

問題 4 – 女團夢想 (Girl Group)

(20 分)

問題敘述

作為一個在臺北最有名的 YTP 經紀公司工作的練習生，小 B 每天都在練習唱歌和跳舞。今天，他接到老闆發的公告，提到了公司想要成立一個新的女子團體。小 B 知道 YTP 經紀公司有自己選擇練習生的方式。所有練習生都有自己的編號，是一個從 1 到 N 的正整數，由他們進入公司的時間決定。為了讓團體的成員能夠團結，YTP 經紀公司只會選擇連續編號的練習生來組成女團。除此之外，每個練習生都會根據他們的能力被標上小寫英文字母表示的等第。YTP 經紀公司認為一個好的女子團體最重要的事情是平衡，意思是當我們令這個女子團體是由編號 l 到編號 r 的練習生組成，那麼編號 l 的練習生和編號 r 的練習生等第就要相同，編號 $l + 1$ 的練習生和編號 $r - 1$ 的練習生等第就要相同，依此類推。

現在，小 B 很好奇編號 l_i 到編號 r_i 的練習生是否有可能組成一個女團。然而，每個練習生的等第可能會改變，因此同樣的人選可能會在不同時間有不同的結果，這讓問題變得更難了。你能寫一支程式幫助小 B 解決這個問題嗎？

輸入格式

輸入的第一行包含兩個正整數 N, Q ，代表 YTP 經紀公司的練習生數量以及事件數量，每個事件可能是有人的等第改變或者是小 B 想知道某些練習生是否有可能組成女子團體。

下一行包含一個長度為 N 的字串 S 代表所有練習生的等第。

接下來的 Q 行，第 i 行會形如 $0\ k_i\ g_i$ 或 $1\ l_i\ r_i$ 。前者代表編號為 k_i 的練習生的等第變成 g_i ；後者代表小 B 想知道編號從 l_i 到 r_i 的練習生是否有可能組成女子團體。

輸出格式

對於每筆詢問輸出一行 “YES” 或 “NO”（不包含 “”）表示那些練習生是否有可能組成女子團體。

資料範圍

- $1 \leq N, Q \leq 2 \times 10^5$
- S_i, g_i 都是小寫英文字母。
- $1 \leq k_i \leq N$
- $1 \leq l_i \leq r_i \leq N$

輸入範例 1

```
5 6
abcda
1 1 5
1 1 1
0 4 b
1 1 5
1 2 4
1 2 5
```

輸出範例 1

```
NO
YES
YES
YES
NO
```

輸入範例 2

```
5 6
abaaa
1 1 5
1 1 3
0 2 a
1 1 5
1 2 4
1 2 5
```

輸出範例 2

```
NO
YES
YES
YES
YES
```

輸入範例 3

```
9 11
stakataka
0 1 a
1 1 9
1 3 9
0 5 z
1 5 7
0 8 t
1 5 9
0 6 b
0 4 b
0 1 a
1 1 9
```

輸出範例 3

NO
YES
NO
NO
YES

範例說明

在範例一中，以下的事件依序發生：

- “abcd~~a~~” 是不平衡的。
- “a” 是平衡的。
- 成績序列變成 “abcba”。
- “abcba” 是平衡的。
- “bcb” 是平衡的。
- “bcba” 是不平衡的。

在範例二中，以下的事件依序發生：

- “abaaa” 是不平衡的。
- “aba” 是平衡的。
- 成績序列變成 “aaaaa”。
- “aaaaa” 是平衡的。
- “aaa” 是平衡的。
- “aaaa” 是平衡的。

在範例三中，以下的事件依序發生：

- 成績序列變成 “atakataka”。
- “atakataka” 是不平衡的。
- “akataka” 是平衡的。
- 成績序列變成 “atakztaka”。
- “zta” 是不平衡的。
- 成績序列變成 “atakztata”。
- “ztata” 是不平衡的。
- 成績序列變成 “atakzbata”。
- 成績序列變成 “atabzbata”。
- 成績序列變成 “atabzbata”（因為第 1 個人的等第本來就是 a，因此其實沒有變化）。
- “atabzbata” 是平衡的。

Q4 - Girl Group

(20 points)

Description

Practicing singing and dancing every day, Little B is a cadet in YTP Company, the most famous management company in Taipei. Today, she receives an announcement from her boss about the next girl group that YTP company wants to set up. Little B knows that YTP company has its own way to choose cadets. All cadets have their own ID, an integer from 1 to N , decided by when they entered the company. In order to unite the members of the girl group, YTP Company will only choose some cadets with continuous ID. Besides, each cadet has a grade based on their ability, which is represented by a lowercase Latin character. YTP Company thinks that the most important thing of a good girl group is balance, which means when a girl group includes cadets whose IDs are from l to r , then the grade of ID l must be the same as the grade of ID r , the grade of ID $l + 1$ must be the same as the grade of ID $r - 1$, and so on.

Now, Little B is wondering whether cadets with ID from l_i to r_i are possible to form a girl group. However, the grade of cadets may change, so the same cadets at different time may have different results, which makes the question more difficult. Can you write a program to help Little B to solve this question?

Input Format

The first line of the input contains two integers N, Q , denoting the number of cadets in YTP Company, and the number of operations which is either a grade change or a question asked by Little B.

The next line contains a string S with length N , denoting the initial grades of all cadets.

In the next Q lines, the i -th line is either 0 k_i g_i or 1 l_i r_i . The former means that the grade of the cadet with ID k_i becomes g_i . The latter means that Little B wants to know whether cadets with IDs from l_i to r_i are possible to form a girl group.

Output Format

For each question, output a single line "YES" or "NO" (without "") denoting whether those cadets are possible to form a girl group.

Data Range

- $1 \leq N, Q \leq 2 \times 10^5$
- S_i, g_i are all lowercase Latin characters.
- $1 \leq k_i \leq N$

- $1 \leq l_i \leq r_i \leq N$

Input Example 1

```
5 6
abcda
1 1 5
1 1 1
0 4 b
1 1 5
1 2 4
1 2 5
```

Output Example 1

```
NO
YES
YES
YES
NO
```

Input Example 2

```
5 6
abaaa
1 1 5
1 1 3
0 2 a
1 1 5
1 2 4
1 2 5
```

Output Example 2

```
NO
YES
YES
YES
YES
```

Input Example 3

```
9 11
stakataka
0 1 a
1 1 9
1 3 9
0 5 z
1 5 7
0 8 t
1 5 9
0 6 b
0 4 b
```

```
0 1 a
1 1 9
```

Output Example 3

```
NO
YES
NO
NO
YES
```

Example Explanation:

In example 1, the events happen with the following order:

- "abcd" is not balance.
- "a" is balance.
- The whole grade sequence changes to "abcba".
- "abcba" is balance.
- "bcb" is balance.
- "bcba" is not balance.

In example 2, the events happen with the following order:

- "abaaa" is not balance.
- "aba" is balance.
- The whole grade sequence changes to "aaaaa".
- "aaaaa" is balance.
- "aaa" is balance.
- "aaaa" is balance.

In example 3, the events happen with the following order:

- The whole grade sequence changes to "atakataka".
- "atakataka" is not balance.
- "akataka" is balance.
- The whole grade sequence changes to "atakztaka".
- "zta" is not balance.
- The whole grade sequence changes to "atakztata".
- "ztata" is not balance.
- The whole grade sequence changes to "atakzbata".
- The whole grade sequence changes to "atabzbata". (In fact, the original grade of cadet 1 is "a", so there is nothing change.)
- "atabzbata" is balance.