

WEEK -3

SPRING CORE-MAVEN

Exercise 1: Configuring a Basic Spring Application

Scenario:

Your company is developing a web application for managing a library. You need to use the Spring Framework to handle the backend operations.

Steps:

- Set Up a Spring Project:

Create a Maven project named **LibraryManagement**.

Add Spring Core dependencies in the **pom.xml** file.

- Configure the Application Context:

Create an XML configuration file named **applicationContext.xml** in the **src/main/resources** directory.

Define beans for **BookService** and **BookRepository** in the XML file.

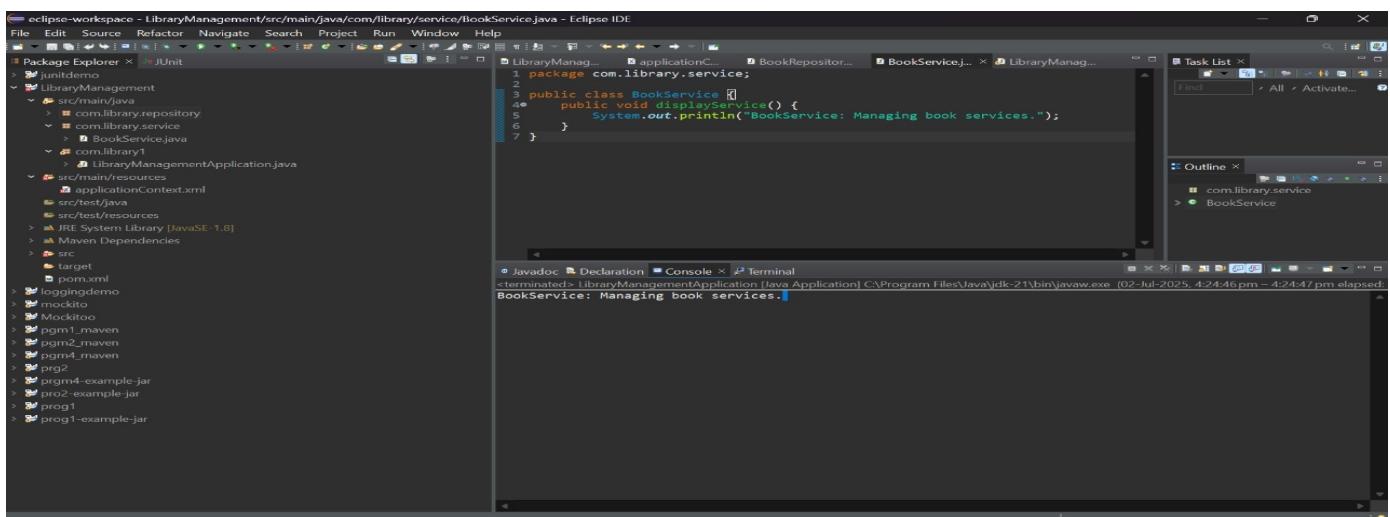
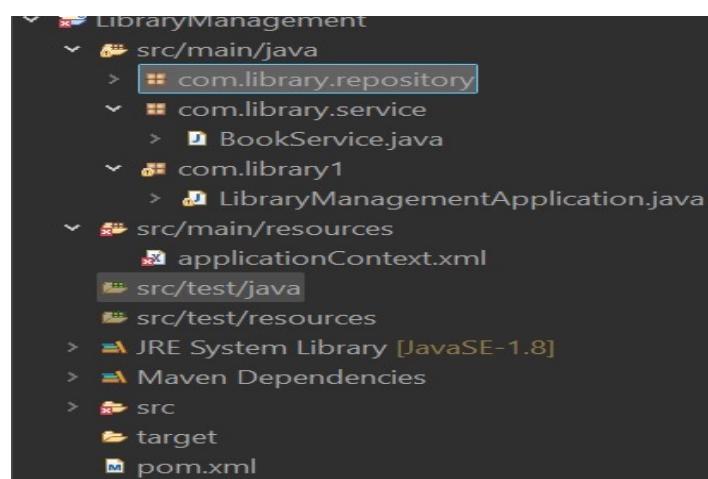
- Define Service and Repository Classes:

Create a package **com.library.service** and add a class **BookService**.

