Trossort

Winter Workshops, Day 2, Available memory 512 MB *02.01.2020 - 08.01.2020*

You are given an integer sequence $a_1, a_2, \ldots, a_n$. You task is to perform m operations on this sequence.

In each operation you are given two integers l and r. If $l \leq r$ you are asked to sort values of the sequence in interval $[l, r]$ in non-descending order, otherwise you should sort the interval $[r, l]$ in non-ascending order. To prove you have done your job you are asked to print the median $(a_{\lceil \frac{n}{2} \rceil})$ of the resulting sequence.

Constraints

- $1 \leq n, m \leq 10^5$
- $1 \leq a_i \leq 10^6$
- $1 \leq l_i, r_i \leq n$

Input

n, m
$a_1, a_2, \ldots, a_n$
l_1, r_1
l_2, r_2
$\vdots$
l_m, r_m

Output

In the first line of the output, write down the median of the sequence after performing given operations.

Examples

Input	Output
3 1 1 3 2 2 3	2
6 4 5 2 3 2 1 4 1 3 5 2 3 6 3 2	1

Scoring

Subtask	Constraints	Points
1	$a_i \leq 1$	10
2	$a_i \leq 2$	10
3	$a_i \leq 3$	10
4	$l_i \leq r_i$ in all queries	20
5	$n, m \leq 500$	20
6	$n, m \leq 40000$	15
7	no additional constraints	15