Parallel Processing (Easy)

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

This is the easy version of the problem. The only difference between two versions is the constraint of N.

You are given a mysterious monoid $(M, \oplus)$ and 4 CPUs to compute it.

Compute the cumulative $\oplus$ of a sequence $A = (A_1, A_2, \ldots, A_N)$ of M in parallel using 4 CPUs, minimizing the number of operations.

Statement

You are given an integer N. Write a program in a custom language to do the following and minimize the number of instructions in your program.

Specification

This program can handle 2004 variables $A[1], A[2], \ldots, A[2000], C_1, C_2, C_3, C_4$. Each variable can hold a sequence of integers, and $A[i]$ $(1 \leq i \leq 2000)$ is initialized to $A[i] = (i)$. (Here (i) denotes an integer sequence consisting of one i.)

At the end of the execution, the following condition must be satisfied:

- For each of $i = 1, 2, ..., N$, $A[i] = (1, 2, ..., i)$ holds.

Format

The first line of the program contains an integer L representing the number of instructions in the program.

The L instructions are written in 4 lines per instruction from the 2nd to the $(4L + 1)$-th lines, and are executed sequentially from top to bottom.

Each instruction is written as 12 integers $c_1, a_1, b_1, c_2, a_2, b_2, c_3, a_3, b_3, c_4, a_4, b_4$, where each integer must be between 1 and 2000 (inclusive).

For each instruction, the following operations are performed in order:

1. Assigns $\text{concat}(A[a_1], A[b_1])$ to C_1.

2. Assigns $\text{concat}(A[a_2], A[b_2])$ to C_2.

3. Assigns $\text{concat}(A[a_3], A[b_3])$ to C_3.

4. Assigns $\text{concat}(A[a_4], A[b_4])$ to C_4.

5. Assigns C_1 to $A[c_1]$.

6. Assigns C_2 to $A[c_2]$.

7. Assigns C_3 to $A[c_3]$.

8. Assigns C_4 to $A[c_4]$.

Here, $\text{concat}(x, y)$ denotes the sequence obtained by concatenating the sequences x and y in that order.

Input

The input is given in the following format:

N

- All values in the input are integers.

- $2 \leq N \leq 16$

Output

Let L be the minimum number of instructions. Output in the following format:

L
op_1
op_2
$\vdots$
op_L

op_i $(1 \leq i \leq L)$ represents the i-th operation and should be output in the following format:

c_1 a_1 b_1
c_2 a_2 b_2
c_3 a_3 b_3
c_4 a_4 b_4

Here, each integer must be between 1 and 2000.

Examples

standard input	standard output
2	1
	2 1 2
	2000 2000 2000
	2000 2000 2000
	2000 2000 2000
4	2
	2 1 2
	4 3 4
	2000 2000 2000
	2000 2000 2000
	3 2 3
	4 2 4
	2000 2000 2000
	2000 2000 2000

Note

In the first example, the first operation changes $A[2]$ to $(1, 2)$ and $A[2000]$ to $(2000, 2000)$. At the end of the execution, $A[1] = (1)$ and $A[2] = (1, 2)$, which satisfies the specification.