

Problem A. Array

Input file: **stdin**
Output file: **stdout**
Time limit: 1.5 seconds
Memory limit: 512 megabytes

bobo has an array $a[1], a[2], \dots, a[n]$.

He subsequently presents q questions of the following 4 types:

- 1 $l_i r_i c_i$ - Update $a[k]$ with $a[k] + c_i$ for all $l_i \leq k \leq r_i$;
- 2 $l_i r_i c_i$ - Update $a[k]$ with $\min\{a[k], c_i\}$ for all $l_i \leq k \leq r_i$;
- 3 $l_i r_i c_i$ - Update $a[k]$ with $\max\{a[k], c_i\}$ for all $l_i \leq k \leq r_i$;
- 4 $l_i r_i$ - Ask for $\min\{a[k] : l_i \leq k \leq r_i\}$ and $\max\{a[k] : l_i \leq k \leq r_i\}$.

Input

The first line contains 2 integers n, q ($1 \leq n, q \leq 200000$).

The second line contains n integers $a_1, a_2, \dots, a_n$ which denotes the initial values of the array ($|a_i| \leq 10^9$).

Each of the following q lines contains an integer t_i which denotes the type of i -th question. If $t_i = 1, 2, 3$, 3 integers l_i, r_i, c_i follows. If $t_i = 4$, 2 integers l_i, r_i follows. ($1 \leq t_i \leq 4, 1 \leq l_i \leq r_i \leq n$)

- If $t_i = 1$, $|c_i| \leq 2000$;
- If $t_i = 2, 3$, $|c_i| \leq 10^9$.

Output

For each question of type 4, two integers denote the minimum and the maximum.

Sample input and output

stdin	stdout
3 4	1 3
1 2 3	2 2
4 1 3	
1 1 2 1	
2 1 3 2	
4 1 3	