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Web Services PS 703128

WSDL Web Services

Required software:

- Java JDK: http://www.oracle.com/technetwork/java/javase/downloads/

- Eclipse: http://www.eclipse.org/downloads/

- Eclipse WTP: http://www.eclipse.org/webtools/

Exercise 1 – Invoking WSDL Web Services

Select an online WSDL Web Service[1] and using the "Web Service Client" from Eclipse WTP create a test client for one method of the service.

WSDL Description

```xml
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:tns="http://www.w3schools.com/xml/"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:s="http://www.w3.org/2001/XMLSchema"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
targetNamespace="http://www.w3schools.com/xml/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:types>
```

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[1] You can find services at http://webservicex.net/ or other available services repository on the Internet

```xml
    <s:schema elementFormDefault="qualified"
targetNamespace="http://www.w3schools.com/xml/">
      <s:element name="FahrenheitToCelsius">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="Fahrenheit"
type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="FahrenheitToCelsiusResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1"
name="FahrenheitToCelsiusResult" type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="CelsiusToFahrenheit">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="Celsius"
type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="CelsiusToFahrenheitResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1"
name="CelsiusToFahrenheitResult" type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="string" nillable="true" type="s:string" />
    </s:schema>
  </wsdl:types>
  <wsdl:message name="FahrenheitToCelsiusSoapIn">
    <wsdl:part name="parameters" element="tns:FahrenheitToCelsius" />
  </wsdl:message>
  <wsdl:message name="FahrenheitToCelsiusSoapOut">
```

```xml
    <wsdl:part name="parameters"
element="tns:FahrenheitToCelsiusResponse" />
  </wsdl:message>
  <wsdl:message name="CelsiusToFahrenheitSoapIn">
    <wsdl:part name="parameters" element="tns:CelsiusToFahrenheit" />
  </wsdl:message>
  <wsdl:message name="CelsiusToFahrenheitSoapOut">
    <wsdl:part name="parameters"
element="tns:CelsiusToFahrenheitResponse" />
  </wsdl:message>
  <wsdl:message name="FahrenheitToCelsiusHttpPostIn">
    <wsdl:part name="Fahrenheit" type="s:string" />
  </wsdl:message>
  <wsdl:message name="FahrenheitToCelsiusHttpPostOut">
    <wsdl:part name="Body" element="tns:string" />
  </wsdl:message>
  <wsdl:message name="CelsiusToFahrenheitHttpPostIn">
    <wsdl:part name="Celsius" type="s:string" />
  </wsdl:message>
  <wsdl:message name="CelsiusToFahrenheitHttpPostOut">
    <wsdl:part name="Body" element="tns:string" />
  </wsdl:message>
  <wsdl:portType name="TempConvertSoap">
    <wsdl:operation name="FahrenheitToCelsius">
      <wsdl:input message="tns:FahrenheitToCelsiusSoapIn" />
      <wsdl:output message="tns:FahrenheitToCelsiusSoapOut" />
    </wsdl:operation>
    <wsdl:operation name="CelsiusToFahrenheit">
      <wsdl:input message="tns:CelsiusToFahrenheitSoapIn" />
      <wsdl:output message="tns:CelsiusToFahrenheitSoapOut" />
    </wsdl:operation>
  </wsdl:portType>
  <wsdl:portType name="TempConvertHttpPost">
    <wsdl:operation name="FahrenheitToCelsius">
      <wsdl:input message="tns:FahrenheitToCelsiusHttpPostIn" />
      <wsdl:output message="tns:FahrenheitToCelsiusHttpPostOut" />
    </wsdl:operation>
    <wsdl:operation name="CelsiusToFahrenheit">
      <wsdl:input message="tns:CelsiusToFahrenheitHttpPostIn" />
      <wsdl:output message="tns:CelsiusToFahrenheitHttpPostOut" />
    </wsdl:operation>
```

```xml
    </wsdl:portType>
  <wsdl:binding name="TempConvertSoap" type="tns:TempConvertSoap">
    <soap:binding transport="http://schemas.xmlsoap.org/soap/http" />
    <wsdl:operation name="FahrenheitToCelsius">
      <soap:operation
soapAction="http://www.w3schools.com/xml/FahrenheitToCelsius"
style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="CelsiusToFahrenheit">
      <soap:operation
soapAction="http://www.w3schools.com/xml/CelsiusToFahrenheit"
style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>
  <wsdl:binding name="TempConvertSoap12" type="tns:TempConvertSoap">
    <soap12:binding transport="http://schemas.xmlsoap.org/soap/http"
/>
    <wsdl:operation name="FahrenheitToCelsius">
      <soap12:operation
soapAction="http://www.w3schools.com/xml/FahrenheitToCelsius"
style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="CelsiusToFahrenheit">
```

```xml
      <soap12:operation
soapAction="http://www.w3schools.com/xml/CelsiusToFahrenheit"
style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>
  <wsdl:binding name="TempConvertHttpPost"
type="tns:TempConvertHttpPost">
    <http:binding verb="POST" />
    <wsdl:operation name="FahrenheitToCelsius">
      <http:operation location="/FahrenheitToCelsius" />
      <wsdl:input>
        <mime:content type="application/x-www-form-urlencoded" />
      </wsdl:input>
      <wsdl:output>
        <mime:mimeXml part="Body" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="CelsiusToFahrenheit">
      <http:operation location="/CelsiusToFahrenheit" />
      <wsdl:input>
        <mime:content type="application/x-www-form-urlencoded" />
      </wsdl:input>
      <wsdl:output>
        <mime:mimeXml part="Body" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>
  <wsdl:service name="TempConvert">
    <wsdl:port name="TempConvertSoap" binding="tns:TempConvertSoap">
      <soap:address
location="http://www.w3schools.com/xml/tempconvert.asmx" />
    </wsdl:port>
    <wsdl:port name="TempConvertSoap12"
binding="tns:TempConvertSoap12">
      <soap12:address
```

```
location="http://www.w3schools.com/xml/tempconvert.asmx" />
    </wsdl:port>
    <wsdl:port name="TempConvertHttpPost"
binding="tns:TempConvertHttpPost">
      <http:address
location="http://www.w3schools.com/xml/tempconvert.asmx" />
    </wsdl:port>
  </wsdl:service>
</wsdl:definitions>
```

