Lab Assignment: Solving Expression
In this assignment, we are going to use stack ADT to solve algebraic expressions.

Given an expression: 3 x (4 + 5)
We can solve the expression, by using the following algorithm. In this case, we need to incorporate two stack ADTs (one to store the number and another to store the operator). Please note, all numbers will be integers.

```
If you read a number
      Push it on the number stack
Else if you read a (
            Push it on the operator stack
Else if you read an operator op
      While the top of the stack has a higher precedence than op
            Evaluate the top
      Push op on the operator stack.
Else if you read a )
      While the top of the stack is not a (
            Evaluate the top
      Pop the (
Else if there is no more input
      While the operator stack is not empty
            Evaluate the top.
```

Deliverable 1: Read the numbers and operators and parse the expression to obtain the correct result
Deliverable 2: The program must test the validity of the input numbers. If the number(s) is invalid or the expression is invalid then the program must throw appropriate exceptions.
Deliverable 3: In the main function, input a number of different expressions and demonstrate how your program produces correct output and/or handles exceptions to provide information about the nature of each exceptions.

Input to your program, would be a single line of string (comprising numbers, operators). In order to split the string expression easily, you can assume that there is a space between each number and operator in the input expression. The output of the program would be the result of the expression (if the expression is valid).

Sample input	Sample output
3 x (((4 + 5) / 3) * (20 + 1))	189
3 x (((4b + 5) / 3) * (20 + 1))	ERROR: invalid number(s)
3 x (((4 + 5) / 3) * (20 + 1)	ERROR: invalid expression
3 x (((4 < 5) / 3) * (20 + 1))	ERROR: invalid operator(s)

Submit the solution on the BrightSpace website by 11:59pm, Monday, 25 March 2023. Let me know if you have any questions. Thank you.

Assignment rubrics | Total points: 45		**Points**	
Deliverable 1:	The program is able to parse the expression (remember a number of different expressions will be used to test the accuracy of the program) correctly	25	points
Deductibles 2:	- The program can determine error cases in the expression including invalid number, invalid expression, and invalid operator used - The program throws exception signals and handles them in the program - The program accurately implements the provided algorithm - Screenshots have been provided in a pdf file to demonstrate all output (including error cases)	20 10 35 10	points
Comments Requirement	Uses Java doc style comments throughout your code to explain the purpose of each method in your program	10	Points