Up-Down Sequence

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

For a given integer N, determine whether there exists a permutation $P = (p_1, p_2, \ldots, p_N)$ of the integers $(1, 2, \ldots, N)$ that satisfies the following condition.

Let an index triple (i, j, k) be any triple of indices such that $1 \leq i < j < k \leq N$.

- The number of index triples (i, j, k) for which $p_i < p_j < p_k$ (a strictly increasing triple) is equal to the number of index triples (i, j, k) for which $p_i > p_j > p_k$ (a strictly decreasing triple).

If such a permutation exists, construct and output any one of them. If no such permutation exists, output -1.

You are given T test cases to solve.

Input

The input is given in the following format:

T
case_1
case_2
$\vdots$
case_T

Each test case is given in the following format:

N

- $1 \leq T \leq 5 \times 10^5$
- $3 \leq N \leq 5 \times 10^5$
- The sum of N over all test cases does not exceed 5×10^5.
- All input values are integers.

Output

For each test case, if no such permutation exists, print -1. Otherwise, print N space-separated integers representing the elements of the permutation P. If there are multiple such permutations, any of them will be accepted.

Example

standard input	standard output
2 3 4	1 3 2 2 4 1 3

Note

In the first test case, $N = 3$. One possible valid permutation is $(1, 3, 2)$. There is exactly one index triple $(1, 2, 3)$, whose corresponding values are $(1, 3, 2)$. This triple is neither strictly increasing nor strictly decreasing. Therefore, the number of increasing triples is 0 and the number of decreasing triples is 0, so the condition is satisfied.

In the second test case, $N = 4$. One possible valid permutation is $(2, 4, 1, 3)$. The index triples are

$$(1, 2, 3),\ (1, 2, 4),\ (1, 3, 4),\ \text{and}\ (2, 3, 4).$$

For each of these triples, the corresponding values are neither strictly increasing nor strictly decreasing. Thus, both the number of increasing triples and the number of decreasing triples are 0, and the condition is satisfied.