Data Structure

Homework 1

Deadline: 2020/10/19 Mon. 23:55

(2020/10/13 Tue. - Update 2)

Task 1: (I/O: 35 points, coding style: 5 points)

Please write a program to check if the brackets are balanced. All of the brackets are "(", ")", "[", "]", "{", and "}", and they must be same type to be balanced. Your program has to read till the input row has only -1. The program must be implemented **by stack**, or you will get zero points.

Input	Output
({4}8763)	> Balanced
({857}857)	> Balanced
func()	> Balanced
{starburst[stream)})	> Unbalanced
func({)}	> Unbalanced
(unbalanced}	> Unbalanced

Task 2: (I/O: 35 points, coding style: 5 points)

Please write a program to convert infix expressions to postfix expressions, and calculate the values by prefix or postfix expressions. All of the input data will be fully parenthesized infix expressions, integers are between 0 and 9, and all of the operators include "+", "-", "*", "/", "(", and ")". Your program has to read till the input row has only -1, and round the results to the nearest integer in the end. The program must be implemented **by stack**, or you will get zero points. [In our rule, -0.5≃-1]

Example:

Input	Output
((9*4)+(8/(7+1)))	> 9 4 * 8 7 1 + / + > 37
((4+(((8+7)-6)*3))-(8/2))	> 4 8 7 + 6 - 3 * + 8 2 / - > 27
((3-(8*7))-((6+3)*(8/2)))	> 3 8 7 * - 6 3 + 8 2 / * - > -89

Note: In addition to the note stated above, you should add the functions: "toPostfix()", "calPostfix()".

Put the files below in the folder (folder name: studentID), and compress this folder as **"studentID.zip"**.

1. Two source code files (filename: studentID_1.c, studentID_2.c)
2. One report with your coding environment (OS, IDE, ...), problems you encountered, and references. (filename: studentID.pdf) (10 points)

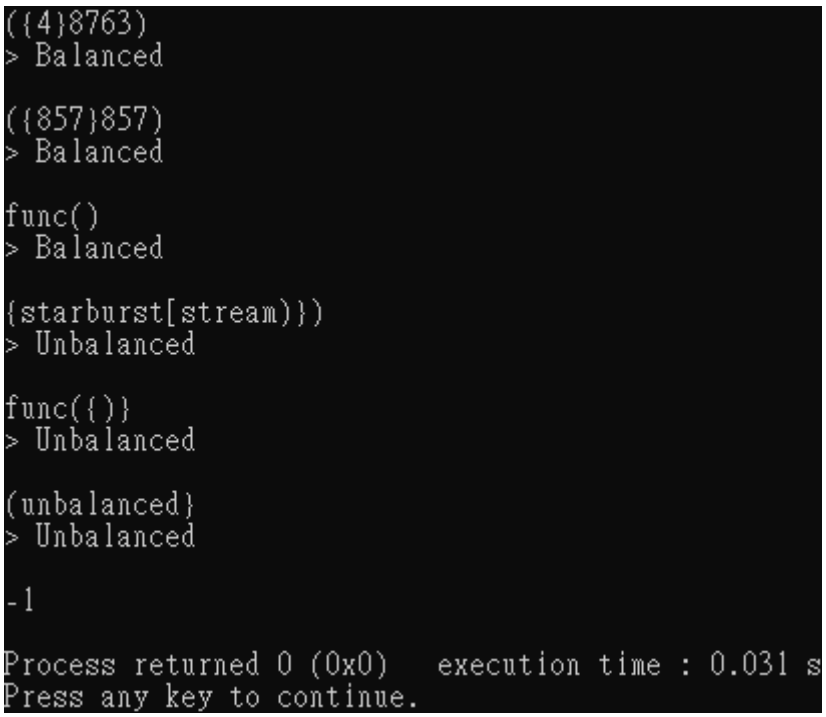
All the file names are correct, or you'll get zero points. (10 points)

You must hand in the assignment on time, or you will get zero points.

Warning: We encourage you to discuss assignments with each other. However, you have the responsibility to finish the assignments individually. **Do not copy others' assignment, or you will get zero points.**

Expected result:

(1)



(2)