Problem L. Game Prediction

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	512 mebibytes

Sunset and Elephant are playing a game on a sequence $b_1, b_2, \ldots, b_m$. The two players move in turns, and Sunset moves first. In each move, the current player selects a value which is either at the beginning of the sequence or at the end of the sequence, adds it to this player's score and removes the value from the sequence. The game ends when the sequence is empty. Both players want to maximize their scores and will play optimally.

You are given a sequence $a_1, a_2, \ldots, a_n$ and q queries. In the i-th query, you will be given two integers l_i and r_i. Please write a program to figure out the final result of the game when they choose $a_{l_i}, a_{l_i+1}, \ldots, a_{r_i}$ as the initial sequence b. Here, $m = r_i - l_i + 1$ and $b_j = a_{l_i+j-1}$ for every j such that $1 \le j \le m$.

Input

There is only one test case in each test.

The test case starts with a line containing two integers n and q ($1 \le n \le 100\,000$, $1 \le q \le 200\,000$) on the first line, denoting the length of the sequence and the number of queries.

On the second line, there are n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le 10^9$).

Each of the next q line contains two integers l_i and r_i ($1 \le l_i \le r_i \le n$), denoting the queries.

It is guaranteed that all the values of a_i are chosen uniformly at random from integers in the range $[1, 10^9]$. The randomness condition does not apply to the sample test case, but your solution must pass the sample as well.

Output

For each query, print a single line containing two integers S and E, denoting the final score of Sunset and the final score of Elephant.

Example

standard input	standard output
5 4 7 9 3 5 2 1 5 3 5 2 4 1 2	12 14 5 5 12 5 9 7