

AND Rounds

You are given a cyclic array A having N numbers. In an AND round, each element of the array A is replaced by the bitwise AND of itself, the previous element, and the next element in the array. All operations take place simultaneously. Can you calculate A after K such AND rounds ?

Input

The first line contains the number of test cases T ($T \leq 50$).

There follow $2T$ lines, 2 per test case. The first line contains two space separated integers N ($3 \leq N \leq 20000$) and K ($1 \leq K \leq 1000000000$). The next line contains N space separated integers A_i ($0 \leq A_i \leq 1000000000$), which are the initial values of the elements in array A .

Output

Output T lines, one per test case. For each test case, output a space separated list of N integers, specifying the contents of array A after K AND rounds.

Example

Sample Input:

```
2
3 1
1 2 3
5 100
1 11 111 1111 11111
```

Sample Output:

```
0 0 0
1 1 1 1 1
```