Problem A. Just RSQ

Input filename:	`rsq.in`
Output filename:	`rsq.out`
Time limit:	2 seconds
Memory limit:	256 Mb

You are given an array, and you need to answer range sum queries and point update queries.

Input file format

First line of the input file contains two numbers: the size of the array $1 \le n \le 10^5$, and the number of queries $1 \le m \le 10^5$. The second line contains the initial state of an array $-10^5 \le a_1, a_2, \ldots, a_n \le 10^5$.

Next m lines contain queries of the type $t\ x\ y$ ($t \in \{0, 1\}$). If $t = 0$ then you should output the sum of the elements with indices from x to y inclusive (it is guaranteed that in this case $1 \le x \le y \le n$). If $t = 1$ then you need to assign the value y to the element with index x (in this case $1 \le x \le n$ and $-10^5 \le y \le 10^5$).

Output file format

For every range sum query output one number on its own line–the requested sum.

Sample tests

rsq.in	rsq.out

5 3
1 2 3 4 5
0 1 5
1 1 -14
0 1 5
	15
	0

8 2
7 3 -10 4 1 2 5 -6
0 2 4
0 5 7
	-3
	8

Problem B. Stars

Input filename:	`stars.in`
Output filename:	`stars.out`
Time limit:	2 seconds
Memory limit:	256 Mb

Vasya likes to watch stars. However, the entire sky is too big to watch at the same time. He therefore watches only the part of the space, namely an $n \times n \times n$ cube. This cube is partitioned into $1 \times 1 \times 1$ cubes. During his watch, the following events happen:

1. In some cube several stars appear or disappear.
2. His friend Petya can come by and ask how many stars are visible in some cuboid.

Input file format

First line contains a positive integer $1 \le n \le 128$. The coordinates of the cubes are integers from 0 to $n-1$. Then some queries follow each on its own line. First number m of the query denotes its type.

1. If $m = 1$ then four numbers $0 \le x, y, z < n$ and $-20000 \le k \le 20000$ follow, meaning that k stars appear or disappear in the cube with coordinates (x, y, z).
2. If $m = 2$ then six numbers x_1, y_1, z_1 and x_2, y_2, z_2 follow, meaning that Petya comes by and asks how many stars are there with $x_1 \le x \le x_2$, $y_1 \le y \le y_2$, and $z_1 \le z \le z_2$.
3. If $m = 3$ then Vasya got tired of watching stars and answering Petya. Vasua will hence go to sleep and no queries will follow.

Output file format

For every Petya's question output one number on its own line–the requested number of stars.

Sample tests

stars.in	stars.out

2
2 1 1 1 1 1 1
1 0 0 0 1
1 0 1 0 3
2 0 0 0 0 0 0
2 0 0 0 0 1 0
1 0 1 0 -2
2 0 0 0 1 1 1
3
	0
	1
	4
	2

Problem C. Inversion Count

Input filename:	`inverse.in`
Output filename:	`inverse.out`
Time limit:	2 seconds
Memory limit:	256 Mb

Given an array $A = \langle a_1, a_2, \ldots, a_n \rangle$, find the number of pairs (i, j) such that $i < j$ and $a_i > a_j$.

Input file format

First line of the input file contains a positive integer n $(1 \leq n \leq 50000)$–the size of the array. The second line contains n pairwise different elements of the array A.

Output file format

Output one number–the answer to the question.

Sample tests

inverse.in	inverse.out
4 1 2 4 5	0
4 5 4 2 1	6

Problem D. Segment Update

Input filename:	`segmentupdate.in`
Output filename:	`segmentupdate.out`
Time limit:	4 seconds
Memory limit:	256 Mb

You are given n numbers. The q queries of two types follow:

1. Add x to segment $[l, r]$.
2. Find the value $a[i]$.

Input file format

First line contains two numbers–$1 \le n \le 10^6$ and $1 \le q \le 10^6$.
Second line contains n numbers $-10^9 \le a_1, a_2, \ldots, a_n \le 10^9$.
Next q lines contain queries.
First number t in every line denotes the type of the query.
If $t = 1$ then three numbers l, r, x follow with $1 \le l \le r \le n$, $-10^3 \le x \le 10^3$.
If $t = 2$ then one number i follows with $1 \le i \le n$.

Output file format

For every query of the second type output the answer on the separate line.

Sample tests

segmentupdate.in	segmentupdate.out

6 7
5 -6 11 2 3 8
2 4
1 2 4 6
2 2
1 1 3 -2
1 2 5 9
2 3
2 4
	2
	0
	24
	17