# E. Alphabet Permutations

time limit per test: 1 second
memory limit per test: 512 megabytes
input: standard input
output: standard output

You are given a string $s$ of length $n$, consisting of first $k$ lowercase English letters.

We define a *c-repeat* of some string $q$ as a string, consisting of $c$ copies of the string $q$. For example, string "acbacbacbacb" is a $4$-repeat of the string "acb".

Let's say that string $a$ contains string $b$ as a subsequence, if string $b$ can be obtained from $a$ by erasing some symbols.

Let $p$ be a string that represents some permutation of the first $k$ lowercase English letters. We define function $d(p)$ as the smallest integer such that a $d(p)$-repeat of the string $p$ contains string $s$ as a subsequence.

There are $m$ operations of one of two types that can be applied to string $s$:

1. Replace all characters at positions from $l_i$ to $r_i$ by a character $c_i$.
2. For the given $p$, that is a permutation of first $k$ lowercase English letters, find the value of function $d(p)$.

All operations are performed sequentially, in the order they appear in the input. Your task is to determine the values of function $d(p)$ for all operations of the second type.

## Input

The first line contains three positive integers $n$, $m$ and $k$ ($1 \le n \le 200\,000$, $1 \le m \le 20000$, $1 \le k \le 10$) — the length of the string $s$, the number of operations and the size of the alphabet respectively. The second line contains the string $s$ itself.

Each of the following lines $m$ contains a description of some operation:

1. Operation of the first type starts with $1$ followed by a triple $l_i$, $r_i$ and $c_i$, that denotes replacement of all characters at positions from $l_i$ to $r_i$ by character $c_i$ ($1 \le l_i \le r_i \le n$, $c_i$ is one of the first $k$ lowercase English letters).
2. Operation of the second type starts with $2$ followed by a permutation of the first $k$ lowercase English letters.

## Output

For each query of the second type the value of function $d(p)$.

### Examples

| input |
| --- |
| 7 4 3<br>abacaba<br>1 3 5 b<br>2 abc<br>1 4 4 c<br>2 cba |

| output |
| --- |
| 6<br>5 |

## Note

After the first operation the string $s$ will be abbbbba.

In the second operation the answer is $6$-repeat of abc: ABcaBcaBcaBcaBcAbc.

After the third operation the string $s$ will be abbcbba.

In the fourth operation the answer is $5$-repeat of `cba`: `cbAcBacBaCBacBA`.

Uppercase letters means the occurrences of symbols from the string $s$.