Create a package **com.library.repository** and add a class **BookRepository**.

- Run the Application:

Create a main class to load the Spring context and test the configuration.



Exercise 2: Implementing Dependency Injection

Scenario:

In the library management application, you need to manage the dependencies between the BookService and BookRepository classes using Spring's IoC and DI.

Steps:

- **Modify the XML Configuration:**

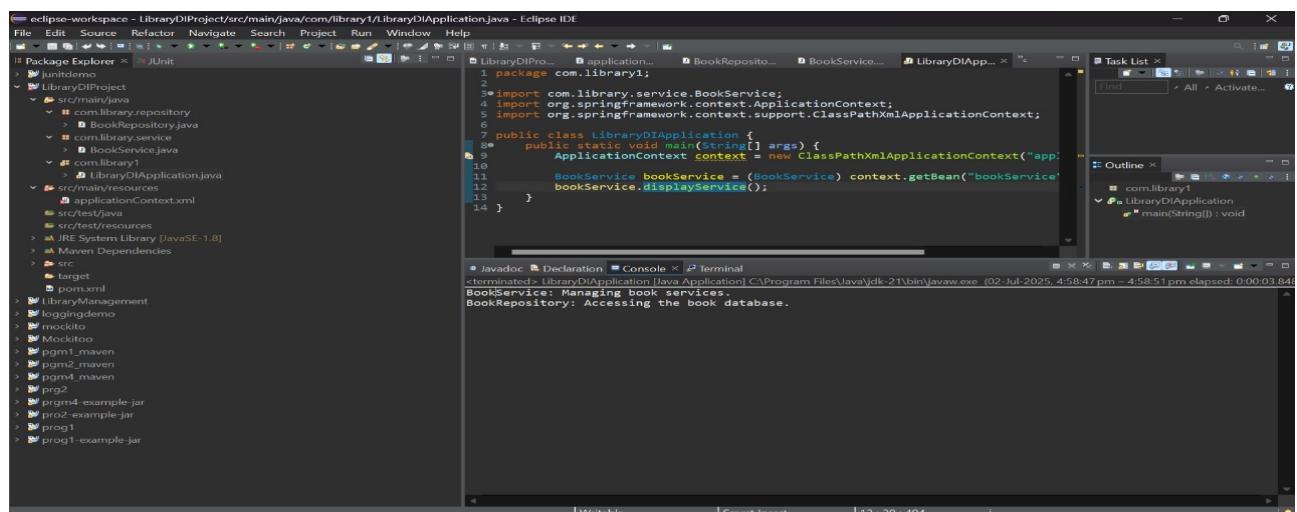
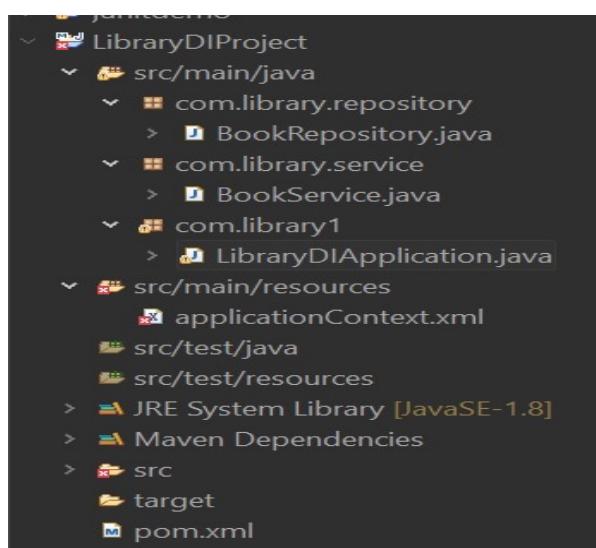
Update **applicationContext.xml** to wire **BookRepository** into **BookService**.

- **Update the BookService Class:**

Ensure that **BookService** class has a setter method for **BookRepository**.

- **Test the Configuration:**

Run the **LibraryManagementApplication** main class to verify the dependency injection.



Exercise 4: Creating and Configuring a Maven Project

Scenario:

You need to set up a new Maven project for the library management application and add Spring dependencies.

Steps:

- **Create a New Maven Project:**

Create a new Maven project named **LibraryManagement**.

