

面向服务软件工程 Assignment 2

1. Task 1: 认证服务 (Start from Java)

1.1 实现逻辑

采用 Bottom-Up 模式，先定义 Java 接口 (`LoginService`)，利用 JAX-WS 注解 (`@WebService`, `@WebMethod`) 暴露服务。服务通过邮箱后缀判断用户身份（老师/本科生/研究生），并考虑对非法输入抛出异常。

2.2 关键代码实现

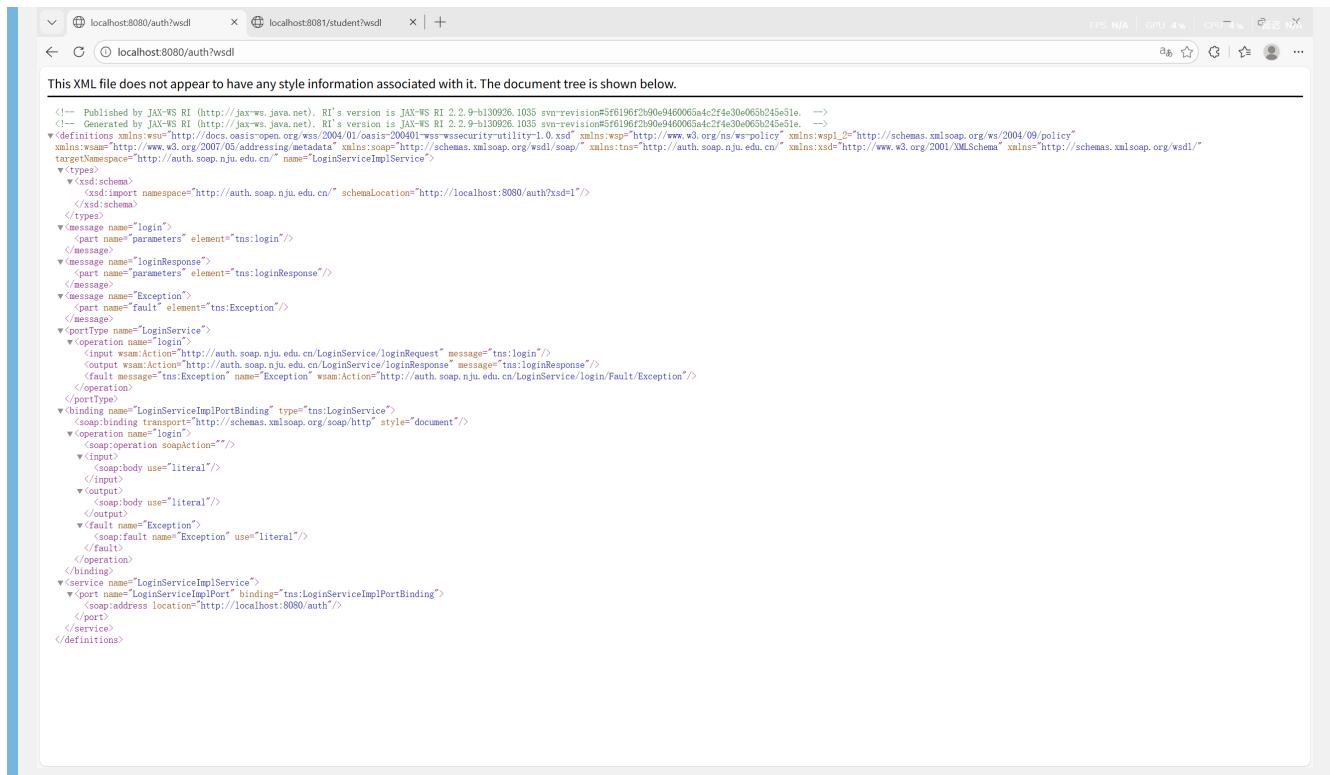
接口定义:

```
@WebService  
public interface LoginService {  
    @WebMethod  
    String login(@WebParam(name = "email") String email,  
                 @WebParam(name = "password") String password) throws Exception;  
}
```

