Radio Transmission

A radio station needs to transmit a message to several recipients. To ensure all listeners get it, the message is played again and again in a continuous loop.

You're given a sequence of characters received by one of the recipients. It is known the sequence is at least as long as the message.

Your task is to write a program that extracts the message transmitted by the station. More formally, your program needs to find the shortest subsequence S' of the input sequence S such that S in turn is a subsequence of the (sufficiently long) repetition $S' + S' + \cdots + S'$.

Input

The input is read from standard input. The first line contains a single integer L, the length of the sequence S. The second line contains exactly L characters, the sequence S itself. The sequence consists of lowercase letters (a ... z).

Output

The program should write one line to standard output containing a single integer: the length L' of the message S'. Note that L' must be the smallest possible.

Example

Input	Output
8	3
cabcabca	

The message could be abc, cab or abcabc, but there's no possible message shorter than 3 characters.

Constraints

$1 < L \leq 1{,}000{,}000$.

Note that the string matching routines in the available standard libraries (strstr in C, string::find in C++, or pos in Pascal) consume time $\Theta(nm)$ in the worst case, when searching for a substring of length n in a string of length m.