

Problem H. XOR Subsequence

Input file: standard input
Output file: standard output
Time limit: 3 seconds
Memory limit: 512 megabytes

Alice used to have a sequence a_1, \dots, a_n , but she has forgotten about it now. Fortunately, she noticed that she had calculated the XOR sum for each non-empty subsequence of the sequence and obtained $2^n - 1$ results, but their order was disrupted.

Now she hopes you can help restore the sequence. If there are multiple possible sequences, please tell her the sequence with the **smallest lexicographical order**, or report there is no correct sequence.

Input

The first line contains a single integer T ($1 \leq T \leq 5000$), denoting the number of test cases.

For each test case, the first line contains an integer n ($1 \leq n \leq 18$).

The next line contains $2^n - 1$ non-negative integers strictly less than 2^{30} , denoting the results.

It is guaranteed that the sum of 2^n over all test cases does not exceed 2^{20} .

Output

For each test case, output one line. If there is no correct sequence, output -1 ; otherwise, output n integers denoting the answer.

Example

standard input	standard output
3	1 2 4
3	0 0 1
1 2 3 4 5 6 7	-1
3	
1 0 1 0 1 0 1	
3	
1 2 3 4 5 6 6	