PROBLEMS   SUBMIT CODE   MY SUBMISSIONS   STATUS   HACKS   ROOM   STANDINGS   CUSTOM INVOCATION

B. Friendly Arrays

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

You are given two arrays of integers — $a_1, \ldots, a_n$ of length n, and $b_1, \ldots, b_m$ of length m. You can choose any element b_j from array b ($1 \le j \le m$), and for **all** $1 \le i \le n$ perform $a_i = a_i | b_j$. You can perform any number of such operations.

After all the operations, the value of $x = a_1 \oplus a_2 \oplus \ldots \oplus a_n$ will be calculated. Find the minimum and maximum values of x that could be obtained after performing any set of operations.

Above, $|$ is the bitwise OR operation, and $\oplus$ is the bitwise XOR operation.

Input

The first line contains a single integer t ($1 \le t \le 10^4$) — the number of test cases. This is followed by the description of the test cases.

The first line of each test case contains two integers n and m ($1 \le n, m \le 2 \cdot 10^5$) — the sizes of arrays a and b.

The second line of each test case contains n integers $a_1, a_2, \ldots, a_n$ ($0 \le a_i \le 10^9$) — the array a.

The third line of each test case contains m integers $b_1, b_2, \ldots, b_m$ ($0 \le b_i \le 10^9$) — the array b.

It is guaranteed that the sum of values of n and m across all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output 2 numbers: the minimum and maximum possible values of x after performing any set of operations.

Example

input

```
2
2 3
0 1
1 2 3
3 1
1 1 2
1
```

output

```
0 1
2 3
```

Note

In the first test case, if we apply the operation with element $b_1 = 1$, the array a will become $[1, 1]$, and x will be 0. If no operations are applied, then $x = 1$.

In the second test case, if no operations are applied, then $x = 2$. If we apply the operation with $b_1 = 1$, then $a = [1, 1, 3]$, and $x = 3$.

CodeTON Round 6 (Div. 1 + Div. 2, Rated, Prizes!)

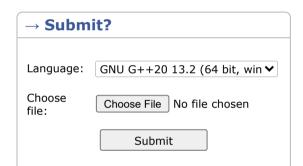**Finished**

Practice

⭐

→ 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

→ Clone Contest to Mashup ⌄

You can clone this contest to a mashup.

Clone Contest

→ Submit?

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

Choose file: Choose File   No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
233486833	Nov/19/2023 21:31	Accepted
233486711	Nov/19/2023 21:30	Runtime error on test 2
233486530	Nov/19/2023 21:28	Wrong answer on test 1

→ Problem tags

bitmasks   greedy   math   *1200

No tag edit access

→ Contest materials

- Announcement   ✕
- Tutorial   ✕

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