Christmas Turkey Farming

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1.5 seconds
Memory limit:	512 megabytes

As the holiday season approaches, a rumour has been going around that turkeys are unsafe to consume. No, it is not because of a virus, it is because of radiation.

Now, the bears want to celebrate Christmas too. After hearing about the amazing time that the cows in Cow Village had with bananas, the bears decided that they would take the risk and continue with their plans to eat turkeys. Bears have huge appetites and as a result, they want the maximum number of turkeys to eat. They look over at their turkey farm in preparation for Christmas, which consists of N pens labelled 1 to N. Each pen has a number of turkeys in there and the i^{th} pen would have T_i turkeys. Naturally, due to radiation, the turkeys have mutated and there are many, many turkeys in each pen, with up to 10^9 turkeys per pen.

However, the bears are feeling rather lazy (as they prefer to sleep) and the job of hunting turkeys seemed to be too much effort. Hence, they requested the help of the cats to get them turkeys to eat.

After much deliberation (and fear of being eaten in place of the turkey), the cats have once again shortlisted a number of plans. The i^{th} plan involves C_i cats catching turkeys in pens labelled S_i to E_i inclusive. However, each cat can only catch turkeys in one pen at a time as cats are not designed to catch turkeys efficiently. Hence, only C_i pens can be used to get turkeys between the pens labelled S_i to E_i. Obviously, the cats would collect turkeys from the C_i pens within the range that would yield the largest total number of harvested turkeys. Do note that since the cats are still planning how to get the turkeys, no turkeys are actually hunted and the i^{th} pen will always have T_i turkeys for every single plan. As with the cows, the cats demand a payment of the minimum number of turkeys caught from the pens (Refer to sample I/O for examples).

However, the turkeys have gotten ahold of their plans, and in order to make the life of the cats more difficult and to cut losses, they decide to do change the number of turkeys in the pens. However, turkeys cannot fly very far, thus, they will choose to send some turkeys to an adjacent pens such that the number of turkeys in both pens are swapped.

The cats have approached you for help, as they are not very good at calculations. They want to know, at any point in time, how many turkeys will they receive as payment with their plan?

Input

Your program must read from standard input.

The first line of input will contain 2 integers, N and Q, where Q is the total number of plans and number of times the turkeys swap pens ($1 \leq N$, $Q \leq 2 \cdot 10^5$).

The next line of input will contain N integers. The i^{th} integer would be T_i , the turkeys originally in the i^{th} pen ($0 \leq T_i \leq 10^9$).

Q lines will follow. The first character of each line will be X.

If X is 0, the cats have executed a plan. 3 integers will follow, S_i, E_i and C_i ($1 \leq S_i \leq E_i \leq N$, $1 \leq C_i \leq (E_i - S_i + 1)$).

If X is 1, the turkeys have decided to swap their places. 1 integer will follow, i, such that the number of turkeys in the i^{th} and $(i+1)^{th}$ place are swapped. Note that the turkeys in the N^{th} pen will not want to swap their places ($1 \leq i < N$).

Output

For each line that the cats execute a plan, output an integer, the maximum number of turkeys they will receive as payment.

Examples

standard input	standard output
5 3 1 2 3 4 5 0 1 5 4 1 1 0 2 3 2	2 1
15 8 2 3 13 1 10 10 15 2 7 15 13 5 14 7 7 0 1 5 3 0 2 10 3 1 3 1 4 1 2 1 8 0 4 7 2 0 1 4 1	3 13 13 10

Note

Explanation for Sample Testcase 1:

As the cats want to maximise the number of turkeys gotten, they will choose pens 2 to 5 for the 4 pens with the most turkeys. As a result, they will get 2 turkeys in return.

Next, the number of turkeys in pens 1 and 2 are swapped. Hence, there are 2 turkeys in pen 1 and 1 turkey in pen 2.

Next, the cats want the two pens with the two largest values of turkeys in pens 2 to 3. Thus, they will take the turkeys from both pens, and as their payment, they will receive 1 turkey.