manage transactions automatically

**CODE:**

**Employee.java**

package com.example.employeeapp.model;

import jakarta.persistence.\*;

*@Entity*

public class Employee {

*@Id*

*@GeneratedValue*(strategy = *GenerationType*.***IDENTITY***)

private Integer id;

private String name;

private String department;

public Employee() {}

public Employee(String name, String department) {

this.name = name;

this.department = department;

}

public Integer getId() { return id; }

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

public String getName() { return name; }

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

public String getDepartment() { return department; }

public void setDepartment(String department) { this.department = department; }

}

**EmployeeService.java**

package com.example.employeeapp.repository;

import com.example.employeeapp.model.Employee;

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

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

package com.example.employeeapp.service;

import com.example.employeeapp.model.Employee;

import com.example.employeeapp.repository.EmployeeRepository;

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

import org.springframework.stereotype.Service;

import jakarta.transaction.Transactional;

@Service

public class EmployeeService {

@Autowired

private EmployeeRepository employeeRepository;

@Transactional

public void addEmployee(Employee employee) {

employeeRepository.save(employee);

}

}

**EmployeeController.java**

package com.example.employeeapp.controller;

import com.example.employeeapp.model.Employee;

import com.example.employeeapp.service.EmployeeService;

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

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

*@RestController*

*@RequestMapping*("/employees")

public class EmployeeController {

*@Autowired*

private EmployeeService employeeService;

*@PostMapping*("/add")

public String addEmployee(*@RequestBody* Employee employee) {

employeeService.addEmployee(employee);

return "Employee added successfully!";

}

}

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

spring.datasource.driverClassName=org.h2.Driver

spring.datasource.username=sa

spring.datasource.password=

spring.jpa.database-platform=org.hibernate.dialect.H2Dialect

spring.h2.console.enabled=true

spring.jpa.hibernate.ddl-auto=update

server.port=8083

**OUTPUT:**

