Folding

Time limit: 1.0 second

Bill is trying to compactly represent sequences of capital alphabetic characters from 'A' to 'Z' by folding repeating subsequences inside them. For example, one way to represent a sequence AAAAAAAAABABABCCD is 10(A)2(BA)B2(C)D. He formally defines folded sequences of characters along with the unfolding transformation for them in the following way:

- A sequence that contains a single character from 'A' to 'Z' is considered to be a folded sequence. Unfolding of this sequence produces the same sequence of a single character itself.
- If S and Q are folded sequences, then SQ is also a folded sequence. If S unfolds to S' and Q unfolds to Q', then SQ unfolds to S'Q'.
- If S is a folded sequence, then X(S) is also a folded sequence, where X is a decimal representation of an integer number greater than 1. If S unfolds to S', then X(S) unfolds to S' repeated X times.

According to this definition it is easy to unfold any given folded sequence. However, Bill is much more interested in the reverse transformation. He wants to fold the given sequence in such a way that the resulting folded sequence contains the least possible number of characters.

Input

The input contains a single line of characters from 'A' to 'Z' with at least 1 and at most 100 characters.

Output

Write a single line that contains the shortest possible folded sequence that unfolds to the sequence that is given in the input. If there are many such sequences then write any one of them.

Samples

input	output
AAAAAAAAABABABCCD	9(A)3(AB)CCD
NEERCYESYESYESNEERCYESYESYES	2(NEERC3(YES))