

# 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  $0, 1, \dots, n - 1$ ;
- Then, for each  $1 \leq i \leq n$ , 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  $t$  ( $1 \leq t \leq 10^4$ ), the number of test cases. For each test case:

- The first line contains a single integer  $n$  ( $1 \leq n \leq 5 \cdot 10^4$ ), which is the length of arrays  $a$  and  $b$ .
- The second line contains  $n$  integers  $a_1, a_2, \dots, a_n$  ( $0 \leq a_i \leq n - 1$ ), which are the elements of  $a$ .
- The third line contains  $n$  integers  $b_1, b_2, \dots, b_n$  ( $0 \leq b_i \leq n - 1$ ), 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	No
3	Yes
0 1 2	Yes
2 1 0	No
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	

## 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.