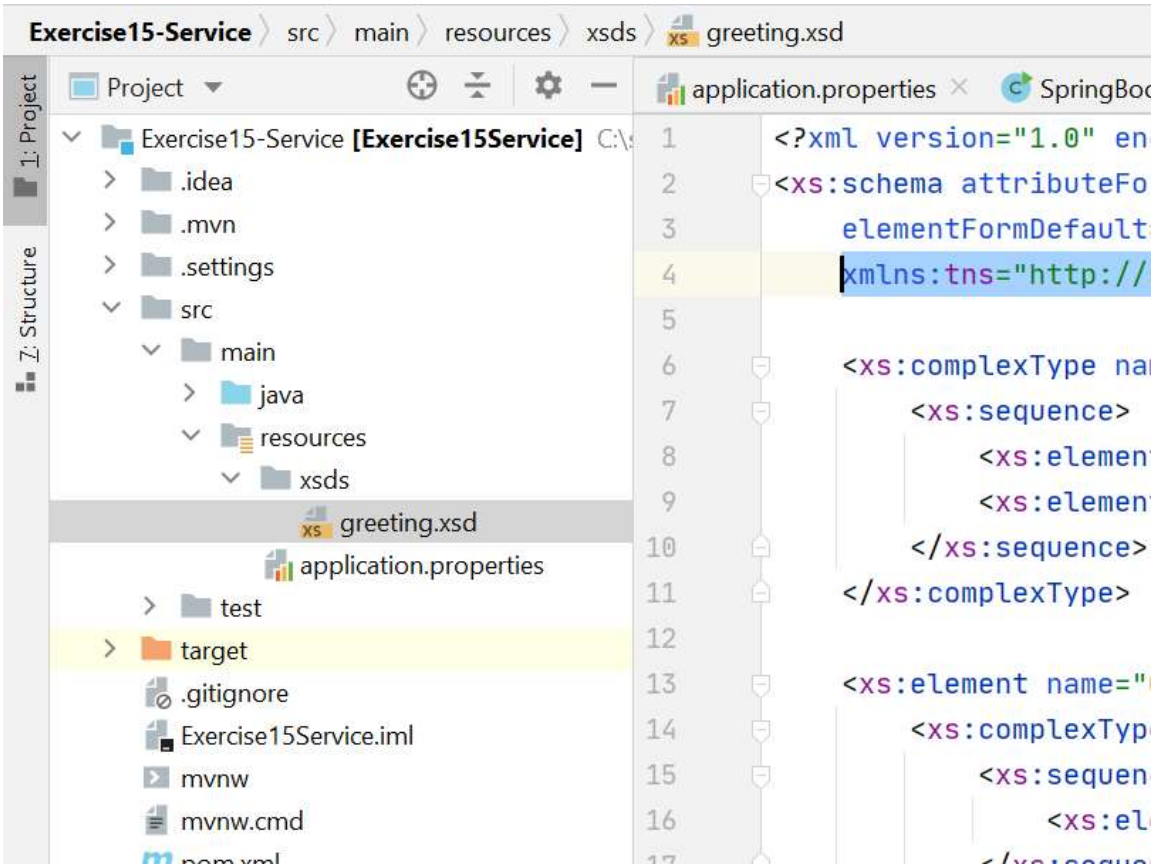
Lab 10

Part A:

Wherever you see the text **Exercise15-Service** in the screenshots, you should see **Lab10-Service** in IntelliJ

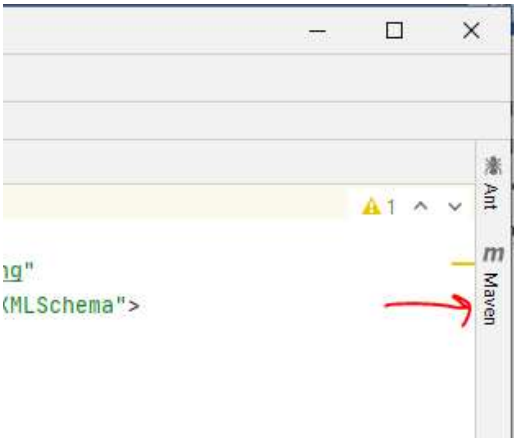
Wherever you see the text **Exercise15-Client** in the screenshots, you should see **Lab10-Client** in IntelliJ

