

Task: KOR

Woodworms

UFAM Workshop, contest #2. Source file kor.* Available memory: 256 MB.

Two woodworms decided to eat an old wooden fence. The fence consists of n railings, which are not necessarily the same height. Woodworms heard from friendly termites, that nothing makes a meal more pleasant, than a little healthy competition. Therefore they decided to play a game and eat fence railings in turns. A woodworm, taking its turn, can eat one of the railings from the end of the fence or both of them at once. Knowing that, each woodworm chooses the railings so that the total of their heights, eaten during the whole game, to be as large as possible, calculate how much wood would be eaten by each of them.

Input

The first line of input contains an integer n ($1 \leq n \leq 1\,000\,000$), describing the number of railings in the fence. The second line contains a sequence of n integers h_i ($1 \leq h_i \leq 1\,000\,000\,000$), describing the lengths of consecutive fence railing.

Output

The first and only line of output should contain two integers. The first one denotes the total fence railing heights, which are the nourishment of the woodworm beginning the game, and the second, how much wood would fall in the share of its opponent.

Example

For the input data:

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4
5 2 9 3
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the correct result is:

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14 5
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Example explanation: In its first move, the first woodworm can choose a railing of a height of 5, of a height of 3, or both at once. The optimal move is eating railing measuring 5. The opponent then eats railings measuring 2 and 3.