Problem B
Hot Potato

Hot potato is a popular game among children in school. The game is simple: on each turn, the child who has the potato passes it to another child. In some point, the teacher, which is not looking at the game will go and say the game is over. When this happens, the child who has the potato loses the game.

A variation of this game, played in the cafeteria is proposed by the teacher. Children are numbered from 1 to N according to their position in the queue, where the child with the number 1 is the first on the queue. Each child receives a paper with a number and during the game whenever a child receives the potato the child will pass it to the child in the position noted in his paper. If the potato gets to a position less or equals to X in the queue, where X is defined at the beginning of the game, the game ends and the teacher wins the game. If this never happens, the game never ends and the children will win the game: The next day all they get a discount in the cafeteria.

The teacher starts the game passing the potato to some child in the queue. As his sight is not very good, he can only guarantee that he will pass the potato to some child in a range $L \ldots R$ in the queue with the same probability. He is considering different possible ranges to start the game. For this, the teacher would like to know, for each of these ranges, which X value he must choose so that the game can be the most fair as possible, this is, the probability that the game ends is as close as possible to the probability of the game not finishing.

You should help the teacher to evaluate the proposals. Given the papers of each child in the queue and several possible ranges, you should answer, for each range, the value of X that makes the fairest game possible. If there is a tie, answer the X closer to the front of the queue.

Input

The input contains several test cases. In each test case, The first line of input contains two integer numbers, N and Q ($2 \leq N \leq 50000$, $1 \leq Q \leq 10^5$). The next line contains N integers $p_1, p_2 \ldots p_N$ ($1 \leq p_i \leq N$), the numbers on the papers each child receives. The next Q lines, each contain two integers L and R ($1 \leq L \leq R \leq N$), the range that is being considered by the teacher.

Output

For each test case in the input, You should print Q lines, each line contains, for each range considered by the teacher, the number X that must be choosen by the teacher so that the game is the fairest as possible.

Examples

Input	Output
9 4	1
2 3 4 5 6 7 4 9 5	3
1 3	3
3 5	1
2 8	1
7 9	1
3 3	2
1 3 3	
1 1	
1 2	
2 3	