Least Operations

Description

Given an array of integers $a_1, a_2, \ldots, a_n$, you are allowed to manipulate i-th element by multiplying it by -1, i.e., set $a_i \rightarrow -a_i$ for every $1 \leq i \leq n$.

Given an integer $1 \leq m \leq n$, you are asked to find the minimum number of operations such that

$$\sum_{i=1}^{k} a_i \geq \sum_{i=1}^{m} a_i , \forall k \in [1, n].$$

Input

Each test contains multiple test cases. The first line contains the number of test cases T. The description of the test cases follows.

The first line of each test case contains two integers n and m as described above.

The second line contains n integers $a_1, a_2, \ldots, a_n$.

Output

For each test case, print an integer indicating the minimum number of operations required.

Sample Input/Output

input

```
6
4 3
-1 -2 -3 -4
4 3
1 2 3 4
1 1
1
5 5
-2 3 -5 1 -20
5 2
-2 3 -5 -5 -20
10 4
345875723 -48 384678321 -375635768 -35867853 -35863586 -358683842 -81725678 38576 -357865873
```

output

```
1
1
0
0
3
4
```

Constraints and Note

The sum of n over all test cases is no greater than $3 \cdot 10^5$, $1 \leq m \leq n \leq 3 \cdot 10^5, -10^9 \leq a_i \leq 10^9$.

Feasible operations for each test case:

1. -1 -2 -3 4
2. 1 2 -3 4
3. 1
4. -2 3 -5 1 -20
5. -2 -3 5 -5 20