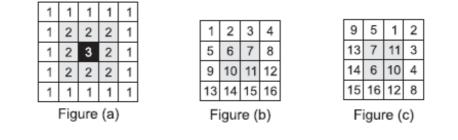
# **Rotating Rings**

Any square grid can be viewed as one or more rings, one inside the other. For example, as shown in figure (a), a  $5 \times 5$  grid is made of three rings, numbered 1, 2 and 3 (from outside to inside.) A square grid of size N is said to be sorted, if it includes the values from 1 to N^2 in a row-major order, as shown in figure (b) for N = 4. We would like to determine if a given square grid can be sorted by only rotating its rings. For example, the grid in figure (c) can be sorted by rotating the first ring two places counter-clockwise, and rotating the second ring one place in the clockwise direction.



### Input

Your program will be tested on one or more test cases. The first input line of a test case is an integer N which is the size of the grid. N input lines will follow, each line made of N integer values specifying the values in the grid in a row-major order. Note than 0

The end of the test cases is identified with a dummy test case with N = 0.

# Output

For each test case, output the result on a single line using the following format:

k. result

Where k is the test case number (starting at 1,) and result is "YES" or "NO" (without the double quotes.) and single space between "." and "result".

## Sample

#### Output:

1. YES 2. NO