Spring Assignment Solutions (Q1 - Q5)

Q1: Student Class using Spring XML Configuration

File: Student.java

```
package com.example.student;

public class Student {
    private String name;
    private int rollno;
    private String email;

    public void setName(String name) {
        this.name = name;
    }

    public void setRollno(int rollno) {
        this.rollno = rollno;
    }

    public void setEmail(String email) {
        this.email = email;
    }

    public void display() {
        System.out.println("Name: " + name);
        System.out.println("Roll No: " + rollno);
        System.out.println("Email: " + email);
    }
}
```

File: applicationContext.xml

```
<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="student1" class="com.example.student.Student">
        <property name="name" value="Alice"/>
        <property name="rollno" value="101"/>
        <property name="email" value="alice@example.com"/>
    </bean>

    <bean id="student2" class="com.example.student.Student">
        <property name="name" value="Bob"/>
        <property name="rollno" value="102"/>
        <property name="email" value="bob@example.com"/>
    </bean>
</beans>
```

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File: MainApp.java

```
package com.example.student;

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");

        Student s1 = (Student) context.getBean("student1");
        Student s2 = (Student) context.getBean("student2");

        s1.display();
        System.out.println("-----");
        s2.display();
    }
}
```

Q2: Sim Interface with Airtel and Voda

File: Sim.java

```
package com.example.sim;

public interface Sim {
    void calling();
    void data();
}
```

File: Airtel.java

```
package com.example.sim;

public class Airtel implements Sim {
    public void calling() {
        System.out.println("Airtel calling...");
    }
    public void data() {
        System.out.println("Airtel data usage...");
    }
}
```

File: Voda.java

```
package com.example.sim;

public class Voda implements Sim {
    public void calling() {
        System.out.println("Voda calling...");
    }
    public void data() {
        System.out.println("Voda data usage...");
    }
}
```

File: applicationContext.xml

```
<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="sim1" class="com.example.sim.Voda"/>
    <bean id="sim2" class="com.example.sim.Airtel"/>
</beans>
```

File: Mobile.java

```
package com.example.sim;

import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;

public class Mobile {
    public static void main(String[] args) {
        ApplicationContext context = new ClassPathXmlApplicationContext("applicationContext.xml");

        Sim sim1 = (Sim) context.getBean("sim1");
        Sim sim2 = (Sim) context.getBean("sim2");

        System.out.println("Using Voda SIM:");
        sim1.calling();
        sim1.data();

        System.out.println("-----");

        System.out.println("Using Airtel SIM:");
        sim2.calling();
        sim2.data();
    }
}
```

Spring Assignment Solutions (Q1 - Q5)

Q3: Vehicle Interface with Car and Bike

File: Vehicle.java

```
package com.example.vehicle;

public interface Vehicle {
    void start();
    void stop();
}
```

File: Car.java

```
package com.example.vehicle;

public class Car implements Vehicle {
    private String name;
    private int id;

    public void setName(String name) {
        this.name = name;
    }

    public void setId(int id) {
        this.id = id;
    }

    public void start() {
        System.out.println("Car " + name + " with ID " + id + " started.");
    }

    public void stop() {
        System.out.println("Car " + name + " with ID " + id + " stopped.");
    }
}
```

File: Bike.java

```
package com.example.vehicle;

public class Bike implements Vehicle {
    private String name;
    private int id;

    public void setName(String name) {
        this.name = name;
    }

    public void setId(int id) {
        this.id = id;
    }
    public void start() {
        System.out.println("Bike " + name + " with ID " + id + " started.");
    }

    public void stop() {
        System.out.println("Bike " + name + " with ID " + id + " stopped.");
    }
}
```

File: applicationContext.xml

```
<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="car" class="com.example.vehicle.Car">
        <property name="name" value="Honda Civic"/>
        <property name="id" value="301"/>
    </bean>

    <bean id="bike" class="com.example.vehicle.Bike">
        <property name="name" value="Yamaha R15"/>
        <property name="id" value="202"/>
    </bean>
</beans>
```

File: Transport.java

```
package com.example.vehicle;

import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;

public class Transport {
    public static void main(String[] args) {
        ApplicationContext context = new ClassPathXmlApplicationContext("applicationContext.xml");

        Vehicle car = (Vehicle) context.getBean("car");
        Vehicle bike = (Vehicle) context.getBean("bike");

        car.start();
        car.stop();

        System.out.println("-----");

        bike.start();
        bike.stop();
    }
}
```

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Q4: Spring MVC - User Form and Display

File: User.java

```
package com.example.model;

public class User {
    private String name;
    private String email;

    public String getName() { return name; }
    public void setName(String name) { this.name = name; }

    public String getEmail() { return email; }
    public void setEmail(String email) { this.email = email; }
}
```

