

Hello, **2024101067**.

Make Valid Bracket Sequence

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C

You are given a bracket sequence consisting solely of the characters '(' and ')'. Remove the minimum number of brackets so that the remaining sequence is valid (i.e., all brackets are properly balanced and nested). Each opening bracket must be paired with the first available closing bracket (from left to right) that can form a valid match. Output the length of the resulting valid sequence followed by the valid sequence itself. The solution is unique.

Input

- An integer **n** representing the length of the bracket sequence.
- A string of **n** characters, each being either '(' or ')'.

Output

- On the first line, print an integer denoting the length of the valid bracket sequence after the removals.
- On the second line, print the valid bracket sequence.

Constraints

- $1 \leq n \leq 1 * 10^6$

Example 1

Input:

```
8
())(())
```

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Hello, **2024101067**.

```
6
()(())
```

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Example 2

Input:

```
6
((())())
```

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Output:

```
6
((())())
```

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? Clarifications

[Request clarification](#)

No clarifications have been made at this time.