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PROBLEMS   SUBMIT CODE   MY SUBMISSIONS   STATUS   STANDINGS   CUSTOM INVOCATION

G. Restoring Table

time limit per test: 2 seconds ❓
memory limit per test: 256 megabytes

Recently Polycarpus has learned the "bitwise AND" operation (which is also called "`AND`") of non-negative integers. Now he wants to demonstrate the school IT teacher his superb manipulation with the learned operation.

For that Polycarpus came to school a little earlier and wrote on the board a sequence of non-negative integers $a_1, a_2, ..., a_n$. He also wrote a square matrix b of size $n \times n$. The element of matrix b that sits in the i-th row in the j-th column (we'll denote it as b_{ij}) equals:

- the "bitwise AND" of numbers a_i and a_j (that is, $b_{ij} = a_i \,\&\, a_j$), if $i \neq j$;
- -1, if $i = j$.

Having written out matrix b, Polycarpus got very happy and wiped a off the blackboard. But the thing is, the teacher will want this sequence to check whether Polycarpus' calculations were correct. Polycarus urgently needs to restore the removed sequence of integers, or else he won't prove that he can count correctly.

Help Polycarpus, given matrix b, restore the sequence of numbers $a_1, a_2, ..., a_n$, that he has removed from the board. Polycarpus doesn't like large numbers, so any number in the restored sequence mustn't exceed 10^9.

Input

The first line contains a single integer n ($1 \leq n \leq 100$) — the size of square matrix b. Next n lines contain matrix b. The i-th of these lines contains n space-separated integers: the j-th number represents the element of matrix b_{ij}. It is guaranteed, that for all i ($1 \leq i \leq n$) the following condition fulfills: b_{ii} = -1. It is guaranteed that for all i, j ($1 \leq i, j \leq n; i \neq j$) the following condition fulfills: $0 \leq b_{ij} \leq 10^9$, $b_{ij} = b_{ji}$.

Output

Print n non-negative integers $a_1, a_2, ..., a_n$ ($0 \leq a_i \leq 10^9$) — the sequence that Polycarpus wiped off the board. Separate the numbers by whitespaces.

It is guaranteed that there is sequence a that satisfies the problem conditions. If there are multiple such sequences, you are allowed to print any of them.

Examples

input	Copy
1	
-1	

output	Copy
0	

input	Copy
3	
-1 18 0	
18 -1 0	
0 0 -1	

output	Copy
18 18 0	

input	Copy
4	
-1 128 128 128	
128 -1 148 160	
128 148 -1 128	
128 160 128 -1	

output	Copy
128 180 148 160	

Note

If you do not know what is the "bitwise AND" operation please read:
`http://en.wikipedia.org/wiki/Bitwise_operation`.

ICPC Assiut University Training - Juniors Phase 1 Sheets-2022

Public

Participant

⭐

→ **Group Contests** ⌄

- Juniors Phase 1 Practice #5 (Bitmask, Bitset, Bits)
- Juniors Phase 1 Practice #4 (Binary search , Two pointers)
- Juniors Phase 1 Practice #3 (STL 2)
- Juniors Phase 1 Practice #2 (STL 1)
- Juniors Phase 1 Practice #1 (Prefix sum , Frequency Array)

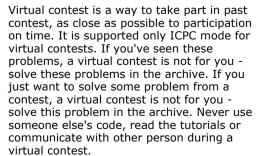**Juniors Phase 1 Practice #5 (Bitmask, Bitset, Bits)**

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** ⌄

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ **Submit?**

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