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Roll Number: 45	Lab Assignment Number: 5
Title of Lab Assignment: Implementation of java application using spring framework.	
DOP: 09-10-2023	DOS: 11-10-2023
CO Mapped: CO3	PO Mapped: PO2, PO3, PO4, PO7, PO11, PSO1, PSO2	Signature:

Practical No. 5

Aim: Implementation of java application using spring framework.

1. Write a program to print "Hello World" using spring framework.

2. Write a program to create shape class and rectangle class Shape class has a relationship with rectangle class. Use constructor injection to invoke object of shape class in rectangle class.

3. Write a program to create address class and Student class address class has a relationship with student class. Use setter injection to invoke the object of address class in student class.

Codes:

1. Write a program to print "Hello World" using spring framework.

   Message.java:

```java
package SpringHello;
public class Message {
    void printMessage() {
        System.out.println("Hello World");
    }
}
```

   TestClass.java

```java
package SpringHello;
import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;
public class TestClass {
        public static void main(String[] args) {
                ApplicationContext context = new
                        ClassPathXmlApplicationContext("configuration.xml");
                Message obj = (Message) context.getBean("messageBean");
                obj.printMessage();
        }
}
```
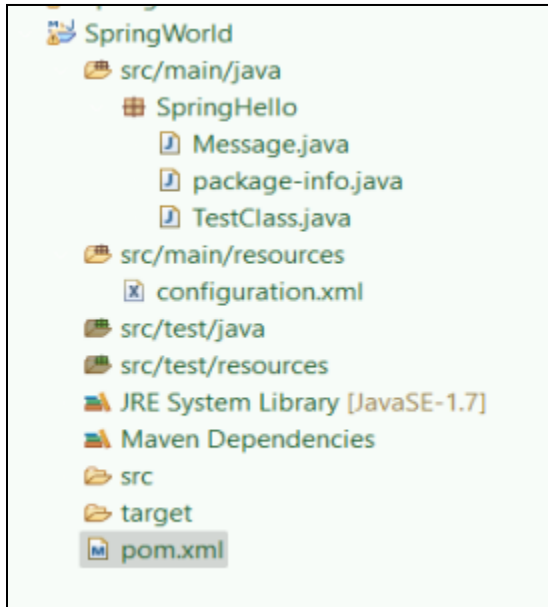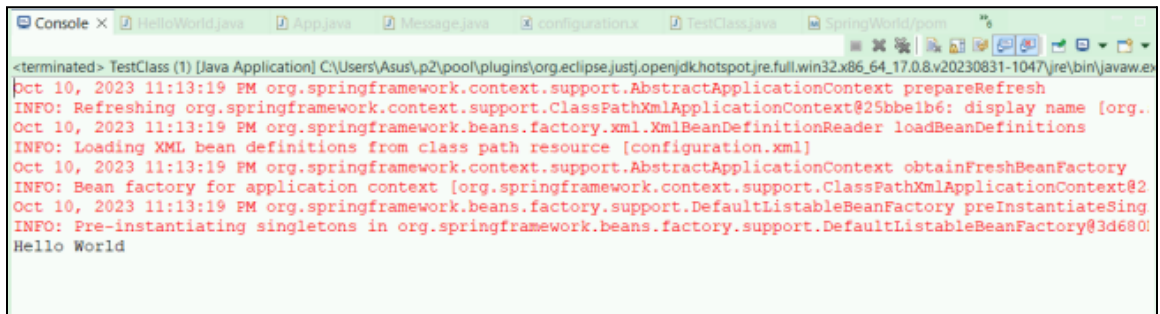
Configuration.xml

```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="messageBean" class="SpringHello.Message">
</bean>
</beans>
```

Pom.xml

```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>Hello_world</groupId>
 <artifactId>SpringWorld</artifactId>
 <version>0.0.1-SNAPSHOT</version>
 <dependencies>
 <dependency>
<groupId>org.springframework</groupId>
<artifactId>spring</artifactId>
<version>2.5.6</version>
</dependency>
 </dependencies>
</project>
```

Project Structure:

Output:

2. Write a program to create shape class and rectangle class Shape class has a relationship with rectangle class. Use constructor injection to invoke object of shape class in rectangle class.

Shape.java

```java
package Shape_constructor;
public class Shape {
    private Rectangle rectangle;
    public Shape(Rectangle rectangle) {
        this.rectangle = rectangle;
    }
    public void printShapeDetails() {
        System.out.println("Shape Details:");
        rectangle.printRectangleDetails();
    }
}
```

Rectangle.java

```java
package Shape_constructor;
public class Rectangle {
    private int length;
    private int width;
    public Rectangle(int length, int width) {
        this.length = length;
        this.width = width;
    }
    public void printRectangleDetails() {
        System.out.println("Rectangle: Length = " + length + ", Width = " + width);
    }
}
```

