



USACO 2026 SECOND CONTEST, GOLD PROBLEM 1. BALANCING THE BARNS

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 Time Remaining: **3 hrs, 57 min, 57 sec**

Not submitted yet

[English \(en\)](#)

Farmer John has N ($1 \leq N \leq 5 \cdot 10^4$) barns arranged along a road. The i -th barn contains a_i bales of hay and b_i bags of feed ($0 \leq a_i, b_i \leq 10^9$).

Bessie has been complaining about the inequality between barns. She defines the "imbalance" of the farm as the difference between the maximum hay in any barn and the minimum feed in any barn. Formally, the imbalance is $\max(a) - \min(b)$.

To address Bessie's concerns, Farmer John can perform exactly K ($1 \leq K \leq 10^{18}$) transfers. In each transfer, he selects a barn i , sells one of its haybales, and buys it a new bag of feed for the same barn. Note that there can be negative amounts in his farm (he is not afraid of debt). Formally, K times, you choose an index $i \in [1, N]$, decrement a_i , and increment b_i .

Help Farmer John determine the minimum possible imbalance after performing exactly K transfers.

INPUT FORMAT (input arrives from the terminal / stdin):

The first line contains T ($1 \leq T \leq 10^3$), the number of independent test cases.

The first line of each test case contains N and K .

The following line contains $a_1 \dots a_N$.

The following line contains $b_1 \dots b_N$.

The sum of N over all test cases is at most $5 \cdot 10^4$.

OUTPUT FORMAT (print output to the terminal / stdout):

For each test case, output a single integer, the minimum possible value of $\max(a) - \min(b)$ after performing K operations.

SAMPLE INPUT:

```
4
1 10
5
3
2 6
100 96
0 4
3 3
1 1 2
0 0 1
3 3
1 2 2
0 1 1
```

SAMPLE OUTPUT:

```
-18
90
0
0
```

In the first test case, Farmer John can transfer 10 haybales from barn 1 into bags of feed. This leaves $a = [-5]$ and $b = [13]$. The imbalance is $\max(a) - \min(b) = -5 - 13 = -18$.

In the second test case, Farmer John can transfer 5 haybales from barn 1 and 1 haybale from barn 2. This leaves $a = [95, 95]$ and $b = [5, 5]$. The imbalance is $95 - 5 = 90$. This is the minimum imbalance Farmer John can achieve.

SCORING:

- Inputs 2-4: $K \leq 500$, sum of N over all testcases is ≤ 500
- Inputs 5-8: Sum of N over all testcases is ≤ 500
- Inputs 9-13: No additional constraints.

Problem credits: Rohin Garg

Language:

C

Source File:

选取文件 未选择文件

Submit Solution