LAB 3 CSE 4304  
SWE B

04-05-2021

Part 1:

Test (Full marks: 100)

1. Complete the missing part of the provided code to implement the stack using array. (50)
2. Using your implemented code for stack solve the following problem:

Read a sequence of parenthesis representing an expression. Your task is to verify whether the expression is balanced or not. (50)

Balanced parentheses means that each opening bracket has a corresponding closing bracket and the pairs of parentheses are properly nested.

Example:   
( [ ( { } ) ] ) is a balanced expression.  
( { ( ) ) is not balanced

Algorithm to solve:

* Declare a character stack S.
* Traverse the expression string.
* If the current character is a starting bracket (, [, or { then push it to stack.
* If the current character is a closing bracket ), ], or } then pop from stack.
* If the popped character
  + Matches starting bracket, then continue.
  + Else brackets are not balanced.
* After complete traversal, if there is nothing left in stack then the expression is balanced, otherwise it is not balanced.

Optional task in next page:

Part2:

(Optional task)

Great Vova Wall

Vova's family is building the Great Vova Wall (named by Vova himself). Vova's parents, grandparents, grand-grandparents contributed to it. Now it's totally up to Vova to put the finishing touches.

The current state of the wall can be represented by a sequence a of n integers, with ai being the height of the i-th part of the wall.

Vova can only use 2×1 bricks to put in the wall (he has infinite supply of them, however).

Vova can put bricks **horizontally** on the neighbouring parts of the wall of equal height. It means that if for some i the current height of part i is the same as for part i+1, then Vova can put a brick there and thus increase both heights by 1. Obviously, Vova can't put bricks in such a way that its parts turn out to be off the borders (to the left of part 1 of the wall or to the right of part n of it).

Vova can also put bricks vertically. That means increasing height of any part of the wall by 2.

Vova is a perfectionist, so he considers the wall completed when:

* all parts of the wall has the same height;
* the wall has no empty spaces inside it.

Can Vova complete the wall using any amount of bricks (possibly zero)?

**Input**

The first line contains a single integer n the number of parts in the wall.

The second line contains n integers a1,a2,…,an the initial heights of the parts of the wall.

**Output**Print "YES" if Vova can complete the wall using any number of bricks (possibly zero).  
Print "NO" otherwise.

**Examples:**

**input**

5

2 1 1 2 5

**output**

YES

**input**

3

4 5 3

**output**

YES

**input**

2

10 10

**output**

YES

**input**

3

1 2 3

**output**

NO

**Explanation:**

In the first example:

Vova can put a brick on parts 2 and 3 to make the wall [2,2,2,2,5] and then put 3 bricks on parts 1 and 2 and 3 bricks on parts 3 and 4 to make it [5,5,5,5,5].

In the second example:

Vova can put a brick vertically on part 3 to make the wall [4,5,5] then horizontally on parts 2 and 3 to make it [4,6,6] and then vertically on part 1 to make it [6,6,6].

In the third example the wall is already complete.