Amidakuji

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 megabytes

You are given a positive integer N. Construct a sequence of permutations of $(1, 2, \cdots, N)$, $p_1, p_2, \ldots, p_K$, that satisfy following conditions, or report that it's impossible.

- $0 \leq K \leq \lceil \log_2 N \rceil + 1$, where K is the length of the sequence.
- $p_1, p_2, \ldots, p_K$ are permutations of $(1, 2, \ldots, N)$. In other words, they are bijections from $\{1, 2, \ldots, N\}$ to $\{1, 2, \ldots, N\}$.
- For all x and y $(1 \leq x, y \leq N)$, there is a sequence of bijections $q_1, q_2, \ldots, q_K$ such that $(q_K \circ q_{K-1} \circ \cdots \circ q_1)(x) = y$ and $q_i = p_i$ or p_i^{-1} for all i.

Here, $\circ$ denotes function composition, and when $K = 0$, $q_K \circ q_{K-1} \circ \cdots \circ q_1$ is defined as an identity function.

Input

Input is given from Standard Input in the following format:

N

Constraints:

- $1 \leq N \leq 1000$

Output

If there is no solution, print -1. Otherwise, print the answer in the following format:

K

$p_{1,1}\ p_{1,2}\ \cdots\ p_{1,N}$

$\vdots$

$p_{K,1}\ p_{K,2}\ \cdots\ p_{K,N}$

Here, $p_{i,j}$ must be a value of $p_i(j)$.

If there are multiple solutions, you can print any of them.

Examples

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

Note

Consider the example 1. For example, for $x = 2, y = 1$, we can set $q_1 = p_1, q_2 = p_2^{-1}, q_3 = p_3$ and get $q_3(q_2(q_1(2))) = 1$.