Java Programming

Assignment

Java OOP

Class : 22CLC-KTPM3

This is an individual assignment.

Submit to Moodle.

Submission file name: **StudentID_SelfEvaluatedPoints.zip**, for example 1912700_05.zip

- The source code files in Java. (7 points)
- The image of class diagram. (3 points)

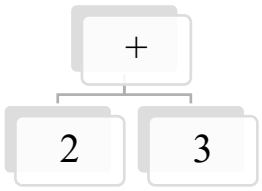
Problem: Arithmetic operations

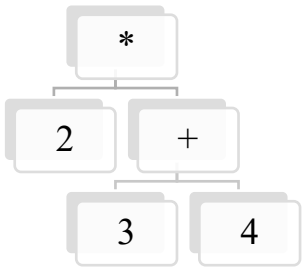
Consider a basic mathematical expression which is a series of real numbers and arithmetic operations (+, -, *, /). A design option to represent this kind of expression is by using a tree.

There are two types of nodes in the expression tree:

- Number node : represents a number which has numerical value.
- Operation node : represent an operation which contains an operation symbol, a left node and a right node, which can be either be number node or operation node.

Write a small program that allows user to input an expression and evaluate it.

Expression	Tree representation	Sample usage code
2 + 3		`OpNode n = new OpNode("+");` `NumNode two = new NumNode(2);` `NumNode three = new NumNode(3);` `n.addLeft(two);` `n.addRight(three);` `double x = n.evaluate();` `// x = 5;`

2 * (3 + 4)		``` OpNode n1 = new OpNode("+"); n1.addLeft(new NumNode(3)); n1.addRight(new NumNode(4)); OpNode n2 = new OpNode("+"); n2.addLeft(new NumNode(2)); n2.addRight(n1); double x = n2.evaluate(); // x = 14 ```