D. Distinct Characters Queries

You are given a string s consisting of lowercase Latin letters and q queries for this string.

Recall that the substring $s[l; r]$ of the string is the string $s_l s_{l+1} \ldots s_r$. For example, the substrings of `"codeforces"` are `"code"`, `"force"`, `"f"`, `"for"`, but not `"coder"` and `"top"`.

There are two types of queries:

- $1\ pos\ c$ ($1 \le pos \le |s|$, c is lowercase Latin letter): replace s_{pos} with ($set\ s_{pos} := c$);
- $2\ l\ r$ ($1 \le l \le r \le |s|$) : calculate the number of distinct characters in the substring $s[l; r]$.

Input

The first line of the input contains one string s consisting of no more than 10^5 lowercase Latin letters.

The second line of the input contains one integer q ($1 \le q \le 10^5$)— the number of queries.

The next q lines contain queries, one per line. Each query is given in the format described in the problem statement. It is guaranteed that there is at least one query of the second type.

Output

For each query of the second type print the answer for it — the number of distinct characters in the required substring in this query.

Examples

input	input
abacaba	dfcbbcfeeedbaea
5	15
2 1 4	1 6 e
1 4 b	2 6 14
1 5 b	1 7 b
2 4 6	1 12 c
2 1 7	2 6 8
	2 1 6
output	1 7 c
3	1 2 f
1	1 10 a
2	2 7 9
	1 10 a
	1 14 b
	1 1 f
	2 1 11
	output
	5
	2
	5
	2
	6