

Contest Duration: 2021-04-17(Sat) 12:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20210417T1610&p1=248>) - 2021-04-17(Sat) 14:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20210417T1810&p1=248>) (local time) (120 minutes)

iso=20210417T1610&p1=248) - 2021-04-17(Sat) 14:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20210417T1810&p1=248>) (local time) (120 minutes)

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## E - Level K Palindrome



Time Limit: 2 sec / Memory Limit: 1024 MB

Score : 500 points

### Problem Statement

As a token of his gratitude, Takahashi has decided to give Snuke a level- $K$  palindrome. A level- $L$  palindrome, where  $L$  is a non-negative integer, is defined as follows:

- Let  $\text{rev}(s)$  denote the reversal of a string  $s$ .
- A string  $s$  is said to be a palindrome when  $s = \text{rev}(s)$ .
- The empty string and a string that is not a palindrome are level-0 palindromes.
- For any **non-empty** level- $(L - 1)$  palindrome  $t$ , the concatenation of  $t$ ,  $\text{rev}(t)$  in this order is a level- $L$  palindrome.
- For any level- $(L - 1)$  palindrome  $t$  and any character  $c$ , the concatenation of  $t$ ,  $c$ ,  $\text{rev}(t)$  in this order is a level- $L$  palindrome.

Now, Takahashi has a string  $S$ . Determine whether it is possible to make  $S$  an exactly level- $K$  palindrome by doing the following action zero or more times: choose a character in  $S$  and change it to another lowercase English letter. If it is possible, find the minimum number of changes needed to make  $S$  a level- $K$  palindrome.

### Constraints

- $K$  is an integer.
- $0 \leq K \leq 5 \times 10^5$
- $S$  consists of lowercase English letters.
- $1 \leq |S| \leq 5 \times 10^5$

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## Input

Input is given from Standard Input in the following format:

$K$   
 $S$

## Output

If it is possible to get an exactly level- $K$  palindrome, print the minimum number of changes needed. If it is impossible, print `impossible`.

### Sample Input 1

[Copy](#)

4  
aabaaaabaa

[Copy](#)

### Sample Output 1

[Copy](#)

0

[Copy](#)

We can find the level of aabaaaabaa as follows:

- the empty string is a level-0 palindrome;
- a is a concatenation of (empty string), a, (empty string) in this order, so it is a level-1 palindrome;
- aa is a concatenation of a, a in this order, so it is a level-2 palindrome;
- aabaa is a concatenation of aa, b, aa in this order, so it is a level-3 palindrome;
- aabaaaabaa is a concatenation of aabaa, aabaa in this order, so it is a level-4 palindrome.

Thus, aabaaaabaa is already a level-4 palindrome and needs no changes.

### Sample Input 2

[Copy](#)

2  
aabaaaabaa

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### Sample Output 2

[Copy](#)

4

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We can, for example, change aabaaaabaa to acbcaacbca to get a level-2 palindrome.

Note that aabaaaabaa is not a level-2 palindrome.

Sample Input 3

Copy

3  
aabaaaabaa

Copy

Sample Output 3

Copy

impossible

Copy

Sample Input 4

Copy

5  
aabaaaabaa

Copy

Sample Output 4

Copy

impossible

Copy

Sample Input 5

Copy

2  
acaabcbababaaac

Copy

Sample Output 5

Copy

6

Copy

Language

Python (3.8.2)

Source Code

1

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\* at most 512 KiB

\* Your source code will be saved as `Main.extension`.



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