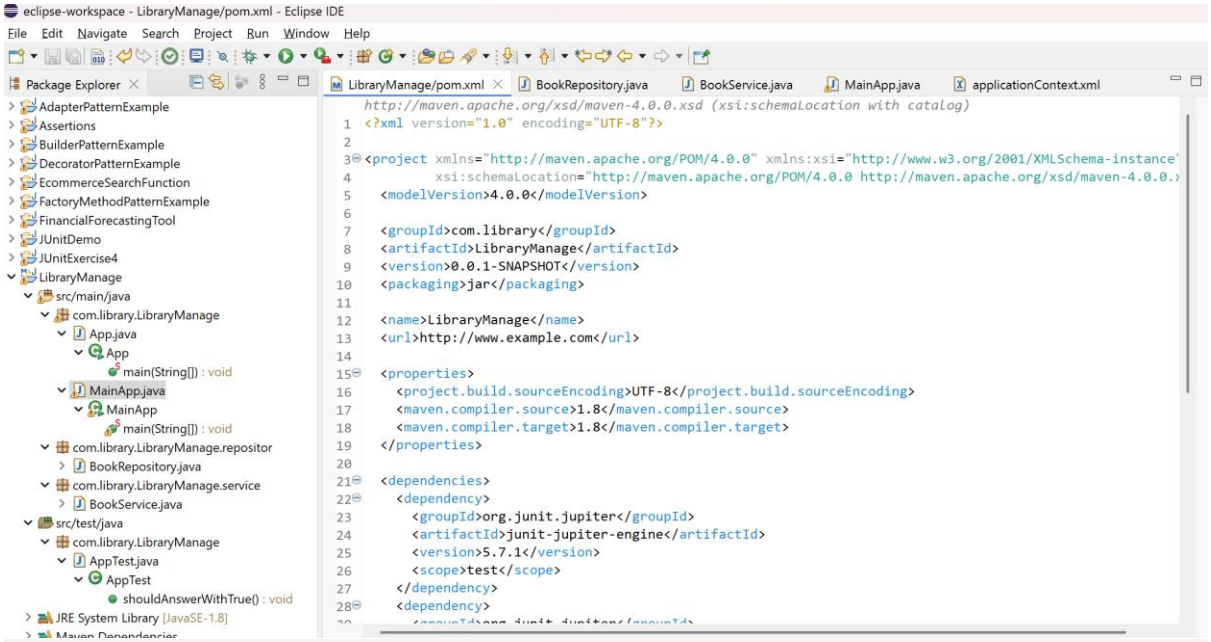
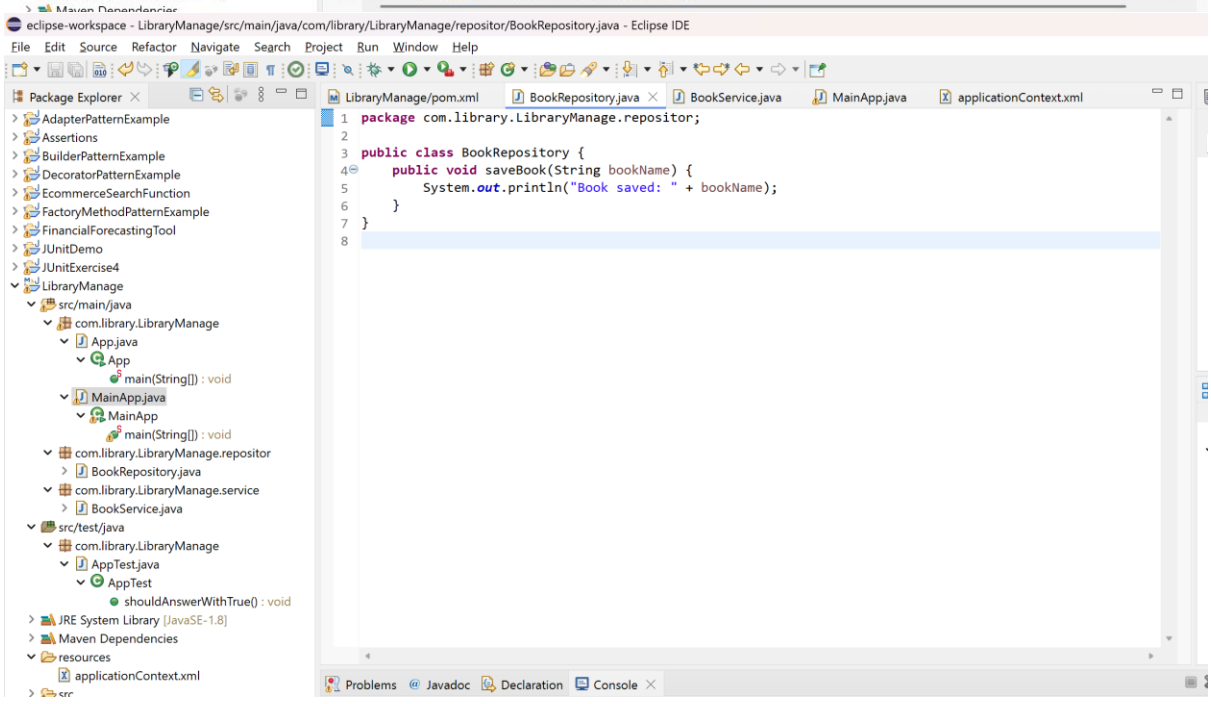
