Competitive Programming

Lec 4 Two Pointers

Remove Duplicates from Sorted Array

Given a sorted array, remove the duplicates in place such that each element appears only once and return the new length.
Note that even though we want you to return the new length, make sure to change the original array as well in place

Do not allocate extra space for another array, you must do this in place with constant memory.

A = [1, 1, 2, 3, 3, 4, 4, 4]

Ans = [1,2,3,4]

Solution Link

CODEFORCES

BerSU Ball

The Berland State University is hosting a ballroom dance in celebration of its 100500-th anniversary! n boys and m girls are already busy rehearsing waltz, minuet, polonaise and quadrille moves.

We know that several boy&girl pairs are going to be invited to the ball. However, the partners' **dancing skill in each pair must differ by at most one**.

For each boy, we know his dancing skills. Similarly, for each girl we know her dancing skills. Write a code that can determine the **largest possible number of pairs that can be formed from n boys and m girls**.

BerSU Ball

Test case 1:
4
1 4 6 2
5
5 1 5 7 9

Output: 3

Test case 2:
5
1 1 1 1 1
3
1 2 3

Output: 2

Solution Link

Balanced Team

You are a coach at your local university. There are **N** students under your supervision, the programming skill of the i-th student is **A[i]**.

You have to create a team for a new programming competition. As you know, the more students team has the more probable its victory is! So you have to create a team with the maximum number of students. **But you also know that a team should be balanced**. It means that the programming skill of each pair of students in a created team should differ by no more than 5.

Your task is to report the **maximum possible number of students in a balanced team**.

Balanced Team

Input:
6
1 10 17 12 15 2
Output: 3

Input:
10
1337 1337 1337 1337 1337 1337 1337 1337 1337 1337
Output: 10

Input:
6
1 1000 10000 10 100 1000000000
Output: 1

Solution Link

Container With Most Water

Given **n non-negative integers a1, a2, ..., an,**

where each represents a point at coordinate (i, ai).

'n' vertical lines are drawn such that the two endpoints of line i is at (i, ai) and (i, 0).

Find two lines, which together with x-axis forms a container, such that the container contains the most water.

Your program should return an integer which corresponds to the maximum area of water that can be contained (Yes, we know maximum area instead of maximum volume sounds weird. But this is 2D plane we are working with for simplicity).

Solution Link

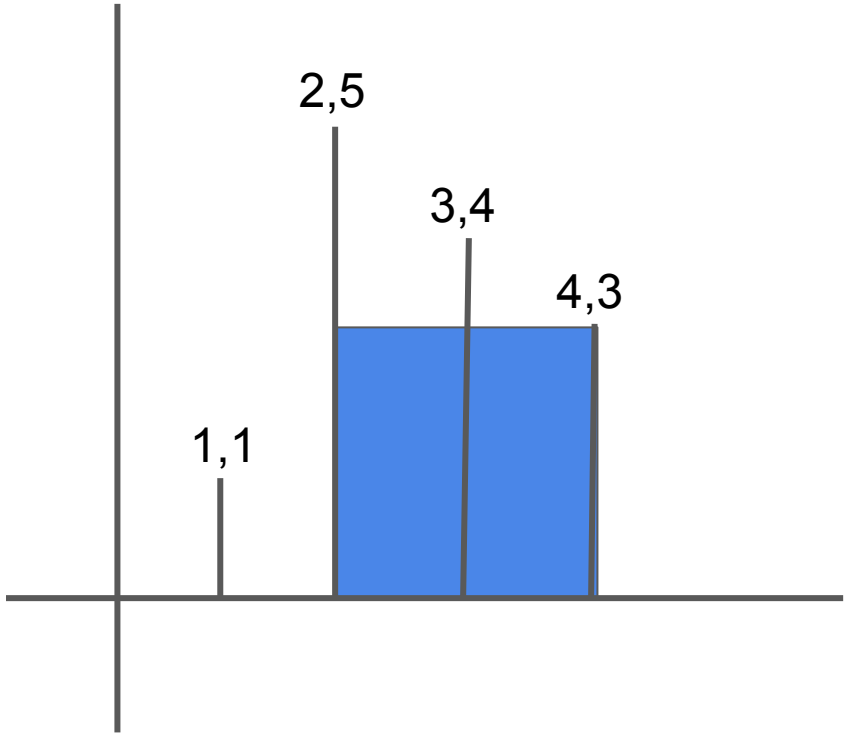
Container With Most Water

Input : [1, 5, 4, 3]

Output : 6

Explanation : 5 and 3 are distance 2 apart. So size of the base = 2. Height of container = min(5, 3) = 3.

So total area = 3 * 2 = 6



Homework

Problem Name	Difficulty Level	Hint/Comment
Sereja and Dima	Easy	-
Diffk	Easy	-
Minimize the absolute difference	Easy	Microsoft