

D. String

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

You are given a string s . Each pair of numbers l and r that fulfill the condition $1 \leq l \leq r \leq |s|$, correspond to a substring of the string s , starting in the position l and ending in the position r (inclusive).

Let's define the function of two strings $F(x, y)$ like this. We'll find a list of such pairs of numbers for which the corresponding substrings of string x are equal to string y . Let's sort this list of pairs according to the pair's first number's increasing. The value of function $F(x, y)$ equals the number of non-empty continuous sequences in the list.

For example: $F(babbabbababbab, babb) = 6$. The list of pairs is as follows:

$(1, 4), (4, 7), (9, 12)$

Its continuous sequences are:

- $(1, 4)$
- $(4, 7)$
- $(9, 12)$
- $(1, 4), (4, 7)$
- $(4, 7), (9, 12)$
- $(1, 4), (4, 7), (9, 12)$

Your task is to calculate for the given string s the sum $F(s, x)$ for all x , that x belongs to the set of all substrings of a string s .

Input

The only line contains the given string s , consisting only of small Latin letters ($1 \leq |s| \leq 10^5$).

Output

Print the single number — the sought sum.

Please do not use the `%lld` specifier to read or write 64-bit integers in C++. It is preferred to use the `cin`, `cout` streams or the `%I64d` specifier.

Examples

| | |
|--------|------|
| input | Copy |
| aaaa | |
| output | Copy |
| 20 | |

| | |
|--------|------|
| input | Copy |
| abcdef | |
| output | Copy |

21

input

Copy

abacabadabacaba

output

Copy

188

Note

In the first sample the function values at x equal to "a", "aa", "aaa" and "aaaa" equal 10, 6, 3 and 1 correspondingly.

In the second sample for any satisfying x the function value is 1.