# UACC 1 P5 - A Lab Report

Time limit: 2.0s   **Memory limit:** 512M

After completing his physics lab, Lucas is tasked with creating a graph to illustrate his collected data. Lucas has gathered an array of N data points, $A_1, A_2, \ldots, A_N$, that are evenly spaced along the x-axis. Based on his research, Lucas knows that the data should be linear, with equal differences between adjacent data points. As a perfectionist, Lucas wants to create a graph that depicts this linear relationship, but he feels guilty about modifying the data too much. He has decided that he will only shift a group of contiguous data points all up or all down by 1 in a single operation. What is the minimum number of operations Lucas will need to perform to make his data linear?
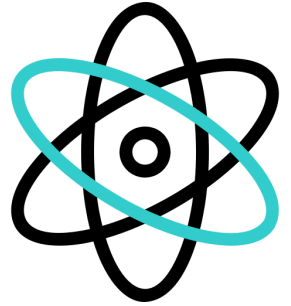
Constraints

$1 \le N \le 10^6$

$-10^9 \le A_i \le 10^9$

Input Specification

The first line contains N.

The next line contains N space-separated integers, $A_1, A_2, \ldots, A_N$.

Output Specification

Output the minimum number of operations needed.

Sample Input 1

```
5
1 2 4 6 10
```

Sample Output 1

```
2
```

Explanation for Sample Output 1

First, increase the subarray $[2, 4, 6]$ by 1. The data becomes $[1, 3, 5, 7, 10]$.

Next, decrease the subarray $[10]$ by 1. The data becomes $[1, 3, 5, 7, 9]$.

It can be proven that 2 is the minimum number of operations needed.

Sample Input 2

```
5
-2 -1 1 6 9
```

Sample Output 2

```
3
```

Explanation for Sample Output 2

First, increase the subarray $[-1, 1]$ by 1. The data becomes $[-2, 0, 2, 6, 9]$.

Next, increase the subarray $[0, 2]$ by 1. The data becomes $[-2, 1, 3, 6, 9]$.

Finally, decrease the subarray $[-2, 1]$ by 1. The data is now $[-3, 0, 3, 6, 9]$.

It can be proven that 3 is the minimum number of operations needed.