

Counting The Way of Bracket Replacement

[English](#)

[Vietnamese](#)

A regular bracket sequence is a string of characters consisting only of opening and closing brackets, and satisfying the following conditions:

- An empty string is a regular bracket sequence.
- If A is a regular bracket sequence, then (A) , $[A]$ and $\{A\}$ are also regular bracket sequences.
- If A and B are regular bracket sequences, then AB is also a regular bracket sequence.

For example, the sequences $[(\{\})]$, $[\{\}\{\}]$ and $\{\{\}\}\{\}$ are regular, but the sequences $[(\{\{(\{$, $[\{\}\{\}$ and $\{\{\}\}\{\}$ are not.

Ivica has found a string which looks like it could be a regular bracket sequence. Some of the characters have become smudged and illegible, and could have been any character.

Write a program that calculates how many ways the illegible characters in the string can be replaced by brackets so that the result is a regular bracket sequence. This number can be very large, so output only its last 5 digits.

Input

The first line contains an even integer N ($2 \leq N \leq 200$), the length of the string.

The second line contains the string. Illegible characters are represented by the '?' character.

Output

Output the number of regular bracket sequences the string could have read.

Sample

input

6
()())

output

1

input

10
?(?[])??

output

3

input

16

??[??????]???

output

92202

In the second example, the three matching regular bracket sequences are $\{((()())\}$, $()(()[\}\}$ and $([([\}\}\}$.