Open the given **Lab10-Service** project, and the **Lab10-Client** project. In the Service project you see the schema file **greeting.xsd** in the folder **src/main/resources/xsds**

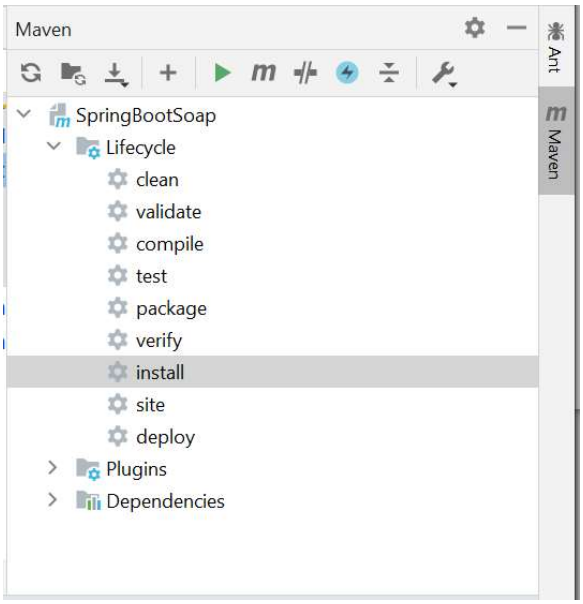


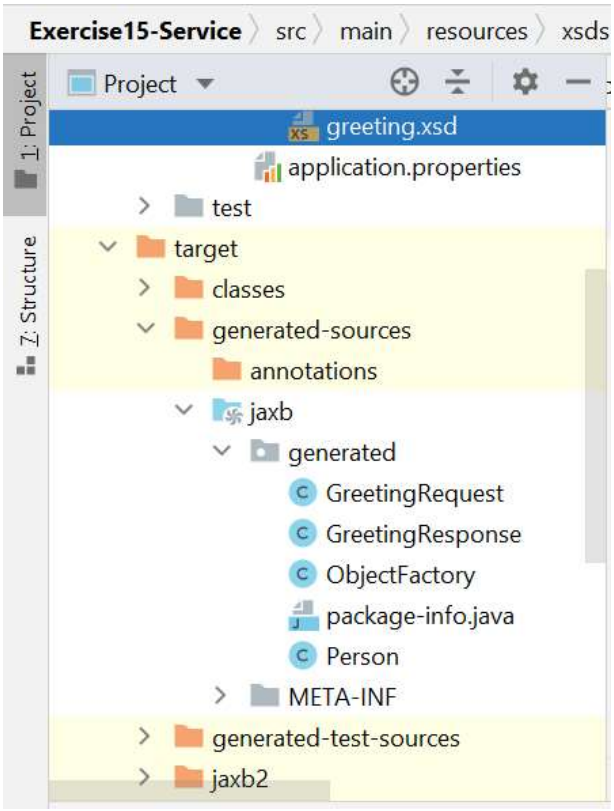
From this xsd file we need to generate the JAXB annotated Java classes

In IntelliJ, click the **Maven** tab at the right hand side of the IntelliJ window.



In the Maven window, double-click the **install** lifecycle.





Notice that this will generate the JAXB annotated classes based on the **greeting.xsd** file in the **resources/xsds** folder.

The GreetingEndpoint,java uses these generated classes:

