Problem E
Even Substrings
Time Limit: 7 seconds



Image from theconversation.com

You are given a string $s[1..n]$ consisting of the first 6 lowercase English letters between `a` and `f`. A substring is called *even* if every distinct letter in it appears an even number of times. For example, in `abbacac` there are 4 even substrings: `abba`, `bb`, `acac`, `bbacac`. If a same substring appears at different locations, they shall be counted multiple times, e.g. the string `aaa` has 2 even substrings `aa`.

You are to process q queries of the following two types:

1. Given a range specified by two integers l and r, count the number of even substrings in $s[l..r]$, the substring of s starting at $s[l]$ and ending at $s[r]$ (both ends are inclusive).
2. Given an index i and a letter x between `a` and `f`, change $s[i]$ to x.

Input

The first line of input has a single string $s[1..n]$ ($1 \le n \le 2 \cdot 10^5$) consisting of letters between `a` and `f`.

The second line of input has a single integer q ($1 \le q \le 2 \cdot 10^5$), the number of queries. Each of the next q lines gives one query:

- Type 1 query has $1\ l\ r$ ($1 \le l \le r \le n$).
- Type 2 query has $2\ i\ x$ ($1 \le i \le n$), where x is a letter between `a` and `f`.

There is at least one query of type 1.

Output

For each type 1 query output the number of even substrings on a single line.

Sample Input 1	Sample Output 1
abbacac 8 1 1 7 2 5 a 1 4 6 1 1 7 2 6 b 1 2 6 1 5 7 1 1 1	4 2 6 4 0 0