- **Add Spring Dependencies in pom.xml:**

Include dependencies for Spring Context, Spring AOP, and Spring WebMVC.

- **Configure Maven Plugins:**

Configure the Maven Compiler Plugin for Java version 1.8 in the pom.xml file.

The screenshot shows the Eclipse IDE interface. On the left is the Package Explorer view displaying a project named 'LibraryDIProject' with various source files and resources. In the center, there are several code editor tabs for 'BookService.java', 'applicationContext.xml', and 'BookRepository.java'. Below the editors is the Task List and Outline views. At the bottom is the Javadoc, Declaration, Console, and Terminal view. The terminal window shows the output of a Java application named 'BookService' which has printed the message 'BookRepository: Accessing the book database.' The status bar at the bottom indicates the terminal was terminated at 02-Jul-2025, 5:02:59 pm - 5:03:03 pm, with a duration of 0:00:03.613.

Hands on 1

Spring Data JPA - Quick Example

Execute the OrmLearnApplication and check in log if main method is called.

The screenshot shows the Eclipse IDE interface. On the left is the Package Explorer view displaying a project named 'orm-learn' with source files like 'OrmLearnApplication.java' and configuration files like 'application.properties'. In the center, there is a code editor for 'application.properties' and a terminal window. The terminal window shows the output of the 'OrmLearnApplication' Java application, which includes a decorative ASCII art logo and the message 'Spring Boot :: (v3.5.3)'. The log output shows the application starting up, with entries like 'INFO c.c.o.OrmLearnApplication' and 'INFO o.h.j.u.LogHelper'. The status bar at the bottom indicates the terminal was terminated at 04-Jul-2025, 11:18:33 am - 11:18:39 am, with a duration of 0:00:05.984 [pid: 9880].

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

The screenshot shows the Eclipse IDE interface with the following details:

- Project Explorer:** Shows the project structure for "employeeapp".
- EmployeeRepository.java:** The code defines a public interface `EmployeeRepository` extending `JpaRepository<Employee, Integer>`. It includes a single method `save(Employee employee)` with a note: "No need to write any code - Spring Data JPA handles CRUD automatically".
- Java Console:** Displays the command-line arguments and the application's log output.
- Log Output:**

```
2025-07-04T12:03:59.516+05:30 INFO 25256 --- [employeeapp] [main] org.hibernate.Version : HHH0001
2025-07-04T12:03:59.578+05:30 INFO 25256 --- [employeeapp] [main] o.n.c.internal.RegionFactoryInitiator : HHH0001
2025-07-04T12:04:00.025+05:30 INFO 25256 --- [employeeapp] [main] o.s.o.j.p.SpringPersistenceUnitInfo : No Load
2025-07-04T12:04:00.068+05:30 INFO 25256 --- [employeeapp] [main] com.zaxxer.hikari.HikariDataSource : Hikari
2025-07-04T12:04:00.688+05:30 INFO 25256 --- [employeeapp] [main] com.zaxxer.hikari.pool.HikariPool : Hikari
2025-07-04T12:04:00.691+05:30 INFO 25256 --- [employeeapp] [main] com.zaxxer.hikari.HikariDataSource : Hikari
2025-07-04T12:04:00.778+05:30 WARN 25256 --- [employeeapp] [main] org.hibernate.orm.deprecation : HHH0001
2025-07-04T12:04:00.782+05:30 WARN 25256 --- [employeeapp] [main] org.hibernate.orm.deprecation : HHH0001
2025-07-04T12:04:01.942+05:30 INFO 25256 --- [employeeapp] [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH0001
2025-07-04T12:04:02.041+05:30 INFO 25256 --- [employeeapp] [main] j.LocalContainerEntityManagerFactoryBean : Initia
2025-07-04T12:04:02.591+05:30 WARN 25256 --- [employeeapp] [main] jpaBaseConfiguration$JpaWebConfiguratio : spring
2025-07-04T12:04:03.126+05:30 WARN 25256 --- [employeeapp] [main] ConfigServletWebServerApplicationContext : Except
2025-07-04T12:04:03.128+05:30 INFO 25256 --- [employeeapp] [main] j.LocalContainerEntityManagerFactoryBean : Closin
2025-07-04T12:04:03.132+05:30 INFO 25256 --- [employeeapp] [main] com.zaxxer.hikari.HikariDataSource : Hikari
2025-07-04T12:04:03.150+05:30 INFO 25256 --- [employeeapp] [main] com.zaxxer.hikari.HikariDataSource : Hikari
2025-07-04T12:04:03.176+05:30 INFO 25256 --- [employeeapp] [main] s.b.a.l.ConditionEvaluationReportLogger :
```
- Error Message:** "Error starting ApplicationContext. To display the condition evaluation report re-run your application with 'debug' enabled."