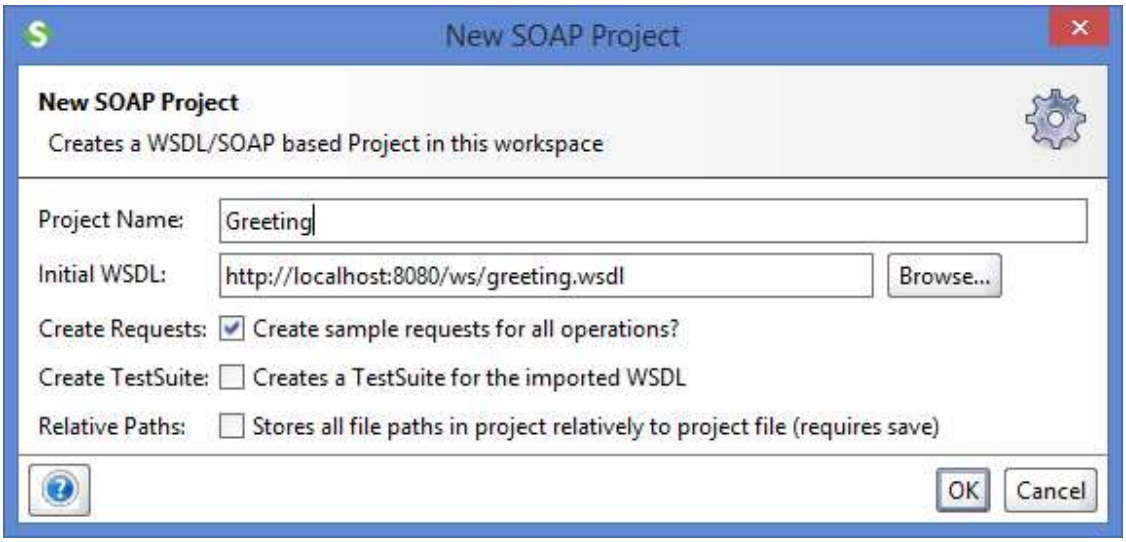
```
@Endpoint
public class GreetingEndpoint {
    private static final String NAMESPACE_URI = "http://springtraining/greeting";

    @PayloadRoot(namespace = NAMESPACE_URI, localPart = "GreetingRequest")
    @ResponsePayload
    public GreetingResponse getGreeting(@RequestPayload GreetingRequest request) {
        GreetingResponse response = new GreetingResponse();
        response.setGreeting(request.getPerson().getFirstName()+" "+request.getPerson().getLastName());
        return response;
    }
}
```

First run the file SpringBootSoapApplication.java. The service is now deployed to tomcat.

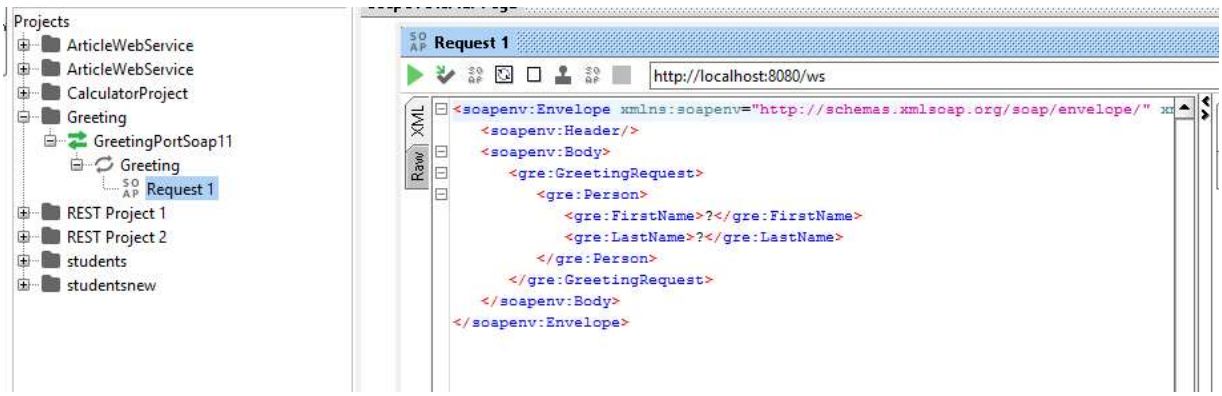
The download SoapUI from https://www.soapui.org/downloads/soapui.html and install SoapUI.

Then run SoapUI.

In SoapUI select **File->New SOAP Project**.

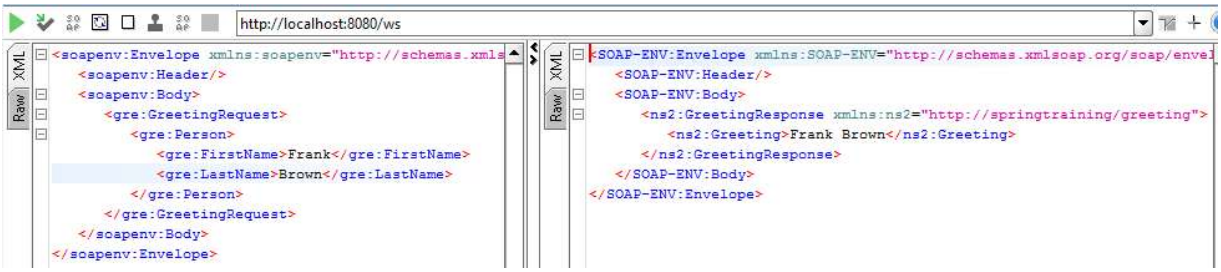


Fill in the Project Name **Greeting** and the Initioal WSDL http://localhost:8080/ws/greeting.wsdl
Then click **OK**.