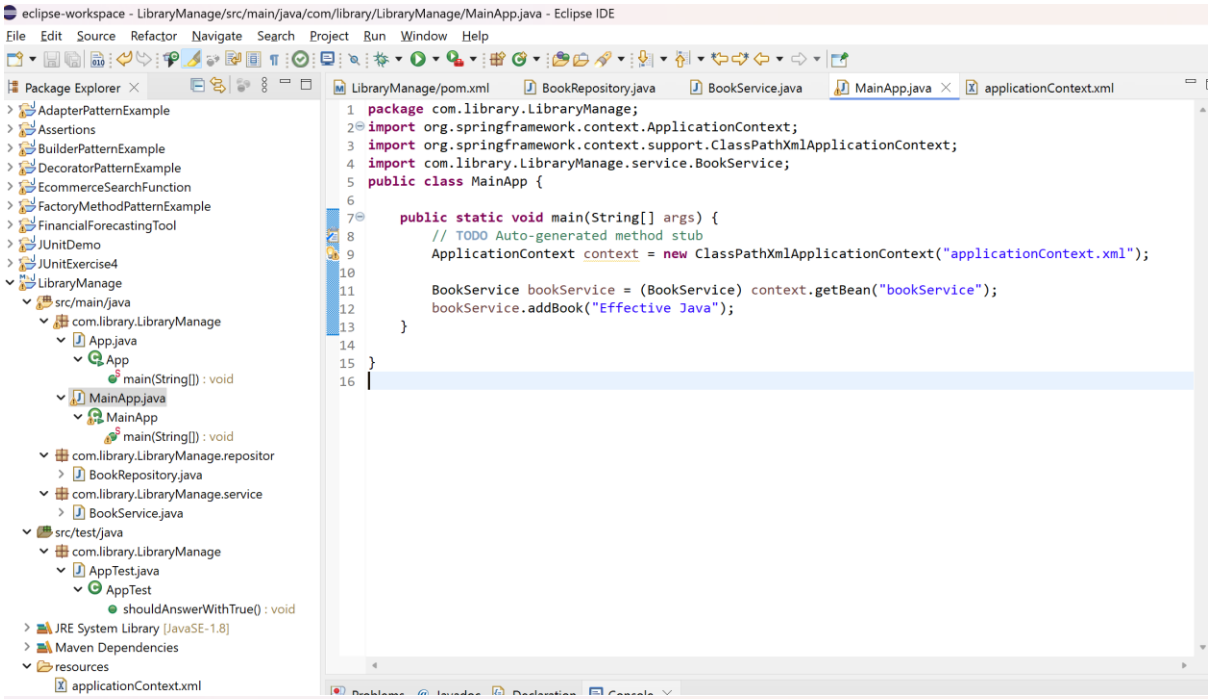
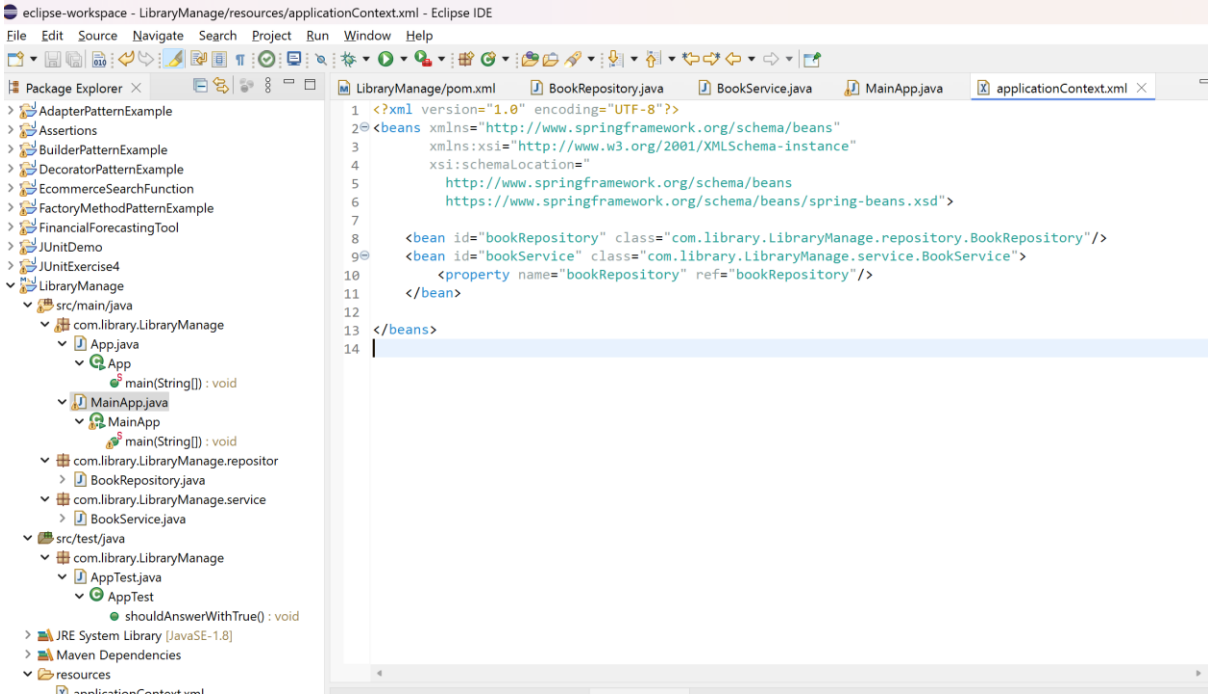
WEEK 3 CODE/OUTPUTS:

