



# Tweedledee's Split Brackets

Time limit: 2000 ms  
Memory limit: 256 MB

Tweedledee has a bracket sequence  $S$  with round and square brackets.

He begins an exercise with two empty sequences  $S_1$  and  $S_2$ . For each bracket in  $S$ , from left to right, Tweedledee decides to append that bracket to either  $S_1$  or  $S_2$ . He wants  $S_1$  and  $S_2$  to have equal length and both be valid bracket sequences. How can he split  $S$  into  $S_1$  and  $S_2$ ?

A valid bracket sequence is defined as follows:

- $()$  and  $[]$  are valid bracket sequences;
- If  $S$  is a valid bracket sequence, then  $( S )$  and  $[ S ]$  are also valid bracket sequences;
- If  $Q$  and  $R$  are two valid bracket sequences, then the concatenation of them,  $S = QR$ , is also a valid bracket sequence.

## Standard input

The input has a single line consisting of the bracket sequence  $S$ .

## Standard output

For each bracket in  $s$  from left to right, output 1 to append the bracket to  $S_1$ , or 2 to append the bracket to  $S_2$ . Separate the numbers by single spaces. If there are multiple answers, output the lexicographically smallest sequence. If there is no solution to make the split, output the word `impossible`.

## Constraints and notes

- $4 \leq |S| \leq 36$

Input	Output	Explanation
<code>([()])[]</code>	<code>1 1 1 2 1 2 2 2</code>	This answer splits the sequence into <code>([])</code> and <code>()[]</code> . Although <code>1 2 2 1 1 1 2 2</code> is also a valid split, <code>1 1 1 2 1 2 2 2</code> is lexicographically smaller.
<code>([])</code>	<code>1 2 1 2</code>	The only valid answer is to split into one pair of round brackets, and one pair of square brackets.
<code>(([])</code>	<code>impossible</code>	

Input	Output	Explanation
<code>(([]))</code>	<code>impossible</code>	Although it is possible to split the sequence into two valid bracket sequences, their lengths cannot equal.
<code>([[[]][[]]])</code>	<code>1 1 1 2 1 1 2 2 1 2 2 2</code>	