Java Spring Laboratory 4: Demonstrating Property Injection (or Setter Injection) using XML based Wiring of Spring Application.

Program Statement 1 – Write a program to demonstrate Setter (Property) Injection assuming Person, Car , MiddleclassPerson abstractions as described below: You have already modelled RichPerson as a type of Person owning his Car at instantiation time. In that program we assumed Person and Car as interfaces and RichPerson as a class implementing Person interface. There you used Constructor Injection to inject an object of a specific Car type into RichPerson object. Modify that project by adding MiddleclassPerson as another class implementing Person interface. We assume a “middleclass” person might or might not own a car. Thus we will model it as an optional dependency, unlike a rich person who was modelled as having “hard” (or instantiation time) dependency on car object. Thus implement the Dependency Injection of specific Car object into an object of MiddleclassPerson using Setter Injection mechanism. Note however, that first name and last name as String types are to be considered as “hard” dependencies for even MiddleclassPerson object. Thus those should be dependency injected through Constructor Injection same as was done for RichPerson.

Car.java

```
package nmitd.spring;

public interface Car {

	public void drive();
}
```

Mercedes.java

```
package nmitd.spring;

import java.io.PrintStream;

public class Mercedes implements Car {
	private PrintStream stream;

	public Mercedes(PrintStream stream)
	{
		this.stream=stream;
	}
	@Override
	public void drive() {
		// TODO Auto-generated method stub
		stream.println("Mercedes 2008 ");
	}

}
```

Maruti.java

```
package nmitd.spring;
import java.io.PrintStream;
public class Maruti implements Car {

	PrintStream stream;
	public Maruti(PrintStream stream) {
```

```
                this.stream=stream;
        }
        @Override
        public void drive() {
                // TODO Auto-generated method stub
                stream.println("Maruti Suzuki Wagon R 2005");
        }

}
```

Person.java

```
package nmitd.spring;

public interface Person {

        public void aboutMyself();
}
```

RichPerson.java

```
package nmitd.spring;
import java.util.List;
public class RichPerson implements Person {

        //private Cars car;
        private String firstName;
        private String lastName;
        private List<Car> carsOwned;

        public RichPerson(String firstName,String lastName,List<Car> carsOwned) {
                this.firstName=firstName;
                this.lastName=lastName;
                this.carsOwned=carsOwned;
        }

        public void aboutMyself()
        {
                System.out.println("Myself "+firstName+" "+lastName+" am a rich
person. I own these cars:");
                for(Car myCar:carsOwned)
                {
                        myCar.drive();
                }

        }
}
```

MiddlePerson.java

```
package nmitd.spring;

public class MiddlePerson implements Person {

        private String firstName;
        private String lastName;
        private Car myCar;

        public MiddlePerson(String firstName,String lastName) {
```

```
        this.firstName=firstName;
        this.lastName=lastName;
    }
    public void setMyCar(Car myCar) {
        this.myCar=myCar;
    }
    @Override
    public void aboutMyself() {
        // TODO Auto-generated method stub
        System.out.println("Myself "+firstName+" "+lastName+" am a Middle 
class person. I own these cars:");
        myCar.drive();
    }

}
```