Exercise 1: Configuring a Basic Spring Application





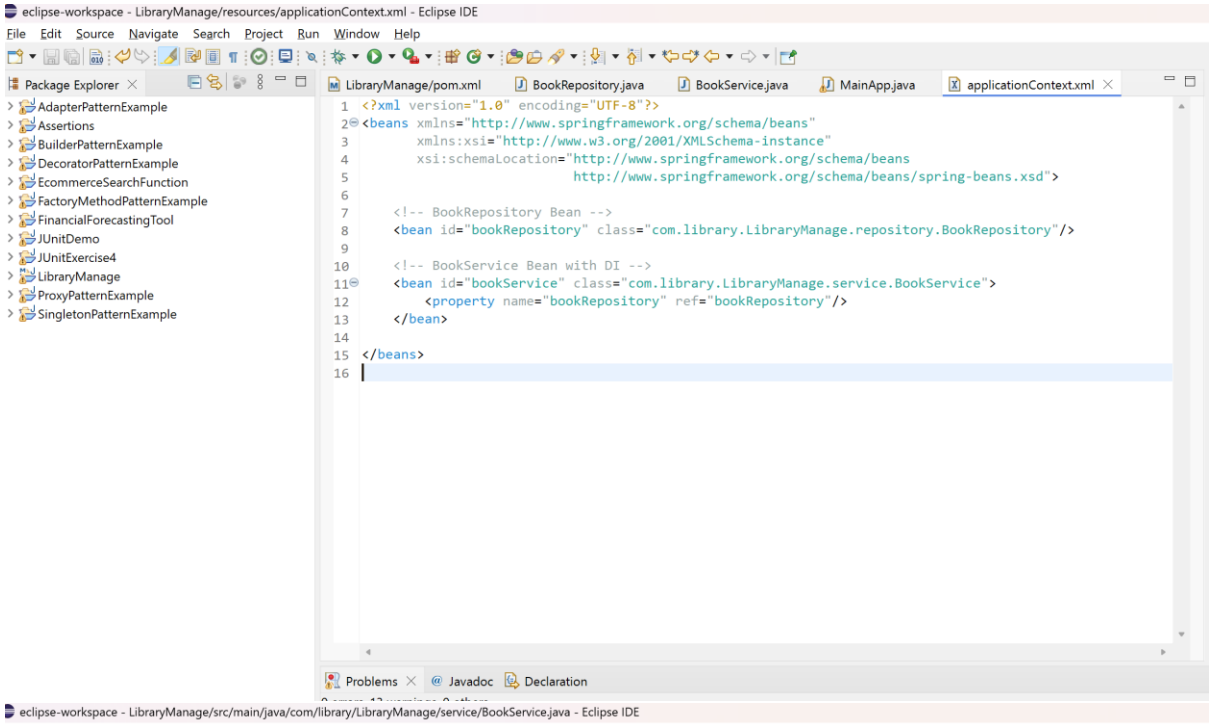


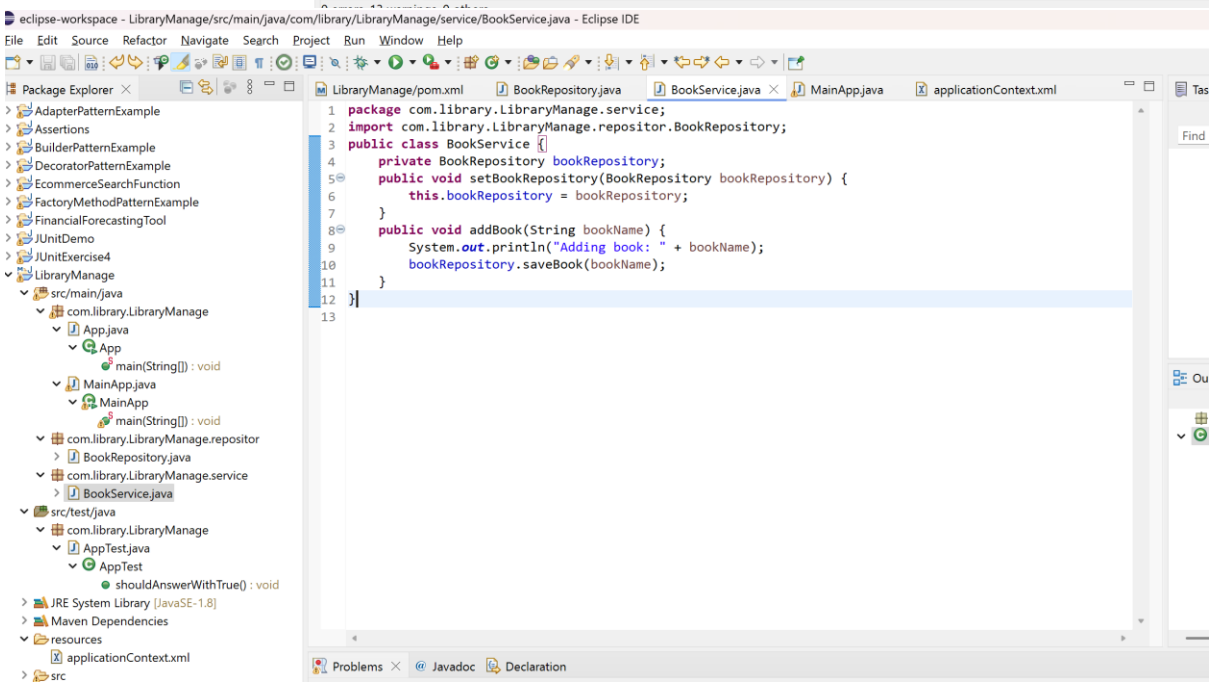


