H • Fully Diversified Sequences of Sets

Problem

Given a positive integer *n*, let *N* be the set of integers from 1 to *n*. A finite sequence *A1*, …, *Ak* of subsets of *N* is ***fully diversified*** if:

a. Each subset *Ai* has an even number of elements.
b. For each element *m* in *N*, there are exactly *m* sets *Ai* in the sequence with *m* as a member.

For example, the sequence of subsets {1,3}, {2,3}, {2,3} is a fully diversified sequence of subsets of {1,2,3}. (Note that subsets in the sequence may be the same.)

A fully diversified sequence of subsets of *N* is ***minimal*** if no other fully diversified sequence of subsets of *N* has a smaller sequence count. The example above is minimal since the element 3 must occur in 3 different sets.

Write a program, which, given an integer *n*, determines whether there is a fully diversified sequence of subsets of the corresponding set *N* and, if there is a fully diversified sequence, finds a minimal fully diversified sequence of subsets of *N*.

Input

The input will be a sequence of positive integers *n*, one per line followed by a zero (0) (on another line) indicating the end of the input.

Output

If there is no fully diversified sequence of subsets of the corresponding set *N*, output a 0 on one line followed by a blank line.

If there is a fully diversified sequence of subsets of the corresponding set *N*, output the number of sets in your minimal sequence on one line, followed by the sets, one per line, followed by a blank line.

The elements of each set should be output in increasing order with a single space between numbers. The sets of sequences should be output in lexicographical order. There may be many possible solutions to each problem.

Example

Input	Output
8 9 11 17 23 0	8 1 3 5 6 7 8 2 4 5 6 7 8 2 4 5 6 7 8 3 4 5 6 7 8 3 4 5 6 7 8 6 8 7 8 7 8 0 Output (continued) 11 1 5 7 8 9 11 2 5 7 8 10 11 2 5 7 8 10 11 3 5 7 9 10 11 3 6 7 9 10 11 3 6 7 9 10 11 4 6 8 9 10 11 4 6 8 9 10 11 4 6 8 9 10 11 4 6 8 9 10 11 5 7 8 9 10 11 0 23 1 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 5 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 9 11 12 13 14 15 16 17 18 19 20 21 22 23 10 11 12 13 14 15 16 17 18 19 20 21 22 23 10 11 12 13 14 15 16 17 18 19 20 21 22 23 12 13 14 15 16 17 18 19 20 21 22 23 13 15 16 17 18 19 20 21 22 23 14 15 16 17 18 19 20 21 22 23 14 15 16 17 18 19 20 21 22 23 16 17 18 19 20 21 22 23 17 19 20 21 22 23 18 19 20 21 22 23 18 19 20 21 22 23 20 21 22 23

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