



CTU Open Contest 2026

Shopping

`shopping.(c|cpp|py), Shopping.(java|kt)`

Míša loves numbers, so he bought n of them from a convenience store. As a true number enthusiast, he wants to find the bitwise OR of all possible subset sums of these numbers.

Formally, let $A = \{a_1, a_2, \dots, a_n\}$ be the multiset of the numbers Míša bought. Míša wants to compute the expression

$$\bigoplus_{S \subseteq A} \left(\sum_{a \in S} a \right)$$

where $\bigoplus$ represents the bitwise OR. Help Míša with this task. Note that the sum for the empty set is 0, i.e., $\sum_{a \in \emptyset} a = 0$.

Input Specification

The first input line contains an integer n ($1 \leq n \leq 10^5$), the number of elements in Míša's multiset A . The second line contains n space-separated integers a_i ($1 \leq a_i \leq 10^{18}$). It is guaranteed that the sum of all elements in A does not exceed 10^{18} .

Output Specification

Output a single integer, the bitwise OR over all possible subset sums of the numbers.

Sample Input 1

2
3 5

Output for Sample Input 1

15

Sample Input 2

3
4 9 13

Output for Sample Input 2

31

Sample Input 3

3
2 9 32

Output for Sample Input 3

43

In the first sample, the subsets are $\{\}, \{3\}, \{5\}, \{3, 5\}$, giving sums 0, 3, 5, 8. In binary, these are $0000_2, 0011_2, 0101_2, 1000_2$, and their bitwise OR is $0000_2 \mid 0011_2 \mid 0101_2 \mid 1000_2 = 1111_2 = 15$.

In the second sample, the subset sums are 0, 4, 9, 13, 17, 22, 26, and their bitwise OR is 31.

In the third sample, the subset sums are 0, 2, 9, 11, 32, 34, 41, 43, and their bitwise OR is 43.