

D. Generating Sets

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

You are given a set Y of n **distinct** positive integers y_1, y_2, \dots, y_n .

Set X of n **distinct** positive integers x_1, x_2, \dots, x_n is said to *generate* set Y if one can transform X to Y by applying some number of the following two operation to integers in X :

1. Take any integer x_i and multiply it by two, i.e. replace x_i with $2 \cdot x_i$.
2. Take any integer x_i , multiply it by two and add one, i.e. replace x_i with $2 \cdot x_i + 1$.

Note that integers in X are not required to be distinct after each operation.

Two sets of distinct integers X and Y are equal if they are equal as sets. In other words, if we write elements of the sets in the array in the increasing order, these arrays would be equal.

Note, that any set of integers (or its permutation) generates itself.

You are given a set Y and have to find a set X that generates Y and the **maximum element of X is minimum possible**.

Input

The first line of the input contains a single integer n ($1 \leq n \leq 50\,000$) — the number of elements in Y .

The second line contains n integers y_1, \dots, y_n ($1 \leq y_i \leq 10^9$), that are guaranteed to be distinct.

Output

Print n integers — set of distinct integers that generate Y and the maximum element of which is minimum possible. If there are several such sets, print any of them.

Examples

input
5 1 2 3 4 5
output
4 5 2 3 1

input
6 15 14 3 13 1 12
output
12 13 14 7 3 1

input
6 9 7 13 17 5 11
output
4 5 2 6 3 1