

Problem C. Simple Set Problem

Time limit: 3 seconds
Memory limit: 256 Megabytes

Given k non empty multiple sets, each multiple set only contains integers with absolute values not exceeding 10^9 .

It is required to select exactly one number from each multiple set to form an array (a_1, a_2, \dots, a_k) with a length of k .

Assuming $d = \max(a_1, a_2, \dots, a_k) - \min(a_1, a_2, \dots, a_k)$. Please calculate the minimum d .

Input

Each test contains multiple test cases. The first line of input contains a single integer t ($1 \leq t \leq 10^6$) — the number of test cases. The description of test cases follows.

The first line of each test case contains a single integer k ($1 \leq k \leq 10^6$) — the number of multiple sets.

The following k lines of each test case first read in a parameter c_i — indicating the size of the i -th multiple set, followed by c_i integers with absolute values not exceeding 10^9 — indicating the elements of the i -th multiple set.

Guarantee that $\sum_{i=1}^k c_i$ for each test case does not exceed 10^6 , the sum of $\sum_{i=1}^k c_i$ for all test cases does not exceed 4×10^6 .

Output

For each testcase, output an integer representing the answer, which is the minimum d .

Example

standard input	standard output
3	1
2	15
1 6	0
3 -7 7 10	
4	
9 -5 -9 2 8 5 4 3 3 8	
2 10 8	
1 -7	
3 1 6 10	
1	
1 9	