**Exercise 1: Configuring a Basic Spring Application**

Directory:

LibraryManagement/

├── pom.xml

├── src/

│ ├── main/

│ │ ├── java/

│ │ │ └── com/

│ │ │ └── library/

│ │ │ ├── MainApp.java

│ │ │ ├── service/

│ │ │ │ └── BookService.java

│ │ │ └── repository/

│ │ │ └── BookRepository.java

│ │ └── resources/

│ │ └── applicationContext.xml

**Code for Service.java:**

package com.library.service;

import com.library.repository.BookRepository;

public class BookService {

    private BookRepository bookRepository;

    public void setBookRepository(BookRepository bookRepository) {

        this.bookRepository = bookRepository;

    }

    public void addBook(String title) {

        System.out.println("Service: Adding book - " + title);

        bookRepository.save(title);

    }

}

**Code for Repository.java:**

package com.library.repository;

public class BookRepository {

    public void save(String title) {

        System.out.println("Saving book to database: " + title);

    }

}

**Code for MainApp:**

package com.library;

import com.library.service.BookService;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

public class MainApp {

    public static void main(String[] args) {

        ApplicationContext context =

                new ClassPathXmlApplicationContext("applicationContext.xml");

        BookService bookService = context.getBean("bookService", BookService.class);

        bookService.addBook("Spring in Action");

    }

}

ApplicationContent.xml:

<?xml version="1.0" encoding="UTF-8"?>

<beans xmlns="http://www.springframework.org/schema/beans"

       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

       xsi:schemaLocation="

         http://www.springframework.org/schema/beans

         https://www.springframework.org/schema/beans/spring-beans.xsd">

    <bean id="bookRepository" class="com.library.repository.BookRepository" />

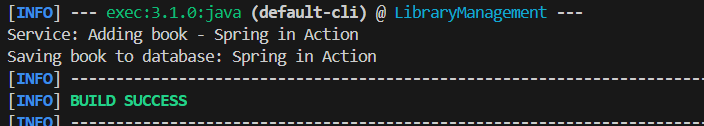
    <bean id="bookService" class="com.library.service.BookService">

        <property name="bookRepository" ref="bookRepository" />

    </bean>

</beans>

Output:



**Exercise 2: Implementing Dependency Injection**

Directory:

LibraryManagement/

├── pom.xml

├── src/

│ ├── main/

│ │ ├── java/

│ │ │ └── com/

│ │ │ └── library/

│ │ │ ├── MainApp.java

│ │ │ ├── service/

│ │ │ │ └── BookService.java

│ │ │ └── repository/

│ │ │ └── BookRepository.java

│ │ └── resources/

│ │ └── applicationContext.xml

**Code for Service.java:**

package com.library.service;

import com.library.repository.BookRepository;

public class BookService {

    private BookRepository bookRepository;

    public void setBookRepository(BookRepository bookRepository) {

        this.bookRepository = bookRepository;

    }

    public void addBook(String title) {

        System.out.println("Service: Adding book - " + title);

        bookRepository.save(title);

    }

}

**Code for Repository.java:**

package com.library.repository;

public class BookRepository {

    public void save(String title) {

        System.out.println("Saving book to database: " + title);

    }

}

**Code for MainApp:**

package com.library;

import com.library.service.BookService;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

public class MainApp {

    public static void main(String[] args) {

        ApplicationContext context =

                new ClassPathXmlApplicationContext("applicationContext.xml");

        BookService bookService = context.getBean("bookService", BookService.class);

        bookService.addBook("Spring in Action");

    }

}

ApplicationContent.xml:

<?xml version="1.0" encoding="UTF-8"?>

<beans xmlns="http://www.springframework.org/schema/beans"

       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

       xsi:schemaLocation="

         http://www.springframework.org/schema/beans

         https://www.springframework.org/schema/beans/spring-beans.xsd">

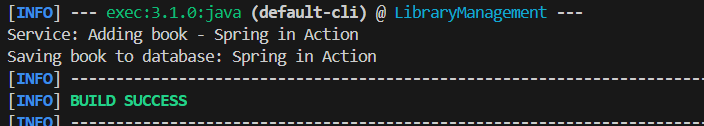
    <bean id="bookRepository" class="com.library.repository.BookRepository" />

    <bean id="bookService" class="com.library.service.BookService">

        <property name="bookRepository" ref="bookRepository" />

    </bean>

</beans>



**Exercise 4: Creating and Configuring a Maven Project**

Directory:

LibraryManagement/

├── pom.xml

└── src/

└── main/

├── java/

└── resources/

**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.library</groupId>

<artifactId>LibraryManagement</artifactId>

<version>1.0-SNAPSHOT</version>

<packaging>jar</packaging>

<dependencies>

<!-- Spring Context (Core + Beans + Expression) -->

<dependency>

<groupId>org.springframework</groupId>

<artifactId>spring-context</artifactId>

<version>5.3.29</version>

</dependency>

<!-- Spring AOP -->

<dependency>

<groupId>org.springframework</groupId>

<artifactId>spring-aop</artifactId>

<version>5.3.29</version>

</dependency>

<!-- Spring Web MVC -->

<dependency>

<groupId>org.springframework</groupId>

<artifactId>spring-webmvc</artifactId>

<version>5.3.29</version>

</dependency>

<!-- SLF4J logger -->

<dependency>

<groupId>org.slf4j</groupId>

<artifactId>slf4j-simple</artifactId>

<version>2.0.13</version>

<scope>runtime</scope>

</dependency>

</dependencies>

<build>

<plugins>

<!-- Maven Compiler Plugin: set Java version -->

<plugin>

<groupId>org.apache.maven.plugins</groupId>

<artifactId>maven-compiler-plugin</artifactId>

<version>3.10.1</version>

<configuration>

<source>1.8</source>

<target>1.8</target>

</configuration>

</plugin>

<!-- Optional: exec plugin to run Java class -->

<plugin>

<groupId>org.codehaus.mojo</groupId>

<artifactId>exec-maven-plugin</artifactId>

<version>3.1.0</version>

<configuration>

<mainClass>com.library.MainApp</mainClass>

</configuration>

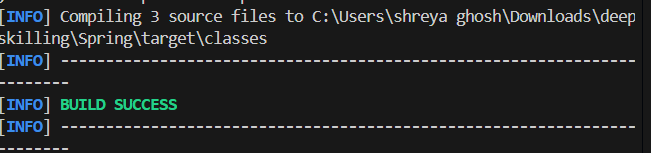
</plugin>

</plugins>

</build>

</project>

**Output:**



**Exercise 5: Configuring the Spring IoC Container**

Directory:

LibraryManagement/

├── pom.xml

├── src/

│ ├── main/

│ │ ├── java/

│ │ │ └── com/

│ │ │ └── library/

│ │ │ ├── MainApp.java

│ │ │ ├── service/

│ │ │ │ └── BookService.java

│ │ │ └── repository/

│ │ │ └── BookRepository.java

│ │ └── resources/

│ │ └── applicationContext.xml

**Code for Service.java:**

package com.library.service;

import com.library.repository.BookRepository;

public class BookService {

    private BookRepository bookRepository;

    public void setBookRepository(BookRepository bookRepository) {

        this.bookRepository = bookRepository;

    }

    public void addBook(String title) {

        System.out.println("Service: Adding book - " + title);

        bookRepository.save(title);

    }

}

**Code for Repository.java:**

package com.library.repository;

public class BookRepository {

    public void save(String title) {

        System.out.println("Saving book to database: " + title);

    }

}

**Code for MainApp:**

package com.library;

import com.library.service.BookService;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

public class MainApp {

    public static void main(String[] args) {

        ApplicationContext context =

                new ClassPathXmlApplicationContext("applicationContext.xml");

        BookService bookService = context.getBean("bookService", BookService.class);

        bookService.addBook("Spring in Action");

    }

}

ApplicationContent.xml:

<?xml version="1.0" encoding="UTF-8"?>

<beans xmlns="http://www.springframework.org/schema/beans"

       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

       xsi:schemaLocation="

         http://www.springframework.org/schema/beans

         https://www.springframework.org/schema/beans/spring-beans.xsd">

    <bean id="bookRepository" class="com.library.repository.BookRepository" />

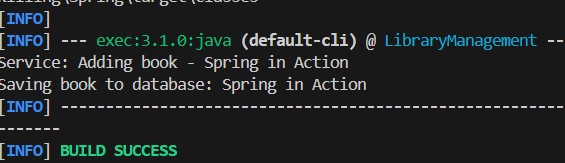
    <bean id="bookService" class="com.library.service.BookService">

          <property name="bookRepository" ref="bookRepository"/>

    </bean>

</beans>

**Output:**

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**Exercise 7: Implementing Constructor and Setter Injection**

Directory:

LibraryManagement/

├── pom.xml

├── src/

│ ├── main/

│ │ ├── java/

│ │ │ └── com/

│ │ │ └── library/

│ │ │ ├── MainApp.java

│ │ │ ├── service/

│ │ │ │ └── BookService.java

│ │ │ └── repository/

│ │ │ └── BookRepository.java

│ │ └── resources/

│ │ └── applicationContext.xml

**Code for Service.java:**

package com.library.service;

import com.library.repository.BookRepository;

public class BookService {

    private BookRepository bookRepository;

private String serviceName;

    public BookService(String serviceName) {

       this.serviceName=serviceName;

    }

    public void setBookRepository(BookRepository bookRepository) {

        this.bookRepository = bookRepository;

    }

    public void addBook(String title) {

        System.out.println("Service: Adding book - " + title);

        bookRepository.save(title);

    }

}

**Code for Repository.java:**

package com.library.repository;

public class BookRepository {

    public void save(String title) {

        System.out.println("Saving book to database: " + title);

    }

}

**Code for MainApp:**

package com.library;

import com.library.service.BookService;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

public class MainApp {

    public static void main(String[] args) {

        ApplicationContext context =

                new ClassPathXmlApplicationContext("applicationContext.xml");

        BookService bookService = context.getBean("bookService", BookService.class);

        bookService.addBook("Spring in Action");

    }

}

ApplicationContent.xml:

<?xml version="1.0" encoding="UTF-8"?>

<beans xmlns="http://www.springframework.org/schema/beans"

       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

       xsi:schemaLocation="

         http://www.springframework.org/schema/beans

         https://www.springframework.org/schema/beans/spring-beans.xsd">

    <bean id="bookRepository" class="com.library.repository.BookRepository" />

    <bean id="bookService" class="com.library.service.BookService">

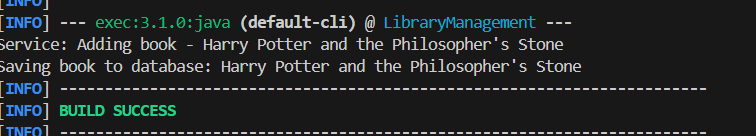
 <constructor-arg value="LibraryService"/>

  <property name="bookRepository" ref="bookRepository" />

    </bean>

</beans>

**Output:**

****