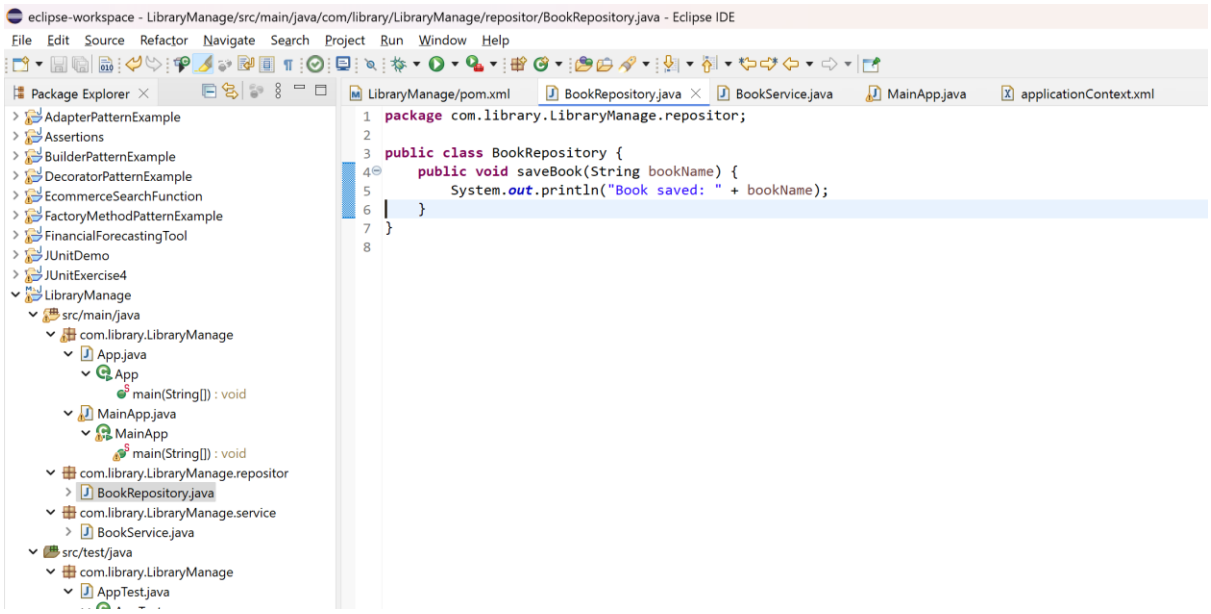
OUTPUT:

```
Adding book: Effective Java
Book saved: Effective Java
```

