Problem C. Play a game

Time limit: 2s
Color of balloons: dark green

Andy and Andrew are very smart guys and they like to play all kinds of games in their spare time. The most amazing thing is that they always find the best strategy, and that's why they feel bored again and again. They just invented a new game, as they usually did.

At the beginning of the game, they write down one string $S = s_1 s_2 s_3 \dots s_k$, and then they take turns(Andy first) to either:

- 1. Erase the leftmost character from S, that is, $S = s_2 s_3 s_4 \dots s_k$.
- 2. Erase the rightmost character from S, that is, $S = s_1 s_2 s_3 \dots s_{k-1}$.

Whenever S is empty or $S \in A$ (A is a given list of strings), the player which plays next loses the game.

For example, let $S = dzxx$ and $A = \{z, dz\}$. If Andy erases 'x' then Andrew can erase another 'x', because $S = dz$ and dz is in A, Andy, the next player, loses. Otherwise, Andy erases 'd', and then Andrew can erase 'z' result in a losing position for Andy.

You are given a string $T = t_1 t_2 t_3 \dots t_n$ and a list of string $A = \{a_1, a_2, \dots, a_m\}$. Your task is to find who is the winner if S is some substring of T. Andy and Andrew play so many times so you need to answer multiple queries.

Input

The first line contains an integer t indicating the total number of test cases. The following lines describe a test case.

The first line of each case contains three integers n, m, q, the length of T, the size of A, and the number of queries. The second line contains a string, representing T. Next m lines, each line consists of a string, representing a_i. Next q lines, each line consists of two integers l, r, representing a query that you should output who is the winner if $S = t_l t_{l+1} \dots t_r$.

- $1 \le t \le 21$
- $1 \le n, q \le 40000$
- $1 \le m \le 10000$
- $1 \le \sum_{i=1}^{m} |a_i| \le 10000$
- $1 \le l \le r \le n$
- T and strings in A consist of lowercase English letters.
- There are at most 6 test cases with $n > 5000$.

Output

For each query, if Andy wins, print "1" (without the quotes) on a single line, otherwise print "0" (without the quotes) on a single line.

Sample

standard input	standard output
1 10 4 10 zzzabcdzxx a z dz abcd 1 3 1 4 3 6 3 7 3 8 3 9 4 4 4 5 5 5 7 10	0 1 1 1 0 1 0 1 1 0