

Problem K. Maximize the Minimum

Input file: *standard input*
Output file: *standard output*
Time limit: 4 seconds
Memory limit: 512 mebibytes

You have an array a of length n and an array b of length m . You can choose to remove some elements from the arrays. Removing element a_i costs c_i coins, and removing element b_j costs d_j coins. Importantly, there should be **at least one** element left in a and **at least one** left in b .

When you are done removing the elements, you compute the following value:

$$\min_{\substack{1 \leq i \leq n \\ 1 \leq j \leq m}} |a_i - b_j|.$$

You want to maximize this value. What is the maximum value you can get if you can spend at most s coins in total?

Input

The first line contains an integer t ($1 \leq t \leq 2 \cdot 10^5$), the number of test cases. The test cases follow.

The first line of each test case contains integers n ($1 \leq n \leq 2 \cdot 10^5$), m ($1 \leq m \leq 2 \cdot 10^5$) and s ($0 \leq s \leq 10^{18}$). The next four lines contain integer arrays a , b , c , d , in this order ($-10^9 \leq a_i, b_j \leq 10^9$; $1 \leq c_i, d_j \leq 10^{12}$). The arrays a and c have length n . The arrays b and d have length m .

The sum of n over all test cases does not exceed $2 \cdot 10^5$. The sum of m over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, print the maximum possible value you can get.

Example

<i>standard input</i>	<i>standard output</i>
2	14
1 4 10	3
15	
1 6 9 13	
8	
3 1 2 4	
5 4 4	
-1 5 3 2 -4	
-7 8 6 2	
2 3 1 1 2	
3 1 1 1	