File: UserController.java

```
package com.example.controller;

import com.example.model.User;
import org.springframework.stereotype.Controller;
import org.springframework.ui.Model;
import org.springframework.web.bind.annotation.*;

@Controller
public class UserController {
    @GetMapping("/user")
    public String showForm(Model model) {
        model.addAttribute("user", new User());
        return "user-form";
    }

    @PostMapping("/user")
    public String submitForm(@ModelAttribute("user") User user, Model model) {
        model.addAttribute("user", user);
        return "user-details";
    }
}
```

File: user-form.jsp

```
<%@ taglib uri="http://www.springframework.org/tags/form" prefix="form" %>
<html>
<head><title>User Form</title></head>
<body>
    <h2>User Input Form</h2>
    <form:form method="POST" action="/user" modelAttribute="user">
        Name: <form:input path="name"/><br/>
        Email: <form:input path="email"/><br/>
        <input type="submit" value="Submit"/>
    </form:form>
</body>
</html>
```

File: user-details.jsp

```
<html>
<head><title>User Details</title></head>
<body>
    <h2>User Details Submitted</h2>
    <p>Name: ${user.name}</p>
    <p>Email: ${user.email}</p>
</body>
</html>
```

File: dispatcher-servlet.xml

```
<beans xmlns="http://www.springframework.org/schema/beans"
       xmlns:mvc="http://www.springframework.org/schema/mvc"
       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
          http://www.springframework.org/schema/mvc
          http://www.springframework.org/schema/mvc/spring-mvc.xsd">

    <mvc:annotation-driven/>

    <bean class="org.springframework.web.servlet.view.InternalResourceViewResolver">
        <property name="prefix" value="/WEB-INF/"/>
        <property name="suffix" value=".jsp"/>
    </bean>

</beans>
```

File: web.xml

```
<web-app xmlns="http://xmlns.jcp.org/xml/ns/javaee"
         version="3.1">

    <servlet>
        <servlet-name>dispatcher</servlet-name>
        <servlet-class>org.springframework.web.servlet.DispatcherServlet</servlet-class>
        <init-param>
            <param-name>contextConfigLocation</param-name>
            <param-value>/WEB-INF/dispatcher-servlet.xml</param-value>
        </init-param>
        <load-on-startup>1</load-on-startup>
    </servlet>

    <servlet-mapping>
```

```
        <servlet-name>dispatcher</servlet-name>
        <url-pattern>/</url-pattern>
    </servlet-mapping>
</web-app>
```

Q5: Spring Boot Web Application - Employee Form

File: Employee.java

```
package com.example.demo.model;

public class Employee {
    private int empid;
    private String name;
    private int age;
    private double salary;

    public int getEmpid() { return empid; }
    public void setEmpid(int empid) { this.empid = empid; }
    public String getName() { return name; }
    public void setName(String name) { this.name = name; }
    public int getAge() { return age; }
    public void setAge(int age) { this.age = age; }
    public double getSalary() { return salary; }
    public void setSalary(double salary) { this.salary = salary; }
}
```

File: EmployeeController.java

```
package com.example.demo.controller;

import com.example.demo.model.Employee;
import org.springframework.stereotype.Controller;
import org.springframework.ui.Model;
import org.springframework.web.bind.annotation.*;

import java.util.*;

@Controller
public class EmployeeController {
    private List<Employee> employeeList = new ArrayList<>();

    @GetMapping("/")
    public String showForm(Model model) {
        model.addAttribute("employee", new Employee());
        model.addAttribute("employees", employeeList);
        return "index";
    }

    @PostMapping("/addEmployee")
    public String addEmployee(@ModelAttribute Employee employee, Model model) {
        employeeList.add(employee);
        model.addAttribute("employee", new Employee());
        model.addAttribute("employees", employeeList);
        return "index";
    }
}
```

File: index.html

```
<!DOCTYPE html>
<html xmlns:th="http://www.thymeleaf.org">
<head><title>Employee Form</title></head>
<body>
    <h2>Enter Employee Details</h2>
    <form action="#" th:action="@{/addEmployee}" th:object="${employee}" method="post">
        Emp ID: <input type="text" th:field="*{empid}" /><br/>
        Name: <input type="text" th:field="*{name}" /><br/>
        Age: <input type="text" th:field="*{age}" /><br/>
        Salary: <input type="text" th:field="*{salary}" /><br/>
        <button type="submit">Submit</button>
    </form>

    <h2>All Employees</h2>
    <table border="1">
        <tr><th>ID</th><th>Name</th><th>Age</th><th>Salary</th></tr>
        <tr th:each="emp : ${employees}">
            <td th:text="${emp.empid}"></td>
            <td th:text="${emp.name}"></td>
            <td th:text="${emp.age}"></td>
            <td th:text="${emp.salary}"></td>
        </tr>
    </table>
</body>
</html>
```

File: DemoApplication.java

```
package com.example.demo;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication
public class DemoApplication {
    public static void main(String[] args) {
        SpringApplication.run(DemoApplication.class, args);
    }
}
```