PersonMain.java

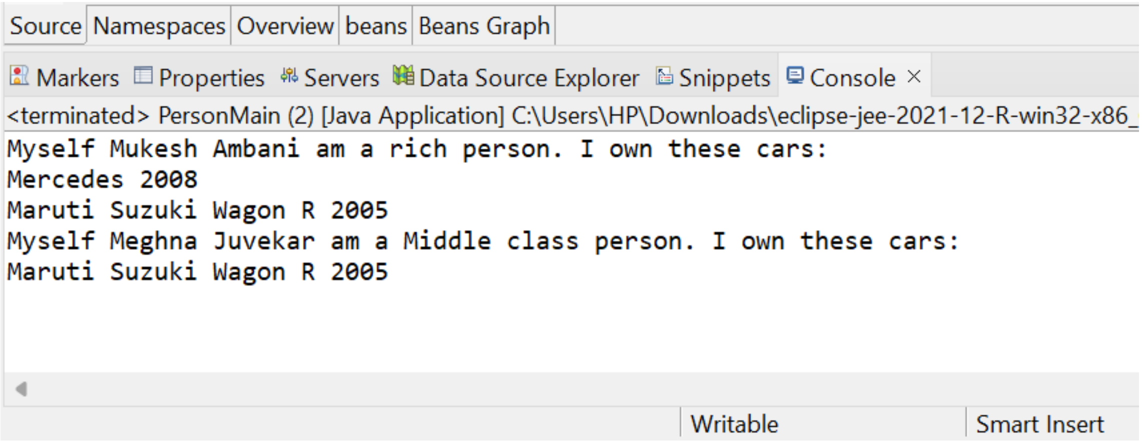
```
package nmitd.spring;

import org.springframework.context.support.ClassPathXmlApplicationContext;

public class PersonMain {

    public static void main(String[] args)
    {
        ClassPathXmlApplicationContext context=new 
ClassPathXmlApplicationContext("nmitd/spring/myBeans.xml");
        Person p1=context.getBean("rPerson",Person.class);
        Person p2=context.getBean("mPerson",Person.class);
        p1.aboutMyself();
        p2.aboutMyself();
        context.close();
    }

}
```

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

<bean id="rPerson" class="nmitd.spring.RichPerson">
    <constructor-arg value="Mukesh"/>
    <constructor-arg value="Ambani"/>
    <constructor-arg>
        <list>
            <ref bean="car1"/>
            <ref bean="car2"/>
        </list>
    </constructor-arg>
</bean>

<bean id="mPerson" class="nmitd.spring.MiddlePerson">
    <constructor-arg value="Meghna"/>
```

```
        <constructor-arg value="Juvekar"/>
        <property name="myCar" ref="car2" />
</bean>
<bean id="car1" class="nmitd.spring.Mercedes">
        <constructor-arg value="#{T(System).out}"/>
</bean>

<bean id="car2" class="nmitd.spring.Maruti">
        <constructor-arg value="#{T(System).out}"/>
</bean>
</beans>
```

Output:



```
<terminated> PersonMain (2) [Java Application] C:\Users\HP\Downloads\eclipse-jee-2021-12-R-win32-x86_
Myself Mukesh Ambani am a rich person. I own these cars:
Mercedes 2008
Maruti Suzuki Wagon R 2005
Myself Meghna Juvekar am a Middle class person. I own these cars:
Maruti Suzuki Wagon R 2005
```

Program Statement 2 – Modify program 1 so as to do Setter Injection of a collection of Car types into a bean of type MiddleclassPerson.

Car.java

```java
package nmitd.spring;

public interface Car {

	public void drive();
}
```

Mercedes.java

```java
package nmitd.spring;

import java.io.PrintStream;

public class Mercedes implements Car {
	private PrintStream stream;

	public Mercedes(PrintStream stream)
	{
		this.stream=stream;
	}
	@Override
	public void drive() {
		// TODO Auto-generated method stub
		stream.println("Mercedes 2008 ");
	}

}
```

Maruti.java

```java
package nmitd.spring;
import java.io.PrintStream;
public class Maruti implements Car {

	PrintStream stream;
	public Maruti(PrintStream stream) {
		this.stream=stream;
	}
	@Override
	public void drive() {
		// TODO Auto-generated method stub
		stream.println("Maruti Suzuki Wagon R 2005");
	}

}
```

Person.java

```java
package nmitd.spring;

public interface Person {

	public void aboutMyself();
}
```

RichPerson.java

```
package nmitd.spring;
import java.util.List;
public class RichPerson implements Person {

        //private Cars car;
        private String firstName;
        private String lastName;
        private List<Car> carsOwned;

        public RichPerson(String firstName,String lastName,List<Car> carsOwned) {
                this.firstName=firstName;
                this.lastName=lastName;
                this.carsOwned=carsOwned;
        }

        public void aboutMyself()
        {
                System.out.println("Myself "+firstName+" "+lastName+" am a rich
person. I own these cars:");
                for(Car myCar:carsOwned)
                {
                        myCar.drive();
                }
        }
}
```

MiddlePerson.java