Exercise 2: Implementing Dependency Injection



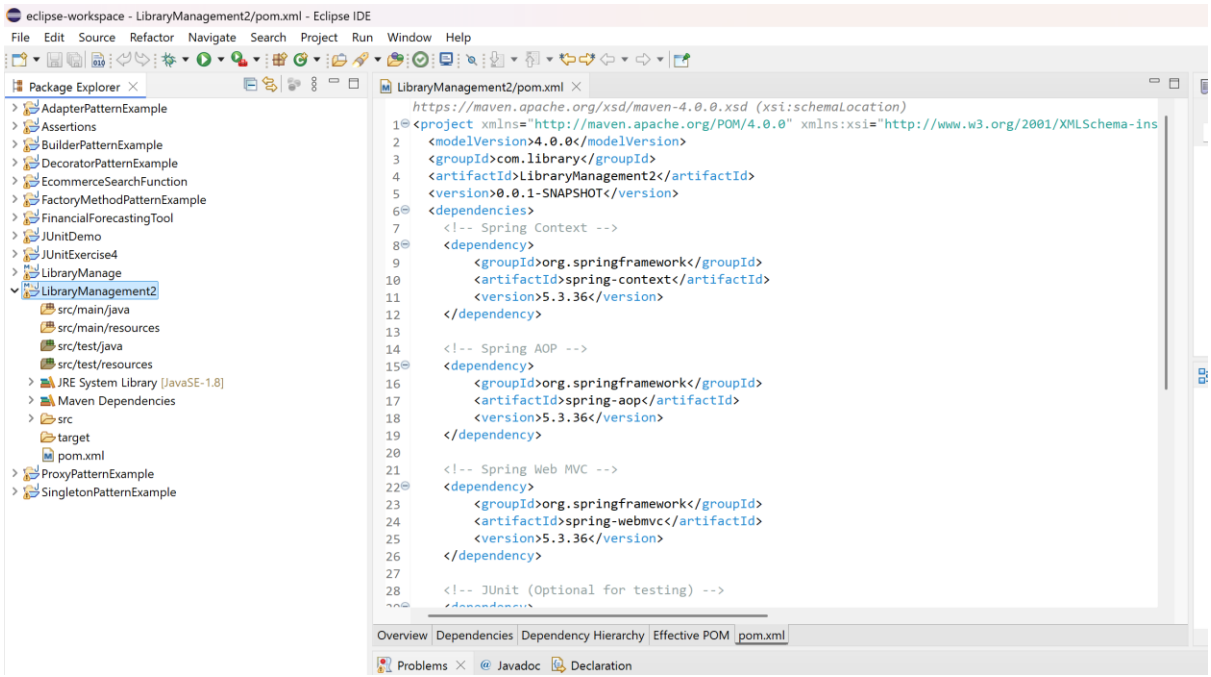


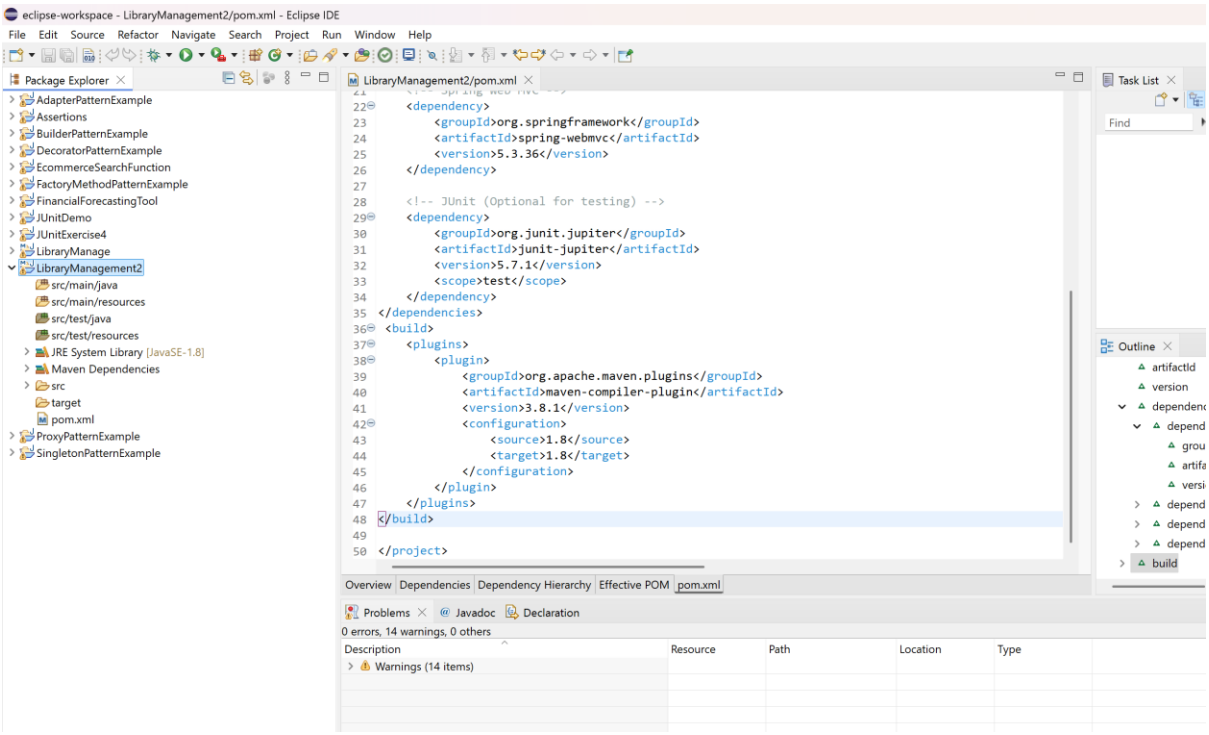


OUTPUT:

```
Adding book: Effective Java
Book saved: Effective Java
```

Exercise 4: Creating and Configuring a Maven Project





Spring Data JPA

Hands on 4

Difference between JPA, Hibernate and Spring Data JPA

pom.xml

xml

<!-- Spring Boot Starter Data JPA -->

<dependency>

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

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

</dependency>

<!-- H2 Database (or MySQL if needed) -->

<dependency>

<groupId>com.h2database</groupId>

<artifactId>h2</artifactId>

<scope>runtime</scope>

```
</dependency>

<!-- Spring Boot Starter -->
<dependency>
   <groupId>org.springframework.boot</groupId>
   <artifactId>spring-boot-starter</artifactId>
</dependency>

<!-- Spring Boot Maven Plugin -->
<build>
   <plugins>
      <plugin>
         <groupId>org.springframework.boot</groupId>
         <artifactId>spring-boot-maven-plugin</artifactId>
      </plugin>
   </plugins>
</build>
```

Project Structure

```
LibraryManagement
 └── src/main/java
    └── com.library
        ├── entity
        │   └── Employee.java
        ├── repository
        │   └── EmployeeRepository.java
        ├── service
        │   └── EmployeeService.java
        └── MainApp.java
 └── src/main/resources
    └── application.properties
```

