

```
#####C++/Rust/Pascal 2#####4#
#####C++/Rust/Pascal 512 M#####1024 M
Special Judge, 64bit IO Format: %lld
```

#####

Given an integer  $N$ , you need to construct a permutation  $P$  of integers from  $0$  to  $N - 1$  such that for all  $1 \leq i < N$ ,  $P_i \oplus P_{i+1}$  is a prime number. Here,  $\oplus$  denotes the bitwise XOR operation.

#####:

The first line contains an integer  $T$  ( $1 \leq T \leq 2 \times 10^5$ ), the number of test cases.

For each test case, there is a single integer  $N$  ( $1 \leq N \leq 10^6$ ).

It is guaranteed that the sum of  $N$  across all test cases does not exceed  $10^6$ .

#####:

For each test case:

If a valid permutation exists, output a single line containing  $N$  space-separated integers representing the permutation  $P$ .

If no such permutation exists, output  $-1$ .

#####1

```
##
2
4
5

##
3 1 2 0
```

C++2clang++18

1

ACM

#####

#####

###

#####

#####