Shopping

Time Limit: 1 Second
Memory Limit: 2048 MB

LetianPie loves buying new stuffs so he goes shopping almost everyday! However, he soon realized that he will run out of money if he keeps doing this, so he decided to control the amount of money he spends everyday. Specifically, every morning LetianPie will write n checks and place them in a line. He will then pick two integers l and r ($1 \leq l \leq r \leq n$) and grab all checks in range $[l, r]$ for shopping today. The only issue with this is that he has to pay the exact amount of the item he buys because there is no way the shop can make changes for his checks! To decide the values of l and r he should choose each morning, he asks you to help him find out the smallest amount that he can't pay with checks in the range $[l, r]$.

Input

The first line of input contains two integers n and q ($1 \leq n, q \leq 10^5$) - the number of checks LetianPie wrote and the number of queries.

The next line contains n integers $a_1, \ldots, a_n$ ($1 \leq \sum a_i \leq 10^9$) denoting the value of each check.

The next q lines describe the queries. Each line contains two integers l and r ($1 \leq l \leq r \leq n$), meaning that LetianPie will grab the checks in the range $[l, r]$. All queries are independent.

Output

For each query, output a single integer denoting the minimum amount of money LetianPie cannot pay with the checks he grabs.

Sample Inputs

```
5 3
1 5 2 4 3
1 2
1 5
3 4
```

Sample Outputs

```
2
16
1
```