Problem A

Our country has n citizens, numbered from 1 to n in the increasing order of their age. The i-th of them earns salary s_i. By the laws of our country, no two citizens are allowed to earn the same amount of money at the same time. However, subject to this restriction, their salaries change over time. Occasionally, we publish median salaries in certain age groups, i.e., for some $f \leq t$ such that $t - f$ is even, we need to determine the median of s_f, s_{f+1}, ..., s_t.

Input and output

The first line contains integers $n, m \leq 100\,000$, the number of citizens and the number of operations. The next line contains n pairwise distinct integers s_1, ..., s_n ($1 \leq s_i \leq 10^9$), the inital salaries. Each of the next m lines describes one operation:

- S i v ($1 \leq i \leq n$, $1 \leq v \leq 10^9$): Change the salary s_i to v. The value v is guaranteed to be different from all other current salaries.

- M f t ($1 \leq f \leq t \leq n$, $t - f$ is even): Output a line containing a single integer, the median of the values s_f, ..., s_t.

Example

Input:

```
4 4
1 3 2 4
M 1 3
S 3 5
M 3 3
M 1 3
```

Output:

```
2
5
3
```