ECE 325 OBJECT-ORIENTED SOFWARE DES (LEC A1 Fa18)

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Assignment 3: Exception Handling

·Source code: Calculator.java

·Due date: **Thursday 4th of October (5:00 pm)**. A working copy of your solution must be submitted to eClass before this date.

Part 1: Calculator

Your program must be able to read in the following expressions. You may wish to construct a BNF grammar in the style of the cookie exercise as an initial task.

Compile, run, and test your program with at least these expressions:

```
let x = 1;
(let x = 1) + x;
(let a = 2) + 3 * a - 5;
(let x = (let y = (let z = 1))) + x + y + z;
1 + (let x = 1) + (let y = 2) + (1 + x) * (1 + y) - (let x = y) - (let y = 1) - x;
1 + (let a = (let b = 1) + b) + a + 1;
(let a = (let a = (let a = (let a = 2) + a) + a) + a) - 9;
(let x = 2) ^ (let y = 3);
(let y = 3) ^ (let x = 2);
```

Correct return values are 1, 2, 3, 4, 5, 6, 7, 8, and 9 respectively.

Part 2: Exception Handling

Add Java exception handling to your code by defining two exception classes SyntaxError and RuntimeError.

·A SyntaxError exception should be thrown when an illegal character is found, a closing) is not found, or a = is not used in a let expression.

A RuntimeError exception should be thrown when an identifier is encountered for which no value can be found.

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The exceptions should propagate the error to the main program which prints the diagnostics of the error. You must handle these errors using Java exceptions and the message should be printed by an exception handler in a catch clause.

These will be the exception test cases:

A Working Procedure Example

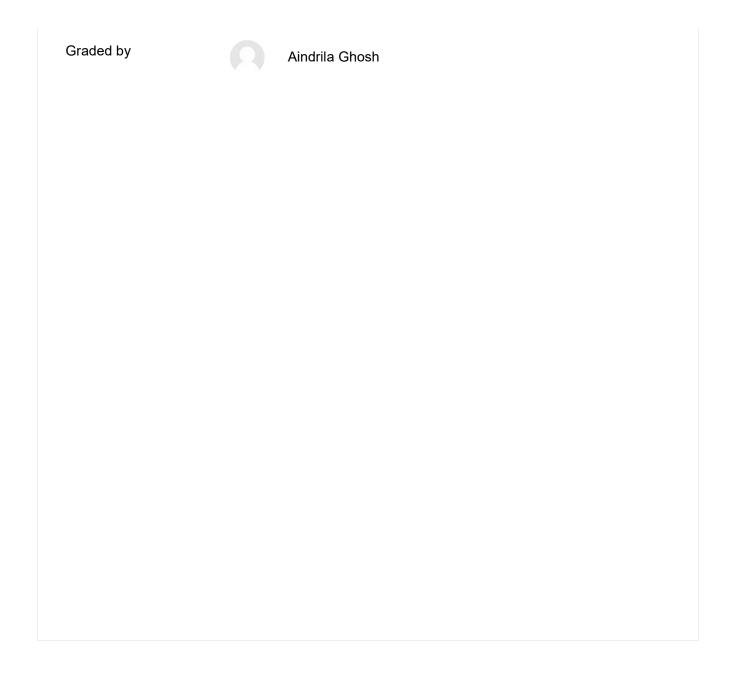
```
1 + (let x = 1) + (let y = 2) + (1 + x * (1 + y)) - (let x = y) - x;
```

	Expression	Stack	Pop & Return	Hŧ
1	1+	1+	/	<ei< td=""></ei<>
2	1 + (let x = 1	let x = 1 1 +	/	<u>x</u>
3	1 + (let x = 1)	1+1	1 (returned from "let x = 1")	x
4	1 + (let x = 1) + (let y = 2) + (1 + x * (1 + y	1 + y 1 + x * 1 + 1 + 2 +	/ ("let y = 2" has already returned 2)	х : У :
5	1 + (let x = 1) + (let y = 2) + (1 + x * (1 + y)	1 + x * 3 1 1 + 1 + 2 +	3 (returned from "1 + y")	x :
6	1 + (let x = 1) + (let y = 2) + (1 + x * (1 + y)) - (let x = y	let x = y 1 + 1 + 2 + 4 -	/ ("1 + x * 3" has already returned 4)	<u>x</u> :
7	1 + (let x = 1) + (let y = 2) + (1 + x * (1 + y)) - (let x = y) - x	1 + 1 + 2 + 4 - 2 - 2	/ ("let x = y" has already returned 2)	x :

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1 1		[I	1		
8 1 + (let x = 1) + (let y	= 2) + (1 + x * (1 + y)) - (let x = y) - x;	<empty></empty>	4	y :		
Calculator.java						
Attempt number This is attempt 1 (1 attempts allowed).						
Submission status	Submitted for grading	Submitted for grading				
Grading status	Graded	Graded				
Due date	Thursday, 4 October 2018, 5:	Thursday, 4 October 2018, 5:00 PM				
Time remaining	Time remaining Assignment was submitted 1 hour 9 mins early					
Last modified	Last modified Thursday, 4 October 2018, 3:50 PM					
File submissions	Calculator.java + Export to portfolio					
Submission comments Comments (0)						
	Edit submission Make changes to your subm	nission				
Feedback						
Grade	Grade 30.00 / 30.00					
Graded on	d on Tuesday, 9 October 2018, 12:23 PM					

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