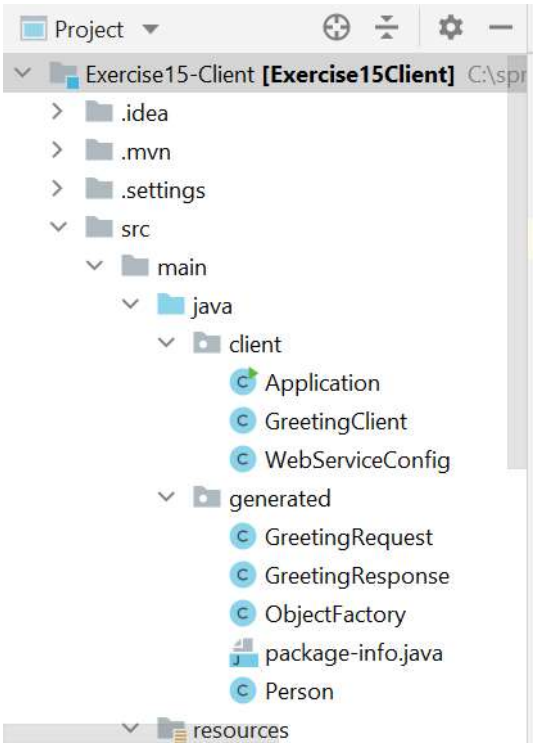


Open the Greeting project, and double click **Request 1**, and you see an example request based on the WSDL.

Fill in a name in the FirstName and LastName tag and click the Submit button which is the green triangle at the top left of the **Request 1** page. The SOAP request is now send to our service, and the response is shown in SoapUI.



Now we will look at the given **Lab10-Client** project



In this project we copied the generated classes from **Lab10-Service** . Then we implemented **GreetingClient.java** to work with these generated classes.

```
public class GreetingClient extends WebServiceGatewaySupport {

    public String getMessage(Person person) {
        GreetingRequest request = new GreetingRequest();
        request.setPerson(person);

        GreetingResponse response = (GreetingResponse)
                getWebServiceTemplate().marshalSendAndReceive(request);
        return response.getGreeting();
    }
}
```

Now run Application.java and you should see the following in the console:

```
Frank Brown
```

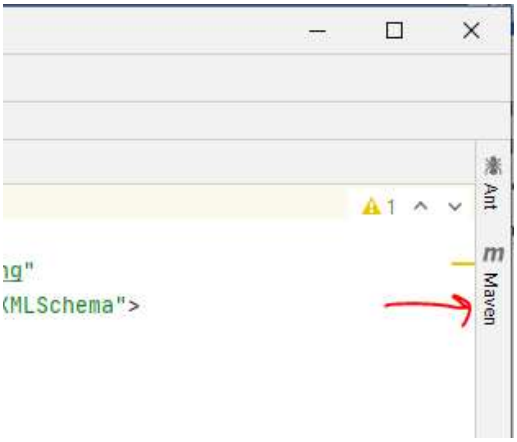
Now we are going to implement a SOAP calculator webservice with Spring boot.

In IntelliJ, right-click the project **Lab10-Service** and select **Copy->Copy**
Then right-click in the same project window and select **Paste**
Give the new project the name **Lab10Calculator**

