

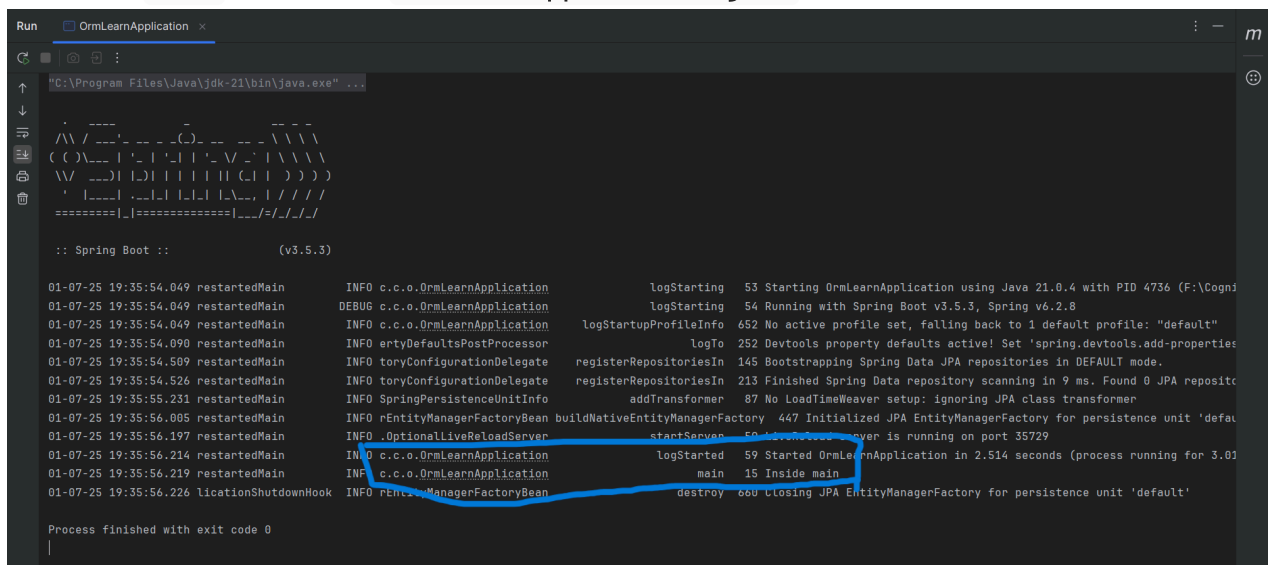
Spring Data JPA Hands on Exercises

Source Code: [Here](#)

Spring Data JPA - Quick Example

Results:

1. In this below image we can check that the logging message `Inside main` which is written in `Main` function in `OrmLearnApplication.java`



```
Run OrmLearnApplication x
"C:\Program Files\Java\jdk-21\bin\java.exe" ...

  ____  _
 / ___|| | | |
| |___| | | |
 \___|_| |_| |

:: Spring Boot ::      (v3.5.3)

01-07-25 19:35:54.049 restartedMain INFO c.c.o.OrmLearnApplication logStarting 53 Starting OrmLearnApplication using Java 21.0.4 with PID 4736 (F:\Cogni
01-07-25 19:35:54.049 restartedMain DEBUG c.c.o.OrmLearnApplication logStarting 54 Running with Spring Boot v3.5.3, Spring v6.2.8
01-07-25 19:35:54.049 restartedMain INFO c.c.o.OrmLearnApplication logStartupProfileInfo 652 No active profile set, falling back to 1 default profile: "default"
01-07-25 19:35:54.090 restartedMain INFO ertyDefaultsPostProcessor logTo 252 Devtools property defaults active! Set 'spring.devtools.add-properties
01-07-25 19:35:54.509 restartedMain INFO toryConfigurationDelegate registerRepositoriesIn 145 Bootstrapping Spring Data JPA repositories in DEFAULT mode.
01-07-25 19:35:54.526 restartedMain INFO toryConfigurationDelegate registerRepositoriesIn 213 Finished Spring Data repository scanning in 9 ms. Found 0 JPA reposic
01-07-25 19:35:55.231 restartedMain INFO SpringPersistenceUnitInfo addTransformer 87 No LoadTimeWeaver setup: ignoring JPA class transformer
01-07-25 19:35:56.005 restartedMain INFO rEntityManagerFactoryBean buildNativeEntityManagerFactory 447 Initialized JPA EntityManagerFactory for persistence unit 'defau
01-07-25 19:35:56.197 restartedMain INFO .OptionalLiveReloadServer startServer 50 LiveReloadServer is running on port 35729
01-07-25 19:35:56.214 restartedMain INFO c.c.o.OrmLearnApplication logStarted 59 Started OrmLearnApplication in 2.514 seconds (process running for 3.01
01-07-25 19:35:56.219 restartedMain INFO c.c.o.OrmLearnApplication main 15 Inside main
01-07-25 19:35:56.226 licationShutdownHook INFO rEntityManagerFactoryBean destroy 660 Closing JPA EntityManagerFactory for persistence unit 'default'

Process finished with exit code 0
```

