

ECE-D

Problem Statement:

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

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:

- $3 \leq n \leq 105$
- $1 \leq \text{arr}[i] \leq 2 \times 10^4$, where $0 \leq i < n$
- 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 first line contains an integer n , the size of the array `arr`. Each of the next n lines contains an integer, `arr[i]`, where $0 \leq i < n$.

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 first two elements, $1+2=3$. The value of the last element is 3.
- Using zero based indexing, $\text{arr}[2]=3$ is the pivot between the two subarrays.
- The index of the pivot is 2.

```

1  /*
2   * Complete the 'balancedSum' function below.
3   *
4   * The function is expected to return an INTEGER.
5   * The function accepts INTEGER_ARRAY arr as parameter.
6   */
7
8  int balancedSum(int arr_count, int* arr)
9  {
10     int totalsum = 0;
11     for (int i =0;i<arr_count;i++){
12         totalsum += arr[i];
13     }
14     int leftsum =0;
15     for(int i =0;i<arr_count;i++){
16         int rightsum = totalsum - leftsum -arr[i];
17         if(leftsum==rightsum){
18             return i;
19         }
20         leftsum +=arr[i];
21     }
22     return 1;
23 }
24

```

	Test	Expected	Got	
✓	int arr[] = {1,2,3,3};	2	2	✓

Question 2: Sum Them All

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:

- $1 \leq n \leq 10^4$
- $1 \leq \text{numbers}[i] \leq 10^4$

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 $0 \leq i < n$.

Sample Input

5 \rightarrow `numbers[]` size $n = 5$

1 \rightarrow `numbers = [1, 2, 3, 4, 5]`

2

3

4

5

Sample Output

15

Explanation

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

```
1  /*
2   * Complete the 'arraySum' function below.
3   *
4   * The function is expected to return an INTEGER.
5   * The function accepts INTEGER_ARRAY numbers as parameter.
6   */
7
8  int arraySum(int numbers_count, int *numbers)
9  {
10     int sum =0;
11     for (int i =0;i<numbers_count;i++){
12         sum = sum+numbers[i];
13     }
14     return sum;
15 }
16
```

	Test	Expected	Got	
✓	int arr[] = {1,2,3,4,5};	15	15	✓

Question 3:**Minimum Difference Sum**

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

$n = 5$, $\text{arr} = [1, 3, 3, 2, 4]$

If the list is rearranged as $\text{arr}' = [1, 2, 3, 3, 4]$, the absolute differences are $|1 - 2| = 1$, $|2 - 3| = 1$, $|3 - 3| = 0$, $|3 - 4| = 1$. The sum of those differences is $1 + 1 + 0 + 1 = 3$.

Function Description

Complete the function `minDiff` in the editor below.

`minDiff` has the following parameter:

`arr`: an integer array

Returns:

`int`: the sum of the absolute differences of adjacent elements

Constraints

$2 \leq n \leq 105$

$0 \leq \text{arr}[i] \leq 109$, where $0 \leq i < n$

Format For Custom Testing

The first 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 $0 \leq i < n$).

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 differences are minimized.

The final answer is $|1 - 3| + |3 - 3| + |3 - 5| + |5 - 7| = 6$.

```
2  * Complete the 'minDiff' function below.
3  *
4  * The function is expected to return an INTEGER.
5  * The function accepts INTEGER_ARRAY arr as parameter.
6  */
7  #include <stdlib.h>
8  int compare(const void *a, const void *b){
9      return (*(int*)a - *(int*)b);
10 }
11 int minDiff(int arr_count, int* arr)
12 {
13     qsort(arr, arr_count, sizeof(int), compare);
14     int totaldiff=0;
15     for(int i =1;i<arr_count;i++){
16         totaldiff += abs(arr[i]-arr[i-1]);
17     }
18     return totaldiff;
19 }
20
```

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