```
package nmitd.spring;

import java.util.List;

public class MiddlePerson implements Person {

        private String firstName;
        private String lastName;
        private List<Car> carsOwned;

        public MiddlePerson(String firstName,String lastName) {
                this.firstName=firstName;
                this.lastName=lastName;
        }
        public void setMyCar(List<Car> carsOwned) {
                this.carsOwned=carsOwned;

        }
        @Override
        public void aboutMyself() {
                // TODO Auto-generated method stub
                System.out.println("Myself "+firstName+" "+lastName+" am a Middle
class person. I own these cars:");
                for(Car myCar:carsOwned) {
                        myCar.drive();
                }
        }
}
```

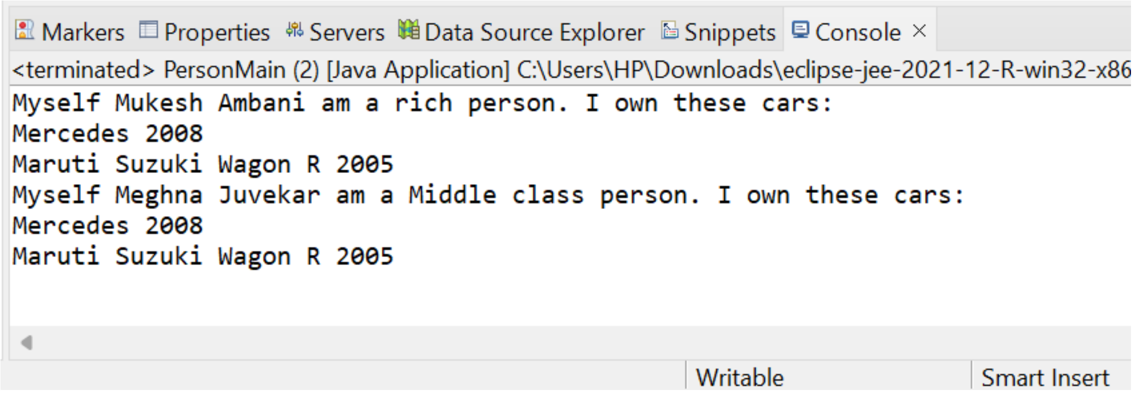
PersonMain.java

```java
package nmitd.spring;

import org.springframework.context.support.ClassPathXmlApplicationContext;

public class PersonMain {

	public static void main(String[] args)
	{
		ClassPathXmlApplicationContext context=new 
ClassPathXmlApplicationContext("nmitd/spring/myBeans.xml");
		Person p1=context.getBean("rPerson",Person.class);
		Person p2=context.getBean("mPerson",Person.class);
		p1.aboutMyself();
		p2.aboutMyself();
		context.close();
	}

}
```

myBeans.xml

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

<bean id="rPerson" class="nmitd.spring.RichPerson">
	<constructor-arg value="Mukesh"/>
	<constructor-arg value="Ambani"/>
	<constructor-arg>
		<list>
			<ref bean="car1"/>
			<ref bean="car2"/>
		</list>
	</constructor-arg>
</bean>

<bean id="mPerson" class="nmitd.spring.MiddlePerson">
	<constructor-arg value="Meghna"/>
	<constructor-arg value="Juvekar"/>
	<property name="myCar">
		<list>
			<ref bean="car1"/>
			<ref bean="car2"/>
		</list>
	</property>
</bean>
<bean id="car1" class="nmitd.spring.Mercedes">
	<constructor-arg value="#{T(System).out}"/>
</bean>

<bean id="car2" class="nmitd.spring.Maruti">
	<constructor-arg value="#{T(System).out}"/>
</bean>
</beans>
```

Output:



<terminated> PersonMain (2) [Java Application] C:\Users\HP\Downloads\eclipse-jee-2021-12-R-win32-x86

```
Myself Mukesh Ambani am a rich person. I own these cars:
Mercedes 2008
Maruti Suzuki Wagon R 2005
Myself Meghna Juvekar am a Middle class person. I own these cars:
Mercedes 2008
Maruti Suzuki Wagon R 2005
```