

Array with Hudai Calculation

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You will be given an array A with N integers A[1...N]. You will also be given two integers P and K. You need to find a value X [X can be any value from array A] for which this function will be maximized:

$$\left(\sum_{i=0}^N (|A[i] - X|)^P \text{MOD } K \right) \text{MOD } K$$

Here ABS means Absolute Value. For example: ABS(-1) is 1, also ABS(1) means 1.

Here MOD means Modulo Operation. W MOD Y will give you the remainder after dividing W by Y.

And X is any value from the array A.

But we don't have interest in X, as there will be several X for which the value will be maximized. So we just want the maximum value. Can you find it for us as you are a great programmer on SPOJ ?

Input

Input starts with an integer **T** (≤ 5), denoting the number of test cases.

Each case starts with a line containing three integers **N**, **P** and **K**. Then the next line will be consisting of N integers.

$1 \leq N \leq 100000$

$1 \leq P \leq 100$

$1 \leq K \leq 1000000009$

$1 \leq A[i] \leq 2000$

Output

For each case, print the case number and the maximum value for the above function with respect to array A.

Sample Input	Output for Sample Input
2	Case 1: 3
3 1 10	Case 2: 5
3 1 2	
3 2 10	
3 1 2	

N.B: Dataset is huge. Use faster IO like Scanf , Printf

