D. Boxes And Balls

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Ivan has n different boxes. The first of them contains some balls of n different colors.

Ivan wants to play a strange game. He wants to distribute the balls into boxes in such a way that for every i ($1 \le i \le n$) i-th box will contain all balls with color i.

In order to do this, Ivan will make some turns. Each turn he does the following:

1. Ivan chooses any non-empty box and takes all balls from this box;
2. Then Ivan chooses any k empty boxes (the box from the first step becomes empty, and Ivan is allowed to choose it), separates the balls he took on the previous step into k non-empty groups and puts each group into one of the boxes. He should put each group into a separate box. He can choose either $k = 2$ or $k = 3$.

The *penalty* of the turn is the number of balls Ivan takes from the box during the first step of the turn. And *penalty* of the game is the total *penalty* of turns made by Ivan until he distributes all balls to corresponding boxes.

Help Ivan to determine the minimum possible *penalty* of the game!

Input

The first line contains one integer number n ($1 \le n \le 200000$) — the number of boxes and colors.

The second line contains n integer numbers a_1, a_2, ..., a_n ($1 \le a_i \le 10^9$), where a_i is the number of balls with color i.

Output

Print one number — the minimum possible *penalty* of the game.

Examples

input
3 1 2 3
output
6

input
4 2 3 4 5
output
19

Note

In the first example you take all the balls from the first box, choose $k = 3$ and sort all colors to corresponding boxes. Penalty is 6.

In the second example you make two turns:

1. Take all the balls from the first box, choose $k = 3$, put balls of color 3 to the third box, of color 4 — to the fourth box and the rest put back into the first box. Penalty is 14;
2. Take all the balls from the first box, choose $k = 2$, put balls of color 1 to the first box, of color 2 — to the second box. Penalty is 5.

Total penalty is 19.