Destruction

SEASON 2021/2022 – SIXTH ROUND

– Make a wish! Blow the candles!

That's what Sashka said to Lime, who was standing in front of the candles on his birthday cake. Lime is turning N years old, so his cake has N candles numbered with integers from 1 to N, with the i-th candle having a wick of a_i centimeters long. Lime was very upset about the marathon task given at the fifth round of CodeIT, so he decided to take his anger out and destroy the candle wicks on the cake. To do this, he would use the gift from Sashka, namely a flamethrower. More precisely, the obliteration of the wicks will proceed as follows:

Lime will arrange the candles successively, in a sequence, in whatever order he wants. The leftmost candle in this arrangement is in position 1, and the rightmost candle in position N. Then, he will take out the flamethrower and start making shots with it. A shot is defined by its power and by the position it is taken. Each shot spreads to the left. If a shot has force $1 \leq p$ and is made at position $1 \leq i \leq N$, then p centimeters will be removed from the candle wick at position i, $p-1$ centimeters will be removed from the candle wick at position $i-1$ (if $i \geq 1$), ..., 1 centimeter will be removed from the candle wick at position $i-p+1$ (if $i-p+1 \geq 1$). If a candle wick remains of non-positive length, it is considered destroyed.

Lime really wants to destroy all candle wicks, but inflation has made the cost of fuel for the flamethrower too expensive even for his standards. Because of this, he wants to minimize the total force of all the shots needed to destroy the candle wicks. Write a program `destruction.cpp` that finds the minimum total force required for the destruction.

Input

On the first line of `destruction.in` is given the integer N. On the second line of the file are given N numbers, $a_1, a_2, a_3, \ldots, a_N$ respectively.

Output

On one line in the file `destruction.out` print one number – the minimum required total force for destruction of the candle wicks.

Constraints

$1 \leq N \leq 10^5$ (yes, Lime is immortal)

$1 \leq a_i \leq 10^9$

Time Limit: 0.4 sec.
Memory Limit: 256 MB.

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Sample testcases

Input (destruction.in)	Output (destruction.out)
4 1 2 1 2	4
8 6 9 5 2 10 6 6 7	11