CSCI 3400 Homework 3

In this assignment, you will implement a program that checks a list of string expressions given in a text file, if they have balanced parenthesis and brackets using a stack data structure. In a balanced expression, every open parenthesis (or bracket) is matched with a corresponding close parenthesis (or bracket), and they are properly nested. An expression can be long or short, but only three types of parenthesis or brackets will be considered such as "()", "[]", and "{}". The expression may also have some random characters, but they should simply be ignored. For example:

```
{{[a]b}[]([c])}
```

is a perfectly balanced expression, because all parenthesis and brackets are matching. Every opening parenthesis has a corresponding closing parenthesis. For this expression, your program should print a message stating the expression is balanced. Another example could be

```
[]}b[]([])(}[
```

which is a not a balanced expression because not all parentheses are matching. In this case, your program will print a message stating the expression is not balanced.

Your program will read a text file called "input.txt" including a list of expressions (one expression in one line). Some of those expressions have balanced parenthesis, and some do not. Your program should check all expressions in a loop and print the corresponding message for each of them.

In your program, please use the stack library (#include <stack>) provided in C++. You can find details of that library and some example codes at

http://www.cplusplus.com/reference/stack/stack/push/

You will submit one cpp file including your solution. I provide a reference "input.txt" file for you to test your program. But I can test your program with different files including different expressions.

On the top of your source code, please add your name and number, Course ID, HW number and the date using a comment block. Please see the example below,

```
/*YOUR_NAME – YOUR_STUDENT_NUMBER
CSCI 3400, HW3
Date:
*/
```

Please do not copy your code from someone else's program. The instructor may use a code comparison program that automatically checks the similarity between different programs. And do not hesitate to contact me if you are having trouble with the homework. I will be more than happy to help you to solve your problem.