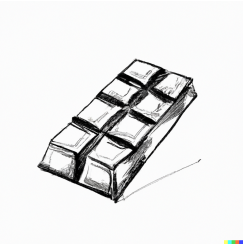
Task Čokolade



Little Lana and little Fran are visiting a chocolate factory. They have seen how chocolate is made, tasted many chocolates, and now they want to buy some of the chocolates.

In the shop, there are n different chocolates, and the i-th of them has the price c_i. Lana and Fran want to buy m chocolates.

Fran found a way to split the cost in the shop:

- If the chocolate is cheaper than k kunas, Lana will pay for it.
- Otherwise, Lana will pay k kunas, and Fran will pay the rest, that is $c_i - k$ kunas.

Let's denote l as the amount Lana has to pay, and f as the amount Fran has to pay. Lana, dissatisfied with Fran's deal, wants to spite Fran and choose the chocolates so the value of the expression $l - f$ is as small as possible. Since Fran is hesitant and doesn't know how many he wants to buy, Lana wants to know the minimal value of the expression $l - f$ for q different numbers k_i and m_i.

Help her choose the chocolates and determine the minimum value of the expression $l - f$ for each of the q queries.

Input

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

The second line contains n integers $c_1, c_2, \ldots, c_q$ ($1 \leq c_i \leq 10^9$), the prices of the individual chocolates, in order.

The following q lines contain integers k_i and m_i ($1 \leq k_i \leq 10^9, 1 \leq m_i \leq n$), Fran's bound, and the number of chocolates they are going to buy.

Output

Print q lines. In the i-th line print the answer to Lana's i-th query.

Scoring

Subtask	Points	Constraints
1	15	$n, q \leq 1000$, $c_i, k_i \leq 10^6$
2	20	$k_1 = \ldots = k_n$
3	35	No additional constraints.

Examples

input

```
5 2
1 9 22 10 19
18 4
5 2
```

output

```
34
-21
```

input

```
7 4
1 5 4 3 7 11 9
5 4
5 7
7 3
4 5
```

output

```
4
16
7
1
```

input

```
3 3
5 6 7
10 1
5 3
3 3
```

output

```
5
12
0
```

Clarification of the first example:
In the first query, Lana can take chocolates with prices 1, 9, 22, and 10. Lana will pay 38 kunas, and Fran 4 kunas. The answer is $38 - 4 = 34$.

In the second query, Lana will choose chocolates with prices 22 and 19. She will pay 10 kunas, and Fran will pay 31 kunas. The answer is $10 - 31 = -21$.