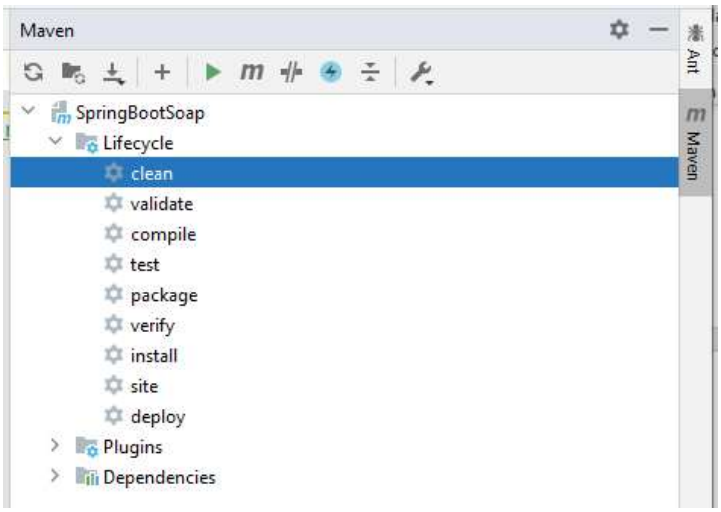
Now open the just created **Lab10Calculator** project in IntelliJ. Delete the file scr/main/resources/xsds/greeting.xsd. Create a new file in scr/main/resources/xsds with the name **calculator.xsd** and copy and paste the following content in this file:

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
   attributeFormDefault="unqualified" elementFormDefault="qualified"
   targetNamespace="http://springtraining/calculator">
   <xs:element name="AddRequest">
      <xs:complexType>
         <xs:sequence>
            <xs:element name="number1" type="xs:int" />
            <xs:element name="number2" type="xs:int" />
         </xs:sequence>
      </xs:complexType>
   </xs:element>
   <xs:element name="SubtractRequest">
      <xs:complexType>
         <xs:sequence>
            <xs:element name="number1" type="xs:int" />
            <xs:element name="number2" type="xs:int" />
         </xs:sequence>
      </xs:complexType>
   </xs:element>
   <xs:element name="AddResponse">
      <xs:complexType>
         <xs:sequence>
            <xs:element name="result" type="xs:int" />
         </xs:sequence>
      </xs:complexType>
   </xs:element>
   <xs:element name="SubtractResponse">
      <xs:complexType>
         <xs:sequence>
            <xs:element name="result" type="xs:int" />
         </xs:sequence>
      </xs:complexType>
   </xs:element>
</xs:schema>
```

In IntelliJ, click the **Maven** tab at the right hand side of the IntelliJ window.

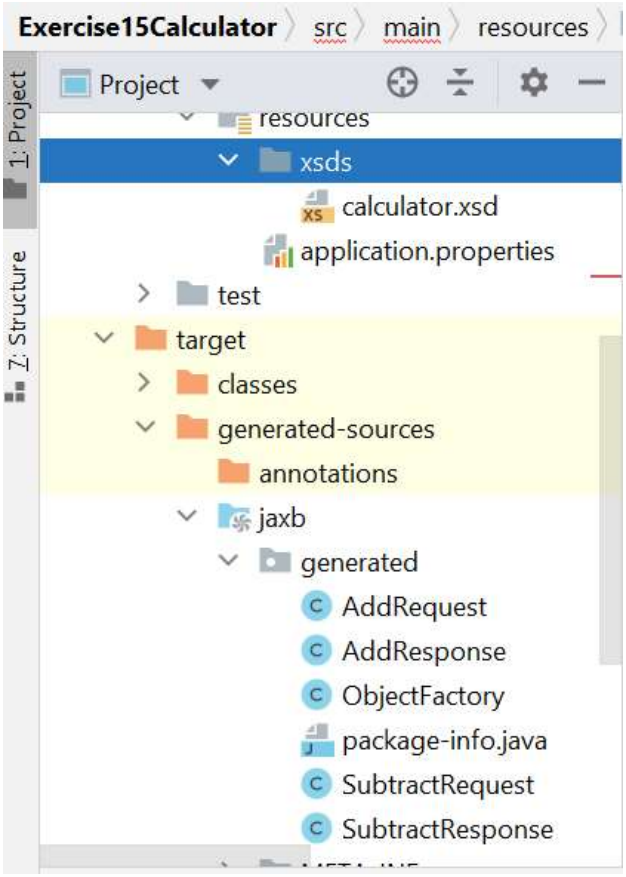


In the Maven window, double-click the **clean** lifecycle.



Notice that the whole **target** directory is removed.

Then double-click the **install** lifecycle in the maven window.



Notice that this will generate the JAXB annotated classes based on the calculator.xsd file in the **resources/xsds** folder.

Then delete the file GreetingEndpoint.java.

Then write a Calculator class as a Spring component:

