

K-Coverage

Input file: standard input
Output file: standard output
Time limit: 1 second
Memory limit: 1024 megabytes

Panda has a one-dimensional axis with n segments placed on its non-negative side. The left endpoint of the i -th segment is l_i . Every segment has the same length, L . This means the i -th segment covers the interval $[l_i, l_i + L - 1]$ (inclusive).

Now, Panda wants you to find the maximum number of integer points on the non-negative side of the axis that can be covered **exactly k** times after moving **at most one** segment. Specifically, you are allowed to select at most one segment and change its left endpoint to **any non-negative integer** (with no upper bound). The segment's length, L , remains the same.

Input

The first line contains an integer T ($1 \leq T \leq 2 \times 10^5$), denoting the number of test cases.

For each test case, the first line contains three positive integers n, L, k ($1 \leq n \leq 2 \times 10^5$, $1 \leq L \leq n$, $1 \leq k \leq n$). n is the total number of segments, L is the fixed length of every segment, and k is the required coverage count.

The second line contains n non-negative integers. The i -th integer is l_i ($0 \leq l_i \leq 2 \times n$) representing the left endpoint of the i -th segment.

It is guaranteed that the sum of n over all test cases does not exceed 2×10^5 .

Output

For each test case, output one line with a single integer, denoting the maximum number of integer points that can be covered exactly k times after moving at most one segment.

Example

standard input	standard output
3	6
3 2 1	3
2 6 2	0
3 3 2	
6 2 0	
5 1 3	
5 6 7 8 9	

Note

For the first test case in the example, initially, the three segments are $[2, 3]$, $[6, 7]$, and $[2, 3]$. You can change the third segment's left endpoint to 114514. After this move, the segments are $[2, 3]$, $[6, 7]$, and $[114514, 114515]$. This results in 6 integer points covered exactly once, which is the maximum achievable.

For the second test case, you can move the first segment's left endpoint to 3 to maximize the number of integer points that are covered exactly twice.