

Interval Mod

Input file: **standard input**
 Output file: **standard output**
 Time limit: 2 seconds
 Memory limit: 256 megabytes

You are given an array a consisting of n integers, as well as a parameter k and an integer set $M = \{p, q\}$. You can perform the following operation on a an arbitrary number of times (possibly zero):

- First, choose an interval $[l, r]$ ($1 \leq l \leq r \leq n$) of length **at least** k (i.e., $r - l + 1 \geq k$) and an integer $m \in M$;
- Then, set $a_i \leftarrow a_i \bmod m$ for each $l \leq i \leq r$.

You have to find the minimum possible value of $\sum_{i=1}^n a_i$ after all operations.

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 four integers n, k, p , and q ($1 \leq k \leq n \leq 10^5, 1 \leq p < q \leq 10^9$) — the length of a , the parameter, and the elements of M .

The second line contains n integers $a_1, a_2, \dots, a_n$ ($1 \leq a_i \leq 10^9$) — the elements of a .

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

Output

For each test case, output a single integer — the minimum possible value of $\sum_{i=1}^n a_i$ after all operations.

Example

standard input	standard output
6	1
1 1 3 4	11
2026	3
3 2 10 20	0
31 41 59	4
4 3 3 4	569
1 2 3 4	
6 4 9 20	
18 27 180 9 45 99	
7 4 3 5	
6 7 14 12 100 78 4	
9 4 244 353	
9982 4435 3998 2443 5399 8244 3539 9824	4353

Note

In the second test case, a possible way to obtain $\sum_{i=1}^n a_i = 11$ is to apply the following operation to a :

1. Choose $[l, r] = [1, 3]$ and $m = 10$, then a becomes $[1, 1, 9]$.

In the third test case, a possible way to obtain $\sum_{i=1}^n a_i = 3$ is to apply the following operations to a :

1. Choose $[l, r] = [1, 4]$ and $m = 4$, then a becomes $[1, 2, 3, 0]$;
2. Choose $[l, r] = [2, 4]$ and $m = 3$, then a becomes $[1, 2, 0, 0]$.