***WEEK – 3***

***MANDATORY HANDS-ON ->***

1. **spring-data-jpa-handson**
2. **Spring Data JPA - Quick Example**

* **Software Pre-requisites**
* MySQL Server 8.0
* MySQL Workbench 8
* Eclipse IDE for Enterprise Java Developers 2019-03 R
* Maven 3.6.2
* **Create a Eclipse Project using Spring Initializr**

**Project Setup with Spring Initializr**

1. Go to [**https://start.spring.io**](https://start.spring.io)
2. Group: **com.cognizant**  
   Artifact: **orm-learn**  
   Description: Demo project for Spring Data JPA and Hibernate
3. Add Dependencies:
   * **Spring Boot DevTools**
   * **Spring Data JPA**
   * **MySQL Driver**
4. Click **Generate**, **extract ZIP**, and **import in Eclipse** via:  
   **File > Import > Maven > Existing Maven Projects**

* **Database Setup:**

Open **MySQL Command Line Client** and run:

* + - CREATE DATABASE ormlearn;
* **application.properties Setup:**

In **src/main/resources/application.properties**, paste:

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

spring.datasource.username=root

spring.datasource.password=root123

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

spring.jpa.hibernate.ddl-auto=validate

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

# Optional logging

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

* **Country Table Setup (in MySQL)**

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');

* **Code Structure to Implement**

1. **Model - Country.java**
   * + In com.cognizant.ormlearn.model

package com.cognizant.orm\_learn;

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 + "]";

}

}

1. **Repository - CountryRepository.java**
   * + In com.cognizant.ormlearn.repository

package com.cognizant.orm\_learn;

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

import org.springframework.stereotype.Repository;

*@Repository*

public interface CountryRepository extends JpaRepository<Country, String> {

}

1. **Service - CountryService.java**
   * + In com.cognizant.ormlearn.service

package com.cognizant.orm\_learn;

import java.util.List;

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

import org.springframework.stereotype.Service;

import org.springframework.transaction.annotation.Transactional;

*@Service*

public class CountryService {

*@Autowired*

private CountryRepository countryRepository;

*@Transactional*

public List<Country> getAllCountries() {

return countryRepository.findAll();

}

}

* **Modify OrmLearnApplication.java to test**

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;

*@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();

System.***out***.println("Countries: " + countries);

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

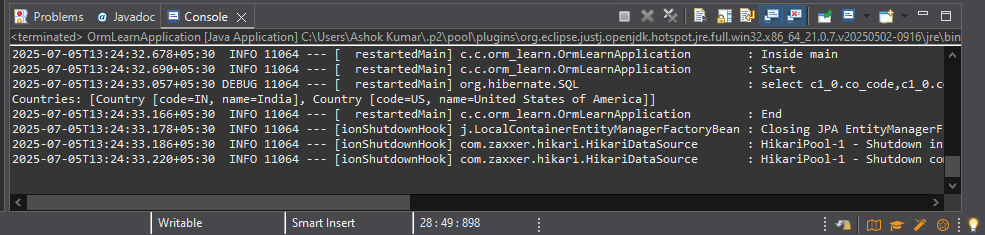
}

}

* **Run and Verify**

Right-click OrmLearnApplication.java  
➡️ **Run As > Java Application**

**OUTPUT:**



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

* ***Using Spring Initializr***
* Go to: [**https://start.spring.io**](https://start.spring.io)
* ***Fill in the following details:***
* *Project:* ***Maven***
* *Language****: Java***
* *Spring Boot version:* ***3.2.4 or latest***
* *Group:* ***com.charitha***
* *Artifact:* ***employee-demo***
* *Name:* ***employee-demo***
* *Description:* ***Spring Boot Project for Employee Management***
* *Package Name:* ***com.charitha.employee\_demo***
* *Packaging:* ***Jar***
* *Java:* ***21***
* ***Add Dependencies:***
* *Spring Web*
* *Spring Data JPA*
* *MySQL Driver*
* *Click* ***Generate*** *to download the .zip file.*
* ***Extract the zip****, open Eclipse →  
  File > Import > Existing Maven Projects → Select the extracted folder → Finish.*
* ***Configure pom.xml (Maven dependencies)***