Additionals:

eclipse-workspace - orm-learn/src/main/java/com/cognizant/ormlearn/OrmLearnApplication.java - Eclipse IDE

File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer X JUnit Javadoc Declaration Console Terminal

EmployeeappApplication [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (04-Jul-2025 12:20:55 pm elapsed: 0:00:18) [pid: 19348]

```
2025-07-04T12:20:59.835+05:30 INFO 19348 --- [employeeapp] [main] .s.d.r.c.RepositoryConfigurationDelegate : Boots
2025-07-04T12:20:59.840+05:30 INFO 19348 --- [employeeapp] [main] .s.d.r.c.RepositoryConfigurationDelegate : Finis
2025-07-04T12:21:00.771+05:30 INFO 19348 --- [employeeapp] [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomca
2025-07-04T12:21:00.792+05:30 INFO 19348 --- [employeeapp] [main] o.apache.catalina.core.StandardService : Start
2025-07-04T12:21:00.792+05:30 INFO 19348 --- [employeeapp] [main] o.apache.catalina.core.StandardEngine : Start
2025-07-04T12:21:00.888+05:30 INFO 19348 --- [employeeapp] [main] o.a.c.c.[Tomcat].[localhost].[/] : Initi
2025-07-04T12:21:00.894+05:30 INFO 19348 --- [employeeapp] [main] w.s.c.ServletWebServerApplicationContext : Root
2025-07-04T12:21:01.256+05:30 INFO 19348 --- [employeeapp] [main] o.hibernate.jpa.internal.util.LogHelper : HHH00
2025-07-04T12:21:01.383+05:30 INFO 19348 --- [employeeapp] [main] org.hibernate.Version : HHH00
2025-07-04T12:21:01.424+05:30 INFO 19348 --- [employeeapp] [main] o.h.c.internal.RegionFactoryInitiator : HHH00
2025-07-04T12:21:01.831+05:30 INFO 19348 --- [employeeapp] [main] o.s.o.j.p.SpringPersistenceUnitInfo : No Lc
2025-07-04T12:21:01.869+05:30 INFO 19348 --- [employeeapp] [main] com.zaxxer.hikari.HikariDataSource : Hikar
2025-07-04T12:21:01.438+05:30 INFO 19348 --- [employeeapp] [main] com.zaxxer.hikari.HikariPool : Hikar
2025-07-04T12:21:02.441+05:30 INFO 19348 --- [employeeapp] [main] com.zaxxer.hikari.HikariDataSource : Hikar
2025-07-04T12:21:02.500+05:30 WARN 19348 --- [employeeapp] [main] org.hibernate.orm.deprecation : HHH90
2025-07-04T12:21:02.562+05:30 WARN 19348 --- [employeeapp] [main] org.hibernate.orm.deprecation : HHH90
2025-07-04T12:21:03.667+05:30 INFO 19348 --- [employeeapp] [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH00
2025-07-04T12:21:03.738+05:30 INFO 19348 --- [employeeapp] [main] j.LocalContainerEntityManagerFactoryBean : Initi
2025-07-04T12:21:04.306+05:30 WARN 19348 --- [employeeapp] [main] JpaBaseConfiguration$JpaWebConfiguration : sprin
2025-07-04T12:21:04.882+05:30 INFO 19348 --- [employeeapp] [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomca
2025-07-04T12:21:04.897+05:30 INFO 19348 --- [employeeapp] [main] c.e.employeeapp.EmployeeappApplication : Start
```

All countries:
IN - India
US - United States
CN - China
JP - Japan
FR - France

Find by name:
India

Search by partial name:
France
Japan

JPQL Query:
India

Native SQL Query:
India