D. Picking Strings

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Alice has a string consisting of characters 'A', 'B' and 'C'. Bob can use the following transitions on any substring of our string in any order any number of times:

- A BC
- B AC
- C AB
- AAA empty string

Note that a substring is one or more consecutive characters. For given queries, determine whether it is possible to obtain the target string from source.

Input

The first line contains a string S ($1 \le |S| \le 10^5$). The second line contains a string T ($1 \le |T| \le 10^5$), each of these strings consists only of uppercase English letters 'A', 'B' and 'C'.

The third line contains the number of queries Q ($1 \le Q \le 10^5$).

The following Q lines describe queries. The i-th of these lines contains four space separated integers a_i, b_i, c_i, d_i. These represent the i-th query: is it possible to create $T[c_i..d_i]$ from $S[a_i..b_i]$ by applying the above transitions finite amount of times?

Here, $U[x..y]$ is a substring of U that begins at index x (indexed from 1) and ends at index y. In particular, $U[1..|U|]$ is the whole string U.

It is guaranteed that $1 \le a \le b \le |S|$ and $1 \le c \le d \le |T|$.

Output

Print a string of Q characters, where the i-th character is '1' if the answer to the i-th query is positive, and '0' otherwise.

Example

input
AABCCBAAB ABCB 5 1 3 1 2 2 2 2 4 7 9 1 1 3 4 2 3 4 5 1 3
output
10011

Note

In the first query we can achieve the result, for instance, by using transitions .

The third query asks for changing AAB to A — but in this case we are not able to get rid of the character 'B'.