

## G2. 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  $\leq 200$ .

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  $\leq 2000$ .

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  $\leq 50000$ .

### 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
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<pre> 1tntlnen 3 n 0 0 ttlneenl 1 4 lelllt 1 1 </pre>
<b>output</b>
2

<b>input</b>
<pre> a 0 </pre>
<b>output</b>
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.