2. For this project check maven dependency tree here

```
Downloaded from central: https://repo.maven.apache.org/maven2/org/eclipse/sisu/org.eclipse.sisu.inject/0.9.0.M3/org.eclipse.sisu.inject-0.9.0.M3.jar (434 kB at 51 kB/s)
[INFO] com.cognizant:orm-learn:jar:0.0.1-SNAPSHOT
[INFO] +- org.springframework.boot:spring-boot-starter-data-jpa:jar:3.5.3:compile
[INFO] | +- org.springframework.boot:spring-boot-starter-logging:jar:3.5.3:compile
[INFO] | | +- ch.qos.logback:logback-classic:jar:1.5.18:compile
[INFO] | | | +- ch.qos.logback:logback-core:jar:1.5.18:compile
[INFO] | | +- org.apache.logging.log4j:log4j-to-slf4j:jar:2.24.3:compile
[INFO] | | | +- org.apache.logging.log4j:log4j-api:jar:2.24.3:compile
[INFO] | | | +- org.slf4j:jul-to-slf4j:jar:2.0.17:compile
[INFO] | | +- jakarta.annotation:jakarta.annotation-api:jar:2.1.1:compile
[INFO] | +- org.yaml:snakeyaml:jar:2.4:compile
[INFO] +- org.springframework.boot:spring-boot-starter-jdbc:jar:3.5.3:compile
[INFO] | +- com.zaxxer:HikariCP:jar:6.3.0:compile
[INFO] | +- org.springframework:spring-jdbc:jar:6.2.8:compile
[INFO] | +- org.hibernate.orm:hibernate-core:jar:6.6.18.Final:compile
[INFO] | | +- jakarta.persistence:jakarta.persistence-api:jar:3.1.0:compile
[INFO] | | +- jakarta.transaction:jakarta.transaction-api:jar:2.0.1:compile
[INFO] | | +- org.jboss.logging:jboss-logging:jar:3.6.1.Final:runtime
[INFO] | | +- org.hibernate.common:hibernate-commons-annotations:jar:7.0.3.Final:runtime
[INFO] | | +- io.smallrye:jandex:jar:3.2.0:runtime
[INFO] | | +- com.fasterxml:classmate:jar:1.7.0:runtime
[INFO] | | +- net.bytebuddy:byte-buddy:jar:1.17.6:runtime
[INFO] | | +- org.glassfish.jaxb:jaxb-runtime:jar:4.0.5:runtime
[INFO] | | | +- org.glassfish.jaxb:jaxb-core:jar:4.0.5:runtime
[INFO] | | | +- org.eclipse.angus:angus-activation:jar:2.0.2:runtime
[INFO] | | | +- org.glassfish.jaxb:txw2:jar:4.0.5:runtime
[INFO] | | | +- com.sun.istack:istack-commons-runtime:jar:4.1.2:runtime
[INFO] | | +- jakarta.inject:jakarta.inject-api:jar:2.0.1:runtime
[INFO] | | +- org.antlr:antlr4-runtime:jar:4.13.0:compile
[INFO] +- org.springframework.data:spring-data-jpa:jar:3.5.1:compile
[INFO] | +- org.springframework.data:spring-data-commons:jar:3.5.1:compile
[INFO] | +- org.springframework:spring-orm:jar:6.2.8:compile
[INFO] | +- org.springframework:spring-context:jar:6.2.8:compile
[INFO] | | +- org.springframework:spring-expression:jar:6.2.8:compile
[INFO] | | +- io.micrometer:micrometer-observation:jar:1.15.1:compile
[INFO] | | | +- io.micrometer:micrometer-commons:jar:1.15.1:compile
