

Array Assignment(Basic Array,Prefix Sum,Carry Forward)

Q1. Max Min of an Array

Problem Description

- Given an array A of size N.
- You need to find the sum of the Maximum and Minimum elements in the given array.

Problem Constraints

$$1 \leq N \leq 105$$

$$-109 \leq A[i] \leq 109$$

Example Input

Input 1:

A = [-2, 1, -4, 5, 3]

Input 2:

A = [1, 3, 4, 1]

Example Output

Output 1:

1

Output 2:

5

Example Explanation

Explanation 1:

Maximum Element is 5 and Minimum element is -4. $(5 + (-4)) = 1$.

Explanation 2:

Maximum Element is 4 and Minimum element is 1. $(4 + 1) = 5$.

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Q2. Linear Search - Multiple Occurences

Problem Description

Given an array A and an integer B, find the number of occurrences of B in A.

Problem Constraints

$1 \leq B, A_i \leq 109$

$1 \leq \text{length}(A) \leq 105$

Example Input

Input 1:

A = [1, 2, 2], B = 2

Input 2:

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

Example Output

Output 1:

2

Output 2:

0

Example Explanation

Explanation 1:

Element at index 2, 3 is equal to 2 hence count is 2.

Explanation 2:

There is no element equal to 3 in the array.

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Q3. Range Sum Query

Problem Description

- You are given an integer array A of length N.
- You are also given a 2D integer array B with dimensions M x 2, where each row denotes a [L, R] query.
- For each query, you have to find the sum of all elements from L to R in A (0 - indexed).
- More formally, find $A[L] + A[L + 1] + A[L + 2] + \dots + A[R - 1] + A[R]$ for each query.

Problem Constraints

$$1 \leq N, M \leq 10^3$$

$$1 \leq A[i] \leq 10^5$$

$$0 \leq L \leq R < N$$

Example Input

Input 1:

A = [1, 2, 3, 4, 5]

B = [[0, 3], [1, 2]]

Input 2:

A = [2, 2, 2]

B = [[0, 0], [1, 2]]

Example Output

Output 1:

[10, 5]

Output 2:

[2, 4]

Example Explanation

Explanation 1:

The sum of all elements of $A[0 \dots 3] = 1 + 2 + 3 + 4 = 10$.

The sum of all elements of $A[1 \dots 2] = 2 + 3 = 5$.

Explanation 2:

The sum of all elements of $A[0 \dots 0] = 2 = 2$.

The sum of all elements of $A[1 \dots 2] = 2 + 2 = 4$.

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Q4. Time to equality

Problem Description

- Given an integer array A of size N .
- In one second, you can increase the value of one element by 1.
- Find the minimum time in seconds to make all elements of the array

equal.

Problem Constraints

$1 \leq N \leq 1000000$

$1 \leq A[i] \leq 1000$

Example Input

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

Example Output

8

Example Explanation

We can change the array $A = [4, 4, 4, 4, 4]$. The time required will be 8 seconds.

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Q5. In-place Prefix Sum

Problem Description

- Given an array A of N integers.
- Construct the prefix sum of the array in the given array itself.

Problem Constraints

$1 \leq N \leq 105$

$1 \leq A[i] \leq 103$

Example Input

Input 1:

$A = [1, 2, 3, 4, 5]$

Input 2:

$A = [4, 3, 2]$

Example Output

Output 1:

$[1, 3, 6, 10, 15]$

Output 2:

$[4, 7, 9]$

Example Explanation

Explanation 1:

The prefix sum array of [1, 2, 3, 4, 5] is [1, 3, 6, 10, 15].

Explanation 2:

The prefix sum array of [4, 3, 2] is [4, 7, 9].

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Q6. Product array puzzle

Problem Description

- Given an array of integers A, find and return the product array of the same size where the i th element of the product array will be equal to the product of all the elements divided by the i th element of the array.
- Note: It is always possible to form the product array with integer (32 bit) values. Solve it without using the division operator.

Constraints

$2 \leq \text{length of the array} \leq 1000$

$1 \leq A[i] \leq 10$

For Example

Input 1:

A = [1, 2, 3, 4, 5]

Output 1:

[120, 60, 40, 30, 24]

Input 2:

A = [5, 1, 10, 1]

Output 2:

[10, 50, 5, 50]

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Q7. Leaders in an array

Problem Description

- Given an integer array A containing N distinct integers, you have to find all the leaders in array A. An element is a leader if it is strictly greater than all the elements to its right side.

NOTE: The rightmost element is always a leader.

Problem Constraints

$1 \leq N \leq 105$

$1 \leq A[i] \leq 108$

Example Input

Input 1:

A = [16, 17, 4, 3, 5, 2]

Input 2:

A = [5, 4]

Example Output

Output 1:

[17, 2, 5]

Output 2:

[5, 4]

Example Explanation

Explanation 1:

Element 17 is strictly greater than all the elements on the right side to it.
Element 2 is strictly greater than all the elements on the right side to it.
Element 5 is strictly greater than all the elements on the right side to it.

So we will return these three elements i.e [17, 2, 5], we can also return [2, 5, 17] or [5, 2, 17] or any other ordering.

Explanation 2:

Element 5 is strictly greater than all the elements on the right side to it.

Element 4 is strictly greater than all the elements on the right side to it.

So we will return these two elements i.e [5, 4], we can also do any other ordering.

