

Jump Cycle

Input file: *standard input*
Output file: *standard output*
Time limit: 3 seconds
Memory limit: 1024 mebibytes

You are given a positive even integer n . Consider an $n \times n$ grid whose rows and columns are both numbered from 1 to n . The cell in row r and column c is denoted (r, c) .

Your task is to arrange all n^2 cells of the grid into a sequence $p_1, p_2, \dots, p_{n^2}$ in which every cell appears exactly once such that, with the convention $p_{n^2+1} = p_1$, for every i from 1 to n^2 , the cells p_i and p_{i+1} lie in the same row or in the same column and satisfy

$$|r_i - r_{i+1}| + |c_i - c_{i+1}| = ((i - 1) \bmod 4) + 1,$$

where $p_i = (r_i, c_i)$ and $p_{i+1} = (r_{i+1}, c_{i+1})$.

In other words, the sequence should be a closed tour of length n^2 visiting every cell once, each move is horizontal or vertical, and the move lengths form a sequence $1, 2, 3, 4, 1, 2, 3, 4, \dots$ repeating cyclically, including the final move from p_{n^2} back to p_1 .

If such a sequence exists, output any one of them.

Input

The first line contains a single even integer n ($4 \leq n \leq 200$).

Output

If no valid sequence exists, print a single line containing NO.

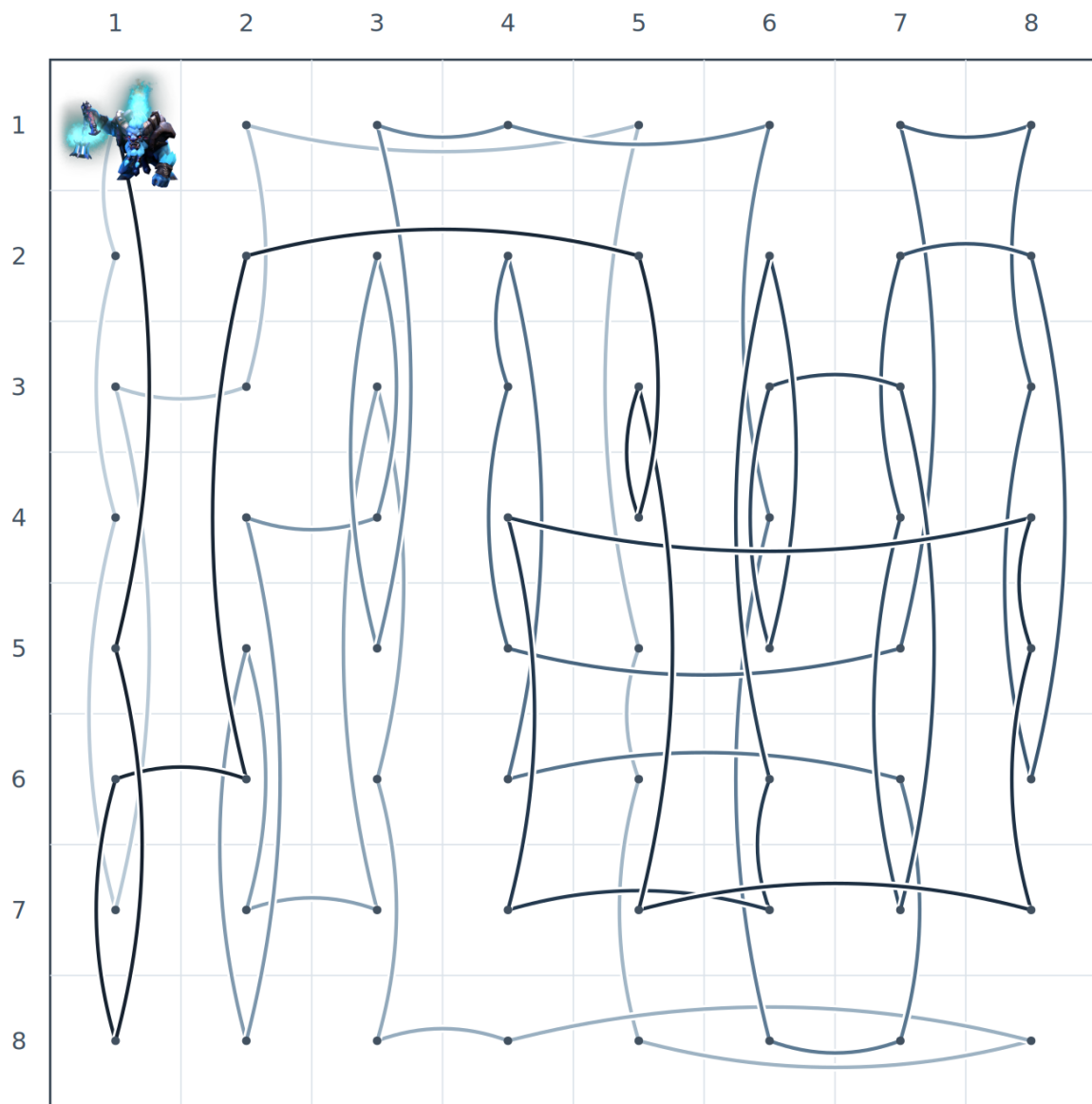
Otherwise, print YES on the first line, and then print n lines containing n integers each. The j -th column of the i -th row should contain one integer k such that, in your answer, p_k is the cell (i, j) .

If there are multiple valid answers, print any one of them.

Example

<i>standard input</i>	<i>standard output</i>
8	YES 1 7 25 26 8 27 37 38 2 60 23 33 59 48 42 41 5 6 16 34 57 46 45 39 3 21 22 52 58 28 43 53 64 19 24 35 9 47 36 54 62 61 15 32 10 49 31 40 4 18 17 51 56 50 44 55 63 20 14 13 11 29 30 12

Note



move 1 (light)

move 64, back to the start (dark)