

C. Bits

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Let's denote as the number of bits set ('1' bits) in the binary representation of the non-negative integer x .

You are given multiple queries consisting of pairs of integers l and r . For each query, find the x , such that $l \leq x \leq r$, and is maximum possible. If there are multiple such numbers find the smallest of them.

Input

The first line contains integer n — the number of queries ($1 \leq n \leq 10000$).

Each of the following n lines contain two integers l_i, r_i — the arguments for the corresponding query ($0 \leq l_i \leq r_i \leq 10^{18}$).

Output

For each query print the answer in a separate line.

Examples

| input |
|-------------------------|
| 3 1 2 2 4 1 10 |
| output |
| 1 3 7 |

Note

The binary representations of numbers from 1 to 10 are listed below:

$$1_{10} = 1_2$$

$$2_{10} = 10_2$$

$$3_{10} = 11_2$$

$$4_{10} = 100_2$$

$$5_{10} = 101_2$$

$$6_{10} = 110_2$$

$$7_{10} = 111_2$$

$$8_{10} = 1000_2$$

$$9_{10} = 1001_2$$

$$10_{10} = 1010_2$$