SRISHA S

B.E COMPUTER SCIENCE & DESIGN

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WEEK 13

Problem Statement 1:

Given an array of numbers, nd the index of the smallest array element (the pivot), for which the sums of all elements to the left and to the right are equal. The array may not be reordered.

Example: arr=[1,2,3,4,6]

•the sum of the rst three elements, 1+2+3=6. The value of the last element is 6.

• Using zero based indexing, arr[3]=4 is the pivot between the two subarrays.

• The index of the pivot is 3.

Function Description:

Complete the function balancedSum in the editor below. balancedSum has the following parameter(s): int arr[n]: an array of integers Returns: int: an integer representing the index of the pivot

Constraints:

• 3 ≤ n ≤ 105

• 1 ≤ arr[i] ≤ 2 × 104, where 0 ≤ i < n

• It is guaranteed that a solution always exists.

Input Format for Custom Testing

Input from stdin will be processed as follows and passed to the function. The rst line contains an integer n, the size of the array arr. Each of the next n lines contains an integer, arr[i], where 0 ≤ i < n.

Sample Input:

STDIN Function Parameters

----- ----------

4 → arr[] size n = 4

1 → arr = [1, 2, 3, 3]

2

3

3

Sample Output 0

2

Explanation 0

- **The sum of the rst two elements, 1+2=3. The value of the last element is 3.**
- **Using zero based indexing, arr[2]=3 is the pivot between the two subarrays.**
- **The index of the pivot is 2.**

Answer: (penalty regime: 0 %)

Reset answer

```
/*
 * Complete the 'balancedSum' function below.
 *
 * The function is expected to return an INTEGER.
 * The function accepts INTEGER_ARRAY arr as parameter.
 */

int balancedSum(int arr_count, int* arr)
{
int totalsum=0;
for(int i=0;i<arr_count;i++){
    totalsum+=arr[i];
}
int leftsum=0;
for(int i=0;i<arr_count;i++){
    int rightsum=totalsum-leftsum-arr[i];
    if(leftsum==rightsum){
        return i;
    }
    leftsum+=arr[i];
}
return 1;
}
```

	Test	Expected	Got	
✓	int arr[] = {1,2,3,3}; printf("%d", balancedSum(4, arr))	2	2	✓

Passed all tests! ✓

Problem Statement 2:

Calculate the sum of an array of integers.

Example:

numbers = [3, 13, 4, 11, 9]

The sum is 3 + 13 + 4 + 11 + 9 = 40.

Function Description

Complete the function arraySum in the editor below.

arraySum has the following parameter(s):

int numbers[n]: an array of integers

Returns

int: integer sum of the numbers array

Constraints:

- **1 ≤ n ≤** 10^4
- **1 ≤ numbers[i] ≤** 10^4

Input Format for Custom Testing

Input from stdin will be processed as follows and passed to the function. The first line contains an integer n, the size of the array numbers.Each of the next n lines contains an integer numbers[i] where 0 ≤ i < n.

Sample Input

5 → numbers[] size n = 5

1 → numbers = [1, 2, 3, 4, 5]