```
@Component
public class Calculator {
    public int add(int x, int y){
        return x+y;
    }
    public int subtract(int x, int y){
        return x-y;
    }
}
```

Now we write the Calculator endpoint as follows:

```
import generated.AddRequest;
import generated.AddResponse;
import generated.SubtractRequest;
import generated.SubtractResponse;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.ws.server.endpoint.annotation.Endpoint;
import org.springframework.ws.server.endpoint.annotation.PayloadRoot;
import org.springframework.ws.server.endpoint.annotation.RequestPayload;
import org.springframework.ws.server.endpoint.annotation.ResponsePayload;


@Endpoint
public class CalculatorEndpoint {

   @Autowired
   Calculator calculator;

   private static final String NAMESPACE_URI =
"http://springtraining/calculator";

   @PayloadRoot(namespace = NAMESPACE_URI, localPart = "AddRequest")
   @ResponsePayload
   public AddResponse add(@RequestPayload AddRequest request) {
      AddResponse response = new AddResponse();
      int calcresult= calculator.add(request.getNumber1(),
request.getNumber2());
      response.setResult(calcresult);
      return response;
   }

   @PayloadRoot(namespace = NAMESPACE_URI, localPart = "SubtractRequest")
   @ResponsePayload
   public SubtractResponse add(@RequestPayload SubtractRequest request) {
      SubtractResponse response = new SubtractResponse();
      int calcresult= calculator.subtract(request.getNumber1(),
request.getNumber2());
      response.setResult(calcresult);
      return response;
   }
}
```

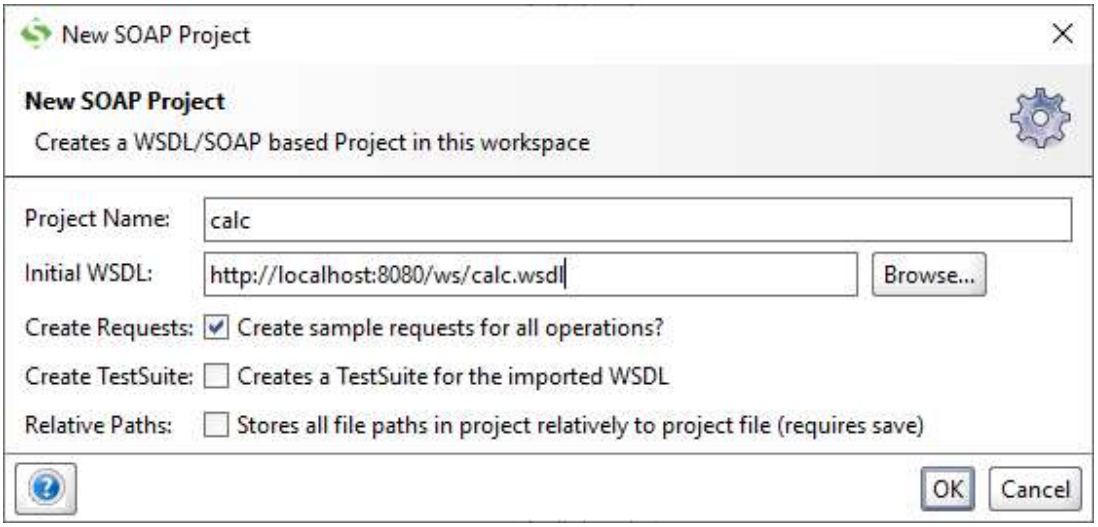
The last thing we have to do is to modify WebServiceConfig as follows:

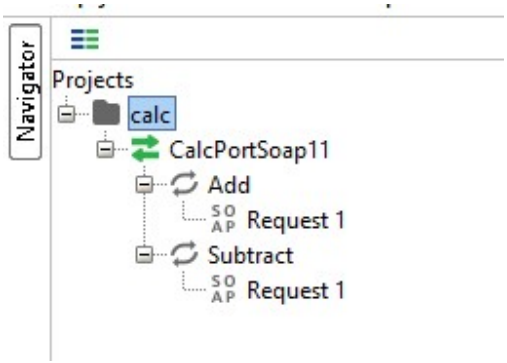
```
@EnableWs
@Configuration
public class WebServiceConfig extends WsConfigurerAdapter {
   @Bean
   public ServletRegistrationBean messageDispatcherServlet(ApplicationContext
applicationContext) {
      MessageDispatcherServlet servlet = new MessageDispatcherServlet();
      servlet.setApplicationContext(applicationContext);
      servlet.setTransformWsdlLocations(true);
      return new ServletRegistrationBean(servlet, "/ws/*");
   }

