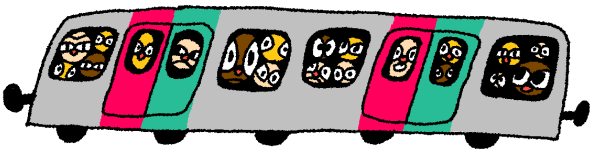
Heure de Rush

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	256 mebibytes



You are managing a metro train of n cars. There are $n \cdot k$ people unevenly distributed over the cars; more precisely, there are h_i people in car i. You want to balance the load and have exactly k people in every car.

At every stop, some people (probably none) can leave their car and run to another one, but they cannot move more than d cars in one run.

It's up to you to decide who runs where and when. How many stops do you need to achieve your goal?

Input

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

The first line of each test case contains two integers n and d ($1 \le d \le n \le 10^6$): the number of cars and the distance one person can run at once.

The second line of each test case contains n integers $h_1, h_2, \ldots, h_n$ ($0 \le h_i \le 10^9$): the distribution of people over the train. The sum of h_i is divisible by n.

The sum of n over all test cases does not exceed 10^6.

Output

For each test case, output a line with a single integer: how many stops you need.

Example

standard input	*standard output*
3 1 1 5 3 2 3 0 0 10 1 0 0 10 0 0 0 0 10 0 0	0 1 2

Note

In the first test case, there is a single car, so people are evenly distributed from the start.

In the second test case, before the start, there are 3 people in the first car: Aleksei, Dima, and Kostya. On the first stop, Dima runs to the second car, and Kostya runs to the third one, so one stop is enough to make every car have one person.