2

3

4

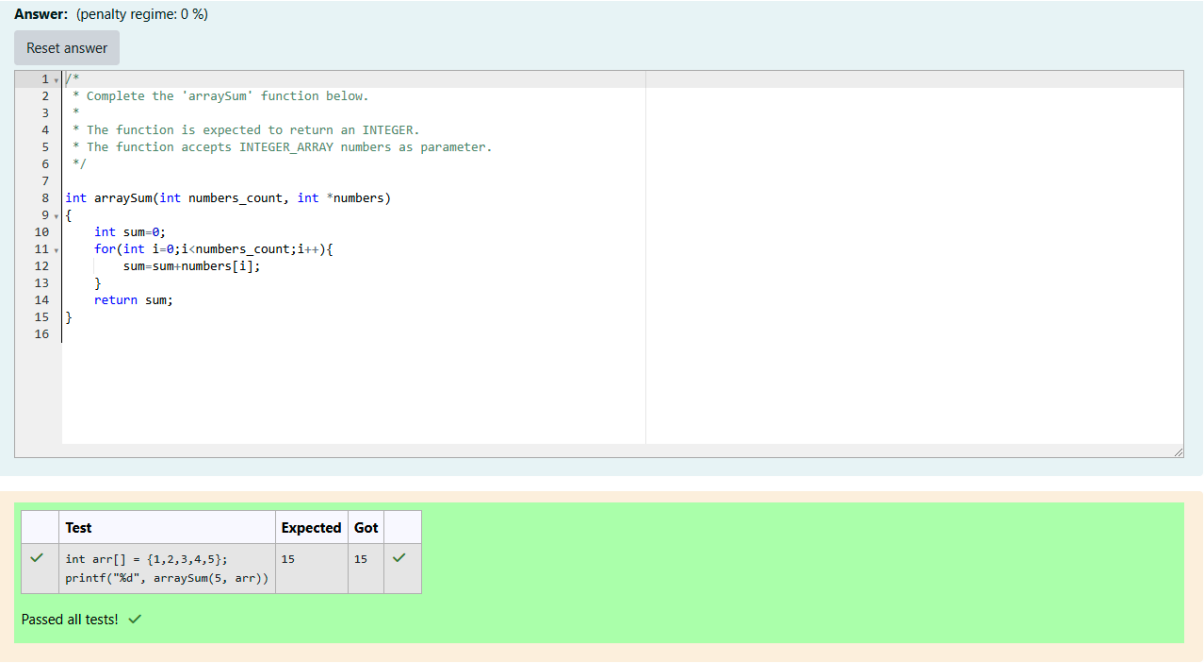
5

Sample Output

15

Explanation

1 + 2 + 3 + 4 + 5 = 15.



Problem Statement 3:

Given an array of n integers, rearrange them so that the sum of the absolute differences of all adjacent elements is minimized. Then, compute the sum of those absolute differences.

Example

n = 5, arr = [1, 3, 3, 2, 4]

If the list is rearranged as arr' = [1, 2, 3, 3, 4], the absolute dierences are |1 - 2| = 1, |2 - 3| = 1,|3 - 3| = 0, |3 - 4| = 1. The sum of those dierences is 1 + 1 + 0 + 1 = 3.

Function Description

Complete the function minDi in the editor below. minDi has the following parameter: arr: an integer array

Returns:

int: the sum of the absolute dierences of adjacent elements

Constraints

2 ≤ n ≤105

0 ≤ arr[i] ≤ 109, where 0 ≤ i < n

Format For Custom Testing

The rst line of input contains an integer, n, the size of arr. Each of the following n lines contains an integer that describes arr[i] (where 0 ≤ i < n) .

Sample Input For Custom Testing

5 → arr[] size n = 5

5 → arr[] = [5, 1, 3, 7, 3]

1

3

7

3

Sample Output

6

Explanation

n = 5, arr = [5, 1, 3, 7, 3] If arr is rearranged as arr' = [1, 3, 3, 5, 7], the dierences are minimized. The nal answer is |1 - 3| + |3 - 3| + |3 - 5| + |5 - 7| = 6

Answer: (penalty regime: 0 %)

Reset answer

```c
/*
 * Complete the 'minDiff' function below.
 *
 * The function is expected to return an INTEGER.
 * The function accepts INTEGER_ARRAY arr as parameter.
 */
#include<stdlib.h>
int compare(const void*a,const void *b){
    return (*(int*)a-*(int*)b);
}
int minDiff(int arr_count, int* arr)
{
    qsort(arr,arr_count,sizeof(int),compare);
    int totaldiff=0;
    for(int i=1;i<arr_count;i++){
        totaldiff+=abs(arr[i]-arr[i-1]);
    }
    return totaldiff;
}
```

	Test	Expected	Got	
✓	int arr[] = {5, 1, 3, 7, 3}; printf("%d", minDiff(5, arr))	6	6	✓

Passed all tests! ✓