Problem Shù Yìn

Input file	`stdin`
Output file	`stdout`

这个常数是对数吗?
Zhège chángshù shì duì shù ma?

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Let a **valid tree** be a rooted tree with N nodes distinctly labeled with integers from 1 to N, with node 1 as the root. Two valid trees are considered **distinct** if there exist two nodes u and v such that v is a child of u in one tree but not in the other.

We define the **yìn** of such a tree using the following function:

```
function DFS(v):
begin
    result = "("
    for each child u of v, in increasing order of label:
        result += DFS(u)
    result += ")"
    return result
end
```

The **yìn** of the tree is the string returned by `DFS(1)`.

Given a **yìn**, determine the number of **distinct valid trees** with N nodes that produce this **yìn**, modulo $10^9 + 7$.

Input

The first line contains a valid yìn of length $2 \cdot N$, consisting only of the characters '(' and ')'.

Output

Print a single integer: the number of **distinct valid trees** with N nodes (where $2 \cdot N$ is the length of the given yìn) that produce this yìn, modulo $10^9 + 7$.

Restrictions

- $1 \leq N \leq 10^6$
- It is guaranteed that there exists at least one valid tree that produces this yìn.

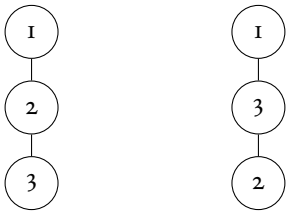
#	Points	Restrictions
1	20	$N \leq 8$
2	20	The yìn does not contain the substring ") (".
3	10	Every '(' other than the first character of the yìn is immediately followed by ')'.
4	15	$N \leq 10^3$
5	15	$N \leq 10^5$
6	20	$N \leq 10^6$

Examples

Input file	Output file
((()))	2
(()(()))	3

Explanations

Example 1. The 2 valid labelings are shown below.



Example 2. The 3 valid labelings are shown below.