

Partial Sums

Given a sequence of positive integers a_1, a_2, \dots, a_N , and $1 \leq i \leq j \leq N$, the partial sum from i to j is $a_i + a_{i+1} + \dots + a_j$.

In this problem, you will be given such a sequence and two integers P and K . Your task is to find the smallest partial sum modulo P that is at least K .

For example, consider the following sequence of integers:

12 13 15 11 16 26 11

Here $N = 7$. Suppose $K = 2$ and $P = 17$. Then, the answer is 2 because $11 + 16 + 26 = 53$ and $53 \bmod 17$ is 2. On the other hand, if $K = 0$ the answer is 0 since $15 + 11 + 16 + 26 = 68$ and $68 \bmod 17$ is 0.

You may assume $1 \leq N \leq 100000$.

Input

The first line of the input contains the number of test cases, T .

Each test case begins with a line containing three integers, N , K and P . This is followed by the values of a_1, a_2, \dots, a_N , one per line.

Output

Output one line per test case, containing the smallest partial sum modulo P that is at least K , as described above.

Example

Input:

```
1
7 2 17
12
13
15
11
16
26
11
```

Output:

```
2
```

Warning: large Input/Output data, be careful with certain languages