

Problem F. Bad Word

Input file: *standard input*
Output file: *standard output*
Time limit: 1 second
Memory limit: 256 mebibytes

Marichka has seen bad word while surfing the net! She immediately starts crying and asks Zenyk to destroy it.

Zenyk knows that Marichka saw word S which consists of lower case english characters. Zenyk can delete any substring $S_l S_{l+1} S_{l+2} \dots S_r$ of this word in one minute. But he knows that Marichka is keen on palindromes so if this substring is palindrome, Marichka will resent. Zenyk decided that he wouldn't delete such substrings. Now Zenyk wants to know minimum time to destroy bad word or if it is impossible.

Palindrome is such string that reads the same backward as forward. For example, strings "bob", "abba", "aaaa" are palindromes and "cat", "dog", "penguin" are not.

Input

First line contains one integer N – length of the word S ($1 \leq N \leq 10^5$). Second line contains word S which consists of lower case english characters.

Output

Print minimum number of minutes to destroy bad word or -1 if it is impossible.

Examples

standard input	standard output
7 abcdcba	2
3 xxx	-1

Note

In the first case Zenyk can delete substring "bcd" during the first minute. Remaining word equals "acba" and can be deleted during the second minute.