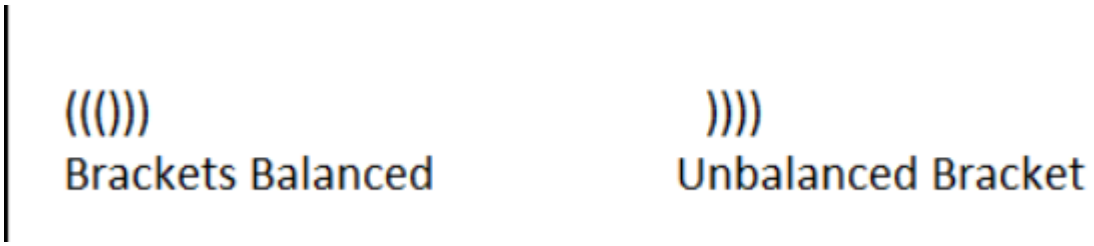
Day-6 Time: 1 hour 30 min.

Question no 1.

For a given string expression containing only round brackets or parentheses, check if they are balanced or not. Brackets are said to be balanced if the bracket which opens last, closes first.



Example:

Expression: (()())

Since all the opening brackets have their corresponding closing brackets, we say it is balanced and hence the output will be, 'true'.

Note:

The input expression will not contain spaces in between

Input Format:

The first and the only line of input contains a string expression without any spaces in between.

Input string will only consists of round brackets.

Output Format:

The only line of output prints 'true' or 'false'.

Constraints:

1 <= N <= 10^7

Where N is the length of the expression.

Sample Input 1 :

(()()())

Sample Output 1 :

true

Sample Input 2 :

()()(()

Sample Output 2 :

false

Explanation to Sample Input 2:

The initial two pairs of brackets are balanced. But when you see, the opening bracket at the fourth index doesn't have its corresponding closing bracket which makes it imbalanced and in turn, making the whole expression imbalanced. Hence the output prints 'false'.

Question no 2.

Amit has been working with an organization called 'Money Traders' for the past few years. The organization is into the money trading business. His manager assigned him a task. For a given array/list of stock's prices for N days, find the stock's span for each day.

The span of the stock's price today is defined as the maximum number of consecutive days(starting from today and going backwards) for which the price of the stock was less than today's price.

For example, if the price of a stock over a period of 7 days are [100, 80, 60, 70, 60, 75, 85], then the stock spans will be [1, 1, 1, 2, 1, 4, 6].

Explanation:

On the sixth day when the price of the stock was 75, the span came out to be 4, because the last 4 prices(including the current price of 75) were less than the current or the sixth day's price.

Similarly, we can deduce the remaining results.

Amit has to return an array/list of spans corresponding to each day's stock's price. Help him to achieve the task.

Input Format:

The first line of input contains an integer N, denoting the total number of days.

The second line of input contains the stock prices of each day. A single space will separate them.

Output Format:

The only line of output will print the span for each day's stock price. A single space will separate them.

Constraints:

0 <= N <= 10^7

1 <= X <= 10^9

Where X denotes the stock's price for a day.

Sample Input 1:

4

10 10 10 10

Sample Output 1:

1 1 1 1

Sample Input 2:

8

60 70 80 100 90 75 80 120

Sample Output 2:

1 2 3 4 1 1 2 8

Question no 3.

Given an array of length N and an integer x, you need to find all the indexes where x is present in the input array. Save all the indexes in the output array (in increasing order).

Do this recursively. Indexing in the array starts from 0.

Hint:

Try making a helper function with the required arguments and call the helper function from the allIndexes function.

Input Format :

Line 1 : An Integer N i.e. size of array

Line 2 : N integers which are elements of the array, separated by spaces

Line 3 : Integer x

Output Format :

Return all the indexes in the output array (in increasing order).

Constraints :

1 <= N <= 10^3

Sample Input :

5

9 8 10 8 8

8

Sample Output :

1 3 4