10610CS235101  
Data Structures Homework 1

Due date: 2017/10/31 23:59

Submit to OJ: #11595

Upload code to iLMS

Submission

* Please **1)** submit your code to OJ (OJ: #11595),   
  and **2)** upload the zipped file (source codes) to iLMs.   
  **Both should be done before the due date.**
* Scores will be given based on your OJ results, and the uploaded zipped file (the source codes) should be identical to those submitted to OJ. TAs will examine your uploaded codes.

Description

Please check whether the format of the input parentheses is valid or not, and evaluate the outcome of the expression.

If the format is invalid, you need to revise right parentheses, add new right parentheses, or delete redundant right parentheses based on the left parentheses, and show the correct format and the evaluated value.

Note that the <stack>, <queue>, <vector> and <list> are not allowed.

**Time Limit:** 3 sec

Input

The input is a line of string without any space character. The length of the input (number of characters) is between 1 and 1000000.

Each operand is a digit (0 - 9), and the set of operators are: (){}[]+-\*/.

Note that the 1st character must be “(“, “{“, or “[“.

There are two kinds of input format:

1. Including infix expressions in the input: e.g. (7/[5+1]

2. No infix expression: e.g. {(})

In this case, the input contains only the parentheses, and the evaluated value is defined as 0.

Note

The priority of operators is “left to right “.

三種括號(小括號),[中括號],{大括號}的優先權都視為等價。

**以下是不會出現的case：**

1. 單一括號內必定會是合法的infix expression。

The following cases will never appear: “5(+)3”, “(\*5)”, “(-5)”.

1. 兩數之間必有arithmetic operators作連結。

The following cases will never appear: “(3)(5)”.

(3). 不會有/0的情況

(4). 在運算式中，不會有空括號計算的情況。

The following cases will never appear: “[4+5/()]\*9”, “(()+2)”.

(5). 在運算式中，不會有括號的外側直接連接數字。

The following cases will never appear: “(3\*5)5”, ”3(4/3)”.

若是在運算式之外，則數字可與空括號連結。 E.g. ({}){4+5}\*6{}}

All the things you need to do is to **check the format of parentheses**, and we **guarantee that all the infix expressions are correct in the input**.

Output

There would be 2 cases for the output.

1. If the format of parentheses is **valid**, output the following two lines:

**First line:** True

**Second line:** The evaluated value

1. If the format of parentheses is **invalid**, output the following two lines:

**First line:** True

**Second line:** Transform the expression to the correct form

**Third line:** The evaluated value

Lines are separated with the new line (endl)

The outputted evaluated value (int) will be **Positive** or **Negative** or **0**

Sample Input

{()}

(7/[5+1]

Sample output

True

0

False

(7/[5+1])

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