Race Against Time

As another one of their crazy antics, the N ($1 \le N \le 100,000$) cows want Farmer John to race against the clock to answer some of their pressing questions.

The cows are lined up in a row from 1 to N, and each one is holding a sign representing a number, A_i ($1 \le A_i \le 1,000,000,000$). The cows need FJ to perform Q ($1 \le Q \le 50,000$) operations, which can be either of the following:

- Modify cow i's number to X ($1 \le X \le 1,000,000,000$). This will be represented in the input as a line containing the letter M followed by the space-separated numbers i and X.
- Count how many cows in the range [P, Q] ($1 \le P \le Q \le N$) have $A_i \le X$ ($0 \le X \le 1,000,000,000$). This will be represented in the input as a line containing the letter C followed by the space-separated numbers P, Q, and X.

Of course, FJ would like your help.

Input

The first line gives the integers N and Q, and the next N lines give the initial values of A_i. Finally, the next Q lines each contain a query of the form "M i X" or "C P Q X".

Output

Print the answer to each 'C' query, one per line.

Example

Input:
```
4 6
3
4
1
7
C 2 4 4
M 4 1
C 2 4 4
C 1 4 5
M 2 10
C 1 3 9
```

Output:
```
2
3
4
2
```

FJ has 4 cows, whose initial numbers are 3, 4, 1, and 7. The cows then give him 6 operations; the first asks him to count the how many of the last three cows have a number at most 4, the second asks him to change the fourth cow's number to 1, etc.

Warning: large input/output data.