Optimal Gene Regulation

A gene with a higher expression level in cancer cells than in normal cells may be more involved in the cancer process and thus deserve more transcription factors to control its expression. Alternatively, a gene with a high differential expression between two conditions may indicate a significant change in its function or regulation and thus require more transcription factors to adjust its expression. There are n genes in a genome. Each gene is assigned an expression level or a differential expression value given in the integer array values.

You are assigning transcription factors to these genes subjected to the following requirements:

1. Each gene must have at least one transcription factor.
2. Genes with a higher expression level or differential expression get more transcription factors than their neighboring genes.

Return the minimum number of transcription factors you need to have to regulate the genes in the genome.

Input Format

Example 1:

Input: values = "0 2 4" Output: 6 Explanation: You can assign to the first, second and third gene with 1, 2, 3 transcription factors respectively.

Example 2:

Input: values = "4 4 2" Output: 4 Explanation: You can assign to the first, second and third gene with 1, 2, 1 transcription factors respectively. The first gene gets 1 transcription factor because it satisfies the above two conditions.

Input are given to the stdin.

Constraints

The length of the expression level array n , is between 1 and 2×10^4.

Expression levels are integers between 0 and 2×10^4.

Output Format

Write to the stdout the minimum number of transcription factors you need to have to regulate the genes in the genome as an integer.

Sample Input 0

```
0 2 4
```

Sample Output 0

```
6
```

Sample Input 1

```
3 3 1
```

Sample Output 1

```
4
```