Object Oriented Programming 2

Rolf Haenni & Andres Scheidegger

Exercises 5

1. Marshal and Unmarshal Person Data with Annotations

Open a new Eclipse Java project. Import the *Person* class and the *MaritalStatus* enum from Exercise 1. Add a new class *Persons*, which contains a list of Person objects. Add also a class *PersonRegistry* with a main method. In this method create a *Persons* object and add several *Person* objects to it.

Now annotate your *Persons* and your *Person* classes with the JAXB annotations necessary to write and read all person data to / from an XML file.

In the main method create a JAXB marshaller and marshal your Persons object to the console and to an XML file. Finally, create an unmarshaller and try to read in the XML file again and to print the person data to the console.

Play with your annotations and try to get as close as possible to the XML file for person data from Exercise 4, task 6.

Hint: You will note, that the XML type for dates is a different one, then we use in Java. Implement an appropriate *XMLAdapter* (see slides).

2. Marshal and Unmarshal Person Data with Annotations

This is basically the same as task 1, however a bit more complicated.

Use the given classes (directory *topic05\Sources\university*) to create an instance of the class *University* and store it in an XML file. In a second step, try to read in again the generated XML file and show the content on the screen.

Given classes:

- UniMain.java (main class)
- University.java
- Person.java
- Student.java
- Employee.java
- Professor.java

The resulting XML file should look like to following example (next page):

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<university>
    <name>bfh</name>
    <staff>
        <staffmember xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                     xsi:type="student">
            <name>Max</name>
            <email>max@bfh.ch</email>
            <grade>B</grade>
        </staffmember>
        <staffmember xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                     xsi:type="professor">
            <name>Mr. X</name>
            <email>prof.x@bfh.ch</email>
            <subject>IT Security</subject>
        </staffmember>
        <staffmember xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                     xsi:type="employee">
            <name>Erni Schmidt</name>
            <email>erni.schmidt@bfh.ch</email>
        </staffmember>
    </staff>
    <students>
        <student>
            <name>Max</name>
            <email>max@bfh.ch</email>
            <grade>B</grade>
        </student>
        <student>
            <name>Tom</name>
            <email>tom@bfh.ch</email>
            <grade>c</grade>
        </student>
    </students>
</university>
```

Hint: The Person class in an abstract class. Annotate the fields with *@XmlElement* to include them in the XML file.

Hint2: Use the annotation *@XmlSeeAlso* in the abstract class to establish the links in the class hierarchy.

3. Generate Java Classes from XML Schema

Use the given XML schema fax.xsd (directory topic05\Sources\Fax\Schema) to generate the corresponding JAXB classes (use *xjc*). Write a program that creates a valid fax instance and marshals it. The result should look like the example on next page.

In a second step, try to validate and read in the generated XML file and show the content on the screen.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns1:fax xmlns:ns1="http://www.bfh.ch/fax/">
    <header>
        <from name="MyCompany" ns1:faxno="012 345 67 89"/>
        <to name="YourCompany" ns1:faxno="098 765 43 21"/>
        <priority>URGENT</priority>
        <pages>1</pages>
    </header>
    <body>This is the message in the body.</body>
</ns1:fax>
```

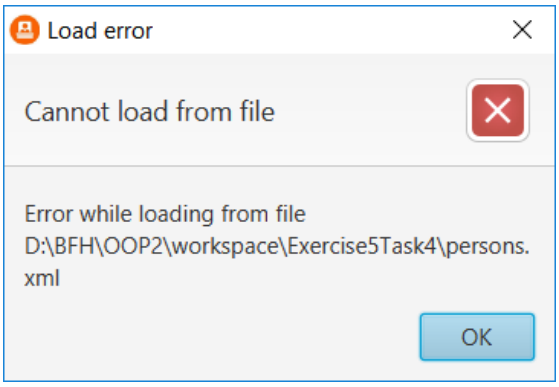
4. Combine JavaFX Application and JAXB

Now it is time to get back to our JavaFX Person Registry application as we left it back in Exercise 3. The goal is to add persistence of the person data via JAXB, based on the XML schema from Exercise 4, task 6.

Copy your application to a new JavaFX project and add a folder with the schema. Use *xjc* to create the Java classes. Now, implement a new *PersonDAO* using JAXB marshalling and unmarshalling. Change your application to use the new DAO.

Find out how you can set the *xsi:schemaLocation* attribute in the XML file where the person data is stored. Provide a valid path to the schema file and verify, that the XML file is validated in your Eclipse project (no warnings or errors shown on the generated XML file).

Enable also validation when unmarshalling the XML file and adapt your error handling code. If validation fails while unmarshalling the following *Alert* should be shown to the user:



At the same time the stack trace should be printed to the console.