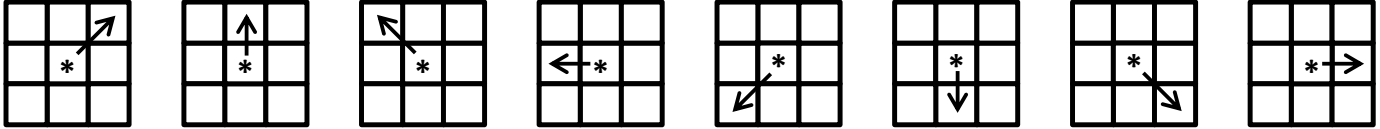


Rotating Walk in Matrix

We are given a square matrix of $n \times n$ cells. A rotating walk in the matrix is walk that starts form the top left corner of the matrix and goes in down-right direction. When no continuation is available at the current direction (either the matrix wall or non-empty cell is reached), the direction is changed to the next possible clockwise. The eight possible directions are as follows:



When no empty cell is available at all directions, the walk is restarted from an empty cell at the smallest possible row and as close as possible to the start of this row. When no empty cell is left in the matrix, the walk is finished.

Your task is to write a program that reads from the console an integer number n ($1 \leq n \leq 100$) and displays the filled matrix on the console.

The input data will be correct and it is not required to check it explicitly.

Sample input

$n = 6$

Sample output

| | | | | | |
|----|----|----|----|----|----|
| 1 | 16 | 17 | 18 | 19 | 20 |
| 15 | 2 | 27 | 28 | 29 | 21 |
| 14 | 31 | 3 | 26 | 30 | 22 |
| 13 | 36 | 32 | 4 | 25 | 23 |
| 12 | 35 | 34 | 33 | 5 | 24 |
| 11 | 10 | 9 | 8 | 7 | 6 |