Problem

Chef has two arrays A and B of the same size N.

In one operation, Chef can:

- Choose two integers i and j $(1 \leq i, j \leq N)$ and swap the elements A_i and B_j.

Chef came up with a task to find the **minimum** possible value of $(A_{max} - A_{min})$ after performing the swap operation any (possibly zero) number of times.

Since Chef is busy, can you help him solve this task?

Note that A_{max} and A_{min} denote the maximum and minimum elements of the array A respectively.

Input Format

- The first line of input will contain a single integer T, denoting the number of test cases.
- Each test case consists of multiple lines of input.
  - The first line of each test case contains one integer N — the number of elements in each array.
  - The second line consists of N space-separated integers $A_1, A_2, \ldots, A_N$ denoting the elements of the array A.
  - The third line consists of N space-separated integers $B_1, B_2, \ldots, B_N$ denoting the elements of the array B.
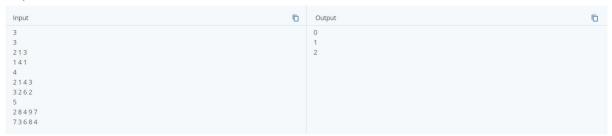
Output Format

For each test case, output on a new line, the **minimum** possible value of $(A_{max} - A_{min})$ in the array A after doing swap operation any number of times.

Constraints

- $1 \leq T \leq 10^5$
- $1 \leq N \leq 2 \cdot 10^5$
- $1 \leq A_i, B_i \leq 10^9$
- The sum of N over all test cases won't exceed $2 \cdot 10^5$.

Sample 1:

Input	Output
3 3 2 1 3 1 4 1 4 2 1 4 3 3 2 6 2 5 2 8 4 9 7 7 3 6 8 4	0 1 2

Explanation:

Test case 1: Chef can make the following operations:
- Operation 1: Choose $i = 1$ and $j = 1$ and swap A_1 with B_1.
- Operation 2: Choose $i = 3$ and $j = 3$ and swap A_3 with B_3.

By doing the above operations, array A becomes $[1, 1, 1]$. Here $(A_{max} - A_{min}) = 0$. It can be shown that this is the minimum value possible.

Test case 2: Chef can make the following operations:

- Operation 1: Choose $i = 2$ and $j = 2$ and swap A_2 with B_2.
- Operation 2: Choose $i = 3$ and $j = 1$ and swap A_3 with B_1.
- Operation 3: Choose $i = 4$ and $j = 4$ and swap A_4 with B_4.
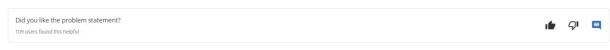
By doing the above operations, array A becomes $[2, 2, 3, 2]$. Here $(A_{max} - A_{min}) = 1$. It can be shown that this is the minimum value possible.

Test case 3: Chef can make the following operations:

- Operation 1: Choose $i = 1$ and $j = 1$ and swap A_1 with B_1.
- Operation 2: Choose $i = 3$ and $j = 4$ and swap A_3 with B_4.

By doing the above operations, array A becomes $[7, 8, 8, 9, 7]$. Here $(A_{max} - A_{min}) = 2$. It can be shown that this is the minimum value possible.

✔ Accepted	📄 Submissions	◎ Accuracy
3350	9989	36.1

Did you like the problem statement?

109 users found this helpful

👍 👎 💬

More Info ^

Date Added
27-12-2022

Time limit
1 secs

Source Limit
50000 Bytes

Languages
CPP17, CPP14, PYTH 3, C, JAVA, PYP3, PYTH, CS2, NODEJS, GO, JS, TEXT, PHP, kotlin, RUBY, rust, PYPY, PAS fpc, HASK, SCALA, swift, PERL, SQLQ, D, LUA, BASH, LISP sbcl, ADA, R, TCL, SQL, PRLG, FORT, PAS gpc, FS, SCM qobi, CLPS, NICE, CLOJ, PERL6, CAML, SCM chicken, ICON, ICK, ST, WSPC, NEM, LISP clisp, COB, ERL, BF, ASM, PIKE, SCM guile

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