Employee.java

```
package com.library.entity;
import jakarta.persistence.*;
@Entity
public class Employee {
   @Id
   @GeneratedValue
   private int id;
   private String name;
   private double salary;

   // Getters and Setters
}
```

Repository Interface

```
package com.library.repository;
import org.springframework.data.jpa.repository.JpaRepository;
import com.library.entity.Employee;
public interface EmployeeRepository extends JpaRepository<Employee, Integer> {
}
```

Service.java

```
package com.library.service;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;
import org.springframework.transaction.annotation.Transactional;
import com.library.entity.Employee;
import com.library.repository.EmployeeRepository;
@Service
public class EmployeeService {

   @Autowired
   private EmployeeRepository employeeRepository;
```

```
    @Transactional
    public void addEmployee(Employee emp) {
        employeeRepository.save(emp);
    }
}
```

Main

```
package com.library;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.context.ApplicationContext;
import com.library.entity.Employee;
import com.library.service.EmployeeService;

@SpringBootApplication
public class MainApp {
    public static void main(String[] args) {
        ApplicationContext context = SpringApplication.run(MainApp.class, args);
        EmployeeService service = context.getBean(EmployeeService.class);

        Employee emp = new Employee();
        emp.setName("Neha");
        emp.setSalary(50000);

        service.addEmployee(emp);
        System.out.println("Employee Saved!");
    }
}
```

application.properties

```
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.jpa.hibernate.ddl-auto=update

spring.h2.console.enabled=true

OUTPUT:
"Employee Saved!"

Hands on 1

Spring Data JPA - Quick Example

Country.java

```
package com.cognizant.ormlearn.model;

import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.Id;
import javax.persistence.Table;

@Entity
@Table(name = "country")
public class Country {

    @Id
    @Column(name = "code")
    private String code;

    @Column(name = "name")
    private String name;

    // Getters and Setters
    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;
    }

    // toString
    @Override
    public String toString() {
        return "Country [code=" + code + ", name=" + name + "]";
    }
}
```

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> {
}
```

CountryService.java

```
package com.cognizant.ormlearn.service;

import java.util.List;
import javax.transaction.Transactional;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;
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();
    }
}
```

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");
    }
}
```

application.properties

```
# Spring Framework and application log
logging.level.org.springframework=info
logging.level.com.cognizant=debug

# Hibernate logs for displaying executed SQL, input and output
logging.level.org.hibernate.SQL=trace
logging.level.org.hibernate.type.descriptor.sql=trace
```

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

# Database 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 configuration
spring.jpa.hibernate.ddl-auto=validate
spring.jpa.properties.hibernate.dialect=org.hibernate.dialect.MySQL5Dialect
```

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 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.cognizant</groupId>
    <artifactId>orm-learn</artifactId>
    <version>0.0.1-SNAPSHOT</version>
    <packaging>jar</packaging>

    <name>orm-learn</name>
    <description>Demo project for Spring Data JPA and Hibernate</description>

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

```
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>2.5.4</version>
</parent>

<dependencies>
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-data-jpa</artifactId>
    </dependency>
    <dependency>
        <groupId>mysql</groupId>
        <artifactId>mysql-connector-java</artifactId>
        <scope>runtime</scope>
    </dependency>
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-devtools</artifactId>
        <scope>runtime</scope>
    </dependency>
</dependencies>

<build>
    <plugins>
        <plugin>
            <groupId>org.apache.maven.plugins</groupId>
            <artifactId>maven-compiler-plugin</artifactId>
            <configuration>
                <source>1.8</source>
                <target>1.8</target>
            </configuration>
        </plugin>
```

```
      </plugins>
   </build>
</project>
```

MYSQL

```
CREATE DATABASE ormlearn;
USE ormlearn;
CREATE TABLE country (
   code VARCHAR(2) PRIMARY KEY,
   name VARCHAR(50)
);
INSERT INTO country VALUES ('IN', 'India'), ('US', 'United States of America');
```

OUTPUT:

```
03-07-25 16:45:01.102 main  INFO  OrmLearnApplication - Inside main
03-07-25 16:45:01.103 main  INFO  OrmLearnApplication - Start
03-07-25 16:45:01.105 main  DEBUG OrmLearnApplication - countries=[Country [code=IN, name=India], Country [code=US, name=United States of America]]
03-07-25 16:45:01.106 main  INFO  OrmLearnApplication - End
```