Problem D. Distinct Substrings

Time limit: 3 seconds
Memory limit: 512 megabytes

Diana bought a Long Random String Generator on some weird website. She planned to generate a long string s of length n and then use its contiguous substrings as passwords for other weird websites.

Soon she discovered that the generated string s of length n was not random at all, but rather a string p of length k repeated many times and then cut to length n. Thus, $s[i] = p[i \bmod k]$ for all i from 0 to $n - 1$.

Diana wonders how many different passwords she can get from the generated string. Help her find the number of distinct non-empty substrings in string s.

Input

The first line of the input contains a string p consisting of k lowercase English letters ($1 \le k \le 1000$).

The second line contains an integer n ($k \le n \le 10^9$).

Output

Output the number of distinct non-empty substrings in s.

Examples

standard input	standard output
abba 7	20
a 42	42

Note

In the first example, the generated string is `abbaabb`. It contains 20 distinct non-empty substrings: `a`, `b`, `aa`, `ab`, `ba`, `bb`, `aab`, `abb`, `baa`, `bba`, `aabb`, `abba`, `baab`, `bbaa`, `abbaa`, `baabb`, `bbaab`, `abbaab`, `bbaabb`, `abbaabb`.