Minimum cost of a correct parenthesization (1) P76915_en

Examen parcial d'Algorísmia, FME (2014-11-14)

Given a word made up of only opening and closing parentheses, we must make it a correct parenthesization. The only allowed operation is turning each parenthesis, that is, changing its orientation. What is the minimum number of turns needed?

For example, if the word is "`)(()(((`", then we can achieve the correct parenthesization "`((())())`" just turning three parentheses, and we cannot do better.

Input

Input consists of several cases, each with a word with n opening or closing parentheses. You can assume that n is even and between 2 and 100.

Output

For every case, print the minimum cost of a correct parenthesization.

Hint

Although there are more efficient solutions, a dynamic programming with time cost $\Theta\left(n^3\right)$ and space cost $\Theta\left(n^2\right)$ should be enough.

Sample input

```
()
()()
(()(
))))
))((
)(
)(()((()
```

Sample output

```
0
0
1
2
2
2
3
```

Problem information

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