

AVAILABLE LESSONS:

Lesson 1

Time Complexity

Lesson 2

Counting
Elements

Lesson 3

Prefix Sums

Lesson 4

Sorting

Lesson 5

Stacks and
Queues

Lesson 6

Leader

Lesson 7

Maximum slice
problem

Lesson 8

Prime and
composite
numbers

Lesson 9

Sieve of
Eratosthenes

Lesson 10

PAINLESS

TapeEquilibrium

START

Minimize the value $| (A[0] + \dots + A[P-1]) - (A[P] + \dots + A[N-1]) |$.

Programming language: JavaScript ▼

A non-empty zero-indexed array A consisting of N integers is given. Array A represents numbers on a tape.

Any integer P , such that $0 < P < N$, splits this tape into two non-empty parts: $A[0], A[1], \dots, A[P-1]$ and $A[P], A[P+1], \dots, A[N-1]$.

The *difference* between the two parts is the value of: $| (A[0] + A[1] + \dots + A[P-1]) - (A[P] + A[P+1] + \dots + A[N-1]) |$

In other words, it is the absolute difference between the sum of the first part and the sum of the second part.

For example, consider array A such that:

```
A[0] = 3
A[1] = 1
A[2] = 2
A[3] = 4
A[4] = 3
```

We can split this tape in four places:

- $P = 1$, difference = $|3 - 10| = 7$
- $P = 2$, difference = $|4 - 9| = 5$
- $P = 3$, difference = $|6 - 7| = 1$
- $P = 4$, difference = $|10 - 3| = 7$

Write a function:

```
function solution(A);
```

that, given a non-empty zero-indexed array A of N integers, returns the minimal difference that can be achieved.

Euclidean algorithm
<i>Lesson 11</i> Fibonacci numbers
<i>Lesson 12</i> Binary search algorithm
<i>Lesson 13</i> Caterpillar method
<i>Lesson 14</i> Greedy algorithms
<i>Lesson 15</i> Dynamic programming
<i>Lesson 99</i> Future training

For example, given:

```
A[0] = 3
A[1] = 1
A[2] = 2
A[3] = 4
A[4] = 3
```

the function should return 1, as explained above.

Assume that:

- N is an integer within the range [2..100,000];
- each element of array A is an integer within the range [-1,000..1,000].

Complexity:

- expected worst-case time complexity is $O(N)$;
- expected worst-case space complexity is $O(N)$, beyond input storage (not counting the storage required for input arguments).

Elements of input arrays can be modified.

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