ZOJ Problem Set - 2112

Dynamic Rankings

Time Limit: 10 Seconds Memory Limit: 32768 KB

The Company Dynamic Rankings has developed a new kind of computer that is no longer satisfied with the query like to simply find the k-th smallest number of the given N numbers. They have developed a more powerful system such that for N numbers a[1], a[2], ..., a[N], you can ask it like: what is the k-th smallest number of a[i], a[i+1], ..., a[j]? (For some i<=j, 0<k<=j+1-i that you have given to it). More powerful, you can even change the value of some a[i], and continue to query, all the same.

Your task is to write a program for this computer, which

- Reads N numbers from the input (1 <= N <= 50,000)

- Processes M instructions of the input (1 <= M <= 10,000). These instructions include querying the k-th smallest number of a[i], a[i+1], ..., a[j] and change some a[i] to t.

Input

The first line of the input is a single number X (0 < X <= 4), the number of the test cases of the input. Then X blocks each represent a single test case.

The first line of each block contains two integers N and M, representing N numbers and M instruction. It is followed by N lines. The (i+1)-th line represents the number a[i]. Then M lines that is in the following format

Q i j k or
C i t

It represents to query the k-th number of a[i], a[i+1], ..., a[j] and change some a[i] to t, respectively. It is guaranteed that at any time of the operation. Any number a[i] is a non-negative integer that is less than 1,000,000,000.

There're NO breakline between two continuous test cases.

Output

For each querying operation, output one integer to represent the result. (i.e. the k-th smallest number of a[i], a[i+1],..., a[j])

There're NO breakline between two continuous test cases.

Sample Input

```
2
5 3
3 2 1 4 7
Q 1 4 3
C 2 6
Q 2 5 3
5 3
3 2 1 4 7
Q 1 4 3
C 2 6
Q 2 5 3
```

Sample Output

```
3
6
3
6
```

(adviser)
Site: *http://zhuzeyuan.hp.infoseek.co.jp/index.files/our_contest_20040619.htm*

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Source: **Online Contest of Christopher's Adventure**

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