Lesson 3, Task 1: Tape Equilibrium

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], ..., A[P − 1] and A[P], A[P + 1], ..., A[N − 1].

The difference between the two parts is the value of: |(A[0] + A[1] + ... + A[P − 1]) − (A[P] + A[P + 1] + ... + 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:

int solution(int A[], int N);

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

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.