C. Ilya and Matrix

Ilya is a very good-natured lion. He likes maths. Of all mathematical objects, his favourite one is matrices. Now he's faced a complicated matrix problem he needs to solve.

He's got a square $2^n \times 2^n$-sized matrix and 4^n integers. You need to arrange all these numbers in the matrix (put each number in a single individual cell) so that the *beauty* of the resulting matrix with numbers is maximum.

The *beauty* of a $2^n \times 2^n$-sized matrix is an integer, obtained by the following algorithm:

1. Find the maximum element in the matrix. Let's denote it as m.
2. If $n = 0$, then the beauty of the matrix equals m. Otherwise, a matrix can be split into 4 non-intersecting $2^{n-1} \times 2^{n-1}$-sized submatrices, then the beauty of the matrix equals the sum of number m and other four beauties of the described submatrices.

As you can see, the algorithm is recursive.

Help Ilya, solve the problem and print the resulting maximum beauty of the matrix.

Input

The first line contains integer 4^n ($1 \le 4^n \le 2 \cdot 10^6$). The next line contains 4^n integers a_i ($1 \le a_i \le 10^9$) — the numbers you need to arrange in the $2^n \times 2^n$-sized matrix.

Output

On a single line print the maximum value of the beauty of the described matrix.

Please, do not use the `%lld` specifier to read or write 64-bit integers in C++. It is preferred to use the `cin`, `cout` streams or the `%I64d` specifier.

Examples

input
1 13

output
13

input
4 1 2 3 4

output
14

Note

Consider the second sample. You need to arrange the numbers in the matrix as follows:

```
1 2
3 4
```

Then the beauty of the matrix will equal: 4 + 1 + 2 + 3 + 4 = 14.