Problem K. Killing Bits

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	512 megabytes

You are given two arrays a and b, both consisting of n non-negative integers. You can perform the following operation on the array a an arbitrary number of times (possibly, zero):

- First, you select a permutation p of $0, 1, \ldots, n-1$;
- Then, for each $1 \le i \le n$, you set a_i to $a_i \,\&\, p_i$. Here, & denotes the bitwise AND operation.

You have to determine whether it is possible to transform a into b.

Input

The input consists of multiple test cases. The first line contains an integer t ($1 \le t \le 10^4$), the number of test cases. For each test case:

- The first line contains a single integer n ($1 \le n \le 5 \cdot 10^4$), which is the length of arrays a and b.
- The second line contains n integers $a_1, a_2, \ldots, a_n$ ($0 \le a_i \le n-1$), which are the elements of a.
- The third line contains n integers $b_1, b_2, \ldots, b_n$ ($0 \le b_i \le n-1$), which are the elements of b.

It is guaranteed that the sum of n over all test cases does not exceed $5 \cdot 10^4$.

Output

For each test case, print "`Yes`" in a single line if it is possible to transform a into b. Otherwise, print "`No`".

You can output the answer in any case (upper or lower). For example, the strings "`yEs`", "`yes`", "`Yes`", and "`YES`" will be recognized as positive responses.

Example

standard input	standard output
4 3 0 1 2 2 1 0 5 1 0 1 3 4 0 0 1 1 4 8 1 2 3 4 5 6 7 7 1 2 3 4 5 6 7 7 8 7 7 7 7 7 7 7 7 1 2 3 4 5 6 7 7	No Yes Yes No

Note

In the first test case, we need to use at least one operation to transform a into b. Note that $a_1 \,\&\, p_1$ is always 0 because $a_1 = 0$. However, $b_1 > 0$, so it is impossible to make $a_1 = b_1$, no matter how the permutations are selected during the operations.

In the second test case, you can select $p = [2, 0, 3, 1, 4]$. After this operation, a is transformed into b.

In the third test case, $a = b$, so we do not need any operations.