[INFO] | +- org.springframework:spring-aop:jar:6.2.8:compile
[INFO] | +- org.springframework:spring-tx:jar:6.2.8:compile
[INFO] | +- org.springframework:spring-beans:jar:6.2.8:compile
[INFO] | +- org.slf4j:slf4j-api:jar:2.0.17:compile
[INFO] +- org.springframework:spring-aspects:jar:6.2.8:compile
[INFO] | +- org.aspectj:aspectjweaver:jar:1.0.24:compile
[INFO] +- org.springframework.boot:spring-boot-devtools:jar:3.5.3:runtime (optional)
[INFO] | +- org.springframework.boot:spring-boot:jar:3.5.3:compile
[INFO] | +- org.springframework.boot:spring-boot-autoconfigure:jar:3.5.3:compile
[INFO] +- com.mysql:mysql-connector-j:jar:9.2.0:runtime
[INFO] +- org.springframework.boot:spring-boot-starter-test:jar:3.5.3:test
[INFO] | +- org.springframework.boot:spring-boot-test:jar:3.5.3:test
[INFO] | +- org.springframework.boot:spring-boot-test-autoconfigure:jar:3.5.3:test
[INFO] | +- com.jayway.jsonpath:json-path:jar:2.9.0:test
[INFO] | +- jakarta.xml.bind:jakarta.xml.bind-api:jar:4.0.2:runtime
[INFO] | | +- jakarta.activation:jakarta.activation-api:jar:2.1.3:runtime
[INFO] | +- net.minidev:json-smart:jar:2.5.2:test
[INFO] | | +- net.minidev:accessors-smart:jar:2.5.2:test
[INFO] | | | +- org.ow2.asm:asm:jar:9.7.1:test
[INFO] | +- org.assertj:assertj-core:jar:3.27.3:test
[INFO] | +- org.awaitility:awaitility:jar:4.2.2:test
[INFO] | +- org.hamcrest:hamcrest:jar:3.0:test
[INFO] | +- org.junit.jupiter:junit-jupiter:jar:5.12.2:test
[INFO] | | +- org.junit.jupiter:junit-jupiter-api:jar:5.12.2:test
[INFO] | | | +- org.opentest4j:opentest4j:jar:1.3.0:test
[INFO] | | | +- org.junit.platform:junit-platform-commons:jar:1.12.2:test
[INFO] | | | | +- org.apiguardian:apiguardian-api:jar:1.1.2:test
[INFO] | | +- org.junit.jupiter:junit-jupiter-params:jar:5.12.2:test
[INFO] | | +- org.junit.jupiter:junit-jupiter-engine:jar:5.12.2:test
[INFO] | | | +- org.junit.platform:junit-platform-engine:jar:1.12.2:test
[INFO] | +- org.mockito:mockito-core:jar:5.17.0:test
[INFO] | | +- net.bytebuddy:byte-buddy-agent:jar:1.17.6:test
[INFO] | | +- org.objenesis:objenesis:jar:3.3:test
[INFO] | +- org.mockito:mockito-junit-jupiter:jar:5.17.0:test
[INFO] | +- org.skyscreamer:jsonassert:jar:1.5.3:test
[INFO] | | +- com.vaadin.external.google:android-json:jar:8.0.20131108.vaadin1:test
[INFO] | +- org.springframework:spring-core:jar:6.2.8:compile
[INFO] | | +- org.springframework:spring-jcl:jar:6.2.8:compile
[INFO] | +- org.springframework:spring-test:jar:6.2.8:test
[INFO] | +- org.xmlunit:xmlunit-core:jar:2.10.2:test
[INFO] BUILD SUCCESS
[INFO]
```