*File:* ***pom.xml***

<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>

<groupId>com.charitha</groupId>

<artifactId>employee-demo</artifactId>

<version>0.0.1-SNAPSHOT</version>

<name>employee-demo</name>

<description>Spring Boot Project for Employee Management</description>

<packaging>jar</packaging>

<parent>

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

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

<version>3.2.4</version>

<relativePath/>

</parent>

<properties>

<java.version>21</java.version>

</properties>

<dependencies>

<!-- Spring Web -->

<dependency>

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

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

</dependency>

<!-- Spring Data JPA -->

<dependency>

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

<artifactId>spring-boot-starter-data-jpa</artifactId>

</dependency>

<!-- MySQL -->

<dependency>

<groupId>com.mysql</groupId>

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

<scope>runtime</scope>

</dependency>

<!-- Transactions -->

<dependency>

<groupId>jakarta.transaction</groupId>

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

<version>2.0.1</version>

</dependency>

<!-- DevTools -->

<dependency>

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

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

<scope>runtime</scope>

</dependency>

<!-- Testing -->

<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>

<version>3.2.4</version>

</plugin>

</plugins>

</build>

</project>

* ***Create the application.properties file***

*📁 Location:* ***src/main/resources/application.properties***

spring.datasource.url=jdbc:mysql://localhost:3306/employee\_db

spring.datasource.username=root

spring.datasource.password=root123

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

* ***Create the Entity Class – Employee***

1. *Package: com.charitha.employee\_demo.model*
2. *File: Employee.java*
3. *Type:* ***Class***

package com.charitha.employee\_demo.model;

import jakarta.persistence.Entity;

import jakarta.persistence.Id;

*@Entity*

public class Employee {

*@Id*

private int id;

private String name;

private String department;

// Getters and setters

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 String getDepartment() {

return department;

}

public void setDepartment(String department) {

this.department = department;

}

// Optional: toString() for debug print

*@Override*

public String toString() {

return "Employee [id=" + id + ", name=" + name + ", department=" + department + "]";

}

}

* ***Create Repository Interface – EmployeeRepository***

1. *Package: com.charitha.employee\_demo.repository*
2. *File: EmployeeRepository.java*
3. *Type:* ***Interface***

package com.charitha.employee\_demo.repository;

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

import com.charitha.employee\_demo.model.Employee;

public interface EmployeeRepository extends JpaRepository<Employee, Integer> {

// No need to write any method — JpaRepository gives CRUD methods automatically

}

* **Create Service Class – *EmployeeService***

1. *Package: com.charitha.employee\_demo.service*
2. *File: EmployeeService.java*
3. *Type:* ***Class***

package com.charitha.employee\_demo.service;

import java.util.List;

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

import org.springframework.stereotype.Service;

import com.charitha.employee\_demo.model.Employee;

import com.charitha.employee\_demo.repository.EmployeeRepository;

*@Service*

public class EmployeeService {

*@Autowired*

private EmployeeRepository employeeRepository;

public void addEmployee(Employee employee) {

employeeRepository.save(employee);

}

public List<Employee> getAllEmployees() {

return employeeRepository.findAll();

}

}

* **Create Main Class – *EmployeeDemoApplication***

1. *Package: com.charitha.employee\_demo*
2. *File: EmployeeDemoApplication.java*
3. *Type:* ***Class***

package com.charitha.employee\_demo;

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

import org.springframework.boot.CommandLineRunner;

import org.springframework.boot.SpringApplication;

import org.springframework.boot.autoconfigure.SpringBootApplication;

import com.charitha.employee\_demo.model.Employee;

import com.charitha.employee\_demo.service.EmployeeService;

*@SpringBootApplication*

public class EmployeeDemoApplication implements CommandLineRunner {

*@Autowired*

private EmployeeService employeeService;

public static void main(String[] args) {

SpringApplication.*run*(EmployeeDemoApplication.class, args);

}

*@Override*

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

System.***out***.println("Inside main");

Employee emp = new Employee();

emp.setId(1);

emp.setName("Charitha");

emp.setDepartment("IT");

employeeService.addEmployee(emp);

System.***out***.println("Employees: " + employeeService.getAllEmployees());

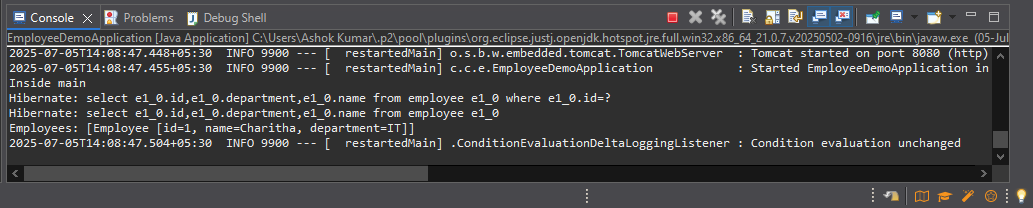
}

}

* ***Run the Application***

1. *Right-click on EmployeeDemoApplication.java →* ***Run As → Java Application***
2. *Observe the output in the console.*

* ***OUTPUT:***

******