   @Bean(name = "calc")
   public DefaultWsdl11Definition calcdefaultWsdl11Definition(XsdSchema
calcSchema) {
      DefaultWsdl11Definition wsdl11Definition = new
DefaultWsdl11Definition();
      wsdl11Definition.setPortTypeName("CalcPort");
      wsdl11Definition.setLocationUri("/ws");

wsdl11Definition.setTargetNamespace("http://springtraining/calculator");
      wsdl11Definition.setSchema(calcSchema);
      return wsdl11Definition;
   }

   @Bean
   public XsdSchema calcSchema() {
      return new SimpleXsdSchema(new
ClassPathResource("xsds/calculator.xsd"));
   }
}
```

Now run the application.

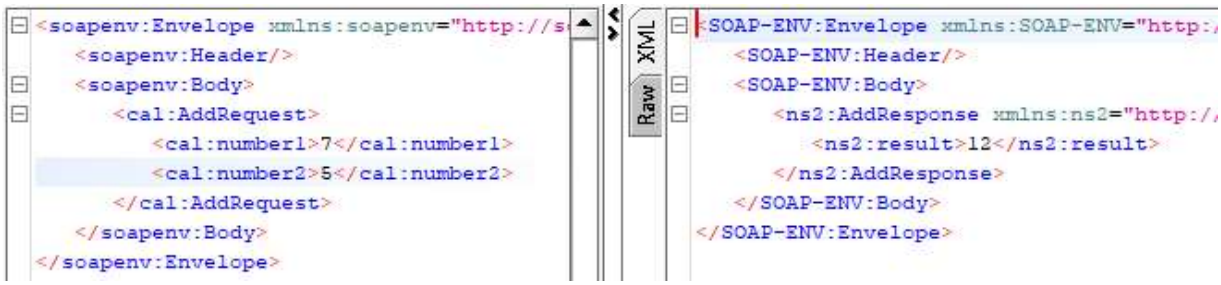
Check if you can get the WSDL file with the URL: http://localhost:8080/ws/calc.wsdl

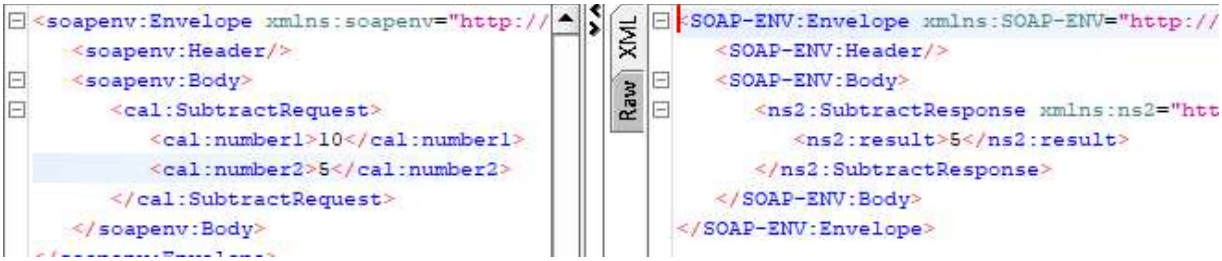
