Problem D – Doubled Sequence II

Let's be direct. No stories, no worries. You will be given an integer n and you must determine if there is a sequence a of length $2n$ such that:

- Each value from 1 to n occurs exactly twice in a.

- For each $i = 1, \ldots, n$, the distance between both of its occurrences is exactly $i + 1$. This is, let L_i and R_i be the leftmost and rightmost occurrence of i, respectively. Then, $R_i - L_i = i + 1$.

If there is at least one sequence, print it. Otherwise, print -1.

Input

The first line contains an integer t $(1 \leq t \leq 10^5)$ — The number of testcases.

The following t lines contain an integer n_i $(1 \leq n_i \leq 10^6)$ — The value of n of the i-th query.

It is guaranteed that the sum of n_i doesn't exceed $2 \cdot 10^6$.

Output

For each query, print a single line — Print -1 if there is no sequence that holds the conditions or $2n$ integers separated by a space representing a valid sequence.

Sample input 1	Sample output 1
5	-1
1	-1
2	2 3 1 2 1 3
3	2 3 4 2 1 3 1 4
4	1 5 1 6 3 7 4 5 3 2 6 4 2 7
7	