E. Lucky Queries

Petya loves lucky numbers very much. Everybody knows that lucky numbers are positive integers whose decimal record contains only the lucky digits **4** and **7**. For example, numbers **47**, **744**, **4** are lucky and **5**, **17**, **467** are not.

Petya brought home string s with the length of n. The string only consists of lucky digits. The digits are numbered from the left to the right starting with 1. Now Petya should execute m queries of the following form:

- switch $l\ r$ — "switch" digits (i.e. replace them with their opposites) at all positions with indexes from l to r, inclusive: each digit 4 is replaced with 7 and each digit 7 is replaced with 4 $(1 \leq l \leq r \leq n)$;
- count — find and print on the screen the length of the longest non-decreasing subsequence of string s.

Subsequence of a string s is a string that can be obtained from s by removing zero or more of its elements. A string is called non-decreasing if each successive digit is not less than the previous one.

Help Petya process the requests.

Input

The first line contains two integers n and m $(1 \leq n \leq 10^6, 1 \leq m \leq 3{\cdot}10^5)$ — the length of the string s and the number of queries correspondingly. The second line contains n lucky digits without spaces — Petya's initial string. Next m lines contain queries in the form described in the statement.

Output

For each query count print an answer on a single line.

Examples

input
```
2 3
47
count
switch 1 2
count
```
output
```
2
1
```

input
```
3 5
747
count
switch 1 1
count
switch 1 3
count
```
output
```
2
3
2
```

Note

In the first sample the chronology of string s after some operations are fulfilled is as follows (the sought maximum subsequence is marked with **bold**):

1. **47**
2. 74
3. **74**

In the second sample:

1. 7**47**
2. 447
3. **447**
4. 774
5. **77**4