







Rank

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# Stacks: Balanced Brackets





Problem Submissions Leaderboard Discussions Editorial

Check out the resources on the page's right side to learn more about stacks. The video tutorial is by Gayle Laakmann McDowell, author of the best-selling interview book Cracking the Coding Interview.

A bracket is considered to be any one of the following characters: (, ), {,}, [, or ].

Two brackets are considered to be a *matched pair* if the an opening bracket (i.e., (, [, or {) occurs to the left of a closing bracket (i.e., ), ], or }) of the exact same type. There are three types of matched pairs of brackets: [], {}, and ().

A matching pair of brackets is *not balanced* if the set of brackets it encloses are not matched. For example, {[(])} is not balanced because the contents in between { and } are not balanced. The pair of square brackets encloses a single, unbalanced opening bracket, (, and the pair of parentheses encloses a single, unbalanced closing square bracket, ].

By this logic, we say a sequence of brackets is considered to be balanced if the following conditions are met:

- It contains no unmatched brackets.
- The subset of brackets enclosed within the confines of a matched pair of brackets is also a matched pair of brackets.

Given n strings of brackets, determine whether each sequence of brackets is balanced. If a string is balanced, print YES on a new line; otherwise, print NO on a new line.

#### **Input Format**

The first line contains a single integer,  $n_i$  denoting the number of strings. Each line i of the n subsequent lines consists of a single string, s, denoting a sequence of brackets.

## Constraints

- $1 < n < 10^3$
- $1 \le length(s) \le 10^3$ , where length(s) is the length of the sequence.
- Each character in the sequence will be a bracket (i.e., { , } , ( , ) , [ , and ] ).

#### **Output Format**

For each string, print whether or not the string of brackets is balanced on a new line. If the brackets are balanced, print YES; otherwise, print NO.

## Sample Input

```
3
{[()]}
{[(])}
{{[[(())]]}}
```

# Sample Output

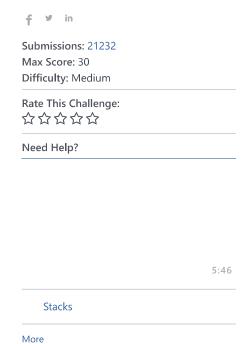
YES NO

YES

YES

#### **Explanation**

- 1. The string {[()]} meets both criteria for being a balanced string, so we print YES on a new line.
- 2. The string {[(])} is not balanced, because the brackets enclosed by the matched pairs [(] and (]) are not balanced. Thus, we print NO on a new line
- 3. The string  $\{\{[[(())]]\}\}$  meets both criteria for being a balanced string, so we print YES on a new line.



```
Current Buffer (saved locally, editable) &
                                                                                     Java 8
    import java.io.*;
 2
     import java.util.*;
 3
    import java.text.*;
 4
    import java.math.*;
 5
    import java.util.regex.*;
 6
 7
    public class Solution {
 8
 9
         public static boolean isBalanced(String expression) {
10
11
         // Must be even
         if ((expression.length() & 1) == 1)
12
13
             return false;
14
         else {
15
         char[] brackets = expression.toCharArray();
16
         Stack<Character> s = new Stack<>();
17
         for (char bracket : brackets)
18
             switch (bracket) {
                 case '{': s.push('}'); break;
19
                 case '(': s.push(')'); break;
case '[': s.push(']'); break;
20
21
22
                 default:
23
                      if (s.empty() || bracket != s.peek())
24
                          return false;
25
                      s.pop();
26
27
         return s.empty();
28
29
30
31
         public static void main(String[] args) {
32
             Scanner in = new Scanner(System.in);
33
             int t = in.nextInt();
             for (int a0 = 0; a0 < t; a0++) {
34
```

Next Challenge

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