Using your implementation and the TCP/IP Monitor[2] integrated in Eclipse capture a SOAP request and response to the method you have selected.

SOAP Request
POST /WSDL/services/TempConvertSoap HTTP/1.0 Content-Type: text/xml; charset=utf-8 Accept: application/soap+xml, application/dime, multipart/related, text/* User-Agent: Axis/1.4 Host: localhost:8081 Cache-Control: no-cache Pragma: no-cache SOAPAction: "http://www.w3schools.com/xml/CelsiusToFahrenheit" Content-Length: 363 \<?xml version="1.0" encoding="UTF-8"?>\<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">\<soapenv:Body>\<CelsiusToFahrenheit xmlns="http://www.w3schools.com/xml/">\<Celsius>25\</Celsius>\</CelsiusToFahrenheit>\</soapenv:Body>\</soapenv:Envelope>
SOAP Response
HTTP/1.1 200 OK Server: Apache-Coyote/1.1 Content-Type: text/xml;charset=utf-8 Date: Mon, 18 Jan 2016 21:29:17 GMT Connection: close \<?xml version="1.0" encoding="utf-8"?>\<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">\<soapenv:Body>\<CelsiusToFahrenheitResponse xmlns="http://www.w3schools.com/xml/">\<CelsiusToFahrenheitResult>77.0\</CelsiusToFahrenheitResult>\</CelsiusToFahrenheitResponse>\</soapenv:Body>\</soapenv:Envelope>

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[2]Info: http://www.avajava.com/tutorials/lessons/how-do-i-monitor-http-communication-in-eclipse.html

Exercise 2 – WSDL Web Service Design

Based on the following RemotePrinter interface, define a WSDL 2.0 service description. It is sufficient to define just one binding SOAP/HTTP.

You can use the WSDL editor from Eclipse WTP for assistance.

```java
public interface RemotePrinter {

        /**
         * Submit a new print job.
         *
         * @param text the text to be printed
         * @return the id of the print job.
         */
        public int submitJob(String text);

        /**
         * Check the job's completion status.
         *
         * @param id the job id
         * @return <code>true</code> if the job is complete and
         * <code>false</code> otherwise.
         */
        public boolean isComplete(int id);

        /**
         * Queries the printer status.
         *
         * @return printer status in a human readable form.
         */
        public String getPrinterStatus();
}
```

WSDL Description