服务发布: 为了满足“学院内网可访问性”的要求，服务绑定地址设为 `0.0.0.0`。

```
String address = "http://0.0.0.0:8080/auth";  
Endpoint.publish(address, new LoginServiceImpl());
```

2.3 运行结果验证



```

<!-- Published by JAX-WS RI (http://jax-ws.java.net). RI's version is JAX-WS RI 2.2.9-b130926.1035 svn-revision#5f6196f2990e9460065a4c2f4e30e065b245e51e. -->
<!-- Generated by JAX-WS RI (http://jax-ws.java.net). RI's version is JAX-WS RI 2.2.9-b130926.1035 svn-revision#5f6196f2990e9460065a4c2f4e30e065b245e51e. -->
<definitions xmlns="http://www.w3.org/2001/XMLSchema" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/" xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:ns="http://auth.soap.nju.edu.cn/" xmlns:ns1="http://auth.soap.nju.edu.cn/" targetNamespace="http://auth.soap.nju.edu.cn/" name="LoginServiceImplService">
  <xsd:schema>
    <xsd:import namespace="http://auth.soap.nju.edu.cn/" schemaLocation="http://localhost:8080/auth?xsd=1"/>
  </xsd:schema>
  <types>
  </types>
  <message name="login">
    <part name="parameters" element="tns:login"/>
  </message>
  <message name="loginResponse">
    <part name="parameters" element="tns:loginResponse"/>
  </message>
  <message name="Exception">
    <part name="fault" element="tns:Exception"/>
  </message>
  <operationType name="LoginService">
    <operation name="login">
      <input wsam:Action="http://auth.soap.nju.edu.cn/LoginService/loginRequest" message="tns:login"/>
      <output wsam:Action="http://auth.soap.nju.edu.cn/LoginService/loginResponse" message="tns:loginResponse"/>
      <fault message="tns:Exception" name="Exception" wsam:Action="http://auth.soap.nju.edu.cn/LoginService/login/Fault/Exception"/>
    </operation>
  </operationType>
  <binding name="LoginServiceImplPortBinding" type="tns:LoginService">
    <soap:binding transport="http://schemas.xmlsoap.org/soap/http" style="document"/>
    <operations name="login">
      <operation soap:operation="login">
        <input>
          <soap:body use="literal"/>
        </input>
        <output>
          <soap:body use="literal"/>
        </output>
        <fault name="Exception">
          <soap:fault name="Exception" use="literal"/>
        </fault>
      </operation>
    </operations>
  </binding>
  <service name="LoginServiceImplService">
    <port name="LoginServiceImplPort" binding="tns:LoginServiceImplPortBinding">
      <soap:address location="http://localhost:8080/auth"/>
    </port>
  </service>
</definitions>

```

2. Task 2: 业务服务 (Start from WSDL)

2.1 实现逻辑

采用 Top-Down 模式，首先编写 WSDL 文档，定义了 `StudentType` 数据结构以及 `getStudentInfo` (档案获取) 和 `checkIn` (签到) 两个操作。

2.2 代码生成与实现

使用 JDK 自带工具 `wsimport` 生成服务端接口代码：`wsimport -keep -p cn.edu.nju.soap.biz -d/xml_data/StudentService.wsdl`

