



Strings

Source Code: strings.c; strings.cpp; strings.pas

Memory Limit: 256 MB

Time Limit: 1.0 s

Input: Standard input

Output: Standard output

Description

You have an initial string $S = [s_1, \dots, s_n]$.

By definition, $S_{x,y}$ is a part of string S as follows:

- $S_{x,y} = [s_x, \dots, s_y]$, if $x \leq y$;
- $S_{x,y}$ is an empty string, if $x > y$.

You are given m queries of several types:

1. A question query, given i, j ($1 \leq i \leq j \leq n$), is the substring $[s_i, \dots, s_j]$ a palindrome?

2. A modification query which can be of 3 types:

(a) Cut the string into 3 (possibly empty) parts $S_{1,i-1}, S_{i,j}, S_{j+1,n}$.

Concatenate the first part with the last one into $T = S_{1,i-1} S_{j+1,n}$ and insert the middle one as follows $S' = T_{1,k} S_{i,j} T_{k+1,n'}$ (where $n' = n - (j - i + 1)$ respectively), then set S to be equal to S' .

Note that $1 \leq i \leq j \leq n$; $0 \leq k \leq n - (j - i + 1)$.

(b) Reverse the substring $S_{i,j}$.

Note that $1 \leq i \leq j \leq n$.

(c) Insert a character c at position i , i.e. set $S = S_{1,i-1} c S_{i,n}$.

Note that $1 \leq i \leq n+1$.

Note that the value of n will change on modification queries of type (c).

Task

Write a program that runs the queries above.

Input

- The first line contains two space-separated integers n, m .
- The second line contains n characters representing the initial string.
- The following m lines contain the description of the m queries.



- A question query is of the form:

$Q\ i\ j$ where $1 \leq i \leq j \leq n$.

- A modification query is of the form:

$M\ 1\ i\ j\ k$ – Modification query (a), where $i \leq j$.

$M\ 2\ i\ j$ – Modification query (b), where $i \leq j$.

$M\ 3\ i\ c$ – Modification query (c), where c is a character.

You can assume that the string will contain only lowercase characters of the English alphabet at all times.

You may assume that the input is valid.

Output

For each question query, output a single line of "YES" or "NO" (without quotes).

Example

Standard Input

```
6 10
banana
Q 2 6
Q 2 5
M 2 2 3
Q 2 5
M 2 5 6
Q 1 6
M 3 7 b
Q 1 7
M 1 1 2 4
Q 4 7
```

Standard Output

```
YES
NO
YES
NO
YES
NO
```

Explanation

The modification queries will change the string in the following way:

Initially : $S = \text{banana}$

Query 1: $S = \text{bnaana}$

Query 2: $S = \text{bnaaan}$

Query 3: $S = \text{bnaaanb}$

Query 4: $S = \text{aaanbnb}$

Subtask 1 (10 points)

$n, m \leq 10^4$.

All types of queries are present.

Subtask 2 (20 points)

$n, m \leq 2 \cdot 10^5$.

Only question and second modification queries are present.



Subtask 3 (20 points)

$n, m \leq 2 \cdot 10^5$.

Only question and third modification queries are present.

Subtask 4 (20 points)

$n, m \leq 2 \cdot 10^5$.

Only question queries are present.

Subtask 5 (30 points)

$n, m \leq 2 \cdot 10^5$.

All types of queries are present.