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 Copy

```
7 4 3
abacaba
1 3 5 b
2 abc
1 4 4 c
2 cba
```

output Copy

```
6
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.