Using the java Stack class, write a main program to solve the following problem:

Given a sequence consisting of parentheses, determine whether the expression is balanced. A sequence of parentheses is balanced if every open parenthesis can be paired uniquely with a closed parenthesis that occurs after the former. Also, the interval between them must be balanced. You will be given three types of parentheses: **(**, **{**, and **[**.

The input of your program will be a string from the keyboard, a mathematical expression, which may contain multiple types of parentheses.

The output of your program will be a set of stack displays (display stack every time when it is used) and a message that indicates if the expression is balanced or not, if not, points out the location where the first mismatch happens.

Sample output

Please enter a mathematical expression:

a/{a+a/[b-a*(c-d)]}

{

{[

{[(

{[

{

The input expression is balanced!

Please enter a mathematical expression:

[2*(2+3]]/6

[

[(

The input expression is not balanced! The first mismatch is found at position 7!