Activity Rehearsal

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Little J is currently rehearsing for an activity. Now, n students are lined up in order, each holding a sign with a number on it. It is assumed that the number on the sign held by the i-th student from left to right is a_i. The numbers on the signs are all distinct integers within the range of 1 to n.

Now, a "comparison"activity rehearsal is to be conducted. This activity will take a total of $n-1$ rounds. In each round, the two students at the far left will step forward, and then they will compare the numbers on their signs. The student with the larger number will be **selected**, while the student with the smaller number will return to the far right. **Note that the selected student will not return to the lineup and will not participate in subsequent rounds.**

Little J wants to know who is selected in each round under different arrangements of numbers. He will perform m operations, each of which is one of the following two types:

- Choose two positions x, y such that $1 \leq x < y \leq n$, and then swap the signs held by the x-th and y-th students;
- Given two parameters l, r such that $1 \leq l \leq r < n$, **simulate** a "comparison"activity and calculate the sum of the numbers on the signs of the selected students between the l-th round and the r-th round. After the simulation, all students will **return to their original positions**.

Input

The first line of input contains two integers n, m ($2 \leq n \leq 10^5, 1 \leq m \leq 10^5$), representing the number of students and the number of operations.

The next line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \leq a_i \leq n$), representing the initial numbers on the signs held by each student. It is guaranteed that all a_i are distinct.

The following m lines each contain a character and two integers, representing an operation.

- If the input format is `C` x y, it means to swap the signs held by the x-th and y-th students, with the guarantee that $1 \leq x < y \leq n$;
- If the input format is `A` l r, it means to simulate a "comparison"activity and calculate the sum of the selected numbers between the l-th round and the r-th round, with the guarantee that $1 \leq l \leq r < n$.

Output

For each simulation operation, output a single integer on a new line, representing the answer.

Example

standard input	standard output
5 6 4 3 1 2 5 A 3 4 C 1 2 A 3 4 A 2 4 C 3 5 A 1 3	8 8 10 12

Note

In the first simulation operation, the numbers held by the students in order are $[4, 3, 1, 2, 5]$. In the four rounds of comparison, the selected numbers are $4, 2, 5, 3$, so the sum of the selected numbers between the 3-rd round and the 4-th round is $5 + 3 = 8$.

In the last simulation operation, the numbers held by the students in order are $[3, 4, 5, 2, 1]$. In the four rounds of comparison, the selected numbers are $4, 5, 3, 2$, so the sum of the selected numbers between the 1-st round and the 3-rd round is $4 + 5 + 3 = 12$.