

G3. Good Substrings

time limit per test: 4 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Smart Beaver recently got interested in a new word game. The point is as follows: count the number of distinct good substrings of some string s . To determine if a string is good or not the game uses rules.

Overall there are n rules. Each rule is described by a group of three (p, l, r) , where p is a string and l and r ($l \leq r$) are integers. We'll say that string t complies with rule (p, l, r) , if the number of occurrences of string t in string p lies between l and r , inclusive. For example, string "ab", complies with rules ("ab", 1, 2) and ("aab", 0, 1), but does not comply with rules ("cd", 1, 2) and ("abab", 0, 1).

A *substring* $s[l... r]$ ($1 \leq l \leq r \leq |s|$) of string $s = s_1s_2... s_{|s|}$ ($|s|$ is a length of s) is string $s_ls_{l+1}... s_r$.

Consider a *number of occurrences* of string t in string p as a number of pairs of integers l, r ($1 \leq l \leq r \leq |p|$) such that $p[l... r] = t$.

We'll say that string t is good if it complies with all n rules. Smart Beaver asks you to help him to write a program that can calculate the number of distinct good substrings of string s . Two substrings $s[x... y]$ and $s[z... w]$ are considered to be distinct iff $s[x... y] \neq s[z... w]$.

Input

The first line contains string s . The second line contains integer n . Next n lines contain the rules, one per line. Each of these lines contains a string and two integers p_i, l_i, r_i , separated by single spaces ($0 \leq l_i \leq r_i \leq |p_i|$). It is guaranteed that all the given strings are non-empty and only contain lowercase English letters.

The input limits for scoring 30 points are (subproblem G1):

- $0 \leq n \leq 10$.
- The length of string s and the maximum length of string p is ≤ 200 .

The input limits for scoring 70 points are (subproblems G1+G2):

- $0 \leq n \leq 10$.
- The length of string s and the maximum length of string p is ≤ 2000 .

The input limits for scoring 100 points are (subproblems G1+G2+G3):

- $0 \leq n \leq 10$.
- The length of string s and the maximum length of string p is ≤ 50000 .

Output

Print a single integer — the number of good substrings of string s .

Examples

input
aaab 2 aa 0 0 aab 1 1
output
3

input

<pre> lntlnen 3 n 0 0 ttlneenl 1 4 lelllt 1 1 </pre>
output
2

input
<pre> a 0 </pre>
output
1

Note

There are three good substrings in the first sample test: «aab», «ab» and «b».

In the second test only substrings «e» and «t» are good.