J. AND, OR and square sum

time limit per test: 2 seconds

memory limit per test: 512 megabytes

Gottfried learned about binary number representation. He then came up with this task and presented it to you.

You are given a collection of n non-negative integers $a_1, \ldots, a_n$. You are allowed to perform the following operation: choose two distinct indices $1 \leq i, j \leq n$. If before the operation $a_i = x$, $a_j = y$, then after the operation $a_i = x$ AND y, $a_j = x$ OR y, where AND and OR are bitwise AND and OR respectively (refer to the Notes section for formal description). The operation may be performed any number of times (possibly zero).

After all operations are done, compute $\sum_{i=1}^{n} a_i^2$ — the sum of squares of all a_i. What is the largest sum of squares you can achieve?

Input

The first line contains a single integer n ($1 \leq n \leq 2 \cdot 10^5$).

The second line contains n integers $a_1, \ldots, a_n$ ($0 \leq a_i < 2^{20}$).

Output

Print a single integer — the largest possible sum of squares that can be achieved after several (possibly zero) operations.

Examples

input	Copy
1 123	

output	Copy
15129	

input	Copy
3 1 3 5	

output	Copy
51	

input	Copy
2 349525 699050	

output	Copy
1099509530625	

Note

In the first sample no operation can be made, thus the answer is 123^2.

In the second sample we can obtain the collection $1, 1, 7$, and $1^2 + 1^2 + 7^2 = 51$.

If x and y are represented in binary with equal number of bits (possibly with leading zeros), then each bit of x AND y is set to 1 if and only if both corresponding bits of x and y are set to 1. Similarly, each bit of x OR y is set to 1 if and only if at least one of the corresponding bits of x and y are set to 1. For example, $x = 3$ and $y = 5$ are represented as 011_2 and 101_2 (highest bit first). Then, x AND $y = 001_2 = 1$, and x OR $y = 111_2 = 7$.

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- Juniors Phase 1 Practice #3 (STL 2)
- Juniors Phase 1 Practice #2 (STL 1)
- Juniors Phase 1 Practice #1 (Prefix sum , Frequency Array)

Juniors Phase 1 Practice #5 (Bitmask, Bitset, Bits)

Finished

Practice

→ About Time Scaling

This contest uses time limits scaling policy (depending on a programming language). The system automatically adjusts time limits by the following multipliers for some languages. Despite scaling (adjustment), the time limit cannot be more than 30 seconds. Read the details by the link.

→ Virtual participation

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Start virtual contest

→ Submit?

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

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