Homework 8 : Exceptions

In this homework, you are to implement IntegerCalculator interface given below.

Interface

```
import java.util.Map;

public interface IntegerCalculator {

    int perform(String operand1, String operator, String operand2);

    Map<String, String> getOperatorDesc();

}
```

Your implementation will be tested by the following class. Also below, find the test inputs and corresponding outputs printed by the class. Note that you should consider exceptional conditions including illegal arguments, arithmetic exceptions and overflow conditions in your implementations. And you should not modify the test class (IntegerCaculatorApp.java).

Test Code

```
import java.util.Iterator;
import java.util.Scanner;

public class IntegerCaculatorApp {

    public static void main (String[] args){

        IntegerCalculator calc = new IntegerCalculatorImpl();
        System.out.println("Welcome to Integer Calculator! You can use the following operators.");
        Iterator<String> itr = calc.getOperatorDesc().keySet().iterator();
        while (itr.hasNext()){
            String operator = itr.next();
            System.out.println(operator + " " + calc.getOperatorDesc().get(operator));
        }

        boolean exit = false;
        Scanner scan = new Scanner(System.in);
        while (!exit){
            System.out.println();
            System.out.print("Enter first operand: ");
            String operand1 = scan.nextLine();
            System.out.print("Enter operator: ");
            String oper = scan.nextLine();
```

```
            System.out.print("Enter second operand: ");
            String operand2 = scan.nextLine();

            try{
                int result = calc.perform(operand1,oper,operand2);
                System.out.println("Result: " +result);
            }catch(OverflowException ex){
                System.out.println("Overflow: " + ex.getMessage());
            }catch(IllegalArgumentException | ArithmeticException ex){
                System.out.println("Error: " + ex.getMessage());
            }
        }
        scan.close();
    }
}
```

Sample Test Input and Expected Output:

```
Welcome to Integer Calculator! You can use the following operators.
+ Calculates the sum of the given operands
- Subtracts the second operand from the first one
* Multiplies the operands
/ Divides the first operand by the second one
% Finds the remainder after division of first operand by second one

Enter first operand: 4
Enter operator: +
Enter second operand: 5
Result: 9

Enter first operand: 4
Enter operator: -
Enter second operand: 5
Result: -1

Enter first operand: 4
Enter operator: *
Enter second operand: 5
Result: 20

Enter first operand: 14
Enter operator: /
Enter second operand: 3
Result: 4

Enter first operand: 14
```

```
Enter operator: %
Enter second operand: 3
Result: 2

Enter first operand: 5
Enter operator: /
Enter second operand: 0
Error: / by zero

Enter first operand: 5
Enter operator: %
Enter second operand: 0
Error: / by zero

Enter first operand: A
Enter operator: +
Enter second operand: 3
Error: A is not a valid Integer

Enter first operand: 5
Enter operator: q
Enter second operand: 3
Error: q is not a valid Operator

Enter first operand: 5
Enter operator: *
Enter second operand: t
Error: t is not a valid Integer

Enter first operand: 2147483647
Enter operator: +
Enter second operand: 5
Overflow: 2147483647 + 5 can not be represented by Integer

Enter first operand: -2147483648
Enter operator: -
Enter second operand: 1
Overflow: -2147483648 - 1 can not be represented by Integer

Enter first operand: 10000000
Enter operator: *
Enter second operand: 1000000
Overflow: 10000000 * 1000000 can not be represented by Integer
```

Due date: **11.04.2016 13:30**

Submission:

- You will submit your homework to **onurkilincceker@gmail.com**
- Write CENG 1004 HW8 in the subject line of your email.
- To this email, you should attach your compressed deliverable file (zip file) which contains the source files of your application.
- The name of your zip file should be in the following format: StudentID_HW8.zip and you should replace StudentID with your own ID number. Assuming 1007090002 is your ID number, then the name of your zip file should be 1007090002_HW8.zip