In SoapUI create a new SOAP project with the calculator WSDL link:





Now test if the service works correctly



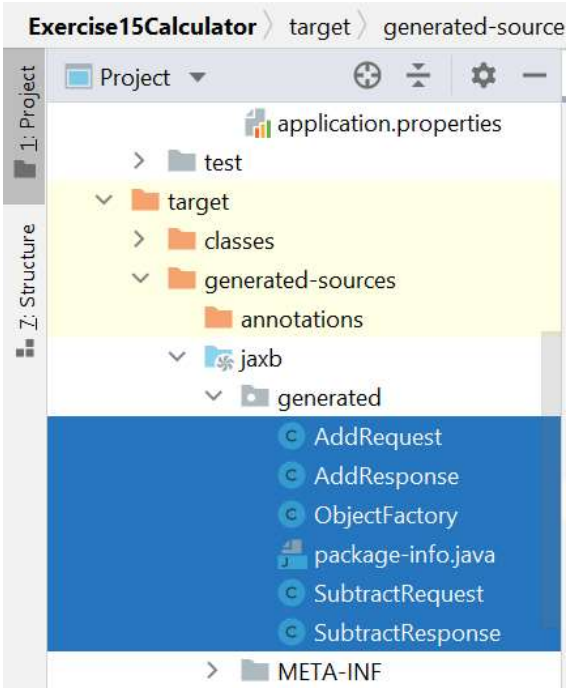


Modify the Calculator webservice so that we can also multiply.

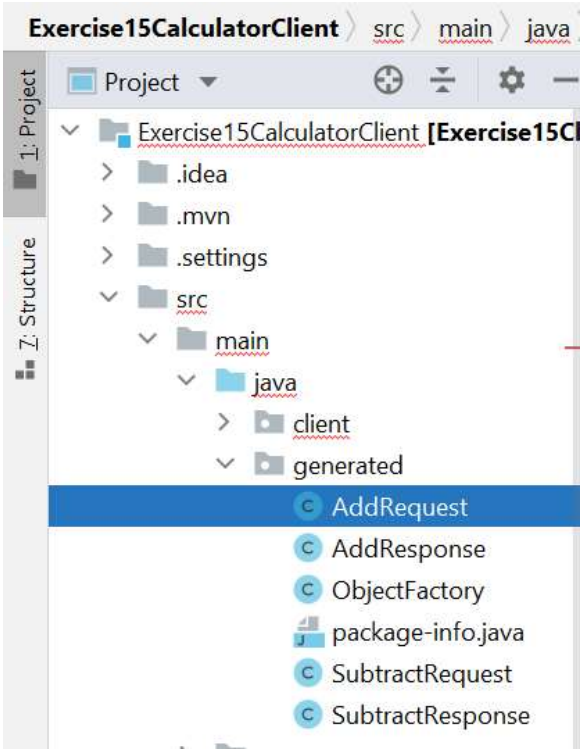
Now Copy and paste the project **Lab10-Client** to **Lab10CalculatorClient**

Open the just created project **Lab10CalculatorClient**

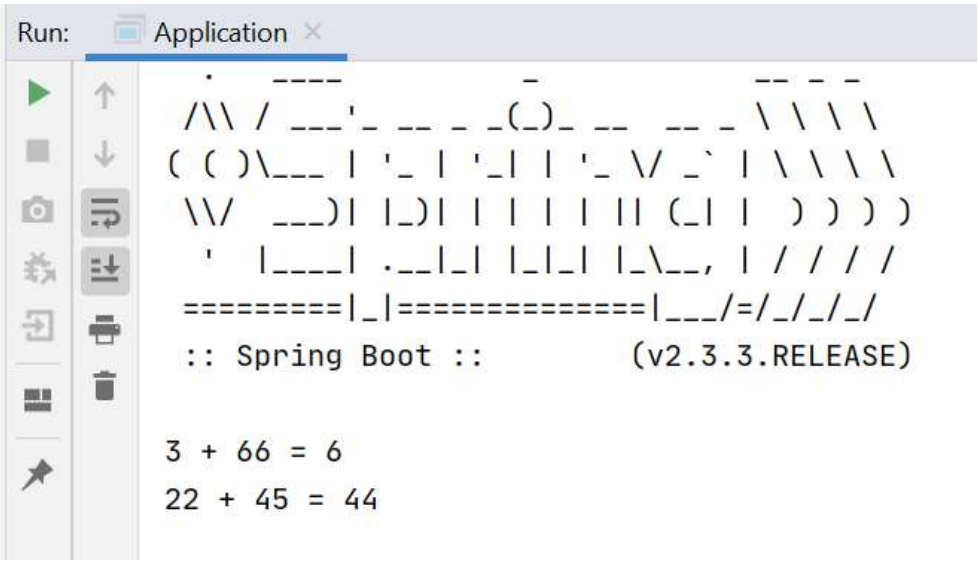
Then copy the files from **target/generated-sources/jaxb/generated** from the project **Lab10Calculator**



And paste these files in **src\main\java\generated** in the project **Lab10CalculatorClient**



Modify the client project so that we can call the calculator webservice.



What to hand in:

1. A separate zip file with the solution of this lab