3.3 运行结果验证

```

<!-- Published by JAX-WS RI (http://jax-ws.java.net). RI's version is JAX-WS RI 2.2.9-b130926.1035 svn-revision#5f6196f2990e9460065a4c2f4e30e065b245e51e. -->
<!-- Generated by JAX-WS RI (http://jax-ws.java.net). RI's version is JAX-WS RI 2.2.9-b130926.1035 svn-revision#5f6196f2990e9460065a4c2f4e30e065b245e51e. -->
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions xmlns:wsdl="http://www.w3.org/2001/05/Addressing/WS-Addressing-Relax.xsd" xmlns:wsp="http://www.w3.org/ns/ws-policy" xmlns:wsp1_2="http://schemas.xmlsoap.org/ws/2004/09/policy" xmlns:wsu="http://www.w3.org/2007/05/addressing/metadata" xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:tns="http://jw.nju.edu.cn/wsdl/" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://schemas.xmlsoap.org/wsdl/" targetNamespace="http://jw.nju.edu.cn/wsdl/" name="StudentService">
  <types>
    <xsd:schemas>
      <xsd:import namespace="http://jw.nju.edu.cn/wsdl/" schemaLocation="http://localhost:8081/student?xsd=1"/>
    </xsd:schemas>
  </types>
  <message name="checkIn">
    <part name="parameters" element="tns:checkInRequest"/>
  </message>
  <message name="checkInResponse">
    <part name="parameters" element="tns:checkInResponse"/>
  </message>
  <message name="ServiceError">
    <part name="fault" element="tns:ServiceFault"/>
  </message>
  <message name="getStudentInfo">
    <part name="parameters" element="tns:getStudentRequest"/>
  </message>
  <message name="getStudentInfoResponse">
    <part name="parameters" element="tns:getStudentResponse"/>
  </message>
  <portType name="StudentPortType">
    <operation name="checkIn">
      <input wsam:Action="http://jw.nju.edu.cn/wsdl/StudentPortType/checkInRequest" message="tns:checkIn"/>
      <output wsam:Action="http://jw.nju.edu.cn/wsdl/StudentPortType/checkInResponse" message="tns:checkInResponse"/>
      <fault message="tns:ServiceError" name="ServiceError" wsam:Action="http://jw.nju.edu.cn/wsdl/StudentPortType/checkIn/Fault/ServiceError"/>
    </operation>
    <operation name="getStudentInfo">
      <input wsam:Action="http://jw.nju.edu.cn/wsdl/StudentPortType/getStudentInfoRequest" message="tns:getStudentInfo"/>
      <output wsam:Action="http://jw.nju.edu.cn/wsdl/StudentPortType/getStudentInfoResponse" message="tns:getStudentInfoResponse"/>
      <fault message="tns:ServiceError" name="ServiceError" wsam:Action="http://jw.nju.edu.cn/wsdl/StudentPortType/getStudentInfo/Fault/ServiceError"/>
    </operation>
  </portType>
  <binding name="StudentServiceImplPortBinding" type="tns:StudentPortType">
    <soap:binding transport="http://schemas.xmlsoap.org/soap/http" style="document"/>
    <operation name="checkIn">
      <soap:operation soapAction="" />
      <input>
        <soap:body use="literal"/>
      </input>
      <output>
        <soap:body use="literal"/>
      </output>
      <fault name="ServiceError">
        <soap:fault name="ServiceError" use="literal"/>
      </fault>
    </operation>
    <operation name="getStudentInfo">
      <soap:operation soapAction="" />
      <input>
        <soap:body use="literal"/>
      </input>
      <output>
        <soap:body use="literal"/>
      </output>
    </operation>
  </binding>

```

3. 客户端测试 (Client)

3.1 测试用例设计

- Login 测试:** 验证正确邮箱返回角色，错误邮箱抛出异常。
- 档案测试:** 使用老师邮箱（高权限）成功获取 Mock 学生数据。
- 签到测试:** 模拟学生完成签到操作。

3.2 控制台输出结果

程序输出结果如下，符合预期。

```

>>> 1. 测试 Login 服务
Testing Teacher: TEACHER
Testing Student: UNDERGRADUATE
Testing Error:
Expected Exception: AuthError: Invalid email domain. Use nju.edu.cn or
smail.nju.edu.cn

>>> 2. 测试 Archive & CheckIn 服务
尝试获取档案(使用老师邮箱)...
Success: Got student Mock Student
尝试签到...
Student 1001 checked in for SOA_2024

```

```
"C:\Program Files (x86)\Java\jdk-1.8\bin\java.exe" ...
>>> 1. 测试 Login 服务
Testing Teacher: TEACHER
Testing Student: UNDERGRADUATE
Testing Error:
Expected Exception: AuthError: Invalid email domain. Use nju.edu.cn or smail.nju.edu.cn

>>> 2. 测试 Archive & CheckIn 服务
尝试获取档案(使用老师邮箱)...
Success: Got student Mock Student
尝试签到...
Student 1001 checked in for SOA_2024

进程已结束, 退出代码为 0
```