

Problem ID: stumps

The next stop on your trip around the world is the beautiful village Baños de Agua Santa in Ecuador. Upon arrival you witness a huge catastrophe there. Baños is located on the foothills of the active Tungurahua volcano, which erupted just yesterday. Luckily no one was injured, but the whole city got covered in ashes. The cleanup has already begun, but there is still a lot of work to do.

The streets have already been cleared, but the rows of houses are more complicated. All houses in a street stand in one straight line. First, heavy bulldozers repeatedly moved over this line of houses from one end to the other carrying away more and more ashes. What remains is the least possible amount of ashes that – together with the underlying houses – still form a smooth surface for the bulldozers to cross. Bulldozers can only move along a horizontal surface or ascend and descend on ramps inclined at a 45 degree angle. Right now the bulldozers can still cross from left to right, but removing any more ashes would make this impossible (see the picture below).

Now that the work with the bulldozers is finished, the next step is to clean up the remaining ashes. You are given a side view of the street with the houses before the eruption. In order to help estimate the amount of work remaining, you have to determine the area that is covered with ashes when seen from this view.

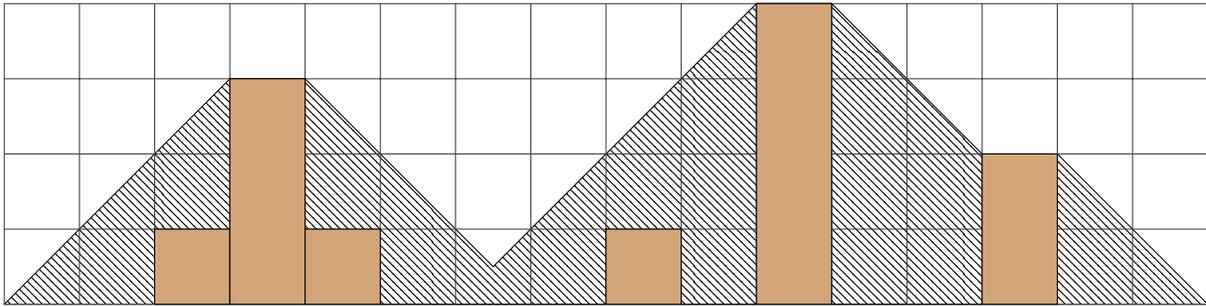


Figure 1: Side view of the second sample input.

Input

The input describes one row of houses with two lines:

- The integer n ($1 \leq n \leq 500\,000$), the number of height values along the street.
- The heights h_i ($0 \leq h_i \leq 500\,000$). The buildings in the interval $[i, i + 1]$ form a flat surface of height h_i . A height of 0 indicates the ground level.

Output

Print a single number – the area that is still covered by ashes after the bulldozers finished their work. Output the result with exactly two decimal digits.

Sample Input 1

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4
1 0 0 1
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Sample Output 1

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2.00
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Sample Input 2

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12
1 3 1 0 0 0 1 0 4 0 0 2
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Sample Output 2

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21.75
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