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D. Zero Remainder Array

time limit per test: 2 seconds memory limit per test: 256 megabytes input: standard input output: standard output

You are given an array a consisting of n positive integers.

Initially, you have an integer x=0 . During one move, you can do one of the following two operations:

- 1. Choose **exactly one** i from 1 to n and increase a_i by x ($a_i:=a_i+x$), then increase x by 1 (x:=x+1).
- 2. Just increase x by 1 (x := x + 1).

The first operation can be applied **no more than once** to each i from 1 to n.

Your task is to find the minimum number of moves required to obtain such an array that each its element is **divisible by** k (the value k is given).

You have to answer *t* independent test cases.

Input

The first line of the input contains one integer t ($1 \le t \le 2 \cdot 10^4$) — the number of test cases. Then t test cases follow.

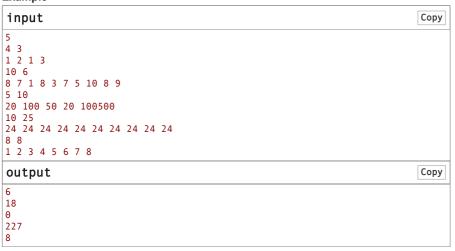
The first line of the test case contains two integers n and k ($1 \leq n \leq 2 \cdot 10^5$; $1 \leq k \leq 10^9$) — the length of a and the required divisior. The second line of the test case contains n integers a_1, a_2, \ldots, a_n ($1 \leq a_i \leq 10^9$), where a_i is the i-th element of a.

It is guaranteed that the sum of n does not exceed $2 \cdot 10^5$ ($\sum n \leq 2 \cdot 10^5$).

Output

For each test case, print the answer — the minimum number of moves required to obtain such an array that each its element is **divisible by** k.

Example



Note

Consider the first test case of the example:

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1. x=0, a=[1,2,1,3]. Just increase x; 2. x=1, a=[1,2,1,3]. Add x to the second element and increase x; 3. x=2, a=[1,3,1,3]. Add x to the third element and increase x; 4. x=3, a=[1,3,3,3]. Add x to the fourth element and increase x; 5. x=4, a=[1,3,3,6]. Just increase x; 6. x=5, a=[1,3,3,6]. Add x to the first element and increase x; 7. x=6, a=[6,3,3,6]. We obtained the required array.
```

Note that you can't add \boldsymbol{x} to the same element more than once.

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