Problem H. H

Time limit 1000 ms
Mem limit 262144 kB

Karel is a salesman in a car dealership. The dealership has n different models of cars. There are a_i cars of the i-th model. Karel is an excellent salesperson and can convince customers to buy up to x cars (of Karel's choice), as long as the cars are from different models.

Determine the minimum number of customers Karel has to bring in to sell all the cars.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 10^4$). The description of the test cases follows.

The first line of each test case contains two integers n and x ($1 \leq n \leq 5 \cdot 10^5$; $1 \leq x \leq 10$) — the number of different models of cars and the maximum number of cars Karel can convince a customer to buy.

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \leq a_i \leq 10^9$) — the number of cars of each model.

It is guaranteed that the sum of n over all test cases does not exceed $5 \cdot 10^5$.

Output

For each test case, output the minimum possible number of customers needed to sell all the cars.

Examples

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

Note

For the first case, Karel only needs to lure in 3 customers. He will convince the customers to buy the following models of cars:

- Customer 1 buys 2 cars with model 1 and 3.
- Customer 2 buys 2 cars with model 1 and 2.
- Customer 3 buys 2 cars with model 1 and 3.

For the second case, Karel only needs to lure in 3 customers. He will convince the customers to buy the following models of cars:

- Customer 1 buys 2 cars with model 1 and 3.
- Customer 2 buys 3 cars with model 1, 2 and 3.
- Customer 3 buys 1 car with model 3.