3. We have implemented entity, repository and service classes, then retrieved list of countries from our MySQL database.

The screenshot shows a database management tool interface. On the left, a 'SCHEMAS' pane lists various databases, with 'ormlearn' selected. The main area displays a SQL query in the 'Query 1' editor:

```
1 • create database ormlearn;
2
3
4 • create table country(co_code varchar(2) primary key, co_name varchar(50));
5
6 • insert into country values ('IN', 'India'),
7   ('US', 'United States of America');
8
9 • select *from country;
10
```

Below the query editor, the 'Result Grid' shows the results of the query:

co_code	co_name
IN	India
US	United States of America

The bottom of the interface shows the 'country i' tab selected, with 'Apply' and 'Revert' buttons.

Code:

```
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;
```

```
// Constructor, getter and setters, and toString()
```

```
}
```

```
```java
```

```
package com.cognizant.orm_learn.repository;
```

```
import com.cognizant.orm_learn.model.Country;
```

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

```
import org.springframework.stereotype.Repository;
```

```
@Repository
```

```
public interface CountryRepository extends JpaRepository<Country, String> {
}
```

```
package com.cognizant.orm_learn.service;
```

```
import com.cognizant.orm_learn.model.Country;
```

```
import com.cognizant.orm_learn.repository.CountryRepository;
```

```
import org.slf4j.Logger;
```

```
import org.slf4j.LoggerFactory;
```

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

```
import org.springframework.stereotype.Service;
```

```
import java.util.List;
```

```
@Service
```

```
public class CountryService {
```

```
 private static final Logger logger =
```

```

LoggerFactory.getLogger(CountryService.class);
@Autowired
private CountryRepository countryRepository;

public List<Country> getAllCountries(){
 logger.info("Started fetching countries list");
 return countryRepository.findAll();
}
}

```

```

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.beans.factory.annotation.Autowired;
import org.springframework.boot.CommandLineRunner;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.data.jpa.repository.config.EnableJpaRepositories;

import java.util.List;

@EnableJpaRepositories(basePackages =
{"com.cognizant.orm_learn.repository"})
@SpringBootApplication
public class OrmLearnApplication implements CommandLineRunner {
 @Autowired
 private CountryService countryService;
 private static final Logger logger =
LoggerFactory.getLogger(OrmLearnApplication.class);

 public static void main(String[] args) {
 SpringApplication.run(OrmLearnApplication.class, args);
 logger.info("Inside main");
 }

 private void testGetAllCountries() {
 logger.info("Start");
 List<Country> countries = countryService.getAllCountries();
 logger.debug("countries={}", countries);
 logger.info("End");
 }

 @Override
 public void run(String... args) throws Exception {
 logger.info("Inside run()");
 testGetAllCountries();
 }
}

```

}

[illegible]

## Code

}

```

package com.cognizant.orm_learn.handson_4.service;

import com.cognizant.orm_learn.handson_4.model.Employee;
import jakarta.persistence.EntityManagerFactory;
import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.Transaction;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;

@Service
public class EmployeeService {
 @Autowired
 private SessionFactory factory;

 public Long addEmployeeHibernate(Employee emp){
 Long empId = null;
 Session session = factory.openSession();
 Transaction txn = null;
 try{
 txn = session.beginTransaction();
 empId = (Long) session.save(emp);
 txn.commit();
 }
 catch (Exception e){
 if(txn != null) txn.rollback();
 e.printStackTrace();
 }
 finally {
 session.close();
 }
 return empId;
 }
}

```

```

package com.cognizant.orm_learn;

// Improting all the required classes, interfaces

@EnableJpaRepositories(basePackages =
{"com.cognizant.orm_learn.repository"})
@SpringBootApplication
public class OrmLearnApplication implements CommandLineRunner {
 @Autowired
 private CountryService countryService;
 @Autowired
 private EmployeeService employeeService;
 private static final Logger logger =

```

```

LoggerFactory.getLogger(OrmLearnApplication.class);

public static void main(String[] args) {
 SpringApplication.run(OrmLearnApplication.class, args);
 logger.info("Inside main");
}

@Override
public void run(String... args) throws Exception {
 logger.info("Inside run()");

 testHibernateDemo();
}

private void testHibernateDemo(){
 Employee emp = new Employee("Harsha");
 long id = employeeService.addEmployeeHibernate(emp);
 logger.debug("Saved employee data with ID {}", id);
}
}

```

## Output

