The Absolute MEX Challenge

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Given n, please construct a permutation* p of length n such that $\text{MEX}^\dagger(\{|p_1 - 1|, |p_2 - 2|, \ldots, |p_n - n|\}) \geq n - 1$.

*A permutation is a sequence of integers from 1 to n of length n containing each number exactly once. For example, $[2, 1, 3]$ is a permutation, but $[2, 1, 2]$ and $[2, 1, 4]$ are not.

†The minimum excluded (MEX) of a set of integers is the smallest non-negative integer that does not appear in the set. For example, $\text{MEX}(\{1, 2, 3\}) = 0$ and $\text{MEX}(\{2, 9, 0, 1\}) = 3$.

Input

The first line contains a single integer t $(1 \leq t \leq 1000)$ — the number of test cases.

Each test case consists of a single integer n $(1 \leq n \leq 3 \cdot 10^5)$.

It is guaranteed that the sum of n over all test cases does not exceed $3 \cdot 10^5$.

Output

For each test case, print n integers — a permutation that satisfies the aforementioned condition or -1 if no such permutation exists. If there are multiple solutions, output any.

Example

standard input	standard output
3 8 5 6	6 8 5 4 2 7 3 1 5 2 4 1 3 4 6 1 3 5 2

Note

In the first test case, for $n = 8$, a possible permutation is $[6, 8, 5, 4, 2, 7, 3, 1]$. The absolute differences are $\{|6-1|, |8-2|, |5-3|, |4-4|, |2-5|, |7-6|, |3-7|, |1-8|\} = \{5, 6, 2, 0, 3, 1, 4, 7\}$. The MEX of this set is $8 \geq n - 1 = 7$.

In the second test case, for $n = 5$, a possible permutation is $[5, 2, 4, 1, 3]$. The absolute differences are $\{|5-1|, |2-2|, |4-3|, |1-4|, |3-5|\} = \{4, 0, 1, 3, 2\}$. The MEX of this set is $5 \geq n - 1 = 4$.

In the third test case, for $n = 6$, a possible permutation is $[4, 6, 1, 3, 5, 2]$. The absolute differences are $\{|4-1|, |6-2|, |1-3|, |3-4|, |5-5|, |2-6|\} = \{3, 4, 2, 1, 0, 4\}$. The MEX of this set is $5 \geq n - 1 = 5$.