Software Quality
Winter 2023

Software Project Management and Comprehension Tool (Apache Maven)
LAB 1

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DESIGN REPORT

The design report is a continuation of the Binary Calculator project task in Lab 1

TASK

It's required from your team to

1. Add three functions to the Binary class that perform the following operations over two binary variables. The output of the function should be also a binary function:
    - OR: bitwise logical OR
    - AND: bitwise logical AND
    - Multiply: multiply two binary variables (Note: you may use the Add function)
2. Update the App.java file to call the new three functions. You may update it to be more interactive and user friendly.
3. Add three test functions at least for each of new function added into the Binary class

Update Source code:

In the Binary.java file, three more functions were added to it:

a. A static **or** function that calculates the bitwise logical OR operation of two binary numbers. This function takes the input as a string, converts the string binary numbers to decimal numbers, calculates the bitwise logical operation, then converts it back to binary.
b. A static **and** function that calculates the bitwise logical AND operation of two binary numbers. This function takes the input as a string, converts the string binary numbers to decimal numbers, calculates the bitwise logical operation, then converts it back to binary.
c. A static **multiply** function that calculates the product of two binary numbers. This function takes the input as a string, converts the string binary numbers to decimal numbers, calculates the product, then converts it back to binary.

The App.java file is also updated to call these functions to calculate the two binary variables given.

After updating the files, we rebuild the project using:

```
mvn clean package site assembly:single
```

Then run the generated jar file using:

```
java -jar target/BinaryCalculator-1.0.0-jar-with-dependencies.jar
```

This is the output:

```
pendencies.jar
The current local time is: 13:10:26.583
First binary number is 10001000
Second binary number is 111000
Their summation is 11000000
Bitwise AND is 1000
Bitwise OR of the number is 10111000
Product of the binary numbers is 1110111000000
```

Add Test Cases:
In BinaryTest.java three more test cases were added to test the **or**, **and** and **multiply** functions:

a. Test case **or1** and test case **and1** tests the functions **and** and **or** with two binary values of different length.
b. Test case **mul1** tests the function **multiply** with two binary numbers of the same length.

After the test cases were added, the project was rebuilt again using:

```
mvn clean package site assembly:single
```

The result of the test cases can be accessed in the summary report by opening the **index.html** file in the **Target** folder:

Surefire Report

Summary

[Summary] [Package List] [Test Cases]

Tests	Errors	Failures	Skipped	Success Rate	Time
15	0	0	0	100%	0.038

Note: failures are anticipated and checked for with assertions while errors are unanticipated.

Package List