Problem 1503: Last Moment Before All Ants Fall Out of a Plank

Problem Information

Difficulty: Medium
Acceptance Rate: 68.24%
Paid Only: No
Tags: Array, Brainteaser, Simulation

Problem Description

We have a wooden plank of the length `n` **units**. Some ants are walking on the plank, each ant moves with a speed of **1 unit per second**. Some of the ants move to the **left** , the other move to the **right**.

When two ants moving in two **different** directions meet at some point, they change their directions and continue moving again. Assume changing directions does not take any additional time.

When an ant reaches **one end** of the plank at a time `t`, it falls out of the plank immediately.

Given an integer `n` and two integer arrays `left` and `right`, the positions of the ants moving to the left and the right, return _the moment when the last ant(s) fall out of the plank_.

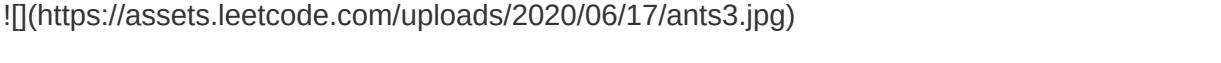
Example 1:

Input: n = 4, left = [4,3], right = [0,1] **Output:** 4 **Explanation:** In the image above: -The ant at index 0 is named A and going to the right. -The ant at index 1 is named B and going to the right. -The ant at index 3 is named C and going to the left. -The ant at index 4 is named D and going to the left. The last moment when an ant was on the plank is t = 4 seconds. After that, it falls immediately out of the plank. (i.e., We can say that at t = 4.0000000001, there are no ants on the plank).

Example 2:

Input: n = 7, left = [], right = [0,1,2,3,4,5,6,7] **Output:** 7 **Explanation:** All ants are going to the right, the ant at index 0 needs 7 seconds to fall.

Example 3:



Input: n = 7, left = [0,1,2,3,4,5,6,7], right = [] **Output:** 7 **Explanation:** All ants are going to the left, the ant at index 7 needs 7 seconds to fall.

Constraints:

* `1 <= n <= 104` * `0 <= left.length <= n + 1` * `0 <= left[i] <= n` * `0 <= right.length <= n + 1` * `0 <= right[i] <= n` * `1 <= left.length + right.length <= n + 1` * All values of `left` and `right` are unique, and each value can appear **only in one** of the two arrays.

Code Snippets

C++:

```
class Solution {
public:
int getLastMoment(int n, vector<int>& left, vector<int>& right) {

}
};
```

Java:

```
class Solution {
public int getLastMoment(int n, int[] left, int[] right) {

}
}
```

Python3:

```
class Solution:
def getLastMoment(self, n: int, left: List[int], right: List[int]) -> int:
```