Problem G. Geometry Task

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

There are n red lines and n blue lines in a two-dimensional plane. The equation of the i-th red line is $y = a_i x + b_i$, and the equation of the i-th blue line is $x = c_i$.

Define the value of pairing a red line with a blue line as the y-coordinate of their intersection point. You want to pair each red line with exactly one blue line, resulting in n values. Determine the maximum possible median of these n values.

The median of an array of length n is the $\lceil \frac{n}{2} \rceil$-th **largest** element in the array. For example, the median of array $[3, 4, 2]$ is 3 and the median of array $[1, 1, 4, 5, 1, 4]$ is 4.

Input

The first line contains the number of test cases T ($1 \le T \le 10^5$). The description of the test cases follows.

The first line of each test case contains one integer n ($1 \le n \le 10^5$).

The second line of each test case contains n integers $a_1, a_2, \ldots, a_n$ ($-10^9 \le a_i \le 10^9$).

The third line of each test case contains n integers $b_1, b_2, \ldots, b_n$ ($-10^{18} \le b_i \le 10^{18}$).

The fourth line of each test case contains n integers $c_1, c_2, \ldots, c_n$ ($-10^9 \le c_i \le 10^9$).

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 maximum possible median value.

Example

standard input	standard output
3 5 0 5 -2 1 2 9 -4 0 10 5 -4 -1 4 -2 4 10 -6 3 1 0 6 -2 -4 3 0 10 22 65 11 1 -34 -1 -39 -28 25 24 10 9 1 -2 -5 8 -7 -10 -7 -7 1 101 48763 651	9 25 114514