# Problem B. Bitsets

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|---|---|
| Input file: | *standard input* |
| Output file: | *standard output* |
| Time limit: | 3 seconds |
| Memory limit: | 512 mebibytes |

Let us consider the following operations on bitsets of size $m$:

- $c = a$ and $b$. Here, $c_i = 1$ if both $a_i$ and $b_i$ are equal to 1. Otherwise, $c_i = 0$.
- $c = a$ or $b$. Here, $c_i = 1$ if either $a_i$ or $b_i$ is equal to 1. Otherwise, $c_i = 0$.
- $c = a$ xor $b$. Here, $c_i = 1$ if exactly one of $a_i$ and $b_i$ is equal to 1. Otherwise, $c_i = 0$.
- $c =$ not $a$. Here, $c_i = 1$ if $a_i$ is equal to 0. Otherwise, $c_i = 0$.

You are given an array of bitsets $s_1, s_2, \ldots, s_n$. Write a program that can answer $k$ queries of the following form:

1. Take two integers $\ell$ and $r$.
2. Find bitset $t$ using the formula: $t = (s_\ell$ and $s_{\ell+1}$ and $\ldots$ and $s_r)$ xor (not ($s_\ell$ or $s_{\ell+1}$ or $\ldots$ or $s_r$)).
3. Count the number of ones in bitset $t$: it is the answer.

## Input

The first line contains two integers $n$ and $m$ ($1 \le n, m \le 10^5$; $n \cdot m \le 10^6$). The following $n$ lines describe the $n$ bitsets, where each line consists of $m$ characters 0 and 1 representing the bits of that bitset.

The next line of the input contains a single integer $k$ ($1 \le k \le 2 \cdot 10^7$), which denotes the number of queries. The following line contains three integers $x$, $y$, and $z$ ($1 \le x, y, z \le 10^9$).

The queries are generated using pseudo-random numbers, with input parameters $x$, $y$, and $z$, and a sequence $q_1, q_2, \ldots, q_{k-1}$ of answers to the queries. Define two sequences $a$ and $b$ as follows:

- $a_1 = 1$.
- $b_1 = n$.
- For $i > 1$, $a_i = (a_{i-1} \cdot x + q_{i-1} \cdot y + z) \bmod n + 1$.
- For $i > 1$, $b_i = (b_{i-1} \cdot y + q_{i-1} \cdot z + x) \bmod n + 1$.

For each query $i$, the parameters $\ell$ and $r$ are defined as $\ell = \min(a_i, b_i)$ and $r = \max(a_i, b_i)$.

## Output

Output a single integer: the sum of the answers for all queries.

## Example

| standard input | standard output | explanation |
|---|---|---|
| 4 10<br>1010110101<br>0101111001<br>1101101101<br>1011010000<br>4<br>10 5 4 | 9 | The queries are listed below:<br># $\ell$ $r$ answer<br>1 1 4 1<br>2 3 4 3<br>3 2 4 2<br>4 1 3 3 |