G. Even-Odd XOR

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Given an integer n, find any array a of n **distinct** nonnegative integers less than 2^{31} such that the bitwise XOR of the elements on odd indices equals the bitwise XOR of the elements on even indices.

Input

The first line of the input contains an integer t ($1 \le t \le 629$) — the number of test cases.

Then t lines follow, each containing a single integer n ($3 \le n \le 2 \cdot 10^5$) — the length of the array.

It is guaranteed that the sum of n over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output one line containing n distinct integers that satisfy the conditions.

If there are multiple answers, you can output any of them.

Example

input
7
8
3
4
5
6
7
9

output
4 2 1 5 0 6 7 3
2 1 3
2 1 3 0
2 0 4 5 3
4 1 2 12 3 8
1 2 3 4 5 6 7
8 2 3 7 4 0 5 6 9

Note

In the first test case the XOR on odd indices is $4 \oplus 1 \oplus 0 \oplus 7 = 2$ and the XOR on even indices is $2 \oplus 5 \oplus 6 \oplus 3 = 2$.