Home

Scoreboard

Ends in 2h 57m 38s
Score: 0 / 100 points
Rank: 1st out of 6,192

PROBLEMS

A1: Ready, Go (Part 1) 8 pt

A2: Ready, Go (Part 2) 9 pt

B: Meta Game 18 pt

C: Wiki Race 24 pt

D: Tower Rush 41 pt

FAQ

My Clarifications

Problem B: Meta Game

Validate Solution & Submit

18 points

Problem | My Submissions

Hacker Cup contest strategy often involves a metagame, where choosing which problems to work on might just be an important decision. On a Quest to become more Pro, you encounter an oracle promising to teach you the contest meta if you play her own Meta-game.

The oracle presents a peg board with $2N$ moving dots. The initial y-positions of the dots are given as two arrays $A_{1..N}$ and $B_{1..N}$. Each second, simultaneously, A_1 will move to the end of B, while B_1 will move to the end of A (with all elements shifting left accordingly).

You can connect the dots to form a *Meta-like logo* if all of the following are true:

- For the first half of both arrays, each dot in A is below the corresponding dot in B.
- For the last half of both arrays, each dot in A is above the corresponding dot in B.
- A equals the reverse of B.

Formally:

- $A_i < B_i$ for every $i < (N+1)/2$
- $A_i > B_i$ for every $i > (N+1)/2$
- $A_i = B_{N-i+1}$ for every $i = 1..N$

Note that if N is odd, the arrays' middle elements are not subject to the first two constraints.

The following is a visualization of a Meta-like logo (corresponding to the first sample case), with dots in

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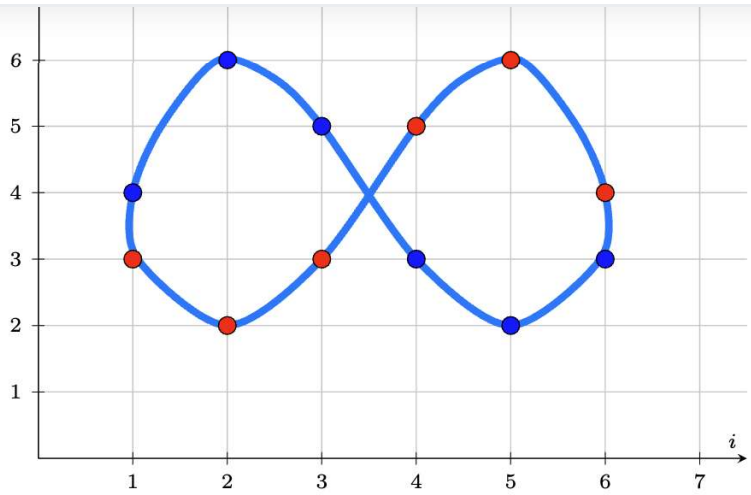

You must answer the oracle: how many seconds must pass before a Meta-like logo appears? If one never appears, output -1.

Constraints

$1 \leq T \leq 400$
$2 \leq N \leq 2{,}000{,}000$
$0 \leq A_i, B_i \leq 1{,}000{,}000{,}000$

The sum of N across all test cases is at most $9{,}000{,}000$.

Input Format

Input begins with an integer T, the number of test cases. For each case, there is first a line containing a single integer N. Then, there is a line containing integers $A_1, ..., A_N$. Then, there is a line containing integers $B_1, ..., B_N$.

Output Format

For the ith test case, print "`Case #i: `" followed by a single integer, the number of seconds that must pass before a Meta-like logo appears, or -1 if that will never happen.

Sample Explanation

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The second case is not initially a Meta-like logo, for several reasons. One reason is that it is not symmetric. Specifically, the $[3, 3, 2, 3, 5, 6]$ is not the reverse of $[4, 4, 6, 5, 3, 2]$. After 1 second though, this case turns into the case above and is Meta-like.

The third and fourth cases will never turn into a Meta-like logo, no matter how many seconds we wait.

In the fifth case, after 6 seconds we see the first Meta-like logo. In this case $A = [1, 1, 2, 2]$ and $B = [2, 2, 1, 1]$.

Sample Input

```
8
6
3 2 3 5 6 4
4 6 5 3 2 3
6
3 3 2 3 5 6
4 4 6 5 3 2
6
4 3 2 3 5 6
3 4 6 5 3 2
2
1 1
1 1
4
2 2 2 2
1 1 1 1
5
3 3 3 3 3
1 1 1 1 1
5
3 3 3 3 3
1 1 1 1 3
5
1 1 1 1 3
3 3 3 3 3
```

Sample Output

```
Case #1: 0
Case #2: 1
Case #3: -1
Case #4: -1
Case #5: 6
Case #6: -1
Case #7: 7
Case #8: 2
```

Validate Solution & Submit