MainApp.java

```java
package Shape_constructor;
import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;
```
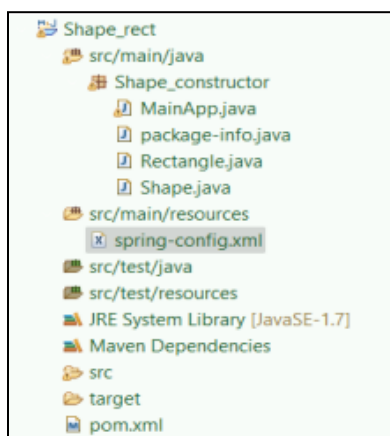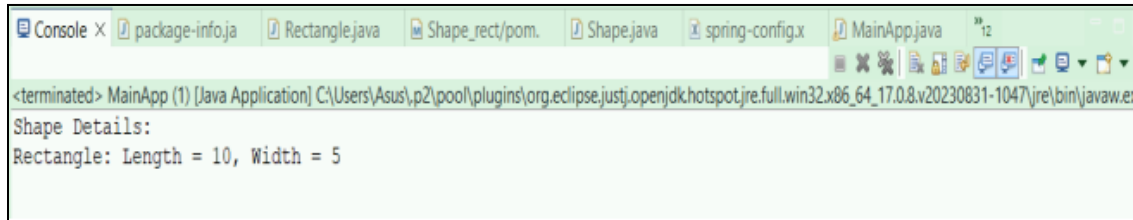
```
public class MainApp {
    public static void main(String[] args) {
        ApplicationContext context = new
ClassPathXmlApplicationContext("springconfig.xml");
        Shape shape = (Shape) context.getBean("shape");
        shape.printShapeDetails();
    }
}
```

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>ShapeQ2</groupId>

<artifactId>Shape_rect</artifactId>

<version>0.0.1-SNAPSHOT</version>

<dependencies>

<dependency>

<groupId>org.springframework</groupId>

<artifactId>spring-context</artifactId>

<version>5.3.10</version> <!-- Use the latest Spring version --> </dependency>

</dependencies>

</project>
```

Project Structure:

Output:

3. Write a program to create address class and Student class address class has a relationship with student class. Use setter injection to invoke the object of address class in student class.

Student.java

```
package Student_addresss;
public class Student {
    private Address address;
    // Setter method for address
    public void setAddress(Address address) {
        this.address = address;
    }
    // Getter method for address
    public Address getAddress() {
        return address;
    }
    public void printStudentDetails() {
        System.out.println("Student Details:");
        System.out.println("Student's " + address.toString());
    }
}
```

Address.java

```
package Student_addresss;
public class Address {
    private String street;
    private String city;
    private String state;
```

```java
   // Getter and Setter methods for street
   public String getStreet() {
      return street;
   }
   public void setStreet(String street) {
      this.street = street;
   }
   // Getter and Setter methods for city
   public String getCity() {
      return city;
   }
   public void setCity(String city) {
      this.city = city;
   }
   // Getter and Setter methods for state
   public String getState() {
      return state;
   }
   public void setState(String state) {
      this.state = state;
   }
   @Override
   public String toString() {
      return "Address: " + street + ", " + city + ", " + state;
   }
}
```

MainApp.java

```java
package Student_addresss;
import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;
public class MainApp {
public static void main(String[] args) {
  ApplicationContext context = new ClassPathXmlApplicationContext("springconfig.xml");
```

```
  Student student = (Student) context.getBean("student");
  student.printStudentDetails();
 }
}
```

Spring-config.xml
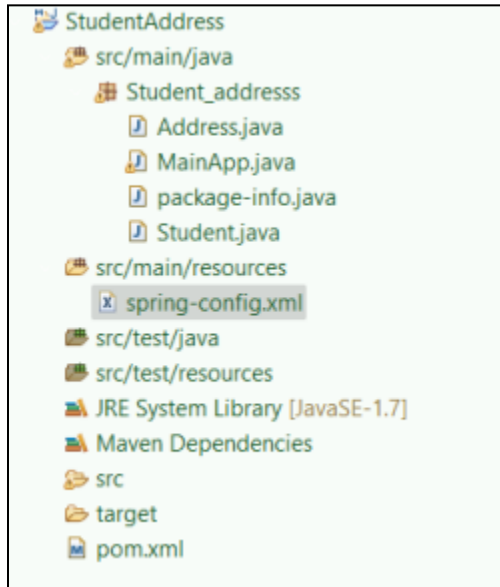
```xml
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xsi:schemaLocation="http://www.springframework.org/schema/beans
   http://www.springframework.org/schema/beans/springbeans.xsd">
   <bean id="address" class="Student_addresss.Address">
      <property name="street" value="Old Highway Street" />
      <property name="city" value="Badlapur" />
      <property name="state" value="Maharashtra" />
   </bean>
   <bean id="student" class="Student_addresss.Student">
      <property name="address" ref="address" />
   </bean>
</beans>
```

Pom.xml

```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>Student_address</groupId>
<artifactId>StudentAddress</artifactId>
<version>0.0.1-SNAPSHOT</version>
<dependencies>
<dependency>
<groupId>org.springframework</groupId>
<artifactId>spring-context</artifactId>
```

<version>5.3.10</version> <!-- Use the latest Spring version --> </dependency>

</dependencies>

</project>

Project Structure:

```
StudentAddress
    src/main/java
        Student_addresss
            Address.java
            MainApp.java
            package-info.java
            Student.java
    src/main/resources
        spring-config.xml
    src/test/java
    src/test/resources
    JRE System Library [JavaSE-1.7]
    Maven Dependencies
    src
    target
    pom.xml
```

Output:

```
Console ×  package-info.ja   Address.java   Student.java   StudentAddress/   spring-config.x   MainApp.java   "11
<terminated> MainApp (2) [Java Application] C:\Users\Asus\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_17.0.8.v20230831-1047\jre\bin\javaw.e
Student Details:
Student's Address: Old Highway Street, Badlapur, Maharashtra
```