Arithmetic Calculator

Documentation

Introduction

This short document to give a short description about the task (building arithmetic calculator). The application is build based on the requirements stated by “HPE”:

“Assignment Topic: Design and implement an service evaluating algebraic expressions in JAVA.

Deliverables: source codes, build script creating an war file deployable on an common servlet container (e.g. Tomcat)

Assignment: Design an input format suitable for representation of algebraic expressions. (e.g. XML, JSON, plaintext prefix notation.. whatever).

The expression can contain:

- integer constant

- string constant

- binary operators +,-,*,/

- unary operator sizeof (string) – length of the string argument

- unary operator abs(int) - absolute value of the integer argument

Actual syntax does not matter (element name "plus" suits well XML format while symbol "+" can be convenient for plaintext notations).

Then implement an service evaluating the input expression in Java using the technologies of your choice (REST, SOAP, plain network sockets, Spring, JAX-WS).

When invoked with a valid request the service will produce a response using the same format (result is either string or integer constant)

When evaluating the solution we well be interested in particular:

- object oriented design

- design patterns

- modular and extensible design

- maintainability of the delivered artefacts

- correct usage of the selected technologies

- justification of the selected technologiesThe next few sections will provide more description about the Java project.”

Technologies used:

The following frameworks, libraries, and build tools have been used to build the project:

Spring MVC (4.0.2.RELEASE): MVC framework to build the front layer right before the final views.

JSP & JSTL (1.2): Used to render the model objects returned from Spring MVC.

JAXB: Used to unmarshal the XML format into Java objects model.

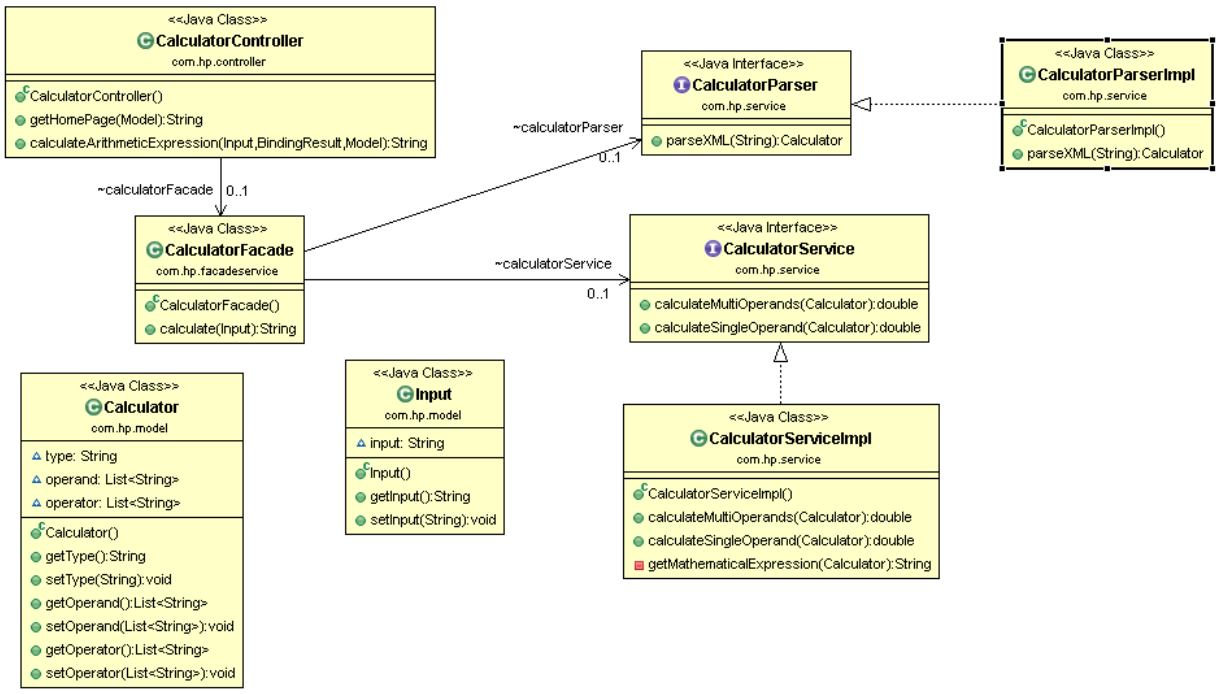
Maven: Used to build and resolve the project dependencies.

Oravle WebLogic Application Server (10.3.5): Used to publish the final project artifact (war file).

Eclipse (Kepler Service Release 1): used as an IDE that provides flexibility to use different plugins.

Layers Design:

The following class diagram describes the classes used to build the application:



Source code

Eclipse project could be checked out from the public “github” repository:

https://github.com/Mohammed-Rady/Arithmetic-Calculator.git

Screenshots

The below is some screenshots from the application:

The home page of the application will look like:

As shown in the screen shot instructions, the prompt is to provide XML format input. The user will be able to provide two types of inputs:

- Multi-operands input (+, -, *, /).
- Single-operand input (abs(number), sizeOf(string)).

The following screen shot shows the first type of the input (Multi-operands input):

Online Calculator

Please provide XML format input

```
<?xml version="1.0" encoding="UTF-8"
standalone="yes"?>
<calculator type="multi-operands">
        <operand>5344.43</operand>
        <operator>+</operator>
        <operand>12.22</operand>
        <operator>/</operator>
        <operand>1</operand>
        <operator>+</operator>
        <operand>52222</operand>
        <operator>-</operator>
        <operand>34</operand>
        <operator>+</operator>
        <operand>87444.3</operand>
        <operator>*</operator>
        <operand>32</operand>
        <operator>+</operator>
        <operand>10000</operand>
</calculator>
```

Calculate

Result: 2865762.25

The next two screens show the second type of the input (single-operand input):

Online Calculator

Please provide XML format input

```
<?xml version="1.0" encoding="UTF-8"
standalone="yes"?>
<calculator type="single-operand">
        <operand>-5344</operand>
        <operator>abs</operator>
</calculator>
```

Calculate

Result: 5344.0

Online Calculator

Please provide XML format input

```
<?xml version="1.0" encoding="UTF-8"
standalone="yes"?>
<calculator type="single-operand">
        <operand>asqweqwer</operand>
        <operator>sizeOf</operator>
</calculator>
```

Calculate

Result: 9.0

IDE Screenshot: