

Task: WCA

Not Nim



XXIII OI, Stage II, Day two. Source file `wca.*` Available memory: 128 MB.

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Bythony and his little brother Bytie often play the game Nim. Bythony explained the winning strategy in Nim to his younger brother, but Bytie seems incapable of applying it, as he loses quite often. Therefore, little Bytie keeps suggesting alternative rules, hoping that these would facilitate the game.

His latest proposal is as follows: there are n pairs of heaps, where each heap in the i -th pair initially has a_i pebbles. The players move alternately. Each Bytie's move consists in removing any positive number of pebbles from a heap of his choice. Each Bythony's move on the other hand consists in moving any positive number of pebbles within a pair of heaps of his choice. Bytie moves first. The player who cannot make a move loses.

Bythony was quick to notice that he cannot hope to win this game, but he agreed to play nevertheless, to make his little brother happy. In fact, he intends to delay the inevitable defeat as much as possible, i.e., make as many moves as possible before he loses. Aid him by writing a program that will determine the maximum duration of the game when both players play optimally, i.e., when Bytie aims to win in the fewest number of moves, whereas Bythony aims to make as many moves as possible before losing.

Input

In the first line of the standard input, there is a single positive integer n that specifies the number of pairs of heaps. In the second line, there is a sequence of n positive integers a_1, a_2, \dots, a_n , separated by single spaces, that specify the common size of both heaps in successive pairs.

Output

In the only line of the standard output, a single integer should be printed: the number of moves until the game is over when both brothers are playing optimally.

Example

For the input data:

```
2
1 2
```

the correct result is:

```
7
```

Explanation of the example: One optimal sequence of moves is as follows:

1122 \rightarrow 1120 \rightarrow 1111 \rightarrow 1110 \rightarrow 1101 \rightarrow 1100 \rightarrow 2000 \rightarrow 0000

Sample Grading Tests:

1ocen: $n = 1$, $a_1 = 100$, result is 15,

2ocen: $n = 5$, all heaps have two pebbles, result is 21,

3ocen: $n = 3$, $a_1 = 10^7$, $a_2 = 10^8$, $a_3 = 10^9$, result is 163,

4ocen: $n = 3000$, $a_i = i$, result is 65 197,

5ocen: $n = 100\,000$, all heaps have only one stone, result is 200 001.

Grading

The set of tests consists of the following subsets. Within each subset, there may be several test groups. All subsets satisfy the condition $a_i \leq 1\,000\,000\,000$.

Subset	Property	Score
1	$n = 1$	10
2	suma of all $a_i \leq 10$	10
3	$n \leq 3$	20
4	$n \leq 3\,000$	20
5	$n \leq 500\,000$	40