Where Proofless Assumption Fails

Observe the Patterns,

Your assumptions might DO.

But, what will be your approach,

When there will be no CLUE…..?

--- XUDOKU

XOXO_Bunnyface is learning Bit masking. While watching the tutorials on Bit masking with his friend *George Boole*, an idea came upon the mind of *George*. As being the inventor of the Boolean algebra, *George Boole* invented a game to trick *XOXO,* who always prefer assumptions than proof.

George named the game as ***XUDOKU***. The game consists of a ***3*N matrices***. Where 3 is the constant number of rows and N is the number of columns. Initially the first row is filled with N integers. To win the tricky game, *XOXO* have to fill the remaining two rows with some integers in such a way that, the following conditions are true.

1. $X_{(3,i)} = X_{(1,i)} \oplus X_{(2,i)}$; for all i (1<=i<=N).
2. $X_{(3,i)} = X_{(3,i+1)} \,\&\, X_{(3,i)}$; for all i (1<=i<=N-1).
3. The number sequence of the 2nd row should be **lexicographically smallest**.
4. The number sequence of the 3rd row should be **non-decreasing.**

($X_{(i,\ j)}$ means the j-th element of the i-th row of the XUDOKU matrices).

Input

The first line contains G (1<=G<=1000), the number of games to be played.

The second line contains N ($2 <= N <= 2*10^5$), the width of the XUDOKU board. I.e. number of columns.

The Third line contains N integers of the First row. $X_{(1,\ j)}$ ($0 <= X_{(1,\ j)} < 2^{30}$)

Output

On each G, you have to print the output in the following manner.

Game #G_i

$X_{(1,i)}$ $X_{(1,i+1)}$ $X_{(1,i+2)}$ $X_{(1,i+3)}$ $X_{(1,i+4)}$ …….. $X_{(1, N)}$

$X_{(2,i)}$ $X_{(2,i+1)}$ $X_{(2,i+2)}$ $X_{(2,i+3)}$ $X_{(2,i+4)}$ …….. $X_{(2, N)}$

$X_{(3,i)}$ $X_{(3,i+1)}$ $X_{(3,i+2)}$ $X_{(3,i+3)}$ $X_{(3,i+4)}$ …….. $X_{(3, N)}$

Samples:

Input:

3

4

9 3 7 13

8

18 6 3 2 4 0 0 4

4

16 18 17 14

Output:

Game #1

9 3 7 13

0 8 8 2

9 11 15 15

Game #2

18 6 3 2 4 0 0 4

0 16 20 21 19 23 23 19

18 22 23 23 23 23 23 23

Game #3

16 18 17 14

0 0 2 17

16 18 19 31