

## C. Famil Door and Brackets

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

As Famil Door's birthday is coming, some of his friends (like Gabi) decided to buy a present for him. His friends are going to buy a string consisted of round brackets since Famil Door loves string of brackets of length  $n$  more than any other strings!

The sequence of round brackets is called *valid* if and only if:

1. the total number of opening brackets is equal to the total number of closing brackets;
2. for any prefix of the sequence, the number of opening brackets is greater or equal than the number of closing brackets.

Gabi bought a string  $s$  of length  $m$  ( $m \leq n$ ) and want to complete it to obtain a valid sequence of brackets of length  $n$ . He is going to pick some strings  $p$  and  $q$  consisting of round brackets and merge them in a string  $p + s + q$ , that is add the string  $p$  at the beginning of the string  $s$  and string  $q$  at the end of the string  $s$ .

Now he wonders, how many **pairs** of strings  $p$  and  $q$  exists, such that the string  $p + s + q$  is a valid sequence of round brackets. As this number may be pretty large, he wants to calculate it modulo  $10^9 + 7$ .

### Input

First line contains  $n$  and  $m$  ( $1 \leq m \leq n \leq 100\,000$ ,  $n - m \leq 2000$ ) — the desired length of the string and the length of the string bought by Gabi, respectively.

The second line contains string  $s$  of length  $m$  consisting of characters '(' and ')' only.

### Output

Print the number of pairs of string  $p$  and  $q$  such that  $p + s + q$  is a valid sequence of round brackets modulo  $10^9 + 7$ .

### Examples

<b>input</b>
4 1 (
<b>output</b>
4
<b>input</b>
4 4 (())
<b>output</b>
1
<b>input</b>
4 3 (( (
<b>output</b>
0

### Note

In the first sample there are four different valid pairs:

1.  $p = "(, q = ")"$
2.  $p = "(), q = ")"$
3.  $p = "", q = "()"$
4.  $p = "", q = ")()"$

In the second sample the only way to obtain a desired string is choose empty  $p$  and  $q$ .

In the third sample there is no way to get a valid sequence of brackets.