# 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 $1 \le l \le r \le |s|$, 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 ($1 \le |s| \le 10^5$).

## Output

Print the single number — the sought sum.

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

### Examples

| input |
| --- |
| aaaa |
| **output** |
| 20 |

| input |
| --- |
| abcdef |
| **output** |
| 21 |

| input |
| --- |
| abacabadabacaba |
| **output** |

```
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.