```

02-07-25 18:31:53.288 restartedMain INFO c.c.o.OrmLearnApplication logStarted 59 Started OrmLearnApplication in 4.373 seconds (process running for
02-07-25 18:31:53.298 restartedMain INFO c.c.o.OrmLearnApplication run 40 Inside run()
02-07-25 18:31:53.348 restartedMain DEBUG org.hibernate.SQL logStatement 135 select next_val as id_val from employee_seq for update
02-07-25 18:31:53.362 restartedMain DEBUG org.hibernate.SQL logStatement 135 update employee_seq set next_val= ? where next_val=?
02-07-25 18:31:53.409 restartedMain DEBUG org.hibernate.SQL logStatement 135 insert into employee (name,id) values (?,?)
02-07-25 18:31:53.427 restartedMain DEBUG c.c.o.OrmLearnApplication testHibernateDemo 49 Saved employee data with ID 1
02-07-25 18:31:53.427 restartedMain INFO c.c.o.OrmLearnApplication main 28 Inside main
02-07-25 18:31:53.441 licationShutdownHook INFO rEntityManagerFactoryBean destroy 660 Closing JPA EntityManagerFactory for persistence unit 'default'
Process finished with exit code 0

```

```
10 • select *from employee;
```

Result Grid		Filter Rows:	Edit:
id	name		
1	Harsha		
NULL	NULL		

## Spring Data JPA with JpaRepository

### Code

```

package com.cognizant.orm_learn.handson_4.repository;

import com.cognizant.orm_learn.handson_4.model.Employee;
import org.springframework.data.jpa.repository.JpaRepository;

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

```

```

package com.cognizant.orm_learn.handson_4.service;

// Import all the required classes and interfaces

@Service
public class EmployeeService {
 @Autowired
 private SessionFactory factory;
 @Autowired
 private EmployeeRepository employeeRepository;

 @Transactional
 public Long addEmployeeJpa(Employee emp){
 Long id = null;
 try{
 id = employeeRepository.save(emp).getId();
 }
 catch (Exception e){
 e.printStackTrace();
 }
 return id;
 }
}

```

```

package com.cognizant.orm_learn;

// Import all the required classes and interfaces

@EnableJpaRepositories(basePackages = {"com.cognizant.orm_learn.repository",
"com.cognizant.orm_learn.handson_4.repository"})
@SpringBootApplication
public class OrmLearnApplication implements CommandLineRunner {
 @Autowired
 private CountryService countryService;
 @Autowired
 private EmployeeService employeeService;
 private static final Logger logger =
LoggerFactory.getLogger(OrmLearnApplication.class);
}

```



```

public static void main(String[] args) {
 SpringApplication.run(OrmLearnApplication.class, args);
 logger.info("Inside main");
}

@Override
public void run(String... args) throws Exception {
 logger.info("Inside run()");
 testJpa();
}

private void testJpa(){
 Employee emp = new Employee("JPA Employee");
 long id = employeeService.addEmployeeJpa(emp);
 logger.debug("Saved employee data using JPA with ID {}", id);
}
}

```

## Output

```

02-07-25 18:50:27.498 restartedMain INFO rEntityManagerFactoryBean buildNativeEntityManagerFactory 447 Initialized JPA EntityManagerFactory for persistence unit '
02-07-25 18:50:28.009 restartedMain INFO .OptionalLiveReloadServer startServer 59 LiveReload server is running on port 35729
02-07-25 18:50:28.049 restartedMain INFO c.c.o.OrmLearnApplication logStarted 59 Started OrmLearnApplication in 4.709 seconds (process running for
02-07-25 18:50:28.054 restartedMain INFO c.c.o.OrmLearnApplication run 40 Inside run()
02-07-25 18:50:28.117 restartedMain DEBUG org.hibernate.SQL logStatement 135 select next_val as id_val from employee_seq for update
02-07-25 18:50:28.117 restartedMain DEBUG org.hibernate.SQL logStatement 135 update employee_seq set next_val= ? where next_val=?
02-07-25 18:50:28.165 restartedMain DEBUG org.hibernate.SQL logStatement 135 insert into employee (name,id) values (?,?)
02-07-25 18:50:28.165 restartedMain DEBUG c.c.o.OrmLearnApplication testJpa 54 Saved employee data using JPA with ID 2
02-07-25 18:50:28.165 restartedMain INFO c.c.o.OrmLearnApplication main 28 Inside main
02-07-25 18:50:28.181 restartedMain INFO rEntityManagerFactoryBean destroy 660 Closing JPA EntityManagerFactory for persistence unit 'default'

```

```

10 • select *from employee;

```

Result Grid			Filter Rows:	Edit:
	id	name		
▶	1	Harsha		
	2	JPA Employee		
✱	NULL	NULL		