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

**Project Structure**

spring-basic-app/

├── pom.xml

└── src/

├── main/

│ ├── java/

│ │ └── com/example/

│ │ ├── App.java

│ │ ├── Student.java

│ │ ├── Course.java

│ │ └── Address.java

│ └── resources/

│ └── beans.xml

*App.java*

package com.example;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

public class App {

public static void main(String[] args) {

ApplicationContext context = new ClassPathXmlApplicationContext("beans.xml");

Student student = context.getBean("student", Student.class);

student.showDetails();

}

}

*Student.java*

package com.example;

public class Student {

private Address address;

private Course course;

public void setAddress(Address address) { // setter-based

this.address = address;

}

public void setCourse(Course course) { // setter-based

this.course = course;

}

public void showDetails() {

System.out.println("Student Details:");

address.display();

course.display();

}

}

*Course.java*

package com.example;

public class Course {

private String name;

private int duration;

public Course(String name, int duration) {

this.name = name;

this.duration = duration;

}

public void display() {

System.out.println("Course Name: " + name + ", Duration: " + duration + " months");

}

}

*Address.java*

package com.example;

public class Address {

private String city;

private String country;

public void setCity(String city) {

this.city = city;

}

public void setCountry(String country) {

this.country = country;

}

public void display() {

System.out.println("City: " + city + ", Country: " + country);

}

}

*beans.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">

<!-- Setter-based DI -->

<bean id="address" class="com.example.Address">

<property name="city" value="Mumbai"/>

<property name="country" value="India"/>

</bean>

<!-- Constructor-based DI -->

<bean id="course" class="com.example.Course">

<constructor-arg value="Spring Framework" />

<constructor-arg value="3" />

</bean>

<!-- Student with setter-based DI -->

<bean id="student" class="com.example.Student">

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

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

</bean>

</beans>

**Running command**

mvn clean compile

mvn exec:java

**Output**

Student Details:

City: Mumbai, Country: India

Course Name: Spring Framework, Duration: 3 months

