

D. The Next Good String

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

In problems on strings one often has to find a string with some particular properties. The problem authors were reluctant to waste time on thinking of a name for some string so they called it *good*. A string is good if it doesn't have palindrome substrings longer than or equal to d .

You are given string s , consisting only of lowercase English letters. Find a good string t with length $|s|$, consisting of lowercase English letters, which is lexicographically larger than s . Of all such strings string t must be lexicographically minimum.

We will call a non-empty string $s[a \dots b] = s_a s_{a+1} \dots s_b$ ($1 \leq a \leq b \leq |s|$) a *substring* of string $s = s_1 s_2 \dots s_{|s|}$.

A non-empty string $s = s_1 s_2 \dots s_n$ is called a *palindrome* if for all i from 1 to n the following fulfills: $s_i = s_{n-i+1}$. In other words, palindrome read the same in both directions.

String $x = x_1 x_2 \dots x_{|x|}$ is *lexicographically larger* than string $y = y_1 y_2 \dots y_{|y|}$, if either $|x| > |y|$ and $x_1 = y_1, x_2 = y_2, \dots, x_{|y|} = y_{|y|}$, or there exists such number r ($r < |x|, r < |y|$), that $x_1 = y_1, x_2 = y_2, \dots, x_r = y_r$ and $x_{r+1} > y_{r+1}$. Characters in such strings are compared like their ASCII codes.

Input

The first line contains integer d ($1 \leq d \leq |s|$).

The second line contains a non-empty string s , its length is no more than $4 \cdot 10^5$ characters. The string consists of lowercase English letters.

Output

Print the good string that lexicographically follows s , has the same length and consists of only lowercase English letters. If such string does not exist, print "Impossible" (without the quotes).

Examples

input
3 aaaaaaa
output
aabbcaa

input
3 zzyzzzz
output
Impossible

input
4 abbabbbabbb
output
abbbcaaabab