

C. Serval and Parenthesis Sequence

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Serval soon said goodbye to Japari kindergarten, and began his life in Japari Primary School.

In his favorite math class, the teacher taught him the following interesting definitions.

A *parenthesis sequence* is a string, containing only characters "(" and ")"

A *correct parenthesis sequence* is a parenthesis sequence that can be transformed into a correct arithmetic expression by inserting characters "1" and "+" between the original characters of the sequence. For example, parenthesis sequences "()"(), "(())" are correct (the resulting expressions are "(1+1)+(1+1)", "((1+1)+1)"), while ")((" and ")))" are not. Note that the empty string is a correct parenthesis sequence by definition.

We define that  $|s|$  as the length of string  $s$ . A *strict prefix*  $s[1..l]$  ( $1 \leq l < |s|$ ) of a string  $s = s_1s_2 \dots s_{|s|}$  is string  $s_1s_2 \dots s_l$ . Note that the empty string and the whole string are not strict prefixes of any string by the definition.

Having learned these definitions, he comes up with a new problem. He writes down a string  $s$  containing only characters "(", ")", and "?". And what he is going to do, is to replace each of the "?" in  $s$  independently by one of "(" and ")" to make all strict prefixes of the new sequence not a correct parenthesis sequence, while the new sequence should be a correct parenthesis sequence.

After all, he is just a primary school student so this problem is too hard for him to solve. As his best friend, can you help him to replace the question marks? If there are many solutions, any of them is acceptable.

**Input**

The first line contains a single integer  $|s|$  ( $1 \leq |s| \leq 3 \cdot 10^5$ ), the length of the string.

The second line contains a string  $s$ , containing only "(", ")", and "?".

**Output**

A single line contains a string representing the answer.

If there are many solutions, any of them is acceptable.

If there is no answer, print a single line containing ": (" (without the quotes).

Examples

input

Copy

6  
(????

output

Copy

((())

input

Copy

10  
???(? ?(?

output

Copy

: (

**Note**

It can be proved that there is no solution for the second sample, so print ": (".

Codeforces Round #551 (Div. 2)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++11 5.1.0

Choose file: 

选择文件

 未选择任何文件

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

Submit

→ Last submissions

Submission	Time	Verdict
<a href="#">52735048</a>	Apr/14/2019 09:08	Accepted
<a href="#">52734943</a>	Apr/14/2019 09:04	Accepted
<a href="#">52734888</a>	Apr/14/2019 09:03	Wrong answer on test 31
<a href="#">52711328</a>	Apr/13/2019 18:52	Wrong answer on pretest 5
<a href="#">52698483</a>	Apr/13/2019 17:51	Wrong answer on pretest 6
<a href="#">52696756</a>	Apr/13/2019 17:44	Wrong answer on pretest 4



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[→ Problem tags](#)[greedy](#) [strings](#) [\\*1600](#)

No tag edit access

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- Announcement (en) 
- Tutorial (en) 

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